

The Results Are In! How Power Computing's Clone Stacks Up

AUGUST 1995 / \$3.95

MacUser

ZD ZIFF-DAVIS PUBLISHING COMPANY

Superfast PowerPC Chip

New Power Mac

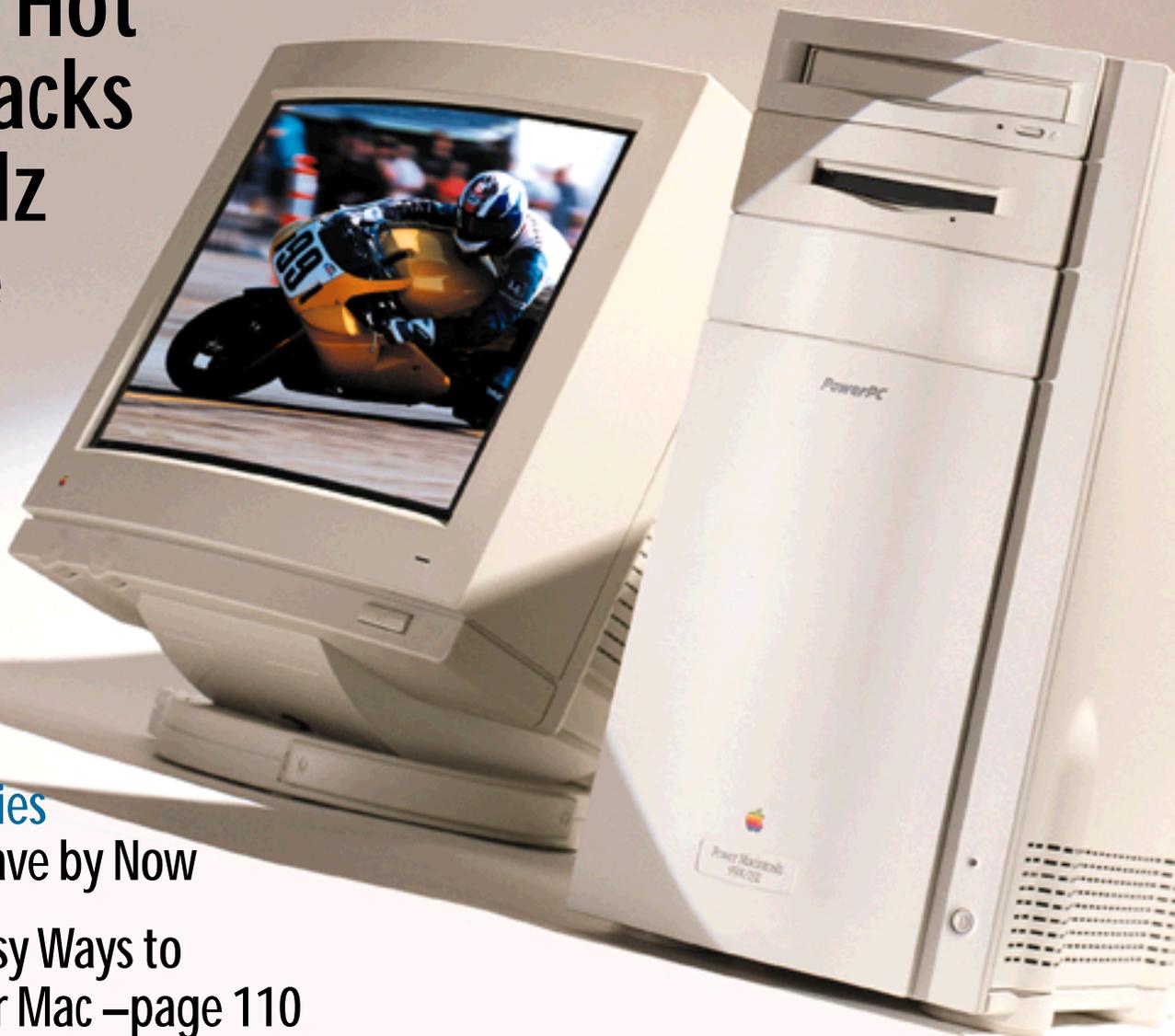
Apple's Hot
9500 Packs
132 MHz
of Pure
Speed

PLUS

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You Should Have by Now

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Cover photo / Fred Stimson

Screen image / Photo of A.M.A. Superbike racer Al Salaverria by Patrick E. Dickinson

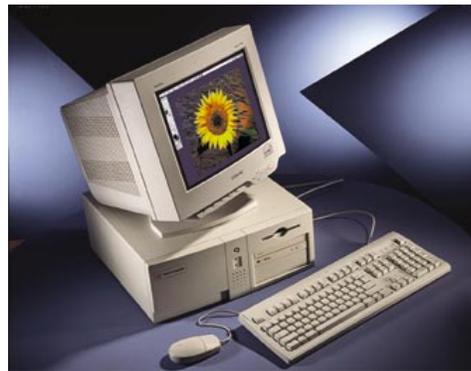
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Alchemy 3.0 The latest version of this sound-editing software supports 16-bit sound directly on Power Macs and AV Macs. / 61

ScanPartner Jr. Bargain-priced compact scanner excels at scanning letters, fliers, and legal documents but is otherwise limited. / 63

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MacLinkPlus 8.0 Premier file-translation tool now supports hundreds of programs. / 67

Hewlett-Packard ScanJet 3c This zippy 600-dpi color flatbed scanner does double duty as a photocopier. / 52

TurboCAD for Macintosh Awkward interface aside, this CAD program delivers basic CAD features at a reasonable price. / 53

OneWorld Internet Innovative hardware/software combo simplifies Internet access for small businesses. / 54



52 / A scanner and a photocopier.

COVER STORY

The Power Macintosh 9500

New top-of-the-line Mac features a new PPC chip, a new bus, and a new System 7.



APPLE'S IMPLEMENTATION of the industrywide PCI bus standard in its Power Mac 9500 is good news for anyone looking for wicked-fast throughput. Add in the long-awaited PowerPC 604 chip, and you've got a box that lives up to its billing as Apple's fastest-ever computer. Even though it's priced aggressively, trading up to a 9500 will require some serious planning, because everything about this Mac is new — from memory to add-in cards. BY CHERYL ENGLAND / 68



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The Desktop Publisher's Toolkit

WHETHER YOU'RE A NOVICE OR A PRO, using the right DTP tools can spell the difference between a professional-looking publication and a design disaster. This collection of over 40 tools — from file converters to preflight tools — should ensure that you get the job done right, from start to finish. BY AILEEN ABERNATHY / 82

The Ultimate Utility Belt

IT'S UTILITIES THAT MAKE LIFE WITH A MAC a personal adventure, letting you configure your Mac just the way you like it. Here we present the best of the best utilities no Mac user should be without. BY GREGORY WASSON / 92



Quick Labs



PROBLEM: CAN'T KEEP UP with all the great products introduced each month. Solution: Quick Labs, a monthly bulletin of lab results on the latest printers, monitors, and storage systems. / 96

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SEND PRODUCT INFORMATION to Jason Snell (News) and send new products to Kristin M. Balleisen (Reviews) at *MacUser*, 950 Tower Lane, 18th Floor, Foster City, CA 94404.

LETTERS

Net Worth

THANK YOU FOR YOUR special report on the Internet ("Making the Internet Connection," May '95, page 66). I especially liked how you included Internet addresses and didn't simply name-drop, allowing us to explore the I-way ourselves. Michael Swaine's ongoing column Net Traveler is great reading too.

Rick Rudge
rudge@cup.portal.com

I WAS LOOKING for an economical way to get on the Net but had no idea where to begin. Now I have a basic setup, with e-mail and Usenet news. With the help of your article, I chose the right path for me to get online! Thanks.

Artie Evans
artie@clark.net

ADAM C. ENGST suggests America Online as the appropriate online service for teachers, but Delphi would have been a much better choice. It offers text-based World Wide Web access, ftp, Gopher, WAIS, and Telnet, with graphic access coming soon. You knock eWorld for chopping messages into 7K chunks, but AOL also segments its messages, although into larger chunks. Delphi doesn't split any incoming mail. For the example you gave, Delphi (with its pricing of 20 free hours for \$20 a month, extra hours \$1.80 each) would have also been cheaper than AOL.

Theresa London
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WRITE TO LETTERS

c/o MacUser
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To send your letter electronically via the Internet, MCI Mail, CompuServe, or ZiffNet/Mac (our on-line service), see How to Reach Us. All letters become the property of MacUser, and we reserve the right to edit any letters we print. Include a return address and a daytime phone number. If you write to us on-line, please specify whether you want your electronic address printed.

/ For the purposes of the article, we assumed that Mac users were not interested in learning or navigating arcane and confusing command-line or character-based interfaces. For the time being, Delphi falls squarely into that category. You are right about Delphi's Internet offerings and pricing. Allow me to recommend the ideal companion machine for accessing it: a used 80286 clone running DOS 3.3. / ACE

YOUR MAY COVER ARTICLE on the Internet was terrific, but one sidebar gave some dubious advice: It pointed potential users to the PDIAL and Nixpub lists to locate a local Internet provider, but those lists haven't been updated in years. Two good, current U.S. lists are the Yahoo list (www.yahoo.com/Regional_Information/States/) and the POCIA directory (<http://www.teleport.com/~cci/directories/pocia/>).

A final tip for new users: Many local Internet providers will let you try their services for free for a few weeks. It makes sense to try before you buy.

Draper Kauffman
via the Internet

Call the Net.Cops

I MUST PROTEST Maggie Canon's May 1995 piece on regulation of the Internet ("Life in the Big City," page 17). I, too, am fearful of the government's continual intrusion into the First Amendment rights granted to us, but not all speech or actions are covered by it. For instance, shouting "Fire!" in a crowded area and threatening the president are not covered.

In general, I distrust the government and am wary of *anything* that expands its powers. But I think protecting people from potentially violent acts would be acceptable. I hope that self-policing of the Internet would make government action unneeded, because we would adhere to a higher standard than that set by society. After all, aren't we the technological elite? Our behavior should set a standard instead of crying for regulation.

Bucky Turk
via the Internet



OPEN FOLDER

Everybody wants to get into the act, whether it's working for *MacUser* or just striving for that brush with fame that accompanies being cited in our Letters column. This month we received several nudges from folks who want to join our ranks: "I am interested in going into journalism," wrote high-school student James Leyba via the Internet. Steve Huisman sent via eWorld a list of topics he'd like to see covered and appended, "Or hire me to do it. I majored in Journalism."

The halcyon days of Woodward and Bernstein notwithstanding, journalism isn't so glamorous. But it is nice to hear from readers who appreciate the fact that, as humans, we all make mistakes. After triumphantly pointing out a minor inaccuracy via eWorld, Richard Williamson added, "Please shoot your editors." Talk about a tough crowd.

We'd be frightened of such suggestions, were it not for one friendly chain letter we received this week via the Internet: "This message has been sent to you for good luck. It has been sent around the world nine times." Another frequently forwarded file came to us via the Internet from Sylvia Hysong: "If you receive a mail message with the subject 'Good Times,' delete it! Loading the message causes the program to initialize and execute. Delete it immediately!" That's good advice for just about any chain letter, even though the Good Times virus itself is only a hoax.

Fame is fleeting, but those 15 minutes of notoriety are enough for some people — and if it sells more magazines, why not go along with it? "If you print my letter, I will buy another issue just to see my name!" wrote David Kaufman via the Internet. You've got yourself a deal. And while we're on the subject of letter writers, we got this missive from Kyle Sullivan via the Internet: "It would be cool if you wrote a column about all the utterly moronic things people send to you via e-mail." Sounds like a good idea. We'll call it ... Open Folder.

MAGGIE CANON SUGGESTS that the Internet needs to be regulated. The Internet doesn't need regulation any more than the video-game industry does. There are no more pedophiles, pornography, or other corrupting influences on the Internet than there are in the "real world," and on the Internet, they can be sent away with a click.

Walt Dean
waltdn@aol.com

INTERNET SERVICE PROVIDERS should be treated just like phone companies. You wouldn't expect a phone company to listen in on every call to make sure no one is using the system incorrectly. Furthermore, you wouldn't expect the phone company to tell you who you can and cannot call or be called by, simply because it doesn't agree with their moral standards.

The most important safety shield is this: Spend time with your children. Keep an eye on what they are getting access to via the Internet, the same way you should with TV. Phrases such as "Don't send e-mail to strangers" and "Don't give out your address or phone number over the Internet" should be added to phrases such as "Don't get into cars with strangers."

The Internet has so much potential, I would hate to see it get smothered by well-meaning politicians or anyone else.

Rob Shields
therob@teleport.com

I'M AN 18-YEAR-OLD female who subscribes to America Online. Although only a small percentage of the people I regularly meet online are females, there are many chat rooms full of them. I have had a few brushes with the scum of the service and heard all the news stories about what is bad about the Net. But those of us who are online are smart enough to separate the good from the bad.

The first day I am truly a happy online user is the first day no one comes to me with unfounded fears of what will happen to me if I simply have an occasional cyberchat.

C. A. Wooster
Arabel1@aol.com

Upgrade Update

IN YOUR "POWER MAC Upgrade Worksheet" (May '95, page 110), you failed to mention the upgrade option IIvx users

have. One of the seemingly few advantages of the IIvx is its case — it allows for a logic-board upgrade to the 7100 series.

Aaron Miscenich
AaronM2870@aol.com

YOU SHOW THE Centris/Quadra 660AV as one of the machines that can be upgraded with Apple's Power Macintosh Upgrade Card. I had always heard that this upgrade wasn't available for the 660AVs. Have you at *MacUser* found that the card *does* in fact work with the 660AVs?

David Burns
ChipWeasel@aol.com

/ You're both correct. The IIvx can be upgraded to the 7100 series via a logic-board upgrade, and the 660AV is upgradable to Power Mac status only via a logic-board upgrade to the 6100 series. / JS

Nisus Redux

WE WERE PLEASED that Nisus Writer was rated high on your list of Mac word processors ("War of the Words," April '95, page 84). However, I'd like to correct a few inaccuracies in the article.

The Nisus Writer Language Key (\$100) enables text entry in Arabic, Chinese, Cyrillic, Eastern European languages, Farsi, Hebrew, and Korean. Users don't need to buy a key for each language; one purchase enables them to use all the languages listed here. The Language Key is not needed for languages that use the Roman alphabet or for Japanese.

Nisus Writer *does* allow you to create glossary abbreviations for graphics as well as words and phrases. And the Nisus Writer thesaurus does offer antonyms, related words, and contrasting words as well as synonyms.

Edwina Riblet, Director of Marketing
Nisus Software, Solana Beach, CA

Image Is Everything

I FIND IT DISHEARTENING that nowhere in your recent review of 17-inch color monitors ("The Sharper, Cheaper Image," May '95, page 74) do you mention the actual usable screen area of each one. I don't know of any monitors that actually have the advertised diagonally measured screen area. Monitors designated as 17-inch really come closer to 15 inches diagonally these days.

Brett Norris
deckard@halcyon.com

YOU MENTIONED THAT some of the monitors you tested support resolutions of 1,600 x 1,200 pixels. All the vendors and manufacturers I contacted said that they do not know of 17-inch monitors that support this resolution on the Mac. Can you tell me which of the monitors you tested support 1,600-x-1,200-pixel resolution when used with a Mac?

Stefan Treue
streue@bcm.tmc.edu

/ If you have a suitable video card, the ViewSonic 17 will support 1,600-x-1,200-pixel resolution on your Mac — but at a less than optimal refresh rate of 60 Hz. By the time you read this, however, 17-inch monitors offering "super resolution" at 75 Hz should be available. / JSA

IN YOUR "PUBLIC ACCESS" sidebar (May '95, page 77), you mention Apple's Display Manager software. I have System 7.5 and searched America Online and Apple's ftp site to no avail. How do I get it?

Eddie Krakaur
EKrakaur@aol.com

/ The enhanced Monitors control panel, once available exclusively in the Display Manager software bundle, is part of System 7.5, so your Mac is *already* set for resolution switching: Just configure a multi-resolution-display adapter appropriately and click on the control panel's Options button. / JSA

The Bus Stops Here

AFTER READING YOUR very complete explanation about the speed advantages of the PCI bus ("New Power Macs Fix NuBus Problems," May '95, page 27), I was perplexed when I saw the comparison chart for hard-disk access speeds at the end of the article: Do you really mean that a professional using a high-end, expensive Power Mac 8100/100 with a special FWB Jack-Hammer SCSI-accelerator NuBus card ends up with less hard-drive speed than a mere home user with a standard inexpensive Quadra 630?

Philippe Lopatka
via the Internet

/ It depends. The JackHammer can handle some very fast drives, but on Power Macs, it's burdened by the slowness of NuBus and the emulated SCSI Manager. So, for applications that transfer their data in small blocks, the JackHammer and the drives connected to it don't do very well. For applications — such as Photoshop, QuarkXPress, and QuickTime 2.0 — that transfer their data in large chunks, the

JackHammer with fast drives does better.

The IDE drive that shipped in early Quadra 630s is a weird beast. (Later models of the 630 have slower drives installed.) IDE is very fast, even for small transfers. Also, in IDE drives, all caching is either on or off. On SCSI drives, write and read caching are independently controllable, and Apple, in its infinite wisdom, continues to ship its SCSI drives with write caching off. / JP

Fill 'er Up

YOUR REVIEW OF Macromedia FreeHand 5.0 (May '95, page 35) says that in FreeHand "a fill is limited to each individual object." But if you select the objects and apply the Join Objects command, you'll create a composite path. Fills flow across a composite path as if it were a single path. This feature has been part of FreeHand since version 3. Does FreeHand get another half mouse?

R. Patrick Atherton
RPat@aol.com

/Thanks for pointing out our oversight, but the mouse rating remains the same. FreeHand should take a cue from Illustrator 5 and include a tool for interactively changing the gradient behavior on single or multiple objects. Although we really like FreeHand, it still has other weaknesses (such as a poor tutorial) that keep it from receiving a five-mouse rating. / SIS

Memo to Janet Reno

THE ATTORNEY GENERAL should stop wasting resources investigating software manufacturers' touting of vaporware, or unreleased software. Instead, she should start investigating promises software companies make about stuff you've actually *bought*. My Attorney General's Hit List:

Vaporlines. The busy signals and hold times you get when calling for tech support make promises of assistance nothing short of fraud. If you're going to promise me help as part of what I'm paying for, then give me more than a solitary soul in a back room with one rotary-dial telephone.

Vaporchase. Sending you from one phone number to another, eventually hopping back to the original number you called but only after four or five toll calls and 45 automated-voice options, would be funny if only your phone bill weren't gaining on the national debt.

Vaporupgrades. This trick promises you product announcements and technical upgrades if you send in your registration card.

When was the last time you got an unsolicited disk or even a postcard saying, "We goofed"?

Vaporhelp. If you're lucky enough to speak to a human being after calling tech support, you might get someone with some experience, but more often, the best you'll get is a suggestion to turn off your extensions and reinstall the program.

Everybody loves to hate Microsoft, but the next time you feel the urge to drive a stake through Bill Gates' heart, ask yourself how much vapor other software companies are giving you.

Richard A. Setterberg
Cincinnati, OH

The End Isn't Nigh

I'M GETTING SICK of Mr. Dvorak's repeating himself (May '95, page 182). This is the third or fourth month he has recounted the possibilities of Apple Computer either being taken over, going out of business, or otherwise being in a state of demise. Come on! There are five clone makers on the horizon!

Scott Bittick
scott_bittick@commonlink.com

SO JOHN'S GETTING TIRED of hearing that Apple will go broke. Explain to me why I shouldn't be tired of hearing why Apple should have licensed its stuff years ago and why it's lost the window of opportunity to capitalize on that action. I have yet to hear a compelling argument for such a strategy.

Tim Covey
covey@wfu.edu

We're Game

YOU JUST DON'T PRINT enough information on games. I'd like to know what new games are coming in the next few months! You do a good job in covering news about hardware and software — except for games.

David Wong
via the Internet

/As you've no doubt noticed by now, we've beefed up our coverage of games and other fun products with our new Personal Mac section. Be sure to look there for the skinny on the hottest new games as well as tips and tricks for your old favorites. / JS ▲

CORRECTION

The correct vendor of PCShare ("Upgrades Ease Connections," May '95, page 103) is Helios.



Trash Talkin'

LOOKS LIKE THE HEAT IS ON IN AUGUST, and not just at the Boston Expo. Windows 95, originally promised in '93, then at the

end of '94, will finally have its coming-out party at the end of August, with just four months to spare. Many Macintosh zealots have been outright dismissive of Windows 95, noting that many of its exciting "new" features (such as filenames longer than eight characters) have long been standard in the Mac OS. Fair enough. But the reaction of the majority of people when they see what Microsoft has wrought runs more along the lines of "Gee, that's pretty impressive."

That's because despite the drubbing it's received from the press during beta reviews, Windows 95 is loaded with features that demo well. I've seen the demos and talked with the beta testers, and, frankly, Win 95 makes a pretty good first impression. But does it wipe out the Mac advantage? I don't think so. Do Macintosh users need to look to Copland, still a digital dot on the horizon, for an operating system that can stand up to Windows 95? Nope, stash the binoculars. Does Apple need to temper its focus on visions of future OS releases with serious marketing of what is here, right now, in System 7.5? You betcha.

Why Apple has never seemed able to apply as much creativity and innovation to marketing as it does to designing systems will always remain one of the industry's great mysteries. This time, though, I think you'll see Apple take a new tack vis-à-vis Windows 95. And an effective one.

Rather than compare OS with OS, Apple will compare platforms: the Mac OS platform versus the Windows platform. I think this is a smart approach, given the expectations that Windows 95 has aroused on the PC side: plug-and-play, multimedia, speech recognition, and other "enabling" technologies. Those kinds of features depend on

hardware/software integration — which has always been one of Apple's primary strengths. That's because Apple controls hardware standards, making its computers incredibly easy to set up and use. You don't have to worry about whether you can easily add a peripheral; you just do it.

That kind of compatibility cannot be taken for granted in the DOS/Windows domain, though, because — powerful though it is — Microsoft doesn't yet determine hardware standards, so adding anything to machines running Windows can be an absolute nightmare.

But wait! Here comes Windows 95 Plug and Play to the rescue. Won't this end the hardware headaches for Windows users? Not exactly. Before you consider giving your Mac to the Smithsonian, let's examine this new feature a little more closely.

Just installing Windows 95 Plug and Play won't fix anything by itself. In fact, it can end up being a potentially expensive proposition. First, to realize any Plug and Play benefit, users who upgrade to Win 95 will at the very least have to figure out what new video drivers they need. They may also have to buy a card or two to hook up various peripherals. So, for the 30 million or so PC users out there, it *won't* be instantly easy. In other words, it won't be like a Mac.

OK, so installation of peripherals with Win 95 won't be as easy as it is with a Mac. But what about software? Sorry. Software installation will still require users to resolve the conflicts caused by all the drivers needed to make a Windows machine work. And

when you install an application, it still puts INI files in various places, which makes it difficult to deinstall an application, because you have to locate all the INI files and delete them too.

Preemptive multitasking and memory protection have been touted as ways Win 95 is better than the Mac OS. But preemptive multitasking is available for 32-bit apps only. That means that 16-bit apps, which represent the vast majority of applications available, won't take advantage of preemptive multitasking at all.

Also, according to the beta testers I've talked to, if you have even one 16-bit application

running, it takes over the system and prevents you from running any 32-bit applications concurrently. Memory protection is a similar story. Only 32-bit apps are memory-protected, and a crash of any 16-bit app can bring down the whole system. Some day in the distant future, when all apps are 32-bit, Windows 95 should run pretty smoothly.

So, what's the bottom line? Windows 95 is a substantial improvement over Windows 3.1 and will undoubtedly be hugely successful. But it's not as easy to use as the Mac OS. There are still a lot of conflicts, it's not as easy to set up and use, and it's not consistent across hardware and software.

Windows 95 is trying to emulate the ease of use the Mac has had for ten years, but it's going to take a lot more than adding long filenames. The next time some trash-talkin' Windows advocate starts telling you there's no difference between Windows and the Mac OS, ask them why Windows 95 won't let you drag your file to the recycle bin and delete it. ☺

Frankly, Win 95 makes a pretty good first impression. But does it wipe out the Mac advantage? I don't think so.



CD-Rummage

MORALS AND ETHICS, LADIES AND GENTLEMEN, morals and ethics. This month I want to state right off that there isn't a man,

woman, or child treading this green (well, somewhat green) Earth who, if they were a mystical and ancient pyramid, would not have at the broadest base of that pyramid a solid foundation of bedrock. Or limestone? I keep forgetting what the mystical and ancient pyramids were made of. Well, that's beside the point. A foundation of ethics and moral fiber is the point I'm getting at.

All right. I've just read back that opening paragraph and realized that I'm not making any sense whatsoever. And who can blame me? I'm just frustrated, because right underneath my desk sits a sturdy military-style wooden chest containing hundreds of commercial (and valuable) CD-ROMs, each sent to me for free by one nice corporation or another. I could sell its contents for tens, if not dozens, of dollars, but my hand is stayed solely by my personal code of ethics, my convictions, and the thought that maybe somehow word would get back to LucasArts and I'd never get another CD-ROM from them even if I paid for it.

And there the matter has always stood, until late last year, when most of my local used-CD exchange stores began to accept CD-ROMs for trade. Unbidden, thoughts of that magical chest flooded in. Feeling my moral resolve slipping, I had to immediately flee the scene, pausing only long enough to argue with the shopkeeper that my Kentucky Headhunters CD was certainly worth more than \$3 and that the scratches were merely cosmetic.

My moral resolve was restored by the swift application of 12 ounces of Dr. Pepper (its resolve-restoring agent, developed during the Cold War by the Department of Defense for use by Army Special Forces, is what accounts for the beverage's slightly

odd taste). All right. So I couldn't ethically realize a profit from my CD-ROMs *directly*. But what if I went through the box and wrote a column *about* them?

But that thought, too, was dispelled by the sight of the object on the wall of my office next to the gelato machine: a large claw hammer hanging over my written pledge to bludgeon myself, slowly and messily, if I ever wrote a "Let's see what's in Andy's trash/mail!" column, a document I composed and signed before agreeing to write for *MacUser*.

(One item in the box is sufficiently annoying to merit note, though: Inroads Interactive's Multimedia Dogs. It's fun and entertaining, sure, but every time I see it in the box, I think I'm going to see an interactive presentation of Harvey Keitel stanching his partner's profuse bleeding in the backseat of a getaway car. I get so excited that I always forget that it's just a CD-ROM about dogs.)

So, friends, a man has to eat. I've decided to do the only thing a morally upstanding and eager columnist can do: go around to used-CD shops, buying any interesting non-commercial CD-ROMs he can find and then writing a column about them, satisfying himself with a fat column payment and a pile of tax deductions.

And a quick "Now, hush" to my editor. This is useful information. Because in my investigations, I've found that some of the most useful and informative CD-ROMs literally *aren't* available in any store. Take the ABC Television Network February Sweeps '94 CD-ROM. Folks, it's about time we faced the

facts: Kids today care as much about the Bronze Age as we did at that age. Sure, they'll fire up the \$99 multimedia reference library you bought them once or twice, but after that report on the solar system is finished, they'll go right back to the TV for more *Teenage Mutant Ninja Turtles* or whatever it is the kids are into today.

Imagine if you got them a resource they could *use*. Remember the frustration you felt as a kid, not knowing *why* Lenny and Squiggy felt they could just barge right into Laverne and Shirley's apartment whenever they pleased? What about the eight-

year-old who doesn't understand why Roseanne inflicts unrelenting emotional and physical abuse upon her helpless and cowering family? With the ABC CD-ROM, they can call up a handy background synopsis of the show

and learn that "She's a blue-collar working mom, and she's got a personality as big as life: Big mouth, big ideas, and a big, biting sense of humor." Parents, when faced with teary-eyed children who don't know why Mr. Spock is delivering the nightly news, can mount the CD-ROM and reassure them that it's only Sam Donaldson . . . and that for a trustworthy source of the day's crucial news events, you could do little better than someone with a bachelor's degree from Texas Western College.

The DOS world really isn't my beat, of course, but when I saw the MS-DOS 5.0 Introduction Commemorative CD-ROM offered for only \$14, arcing my MasterCard to the clerk was the work of a moment. I have to admit that I was seduced by the liner notes on the back of the jewel box: "This compact disc has been pressed . . . to recognize the role MS-DOS and

The many members of Van Halen have families and other things to support; why did Apple so callously rip off their smash hit 'Dreams'?

compatible hardware and software have played in the lives of MS-DOS Users.” Such was my excitement that I sent three school buses tumbling down the cruel embankments along Route 128 as I rocketed home to my CD-ROM drive. And well, I got hosed. Nothing but five minutes of Dave Brubeck jazz. No data or anything. I mean, jeez, years ago *tribute* meant painting frescoes, building massive monuments, brutally sacking a conveniently located weakened empire. Hmph. Worst of all, the tune was the one most of America has in mind as the dictionary definition of *jazz*, a tune colloquially known to all as “And Now, a Look at Today’s Weather Across the Country.”

I’ve saved the most explosive entry for last, and I can only hope that my tortured decision to bring these facts to the cold light of public scrutiny is the right one. I refer of course to the prerelease edition of Apple’s own Phil & Dave’s Excellent CD. The first in a justly honored line of CD-ROMs for developers of Apple software, it is indeed a font of curious and hard-to-come-by information. But I direct your attention to the disc’s

seven audio tracks, containing Apple promotional tunes. I mean, for a company as defensive about copyright and trademark infringements as Apple is, they seem to play fast and loose with the law when it comes to the hardworking men and women of the music industry. The many members of Van Halen have families and other things to support; why did Apple so callously rip off their smash hit “Dreams” for the so-called “Breaking Through”? I would advise Apple that the music industry has its tendrils (and its lawyers) everywhere, and unless they want to become a wholly owned subsidiary of Geffen . . .

The brightest gem on the disc is “Leading the Way.” Plagiarized from a Top Ten hit, like all the rest (“What a Feeling [Theme from ‘Flashdance’]”), shamelessly, it is nonetheless more aptly compared to the Led Zeppelin classic “Stairway to Heaven.” First, because it’s about seven minutes long, and second, because it’s best appreciated while under the influence of mind-altering substances. A peppy, “Let’s go set fire to any store that doesn’t sell Apple-compatible

hardware and software” anthem designed to agitate the proletariat into unbreakable allegiance, it centers on the following inspirational lyric:

*And tomorrow’s much brighter ‘cause
Apple is leading the way, leading the way!
leading the way leading the way/ooo . . .
leading the way/leading the way leading the
way/Leading the way . . . ooo . . . LEADING
THE WAAAY!*

This is punctuated by several exciting laser bursts. If the aerobics salons in the Cupertino area don’t use this as a staple of their advanced classes, well, then those aerobics salons don’t deserve their stellar reputation.

So remember: Your local used-CD shop isn’t just the place to find the unwanted castaways of the local music scene . . . it’s also a place for chilling bits of industry history. I’m on the lookout for more (and incidentally can be reached at andyi@world.std.com), but not today. While putting away my Phil & Dave CD, I found this cool Quentin Tarantino CD-ROM I didn’t even know I had . . . 

NEW ON THE MENU

Finally, an Apple Color LaserWriter

New color laser heads Apple printer onslaught.

THE LONG-rumored arrival of Apple's color laser printer has finally taken place. The Apple Color LaserWriter 12/600 PS heads an avalanche of new imaging products that provide solutions for everyone, from the corporate



executive to the traveling road warrior.

Color LaserWriter 12/600 PS. Setting an aggressive price point of \$6,500, Apple's Color LaserWriter offers many standard features (such as true 600-x-600-dpi resolution for both color and monochrome output) that are considered options in other printers.

Perhaps the most striking thing about the new Color LaserWriter is its efficient design, which gives one-door access to its consumables. Its four toner cartridges are in a carousel, so they're easy to replace.

The Color LaserWriter is also designed to be fast. Its Canon engine can print monochrome at 12 ppm, color at 3 ppm, and color transparencies at 1 ppm. It's powered by a 30-MHz RISC controller and ships with 12 MB of RAM, upgradable to 40 MB. Six custom ASICs speed image processing, input/output functions, and memory control.

Built-in image-enhancement features, such as Color PhotoGrade, ColorSync 2.0, and Pantone support, should make this PostScript printer appealing to graphic artists as well as corporate communicators. For faster printing of large graphics files, support for JPEG image compression is built in to the driver.

Other standard features are LocalTalk and EtherTalk, a 100-sheet multipurpose

paper tray and a 250-sheet cassette (a second cassette is optional), and a SCSI port (an internal hard drive costs \$399). The printer ships with a Windows driver and Apple's new Desktop Printing extension, which lets you control

print jobs from the Finder — without using QuickDraw GX.

LaserWriter 4/600 PS. At the other end of Apple's laser-printer line is the new LaserWriter 4/600 PS, a monochrome unit that offers 600-dpi output at 4 ppm. This PostScript Level 2 printer is designed for individual users or for small offices that run on LocalTalk. It contains a 16-MHz RISC processor and ships with 2 MB of RAM. The 4/600 PS is slated to sell for about \$900.

Color StyleWriter 2200. A color laser printer isn't Apple's only neat new product. The

Color StyleWriter 2200, Apple's first portable color inkjet printer, is designed for PowerBook owners or anyone else who needs a color printer with a small footprint. Weighing 3.1 pounds (the \$129 nickel metal hydride battery pack adds 1.1 pounds), the slate-gray 2200 is slightly longer and narrower than a letter-sized sheet of paper. Its price is petite too: about \$400.

The 2200 prints monochrome pages at 720 x 360 dpi at 5 ppm and color pages at 360 x 360 dpi at 3 minutes per page. Two ink cartridges are available: One has CMY and black tanks; the other has black only. You can feed 30 letter-sized pages or 5 envelopes at a time. An AC adapter is included; pricing for the universal power adapter wasn't set at press time.

Color StyleWriter 2400. This slightly modified inkjet printer sports firmware adjustments that allow it to print monochrome at 720 x 360 dpi at 5 ppm (color printing remains at 360 x 360 dpi at 3 minutes per page). Apple has also dropped the 2400's price to the \$400 range. 800-776-2333 or 408-996-1010. / Pamela Pfiffner

PHOTOGRAPHY / LON CLARK



INTERNET /

Cyberdog Unleashed

JUST AS THE INTERNET is greater than the sum of its parts, so too is Apple's Internet browser (code-named Cyberdog), a collection of OpenDoc parts that can fetch information from any source on the Net. Expected to be available in early 1996, Cyberdog is Apple's attempt to create a guide to the Net's cryptic protocols and a way of showing off the OpenDoc component-software architecture.

Cyberdog's communication parts talk to servers, using protocols such as HTTP, ftp, Gopher, and NNTP, and file-translation parts interpret file formats such as HTML (hypertext), GIF and JPEG (graphics), and AIFF (sound).

Such parts can be combined in a container application. (Apple's sample container, for instance, is called Internet Assistant.) This combination makes moving among different types of Internet servers — which offer text, graphics, and sound in a variety of formats — effortless.

Other parts of Cyberdog enhance its interface, which features hierarchical listings of all the places you've been. You can drag and drop your favorite sites into a Personal Notebook part that keeps track of your travels, and those listings can be dragged onto the desktop, where they appear as Finder icons. Double-clicking on one automatically takes you to whichever Internet site it represents.

Since Cyberdog is a collection of OpenDoc

PCI Clones on Horizon

Exclusive look at Power Computing's low-end CPU.

THE WRAPS ARE OFF Apple's new top-of-the-line PCI-based Power Mac 9500 (see "The Power Macintosh 9500," in this issue), so eyes naturally turn to the Mac OS licensees to see their response. Our chats with the three licensees with compatibles in the U.S. market — DayStar, Power Computing, and Radius — unearthed the following tidbits.

In a move that left executives in Cupertino a bit queasy, DayStar actually announced its 9500 clone, the Genesis MP, months before Apple announced the 9500, but in deference to Apple, DayStar intentionally omitted salient details. However, we can now tell you that the motherboard in the Genesis MP is the very same as that in the 9500 — the same number of PCI slots (6), the same number of RAM DIMM slots (12), and the same slot for an upgradable processor daughterboard.

The interesting twist is this: Apple and DayStar codeveloped the Multiprocessor (MP) API software that the 9500, the Genesis MP, and presumably other systems will use. But it will be DayStar, not Apple, that first ships systems containing two- and four-processor daughterboards. And DayStar will evangelize and support the API — not only with third-party-software vendors but with other Mac OS licensees as well.

Are any software vendors currently jumping on the multiprocessing bandwagon? You betcha. At the Apple Worldwide

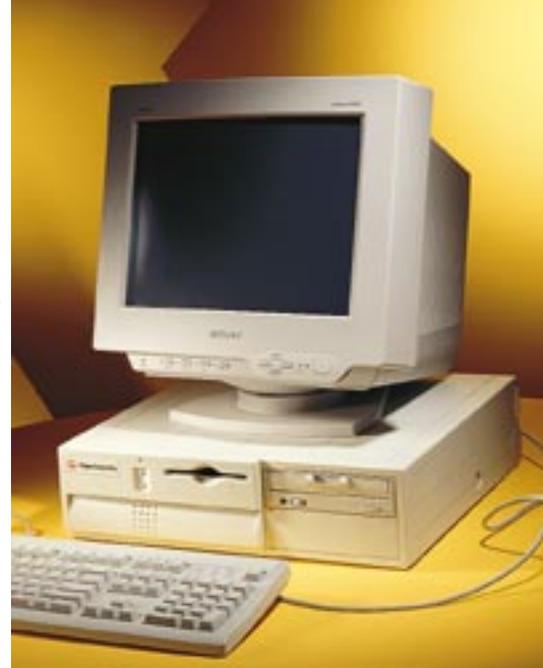
parts, users can surf from within any OpenDoc-savvy application. For instance, using an OpenDoc-savvy word processor, you can create a box that lists all the latest messages in a Usenet newsgroup or that downloads a relevant file after just the click of a button.

Because OpenDoc is extensible, developers will be able to write new parts to compete with Apple's offerings. For example, a developer might write an HTML part that interprets Netscape Communications' formatting enhancements for the World Wide Web. No longer will Internet-tool developers be required to build a Swiss-army knife that supports the endless possibilities the Internet can offer — with OpenDoc, all they'll have to do is build a blade. / Jason Snell

Developers Conference in May, DayStar demonstrated a prototype multiprocessing plug-in that accelerates many of Adobe Photoshop's functions to lightning speed. *MacUser* logged some lab time on one such system, which sported four 100-MHz 601 processors (see chart) — shipping systems will most likely contain 604 chips, but such systems weren't testable at press time. Adobe plans to develop its own optimized version of the MP plug-in, which will yield even greater speed boosts when Genesis systems ship, in September. Elastic Reality and Strata said their products will also support the MP API.

Power Computing also plans to ship PCI systems in September. Its ace in the hole will be a hitherto secret chip code-named StarGate, a nod to those who wonder what to do with their old multikilobuck NuBus cards in the wake of PCI. StarGate is a PCI/NuBus bridge chip that makes it possible for systems to contain both types of buses and to concurrently support both types of adapter cards. This will be especially important for those with audio-compression, digital-video, and other high-ticket NuBus cards that won't immediately be replaceable with inexpensive PCI alternatives.

Pricing and exact configurations of these forthcoming systems aren't yet available, but Power Computing did let us sneak a peek at a computer, with a new three-slot low-profile design, that may challenge the low end of Apple's Power Mac line (see photo). Power Computing will also offer mixed-bus and PCI-only systems in its desktop and tower lines. Nearer on the



Not expected until September, this low-profile Power Computing form factor will be host to models that fill out the company's product line at the low end. Despite its compact size, look for it to contain PCI as well as NuBus slots.

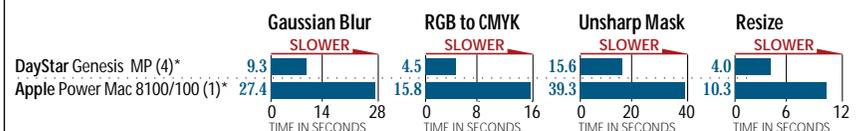
horizon are its 120-MHz 601 systems as well as tower systems that offer more expansion than the original desktop systems.

As for Radius, mum's the word. Betting types might speculate that Radius will offer a high-end line of PCI-based as well as mixed-PCI-and-NuBus systems. You might imagine that the company will also offer accelerated-video cards and digital-video cards with a distinctly PCI flavor. And you might theorize that Radius-brand multiprocessing systems will be quite attractive to Radius' core publishing and video customers and thus that Radius — despite its surprise at learning that it will have to rely on archrival DayStar for MP support — is at this very minute scrambling to design MP systems of its own. You could hypothesize any or all of these things, but no one at Radius would so much as raise an eyebrow in response. / Henry Bortman



Multiprocessing Monster? / gobbling up the CPU cycles

Even at the prototype stage, DayStar's Genesis MP, with a quartet of 100-MHz 601 processors, performed compute-intensive Photoshop tasks 2.5 to 3.5 times as fast as a stock Power Mac 8100/100, with a single 100-MHz 601. DayStar expects the speed gains of the final hardware/software package to be even greater.



INTEGRATED SOFTWARE /

Claris Revs Again

New versions of ClarisWorks, Impact due.

SEEKING TO CARVE OUT a niche with cross-platform applications for general home and business users, Claris has announced new versions of ClarisWorks and Claris Impact.

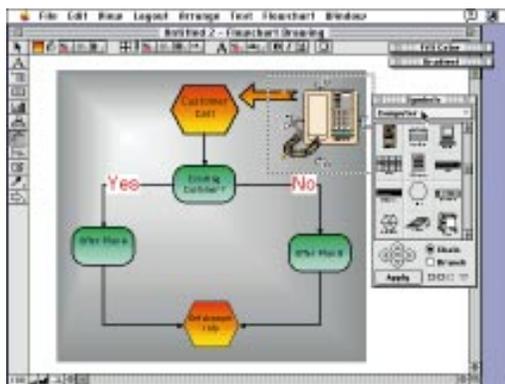
ClarisWorks 4.0. In its second revision in less than a year, ClarisWorks is designed to stay ahead in its battle against Microsoft Works. In version 3.0, Claris introduced Assistants, which guide users through the process of creating documents, à la Microsoft's Wizards. Version 4.0 adds new Assistants for making mailing labels, home-finance spreadsheets, and certificates. Also new is a drag-and-drop image organizer, complete with 500 pieces of clip art.

ClarisWorks' word processor has received the biggest boost in version 4.0, gaining style sheets, outline integration into any document, section breaks, multiple headers and footers, support for left/right facing pages, endnotes, and a mail-merge preview. And in a tip of the hat to the popularity of the Internet, ClarisWorks now includes a translator that transforms documents into HTML, the language of the World Wide Web.

ClarisWorks' database module now offers layout features familiar to FileMaker Pro users, such as radio buttons, check boxes, and value lists as well as a spreadsheetlike list view. \$129; update from ClarisWorks 3.0, \$49.

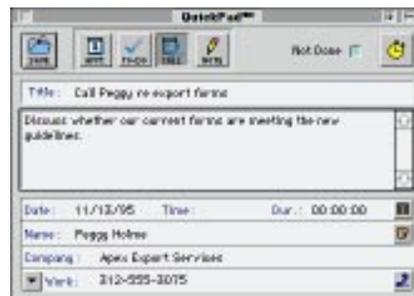
Claris Impact 2.0. Like ClarisWorks, Impact is something of a hybrid: a business-graphics application that doubles as a presentation program. This new version beefs up its cross-platform capabilities and introduces DataDraw — which makes graphics files out of data imported from FileMaker Pro or Microsoft Excel or any data saved in a text format.

Impact 2.0 offers object libraries and predesigned styles, for quickly making flowcharts, organizational diagrams, calen-



dars, and so on. Smart connectors snap symbols and objects into place with appropriate lines attached. Printing options for making color and monochrome hard copies of charts are vastly improved.

Although it's not a presentation program per se, Impact boasts several new presentation features, such as an integrated outliner, a virtual light box, new transitional effects, and a PowerPoint translator. \$129; upgrade from 1.0, \$59. 408-987-7000. / Jason Snell



CONTACT MANAGERS /

New Now Is Noteworthy

TRUE PIM JUNKIES may keep their PIMs open all the time, but the rest of us never seem to have all that information at hand when we need it the most. Version 3.5 of Now Contact & Now Up-to-Date, Now Software's PIM combo, offers a way to input data directly into the PIMs without either application being loaded. Now QuickPad automatically looks up information from contact and calendar data files and also automatically links new information back to those data files. Now you can type notes about your phone messages as soon as you get them, instead of avoiding the task because your PIM isn't loaded.

Version 3.5 of Now's PIM combo also offers improved support for Macintosh Drag and Drop, and to-do lists can be added to any calendar view. Users of Now Up-to-Date's repeating events will be relieved that each occurrence of a repeating event can be given its own unique agenda. 800-722-5963 or 503-274-2800. \$99 each; bundle, \$149; upgrade from version 3.0, \$20. / JS



GOOFY GADGETS /

Rodent Regalia

OK, IT'S SILLY, but you gotta stare in bemused wonder at *MouseHouse*, a book of five cut-and-assemble domiciles for your mouse. Choose from Chartres Cathedral; the Gold Pavilion; the Parthenon; the Taj Mahal; and, of course, the White House. The mind boggles. \$10. Penguin. 212-366-2000.

And what does the best-dressed mouse wear when staying at the Taj Mahal? Why, a Gooshie, of course. This ribbed silicone cover keeps your mouse clean and comforts your hand to relieve Mouse Joint Syndrome, which is caused by repetitive clicking. To fit most mice, it comes in three styles and four colors, and best of all, it's dishwasher-safe. \$15. Van Oren. 800-991-9941 or 619-249-4179.

/ Pamela Pfiffner

PHOTOGRAPHY / LON CLARK



MACUSER/ZMAC UTILITY OF THE MONTH



Penny-Pinching Pixel Picker

DOWNRIGHT CHEAP — not "inexpensive," not "budget," not "attractively priced," but cheap. The latest incarnation of ZMac's lightweight image editor, The Cheaper Image, offers more bang for no bucks than ever before. On top of its array of resizing, recoloring, and rearranging powers, this major update to last November's MacUser/ZMac utility sports a complete interface makeover and color paint tools, and its support for Easy Open and XTND translators lets you work with files in any number of graphics formats. It still runs at full PowerPC-native speed, it still supports Photoshop-compatible plug-ins, and it's still absolutely free from ZiffNet/Mac.

Created by Mike Throckmorton, ZMac's The Cheaper Image is available exclusively from the ZiffNet/Mac service on CompuServe (GO ZMC:MACUSER), ZiffNet Selections on AppleLink, and ZiffNet/Mac services on eWorld (Shortcut: MacUser). / Mark Simmons

Removables Aim High

OCEAN doubles MO capacity, SyQuest gets small.



HOPING TO DELIVER a low-cost removable-media drive to compete with Iomega's popular Zip drive, SyQuest has introduced the EZ135 Drive. OCEAN Microsystems, on the other hand, hopes its Triton will attract buyers looking for a high-capacity removable-media drive.

SyQuest EZ135 Drive. With a cartridge capacity of 135 MB — 35 MB more than the Zip drive's — the EZ135 Drive is targeted at small-office and home-office users who need low-cost storage. Like SyQuest's 270-MB cartridge system, the EZ135 uses a 3.5-inch cartridge that contains a platter similar to that in a standard hard disk. On paper, the EZ135 appears to offer twice the speed of the Zip drive, although we weren't able to

verify SyQuest's claims at press time. The EZ135 has a 13.5-millisecond access time and a 2.4-MB-per-second sustained transfer rate. Initially, SyQuest will offer an internal mechanism that uses an IDE interface suitable for PCs, but starting in July, the company also plans to offer internal and external versions that have a SCSI interface suitable for use with any Mac. \$199; 135-MB cartridge, \$20. 510-226-4000.

OCEAN Triton. Doubling the capacity of current 5.25-inch magneto-optical (MO) technology, but without doubling the price, OCEAN Microsystems is set to launch the Triton system.

This 5.25-inch MO drive uses 2.6-GB cartridges and is backward-compatible with the current 1.3-MB ISO-standard cartridges. It can also read — but not write to — 650-MB cartridges. The Triton is slower than a typical hard drive, with an access time of 40 milliseconds and a sustained transfer rate of 2.1 MB per second. These features make it best suited for backup and for delivering large desktop-publishing or digital-video files to service bureaus. \$2,499. 714-898-1340. / Sean J. Safreed

DIGITAL VIDEO /

MPEG Comes to Low-End Macs

CHOPPY, SMALL SCREENS of moving video making you crazy? Until now, Mac users have had to either rely on costly NuBus solutions for MPEG playback or be content with the small screen size of software compression schemes such as Radius' CinePak. Thanks to new offerings from Apple and Radius, both the hardware and the software compression approaches should enjoy radical improvements.

MPEG Hardware. Unlike video that uses software compression schemes, MPEG video requires special hardware to decompress the video data and provides near-VHS quality. At a recent technology

demonstration, Apple showed the low-cost MPEG Media System, which includes an LC PDS card that integrates with the Apple Video System. The combination provides full-screen playback of CD-ROM titles that use MPEG video at 30 frames per second, with CD-quality, 16-bit audio. The system also plays VideoCDs.



MPEG compression enables developers to produce full-motion, full-screen playback from CD-ROMs such as Sumeria's Wild Africa.

The MPEG Starter Kit for Developers — which was scheduled to be available in May, for around \$200 — includes the LC PDS card, six MPEG titles, and a CD-ROM that explains how to produce MPEG video. The end-user

Apple on the Fast Track

RUBBING ELBOWS with the music industry and the racing world, Apple has announced new alliances with Sony Music Entertainment, Warner Bros. Records, and others to use QuickTime tools in interactive music CDs. And to promote the Power Mac's speed, Apple is sponsoring a race car in the IMSA racing series.

The music industry has already started shipping discs in the CD Plus format. These discs contain audio tracks playable in any CD player and interactive material — such as song lyrics, music videos, and tour information — accessible with a CD-ROM drive. Later this year, Apple will provide its partners with the QuickTime Music Toolkit, which offers the necessary CD Plus-development tools and run-time software that works on the Mac or on Windows-based PCs. So that Mac users can play these interactive music titles, new Apple CD-ROM driver software that can handle the CD Plus format is expected by the end of 1995.

Apple hopes to get some mileage out of race-car sponsorship à la Pennzoil or Rolex. Not only will the Power Mac race car run in events such as the Sebring Grand Prix but it will also be featured in a traveling road show in which corporate customers and shoppers at superstores can test-drive Power Macs and Intel Pentium-based PCs in a specially outfitted trailer. / SJS



system should be available this summer for less than \$300. It will come bundled with several multimedia CD-ROMs that feature MPEG video and will work in the Quadra 580, the Quadra 630, and the Power Mac 5200. 408-996-1010.

Software Solutions. Software decompression should get a boost when developers get their hands on Radius' CinePak Toolkit, slated for release in June. CinePak, which is widely used in current CD-ROM titles, is a software-only codec (compression/decompression code).

With the CinePak Toolkit, developers can produce higher-quality video, thanks to several unique features. The software filters noise out of the source material and softens and resizes the video, using proprietary algorithms. The resulting compressed video looks much smoother and doesn't contain the artifacts found in most CD-ROM-based digital video. \$499. 408-541-6100. / SJS

New Inkjets Loom Large

INKJET PRINTERS are usually touted for the casual home user, but two companies are eyeing the graphic artist, with new color inkjet printers that print tabloid pages.

Epson Stylus Pro XL. Building on the success of its Stylus Color inkjet printer, Epson is releasing the Stylus Pro XL in August. The new model handles paper of up to 13 x 19 inches, accommodating full-bleed layouts.

Like the earlier, letter-sized model, the Pro XL prints color at 720 dpi or monochrome at 360 dpi. To speed print times, Epson devised a new driver for the Pro XL. Per Epson, a full-color 720-dpi tabloid-sized image can print in 40 minutes.

The Pro XL is a QuickDraw printer, but PostScript, LocalTalk, and EtherTalk will be available later this year, says Epson. Serial and parallel ports are standard. Pricing wasn't set at press time, but the expected street price



is \$1,500. 800-289-3776 or 310-782-0770. **Lexmark 4079 plus.** Topping Epson in terms of price and features, Lexmark has introduced the 4079 plus, a \$3,199 360-dpi color inkjet printer that prints on 11-x-17-inch paper but that lacks full-bleed capability.

The PostScript Level 2 device includes ColorGrade enhanced screening, Image Diffusion printing, Pantone color, and profiles for Apple's ColorSync 2.0 and Agfa's FotoTune color-management software.

The 4079 plus has a 25-MHz RISC processor and 4 MB of RAM, upgradable to 36 MB. According to Lexmark, it offers a print speed of 1 ppm for letter-sized color output. Serial and LocalTalk connections are included; network adapters for token ring and Ethernet cost extra. The printer ships with the LaserWriter 8 and QuickDraw GX drivers. 800-358-5835 or 606-891-2000. / Pamela Pfiffner

PCI CARDS /

PCI Boosts Power Mac Speed

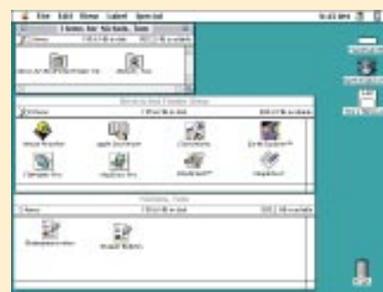
FOR MORE THAN A YEAR, Apple promised the adoption of the PCI-bus standard, and with the release of the Power Mac 9500, the first PCI-based Macs are here (see "The Power Macintosh 9500," in this issue). Apple provides a lot of built-in capabilities, but PCI cards can boost the speed of the latest Power Mac even further. Here's a selection of new low-cost PCI cards:

ATTO ExpressPCI. Extra SCSI ports may seem redundant, but not for superfast throughput for digital-video or Photoshop work. The ATTO ExpressPCI card supports the latest SCSI standard, SCSI-3, and comes in single and multiport designs, to make it easy to add RAID level 0, 1, or 5 arrays — up to 210 for multiple gigabytes of storage. \$895. 716-691-1999.

Orange Micro OrangePC. The Series 400 cards are the latest in the OrangePC line — each has a full 486 chip for running DOS and Windows. By moving to the PCI bus, the OrangePC Series 400 cards are able to access devices connected to the Mac, without the penalty of NuBus overhead. The series offers coprocessors with a 486 DX4/100 or Pentium OverDrive, up to 64 MB of

RAM, and up to 2 MB of VRAM for SuperVGA video support. An optional SoundBlaster I/O card offers multiple serial and parallel ports; a game port; and support for 16-bit sound, making PC games and multimedia titles possible on your PCI-based Power Mac. \$799 and up, depending on configuration. 714-779-2772.

YARC Screamer. With a name like Screamer, it must do something fast. YARC's first entry into the display category is focused on acceleration of QuickDraw 2D and 3D. According to YARC, the Screamer — which uses a GLINT 200SX coprocessor — renders as many as 300,000 Gouraud-shaded, anti-aliased triangles per second, with display resolutions of up to 1,280 x 1,024 pixels. The Screamer comes in two versions, with either 4.5 MB or 9 MB of VRAM; both versions support single- and double-buffered graphics. Double-buffering smooths the animation of QuickDraw 3D-rendered graphics, providing workstation-like graphics. The low-end version should be well under \$1,000, and the professional version will be well under \$2,000. 805-499-9444. / Sean J. Safreed



SECURITY /

Lock Down That Mac

EASY TO USE unfortunately means easy to break into when it comes to the devilish problem of sharing Macs. MacAdministrator and At Ease 3.0 are two new security packages that protect unsuspecting Macs from idle hands, without impairing ease of use.

MacAdministrator. Hi Resolution's MacAdministrator secures groups of Macs without changing the familiar Finder interface, and it can be administered across a network. As with other security packages, an administrator can restrict user access to available printers on the network and particular applications or folders on the hard disk. The software also tracks printer usage and can limit the number of pages a user can print.

When a user logs on to a protected machine, MacAdministrator can automatically copy that user's personal files onto a hard disk and then copy them back to a server when they log out. MacAdministrator also offers an automatic software-distribution system, which allows an administrator to update applications remotely. 800-455-0888 or 408-257-2151. Prices vary.

At Ease 3.0. The latest version of Apple's security software comes in two versions: At Ease, for individual Macs, and At Ease for Workgroups.

Originally, At Ease simplified the Mac interface (and protected sensitive items from being moved or deleted) by substituting a large-buttoned window for the Finder. Although At Ease 3.0 still offers that interface, users can instead be placed in a protected version of the Finder. At Ease also now displays floppy-disk or CD-ROM items on a separate "card," rather than having them crowd the user's main card. Administrators can deny access to programs or files, on CD-ROM or disk, that haven't been approved. They can also lock out entire CD-ROMs.

At Ease 3.0 adds support for read-only and write-enabled shared folders, allowing teachers to create folders for group projects as well as drop folders that students can use to hand in assignments. At Ease, \$295. At Ease for Workgroups, \$162 (10 computers); school site license, \$500. 800-800-2775 or 408-996-1010. / Jason Snell

NEW & NOTABLE

HARDWARE /

* **Olympus Deltis CD-R.** This double-speed CD recorder enables users to create CD-ROMs and audio CDs as well as discs in several other CD-based formats. The recorder comes with a SCSI-2 interface and card as well as CD-creation software. It supports multisession recording formats, so new information can be added to a disc over the course of time. \$1,995. 516-364-3000.



Nokia Multigraph 449X. Targeting the high end of the 15-inch-monitor market, this display offers a resolution of 1,024 x 768 pixels, on-screen controls, and dynamic autofocus to keep the display area sharp. \$625. 415-331-4244.

Mitsubishi Diamond Scan 20H. With a maximum resolution of 1,280 x 1,024 pixels, this 20-inch monitor has on-screen controls and an advanced electron gun, which improves focus. Color-matching software is also included. \$1,750. 800-843-2515 or 714-220-2500.

Kyocera FS-3600A. Offering 600-dpi resolution, this 18-ppm printer employs LED technology. The FS-3600A comes with Kyocera's own PostScript emulation and 2 MB of RAM (it accommodates 66 MB maximum). \$3,495; LocalTalk support, \$199; Ethernet support, \$429. 908-560-3400.

GCC Elite XL Printers. Offering PhoenixPage PostScript Level 2 emulation, the two Elite XL printers can print edge to edge on tabloid paper. The Elite XL 408 (\$1,999) offers 600-dpi resolution on letter-sized paper and 400-dpi resolution on tabloid paper. (A 2-MB RAM upgrade is available to increase the XL 408's tabloid resolution to 600 dpi.) It connects to a network via a LocalTalk or parallel port. The Elite XL 1208 (\$3,999) delivers 1,200-dpi resolution and includes LocalTalk, Ethernet, and parallel interfaces and comes with GCC's new AccuGray grayscale-enhancement technology. A companion CD-ROM includes 250 Bitstream fonts. 800-422-7777 or 617-275-5800.

Microtech Digital PhotoAlbum. Bringing PC Cards, or PCMCIA cards, to the Macintosh desktop is this PCMCIA reader/writer, designed primarily for use with digital cameras. Using PCMCIA hard-drive or flash-RAM cards, users can quickly upload and download large image files and transfer them to digital cameras or to other computers. \$865. 800-626-4276 or 203-468-6223.

SOFTWARE /

PhotoMaker. A low-cost paint and image-editing application, PhotoMaker gives users the ability to retouch photographs; use Photoshop filters; and open and save in PICT, TIFF, EPS, Photo CD, Photoshop, and other file formats. \$40. MacSoft. 612-559-5140.

PowerFPU. Working closely with the 680x0 emulator on the Power Mac, this extension emulates the floating-point coprocessor, which is required by some math-intensive 680x0 applications but is not emulated by the Power Mac. \$75. John Neil & Associates. 800-663-2943 or 415-905-3000.

PowerPrint/5P. Enabling Mac users to print to Hewlett-Packard's LaserJet 5P without having to upgrade that printer to PostScript compatibility, this Chooser extension can download TrueType fonts to the printer to reduce print times. \$69. GDT Softworks. 800-663-6222 or 604-291-9121.

FlexWare Version 8.0. Now PowerPC-native, this rewritten version of the high-end accounting package offers an improved interface; greater speed (even on 680x0 Macintoshes); and improved General Ledger, Accounts Receivable, and Accounts Payable modules. \$695 per module. State of the Art. 800-447-5700 or 714-753-1122.

Visual Arranger. Providing an icon-based interface, this program gives even music-theory illiterates the ability to create musical compositions and arrangements. The program contains a library of 1,600 preset music patterns (ranging in style from jazz to Latin to rock) and requires a MIDI interface and MIDI-compatible device for playing pieces back. \$60. Yamaha. 800-301-7076 or 714-522-9937.

* **Corel All-Movie Guide.** Featuring a database of over 90,000 movies, this CD-ROM has an interface that makes use of a video-store metaphor, complete with clerk. Users are able to search for information about films, actors, and directors; get recommendations on what films to see; and even purchase films online. \$69. Corel. 613-728-8200.



The Muppet Calendar. Miss Piggy meets PIMs in this electronic calendar that comprises hundreds of color Muppet photos and 100 pieces of clip art, featuring such notable personalities as Kermit the Frog and Fozzie Bear. Users can personalize their calendars with Muppet art or choose from predesigned templates. \$30. Jim Henson Interactive/SoftKey. 617-494-1200.

MACINTOSH PRICE INDEX

THE UNITED COMPUTER EXCHANGE index reflects average sales prices of new and used Macs as of May 5, 1995. Prices (except 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
SE/30 (5/40)		\$525
Classic II (4/40)		\$450
Color Classic (4/80)		\$700
LC III (4/80)		\$500
Performa 475 (4/160)	\$1,099	\$850
Performa 550 CD (5/160)	\$1,100	\$800
Performa 575 CD (5/250)	\$1,499	\$1,200
IIsi (5/40)		\$375
IIfx (5/80)		\$650
IIfx (8/160)		\$800
Quadra 605 (4/80)		\$575
Quadra 610 (8/160)		\$800
Quadra 630 (4/250)	\$999	\$825
Quadra 650 (8/230)		\$1,800
Quadra 660Av CD (8/230)		\$1,175
Quadra 700 (8/230)		\$1,250
Quadra 800 (8/230)		\$1,875
Quadra 840Av CD (8/230)		\$2,200
Quadra 900 (8/230)		\$1,600
Quadra 950 (8/230)		\$2,150
Power Mac 6100/60 (8/250)		\$1,000
Power Mac 6100/66 CD (8/350)	\$1,899	\$1,600
Power Mac 7100/66 (8/250)		\$1,750
Power Mac 7100/80 CD (8/700)	\$3,049	\$2,600
Power Mac 8100/80 (8/250)		\$2,500
Power Mac 8100/100 CD (16/1GB)	\$4,399	\$3,800
Power Mac 8100/110 CD (16/2GB)	\$6,299	\$5,700
PowerBook 145B (4/80)		\$750
PowerBook 150 (4/120)	\$999	\$800
PowerBook 165 (4/80)		\$1,150
PowerBook 165c (4/80)		\$1,200
PowerBook 170 (4/40)		\$1,100
PowerBook 180 (4/80)		\$1,550
PowerBook 180c (4/80)		\$1,700
PowerBook 520 (4/160)	\$1,499	\$1,300
PowerBook 520c (4/160)	\$1,999	\$1,700
PowerBook 540 (4/240)		\$2,500
PowerBook 540c (4/320)	\$3,699	\$3,200
Duo 250 (4/200)		\$1,475
Duo 270c (4/240)		\$1,800
Duo 280 (12/240)		\$2,450
Duo 280c (4/320)	\$3,499	\$2,900

- = discontinued model

For more pricing information on these and other models, call 800-755-3033 or 404-955-0569, or find it on ZiffNet/Mac, in Library 1 (Special Reports) of the MacUser Forum (GO ZMC:MACUSER). On AppleLink, look for it in ZiffNet Selections:MacUser Software:Reference. On eWorld, go to shortcut MACUSER, in MacUser Software Library:MacUser Special Files.

REVIEWS & Quick Clicks



Power Computing Power 100 / First-ever Mac clone garners high marks for compatibility and speed.

FROM THE OUTSIDE, it looks more like a PC than a Mac. But once Power Computing's Power 100 is up and running, there's no mistaking it. It's a Mac. The familiar Apple Finder is on-screen. And Apple's own logo is on the keyboard and mouse that come with the computer.

But can Power Computing's clone do everything an Apple Power Mac can do? Will Mac applications run without a hitch? If you already own Mac peripherals, will they work with the Power 100? Is the clone as fast as a comparable machine from Apple? Did Power Computing cut corners in order to save by buying a clone? So many questions and so few answers. You can't even test-drive a Power Computing clone at your local computer store, because the clones are available only through mail order. What to do?

First off, you've come to the right place. MacUser Labs snagged one of the first Power 100s to come off the production line and put it through its paces. A few minor kinks aside, the results of our tests made the Power 100 look so good that we're giving the green light to almost anyone thinking about purchasing a Power Computing clone.

For starters, Power Computing's Power 100 is as full-featured as any Apple Power Mac. In fact, you can think of it as an Apple Power Mac 8100/100 in an oversized 7100-style box. All of Power Computing's models to date — the 80-MHz Power 80, the 100-MHz Power 100, and the 110-MHz Power 110 — come in the same "baby AT" form factor, which is what makes them look like PCs.

Inside, Power Computing has installed a motherboard of its own

design, relying heavily on Apple-licensed ASICs (custom chips that perform a variety of system functions). All three models use the same motherboard and processor (the PowerPC 601) — the only difference is the speed of the clock chip.

The Power 100 has all the ports you'd expect on a Mac — printer, modem, SCSI, ADB, Apple Ethernet, 16-bit stereo sound in and out, and DRAM and VRAM video. There's even a bonus — a VGA connector for VGA monitors. Each Power Computing model also has three NuBus slots.

And *everything* works. Believe it, we tried to stymie the Power 100. We plugged in a slew of NuBus cards, attached printers via LocalTalk and Ethernet, gave file sharing a workout, and connected RAID arrays and removable-storage devices. We ran dozens of applications and installed an ungodly number of extensions and control panels. We didn't find a single bug that couldn't be reproduced on a Power Mac 8100.

Well, that's not quite true. We did encounter one *very minor* problem. The Power Computing clones ship with Toshiba quad-speed CD-ROM drives, which are significantly faster than the double-speed drives in current Apple Power Macs. To control the drives, Power Computing uses FWB's CD-ROM Toolkit, which lets you save an audio-CD track as an AIFF (digital audio) file onto a hard disk. We tried it, of course. It crashed the Power 100. However, odds are that if we put the same Toshiba CD-ROM drive into an Apple Power Mac 8100 and installed FWB's CD-ROM Toolkit, we'd encounter the same problem. More to the point was Power Computing's response to the problem — it plans to fix it, pronto, with a free software update.

Power Computing advertises the same configurations as Apple does, but we found its approach much more flexible. You can request any amount of RAM to be pre-installed, you can order a hard-disk drive in a range of sizes from 700 MB to 4 GB (in some cases, you can even request a specific disk mechanism), you can decide whether or not you want a CD-ROM drive, and you can choose between a VRAM card and an

REVIEWS RATING KEY

★★★★★	OUTSTANDING
★★★★	VERY GOOD
★★★	ACCEPTABLE
★★	POOR
★	SERIOUSLY FLAWED
☹	DANGEROUS



Neck and Neck / speed-testing the Power 100

MacBench 2.0 scores are relative to a Quadra 640 with an IDE hard drive, which is assigned a score of 10 for each test. The results for the graphics-application tests are relative to those for a Power Mac 8100/100, which is assigned a score of 1.0 for each test.

MacBench 2.0 Scores						Graphics Applications	
	PROCESSOR	FLOATING POINT	DISK MIX	VIDEO MIX	CD-ROM MIX	Graphics Storage	Graphics Display
Power Computing Power 100	43	185	9.4	20	29	1.1	0.9
Apple Power Mac 8100/100	43	185	9.5	19	13	1.0	1.0

Longer bars are better.

AV card. You can also order an Orange Micro 486 coprocessor card. Power Computing will configure a system to your specifications and have it on your doorstep within a week.

When it comes to upgrading your system, you'll appreciate the design of Power Computing's systems. One thumbscrew opens the box, and you can easily get to all the relevant places with minimal hassle. Compare that with, say, installing RAM in Apple's 8100.

Another major advantage of Power Computing's machines over Apple's is what comes bundled with them. Although you don't get a microphone, each Power Computing model comes with a keyboard and a mouse. Then there's the software — System 7.5, eWorld, ClarisWorks, Now Up-to-Date, Now Contact, Now Utilities, Quicken, 300 Bitstream fonts (in Type 1 as well as TrueType formats), and an America Online account — in short, software worth hundreds of dollars more than the software Apple provides with its machines.

But what about performance? To see how the Power 100's speed compares with that of the Apple Power Macintosh 8100/100, we ran the four primary MacBench subsystem tests — Processor, Floating Point, Disk Mix, and Video Mix — as well as the CD-ROM Mix. Each system had 16 MB of RAM, a Quantum 700-MB hard drive, and a CD-ROM drive.

MacBench scores for the four primary subsystems are weighted heavily toward speed for standard business tasks (read Word, Excel, ClarisWorks, and WordPerfect). Not surprisingly, on these tests, the two computers ran pretty much neck and neck. But on the CD-ROM Mix test, the Power 100, with its quad-speed drive, outperformed the Power Mac 8100/100, with its double-speed drive, by a wide margin.

However, we also wanted to measure the speed of work typically done by high-end-graphics professionals, which stresses disk drives and video-display cards in special ways. To measure these types of workloads, we upped the RAM configuration in both machines to 72 MB and performed a series of tasks in Adobe Photoshop, Infini-D, Adobe Premiere, and QuarkXPress. Again, the results were close, although there were some differences.

Because the Power 100 uses FWB's HD Toolkit as its disk driver, it outperformed the Apple Power Mac 8100/100 on our graphics-storage tests (in which Photoshop's 32K disk reads and writes figure prominently). HD Toolkit turns on write-back caching for a speed boost, whereas the Apple driver on the Power Mac 8100/100 does not.

However, when we ran our graphics-display tests, which focus on scrolling large 24-bit-color images, the Apple machine edged out the Power 100. We did some sleuthing and found that the cause is Power Computing's system-installation process. Although the company's machines ship with Apple's System 7.5.1 update installed, Power Computing removes the enabler that the update installs and replaces it with System 7.5's older PowerPC Enabler 1.1.1. As it turns out, the newer enabler improves scrolling speed.

By now, we hope we've convinced you that Power Computing's clones can do anything a Mac can — and they can do it just as fast. But buying a computer from an unproven company still involves some risk. The question is, Are the dollar savings worth the risk? Based on our experience with the Power 100, we think so. Even if you don't take into consideration the value of the bundled keyboard and software, Power Computing models cost about 15 to 20 percent less than

equivalent Apple Power Mac configurations. That's a significant chunk of change. But if you still have reservations, check this out: If you change your mind, you can return a Power Computing clone within 30 days of the purchase date and get your money back!

The Bottom Line

And so, the verdict is in — you *can* buy a Power Computing clone and expect it to perform just as well as any Apple Power Mac. There are, of course, some caveats. If you want the absolute latest technology, you'll probably want to stick with Apple. Clone vendors, at least for the foreseeable future, will lag behind Apple by several months. If industrial design is important to you, Apple is again the clear winner. And, ironically, if you want the very-lowest-cost system available, Apple is again your best bet. Although Power Computing clones are cheaper than Apple Power Macs for similar configurations, Power Computing currently has offerings only at the middle and high end of the price spectrum. It doesn't yet offer a 6100-class machine, and Apple's 6100s are still less expensive than the cheapest Power Computing model, the Power 80.

However, if you've been considering the purchase of an Apple Power Mac 7100 or 8100, we strongly recommend that you take a serious look at what Power Computing has to offer. After all, we're sure you can think of *something* worthwhile to do with the hundreds of dollars you'll save. / Henry Bortman

Power Computing Power 100



Price: With 16 MB of RAM, 1-GB hard drive, CD-ROM drive, and VRAM card, \$3,349 (direct).

Pros: One hundred percent Mac-compatible. Aggressively priced. Flexible configuration options. Valuable software bundle. Thirty-day money-back guarantee.

Cons: Basic no-frills design. A few minor technical kinks still need to be ironed out.

Company: Power Computing, Milpitas, CA; 800-999-7279 or 408-526-0500.

Reader Service: Circle #403.

InFocus LitePro 580, nView nFinity P115, and Sharp XG-E650U / Multimedia projectors get lighter and cheaper.



SCRAMBLING TO MEET the needs of savvy business presenters, makers of presentation hardware are coming up with lighter and more affordable LCD projection devices. Three of the latest offerings boast easy setup and built-in speakers and amplifiers.

The InFocus LitePro 580, the nView nFinity P115, and the Sharp XG-E650U multimedia projectors are all designed to project full-motion video from VCRs and laserdisc players, in addition to computer-generated images. Besides projecting color images that are bright and sharp, each projector weighs less than 20 pounds and costs less than \$8,000.

InFocus LitePro 580

Don't be fooled by the diminutive size of the LitePro 580. Of the three projectors reviewed here, it boasts the brightest images and the most-vivid colors — impressive when you consider that it uses only a 150-watt metal-halide arc lamp. The LitePro 580 is so bright, in fact, that you don't have to completely darken the room to get a good-looking image (good news for note takers!). We did have two minor complaints, however: Projected images contained some "noise," visible as faint diagonal rolling lines, and the focus was not quite as sharp as that of the other two projectors. But the LitePro 580's vivid colors more than compensated for these small imperfections.

Weighing in at 17 pounds, the LitePro 580

is also the lightest projector of the three. It comes with a PC VGA video cable with a Y configuration that lets you connect a desktop monitor, as well as your computer, to the projector. To accommodate Mac users, two adapters for the cable are included.

The projector has a manually adjustable zoom lens for controlling image size, but we found that the lens had a tendency to distort images at the highest and lowest zoom levels. However, we really liked the plug-and-play setup of the LitePro 580 — it required no adjustments to sync properly with the video sources of our test Macs, a PowerBook 520 and a Quadra 700.

A control panel on the top of the projector allows you to adjust audio volume, image brightness, video source, and the like. Unfortunately, the control panel has no backlighting, which can make it hard to make the correct adjustments in a dark room. There's also a wireless handheld remote control, which does have backlighting, and the most on-screen controls we've seen. The remote control comes with a built-in trackball for controlling your Mac or PC. Just connect the projector to your computer's serial port by using the supplied cable, and install the InFocus software. The Remote Programmer software lets you program five buttons on the remote control for performing mouse operations such as clicking and dragging. And bypassing the projector's on-screen controls, LP-Link lets your computer control the projector's settings.

Although the LitePro 580 offers the ultimate in portability for an LCD projector, if you're interested in mounting it permanently onto your conference room ceiling, it can be set to project images upside down (it can also reverse images).

As was the case with all three of the projectors we looked at, the LitePro 580's built-in speakers and amplifier were just so-so. Volume and bass were limited, so if you plan to use the audio capabilities of any one of the projectors reviewed here, stick with small to medium-sized audiences.

nView nFinity P115

The industrial-looking nFinity P115 uses a halogen light source that gives a warm cast to projected images. Overall, we were quite happy with the nFinity's image quality — the ramped background of our test presentation was smooth, colors were only slightly muted, and text was sharp.

The nFinity was the easiest projector to set up. It synced properly with our test Macs' video sources with no adjustments, and a convenient single cable works with Macs as well as PCs, which means that you don't have to keep track of any adapters. However, there's no zoom lens and you have to position the projector fairly far from your projection screen to focus it properly — we placed ours about seven feet from the screen.

We also found the projector's fan a bit noisy and noticed that the projector got quite warm after it had been on for a while. A standby mode, accessible from the control panel on top of the projector, switches off the lamp but leaves the fan on, so the projector can cool off before you pack it up.

The control panel has no backlighting,

InFocus LitePro 580

Price: \$9,999 (list).

Pros: Compact and light. Very bright images. Vibrant colors. Zoom lens. Most on-screen controls.

Cons: Projector controls lack backlighting. Lens can distort images and does not retract inside projector case. Carrying case optional. Some noise visible in projected images.

Company: InFocus Systems, Wilsonville, OR; 800-294-6400 or 503-685-8888.

Reader Service: Circle #404.

nView nFinity P115

Price: \$7,295 (list).

Pros: Easy setup. Convenient single cable works with Macs as well as PCs. Easy-to-use control panel with backlit LCD menu display. Foam-lined hard case included.

Cons: Noisy fan. Metal case gets hot during operation. Screws on bottom can scratch furniture. Control panel and remote control lack backlighting. No zoom lens.

Company: nView, Newport News, VA; 800-736-8439 or 804-873-1354.

Reader Service: Circle #405.

Sharp XG-E650U

Price: \$7,295 (list).

Pros: Remote-controllable retractable zoom lens. Well-designed backlit control panel and remote control. Built-in lens cover and cord-storage compartment.

Cons: Least bright of all three projectors tested. AV cables not included.

Company: Sharp Electronics, Mahwah, NJ; 800-237-4277 or 201-529-8731.

Reader Service: Circle #406.



Compact and light, the InFocus LitePro 580 (top left) multimedia projector boasts exceptionally bright, colorful images. The Sharp XG-E650U (right) projector has well-designed controls, including a remote-controllable zoom lens. The industrial-looking nView nFinity P115 (bottom left) is a snap to set up, but it lacks a zoom lens.

but the buttons are very easy to find and use. You can also use a wireless handheld remote control, but there's no backlighting to help you locate the right buttons. In place of an on-screen display of your selections, the nFinity has an LCD display.

The nFinity is by far the most rugged of the projectors reviewed here. But look out for the exposed screws on the bottom of its case — they scratched our table as we were setting up the projector. As with the InFocus LitePro 580, you can mount the projector on the ceiling — it can project images upside down as well as reverse them.

The nFinity comes in a foam-lined, hard plastic case, which nView claims meets FAA carry-on-baggage requirements. The case holds all the cabling and manuals as well.

Sharp XG-E650U

Although the Sharp projector uses a 250-watt metal-halide arc lamp as a light source, its projected images aren't quite as bright as those of the other two projectors. Color saturation, however, is quite good, although it's not as impressive as the LitePro 580's. The Sharp projector's images tend to have a cool bluish cast, but they are very sharp and generally cleaner than those produced by the others. And you won't have any problem adjusting image size — the Sharp projector's remote-controllable motorized zoom lens is very well designed, as are all of its controls.

We had to make a few minor adjustments to get the projector to sync with our test Macs and to optimize image brightness and contrast. You can use the controls on the top of the projector or on the handheld remote control — both sets of controls are backlit and clearly labeled, which makes them easy to use, even in a completely dark room.

Sharp includes a PC VGA cable and Mac adapters, but unlike the other projectors, the package doesn't include the AV cables you need in order to connect the projector to a VCR or a laserdisc player.

When you're done presenting, you simply press a button on the front of the projector to retract the lens and power down the unit. You don't get a carrying case, but then you really don't need one. The lens, the cord-storage compartment, and the connectors for the computer and the video sources are all protected by built-in covers. A comfortable handle makes the projector easy to carry. The Sharp projector can reverse images, but it cannot project them upside down.

Overall, the Sharp projector — with its convenient, well-lit controls — is an excellent choice if you're giving your presentations in very dark rooms.

The Bottom Line

It wasn't that long ago that impressing your audience with a multimedia presentation meant lugging a wagonload of hardware to

the conference room. And setup was anything but fast and easy if you planned to use a multimedia projector — sync and image adjustments meant that you had to show up well in advance of your presentation time if you wanted to make sure your equipment was up and running before the first attendee walked through the door.

Fortunately, the latest assortment of multimedia projectors has made giant strides in both portability and ease of use. Weighing less than 20 pounds each, the InFocus LitePro 580, the nView nFinity P115, and the Sharp XG-E650U are all easy to carry. And each comes with cabling for Macs as well as PCs and with pass-through connectors for desktop monitors. Built-in amplifiers and speakers are a nice plus, even though their audio capabilities are most appropriate for small to medium-sized audiences.

Of the three, the nView projector is the most complete out-of-the-box system, but you have to be careful of the screws on the bottom of its case — they can easily scratch your conference table. The Sharp projector has the most stable image, and its well-labeled backlit controls are easy to use, even in complete darkness. The retractable lens and cord-storage compartment make it the most convenient to carry too. The InFocus projector wins points for its compact design and exceptionally bright, colorful images.

/ Jeffrey S. Pittelkau

In Control for Workgroups / Attain's powerful organizer adds group-scheduling tools.

A PROVEN TOOL for organizing busy schedules, In Control enjoyed considerable success as a single-user program. With the latest release, In Control for Workgroups, Attain's outliner/calendar program has branched out into the groupware arena. The new program gives networked users an effective way to plan group projects and coordinate individual efforts. Better yet, it does so without requiring a dedicated server or administrator. However, we found In Con-

public file, you specify which columns from your file will be public; once you have created your public file, you decide which rows in the shared columns are public and which users can access them. When other In Control 3.5 users issue the Use Public File command and select your public file, its contents are automatically incorporated into their local files.

Thereafter, any changes made to the shared items are automatically incorporated into the public file and then passed along to all other In Control documents that are linked to it, including the original source. Updating can take place each time one of the files is opened or saved or can occur automatically at user-specified intervals. If you are traveling with a PowerBook or working at home, you can use the program off-line for as long as you want.

Open to the Public

To specify who can read and edit the public file, you have to depend on your network's file-sharing controls; In Control doesn't give you any way to limit who can make changes to various parts of a shared document. For example, a manager can't lock specific rows, columns, or cells within a public document.

That's an admirably egalitarian approach, but in some cases, it could cause headaches. Suppose, for instance, you're a project manager and you create a public file with assignments, deadlines, and meeting schedules; you put the file on a volume your staff members can write to, so they can check off completed items, log details, and add new tasks.

But what if a member of your staff decided he couldn't hack another meeting or thought his deadlines were too tight? As long as he had write access to the volume in question, he could make changes to any part of the shared file without consulting anyone. Any changes he made would automatically be propagated to everyone else on the team. He could even eliminate entire sections of the document — he'd get a warning message that he was deleting shared data, but no one else would. There's

not even a log or Get Info method to tell you who made changes and when.

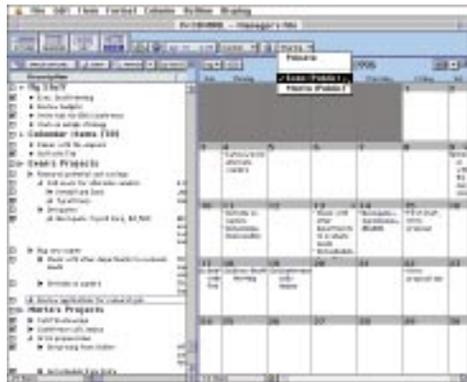
Attain argues, correctly, that these are social issues rather than technical ones, but software designed for the real world needs better safeguards.

We also had reservations about how Attain translated single-user features to the workgroup context. You can, for example, put events on a shared calendar, but there's no way to set up reminders for other users. This is only one of many reasons why In Control for Workgroups is not positioned as an alternative to dedicated group schedulers such as Now Software's Now Up-to-Date or ON Technology's Meeting Maker XP.

Likewise, some features of standard In Control documents — including text formatting, data-entry shortcuts, macros, and links that launch documents in other programs — are not passed along to their public-file versions. (You can distribute copies of your original document, but this seems to defeat the point of a workgroup product.) Your outline hierarchy gets transmitted to others, but if you later drag an item to a new position, that change won't be propagated. Conversely, changes others make to the structure of the outline won't appear in your file. And if someone adds a new column, other users have no way of knowing about it — and all concerned must go out of their way to share the updated file.

The Bottom Line

All in all, In Control for Workgroups is a promising start in an important direction for the popular outliner, but it definitely needs refinement before we can recommend it without hesitation. / Henry Norr



Using In Control for Workgroups, you can share important dates and project information over a network.

trol for Workgroups somewhat compromised by several annoying limitations and idiosyncrasies.

Old and New

In many ways, In Control for Workgroups — also known as In Control 3.5 — looks and works just like version 3.0. It has the same first-rate list-management features, including expand-and-collapse outlining; macros; and customizable columns, for project details such as start and end times. It also has the same less than stellar calendar (see In Control 3.0 review, October '94, page 48). You don't need to upgrade to version 3.5 if you don't plan to exchange your In Control data with colleagues.

In Control 3.5's data-sharing capabilities are what make it different. To share information contained in your In Control 3.5 file, you turn it into a public file — essentially a central master file available on a shared disk or in a shared folder. When you set up your

In Control for Workgroups

Price: \$149.95; 2-pack, \$199.95; 10-pack, \$949.95 (estimated street).

Pros: Great outlining and list-management features. Groups can share data in public files located in any shared folder or disk.

Cons: No built-in access controls or security. Some attributes of source file, including text formatting and data-entry shortcuts, and changes to outline structure don't appear in public files. Can't create reminders for other users.

Company: Attain, Somerville, MA; 800-784-7388 or 617-776-1110.

Reader Service: Circle #407.

ARCserve for Macintosh / Flexible network backup program accommodates mobile PowerBook users.



IF YOU'RE LIKE most network administrators, you probably use a network backup program to back up all the machines on your network during downtime. But traveling PowerBook users who want to back up their machines to the network tape drive when they return to the office are out of luck with most network backup programs. Retrospect Remote, for example, doesn't allow users to initiate their own backups over the network, which means that users whose machines happen to be turned off when network backup occurs are also left out in the cold.

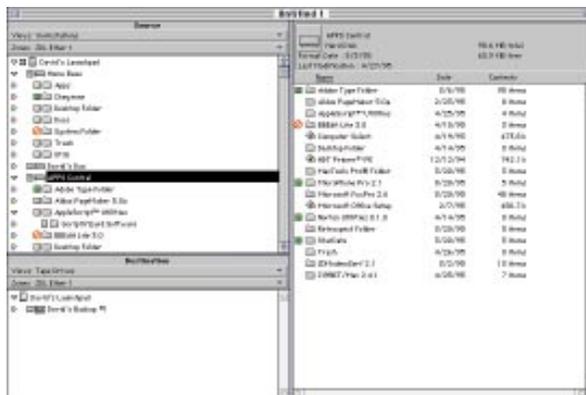
One backup program that *does* permit user-initiated backups over a network, as well as automated centralized backup, is ARCserve for Macintosh. ARCserve also has the advantage of cross-platform support, which the current version of Retrospect Remote does not. However, ARCserve's main drawback is that it's not as convenient to use as it could be.

Source to Destination

For users as well as administrators, using ARCserve is fairly straightforward. In the source window, you select the volumes you want to back up, and in the destination window, you select the storage device to which you want them backed up. If you want to back up or exclude specific files, you simply highlight a volume in the source window and a list of its contents appears in another window. In this window, you check off the specific files or folders you want to back up. Alternatively, you can use the program's filters to include or exclude files by name, size, file creator and type, label, or Finder attributes such as whether a file is locked or shared.

Once you've laid the foundation for the backup, you simply go to Quick Script on the

Run menu and specify whether you want to do a full backup, which backs up all files, or an incremental backup, which copies only the files that have changed since the last backup. You can run the backup immediately; schedule it for a later time; or establish recurring backup times, using an easy-to-understand calendar. The files are backed up in either a Finder-readable for-



Straightforward and easy to use, ARCserve for Macintosh supports both user-initiated and automated centralized backup over a network.

mat or a proprietary ARCfile format, which is the one you'll use if you're doing a cross-platform backup.

By combining the ARCserve for Macintosh client software with the ARCserve for NetWare Windows Edition, Mac users can schedule backup and restore jobs using tape drives and other storage devices connected to a NetWare server. Then, if necessary, you can use the resulting cross-platform tape on a Mac client to do a local restore. If you need to restore only specific files or folders, you can use ARCserve's convenient Quick File Access feature to search for files on a backup device by a variety of criteria, including name, date backed up, date modified, and source.

Several users can use ARCserve for Macintosh to run backups at the same time on the same network — another advantage over Retrospect Remote, which can run only one backup script at a time. For instance, while the automated network backup is running and copying data to a

dedicated file server, a user can back up a PowerBook to a tape drive attached to another Mac on the network.

Room for Improvement

The current version of ARCserve can give you byte-by-byte verification of your backups, but you must be sure to turn on the verification option. Using the default setting, you don't get verification. Furthermore, the program, unlike Retrospect Remote, doesn't tell users when they shut down their computers that a backup is scheduled. And if you're backing up over a network, before you reuse any tapes used by ARCserve, you have to erase them, since the program doesn't overwrite its own files.

The manual is spartan. We would have liked less information on why we should back up and more on the various features, exactly what they do and why, and how and when to use them. To be fair, Cheyenne does have a good section on disaster recovery.

Because of the way the Mac polls machine names under System 7.5, ARCserve identifies your Mac as having a processor one generation older than the one really installed: For instance, ARCserve says that a Quadra 950, which has a 68040 processor, has a 68030. At press time, Cheyenne was working to fix this problem.

The Bottom Line

ARCserve for Macintosh wins points for offering mobile users a way to initiate network backups of their machines when they return to the office. It also boasts cross-platform support and an easy-to-use point-and-click interface. However, several rough edges need to be smoothed out before ARCserve can compete with the convenience of Retrospect Remote. / David Kison

ARCserve for Macintosh 1.5

Price: 5-user base package, \$245 (list).

Pros: Cross-platform capability. Easy to use. Network support includes automated centralized backups as well as user-initiated backups.

Cons: Program defaults to no data verification. Sparse manual. At shutdown, no user notification of scheduled backup.

Company: Cheyenne Software, Roslyn Heights, NY; 516-484-5110.

Reader Service: Circle #408.

Hewlett-Packard ScanJet 3c / Fast, versatile color flatbed scanner zips by the competition.



IF YOU'RE TIRED of twiddling your thumbs while you wait for your office scanner to process color images, consider Hewlett-Packard's fast new alternative, street-priced for less than \$1,000. The reliable HP ScanJet 3c is a 600-dpi color flatbed scanner that delivers higher-quality scans than its similarly priced predecessor, the 300-dpi ScanJet IIcx — plus it comes bundled with software that allows it to do double duty as a photocopier if you also have a printer.

Image Control

The ScanJet 3c captures images in 30-bit color and has a maximum interpolated resolution of 2,400 dpi, which comes in handy if you need to enlarge images from slides or small photos. It can also handle images as large as 8.5 x 14 inches.



An ideal scanner for small offices, the affordable HP ScanJet 3c is speedy for the price — and it comes with software that allows it to do double duty as a photocopier.

The ScanJet 3c's basic software consists of the DeskScan II driver and a limited edition of Adobe Photoshop. You can use the driver without Photoshop to scan images and save them as PICT, TIFF, TIFF-compressed, or EPS files. Or you can simply use TWAIN and the driver to acquire images from within Adobe Photoshop or any other TWAIN-compliant application.

You don't have as many scanning-software features and options with the ScanJet 3c as you do with the similarly priced Agfa StudioScan II (see review, March '95, page

56), but unless you need more-esoteric controls such as unsharp masking, you'll find the ScanJet 3c dependable and adequate for most tasks. The scanning software provides settings for black-and-white, grayscale, and color images. You can also select your output device and its resolution, and the ScanJet 3c calibrates itself to the device. For instance, if you're going to print your image from a 300-dpi thermal-wax printer, the scanner will scan at 300 dpi and save space on your hard disk. You can also adjust highlights, shadows, and color and use curve controls to set midtones and slider controls to set brightness, contrast, and scaling. DeskScan II also lets you produce negatives, mirror images, and uniform scaling simply by clicking on a button. As easy as DeskScan II controls are to use, we wish that it also provided numerical set-

tings for brightness, contrast, and scaling.

Double Duty

The ScanJet Copy utility can be very useful if you have a printer but no photocopier. Essentially, this utility does a quick scan of a document and sends the image directly to the printer selected in the Chooser. Before you throw away your purchase order for a color copier, however, be forewarned that you get the

worst of two worlds: the image quality of a copy machine and the expense of printer consumables — as well as speeds slower than you'd get with a printer or a copier.

Using ScanJet Copy, we made single copies of a page with text only and a page with text and grayscale art; each page took more than three minutes to print from an HP LaserJet 4MP. A single color copy took almost five minutes to print from a Tektronix Phaser 540. As for quality, our grayscale image was muddy, even though the LaserJet 4MP has a 600-dpi resolution. The color

copy was darker than the original and lost details in shadowed areas. You're probably better off using ScanJet Copy as an occasional backup for your photocopier.

The ScanJet 3c comes with WordScan OCR software. You can buy a 50-page automatic document feeder for \$559 and a transparency adapter for \$759.

Making the Grade

To gauge the speed and image quality of the ScanJet 3c — when performing its main function, scanning — we scanned a photograph that had bright colors, a blue gradient background, and varying tones and compared the printed results with those of the Agfa StudioScan II. Our test platform was a Quadra 650.

The ScanJet 3c doesn't waste any time when it comes to helping you meet a deadline. At 300 dpi, the ScanJet 3c was more than twice as fast as the StudioScan II. The ScanJet 3c scanned the photo in 40 seconds, compared to the 90 seconds that it took the StudioScan II to perform the same task.

The ScanJet 3c's image quality was also very good. Color accuracy was acceptable, although the StudioScan II's was marginally better. The ScanJet 3c was particularly adept at accurately producing true bright whites and image highlights, and although it was also good at producing heavily saturated colors, the StudioScan II was slightly better. Both scanners did a good job of producing sharp details in shadowed areas.

The Bottom Line

Nimbleness, good image quality, and reasonable price make the ScanJet 3c ideal for small businesses — and it doesn't hurt that it's flexible enough to fill in as a black-and-white or color copier when you need it.

/ Roman Victor Loyola

HP ScanJet 3c

Price: \$1,179 (list).

Pros: Fast. Good midtones and highlights. Can double as a photocopier (with printer).

Cons: As photocopier, produces mediocre prints and is slower than real photocopier. No numerical settings for brightness, contrast, or scaling.

Company: Hewlett-Packard, Santa Clara, CA; 800-722-6538 or 208-396-2551.

Reader Service: Circle #409.

TurboCAD for Macintosh / Awkward interface compromises 2-D-CAD challenger's strong feature set.

WHEN IN ROME, do as the Romans do: The old adage holds true whether you're traveling in a foreign country or developing CAD software for the Mac. IMSI's TurboCAD for Macintosh competes well with other 2-D-CAD programs when it comes to delivering great features for a good price, but it loses points by abandoning key user-interface elements.

Caught in the Crosshairs

One of the first things you notice in TurboCAD is that there is no arrow pointer; instead it has crosshairs that extend across your entire drawing. Instead of moving a cursor, you move the point where the crosshairs intersect. Although crosshairs are a useful optional drawing aid in many CAD programs, having to use them instead

first and then change its attributes with tools and commands. With TurboCAD, you work in reverse: For instance, if you want to move an object in TurboCAD, you have to click on the move tool before you can select and move the object.

Related to this frustrating quirk is the way TurboCAD makes you click instead of simply letting you release the mouse button. For instance, if you want to create a circle, you have to select the circle tool, click on your drawing to establish its center, drag from that point to define the radius, and click *again* to place the radius.

Furthermore, you can have only one drawing open at a time in TurboCAD. The program lets you use the Merge command in the File menu to merge a saved drawing with the one you have on your screen, but we would much prefer the ability to have multiple documents open instead.

Basic Toolbox

If you can get beyond the interface, you will find some good features in TurboCAD. Although the program doesn't give you on-screen feedback about geometric information (such as where endpoints and centers are in objects), it does have all the basic CAD features, including the ability to

name layers and add text tags to graphic objects. TurboCAD also gives you all the basic 2-D-CAD tools, including dimensioning tools to measure lines, angles, radii, and diameters. However, you do not have any way to apply tolerance variations to the measurements.

In addition to Mac fonts, TurboCAD supports stroked (vector-drawn) fonts, which are the preferred fonts for pen plotting. The program does not support fill patterns, although IMSI says version 2.0 — due out by the time you read this — will.

A robust DXF converter included with

TurboCAD did an excellent job of converting AutoCAD files into TurboCAD format. You can save TurboCAD files in PICT as well as DXF format. But if you want to place your TurboCAD drawings in a desktop-publishing program, you might be disappointed that TurboCAD can't save its drawings in EPS format.

One of the better features in TurboCAD is its support for macros, which come in handy if you want to automatically generate complex geometric objects in your drawing or quickly edit certain kinds of objects. You can write your own macro text files, using the command language documented in the manual, or you can simply record your actions in the program and save or edit the resulting macro as you wish.

When you buy TurboCAD, you receive one version that requires an FPU and another that doesn't. The FPU version worked well on a Quadra 700 and a PowerBook 180, but we had to use the non-FPU version on our Power Mac 8100/80. Nonetheless, even though TurboCAD is not PowerPC-native, it performed up to twice as fast on the Power Mac as on the Quadra for most operations. IMSI promises that TurboCAD 2.0 will be PowerPC-native.

The Bottom Line

If history provides any lessons, TurboCAD will have to adopt a more Mac-like design to succeed. Other Mac CAD programs that started out with a non-Mac interface either changed and adapted, as did Autodesk's AutoCAD, or they vanished from the market, as did Amiable Technologies' FlexiCAD. TurboCAD is a stable and reliable CAD program that delivers all the basic features at a reasonable price, but IMSI has to make it more palatable to Mac users if it wants TurboCAD to compete with Graphsoft's Blueprint. / James K. Anders



Its strong set of CAD tools aside, TurboCAD has an awkward interface that can make it frustrating to use.

of a traditional pointer was disconcerting. At the very least, IMSI should have provided an option for a standard arrow pointer.

However, the crosshairs were far from being the most annoying interface element in TurboCAD: We had more quarrels with the method of creating and editing geometry. Whether you're using a drawing application or the Finder, you usually manipulate objects directly on a Mac. For instance, if you want to move a rectangle in a draw program or an icon in the Finder, you click on it and drag it. If you want to change the color and thickness of a line, you select the line

TurboCAD for Macintosh 1.0

Price: \$149.95 (list).

Pros: Inexpensive. Quality DXF conversion. Good macro support.

Cons: Awkward, non-Mac interface. Does not allow multiple open documents.

Company: IMSI, San Rafael, CA; 800-833-8082 or 415-257-3000.

Reader Service: Circle #411.

OneWorld Internet / Elegant hardware/software package simplifies Internet access for small businesses.



PUTTING A FRIENDLY face on complex communications software has long been Global Village Communication's forte, and the OneWorld Internet continues the tradition. A bundle of hardware, software, and an Internet service provider, the OneWorld Internet greatly simplifies the task of setting up access to the Internet for small-business

OneWorld Internet is installed, each Mac user on your network can exchange mail over the Net and use such services as ftp (file-transfer protocol), Gopher, and the World Wide Web.

The beauty of the OneWorld Internet is that it does away with much of the complexity of setting up Internet access. Without it, network managers need a fair amount of expertise in such arcane arts as routing and IP-address management and must also deal with a variety of hardware and software components.

By contrast, if your office is already using e-mail, most of the OneWorld Internet setup is already done. All you have to do is connect the server box to your network and to a telephone jack, load the configuration software onto the server box, install the Global-

Center server software onto your mail server, and create a MailCenter gateway. The final step — the actual connection with the Internet — is handled remotely for you by the GlobalCenter automated system.

Familiar Face

For e-mail, the OneWorld Internet offers a single big advantage — network users can use the familiar interface of QuickMail or Microsoft Mail to send and receive messages over the Net. The hardest task

they will encounter is learning the Internet address format. To assist them, the OneWorld package includes a helpful guide to Internet addressing.

For direct Internet access that allows network users to take advantage of other Internet services, such as the World Wide Web, you need to install the GlobalCenter user software on each Mac. The software's primary function is to configure Apple's MacTCP (included), which means, among other things, giving it an IP address supplied by the GlobalCenter service, via the OneWorld server. The application is amazingly simple to use — it does a great job of insulating administrators from the complexities of MacTCP configuration.

The client disk also includes a World Wide Web browser (EINet's MacWeb) and some starting points for Internet exploration. Global Village's own Web site contains pointers to its copies of several popular Internet applications; we were disappointed, though, that the company didn't offer the latest versions of several of the applications.

When a user initiates a Web connection or some other type of Net connection, the OneWorld server dials the GlobalCenter, which connects the user's Mac to the Net. The connection remains active as long as it is in use — it times out after three minutes of inactivity to save connect charges. We found that the dial-up process makes initial connection quite slow — Internet applications such as Anarchie (ftp and Archie client software) may time out while waiting. And once a connection is made, access speed is limited by the OneWorld Internet server's 28.8-kbps modem and the Internet itself. If you want the fastest connections, you might want to wait for the ISDN version of OneWorld Internet, due in June.



A breeze to set up and use, Global Village's OneWorld Internet eliminates the hassle of configuring and maintaining Internet access for small networks.

LANs. Your budget and the type of access you need will determine whether it's right for your network.

Well-Integrated Approach

The OneWorld Internet package consists of the OneWorld Internet server — a box with a 28.8-kbps modem, an Ethernet port, a floppy-disk drive, and an Intel 80386 CPU — GlobalCenter management and mail-server software, and client software. The GlobalCenter server software, which works with either CE Software's QuickMail or Microsoft Mail, lets you create an Internet gateway from EtherTalk LANs to the Net, using your mail server.

The package also provides access to the GlobalCenter. Global Village's Internet host system. The GlobalCenter handles the actual process of setting up access to the Net and exchanging mail between your QuickMail or Microsoft Mail server and the Net.

In addition to the \$1,999 price of the package, you pay \$3.95 an hour for connect time or a \$249 monthly flat rate. Once the



With the GlobalCenter Manager, network managers can control access to the Net and schedule connection times for sending and retrieving mail.

Managing Connections

The administration software you get with the OneWorld Internet is top-notch. Called GlobalCenter Manager, the software lets you not only monitor and control users' Internet access but also schedule calls to the Global-Center system to send and retrieve mail. For example, you can schedule connections to the system based on the number of messages in the queue or according to time intervals during the day or night. If you want to control the cost of your Internet service, you can limit Internet access to authorized users only or to a prescribed number of hours per day. You can also track activity by user.

The OneWorld Internet currently works exclusively with QuickMail and Microsoft Mail — you can't use it with Internet-based POP (Post Office Protocol) or other mail systems.

The Bottom Line

The OneWorld Internet is an elegantly designed package for small organizations that want to avoid the hassle of configuring and maintaining Internet access. It's ideally suited for networks that plan to have e-mail as their primary Internet application — seamless integration with existing QuickMail and Microsoft Mail systems is a big plus.

However, experienced and technically savvy Internet users may find the OneWorld Internet's reliance on QuickMail and Microsoft Mail limiting — the OneWorld Internet does not offer the same level of flexibility you get with traditional service providers, which offer fuller access to their host systems. Speed limitations will also be a factor for those who make heavy use of Internet services. / Shelly Brisbin

OneWorld Internet

Price: \$1,999; GlobalCenter service: \$3.95 per hour or \$249 per month.

Pros: Elegant setup and administration. Automated IP-address configuration.

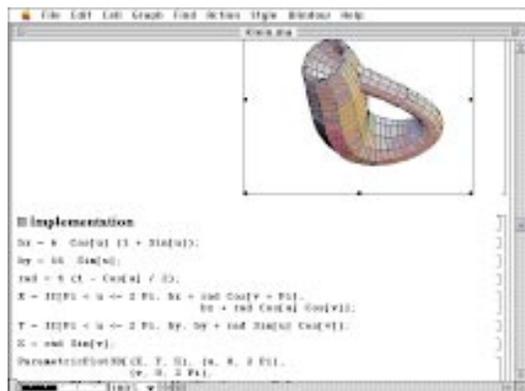
Cons: Works with QuickMail and Microsoft Mail networks only. Speed limited by that of modem connection.

Company: Global Village Communication, Sunnyvale, CA; 800-736-4821 or 408-523-1000.

Reader Service: Circle #413.

Mathematica 2.2.2 / State-of-the-art math software is now PowerPC-native.

FOR HIGH-LEVEL mathematics — numerical, symbolic, and graphical computations — the Power Mac is a pretty inviting platform. Clearly, no one understands this better than Wolfram Research, which recently introduced a PowerPC-native version of its sophisticated math program, Mathematica.



New **graphing capabilities** allow Mathematica to create complex 3-D plots that include three variables.

We speed-tested Mathematica 2.2.2 for the PowerPC and found that it can perform a variety of numerical and symbolic calculations as much as ten times as fast as the non-native version. It can also render graphics as much as five times as fast, making it a good choice for complex tasks such as waveform analysis. The new version also boasts a long list of feature enhancements that includes beefed-up equation-solving tools and an improved interface.

Split Personality

Mathematica is an industrial-strength math program for scientists, engineers, college math teachers and students, and financial analysts. In addition to running on the Mac, Mathematica runs on a variety of other platforms (PCs and a wide range of UNIX-based workstations and supercomputers), so it has obvious advantages for cross-platform environments.

The program consists of two main modules: a front end — which presents the interface and file-management tools — and a calculation kernel. The advantage of Mathematica's split personality is that users who work with computation-intensive math

applications on networks can run the kernel on a speedy workstation or supercomputer while the front end resides on their familiar desktop Mac or PC.

Mathematica is a complex program, but its front end uses a notebook interface that makes it surprisingly easy to use. Notebooks are Mathematica documents. Each document consists of a collection of cells that store various types of information, including text, graphics, and calculations. Cells are organized hierarchically, and you can manipulate them much like you manipulate an outline — by collapsing and expanding entries.

What makes Mathematica so intuitive is that you work with notebooks in much the same way as you work with word-processing documents. Each notebook can have its own style sheet, for example. You can even make notebooks interactive, so, for instance, math professors can create lessons that contain explanations and computational exercises.

Number Cruncher

In addition to being PowerPC-native and taking advantage of the Power Mac's FPU, version 2.2.2 boasts improvements in all computational areas — numerical, symbolic, and graphical.

For numerical computations, Mathematica now recognizes sparse linear systems. In addition, the program's equation-solving capabilities can handle more-complex symbolic matrices.

For symbolic computations, Mathematica 2.2.2 supports fancier methods for treating singularities in definite integrals than the previous version did. Solutions of symbolic differential equations have also been refined, so they are more useful in a variety of contexts, including financial and engineering modeling.

The program also incorporates

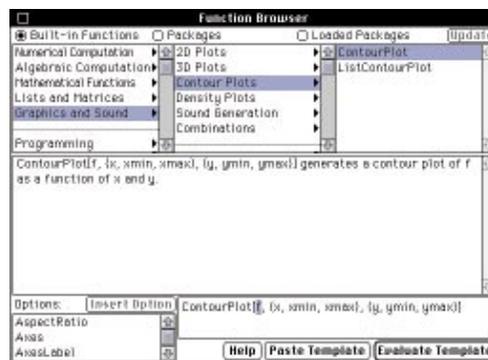
new complete integral methods of solving first-order differential equations and new functions for handling nonlinear differential equations, first-order partial differential equations, and variational methods. New program modules handle spline fitting, variational methods, elliptic integrals, and music.

Mathematica is well known for its graphical capabilities, which let you not only visualize functions and data but also animate sequences of graphs. The program supports a wide range of 2-D and 3-D graph types.

Improvements to Mathematica's graphical prowess include the ability to plot implicit functions of three variables and to construct iso-surfaces from 3-D data sets. Hand in hand with these additions are 3-D contour plotting and audio-signal analysis. Wolfram Research has also strengthened existing graphical and analysis commands, including those for descriptive graphics, statistics, numerical limits, and Fourier and Laplace transforms.

A Convert to PostScript command vastly improves the quality of printed bitmaps and certain graph types such as DensityPlot and RasterArray. The command converts PICT graphics to PostScript, which allows you to export the results to presentation programs or to page-layout programs for publishing.

Mathematica's new online help is nicely integrated with the notebook interface. The most notable feature is the vastly improved Function Browser on the Help menu. The Browser reduces tedium and improves calculation accuracy and input speed. It displays lists of functions, with explanations for each, and you can copy



Mathematica's **Function Browser** not only explains functions but it also lets you copy and paste them directly into notebooks, so you don't have to type in each function manually.

selected functions and paste them into notebook cells, the basic building blocks of Mathematica documents. With the previous version, you had to type in these functions manually. The functions are all nicely organized by categories, making it easy to find what you're looking for. In fact, this feature works so well that you may not need to consult the manuals at all, a real feat for such a complex application.

Mathematica competes head to head with Waterloo Maple's Maple V Release 3. For now, Mathematica has the edge — it's faster at calculating and graphing, because it's PowerPC-native. However, it's only a matter of time before Waterloo Maple releases its own PowerPC-native version. We also found Mathematica's notebook interface to be more intuitive than Maple V's interface.

Wolfram sells two versions of Mathematica for the Mac: Enhanced and Standard. The Enhanced package contains a PowerPC-native version and a version for 680x0 Macs. Both take advantage of the Mac's FPU. The Standard version runs only on 680x0 Macs and does not use the FPU. Wolfram also sells educational and student versions of the Enhanced and Standard packages at discounted prices.

A mathematical powerhouse, Mathematica 2.2.2 eats up system resources. To run the program at optimal speed, we recommend at least 24 MB of memory.

The Bottom Line

As a PowerPC-native application, Mathematica 2.2.2 is a veritable speed demon for computing and graphing high-level math functions. Whether you're trying to analyze a complex graph or solve a system of partial differential equations, you will find the program's tool set powerful and accessible.

/ Don Crabb 

Mathematica 2.2.2

Price: \$995 (list).

Pros: Easy to install and use. Fast. Many new graphical and analysis functions. Improved interface. Built-in online help.

Cons: Requires large amounts of memory.

Company: Wolfram Research, Champaign, IL; 800-441-6284 or 217-398-0700.

Reader Service: Circle #414.

Pantone ColorDrive / One-stop color shop

WHEN YOU WERE a child and wanted to use burnt-sienna orange in a drawing, it was as easy as choosing the right crayon out of your crayon box. Now that you're an adult, getting the same shade on your monitor, in an application different from the one in which you created your drawing, and out of a printer can be an insurmountable challenge. Worse, most color-calibration products correct only one factor at a time, leaving you to recalibrate everything all over again each time you start a new application or use a different printer.

Pantone's ColorDrive software approaches the problem from a different angle. Instead of using just the RGB and CMYK color spaces, ColorDrive contains thorough, detailed spectral data for each color in the Pantone color library, including the complex metallic colors. This data is a device-independent digital representation of the actual colors in the Pantone color wheel. If you have a spectrophotometer, such as the Light Source Colortron (see review, June '95, page 53), you can add colors to ColorDrive. This is particularly useful for comparing and checking the Pantone colors ColorDrive is using in your application with actual press samples of the same colors.

However, even the most thorough spectral data won't print correctly on a color printer if you haven't taken the printer's unique characteristics into account. When you open one of the Pantone color libraries in ColorDrive and designate what kind of printer you are using, ColorDrive gives you a side-by-side preview of how each color appears on your monitor and how the same color will look when you print it on your printer. You can adjust each of the Pantone colors to get the final results you want. Then you can save these adjusted colors as a palette customized for one of several of the most



popular graphics and desktop-publishing applications, including QuarkXPress; Adobe PageMaker, Illustrator, and Photoshop; Fractal Design's Painter; and Macromedia's FreeHand. ColorDrive comes with a variety of utilities for searching and editing its Pantone color libraries.

Out of Sync. ColorDrive's main drawback is its reliance on ColorSync for calibrating color on your monitor. ColorSync 1.0.x leaves much to be desired when it comes to reproducing color accurately on your monitor. (Version 2.0 is promised to be more accurate.) Also, although ColorDrive supports a broad spectrum of printers, it has only one generic profile for imagesetters, so this software is practical only for getting great color proofs from a desktop color printer.

Like the Pantone colors themselves, ColorDrive works only if you're using spot color; it won't do you any good once you delve into the complexities of four-color process printing or scanned continuous-tone photographs. We

were also disappointed that Pantone did not include a color swatch book, an essential element of using ColorDrive that will cost you at least \$85 more.

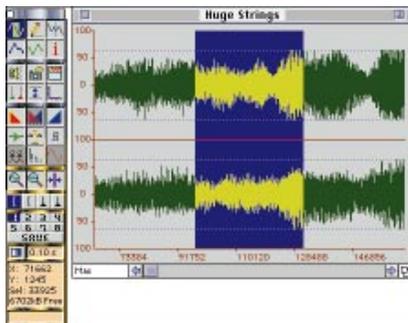
If you swear by your Pantone color wheel; generally use spot color; and simply need to create sharp-looking, color-accurate proofs with your printer, ColorDrive is a worthwhile investment. Otherwise, you're better off developing good intuition and getting a professionally done Matchprint. / David Biedny

Pantone ColorDrive 🍌🍌🍌 / Price: \$199 (list). Company: Pantone, Carlstadt, NJ; 800-222-1140 or 201-935-5500. Reader Service: Circle #415.

Alchemy 3.0 / Enchanting sampling

AS IF BY MAGIC, the once discontinued Alchemy, Passport Designs' professional-quality 16-bit sound-editing software, has returned from the dead.

Audio by Eyesight. Alchemy is a first-rate audio tool for Mac musicians who want to modify digital-audio files. Alchemy displays sampled sounds as waveforms, which you can edit by cutting and pasting or by merging them with other samples. It also allows you to perform more-complex operations — such as pitch shifting, time compression, sample-rate conversion, looping, cross-fades, and digital delay — on your sound sample. Once your sample sounds right, you can load it into your sampler.



With earlier versions of Alchemy, users had to transfer their edited 16-bit sounds to a sampler or use a digital-audio workstation or card to hear their sounds in full fidelity. But thanks to Alchemy 3.0's support for Sound Manager 3.0, you can listen to all your edited sounds in 16-bit from your Power Mac or Quadra AV, without additional hardware. Alchemy doesn't even require an extensive investment in RAM or processing time;

the program needs only 4 MB for most short samples, and pitch-shifting a 15-second 16-bit AIFF file took 2 minutes, 5 seconds on a Power Mac 6100/66.

Sound WAVs. Cross-platform-multimedia

types will be pleased that Alchemy 3.0 supports Windows' WAV files and all the standard Mac sound formats. And if you have a MIDI system with multiport MIDI interfaces, you'll be thrilled that Alchemy sends and retrieves data through Opcode's Studio 5 and Mark of the Unicorn's MIDI Time Piece. On the negative side, Alchemy has software copy-protection and still doesn't have the kind of advanced loop-editing features you can get with specialized high-end sound-looping tools.

Nonetheless, for those who are serious about sound and use a sampler, Alchemy is an invaluable audio tool. Now that it supports 16-bit sound directly on Power Macs and AV Macs, multimedia users and amateurs alike might want to fall under Alchemy's spell. / Christopher Breen

Alchemy 3.0 🍌🍌🍌 / Price: \$495 (list). Company: Passport Designs, Half Moon Bay, CA; 800-443-3210 or 415-726-0280. Reader Service: Circle #416.

ScanPartner Jr. / Compact scanner

IF YOU'RE LOOKING for a small, inexpensive scanner, the ScanPartner Jr. fills the bill, but it's not as elegant or innovative as the Visioneer PaperPort (see review, April '95, page 56) nor as flexible as a flatbed scanner.

Only 11.6 inches wide and 4.2 inches deep, the ScanPartner Jr. is small enough to fit on all but the most crowded desks. You'll have to make some room, however, for its stiff, bulky power cord as well as for a SCSI cable. SCSI does give the Fujitsu product one enormous advantage over the PaperPort, with its serial port, which is likely to be occupied already by a modem or a printer.

To feed pages into the ScanPartner Jr., you simply lay as many as ten of them against a metal guide at the top. This works well for scanning letters, fliers, legal documents, and other sheets of paper up to 8.5 inches wide, but you can't scan material from books, magazines, or newspapers directly.

Bundled with the ScanPartner Jr. is Xerox Imaging Systems' TextBridge 2.0 OCR application. TextBridge is faster and more accurate, by far, than the obsolete WordScan, which accompanies the PaperPort. But TextBridge is the only software that comes with the ScanPartner Jr. It has nothing like Visioneer's PaperPort extension, which launches the PaperPort's scanning application as soon as you insert something into the scanner, nor anything like the document-management features that distinguish the PaperPort application, such as document annotation, keyword searching, integrated faxing, and optional e-mail links. And TextBridge requires more

RAM (more than 4.5 MB) than the PaperPort application does.

Better in Grayscale. In contrast to the black-and-white-only PaperPort, the ScanPartner Jr. can distinguish up to 256 levels of gray. But you have to get additional software to use this capability. TextBridge can save images in TIFF format, but it doesn't have any image-editing capabilities.

Although Xerox offers a PowerPC-native version of TextBridge, Fujitsu bundles only the 680x0 version with the ScanPartner Jr. The bundled TextBridge supports only 5 languages, whereas the \$99 retail version supports 11.

The ScanPartner Jr. does work as advertised, but if you're aiming for a paperless office, you'll come closer to that ideal with the PaperPort. And if you want color support, graphics software, and maximum flexibility, your best bet is to spend a little more money for a flatbed scanner.

/ Henry Norr

ScanPartner Jr. 🍷 / Price: \$499 (list). Company: Fujitsu Computer Products of America, San Jose, CA; 800-626-4686 or 408-432-6333. Reader Service: Circle #419.





Peanuts Family Organizer Organization made easy

IS IT TOUGH to keep track of your busy family? Check out Individual Software's Peanuts Family Organizer, and get your family's act together — the Charlie Brown way.

Peanuts Family Organizer, like other personal information managers (PIMs), has a built-in scheduler, to-do list, and address book. But, unlike other PIMs, this product is much more suited for family use. First you choose a Peanuts character icon to represent all of your personal information. You can schedule appointments for yourself or activities for the whole family, such as a weekend picnic.

To keep current on what everyone is doing on a given day, you can view the calendars, to-do lists, and address books on up to 12 family members. You can also post messages to any or all family members and make any item — be it a to-do or an event — part of a category. **Good Grief!** Although the product is fun to use and effective, there are some problems. For one, there is no password protection, so, for example, if Dad writes "preparations for Junior's surprise party" on his to-do list, the surprise will be ruined if Junior spots it. Additionally, deleting data files from the Finder, rather than within the application, caused a crash.

Nevertheless, Peanuts Family Organizer offers plenty of features and lots of fun — at a price even Lucy can love. / Steve Rubel

Peanuts Family Organizer 1.0 🍌🍌🍌 / Price: \$19.99 (estimated street). Company: Individual Software, Pleasanton, CA; 800-822-3522 or 510-734-6767. Reader Service: Circle #420.

Taxi with Zagat Surveys / Travel companion

TRAVELING TO an unfamiliar city? Be sure to take along Taxi, a map-oriented database system that's sure to have you navigating the streets like a native.

Most of Taxi's action takes place in a main window as you view a city (Taxi's core program includes San Francisco; Washington, D.C.; Los Angeles; New York; and Chicago) from above. Click on one of the navigational tools to zoom in on a specific address and on another to center the map on a specific point, add labels, identify landmarks, or even measure distances. **Easy Router.** Getting there may be half the fun, but Taxi also makes it easy to figure out how. Choose the Path Finding tool to flag a sequence of locations, and in moments Taxi traces out a viable route, factoring in one-way streets and even avoiding areas you've designated as too congested or crime-ridden.

Taxi's maps come peppered with hundreds of hotels and restaurants drawn from a list compiled by Zagat Surveys. Reviews for each are available in the program, and you can search for your perfect eatery or accommodation by using a range of criteria, including overall ranking, price, service, and decor.

Since Taxi looks at all possible paths when routing between two points, this process can sometimes take several minutes. All told, Taxi with Zagat Surveys is a deft companion to help you venture into unfamiliar urban surroundings. / David Rossiter

Taxi with Zagat Surveys 🍌🍌🍌 / Price: \$69.95 (list). Company: Middlegate, Clinton, NJ; 800-439-8294 or 908-735-2555. Reader Service: Circle #421.





MacLinkPlus 8.0 / First-rate general-purpose translation

CAN'T OPEN a certain document because you don't have the application that created it? Chances are MacLinkPlus 8.0 can translate your Mac or PC mystery file into a format your applications can read. The new version contains hundreds of translators supporting the latest versions of Mac and PC word processors, spreadsheet programs, and database managers. DataViz even throws in a few translators for graphics formats.

New in version 8.0 are translators for ClarisWorks, Quattro Pro, Word 6.0, and WordPerfect 3.0 and 3.1 as well as for the new versions of WriteNow and Microsoft Works. The new version also comes with Macintosh PC Exchange 2.0, for mounting DOS disks on the desktop.

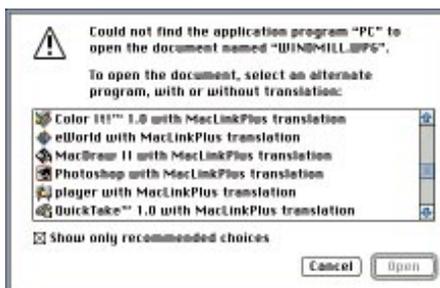
Have a Look. Particularly handy is the new FileView utility, which lets you look at the text of Mac, DOS, and Windows files without translating them. FileView tells you whether or not MacLinkPlus can translate the file and gives you tips for translating troublesome files.

You can use MacLinkPlus in several ways: The easiest is simply to double-click on your file. In place of the "application can't be found" message, Macintosh Easy Open (a System 7.5 control panel that's included with MacLinkPlus) displays translator choices. For example, if you pick "Excel with MacLinkPlus translators," the file will be translated and opened in Excel.

Another way you can use MacLinkPlus is to create a Document

Converter icon; files or folders will be translated when you drag them over the icon. You can also drop a file on top of the MacLinkPlus application itself, which launches the translator utility. Finally, you can access the translators from within certain applications (including ClarisWorks and FrameMaker), using the Save As dialog box.

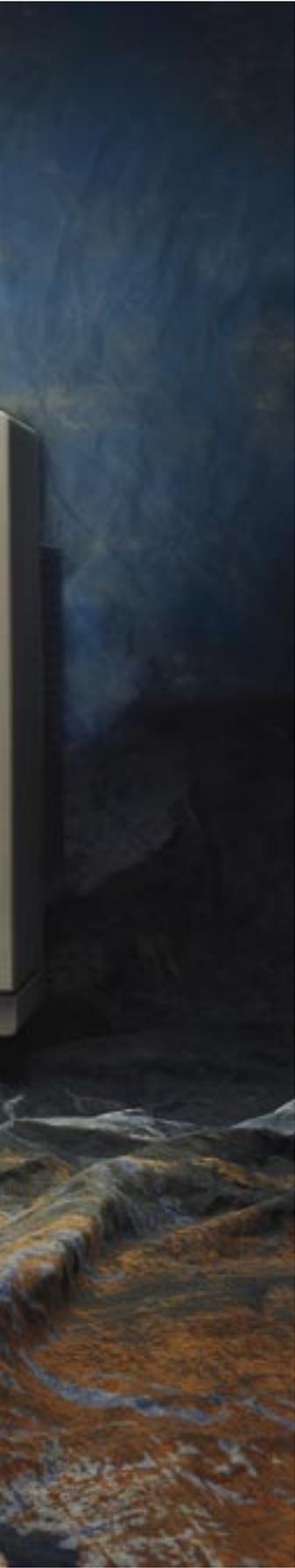
MacLinkPlus 8.0 is available in three packages. MacLinkPlus/Easy Open Translators includes all the software translators you need in order to translate files



from one format to another, using System 7 and (for translating PC files) Macintosh PC Exchange; MacLinkPlus/Translators Pro adds the MacLinkPlus application and Macintosh PC Exchange to the set of software translators; and MacLinkPlus/PC Connect adds a serial cable for moving files between Macs and PCs. Any MacLinkPlus package does a good job of translating formatted text files, even those with embedded graphics. / John Rizzo

MacLinkPlus 8.0 ★★★★★ / Price: MacLinkPlus/Easy Open Translators, \$109; MacLinkPlus/Translators Pro, \$149; MacLinkPlus/PC Connect, \$199 (list). Company: DataViz, Trumbull, CT; 800-791-1466 or 203-268-0030. Reader Service: Circle #422. ☒





The Power Macintosh 9500

**APPLE'S NEWEST MODEL IS FASTER
THAN A POWER MAC 8100 AND MORE
EXPANDABLE THAN A QUADRA 950.
IT'S THE MAC OF THE FUTURE.**

WANT TO KNOW A SECRET? The PowerPC 601 chip is an impostor. Oh sure, the processor that launched the Power Macintosh line is tremendously powerful, and, yes, it does use RISC technology. But it *wasn't* really developed by the nearly four-year-old Apple/IBM/Motorola alliance. You see, IBM had already begun developing the PowerPC 601 when the alliance was formed. So the honor of being the first chip to show what the Big Three can really do when working together on building a superfast processor from the ground up goes to the PowerPC 604 — the processor at the heart of Apple's newest computer, the Power Mac 9500.

The Power Macintosh 9500 is now Apple's most powerful computer, outrunning even the Power Mac 8100/110. Part of the reason for the Power Mac 9500's power is its processor. The PowerPC 604 is faster, smarter, and more efficient than the PowerPC 601, thanks to a significantly different internal architecture.

But a faster processor is just one of many features that make the Power Mac 9500 Apple's new flagship. It's a

powerhouse that can perform some tasks at twice the speed of a Power Mac 8100/110, accommodates up to 768 MB of memory, and includes six high-speed slots for add-in cards. Pricing is aggressive — a base model with 16 MB of memory, a 1-GB hard drive, and a quad-speed CD-ROM drive costs about \$4,700.

The Power Mac 9500 also introduces important technologies that will quickly make their way into midrange and low-end Macs. It uses a new type of memory module, and its six slots use a bus architecture different from that of any previous slots. The Power Mac 9500 even comes with its own version of system software, System 7.5.2, that boasts a faster 680x0 emulator, more native code, speedier disk-system throughput, and improved networking features (see the "System 7.5.2" sidebar). In fact, we'd bet that before too long, the first Power Macs — the 6100, 7100, and 8100 — will start to seem underpowered by comparison — especially if you use demanding graphics or multimedia applications.

BY CHERYL ENGLAND

Ring Out the Nu

A lot of what's right about the Power Mac 9500 can be attributed to one component: a superspeedy PCI (Peripheral Component Interconnect) bus that replaces NuBus. By switching to PCI, Apple has made the Mac a more viable platform for the long run. PCI-based add-in cards will be able to transfer dramatically more data over the PCI bus at any given time than NuBus cards ever could. These high data-transfer rates are necessary for applications such as video capture, fast networking, and data acquisition. For example, National Instruments currently makes a NuBus card that can capture 1 million data samples per second. The combination of PCI's greater bandwidth and the PowerPC 604's greater power will allow National Instruments to make a PCI card that can capture 5 million samples per second.

PCs based on Intel chips have used the PCI bus for quite some time now. In fact, nearly all Pentium-based PCs have a PCI bus. Apple hopes that by using a PCI bus, it will encourage PC vendors to move their products to the Mac. And because the components needed to create a PCI card are relatively inexpensive, PCI add-in cards will be less expensive than equivalent NuBus ones.

The transition to PCI from NuBus won't be completely smooth, however. You can't plug your current NuBus cards in to the Power Mac 9500's PCI slots without using a special external adapter box from third-party vendor Second Wave. Even then, NuBus cards can't take advantage of the speed boost PCI offers. In theory, use of the PCI standard will allow PCI-card vendors to port their PC products over to the Mac with only minor hardware adjustments. But these vendors will have to write new drivers for the Mac, a task that's proven difficult for PC developers in the past.

Fortunately, Apple has enlisted the leading vendors of

high-end PC cards — such as Adaptec, Matrox Graphics, and QLogic — to make their products Mac-ready. Top Mac vendors such as Farallon, FWB, and Radius are also jumping onto the PCI bandwagon, eager to increase their share of the huge PC market. By designing cards that can run on PC and Mac platforms, vendors can order parts in larger quantities, thereby cutting product costs. And cost reductions can be passed on to users — for example, the NuBus version of FWB's SCSI JackHammer card costs \$799; the PCI version costs \$300 less.

Inside and Out

When you first see a Power Mac 9500, you may not realize you are looking at a new machine. Its tower-style enclosure looks like that of the Power Mac 8100, except that it's 2.5 inches taller. Turn the Power Mac 9500 around, and on the back, you'll see the traditional assortment of ports as well as a couple of surprises (see figure 5).

First, you'll notice that it has no monitor port. That's because this new Mac doesn't have any onboard video circuitry. (You can, however, purchase a configuration that includes a third-party accelerated-video card.) Second, you'll notice that Apple has equipped the Power Mac 9500 with a 10BASE-T Ethernet port. For the first time ever, you can hook your Mac to a 10BASE-T Ethernet network without using a \$70 Apple AAUI adapter. (The familiar AAUI port is still there for those who want to use an adapter for other types of Ethernet, such as 10BASE-2.)

If you take the case off the Power Mac 9500, you'll notice a daughterboard attached to the main motherboard (see figure 2). If you remove the daughterboard, the Power Mac 9500 won't work; the daughterboard

figure 1

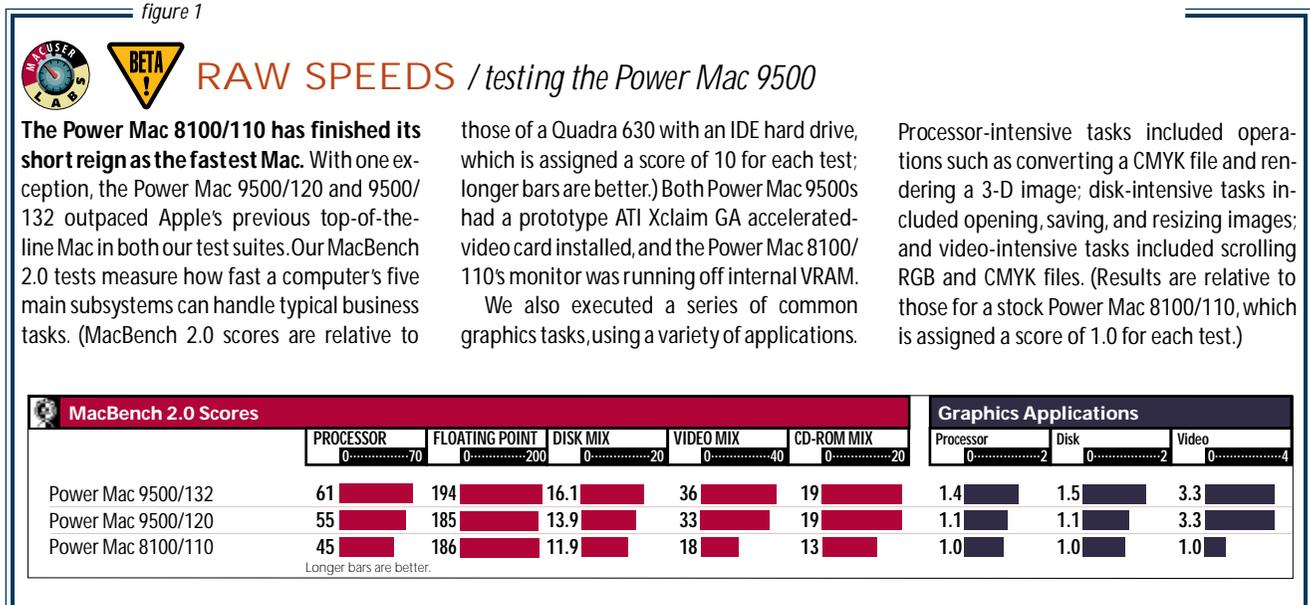
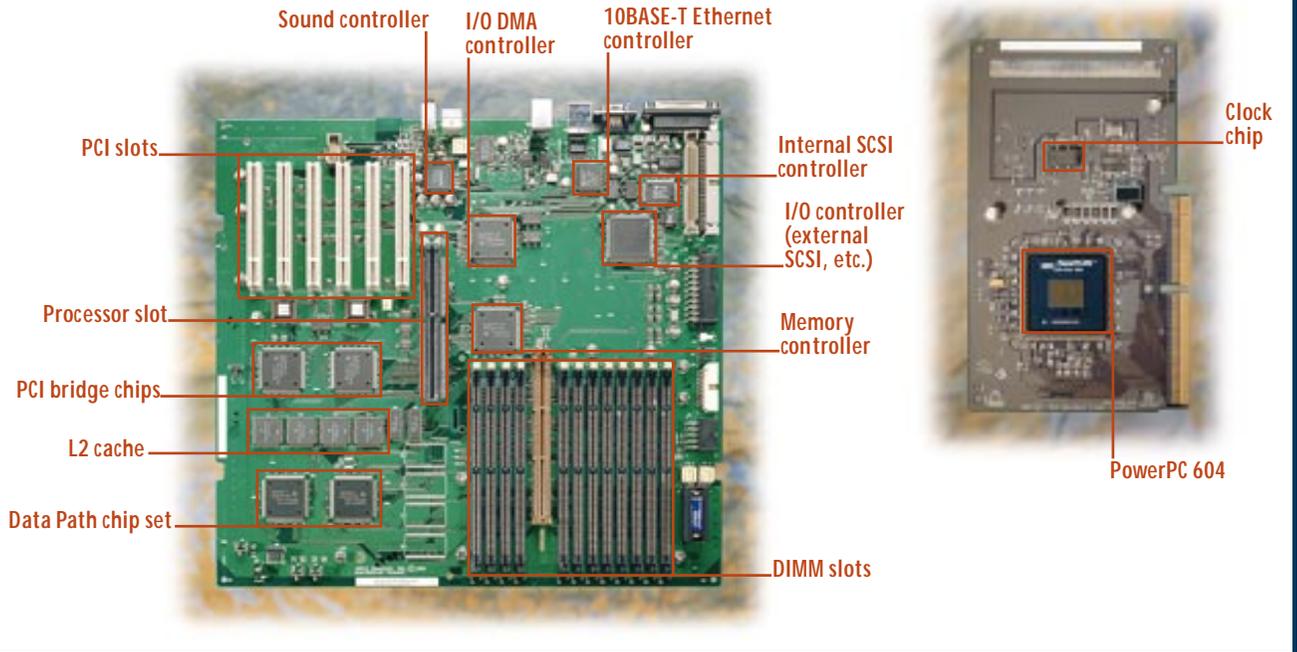


FIGURE 2: DOUBLE-DECKER SYSTEM BOARDS

DOUBLING UP. The Power Mac 9500 contains two system boards: a main logic board (below), which has the majority of components, and a daughterboard (right), which contains the PowerPC 604 processor. The

advantage of this arrangement is that you will have the option of upgrading the processor in the future simply by swapping out the daughterboard.



contains the PowerPC 604 as well as its companion clock chip. (The Power Mac 9500 is available in two configurations, with either a 120-MHz or a 132-MHz clock chip.) Although this design may seem odd at first, it's really quite handy. You'll be able to easily — and affordably — upgrade your Power Mac 9500's processor in the future, either with an Apple-supplied board or a board from a third-party vendor. You'll even be able to

get boards that contain two or more PowerPC processors. Unfortunately, Apple's system software does not yet support multiprocessing. Software vendors will have to upgrade their applications to distribute processing tasks among multiple processors.

Like the Quadra 950, the three-year-old Mac it's designed to replace, the Power Mac 9500 has ample room for expansion (see figure 6). It houses six PCI slots and

figure 3



FULLY EQUIPPED / the power of PCI

If you're using a Power Mac 9500, then you're going to want to equip it with some speedy peripherals. We tested a Power Mac 9500/120 and a Power Mac 9500/132, each equipped with a prototype ATI Xclaim GA accelerated-video card (the only PCI video card available at test time) and with an FWB PCI-based Fast/Wide SCSI-2 JackHammer card connected to an FWB SledgeHammer disk array. We also tested a Power Macintosh 8100/110 equipped with a Radius Thunder IV accelerated-video card and a NuBus version of FWB's JackHammer card connected to the SledgeHammer disk array.

We then ran a series of common graphics tasks, using a variety of applications, to tax

these systems' disk and video subsystems. We used MacBench 2.0 to test the systems' throughput when reading large contiguous chunks of data, a task that simulates opening large graphics files. We also used MacBench 2.0 to find out how quickly the systems could write large contiguous blocks of data, a task that simulates digital-video capture. Once again, the Power Mac 9500 earned the top

spots in our chart. In fact, throughput on the Power Mac 9500 was about twice as fast as on the Power Mac 8100/110, even though each Power Mac was being accelerated with an FWB JackHammer card. Even the prototype ATI Xclaim GA card kept pace with Radius' much more expensive Thunder IV card. (Results are relative to those of a stock Power Mac 8100/110, which is given a score of 1.0.)

	Throughput Tests			
	Graphics Disk 0.....2	Graphics Video 0.....4	Reads 0.....3	Writes 0.....5
Power Mac 9500/132	1.8	3.3	2.2	4.9
Power Mac 9500/120	1.7	3.2	2.4	4.2
Power Mac 8100/110	1.2	3.3	1.7	2.2

Longer bars are better.

FIGURE 4: NEW PATHS TO SPEED

THE POWERFUL POWERPC 604 PROCESSOR is only part of what makes the Power Mac 9500 so fast. Apple has also switched to a new type of memory module and a new bus architecture.

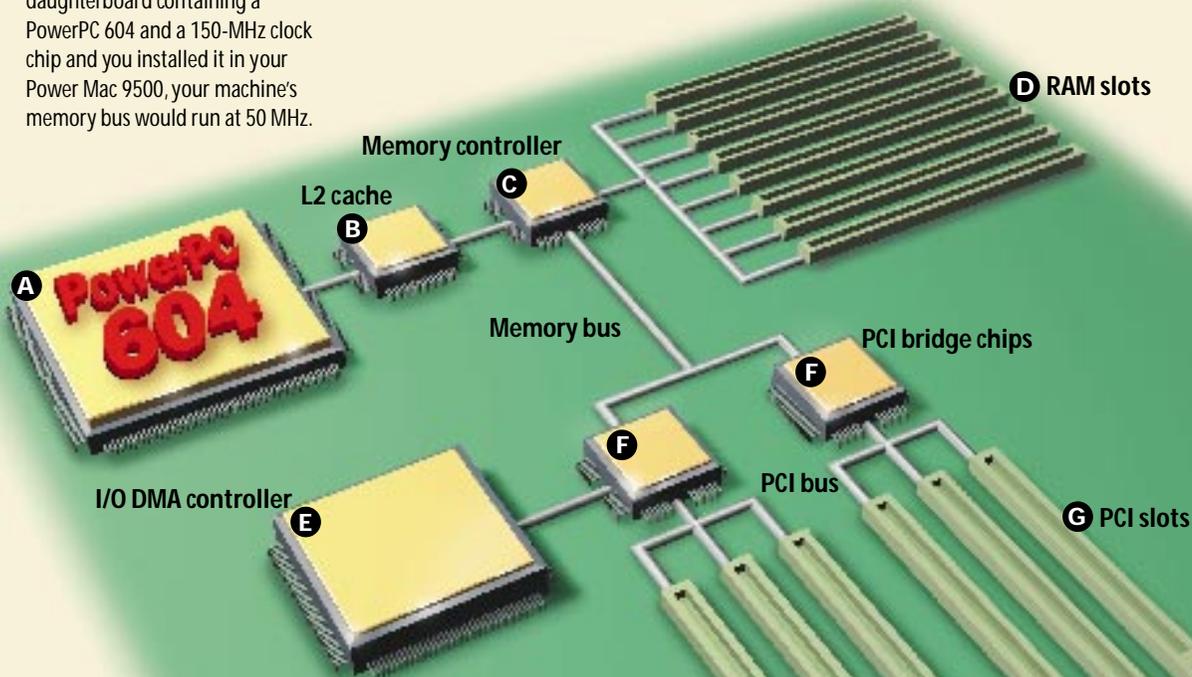
Processor and Memory

A The Power Mac 9500's daughterboard contains a PowerPC 604 and a clock chip. The Power Mac 9500 is available in two configurations, one with a 120-MHz clock chip and one with a 132-MHz chip. The motherboard's memory bus runs at one-third the speed of the daughterboard's clock chip (40 MHz or 44 MHz, respectively). The memory bus can speed up if a daughterboard with a faster clock chip is installed. For example, if a company were to create a daughterboard containing a PowerPC 604 and a 150-MHz clock chip and you installed it in your Power Mac 9500, your machine's memory bus would run at 50 MHz.

B The PowerPC 604 reads data from and writes data to memory over a 64-bit memory bus. An L2 cache (512K of very fast memory) buffers the data. The processor can read data from and write it to the L2 cache at a rate that is two to three times as fast as reading and writing data from and to RAM. Sometimes, however, the processor is forced to access RAM because necessary data is not in the L2 cache.

C Two "traffic cop" chips (the Data Path chip set) and a memory controller sit between the L2 cache and RAM. These chips arbitrate the flow of data from all parts of the board to the memory.

D If you install DIMMs (RAM modules) two at a time, their memory will be interleaved — a technique that lets the 64-bit memory bus act as if it were 128 bits wide. Interleaving can provide a 10-to-15-percent speed boost.



Input/Output

E The I/O-controller chip grabs data from PCI devices (such as RAID controllers and video cards) as well as from the I/O channel (such as the floppy or serial ports). The I/O-controller chip sends the data to its destination — usually another PCI device or the memory controller. If the I/O-controller chip sends data to the memory controller, it does so by using DMA, the software that allows your Mac to perform various input/output operations while the processor is busy.

PCI
F The Power Mac 9500 has two bridge chips, each of which controls three PCI slots. One of the bridge chips also controls all the built-in I/O, such as SCSI and serial. The bridge chips forward data from a PCI device to either the processor, the memory controller, or another PCI device. These chips also receive data coming from the processor, the memory, or a PCI device and send it out to the PCI device for which it is destined.

G The PCI slots transfer data to and from the bridge chips, over a 32-bit-wide PCI bus that always runs at 33 MHz.

comes stock with a floppy drive, a quad-speed CD-ROM drive, and either a 1-GB or a 2-GB hard drive. In addition, it has two 3.5-inch SCSI-device expansion bays, one of which is accessible from the front of the Mac. You can fill the internal bay with a hard drive, and you can fill the accessible bay with any of several kinds of storage devices, including a tape drive or a removable-media drive.

More impressive than any of these expansion options, however, is this new Mac's RAM capacity. The Power Mac 9500 has 12 RAM slots, each of which can be filled with 64 MB of RAM. Do the math, and you'll find that's a total of 768 MB — nearly three times as much as the Power Mac 8100/110 can accommodate.

The RAM-savvy among you may be wondering how this is possible. After all, the highest-capacity SIMMs are only 32 MB each. Well, here's the trick — the Power Mac 9500 uses a new type of memory module called a DIMM, or dual in-line memory module (see the "DIMMs 'n' SIMMs 'n' Things" sidebar). You can install DIMMs one at a time, although installing them in pairs gives the Power Mac 9500 a speed boost. Currently, leading memory vendors such as Newer Technology and TechWorks offer 70-nanosecond DIMMs (the speed Apple requires for the Power Mac 9500) in capacities of 8, 16, 32, and 64 MB. An informal price check revealed that DIMMs cost about the same as SIMMs for similar capacities. That's not cheap, mind you — about \$1,000 for a 32-MB DIMM — but at least you're not paying a premium.

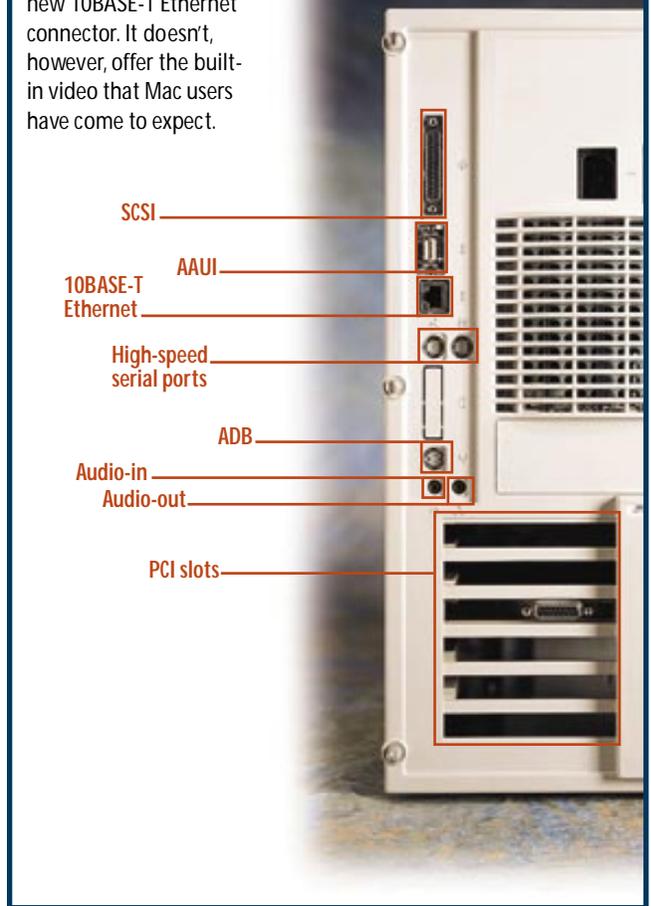
In an uncharacteristic move, Apple is offering only two configurations of the Power Mac 9500, each of which is aggressively priced. The less expensive model costs \$4,699 and has a 120-MHz PowerPC 604; 16 MB of memory; a 1-GB hard drive; a quad-speed CD-ROM drive; and an accelerated-video card from ATI, a leading vendor of video cards for PCs. The video card (the Xclaim GA) comes with 2 MB of VRAM, enough to support 16-bit color at a resolution of 1,152 x 870 pixels; if you increase the VRAM to 4 MB, the card can support 24-bit color at the same resolution. The other Power Mac 9500 system costs \$700 more (\$5,399) and has a 132-MHz PowerPC 604, 16 MB of memory, a 2-GB hard drive, and a quad-speed CD-ROM drive, but it doesn't come with the accelerated-video card. However, you can buy the Xclaim GA separately from ATI. At press time, ATI planned to sell a 2-MB version of the Xclaim GA for \$449 and a 4-MB version for \$649.

Now for the bad news. You can't upgrade *anything* to the Power Mac 9500. You can't upgrade the Quadra 950 you bought three years ago; you can't upgrade the Power Mac 8100 you bought two months ago. Nada. Nothing. The Power Mac 9500's main logic board is too tall to fit into the Power Mac 8100's case. The Quadra 950's case, although tall enough to hold the logic board, is not configured appropriately internally.

FIGURE 5: STANDARD PORTS OF CALL

WIN SOME, LOSE SOME.

The Power Mac 9500 has a basic assortment of ports as well as a handy new 10BASE-T Ethernet connector. It doesn't, however, offer the built-in video that Mac users have come to expect.



Fast, Faster, Fastest

The Power Mac 9500 is fast: Its processor is fast, the main logic board is fast, the CD-ROM drive is fast, and the hard drive is fast. We tested the Power Mac 9500/120 and the Power Mac 9500/132, using MacBench 2.0, a suite of tests that measure how fast each of a computer's five main subsystems — the processor, floating-point unit, hard drive, video, and CD-ROM drive — run when performing common tasks in popular applications. A stock Power Mac 9500/120 with an ATI Xclaim GA card outran a Power Mac 8100/110 in every area except FPU speed, for which the results were virtually equal (see figure 1). We attribute the FPU results to the fact that MacBench 2.0 has not yet been optimized to take advantage of the PowerPC 604's FPU abilities.

These speed results can be attributed to several key advances in the Power Mac 9500. First, the PowerPC 604 can execute more instructions simultaneously than the PowerPC 601 and is smarter at predicting how applications will act. We expect to see even greater speeds as

vendors optimize their software to take advantage of the PowerPC 604's intelligence. Adobe, for example, plans to release a PowerPC 604-optimized version of Photoshop for its speed-hungry users. (Note that applications optimized for the PowerPC 604 will not take a performance hit when run on PowerPC 601-based Macs.)

Second, to increase the speed of its internal hard drive, the Power Mac 9500 comes with a PowerPC-native version of SCSI Manager and the hard-disk formatter enables *write-back caching*, a technique that allows most hard drives to write data without help from the processor. Unfortunately, Apple still has not updated its SCSI bus to handle fast data transfer with external storage devices. For that, you'll need to purchase a third-party PCI SCSI-2 accelerator card.

A variety of other factors contribute to the Power Mac 9500's overall high speed. For example, the Power Mac 9500 has a 512K Level 2 cache, fast memory that caches data traveling between the processor and the slower system RAM. It also supports a more efficient implementation of DMA (direct memory access), software that allows your Macintosh to perform various input/output operations while the processor is busy. And, if you install DIMMs two at a time, the Power Mac 9500 can *interleave* memory — a technique that enables the memory bus to act as though it were 128 bits wide, twice as wide as it really is. (For more on why the Power Mac 9500 is fast, see figure 4.)

The primary factor responsible for the Power Mac 9500's high speed, however, is its PCI bus. We loaded up each Power Mac 9500 configuration with the high-powered peripherals a graphics professional would want: an accelerated-video card from ATI and an FWB

JackHammer SCSI-2 card connected to a SledgeHammer disk array. We then pitted these Power Mac 9500 systems against a Power Mac 8100/110 equipped with a Radius Thunder IV card and FWB's JackHammer/SledgeHammer combination. We found significant increases in the display and storage-system speeds on the Power Mac 9500s. For example, when writing large blocks of data to the external hard disk — a task that approximates what happens when you capture digital video — the Power Mac 9500s were roughly twice as fast as the Power Mac 8100/110 (see figure 3).

The Power Mac 9500's PCI bus runs at 33 MHz, significantly faster than NuBus' 10-MHz speed. Even more important, the PCI bus has a sustained throughput rate that is three times that of NuBus. For example, the PCI bus can write data at a rate of 96 MB per second; NuBus can write data at only 30 MB per second. Add-in cards such as FWB's PCI SCSI JackHammer are designed to support PCI's transfer rate, but due to general system overhead and bottlenecks such as slow hard drives, throughput rates don't yet reach their theoretical limits. Even so, rates are much higher than those for NuBus. Some users with prerelease units of the Power Mac 9500 were reporting data-throughput rates as high as 30 MB per second when writing data to a 4-GB Fast/Wide array as compared to speeds of 6 MB per second on a similarly equipped Power Mac 8100/110.

PCI's greater bandwidth will enable high-end applications to run more smoothly. For example, digital-video producers will be able to capture full-motion video without using compression and Photoshop users will be able to display and manipulate high-resolution, full-color images more quickly. Some technologies that

SYSTEM 7.5.2 / a new system for a new machine

SINCE THE INTRODUCTION OF SYSTEM 7, Apple has generally supported model-specific features of new Macs by providing customized system enablers for each new model. But the hardware architecture of the PCI-based Power Mac 9500 is so radical a departure from that of previous Macs — not to mention that several new chunks of the OS have been ported to native PowerPC code — that Apple decided it made more sense to deliver a new version of the operating system, System 7.5.2, with the new machine.

THE GOOD NEWS

Here's some of what the new system software will offer:

IMPROVED EMULATOR. When Apple released the first Power Macs, in March 1994, many core functions of the Mac OS remained emulated. And so they remain today. This means that even though most major applications have now been reworked with native code, every time your Mac needs to read from or write to disk, do a network transaction, or perform any of several other basic activities, it must switch to the 680x0 emulator to handle the non-native system code. This slows it down considerably.

System 7.5.2 offers a new 680x0 emulator that is more "intelligent"

and efficient than the original. It's called a *dynamic recompilation*, or DR, emulator. The original Power Mac emulator, the one in System 7.1.2 and 7.5, translates each and every 680x0 instruction that comes its way into native code. If the same instruction is repeated multiple times, it gets translated multiple times. This is slow.

The DR compiler maintains a cache of translated instructions. So when a 680x0 instruction comes along for which the equivalent PowerPC instructions are in the cache, the DR emulator merely fetches the native code rather than retranslating the original instruction. This is faster. In addition, the DR compiler is smart about which translated instructions are worth caching in the first place — for example, very simple instructions take more effort to cache and fetch than to retranslate each time.

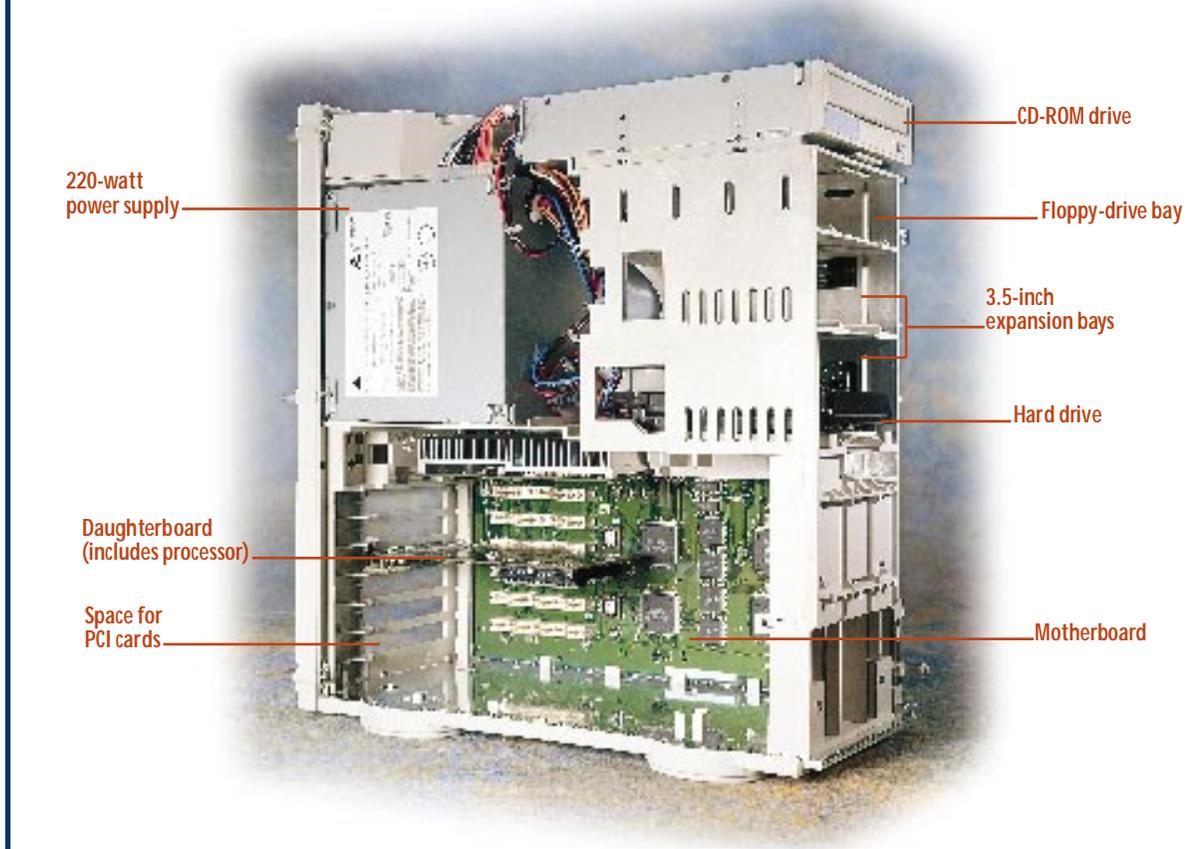
MORE NATIVE SYSTEM CODE. System 7.5.2 also includes some new native code that helps make the Power Mac 9500 more sprightly. One such set of system routines is the Resource Manager. Every time your Mac needs to fetch an icon, list items on a menu, or put up a dialog box, the Resource Manager gets involved. Having these routines native will improve the overall snappiness of the Mac's interface.

FASTER DISK I/O. Historically, the Mac's disk-I/O subsystem has not

FIGURE 6: UNDER THE HOOD

IT'S FASTER AND MORE EXPANDABLE, but the Power Mac 9500 is no easier to upgrade than the Power Mac 8100. To get inside, you have to remove six screws, tug the case off, and remove a metal shield. Even then, all you can do is swap PCI cards or the

processor daughterboard. To add memory, you must remove all the PCI cards and the processor board, unplug several ribbon connectors, and pry the motherboard out. Of course, you then have to reassemble. If the additions don't work, you'll have to start over.



been its strong point. In fact, our MacBench 2.0 tests have shown that when performing typical business tasks, even the supposedly fast 1- and 2-GB drives in Power Mac 8100s can barely outrun the 250-MB IDE drive in the original low-end Quadra 630. There are several reasons for this, and Apple has addressed two important ones in System 7.5.2.

First, SCSI Manager, which controls reads from and writes to storage devices (and most other SCSI devices such as scanners), is now native. (File Manager won't be native until Copland. Sorry.) Second — hallelujah! — Apple has finally enabled *write-back caching* in its hard-disk formatter (which is renamed Drive Setup in System 7.5.2). Other vendors' storage-device formatters have been providing this for years. The impact of Apple's reluctance has been a significant performance bottleneck for almost the entire Mac line, including Power Macs. (Warning: Although the new formatter could provide a performance boost to users of a wide range of older Mac models, the version that ships with the Power Mac 9500 will be hard-coded to work only with that machine.)

OPEN TRANSPORT. Another exciting area of improvement is Open Transport, Apple's moniker for the Mac's completely rewritten networking architecture. For one thing, Open Transport runs native on Power Macs, so networking will get a speed boost. For another, configuring

network connections, in particular TCP/IP connections, will be much simpler. For a more detailed rundown of Open Transport's capabilities, see Mac to PC in this issue.

THE BAD NEWS

Now for the bad news. System 7.5.2 will be available only with Power Mac 9500s. Presumably it will also be the system-software version that ships with future Power Macs. But although Open Transport will be distributed separately — expect to see it some time in the second half of 1995 for older Power Macs and 680x0 Macs — at press time, Apple was unwilling to commit to offering System 7.5.2 to the one million purchasers of the original Power Mac line. All a company spokesperson was willing to say was, "We're investigating the possibilities."

What about all those people who believed Apple's claim that Power Macs would keep getting faster as more and more of the operating system was ported to run native? Are they going to be stuck waiting till mid-1996 (assuming Copland ships on time) to see any progress on this front? System 7.5.2 offers some definite improvements. Whether early adopters of the Power Mac will ever see those improvements is up to Apple. / Henry Bortman

send data much faster than NuBus can handle (for example, fast networking standards such as ATM) will now become feasible on the Macintosh.

Dealing with Cards

Specifications, tests, and technical jargon are all important items to understand. But the real question is still, What can you *do* with a Power Mac 9500? Judging by the types of third-party PCI cards vendors had announced at press time, we'd say you can do quite a lot.

The Mac has had NuBus cards that handle everything from QuickDraw acceleration to fast networking to RAID for years. But this is the first time leading PC vendors have ventured into the Mac market en masse with high-end products (see table at end of article). As a result, users will have a greater variety of products, at better prices, from which to choose — if, that is, the PC vendors can learn to make Mac-centric products.

Over the years, numerous PC vendors have tried to make it in the Mac market. Few have succeeded. The reasons for this are many, ranging from underestimating the expectations of Mac users to an inability to navigate the distribution channel for Mac peripherals.

What does it take to be successful in the Macintosh market? For one thing, a company needs to hire product

managers and engineers who have Macintosh experience. ATI, the company that is bundling its Xclaim GA accelerated-video card with the Power Mac 9500/120, has a team that includes former Apple engineers and that is devoted entirely to Mac development. As a result, ATI's software takes full advantage of Mac standards — for example, implementing Apple Guide and including full support for Open Firmware, a standard that enables a computer to recognize a card prior to booting up, thereby making installation easier for users.

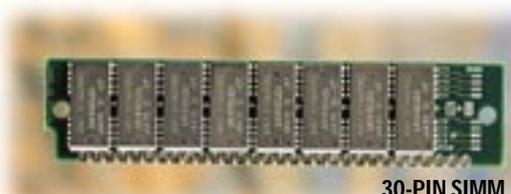
The need for experienced Mac engineers becomes even more apparent when a company tries to develop a Mac driver — as all these companies must do in order to create PCI cards. At a press briefing Apple held in late April, PC developers were bemoaning the amount of effort it took them to create drivers for their cards. The Mac developers just shook their heads, laughing over what seemed to them to be a silly complaint — these PC guys obviously had never had to develop a *NuBus* driver. Now that's something to complain about.

Even if many of the PC vendors fall by the wayside, users will still have numerous high-end products from which to choose. Mac vendors are taking advantage of the new opportunities PCI affords by adding products to their lineups. Farallon, for example, is putting its

DIMMS 'N' SIMMS 'N' THINGS / understanding memory

IT DOESN'T TAKE A CRYSTAL BALL to know that tomorrow's applications will require ever more memory. So, in planning for the future, Apple has designed the Power Mac 9500 to use DIMMs, a relatively new type of memory

module that can support higher capacities than the SIMMs so familiar to Mac users. Since DIMMs use the same kind of RAM chips that SIMMs do, prices and availability for DIMMs will be consistent with those of SIMMs.



30-PIN SIMM

THE QUADRA 950 is the only currently shipping Mac that uses 30-pin SIMMs such as the 4-MB module shown here. These SIMMs have a 16-bit data path; in order to sync with the 32-bit Motorola 68040 in the Quadra 950, they have to be installed in pairs. Each 30-pin SIMM contains 30 lead contact pads, each of which contains a single signal line — thus the name *single in-line memory module*. These SIMMs can have capacities as high as 16 MB each.

THE REST OF APPLE'S CURRENTLY SHIPPING MACS

, except for the Power Mac 9500, use 72-pin SIMMs such as the 4-MB module shown here. These SIMMs have a 32-bit data path; in order to sync with the 64-bit PowerPC 601 in the first Power Macs, they have to be installed in pairs. But in Macs that use the 32-bit 68040, the 72-pin SIMMs can be installed one at a time. Each 72-pin SIMM contains 72 lead contact pads, each of which contains a single signal line. Typically, these SIMMs have a maximum capacity of only 32 MB each. Some 64-MB 72-pin SIMMs are available, but they are rare and most Macs cannot recognize them.



72-PIN SIMM

development and marketing muscle behind a new line of Fast Ethernet products. Other Mac vendors are rapidly creating PCI versions of their most popular high-end peripherals.

Who Should Buy?

Clearly, users of high-end systems will benefit the most from the speed and flexibility the Power Mac 9500 offers. The first Power Mac 9500s will most likely sell in markets in which Apple is already strong — prepress, audio and video processing, and data acquisition, for example. Prepress professionals who have been struggling with the expansion limitations of the Power Mac 8100 or the speed limitations of the Quadra 950 might, for example, opt for a Power Mac 9500 stocked with a couple of Fast/Wide SCSI-2 accelerators, a video accelerator, a Fast Ethernet card, and a LinoColor card. Apple also hopes to make inroads into areas traditionally served by workstations — medical imaging and high-end 3-D animation, for example.

Ironically, it is also users at the high end who will suffer most from switching over to a Power Mac 9500. The cost in hard dollars will be quite high. The Power Mac 9500 itself is reasonably priced, but you have to consider the cost of purchasing all-new memory and all-new

cards. Some vendors claim they will offer trade-up programs for their customers, but none could give us exact details at press time; others won't even consider offering them. If you're moving from a 68040-based Mac, you may also need to factor in the cost of upgrading your software to PowerPC-native versions.

There's also a good chance that not all the cards you currently use will be available in PCI versions. For example, Radius claims that it will make a PCI version of its VideoVision card, but it could not give us even an estimated ship date. National Instruments readily acknowledges that it will not make PCI versions of all 41 of its data-acquisition products; some are just too specialized to justify the development costs.

If you find yourself in an upgrade bind, you have a couple of options, although neither is ideal. You can purchase an expansion chassis from Second Wave that will allow you to run your NuBus cards with a Power Mac 9500. You won't, however, see any speed gain from using the Power Mac 9500 when you're using the NuBus cards. Alternatively, you can switch to another vendor's product. For example, Truevision offers an aggressive trade-in program for VideoVision users — the company will give you 35 percent off the list price of a PCI version of its competing Targa 2000 digital-video card.

THE POWER MAC 9500 uses 168-pin DIMMs such as the 64-MB module shown here. DIMMs have a 64-bit data path, so they can be installed one at a time, making memory upgrades more affordable. If you count the gold contact pads that line the edge of the DIMM, you'll note that there are only 84, not 168. The contact pads on the front of a DIMM are completely separate from the contact pads on the back. Each contact pad contains a signal line, so on a DIMM, you get signal lines on the front of the module and on the back — thus the *dual in-line memory module*. The additional lines will allow DIMMs to eventually have capacities as high as 512 MB each, but the Power Mac 9500 will be able to recognize only 128-MB DIMMs. For the near future, you'll be able to find 8-, 16-, and 32-MB DIMMs relatively easily; 64-MB DIMMs will be

in tighter supply; and 128-MB DIMMs will be nearly impossible to find.

You install DIMMs slightly differently from the way you do SIMMs. With SIMMs, you place the module at a 45-degree angle to the SIMM socket. The SIMM clicks in, you rotate it, and it locks in place. With DIMMs, you simply push the module directly into the socket. To help you remove the DIMM, Apple includes tiny levers on each end of the socket that pop the DIMM out when you press them.

Currently only a few workstations and some PC notebook computers use DIMMs, although none use the 168-pin DIMMs that the Power Mac 9500 does. You can, however, expect DIMMs to become the next memory standard, since the newest generation of processors all have 64-bit-wide data paths.



168-PIN DIMM

Should you take the plunge and buy a Power Mac 9500? If your applications are limited to word processors, spreadsheet programs, and basic drawing programs, then, no, you shouldn't. But if you're a user of high-end programs who is looking for a Mac to replace an aging Quadra 950 or even a Power Mac 8100, then you should definitely pop open a spreadsheet program

and start toting up how much your dream machine will cost. This may just be the time to start over. ☺

Cheryl England is a *MacUser* executive editor. Jeffrey Milstead managed the testing for this report.



MacBench 2.0 is available online on ZiffNet/Mac. See How to Reach Us for instructions on accessing ZiffNet/Mac.

WHO'S WHO IN PERIPHERALS / the first round of PCI products

PRODUCT		LIST PRICE	EXPECTED SHIP DATE	PRODUCT DESCRIPTION	COMPANY INFORMATION
DIGITAL VIDEO					
Avid Technology	MediaSuite Pro	\$7,995	fall	digital-video-editing system	Tewksbury, MA; 800-949-2843 or 508-640-3622
Data Translation	Media 100	\$8,995	fall	digital-video-editing and multimedia-authoring system	Marlboro, MA; 508-460-1600
Intelligent Resources Integrated Systems	Media Explorer	*	June	digital-video-editing system	Arlington Heights, IL; 708-670-9388
Precision Digital Images (PDI)	IMAXX/PCI	*	June	video-digitizing card	Redmond, WA; 800-678-6505 or 206-882-0218
Truevision	Targa 2000 and Targa 2000 Pro	\$5,495 – \$7,995	summer	graphics-display and video-digitizing, compression, and playback cards	Santa Clara, CA; 800-729-2656 or 408-562-4200
DISPLAY ADAPTERS/QUICKDRAW ACCELERATORS					
ATI Technologies	Xclaim GA	\$449 – \$649	June	accelerated-video card	Toronto, ON, Canada; 905-882-2600
Diamond Multimedia Systems	Mac Multimedia Accelerator ¹	*	June	accelerated-video card, optional MPEG playback card	San Jose, CA; 800-468-5846 or 408-325-7346
Matrox Graphics	MGA Millennium	*	June	accelerated-video card and 3-D card	Dorval, PQ, Canada; 514-685-2630
Radius	Thunder 30 series	\$999 – \$1,499	June	accelerated-video, Photoshop, and color card	Sunnyvale, CA; 800-541-7680 or 408-541-6100
Radius	ThunderColor 30 series	\$1,999 – \$2,499	June	accelerated-video card	Sunnyvale, CA; 800-541-7680 or 408-541-6100
Radius	PrecisionColor	\$599	June	accelerated-video card	Sunnyvale, CA; 800-541-7680 or 408-541-6100
YARC Systems	SCREAMER	<\$1,000	June	RISC-based accelerator for QuickDraw 2D/3D	Newbury Park, CA; 800-275-9272 or 805-499-9444
NETWORKING/COMMUNICATIONS					
Asanté Technologies	AsantéFast 10/100 Adapter	\$269	June	10/100 Fast Ethernet card	San Jose, CA; 800-662-9686 or 408-435-8388
Dayna Communications	FDDIcontroller-PCI	*	September	10/100 Fast Ethernet card	Salt Lake City, UT; 801-269-7200
DEC	Fast-EtherWorks PCI 10-100	\$695 – \$1,695	June	FDDI network card	Littleton, MA; 800-457-8211 or 508-692-2562
DEC	EtherWorks Turbo PCI 10	\$249	June	10/100 Fast Ethernet card	Littleton, MA; 800-457-8211 or 508-692-2562
DEC	EtherWorks Turbo PCI 10	\$149	June	Ethernet adapter card	Littleton, MA; 800-457-8211 or 508-692-2562
Farallon Computing	Fast EtherTX-10/100	<\$300	June	10/100 Fast Ethernet card	Alameda, CA; 510-814-5000
Interphase	5515 PCI ATM	\$650 – \$850	June	ATM 155-Mbps network card	Senlac, TX; 800-327-8638 or 214-919-9111
Rockwell Network Systems	Rockwell 2200 Series	\$795 – \$1,795	June	FDDI network card	Santa Barbara, CA; 800-262-8023 or 805-968-4262
Rockwell Network Systems	Rockwell 2300 Series	\$245 – \$295	June	10/100 Fast Ethernet card	Santa Barbara, CA; 800-262-8023 or 805-968-4262
Spectra Systems	PowerLink PCI	\$695 – \$795	June	FDDI network card	Alpharetta, GA; 800-821-9501 or 404-410-7803
PREPRESS/DESKTOP PUBLISHING					
Electronic Imaging Systems	ColorQuick series	call for quotes	June	interface card for Linotype-Hell and Dai Nippon scanners	Moorpark, CA; 800-808-8688 or 805-532-1068
4-Sight, LC	ISDN Manager	\$2,795	June	system for transferring prepress files over ISDN	Des Moines, IA; 800-243-0516 or 515-221-3000
4-Sight, LC	Broadcast	\$3,995	June	system for broadcasting prepress files over ISDN	Des Moines, IA; 800-243-0516 or 515-221-3000
Linotype-Hell AG	Mac CTU	*	June	accelerates conversion of image data from one color space to another	Hauppauge, NY; 800-842-9721 or 516-434-2033
YARC Systems	YARC-RIP	\$14,995	June	multiprocessor RIP for Linotronic L12/L15 imagesetters and Heidelberg GTO-DI digital press	Newbury Park, CA; 800-275-9272 or 805-499-9444
STORAGE					
Adaptec	PCI-SCSI Master	\$399	June	Fast/Wide SCSI-2 card	Milpitas, CA; 800-959-7274 or 408-945-8600
ATTO Technology	ExpressPCI	*	June	SCSI-3 accelerator card	Amherst, NY; 716-691-1999
DPT	SmartRAID series	\$1,795 – \$1,995	June	Fast/Wide SCSI-2 disk-array controllers	Maitland, FL; 800-322-4378 or 407-830-5522
DPT	SmartCache series	\$395 – \$595	June	SCSI host adapters	Maitland, FL; 800-322-4378 or 407-830-5522
FWB	PCI SCSI JackHammer	\$499	June	Fast/Wide SCSI-2 card	Menlo Park, CA; 415-325-4392
FWB	SledgeHammer PCI series	\$2,399 – \$12,099	June	Fast/Wide disk arrays and SCSI-2 cards	Menlo Park, CA; 415-325-4392
MicroNet Technology	Raven Pro PCI	*	June	Fast/Wide SCSI-2 card	Irvine, CA; 800-800-3475 or 714-453-6000
QLogic	Fast!SCSI MAC PCI series	\$395 – \$625	June	Fast/Wide SCSI-2 cards	Costa Mesa, CA; 800-867-7274 or 714-438-2200
MISCELLANEOUS					
Creative Solutions	Hustler PCI-6	\$299 – \$995	June	high-speed serial-port expansion cards	Rockville, MD; 800-367-8465 or 301-984-0262
InnoSys	Mac IATE	\$1,996 – \$13,704	June	system for connecting Macs to airline reservation systems	Richmond, CA; 510-222-7717
National Instruments	PCI E-series	\$395 – \$1,295	June	data-acquisition cards	Austin, TX; 800-433-3488 or 512-794-0100
National Instruments	PCI-GPIB	\$495	June	instrument-control card	Austin, TX; 800-433-3488 or 512-794-0100
Orange Micro	OrangePC PCI	\$799	June	486-based coprocessor card that runs DOS	Anaheim, CA; 714-779-2772
Second Wave	Xpanse PN series	\$595 – \$1,895	June	2-, 4-, or 8-slot NuBus expansion chassis	Austin, TX; 512-329-9283
YARC Systems	HYDRA	\$3,000 – \$5,000	June	PowerPC multiprocessor card	Newbury Park, CA; 800-275-9272 or 805-499-9444

*Pricing had not been set at press time.

¹Product name had not been set at press time.

THE DESKTOP PUBLISHER'S *Toolkit*

**WHETHER YOU
DABBLE IN
DINGBATS OR
CONSTRUCT
COMPLEX COLOR
LAYOUTS, THESE
ESSENTIAL
UTILITIES WILL
HELP YOU
BUILD BETTER
PUBLICATIONS.**

FOR MOST DESKTOP PUBLISHERS, DTP is strictly DIY — do it yourself. After drafting a blueprint for design, you create the structure in a page-layout program, build a framework of columns, insert windows for graphics, paint walls with color, and decorate with initial caps. Fonts and spacing are your bricks and mortar, and text and graphics provide the electricity that turns an empty shell into a welcome environment. In fact, if PBS had the publishing equivalent of *This Old House*, you'd be glued to the television each Saturday afternoon.

Programs such as Adobe PageMaker, QuarkXPress, Adobe Photoshop, Macromedia FreeHand, and Adobe Illustrator form the foundation of desktop publishing. But savvy desktop publishers know that using the right utilities can spell the difference between producing a professional-looking publication and making a newsletter that resembles the spice rack you built for Aunt Edna in seventh grade.

That's where our desktop publisher's toolkit comes in. To make sure you're using the right tool for the job — and to help you boost your publishing productivity — we've packed a DTP toolkit of essential utilities that should be in every desktop publisher's toolshed.

And just as woodworkers need specialized screws, saws, and sanders to perfect their craft, desktop publishers need particular tools. With the right DTP utility, you can gain control over your fonts, work with more graphics formats, automate tedious tasks, or match colors between monitor and

printer. Plug-ins add new features to applications, and preflight tools ensure that you don't forget critical fonts or graphics when you're heading to the service bureau.

Our toolkit is divided into four compartments: type, graphics, application add-ons, and printing. Some of these tools are indispensable no matter what project you're working on, whereas others may be helpful only once in a blue moon — but when you need them, you *really* need them. To further help you figure out which tools you need, we've devised different versions of the toolkit for different levels of expertise. If you publish the occasional newsletter or holiday greeting, our Nuts and Bolts selection will get you started. If you're well beyond the hobbyist stage (just how many fonts *do* you have?), you'll want our Complete Socket Set. The Norm Abrams of the publishing world will want our Power Tools selection, which showcases the kind of tools used to publish *This Old House* the magazine.

Now let's look at what's inside.

BY AILEEN ABERNATHY

selection. Even better, TypeTamer allows you to create your own categories for the Font menu — such as Serif, Display, or Pictorial — and group fonts within them. Finally, another display lets you view sample text in any font in three point sizes.

GETTING A GRIP ON GRAPHICS

Whereas fonts are part of the system software, graphics are more directly tied to applications. As a result, many utilities, such as Photoshop Plug-ins (see the next section), are application-specific. Even so, our toolkit wouldn't be complete without the following general graphics goodies.

File Converters. Graphics-conversion utilities are a godsend to any users who have ever received an image file they couldn't open or needed to convert graphics from one file format to another. **DeBabelizer Toolbox** (\$399, Equilibrium Technologies) opens just about every bitmapped format, including PC and UNIX ones, and translates among formats. Plus, it supplies some image-editing tools — they include loads of ways to manipulate color palettes — and lets you batch-process images. You could use it, for example, to automatically open a series of PICT images, resize them, switch from 24- to 8-bit color, and save them as TIFF files. If your main requirement is format conversion, you'll save some cash with **DeBabelizer Lite** (\$129).

Transverter Pro (\$395, TechPool Software) works its magic on PostScript files. It can open generic PostScript files and uneditable EPS images and convert them

into viewable, editable Illustrator EPS files — no mean feat — or into several other object-oriented and bitmapped formats (Mac and PC). It can also convert multipage PostScript documents into single-page EPS files. A \$25 shareware utility, **epsConverter**, also does EPS-to-Illustrator conversions.

Batch Processors. Performing the same image-manipulation tasks over and over is a time-consuming, mind-numbing job. **DeBabelizer** has some batch-processing features, but Gryphon Software's **Batch It!** (\$199), which is cheaper, is easier to configure and supports CMYK color. Want to automate the processing of scanned images? Just link up the necessary tiles in **Batch It!** (see figure 2), apply the sequence to a bunch of graphics files, and go home for the night. Each of the 30 tiles — Open, Blur, Lighten, Contrast, Set Image Size/Resolution, Color Space/Depth, and so on — represents a single operation. Many tiles have options; you can set the radius for Sharpen, for example, and specify sequentially numbered filenames in the Save tile.

Like **Batch It!**, DayStar Digital's **PhotoMatic 2.0** increases your efficiency by letting you automate repetitive activities. However, **PhotoMatic** is a plug-in that works specifically with Photoshop, giving you full AppleScript control over this normally nonscriptable application. It records your activities and saves them as a script, which you can then apply to one or more images. For instance, you could have **PhotoMatic** apply a script to all files dropped into a specific folder. The new version boasts lots of new features — such as Photoshop 3.0 support, a dedicated scripts folder, and a status window — and best of all, it's free from DayStar's Web page (www.daystar.com).

Image Catalogers. To track hundreds of graphics, you need an image-cataloging program, which can create a master catalog of all your artwork, no matter what the format or location. Using filenames, keywords, or other criteria, you can quickly find and view graphics ranging from clip art to EPS illustrations to scanned photographs. **Cumulus PowerLite** (\$199, Canto Software) — see figure 3 — and **Adobe Fetch** (single-user, \$149; multiuser, \$295) catalog files in a wide variety of formats and let you place images directly into PageMaker and QuarkXPress documents. If you're managing



figure 3 / **Cumulus** keeps track of all your graphics, no matter what their format or location. Cataloging images is fast and easy, and you can do database searches based on a variety of criteria.

TOOLKIT #1

NUTS AND BOLTS

for the publishing putterer



If your idea of publishing is designing the occasional newsletter or greeting card, then pack your kit with these basic tools:

TYPE:

Adobe Type Manager for font fidelity on page and screen

Adobe Type Reunion for navigating font menus

PopChar for finding special characters

GRAPHICS:

ColorSync for basic color matching

ScanTastic ps for quick scanning in any application

ADD-ONS:

Kitchen Sink XTension for QuarkXPress or

PageTools Plug-in for PageMaker for quickly accessing common functions

The Black Box Plug-in for Photoshop for demystifying channel operations

PRINTING:

Font Downloader or **LaserWriter Utility** for faster printing through font loading

DocumentDoctor XTension for QuarkXPress for locating common layout errors

graphics over a network, however, get **Cumulus PowerPro**. This client/server database is superfast and easy to use, and — like the Lite version — it exploits System 7.5's Drag and Drop and AppleScript technologies to the max, so cataloging images and attaching keywords is a snap. Pricing starts at \$1,495 for five users.

Color Coordinators. Color management — the consistent matching of color from

scanner to monitor to printer — has long been a Holy Grail for desktop publishers. Happily, the latest version, 2.0, of Apple's system-level solution, **ColorSync**, finally provides "good enough" color matching for many users. It supplies a standard format for device profiles (files that describe the color characteristics of specific hardware); it uses the profiles to automatically perform color transformations at the system level. ColorSync is gaining wide support from application companies (which support it in their software), hardware vendors (which provide the device profiles), and color-management competitors (which are compliant with it and use its profile format). ColorSync is currently available on most online services and will ship with compatible third-party applications as well as System 7.5.2.

If you work with Pantone colors, you know that Rhodamine Red may not look the same in different applications, much less print the same on different printers. Pantone addresses this color-matching problem with **ColorDrive**, a \$199 utility that lets you standardize color palettes across applications. You create custom color palettes that are calibrated for your monitor and printer and then import the corrected palettes into your page-layout and graphics programs. ColorDrive supports a variety of color spaces, including RGB and CMYK, and the palettes' color data can come from ColorDrive's extensive database of Pantone colors, ColorSync profiles, and application color palettes or even from spectrophotometer readings.

For color management that is more sophisticated than ColorSync's, you need **ColorMatch** or **FotoTune**. Each product comes with a set of device profiles as well as Photoshop Plug-ins and Quark XTensions that allow you to select and edit the profiles (to compensate for dot gain, for example), preview the results on-screen (so you can see which colors won't print), and output color-corrected CMYK separations. ColorMatch (\$219) is based on Eastman Kodak's high-end color-matching technology — and Kodak recently acquired the product from its original developer, DayStar Digital. It's a must for working with Photo CD images, and the included ColorSet software lets you calibrate by eye or use DayStar's Colorimeter 24 calibration device (\$599) to create custom monitor profiles. But you can't create or edit scanner profiles (that requires additional software); Agfa's FotoTune (\$395), however, does allow you to make and customize profiles — a strong point of this sophisticated product.

PLUGGED IN

QuarkXPress, PageMaker, and Photoshop are the carpenters of DTP, providing enough power and flexibility to meet most publishing needs. Add the right plug-in partners, and you can turn these steady performers into master craftsmen. There are hundreds of add-ons available — ranging from general program enhancements to professional production tools — but if our toolkit had room for only a handful of hammers and wrenches, here's what we'd include. (At press time, the first plug-ins for Illustrator

and FreeHand had been released, but it's too soon to say which ones will become permanent residents in our toolkit.)

Scanning Master. Add scanning capabilities to most graphics and page-layout applications with **ScanTastic ps**, a handy \$99 utility from Second Glance Software. You can scan images directly into PageMaker or QuarkXPress, for example, and place them on the page. ScanTastic ps lets you choose scanner settings based on output requirements, and it gives you control over resolution, brightness, contrast, sharpness, and color balance.

Quark XTensions. QuarkXPress is the leader in add-on utilities, with about 300 XTensions currently available through XChange, a mail-order distributor. (To order XTensions or get a free catalog, call XChange, not the developers.)

At the top of our list is the aptly named **Kitchen Sink** (\$79, A Lowly Apprentice Production), which adds a slew of productivity enhancements to QuarkXPress. Most useful are the Command Pad and Co-Pilot palettes. Command Pad gives you one-click access to most palettes, submenus, dialog boxes, and so forth. Co-Pilot displays a thumbnail image of the page; clicking anywhere in the thumbnail places you at that location in the document window — invaluable when you're working in magnified views. Other goodies include a nudge palette, a size-box-to-picture option, and quick conversions between spot and process colors (see figure 4).

For streamlining text handling, A Lowly Apprentice Production (ALAP) offers

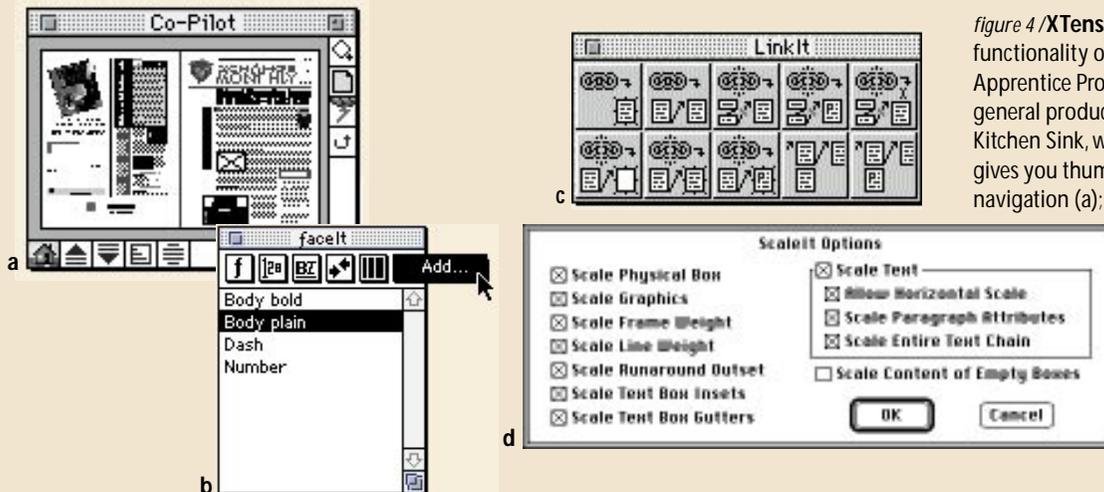


figure 4 /XTensions expand the functionality of QuarkXPress. A Lowly Apprentice Production specializes in general productivity enhancers, such as Kitchen Sink, whose Co-Pilot module gives you thumbnail previews for navigation (a); Facelt, which lets you

assign style sheets on the character level (b); LinkIt, which gives you more flexibility when linking text (c); and ScaleIt, which lets you automatically resize elements (d).

FaceIt (\$99), which endows QuarkXPress with character-based style sheets, and **LinkIt** (\$59), which greatly expands QuarkXPress' text-linking capabilities. Em Software's **Xstyle** (\$99) provides two palettes that let you easily view and edit character, paragraph, and style-sheet attributes without menus and dialog boxes.

For design work, **ScaleIt** (\$99, ALAP) lets you instantly resize lines and boxes — and their contents — at the click of a mouse, with appropriate scaling of line weights, graphics, text (point size, leading, and so on), and gutters. **LayerManager II** (\$99, ALAP) enables you to create layers on QuarkXPress pages and assign boxes and other elements to them; you can then display, hide, and print selected layers.

On the graphics front, **SXetch Pad** (\$229, DataStream Imaging Systems) adds basic drawing features to QuarkXPress, allowing you to create Bézier curves and multicolor blends, wrap text on curves, and convert font characters into editable outlines.

PageMaker Plug-ins. PageMaker's add-on technology, originally called Additions but now renamed Plug-ins, has long lagged behind QuarkXPress' XTensions in both number and quality of products. That's rapidly changing, however, and Extensis' **PageTools** (\$129) is leading the charge. What Kitchen Sink is to QuarkXPress, PageTools is to PageMaker: an irresistible collection of productivity boosters. The centerpiece is PageBar, a customizable icon bar that gives you one-click access to most PageMaker features. PagePrinter supplies a special Print dialog box in which you can

preview pages and opt to print only selected ones (say, only those modified since the last print job). Other pieces of PageTools add a magnifying glass, floating rulers, new alignment features, and the ability to view other pages and move objects to them without leaving the current page.

If you hate reinventing the wheel, get **Zephyr Specs**. This \$199 time-saver from Zephyr Design lets you create a library of design elements — style sheets, colors, layouts, grids, and objects — that can be used in all your publications. And Sundae Software's **GalleyOops** (\$99) is almost as valuable as a spelling checker. It finds typographic faux pas such as extra spaces and characters, capitalization and punctuation errors, misaligned text, incorrect hyphen and dash use, and unprintable elements. You can get both of these utilities, plus a free Plug-ins catalog, from the Adobe Plug-In Connection.

Color publishers will enjoy Adobe's **TrapMaker** (\$80), which provides excellent automatic trapping for text and objects. And, with its ability to trap just parts of objects (stopping, say, when an object passes from a colored background to white space), it outdoes QuarkXPress' autotrapping function.

Photoshop Plug-ins. Say "plug-ins" to most Photoshop users, and they'll rhapsodize about their favorite special-effects filters, but plug-ins can be great productivity enhancers too.

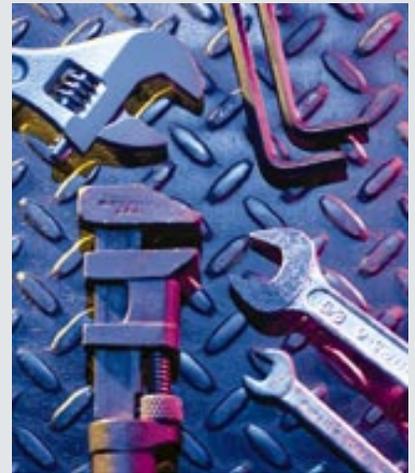
The hands-down favorite for special effects is Kai's **Power Tools**, from HSC Software. Its 37 filters include alternatives to several of Photoshop's built-in filters plus some snazzy new ones, such as Glass Lens and Vortex Tiling. But the main reasons to get this \$199 package with the unique interface are its three sophisticated Explorer modules, which let you experiment with textures, gradients, and fractals to your heart's content.

Another HSC package, **KPT Convolver**, is more practical, more powerful, and a superb value at just \$89. Convolver unlocks the power of Photoshop's Custom filter: Instead of puzzling out the mathematics of a convolution matrix, you use Convolver's intuitive interface to adjust an image's hue, saturation, brightness, contrast, and tint on the fly or to apply varying amounts of sharpening, blur, embossing,

TOOLKIT #2

COMPLETE SOCKET SET

for the handy do-it-yourselfer



In addition to requiring the nuts and bolts, publishers who spend a fair amount of time in Photoshop, QuarkXPress, or PageMaker and who work in color with lots of fonts and graphics also need productivity-enhancing tools such as these:

TYPE:

Suitcase or **MasterJuggler** for managing multitudes of fonts with minimal hassle
FontSqueezer for slimming down font folders

GRAPHICS:

Transverter Pro for editing PostScript files
Batch It! for processing multiple files automatically
Adobe Fetch for keeping track of image libraries
ColorDrive for managing multiple color palettes

ADD-ONS:

Facelt, **Xstyle**, and **ScaleIt** XTensions for QuarkXPress or **Zephyr Specs** and **GalleyOops** Plug-ins for PageMaker for speeding document creation and refining layouts
Kai's Power Tools and **Paint Alchemy** Plug-ins for Photoshop for creating wicked special effects

PRINTING:

Startup Downloader for downloading fonts to the printer automatically
Magpie XTension for QuarkXPress or
Aldus CheckList for PageMaker for preparing files for service-bureau output
LaserCheck for detecting PostScript errors



figure 5/ If you're going to buy only one Photoshop plug-in, KPT Convolver is a good bet. Its Tweak mode has powerful tools for correcting and enhancing images, with real-time feedback for comparing the alterations to the original image.

edge detection, and more (see figure 5). Compare several variations on a theme, choose the best one, and then save it as a custom filter for production situations.

Embossed text and glowing edges are hallmarks of Photoshop special effects, but they require multiple channel operations. **The Black Box** (\$89, Alien Skin Software) takes the mystery out of channel operations, with six filters for the easy creation of drop shadows, glows, beveled edges, and glass-refraction effects. For adding more-artistic effects, natural-media enthusiasts will love **Xaos Tools' Paint Alchemy** (\$199), which has a unique brush technology that can transform images with painterly effects ranging from charcoal to impressionist. It's really more of an organic image editor (à la Fractal Design's Painter) than a filter.

Professionals looking to apply distortions or 3-D effects to images need special tools. Human Software's **Squizz** (\$129) is more flexible (and fun!) than Photoshop's native filters. It lets you warp, stretch, squeeze, smear, and twist images by brushing directly on them or by adjusting points on an interactive grid. And for creating 3-D effects, Andromeda Software's **Series 2, Three D Filter** is hard to beat. With this \$129 plug-in, you can wrap a selected image around a basic three-dimensional form — such as a sphere, cube, or cylinder — and apply a light source.

Of course, special-effects filters aren't the *only* gotta-have-'em plug-ins. Besides the aforementioned PhotoMatic and ScanTastic ps, there's Total Integration's **FASTedit/Deluxe** (\$239), a Photoshop Acquire module that reduces the thumb twiddling normally

associated with multimegabyte files. With FASTedit/Deluxe, you can preview an entire image (say, a 50-MB TIFF file) and then select and open just a small section for spot touchups. Because the working-file size is much smaller, you can edit more quickly. When you're done, the altered area is transparently blended back into the original image. FASTedit/Deluxe works with files saved in the TIFF, DCS, Scitex CT, and Photoshop 2.5 and 3.0 formats.

Another nice thing about Photoshop Plug-ins: They work with a variety of other programs, including Painter, Pixel Resources' PixelPaint Pro3, Deneba's Canvas, DeBabelizer, and Batch It!

PRINT PRIMERS

No matter how perfect your publication looks on-screen, the proof is in the printing. If the pages won't print or don't come out the way you intended, then all your hard work is wasted. Our toolkit includes utilities that streamline the printing process, whether you're sending files to a desktop printer or a service bureau.

Font Downloaders. Most printers have only a few built-in fonts. All the other fonts you use must be sent (downloaded) to the printer each time you print. If you use the same fonts over and over, you can really speed up the printing process by manually downloading them, using Adobe's **Font Downloader** (free with Adobe font packages) or Apple's **LaserWriter Utility** (included with system software). These utilities let you send fonts to the printer just once (say, first thing in the morning), where they stay until you restart the computer or turn off the printer. Font Downloader works with PostScript fonts only; LaserWriter Utility handles TrueType fonts as well. Both programs also let you print PostScript files (created when you print to disk).

To download fonts automatically, use **Startup Downloader** (\$20, shareware) to create a set of PostScript fonts that, when placed in the Startup Items folder, load when you start the Mac. Each set is actually a miniapplication, so you can store it anywhere. Whenever you double-click on a set, it automatically downloads the specified fonts (or PostScript files) to the printer.

Preflight Checklists. Before you head to the service bureau, use a preflight tool to make sure everything's in order and you

TOOLKIT # 3

POWER TOOLS

for the professional contractor



If you make your living producing high-quality output, your toolkit already includes the essential hand tools. Equip your workbench with these professional tools:

TYPE:

theTypeBook for creating type specimen sheets
TypeTamer for all-in-one font finessing

GRAPHICS:

DeBabelizer Toolbox for translating just about any file format
PhotoMatic Plug-in for Photoshop for batch-processing Photoshop files
Cumulus for managing large image databases
ColorMatch or **FotoTune** for ensuring color fidelity across devices

ADD-ONS:

SXetch Pad XTension for QuarkXPress for creating line art quickly
LayerManager II XTension for QuarkXPress for adding customized layers
TrapMaker Plug-in for PageMaker for trapping adjacent colors effectively
FASTedit/Deluxe Plug-in for Photoshop for working quickly on huge image files
KPT Convolver, **Squizz**, and **Series 2, Three D Filter** Plug-ins for Photoshop for adding sophisticated effects to images

PRINTING:

QuarkPrint XTension for QuarkXPress for saving frequently used output settings
Let'er RIP! for downloading and handling PostScript files
Download Mechanic for debugging PostScript



figure 6 / **Aldus CheckList** is an excellent preflight tool for PageMaker, EPS, and PostScript files. It flags potential problems with fonts, linked graphics, and printer settings, allowing you to fix them before heading to the service bureau.

have all the necessary pieces. PageMaker's Pub Info Plug-in can create basic lists of fonts, graphics, and styles used in a document, but if you're a service-bureau regular, get **Aldus CheckList** (\$40), from Adobe. CheckList can analyze a PageMaker, EPS, or PostScript print-to-disk file and generate a report about its contents, including font usage (in both text and graphics), linked graphics files, style sheets, and printer settings (see figure 6). It flags problems such as missing font files and outdated versions of graphics and can gather all the files required to output the document and copy them (with compression, if you like) to a common folder or disk.

QuarkXPress users have several preflight XTensions at their disposal. **Document-Doctor** (\$80, Lepton Technologies) automatically scans documents for common errors — such as overflowed text boxes, suppressed printout settings, and tracking and leading values outside the parameters you've specified — and helps you fix them. You should also use **Collect for Output** (free with QuarkXPress) or **Maggie** (\$99, Show-Ads Omega Group), which have features similar to those in CheckList. There's also **QuarkPrint** (\$195, Quark), an upscale XTension that lets you save frequently used output settings and print just part of a page. (You can get all these XTensions through XChange.)

PostScript Detectors. Troubleshooting your PostScript files before the service bureau tries to output them can save you lots of grief (and money). Systems of Merritt's **LaserCheck** (\$199) is a simple but elegant utility that simulates imagesetter output on a PostScript laser printer. Simply download LaserCheck to the printer, configure your program for imagesetter output, and print the files you want to check. LaserCheck scales each page to fit the printer's imaging area, allowing you to see the entire page plus crop and registration marks. Around the page's edges, it lists the fonts used, page size, PostScript operators used, processing time, and memory status. If it finds a PostScript error, LaserCheck reports it and prints as much of the page as possible — handy for locating the offending element.

The free downloader utilities are fine for basic printing tasks, but for serious PostScript work, you need a professional-level downloader, such as **Let'er Rip!** or

Download Mechanic. Both of these utilities can queue PostScript and EPS files for output, download them in the background while you do other work, and maintain activity logs (including output times and any errors). We like **Let'er RIP!** (\$239, Lupin Software), because you can tell it to automatically print any file you place in a designated folder; it automatically locates the fonts and graphics (including high-resolution DCS or OPI files) needed for output. **Acquired Knowledge's Download Mechanic** (\$249) doubles as a PostScript programming tool. You can view and edit PostScript code on-screen, and it can track down and fix many PostScript problems (including the ever popular limitcheck error).

PACKING YOUR KITS

There you have our top tools for desktop publishers. Whether you're starting a newsletter from scratch, tweaking a color layout before a client presentation, or trying to repair a damaged PostScript file, these essential DTP utilities can tackle just about any publishing project. Of course, every craftsman has particular favorites that aren't mentioned here, but you can't go wrong if you have these utilities packed in your publishing toolkit. ☒

Aileen Abernathy writes about desktop publishing and graphics for several publications and is coauthor of *The Macintosh Bible, 5th Edition* (Peachpit Press).

DIRECTORY / where to buy tools

Acquired Knowledge
San Diego, CA
800-482-1252
619-587-4668
619-587-4669 (fax)

Adobe Plug-In Connection
Seattle, WA
800-685-3547
206-343-4221
206-489-3446 (fax)

Adobe Systems
Mountain View, CA
800-833-6687
415-961-4400
408-562-6775 (fax)

Agfa Division of Bayer
Wilmington, MA
800-685-4271
508-658-5600
508-658-4193 (fax)

Alien Skin Software
Raleigh, NC
919-832-4124
919-832-4065 (fax)

Alsoft
Spring, TX
800-257-6381
713-353-4090
713-353-9868 (fax)

Andromeda Software
Thousand Oaks, CA
800-547-0055
805-379-4109
805-379-5253 (fax)

Apple Computer
Cupertino, CA
800-776-2333
408-996-1010
408-974-2042 (fax)

Canto Software
San Francisco, CA
800-332-2686
415-905-0300
415-905-0315 (fax)

DayStar Digital
Flowery Branch, GA
800-962-2077
404-967-2077
404-967-3018 (fax)

Dubl-Click Software
Bend, OR
503-317-0355
503-317-0430 (fax)

Eastman Kodak
Rochester, NY
800-242-2424
716-724-4000
716-724-9829 (fax)

Equilibrium Technologies
Sausalito, CA
800-524-8651
415-332-4343
415-332-4433 (fax)

Extensis
Portland, OR
800-796-9798
503-274-2020
503-274-0530 (fax)

FontHaus
Fairfield, CT
800-942-9110
203-367-1993
203-367-1860 (fax)

Gryphon Software
San Diego, CA
800-795-0981
619-536-8815
619-536-8932 (fax)

HSC Software
Carpinteria, CA
805-566-6200
805-566-6385 (fax)

Human Software
Saratoga, CA
408-741-5101
408-741-5102 (fax)

Impossible Software
Irvine, CA
714-470-4800
714-470-4740 (fax)

Lupin Software
Davis, CA
916-756-7267
916-756-7267 (fax)

Pantone
Carlstadt, NJ
800-222-1149
201-935-5500
201-896-0242 (fax)

Quark
Denver, CO
800-788-7835
303-894-8888
303-894-3399 (fax)

Rascal Software
Santa Clarita, CA
805-255-6823
805-255-9691 (fax)

Second Glance Software
Laguna Hills, CA
714-855-2331
714-586-0930 (fax)

Symantec
Eugene, OR
800-441-7234
503-345-3322
503-334-7400 (fax)

Systems of Merritt
Mobile, AL
334-660-1240
334-660-7740 (fax)

TechPool Software
Cleveland, OH
800-543-3278
216-291-1922
216-382-1915 (fax)

Total Integration
Palatine, IL
708-776-2377
708-776-2378 (fax)

Xaos Tools
San Francisco, CA
800-289-9267
415-487-7000
415-558-9886 (fax)

XChange
Fort Collins, CO
800-788-7557
303-229-0620
303-229-9773 (fax)

The **Ultimate** Utility Belt

Want heroic gains in Mac productivity? These super utilities will save the day. **BY GREGORY WASSON**

13 MUST-HAVE UTILITIES

1. Conflict Catcher 3
2. Now Utilities 5.0.1
3. RAM Doubler 1.5.1
4. StuffIt Deluxe 3.5
5. CanOpener 3.0
6. DiskTop 4.5
7. MacTools Pro 4.0
8. Norton Utilities for Macintosh 3.1.2
9. QuicKeys 3.0.1
10. Square One 2.0
11. Symantec AntiVirus for Macintosh 4.0
12. Thunder 7 1.5
13. Aladdin Desktop Tools 1.0

A RECENT SUPERHERO POLL confirms it: Rocket cars, jet packs, and invisible planes are terrific, but four out of five crime fighters would sooner ditch all the big guns in their arsenals than give up their utility belts. The gadgetry that is stashed in a crime buster's belt often appears deceptively simple, but time and again, the tools — from grappling hooks to magic lassos — provide escape from the tightest scrapes, make the grind of catching crooks a little easier, and add a dash of personal panache to the workaday war on crime.

What holds for costumed crusaders is also true for Mac heroes — masked or otherwise — and the utility software they use each day. Sure, there are application programs none of us can do without, but it's the utilities that really make life with the Mac a personal adventure. The best of these little programs let you configure your Mac just the way you like it, with shortcuts that suit the way you work. Once configured, they lie low, demanding little memory and few system resources, and then they spring to action when you need them. Some handle tasks your applications — or the Mac OS — can't manage as elegantly as you'd like; others are better than a teenage sidekick when your data's in danger. We think the following 13 software programs belong in your personal utility belt.



When Extensions Clash

Even in the most orderly systems, rogue extensions and control panels sometimes emerge to wreak mayhem on your Mac — and on your sanity. Casady & Greene's Conflict Catcher 3 is the best tool available for tracking down the culprit and "rehabilitating" it. Through a series of trial-and-error startups, Conflict Catcher automatically isolates conflicting extensions. The latest version adds an Intuition option, which can shorten this process considerably, by letting you guess which items might be in conflict. Conflict Catcher, with its powerful set and link features, lets you group related extensions and control the group — it even lets startup items display their names and/or appear as small icons when they load. Don't start up without it.

👍👍👍 CONFLICT CATCHER 3

\$100 (list), \$65 (estimated street). Casady & Greene, Salinas, CA; 408-484-9228.

The Ultimate Team-up

Now Utilities is still the best overall collection of utilities you can buy for your Mac. Its cascading-menu feature, which puts System 7.5's to shame,

is alone practically worth the price of admission: You can add configurable menus to your menu bar and move items by dragging them onto menus and dropping them where you want them. You also get Super Boomerang, a popular tool that keeps recently used files and applications within easy reach; a what-you-see-is-what-you-get font menu in every application; a flexible extension manager; automatic file compression; a keystroke saver that can help restore damaged files; an enhanced Scrapbook; and a diagnostic tool that details your system configuration. You may not need them all, but the tools you settle on will quickly become indispensable.

👍👍👍 NOW UTILITIES 5.0.1

\$89.95 (estimated street). Now Software, Portland, OR; 503-274-2800.



Moderating Memory Mayhem

RAM Doubler, which won a *MacUser* Editors' Choice Award for 1994, is everything a great utility should be. It meets a universal need (the perpetual desire for more memory to open applications), and it does so simply, efficiently, and unobtrusively. Just drop

RAM Doubler into your System Folder, and kiss out-of-memory alerts goodbye. If your Mac (68030, 68040, or PowerPC models only) has 4 MB of actual RAM to begin with, this gem will boost available memory safely, with negligible impact on system speed.

★★★★ RAM DOUBLER 1.5.1

\$99 (list), \$60 (estimated street). Connectix, San Mateo, CA; 415-571-5100.

The Amazing Shrinking Files

Whether you want to compress files for archival storage, for transmission over networks or phone lines, or to save precious space on your hard disk, Stuffit Deluxe is the utility to use. Its flexible controls let you compress and expand files in a variety of ways: via pull-down menus or drag-and-drop icons or even automatically when your Mac is idle. Stuffit's compression format is the standard for the Mac, so your compressed files will always be welcomed by online services and by colleagues — and in cross-platform environments, Stuffit also handles a wide variety of DOS and UNIX compression formats.

★★★★ STUFFIT DELUXE 3.5

\$129.95 (list), \$65 (estimated street). Aladdin Systems, Watsonville, CA; 408-761-6200.

Behold the All-Seeing!

If time's running out and your data is trapped in a damaged file (or one for which you lack the parent application), give CanOpener a try. This versatile file viewer grants you access to the text, graphics, sounds, and QuickTime movies contained in virtually any document file — including a variety of non-Mac files. Using CanOpener is also a great way to preview the text contained in a word-processor file — without launching a word processor. You can even select and copy text and graphics from any file you're viewing. It's PowerPC-native, fast, and foolproof.



★★★★ CANOPENER 3.0

\$125 (list), \$65 (estimated street). Abbott Systems, Pleasantville, NY; 914-747-4171.

Mightiest of Movers

The Mac's drag-and-drop file-management system is fine for everyday chores, but when it's time to reorganize your system or just clean house, DiskTop is invaluable. From a single window, DiskTop lets you search for files by name or any other attribute; view the contents of all your disks; and move, copy, or delete folders, files, and aliases. Its Technical view even lets the daring track down pesky, invisible files.

★★★★ DISKTOP 4.5

\$69.95 (list), \$44 (estimated street). PrairieSoft, West Des Moines, IA; 515-225-3720.



Dynamic Duo Doctors Disks

MacTools Pro 4.0 and Norton Utilities 3.1, now published by the same company, Symantec, are collections of tools with the same primary purpose: They monitor the data on your hard disks; keep the disks in order; and when inevitable data corruption occurs, leap to the rescue to perform emergency repairs. Norton Utilities takes a conservative approach, by asking your permission for every fix; MacTools, on the other hand, can work in the background, invisibly correcting problems as it detects them. Both packages are excellent, and every Mac should have one or the other. But because each can fix certain problems the other cannot, consider adding both to your arsenal.

★★★★ MACTOOLS PRO 4.0

\$149.95 (list), \$99 (estimated street). Symantec, Cupertino, CA; 408-253-9600.

★★★★ NORTON UTILITIES FOR MACINTOSH 3.1.2

\$149 (list), \$99 (estimated street). Symantec, Cupertino, CA; 408-253-9600.

Master of the Magic Keys

QuicKeys is the macro maker for the Mac. With its easy-to-learn icon-based interface, it automates complex tasks; inserts boilerplate text; changes printers, sound levels, and monitor depths on the fly — without making you open a control panel; launches programs; and does a lot more. If you find yourself going through the same sequence of steps and keystrokes over and over again, check out QuicKeys and save yourself, your keyboard, and your mouse considerable wear and tear.

★★★★ QUICKEYS 3.0.1

\$139 (list), \$119 (estimated street). CE Software, West Des Moines, IA; 515-221-1801.



Launching into Action

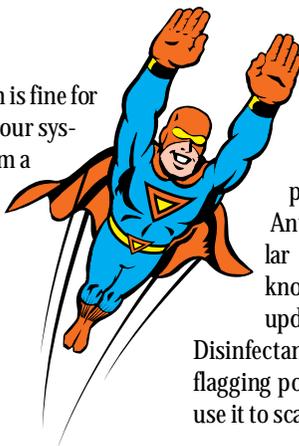
It's a drag to have to rummage through folders to launch an application. System 7.5's Launcher offers some relief, but Square One boasts far more power and elegance. It lets you place applications, folders, and documents in flexibly configurable palettes, for easy launching at the click of a button. Palettes can be set up quickly, using Macintosh Drag and Drop, and you can navigate data via recent-file menus or pop-up hierarchical folder menus.

★★★★ SQUARE ONE 2.0

\$74 (list), \$39.99 (estimated street). Binary Software, Santa Monica, CA; 310-449-1481.

When Evil Lurks, Invisible

Computer viruses are a scourge of the Information Superhighway, but you can take comfort when Symantec AntiVirus for Macintosh (SAM) is on patrol. Like the popular freeware utility Disinfectant, SAM shields you from known Mac viruses, and Symantec continually posts free updates online as new viruses are found. But SAM outdoes Disinfectant by looking for characteristic virus behavior and by flagging potential infections by *undocumented* intruders. You can use it to scan and repair any volumes you add to your Mac, and you





can configure it to check floppy disks for infections. Using SAM is simply the best way to practice safer computing.

👍👍👍 **SYMANTEC ANTIVIRUS FOR MACINTOSH 4.0**

\$99 (list), \$69 (estimated street). Symantec, Cupertino, CA; 408-253-9600.

The Awesome Spells of Thunder 7

Installing separate spelling dictionaries for every program not only hogs space on your hard disk but it also makes you work harder — you must train each dictionary to recognize names and specialized words you commonly use. Enter Thunder 7 to save the day. This splendidly speedy, accurate spelling checker works in just about any program and even includes a glossary, into which you can insert words, phrases, and even entire paragraphs, with just a couple of keystrokes.

👍👍👍 **THUNDER 7 1.5**

\$99.95 (list), \$55 (estimated street price). Baseline Publishing, Memphis, TN; 901-527-2501.

New Squad on the Scene

Aladdin Desktop Tools, Aladdin Systems' recent entry in the utilities-suite category, wisely aims to complement, rather than unseat, Now Utilities. The package offers some nifty goodies, including accelerated file copying and Trash emptying; the ability to print by dragging files onto printer icons — without QuickDraw GX; a menu-bar tool that lets you copy, move, and gather files; recent-file, -folder, and -application menus in Open dialog boxes; and a viewer (less versatile than CanOpener) that lets you check out text, graphics, and sounds in various Mac files. Although none of these tools are as flat-out essential as those in Now's package, you'll quickly find yourself counting on them to help you manage files.

👍👍👍 **ALADDIN DESKTOP TOOLS 1.0**

\$89.95 (list), \$50 (estimated street). Aladdin Systems, Watsonville, CA; 408-761-6200. 📧

Contributing editor Gregory Wasson will take a small, speedy, useful utility over a bloated word processor any day.

JUNIOR SIDEKICKS

SIDEKICKS AREN'T FOR EVERYONE — and for heroes who *do* partner up, not just any eager youngster in tights will suffice. The right assistant must possess a particular sort of derring-do that complements the mentor's style without getting in the way.

The following utilities are sidekicks. They're a bit too narrow in focus to belong on every Mac, and it's doubtful anyone needs them all. But if any of them fit in with your daily tasks, they'll soon prove so valuable you'll gladly tell them your secret identity.

BETTER FOR NETTERS

Resort no longer to SimpleText for preparing online communiqués. BBEdit, a superb text editor, offers search-and-replace capability and supports AppleScript, Macintosh Drag and Drop, and QuickDraw GX. Originally a programming tool, BBEdit reeks of geek in its digital soul, but it's still everyday useful.

👍👍👍 **BBEdit 3.1.1**

\$119 (list), \$79 (estimated street). Bare Bones Software, Natick, MA; 508-651-3561.

CHART OF SIMPLICITY

Cheshire is a clever application that lets you create a variety of simple charts and graphs for use in any program. Its spreadsheetlike interface is familiar to most users, and for those who really need just a quick chart for a report, it's a lot quicker than Excel.

👍👍👍 **Cheshire 1.1**

\$125 (list), \$65 (estimated street), Abbott Systems, Pleasantville, NY; 914-747-4201.

DATA-BASIC

Using a full-fledged database is overkill if all you're concerned with is basic list keeping. For to-dos, phone numbers, addresses, and other personal data, Retriever II is ideal. It's a perky, easy-to-use database DA with some advanced features such as the ability to calculate across fields.

👍👍👍 **Retriever II 1.0**

\$49 (list). Exodus Software, Cincinnati, OH; 513-522-0011.

FADE TO SAVE

Toner Tuner lets you adjust the darkness of the printed page from within the Print dialog box, so you can save toner or ink. It can dramatically cut your printing costs, especially if you print a lot of rough drafts or page proofs.

👍👍👍 **Toner Tuner 1.0.6**

\$24.95 (list), \$20 (estimated street). Working Software, Santa Cruz, CA; 408-423-5696.

DISK, DAT, AND THE OTHER

If you use floppy disks or other removable media, VirtualDisk can help you track what's where. It catalogs every file and volume you mount on your Mac. Browse its catalogs and double-click on a file, and VirtualDisk tells you which cartridge or disk contains it.

👍👍👍 **VirtualDisk 2.0.2**

\$79.98 (list), \$49.98 (estimated street). Continuum Software, Portland, OR; 503-848-7112.

LAST-DITCH DIGGER

RescueTXT is a clever last-resort utility that recovers text from inadvertently deleted files. Give it a text string from a lost file, and RescueTXT reads your hard disk block by block until it locates the string. You can then copy and paste the text into a new document. It's a heavy-handed approach to file recovery, but it works.

👍👍👍 **RescueTXT 1.0**

\$79 (list), \$29 (estimated street). Abbott Systems, Pleasantville, NY; 914-747-4201.

QUICK LABS



• Apple Improves a Classic Printer • Hard-Drivin' Hard Drives • Investing in Monitor Real Estate

If you think there aren't many low-cost, high-quality peripherals for the Mac, then this month's crop of products will make you change your mind. We review two QuickDraw printers (one inkjet and one laser), a handful of bargain-priced hard drives, and seven 15-inch and 17-inch monitors. Whether you're a student, a small-business owner, or an employee of a large corporation that buys in bulk, you'll be glad to know that you can afford the equipment you need to print your thesis paper, store your inventory database, or view your department's consolidated spreadsheet.

MacUser's labs staff and editors tested each product and then evaluated its

performance, features, and functions. A new and improved Apple StyleWriter, several speedy drives, and a monitor from Nanao top our ratings this month, but you'll find plenty of good products to choose from in each category. Budget-conscious users will be pleased to know that a low price doesn't always mean low quality — Genova, Relisys, and MicroNet all offer good, affordable products — but investing a little extra cash can provide big returns.

Since our testing methods are the same from month to month, you can compare these results with those from past and future issues. And if you don't find something you like in this issue, be sure to check out future Quick Labs.



NEW PERSONAL PRINTERS

It's ink versus toner in this month's review of two QuickDraw printers — the Apple StyleWriter 1200 (pictured) and the Brother HL-645M. Since it is a laser printer, you might expect the HL-645M to produce superior output, but we found that the StyleWriter 1200 produced smoother grayscale images and sharper text. In fact, our editors couldn't tell which images were produced by the inkjet printer and which were produced by the laser printer.

The StyleWriter 1200 continues the tradition of quality established by its predecessor, the

StyleWriter II, while improving on speed and boasting new features. The StyleWriter 1200 can print black-and-white images at a resolution of 720 x 360 dpi and uses edge smoothing to eliminate jaggies. It offers eight watermarks; the ability to print thumbnail views of two or four pages on a single letter-sized sheet of paper; and drag-and-drop printing, which allows you to print simply by dragging your file onto a desktop printer icon.

The HL-645M fell short of our expectations. It's poorly designed, lacking a power switch, of all things. To top it off, you'll pay twice as much

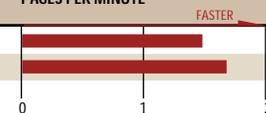
for this printer as you will for the StyleWriter 1200 and you'll be disappointed with its output.

To test speed and output quality, we printed dozens of pages of text, line art, and grayscale graphics, using a variety of applications. We timed each printer as it produced simple and complex files, and we weighted our results to reflect everyday usage. To rate output quality, we printed a test page by using each printer's best quality setting and showed the output samples to a jury of novices and DTP experts.

REVIEWER / REBECCA OLSON TESTING / JIM GALBRAITH

+ / OUTSTANDING ● / ACCEPTABLE - / POOR	ESTIMATED STREET PRICE	RESOLUTION	WARRANTY	TEXT QUALITY	GRAPHICS QUALITY	PAPER HANDLING	SUPPORT	COMMENTS	PAGES PER MINUTE
●●●●	\$249	360 dpi*	1 year	+	+	●	●	A quicker version of its predecessor, the StyleWriter II.	1.5
●●	\$499	300 dpi	1 year	-	-	●	●	Groans of "Oh, brother," as we examined the output quality.	1.0

*A resolution of 720 x 360 dpi is available for text and black-and-white images.





NEW 700-MB TO 4-GB HARD DRIVES

Capturing this month's checkered flag are drives from APS, Marlow Data Systems, and Mirror; each sports a new Quantum mechanism.

Users who have limited desk space will find the small drives from MicroNet and Liberty ideal. The Marlow MDS Express Q2GB, on the other hand, has a larger zero-footprint case

that is designed to fit perfectly underneath a compact Mac, such as the SE.

For users on the go, the Liberty Seagate 4GB includes an internal battery that provides power for up to three hours. The charger costs an additional \$189, however. The MegaDrive Mercury Removable (pictured) lets you remove the tiny drive mechanism from its

docking station and carry it around. You'll need a docking station wherever you use the drive.

We tested each drive's speed with MacBench 2.0. The results are relative to that of a 250-MB Quantum IDE drive in a Quadra 630, which is given a score of 10.

REVIEWER / ROMAN LOYOLA TESTING / MARTIN WONG

+ / OUTSTANDING ● / ACCEPTABLE - / POOR		ESTIMATED STREET PRICE	FORMATTED CAPACITY	PRICE PER MEGABYTE	WARRANTY	CASE	SOFTWARE/MANUALS	SUPPORT	COMMENTS	MacBench 2.0 Disk Mix Score
★★★★	APS Q 2GB	\$1,099	2,045.8 MB	\$.54	5 years	+	●	+	Twice the capacity and just as fast as its smaller sibling.	8.5
★★★★	Marlow MDS Express Q2GB	\$995	2,048.2 MB	\$.49	2 years	+	●	●	Old-fashioned zero-footprint case, but the fastest drive here.	9.5
★★★★	MicroNet Advantage 700	\$459	696.9 MB	\$.66	2 years	●	+	+	Compact, sturdy case that doesn't take up a lot of space.	6.5
★★★★	Mirror Quantum 4300MB	\$2,359	4,061.4 MB	\$.42	5 years	●	●	+	Fast, high-capacity drive with sturdy case.	8.5
★★★★	APS Q 1GB	\$799	1,023.1 MB	\$.78	5 years	+	●	+	Excellent case design includes active switchable termination.	8.5
★★★★	Liberty Seagate 4GB	\$1,649	4,092.5 MB	\$.40	2 years	●	●	-	Small footprint and includes batteries. Noticeably loud.	6.5
★★★★	FWB PocketHammer 1000FMF	\$934	1,008.4 MB	\$.93	5 years	●	+	+	New students of SCSI will love FWB's manual.	7.5
★★★★	FWB PocketHammer 2000FMF	\$1,444	2,047.1 MB	\$.71	5 years	●	+	+	For hard-drive handymen, FWB's software has everything.	8.5
★★★★	MegaDrive Mercury Removable	\$2,180	4,090.4 MB	\$.53	2 years	●	-	●	The driver lacks speed-enhancing features.	6.5

LISTING IS ALPHABETICAL WITHIN GROUPS OF EQUAL MOUSE RATINGS.



NEW 15- AND 17-INCH COLOR MONITORS

You're bound to find an excellent monitor to replace an outdated 13-inch model in this month's batch of products. The two monitors from Nanao — the FlexScan F2-17 (pictured) and the FlexScan T2-17TS — have the most controls of the group, including a slick built-in dial to help you navigate the on-screen settings quickly. The Orchestra French Horn II has an outdated and awkward-to-use mode button, and the Genova TC1017's controls are

difficult to see while you're looking at the screen.

You need a Mac adapter for all the monitors. Nanao will send you an adapter free on request, and you can also ask for ScreenManager Pro, a free package containing several useful utilities and a serial connector. The other vendors offer Mac adapters as options. Only Genova ships a Mac-compatible cable with its monitor.

The image-quality scores are composites based on our tests for image sharpness, focus, brightness, uniformity, pincushioning, color range, color accuracy, and vibrancy. The larger the monitor, the more difficult it is to maintain sharpness and focus, so 17-inch monitors tend to score lower than comparable 15-inch models. A score of 1.0 is considered acceptable.

REVIEWER / ROMAN LOYOLA TESTING / BRIAN FIKES

+ / OUTSTANDING ● / ACCEPTABLE - / POOR		ESTIMATED STREET PRICE	SCREEN SIZE	MAXIMUM RESOLUTION	WARRANTY	MANUALS	SUPPORT	CONTROLS	COMMENTS	IMAGE-QUALITY SCORE
★★★★	Nanao FlexScan F2-17	\$934	17 in.	1,280 x 1,024 pixels	3 years	+	+	+	High image quality and a cornucopia of controls.	1.2
★★★★	Genova TC1017	\$669	17 in.	832 x 624 pixels	2 years	●	●	-	Acceptable quality and easy on the wallet.	1.1
★★★★	Nanao FlexScan T2-17TS	\$1,095	17 in.	1,280 x 1,024 pixels	3 years	+	+	+	The same features as its sibling, but even better image quality.	1.3
★★★★	Relisys VividView Low Radiation TF-1560L	\$379	15 in.	1,024 x 768 pixels	3 years	-	+	-	A basic monitor for basic needs.	1.0
★★★★	Samsung SyncMaster 17GLi	\$849	17 in.	1,024 x 768 pixels	3 years	●	●	●	Excellent image quality, but controls lack elegance.	1.2
★★★★	Nokia Multigraph 449X	\$625	15 in.	1,024 x 768 pixels	3 years	●	●	●	Slightly pricey for slightly better-than-average performance.	1.1
★★★★	Orchestra French Horn II	\$469	15 in.	1,280 x 1,024 pixels	2 years	-	●	-	A capable accompaniment to your Macintosh ensemble.	1.0

LISTING IS ALPHABETICAL WITHIN GROUPS OF EQUAL MOUSE RATINGS.

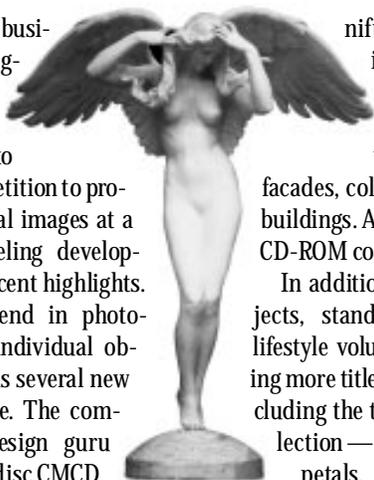
GET INFO / APS Technologies 816-483-6100 Apple Computer 408-996-1010 Brother International 908-356-8880 FWB 415-474-8055 Genova 310-538-4102 Liberty Systems 408-983-1127 Marlow Data Systems 603-446-3383 MegaDrive Systems 310-247-0006 MicroNet Technology 714-453-6000 Mirror Technologies 612-830-1549 Nanao USA 310-325-5202 Nokia 415-331-6622 Orchestra MultiSystems 714-891-3861 Relisys 408-945-9000 Samsung Electronics America 201-229-4000

CLIP ART /

Photo Titles Take Off

Quirky objects, vast vistas come to CD-ROM.

CLIP IMAGES ARE BIG business these days. Photography on CD-ROM is gnawing away at the traditional stock-photo business, and the competition to provide high-quality digital images at a reasonable cost is fueling development. Here are some recent highlights. **PhotoDisc.** The hot trend in photographic CD-ROMs is individual objects, and PhotoDisc has several new collections on the table. The company has acquired design guru Clement Mok's witty 8-disc CMCD



series of objects isolated against neutral backgrounds. After rescanning the images on drum scanners, PhotoDisc plans to give the objects clipping paths — a feature the originals lacked — and add keywords for cataloging. \$159 each.

PhotoDisc also released four new discs of original object art, including the

nifty Retro Relics; the amusing Faces & Hands; and the interesting Architectural Elements, a black-and-white collection of friezes, facades, columns, and so on from old buildings. All the images on each \$159 CD-ROM contain clipping paths.

In addition to releasing discs of objects, standard scenic images, and lifestyle volumes, PhotoDisc is preparing more titles in its Signature Series, including the truly stunning Flowers collection — which shows richly colored

petals, stamens, and pistils up close. Each image in the Signature Series comes as a 72-ppi RGB TIFF (600K) and two 300-ppi RGB JPEG TIFFs of different sizes (10 MB and 26 MB). Images in the regular volumes come in two versions: 72-ppi RGB TIFF (1 – 2 MB) and 300-ppi RGB JPEG TIFF (8 – 10 MB). 206-441-9355.



Central Europe, and British Isles. \$249 each. Digital Stock also has a Signature Series, but each of these collections, such as Mario De Biasi's images of Italy, is shot by a single photographer exploring a single theme (\$349 each).

With these titles, the company inaugurates a new scanning procedure for its Photo CD images. Instead of using the standard Photo CD scanner and software, which can yield inconsistent results, Digital Stock now uses Kodak's Build-It software, which lets the company scan images on a drum scanner, color-correct them, and save them in Photo CD format. \$249. 619-794-4040.

Corel. At the other end of the spectrum is Corel Stock Photo Library 2. This new collection, which is in Photo CD format, is composed of 20,000 images that include just about every imaginable topic. You'll

find individual discs dedicated entirely to topics such as Dog Sledding, Speedo Swimsuits, Navy SEALS, Decorated Pumpkins, and Barbecue & Salads. Frankly, the image quality is simply not up to the standard of PhotoDisc or Digital Stock, and some of the pictures seem dated. But you certainly can't beat the price — \$995 for the entire library of

200 (that's right) CD-ROMs or separately for \$25 per disc. Stock Photo Library 1 is also available for the same price. 613-728-8200. / Pamela Pfiffner

Digital Stock. A primary competitor with PhotoDisc, Digital Stock released ten new volumes of scenic vistas and contemporary lifestyles, including Family and Seniors,

SCANNERS /

Shoestring Scanning

AT THE LOW END of the price spectrum, Epson America has introduced a 30-bit letter-sized flatbed color scanner priced at \$799. With an optical resolution of 400 x 800 dpi, the ES-1000C offers a top interpolated resolution of 3,200 dpi. It captures data in one pass, but users can elect to perform three-pass scanning by making a selection in the driver. According to Epson, the three-pass option can reduce moiré when scanning prescreened images.

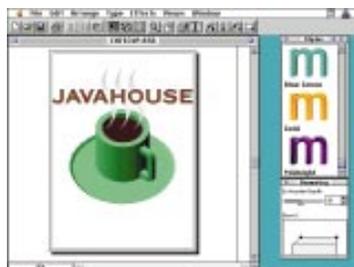
Adobe Photoshop LE, Xerox Imaging Systems' TextBridge OCR software, and Second Glance Software's SCANtastic plug-in module are bundled with the ES-1000C. Optional extras include an automatic document feeder (\$499) and a transparency adapter (\$799). 800-289-3776 or 310-782-0770. / PP

3-D GRAPHICS /

AddDepth 2 Conjures Up 3-D Effects

CREATING 3-D IMAGES usually means investing time and money in specialty software. Ray Dream's AddDepth 2 dispels this notion by offering easy-to-use tools that create interesting 3-D effects with type or graphics — for around \$50 on the street.

The biggest boon for new users is AddDepth Wizard. This handy assistant offers more than 100 templates to help you quickly get the message across in 3-D. Ray Dream is also bundling 30 TrueType fonts and 200 clip-art images with this version.



AddDepth 2 now supports more platforms. It's compatible with AddDepth for Windows and is PowerPC-native. The PowerPC version is twice as fast, and thanks to its interruptible preview, experimenting with a different color or perspective is a snap. Those working on 680x0 Macs also benefit from a fast new wire-frame view.

Those using ClarisWorks or ClarisDraw will appreciate AddDepth's ability to import and export PICT files as well as Illustrator and FreeHand EPS formats. \$99; upgrade, \$39 until August 31. 800-846-0111 or 415-960-0768.

/ Sean J. Safreed

Flatbeds Reach for Higher Ground



DESKTOP DRUM scanners may be rolling into more design studios and service bureaus (see "Scan to a Different Drum," July '95, page 92), but flatbed and slide scanners can offer comparable quality and versatile media handling at competitive prices.

Howtek Scanmaster 2500. Howtek, one of the first companies to develop a drum scanner for the desktop, has released a flatbed CCD-based scanner that, it says, offers image quality comparable to that of drum scanners. The \$14,900 Scanmaster 2500 lets you scan reflective images as large as 13 x 18 inches — a boon for those with oversized or fragile art that can't be wrapped around a drum. A transparency adapter costs \$1,000.

The Scanmaster 2500 uses a trilinear CCD (charge-coupled device) that captures 36 bits of color data in a single pass. The dynamic range

tops out at 3.4, compared to the 3.8 offered by Howtek's drum-based models, the Scanmaster 4500 and the Scanmaster 7500.

With its optical resolution of 600 x 1,200 dpi, the Scanmaster 2500 offers software interpolation up to 4,800 dpi. A plug-in for Adobe Photoshop comes with the scanner. Howtek's Aurora scanning software (\$2,500) also works with the unit. 603-882-5200.

Screen FT-S700. Designed as a compact alternative to a drum scanner, Screen USA's FT-S700 is a slide scanner that also scans reflective art up to 5 x 5 inches as well as 35mm slides and 4-x-5-inch transparencies. To scan an image, you insert into the scanner special media holders, which are encoded with information about image type, size, orientation, and so on. And unlike flatbed scanners, in which the light source travels down the platen, the light source on the FT-S700 remains stationary while the image holder moves across the trilinear CCD array.

With an optical resolution of 1,150 dpi, the FT-S700 can interpolate resolutions of 50 to 6,000 dpi. Its dynamic range is 3.6, and output is either 24 or 48 bits of color data per pixel. The unit ships with a Photoshop plug-in; Screen's ColorScope Pro high-end image-processing software is also available. The price wasn't set at press time, but it's expected to be about \$20,000. 708-870-7400. / PP

PREPRESS /

Polaroid's Instant Prints

GIVEN ITS LEGACY of instant photography, it's not surprising that Polaroid has developed an instant prepress system. Called Print to Press, this hardware/software combination lets photographers color-correct and calibrate images almost on the fly.

A hybrid between digital photography and conventional image processing, the Print to Press system has three components: Polacolor Pro 100 peel-apart instant film, the Polaroid CS-500i scanner, and proprietary software tailored to the film.

The user takes a photo by using a conventional camera equipped with a 4-x-5-inch back that's loaded with the Polacolor film. Unlike conventional photography, in which the peel-apart film might serve as a test print, the instant photo serves as final art, so there's no negative. Photographers get immediate feedback on lighting, exposure, and other composi-

tional aspects.

The user feeds the print into the CS-500i, a scanner designed for this type of film. It offers resolutions of 125 to 500 dpi, with on-the-fly sharpening. Polaroid says a 500-dpi scan takes 30 seconds.

Once scanned, the file is exported into Polaroid's Print to Press software, which color-corrects it, using built-in profiles for film type, ink standard (SWOP, Euroscale, and so on), paper stock, and printing press. Once corrected and separated, the file can be saved in a variety of formats, including TIFF, Scitex CT, DCS, EPS, and JPEG.

Currently, the software is tailored for Polacolor Pro 100 film, but the company said that other Polaroid peel-apart films will be supported in the future. \$2,995. / PP



Proto Types

TRADITIONAL TYPE foundries have been under fire from all sides — facing such challenges as dwindling resources and bargain-basement pricing. But happily there are real signs of life at companies whose names are synonymous with fine typography. * Hot on the heels of releasing its AgfaType CD-ROM version 5 (see "Dialing for Dingbats," June '95, page 95), **Agfa** has announced an ambitious new development program for commissioning original typefaces, many of which are exclusive to Agfa. Agfa's Creative Alliance boasts a who's who of type designers: Matthew Carter, Sumner Stone, José Mendoza, Aldo Novarese, David Berlow, David Quay, Pierre di Scullo, and many others. About 100 new fonts will be released each quarter on diskette, and a new, all-inclusive CD-ROM — version 6.0 — should be available in July. Based on the fonts we've seen thus far, it's an exciting program. 800-424-8963 or 508-658-5600. Agfa's fonts are also sold through Precision Type and Font-Shop. * Another exclusive offering is being sold through **URW**. Arthur Baker's fluid

Calligraphica,
Kigali Zigzag,
and Sassatras

calligraphic fonts, such as Sassatras and Calligraphica, are first drawn by hand and then digitized. URW sells a Baker sampler that includes some of his flowing scripts as well as the quirky Oak Graphic — in which each line has the shakes. Many of Baker's fonts include versions with variations in ascender and descender length. Prices range from \$29 to \$129. 800-229-8791 or 603-882-7445. * The pace at which **Monotype** has been pumping out new faces is breathtaking. Recent releases include Artifacts 3 & 4, picture fonts in a Southwestern style (\$49); Toulouse-Lautrec, a family of display faces and dingbats based on the lettering and graphics of the French artist (\$99); and Strayhorn, a sans serif font reminiscent of Monotype's Ellington, both of which were designed by stonecutter Michael Harvey (\$199). 800-666-6897 or 312-855-1440. / PP

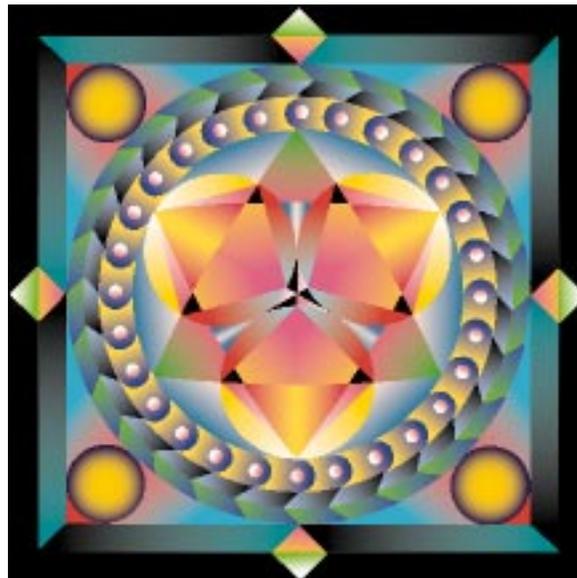
**Strayhorn light extra
italic with variations**

GRAPHICS HOW-TO / BY JANET ASHFORD

Coloring-Book Shapes

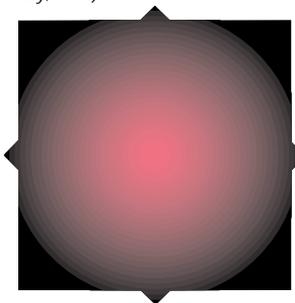
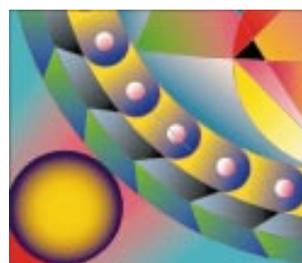
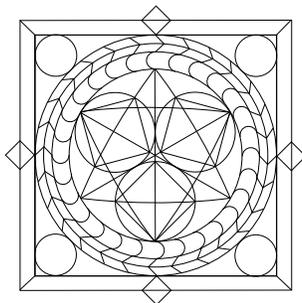
Go from simple lines to elegant glowing shapes, using Illustrator, Photoshop, and Streamline to quickly create a complex geometric design.

SEVEN ARTISTS, including myself, were asked to create digital illustrations focusing on the meaning of the number 7, for *Verbum* magazine's 7th Annual Digital Be-In. I created a mandala in which the components of 7 (3 and 4) play off against each other. Using the drawing tools in Illustrator, I drafted a black-and-white geometric design of unconnected lines rather than closed paths. Drawing each of these shapes as a closed area that could contain a gradient fill would have required use of Pathfinder filters or manual cutting and joining of each region. Streamline's flexible tracing options, coupled with Photoshop's bitmap rasterization, offered the



perfect shortcut for setting up the design. Back in Illustrator, I filled shapes with gradients, creating a complex image that seems to glow. Thanks to Illustrator's resolution-independent output, I was able to print the image in several sizes without loss of quality.

Janet Ashford is the coauthor, with Linnea Dayton, of Adobe Illustrator: A Visual Guide for the Mac (Graphic-sha/Addison-Wesley, 1995).



1. Drawing geometric shapes.

In Adobe Illustrator, I drew the mandala's geometric shapes and rotated and reflected them around a central point. The circles, squares, and triangles are closed paths that can be filled with color. But other elements — for example, the arrow shapes that flow clockwise around a circle — are simple angled lines. To quickly convert these lines into closed shapes, I turned to Adobe Streamline.

2. Autotracing with the outline method.

Streamline's autotracing works on bitmapped artwork only, so I converted the Illustrator file to a bitmap in Photoshop and saved it as a TIFF file. In Streamline, I converted the image to closed paths, using the Outline method (Options: Conversion Setup). The result was a group of white-filled, closed paths layered over a black background. The black lines are defined by the background showing through the gaps between the white shapes.

3. Varying the gradients' angles.

Returning to Illustrator, I opened the autotraced file and selected the white shapes. I filled each shape with a two-color linear or radial gradient created with the Gradient palette. Defining a unique gradient angle for each shape allows the gradients to contribute to the glowing quality and highlights the image's underlying shapes, such as the large circles.

4. Filling the background with a gradient.

The final step was to give the background shape a radial gradient from dark pink to black. The mandala design covers most of the background. But shades of pink show through the gaps between the individual shapes and make it look as if a gradient is bordering each shape — a feat that's impossible with standard line fills.

EXPERT TIPS / BY BOB SCHAFFEL AND CHUCK WEGER



The Color Ruler

How do we measure something we look at but that is too small to see? Two new devices answer that riddle.

COLOR! TO DEFINE IT, correct it, transform it, print it, slice and dice it, we need to be able to measure it. But we're talking about something measured in billionths of a meter (nanometers). The average yardstick just

won't do it. The device of choice for measuring color is something called a *spectrophotometer*, a gizmo that is indeed able to distinguish between the billionths of a meter of light waves. Until recently such a tool has been much too expensive for most people in the graphic arts (in the \$5,000-to-\$15,000 range, depending on the precision required). But now at least two companies, Light Source and X-Rite, have engineered spectrophotometers that cost about \$1,200 apiece. These easy-to-use handheld units attach to a Mac and come with software designed to work with desktop systems.

A spectrophowhosit? Put simply, a spectrophotometer contains a sensor that divides the light reflected into the unit into discrete sections (bands) of the visible spectrum and then measures the light energy in each band. The visible spectrum spans 380 to 700 nanometers — a width of about 320 nanometers. The Colortron, from Light Source, measures thirty-two 10-nanometer bands. The Digital Swatchbook, from X-Rite, records sixteen 20-nanometer bands and then interpolates up to thirty-two bands of readings. (A \$10,000 unit might read one hundred sixty bands, each 2 nanometers wide — overkill for graphic-arts purposes.)

Until the advent of inexpensive spectrophotometers, most graphics workers relied on a different instrument: the *densitometer*. This device tells you whether the boss has a high IQ (just kidding). As its name implies, a densitometer measures the density (or

darkness) of colorants (inks, for example), film, and other graphic-arts materials. In desktop publishing, densitometers are most often used to help verify the quality of film output and to assure the calibration of imagesetters. But these devices do not provide spectral information from measured colors.

The software that comes with the Colortron and the Digital Swatchbook transforms the spectral information into data that can be used to help designers find a Pantone color that more accurately matches the real object, for example, or to help choose other colors that might be visually pleasing when used in proximity to each other. Other production tools indicate the effect of different types of lighting on the visual perception of a color or convert the data into other numerical scales used by graphic artists (such as HSB, RGB, or CIE).

We can do some pretty nifty things with spectral information. A spectrophotometer can measure the color reflected from a product (such as clothing presented in a catalog) and can give a color separator the data required to improve the precision of the reproduction. Colortron's CMYK Process tool, for instance, uses a document-output profile for a CMYK device (such as a printing press) and then applies a mathematical transformation that turns the spectral data into a set of CMYK dot

percentages. These can then be used as numerical color-correction targets in Adobe Photoshop.

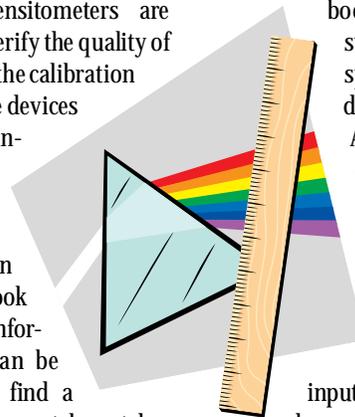
Commercial printers use a plethora of inks and papers. By using a spectrophotometer to read the paper surface and the printed color bars, we can fingerprint our printing press and supply this information to Photoshop. By using the Digital Swatch-

book's Recipe Book, for instance, we can convert the spectral data into CIE coordinates (see Expert Tips, April '95, page 106, for more on CIE). Then if we open Photoshop's Printing Inks preferences (File: Preferences: Printing Inks Setup) and choose Other from the Ink Colors pop-up menu, we can

input this data so that Photoshop will create better RGB-to-CMYK conversions of our scans. This will also improve Photoshop's monitor representations of CMYK.

We can do lots of other things with a spectrophotometer. We can use it to help calibrate our computer monitors, characterize the light in which we view our printed color materials, and help us decide how to adjust the output from a digital color printer. There is one thing we do need to be careful about, though. These devices themselves need to be set up and calibrated properly in order to produce accurate results. So read that manual (for a change), and make sure you aren't producing incredibly precise invalid results. ☒

Bob Schaffel is technology director of the Professional Prepress Alliance. Chuck Weger is a consultant and publisher of the Photoshop Monitor newsletter.





WAN ROUTING /

New High-Speed Connections

TWO NEW WAN connectivity products have joined an increasingly diverse field. ISDN veteran Symplex has added small-office routing to its product lineup, whereas Compatible Systems has higher-volume users in mind for its RISC Router 3400R.

Symplex (800-327-9926 or 313-995-1555) views its \$1,399 DirectRoute Remote RO-1 (and ISDN) as an alternative to leased telephone circuits for branch offices and companies seeking a connection to the Internet. The RO-1 is intended for offices in which fewer than 12 users will connect to ISDN. Unlike many routers,

which simply include an Ethernet port and require that the customer supply an interface to ISDN, the RO-1 contains an ISDN BRI (Basic Rate Interface), along with an Ethernet port.

Because the RO-1 stores network-configuration and phone-number information for contacting remote sites, no user software is required for making connections. Instead, through what Symplex calls CORE (Connection-Oriented Route Establishment), the RO-1 makes connections transparently. For Mac users, this means that a remote site for which there is an ISDN connection will appear on the local network (in the Chooser, in the case of a file server), even when an ISDN connection is not active. Double-clicking on the desired server tells the router to initiate the connection.

The RO-1 includes hardware-based compression, which the company says quadruples throughput. The router can be configured to apply one or both 64-kbps ISDN channels in its BRI to a connection.

Larger organizations looking for connections to several WAN types or to the Internet might find their solution in Compatible Systems' RISC Router 3400R, a four-port router capable of connecting a 10BASE-2 or 10BASE-T Ethernet network to switched-56 and T1/E1 as well as ISDN lines.

The 3400R has two V.35 ports for high-speed T1/E1 connections and two RS-232 ports for leased-56, switched-56, ISDN, or high-speed modems. The V.35 ports also support switched, leased, and ISDN connections. The router's high-speed ports can "roll over" connections to a slower port in the event that a high-speed link fails or is in use.

Priced at \$2,995, the RISC Router 3400R includes updated Mac and Windows management software, and it supports AppleTalk, TCP/IP, IPX, and DECnet network protocols as well as the PPP and frame-relay transport protocols. 800-356-0283 or 303-444-9532. / Shelly Brisbin

INTERNET /

ListSTAR Manages the Mail on the Internet

ANOTHER INTERNET APPLICATION — sophisticated e-mail processing — has come to the Mac. Mailing-list management was, until recently, the province of UNIX systems running programs such as listserv, listproc, and majordomo. Now there's StarNine's ListSTAR, which brings support for Internet and LAN-based mail systems to the Mac.

ListSTAR applies a set of rules to an incoming message, just as e-mail client applications such as Eudora and QuickMail 3.0 do. On the basis of the message contents, subject line, or header information, ListSTAR can respond in several ways: It can send an automated reply, forward a message for redistribution, or use AppleScript to invoke other Mac applications for further processing.

Mailing-list-management features will be familiar to those who have used or administered Internet mailing lists. The software can maintain a list, automating the subscription and posting process and delivering digests (messages comprising several smaller messages) to members of a list. Because ListSTAR supports LAN-based e-mail, it is possible to create internal company lists and perform other management tasks that can't otherwise be accomplished on a LAN.

ListSTAR is available as both a dedicated Internet SMTP (Simple Mail Transfer Protocol) mail server (\$795) and as a mail-management application for LAN-based systems. LAN-based flavors of the application process mail from accounts on existing POP/SMTP,



Message-processing rules can be applied in the order in which they're listed.

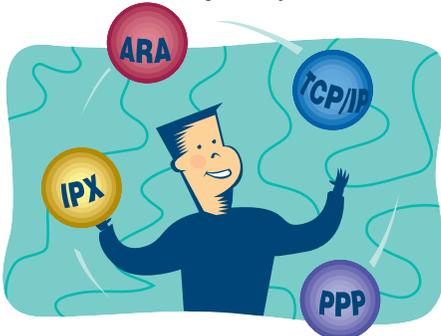
QuickMail, or Microsoft Mail servers. Each LAN-based program is priced at \$295. 510-649-4949. / Jason Snell

REMOTE ACCESS /

New Remote-Access Servers

THE BIGGEST TREND in remote access these days is support for multiple protocols and platforms. Major companies on the Apple side such as Dayna are moving beyond the Mac, whereas PC vendors, including Emulex, are adding AppleTalk and ARA (Apple Remote Access) support to their product lines.

The DaynaLINK Mobile Access Server, from Dayna (800-269-7200 or 801-269-7200), is an enhanced version of the DaynaLINK for ARA that provides dial-in support for IPX, TCP/IP, and PPP (Point-to-Point Protocol) as well as for ARA. The Mobile Access Server is housed in the same enclosure as the original DaynaLINK for ARA,



which means that it contains an Ethernet port and slots for eight PCMCIA modems.

The Mobile Access Server offers a new feature for Mac users: an IP gateway for connecting to a TCP/IP network via ARA. Under this arrangement, ARA users can access Internet accounts and UNIX-based file servers remotely. The Dayna server's other new protocols make

these services available to DOS and Windows users too. PC users dial in to the server with new client software that supports DOS and Windows. The client software provides remote-node and remote-control capabilities as well as support for the remote-access client software built in to Microsoft's Windows 95.

The server includes both Mac and Windows management software, either of which can be run from anywhere on the network. Both versions allow an administrator to define users, passwords, and zone access.

The Mobile Access Server sells for \$2,999 (including the rack-mountable enclosure and DaynaLINK software). Owners of the DaynaLINK for ARA can purchase an upgrade for \$595, which includes version 2.0 of the software and a PCMCIA ROM card.

The \$899 ConnectPlus LT, from Emulex (800-590-5773 or 206-881-4065), is considerably simpler than the slick Mobile Access Server, but it's also a lot cheaper. A good alternative for small organizations, the ConnectPlus LT supports ARA, IPX, TCP/IP, and PPP and contains two serial ports.

Through a feature Emulex calls automatic modem recognition, the ConnectPlus LT detects the manufacturer and model of modems attached to the server. If it finds one of the 20 modems it recognizes, the server uses the appropriate initialization string when making a connection. ConnectPlus LT administration is accomplished through the company's Windows-based management application or a Telnet connection to the server. / David Kison

E-MAIL /

Banyan Moves Beyond PCs

BANYAN IS MAKING IT EASIER for Mac users on Banyan or NetWare LANs to manage e-mail and exchange it with PC users. The company has created Mac and Sun Solaris client software for its formerly PC-only BeyondMail system. BeyondMail 2.1 for Macintosh — Intelligent Messaging Version (\$995 for ten users) can be used on Banyan VINES or Novell NetWare MHS networks.

The *Intelligent Messaging* in the product's name refers to BeyondMail's behind-the-scenes directory support. BeyondMail client software uses Banyan's Intelligent Messaging III, a messaging service that links to the StreetTalk global directory services of VINES, giving Mac users easy access to BeyondMail users on Windows and UNIX platforms.

BeyondMail for Mac comes with filters called MailMinders, a set of software agents that allows users to automate mail-handling functions, such as sorting and replying to messages. Banyan includes a scripting language called BeyondRules that allows users to create their

own mail-routing and notification systems.

BeyondMail 2.1 additionally includes work-flow-customization features that are aimed at enterprise environments. The software is based on Banyan's BeyondWare architecture, which enables organizations to integrate mail into cross-platform work-flow systems such as document management and data access. The client software includes enterprise security features, allowing the encryption of mailboxes and messages. 800-222-6926 or 508-898-1000. / John Rizzo



PowerMerge Goes Networkwide

The latest version of **KeyServer**, from **Sassafras Software** (603-643-3351; sassafras@dartmouth.edu), gets application installers into the software-license-management business. By monitoring the installation applications used by Aldus, Apple, Microsoft, and other vendors, version 4.1 can control or prevent copying of the associated software over the network. Pricing varies by number of users. * Prepress shops have a new OPI (Open Prepress Interface) solution. **Xinet's FullPress** software runs on UNIX-based servers from Silicon Graphics and provides full-fledged AFP and OPI support for Mac users. OPI allows those who work in design and production to view and manipulate draft-quality versions of complex graphic files. The originals, stored on the server, are employed for printing camera-ready pages. Prices start at \$7,500. 510-845-0555. * New software from **Thursby Software Systems** (800-283-5070 or 817-478-5070; sales@thursby.com) allows Mac users to mount NFS (Network File System) volumes on the desktop. **MacNFS** lets users open files and copy them between Macs and NFS-based UNIX file servers, using the Finder. MacNFS is priced at \$249. * **Leader Technologies' PowerMerge** is now available in a network version. The software allows users to synchronize directories between server and client; administrators can use PowerMerge to schedule document or application distribution over a network. Prices begin at \$299 for a five-user license. 800-922-1787 or 714-757-1787. * Interpreting network-traffic stats is easier with version 1.1 of **Skyline/Satellite**, from **AG Group** (800-466-2447 or 510-937-7900). The software, which tracks network packets and retains historical traffic information for later analysis, now has graphing options and uses AppleScript to automate responses to alarms. The upgrade is free to registered users. * Claiming that users will see a 33- to 100-percent increase in speed over the previous version, **Software Ventures** (800-782-9333 or 510-644-9277) has released a PowerPC-native version of **MicroPhone Pro**, the company's telecommunications and terminal-emulation software. Registered users of MicroPhone Pro 2.0 can upgrade for \$24.95. / SB



NET TOOLS / BY SHELLY BRISBIN

Cost-Effective Connections

Keeping the lines of communication open doesn't have to cost your company a fortune. These eight tips add up to more-effective use of ARA.

DIALING IN TO THE OFFICE NETWORK from the road or from home can increase employees' remote productivity, but it also adds to the company phone bill. Fortunately, there are plenty of things users as well as network managers can do to lower the cost of making remote connections with ARA (Apple Remote Access).

The Savvy Remote User

People who travel with PowerBooks often find themselves dialing in to the office from hotels and airports. That can mean a high long-distance bill, unless they take some commonsense steps to keep the cost down. **Speed up access.** Using Farallon's Timbuktu Pro screen-sharing software to launch an Internet mail reader or a copy of QuickMail on an office Mac can be much faster — and therefore cheaper — than loading the software from the office Mac to the remote Mac. Timbuktu Pro gives you fast access to the apps on your desktop machine, because the only data moved across the ARA connection is the screen image from the office Mac. **Move files faster.** Using the Finder isn't the fastest way to copy a file. Both Leader Technologies' PowerMerge synchronization software and Timbuktu Pro copy files faster, by bypassing the Finder and using algorithms optimized for fast file transfer. This process saves time and money when transferring files between a remote user and an office file server.

Practice phone thrift. Think of the company phone bill as if it were your own. If you have a lot of e-mail messages (and if your e-mail package allows it), download them to your PowerBook and then hang up. You can read the messages off line and then reconnect to reply to them. This tactic also frees up

remote-access phone lines for other callers. And don't forget the obvious: Dial in when evening or weekend telephone rates are in force. Remember, you accrue charges based on the time zone from which you're calling.

Managers Make the Difference

Remote-access users can do their part to save money on long-distance calls, but network managers can do more, particularly if many people need to dial in to a single site. Some of these ideas involve changes in telephone service; others can be put into action by use of the management features of the remote-access server. (For more on remote-access-server choices, see "Dial-in Dynamos," January '95, page 94.)

ARA calling circle. Give heavy ARA users a telephone calling card for a group calling plan. Many plans offer discount rates for calls to frequently dialed numbers.

Set up a toll-free number. With a toll-free phone line connected to an ARA server, incoming calls are charged to your company but the user pays nothing. The company still has the bill to pay, but it's certainly more convenient for everyone. However, if telecommuters also access your server remotely, you're better off having both a local and a toll-free access number. That's because if users call the toll-free number from within your area code, their calls will be charged to the toll-free number — and your company will pay for what should be free.

Check phone rates. Make sure you are charged fairly for ARA phone lines. Phone



companies sometimes charge higher monthly fees for modem lines than they do for lines used for voice calls, although there's no difference between the lines or the levels of service. If the telephone-company representative doesn't ask you how the line will be used, don't volunteer the information. Most likely, you'll be charged the lower rate.

Track expenses. You can keep tabs on how much ARA usage is costing and on who's using remote access, with your server's callback feature. When someone dials the server, the callback feature ascertains that person's identity, disconnects, and dials a specified number for the user's modem. Servers that support a roaming callback feature return calls at a number the user enters when calling, which is handy for travelers (although most hotels don't provide direct lines to individual rooms). Servers that support callback can track who dials in, how long they're connected, and each call's cost. **Crack down.** If records reveal that your users aren't doing their part to hold costs down — and if reminders don't work — you can limit their remote access. ARA servers allow you to limit the maximum time per connection. Some even let you specify hours during which users cannot dial in. ☒

Shelly Brisbin is a MacUser associate editor.

ILLUSTRATION / DAVID LEMLEY, SEATTLE

MAC TO PC / BY JOHN RIZZO



Inside Open Transport

Apple's new network system software promises to benefit everyone — and it may actually deliver the goods.

LIKE POLITICIANS PROMISING SOMETHING for every special interest, developers of operating systems rarely succeed in pleasing everybody. Apple, however, may be making some promises it can keep with

its Open Transport communications architecture, the new Mac system software for networking that was due to ship in June. Open Transport benefits developers of cross-platform applications, users, and network administrators — constituent groups whose interests rarely coincide.

Open Transport is the most significant development for Mac networking and Universal Clienthood since the introduction of EtherTalk. Although it doesn't alter AppleTalk protocols, it does change AppleTalk's status as the central focus of Mac networking. With Open Transport, it will be just as easy for everyone who works with Macs to use TCP/IP, IPX, and other protocols.

By adopting networking specifications from the PC and UNIX worlds, Apple is paving the way for more multiprotocol and cross-platform network applications, which will appear during the next few months. In the meantime, Open Transport offers better performance and more network-management tools. I can't see why anyone wouldn't want to adopt it.

Everybody Wins

Open Transport comes with two protocols — AppleTalk and TCP/IP — each with its own network-configuration control panel. Later this year, Apple will include Novell's IPX/SPX with Open Transport. Everyone will get support for other LAN protocols, such as DECnet, through add-ons from third-party developers. Additionally forthcoming is support for serial-modem communications, WANs (X.25), and remote

communications (ARA, PPP, and SLIP).

Specific features of Open Transport have special appeal for each one of our three groups:

Developers. Before Open Transport, programming for the Mac varied with each transport method (AppleTalk, TCP/IP, and so on), and as a result, Mac applications that use non-AppleTalk protocols are the exception rather than the rule. Open Transport, however, employs the same API (application-programming interface) for all protocols, making it easy for developers to create multiprotocol applications. And because Open Transport uses industry-standard APIs, it's a simple matter for developers of Windows network applications to do Mac versions.

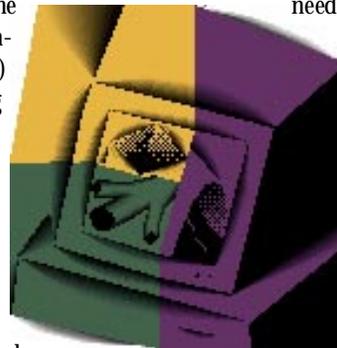
Open Transport uses three standard APIs. The first, X/Open Transport Interface (XTI), is for developers who write network application software. The second is a Mac port of the UNIX System V STREAMS environment, used by developers of protocol stacks. STREAMS code written on UNIX machines can run on Macs that use Open Transport. Hardware developers can use the third API, the Data Link Provider Interface (DLPI), to develop network-interface cards. DLPI, combined with the PCI bus in this year's Macs, will let the idea of cards that work in Macs and PCs become a reality.

Users. Other features of Open Transport benefit those at the other end of the development process. For example, the new APIs are implemented through an architecture called dynamic link and load (DLL). DLL is a boon for users, because they no longer need to restart their Macs when they turn AppleTalk or TCP/IP on or off, change their IP addresses, or reconfigure other settings. They won't have to restart their computers when they swap out network-interface cards either — a handy feature if they're using PCMCIA cards in a PowerBook.

Dynamic loading helps conserve RAM too. Instead of loading all the networking software into RAM at one time, Open Transport loads parts of code when applications need them. Dynamic unloading frees up RAM after two minutes of inactivity. Applications that take advantage of these features are going to be called Open Transport Enhanced (but you'll be able to run most old network software too).

Power Mac users will see performance gains with Open Transport-compatible network applications and PowerPC-native drivers. Expect to see these products by year's end.

Network Administrators. Open Transport gives network administrators new tools for management and troubleshooting. Instead of having to type configuration information into each Mac, administrators can create network configurations in advance and then distribute the preconfigured software to users. They can present users with recommended settings that users can change. And they can lock and password-protect individual configuration fields so that users don't mess them up. Unfortunately, Open



Transport doesn't have a feature for configuring Macs remotely, although Apple plans to add one when Copland ships next year.

The Get Info windows of Open Transport control panels aid in troubleshooting by providing helpful network information, such as node name and address, the closest router (a hard piece of info to get without using a protocol analyzer), and how the control panel is configured.

A Closer Look at Control Panels

For users and network administrators, the interface to most of the new features is through Open Transport's improved network-configuration control panels, which combine greater simplicity for novices and more power for advanced users. You still need to select printers and file servers via the Chooser, but much of the information now available in the Chooser can be found in control panels. Networking with Open Transport is more consistent than before, so control panels for upcoming protocols will look similar to those you'll see here.

Better AppleTalk. The old Network control panel is now called the AppleTalk control panel (see figure 1). It offers three user modes: Basic, Advanced, and Administrator. In Basic mode, you can use pop-up menus to pick the port (Ethernet, printer, or modem) through which to run AppleTalk.

Power users will prefer Advanced mode, which provides more fields. A new feature lets you manually define and lock an AppleTalk address, so that the Mac gets the same address every time it starts up — something you might want to do on a network that includes a lot of PowerBooks. Or you can lock the address the Mac gets at startup time. Administrator mode offers even more options, such as the ability to keep a protocol loaded all the time or to prohibit it from loading into memory.

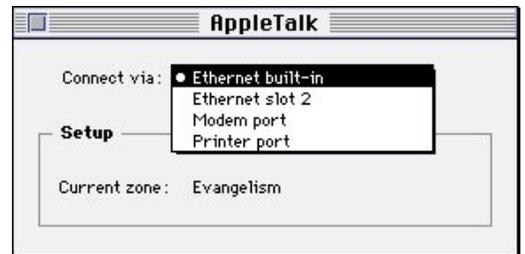


figure 1 / **The Basic mode** of Open Transport's AppleTalk control panel lets you select a port and shows the zone you're connected to.

Beefier TCP/IP. Open Transport replaces the MacTCP protocol stack and control panel with what Apple Open Transport guru Garry Hornbuckle calls “a workstation-class implementation of TCP/IP,” one that’s as powerful as anything you’d find on a UNIX machine. (The new TCP/IP control panel is shown in figure 2.) For instance, network administrators will delight in the support for advanced TCP/IP features, including RARP (Reverse Address Resolution Protocol) and DHCP (Dynamic Host Configuration Protocol). Open Transport also provides support for multiple routers — if a Mac can’t find the main router, the connection automatically goes to another router on a segment. TCP/IP is PowerPC-native (MacTCP still runs in emulation on PowerPC-based Macs).

TCP/IP is better tuned to the needs of mobile users than MacTCP. You can have multiple configuration files, each with different host lists for different locations. Users of MacIP (TCP/IP encapsulated in AppleTalk) will find a new feature that searches the current AppleTalk zone for a local IP gateway, so they don’t end up having to contact a New York gateway when they’re in San Francisco, for example.

Apple is pushing adoption of Open Transport by shipping it with all new Macs, selling it as a shrink-wrapped retail product, and giving it away free to MacTCP and System 7.5 owners who have a software-maintenance contract. It is also selling Open Transport now by promising new and better features in the future. For instance, the current Open Transport has a feature called multihoming, which allows more

than one copy of the same protocol to run via multiple network cards. Right now, multihoming is available only to developers. By the time Copland ships next year, multihoming will be available to users and network administrators as well.

In fact, Apple says that by the time Copland ships, the standard system software will come with file, print, mail, directory,

and remote-access services built in — and not just for use over AppleTalk but over TCP/IP and IPX as well. There is a catch, however. Open Transport doesn’t run on 68000 and 68020 Macs. Face the facts: It’s time to retire those old Mac IIs. ☒

John Rizzo is the author of MacUser Guide to Connectivity and How Macs Work.



figure 2 / **The new TCP/IP control panel's** Administrator mode has advanced features, such as a more powerful domain-name resolver (lower right) that uses implicit and explicit search paths.

7 Speed Boosters

AS FAST AS APPLE and other vendors come up with ways to speed Macs up, ways to slow Macs down multiply even faster. Programs are becoming ever more powerful, but having the additional features usually means you sacrifice speed. Before you spend money on new hardware, such as an accelerator or more RAM, try out these seven software-based tips, which, for the most part, won't cost you a cent.

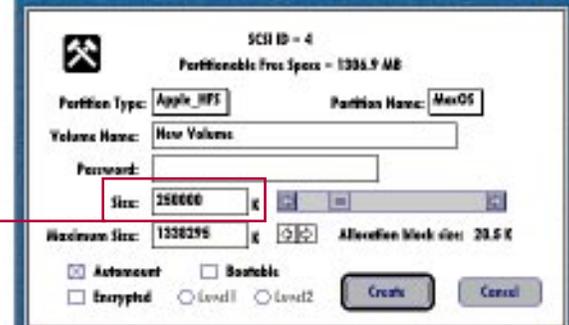
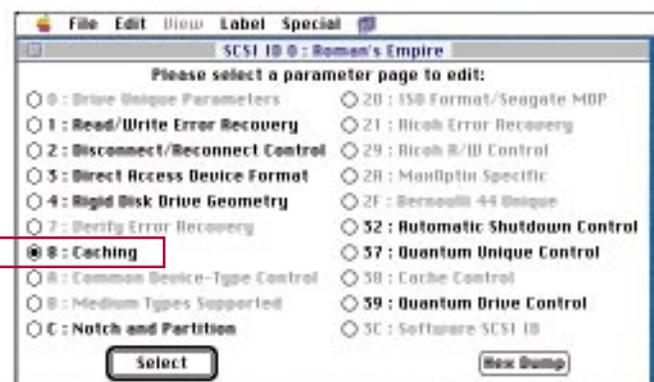
/ BY ROMAN VICTOR LOYOLA

Check Your Cache

When you find yourself waiting for your Mac, it's often because the processor is busy accessing the hard disk. There are several ways to free up the processor faster. One is to increase the disk-cache size (in the Memory control panel). The disk cache stores frequently used information, such as portions of a document, in RAM so the processor can access it there rather than on the hard disk. Increasing the size of the disk cache can reduce the amount of time it takes to do tasks you perform frequently, such as scrolling through a document.

How large you should set the cache to be depends partly on the system software you're using. If you have System 7.5, you can use as much RAM as you can spare for the disk cache. You reach a point of diminishing returns, though — a good amount to set aside is 32K of cache for each megabyte of RAM installed in your Mac. If you're *not* using System 7.5, be aware that setting the cache larger than 32K might actually slow you down. The best way to find the optimal size for your system is to try out different ones and see how they affect your Mac's speed.

Enable write caching.



Make smaller partitions on your hard disk.

The Write Track

Another way to fine-tune the CPU's performance is to use *write caching*, a feature that lets the Mac store information temporarily in RAM before it's written to the hard disk. Because data can be sent to RAM faster than it can be written to a hard disk, the processor is freed up sooner to begin its next task. The result is you can continue working sooner.

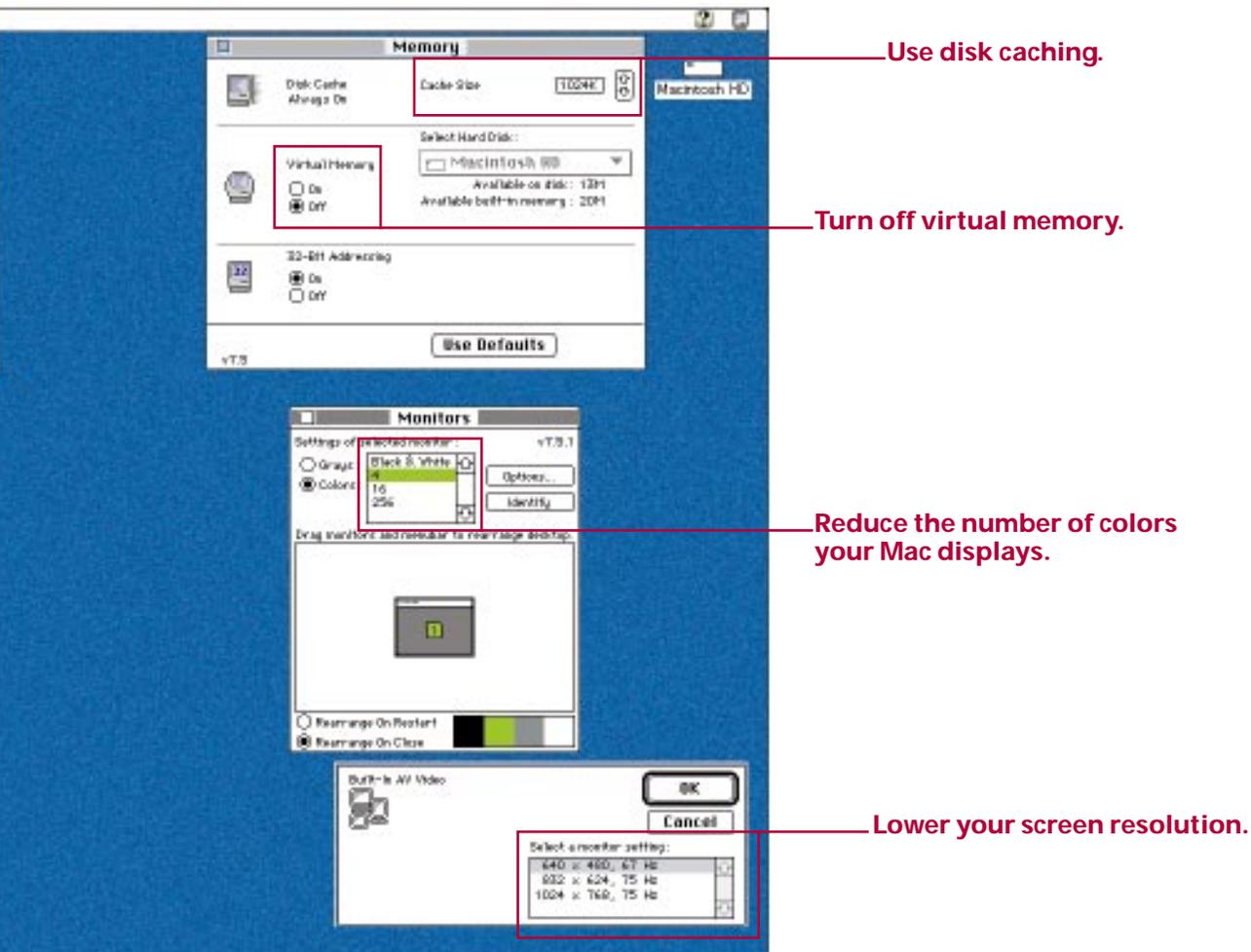
If you're the fortunate owner of one of the new PCI-bus Power Macs, you don't need to do a thing to enable write caching — these are the first Macs to ship with drives that have write caching enabled. If you own a third-party drive, write caching may also already be enabled. But if you don't have one of the PCI-bus Macs and you're using an Apple drive, you'll need a disk-management utility, such as Hard Disk ToolKit (estimated street price, \$125), from FWB

(415-325-4392), or Anubis with Power Control (estimated street price, \$85), from CharisMac Engineering (800-487-4420 or 916-885-4420).

Forget Virtual Memory

Using virtual memory (VM) can speed up program launching and let you keep more programs open simultaneously, but you'll pay a price. Unless you have a Power Mac, it's bound to slow down your Mac's general speed, because it forces the Mac to access the hard disk more often.

If you must use VM with Photoshop, don't set it to be more than 1 MB over the amount of physical RAM; otherwise, the Mac's VM scheme will interfere with Photoshop's VM scheme. If you can spare \$50, the best solution is to use RAM Doubler, from Connectix (800-950-5880 or 415-571-5100), instead of VM.



Divide and Conquer

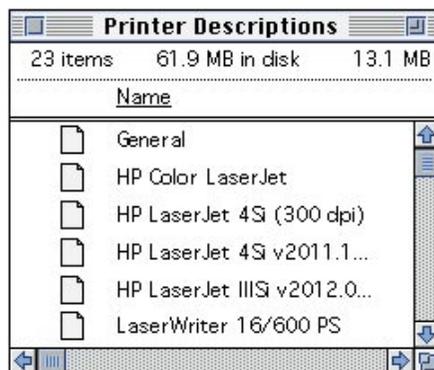
If you have a high-capacity drive, partition the disk into smaller segments (be sure to back it up first). You can do this with software you already have — Apple's HD SC Setup (available on the Disk Tools floppy disk, which comes with every Mac) — or with a third-party vendor's formatting software. Using smaller segments cuts down on *seek time* (the time it takes the read/write head of the hard drive to locate the information your Mac needs).

Another way you can take advantage of a partitioned hard disk is to place the System Folder on the outermost partition of your disk. The Mac can access information on the outer section faster than on the inner section. You can identify the outer partition as the one that appears first on your desktop when you start the formatting procedure; most hard-disk formatters partition from the outside in.

Color — Just Say No

The Mac's color capability is dazzling, but how many colors do you need while using a word processor or spreadsheet program? The more colors your Mac is set to display, the slower it is for screen redraws. Slow screen redraws significantly affect speed, since your Mac has to do them every time you click on a new window, move an object, or scroll through a document.

Setting the color bit depth low makes the biggest difference when you're working with color graphics. If you do need to use full color and you aren't working with photographic images, use 16-bit color instead



Trash unneeded files from these folders.

of 24-bit, since the difference between them is almost undetectable. For business applications, 8-bit color will usually be plenty.

Some programs, especially graphics applications, allow you to change the color bit depth from within the program. Otherwise, you can change it in the Monitors control panel.

If you need to switch among different bit depths frequently, putting an alias of the Monitors control panel on your desktop or writing an AppleScript routine will make it more convenient. (AppleScript comes with System 7.5, with some books about AppleScript, and in kits from software resellers.)

Prevent Pixel Proliferation

To gain speed, use the lowest screen *resolution* (the number of pixels on-screen) that's acceptable — for instance, 640 x 480 pixels. If you have an autosynchronous monitor, you can choose from several resolutions by opening the Monitors control panel, clicking on the Options button, and selecting

a resolution from a scrollable list.

Reducing the resolution speeds up your Mac for the same reason that reducing the number of colors does; the less information on-screen — in this case, the fewer pixels — the faster the Mac can draw it.

Clean Out Your Folders

If you have programs that are slow to open or that stall every time you instruct them to open a Print dialog box, you may have cluttered Printer Descriptions and Fonts folders. Page-layout and word-processing programs in particular are affected when these folders have an excessive number of files.

Throwing out unneeded fonts and printer-description files will speed things up. It's likely you have more than you use. Most CD-ROM programs, for instance, deposit a set of fonts in your Fonts folder that you don't use for other programs. You can get rid of those fonts if you rarely or never use those programs. Also, trash printer-description files for printers you don't use.

The Low Price for Speed

If you want to see a more dramatic speed improvement, you're going to have to invest in more RAM, a faster hard drive, a video-accelerator card, a motherboard upgrade, or even a new Macintosh. But before you shell out for one of those upgrades, it pays to make certain that whatever slowness you're experiencing can't be alleviated for free. After all, using the fixes in this article will still give you a speed gain, even if you opt to start down the hardware-upgrade path. ☒

Crowning Speed for the King / Power Mac tips

EVEN THE SPEEDIEST MAC can use some practical tips for getting the best performance possible. Here are a couple of tips specific to Power Macs:

Expunge Non-Native Extensions

Non-PowerPC-native extensions can't take advantage of a Power Mac's speed, but they also slow down your system by causing it to switch back and forth between native code and emulation. The sure way to ferret out the non-native extensions on your Power Mac is to use Conflict Catcher 3, from Casady & Greene (408-484-9228). If you can live without the non-native offenders, toss them out and then upgrade to native extensions whenever possible.

Get the System 7.5.1 Update

Any Mac will benefit from Apple's update for System 7.5, but Power Macs in particular get improvements intended specifically for those machines. For instance, those who use math-intensive applications, such as 3-D-rendering programs, will get a speed boost from the new MathLib extension. You can find the update on on-line services such as ZiffNet/Mac (see How to Reach Us for instructions on accessing ZiffNet/Mac).

Roman Loyola is a MacUser assistant editor who uses these speed tips for the thrill of running System 7.5 on his Mac SE in his free time.

MOBILE MAC / BY SHARON ZARDETTO AKER



The Pseudo Duo

You can enjoy the economical benefits of a PowerBook Duo system without getting a Duo. But is it worth it?

BOB IS MORE THAN just a nerdy interface guy from Microsoft; it was also the original code name for the Duo. It stood for Best of Both worlds, the worlds being desktop and mobile computing. The Duo's strength

is that it is able to morph into a desktop setup and can also serve as a lightweight road machine.

But PowerBook owners don't need to have a Duo to get their portable machine to do double duty as a desktop one. Unless you own a PowerBook that lacks video-out capabilities (a PowerBook 100, 140, 145, 150, or 170), you can build your own pseudo Duo. Here's what you need to know about setting one up, including the pros and cons.

Desk-Bound PowerBook

The four most essential items you need for your pseudo-Duo desk setup are a monitor, a standard keyboard, a mouse, and a PowerBook video cable (officially dubbed the VID-14 Video Adapter Cable). The last item

lets you attach your PowerBook to a standard monitor video cable. The adapter cable is available from most computer stores.

You also need an additional AC adapter if you want the conveniences you'd get with a Duo, which comes with an AC adapter. Having an extra adapter lets you avoid the hassle of plugging the adapter in to and unplugging it from a hard-to-reach spot. It also solves the problem of forgetting to take the adapter with you. I keep one at my desk

and another one in my carrying case.

One other item you will need in order to make your PowerBook as convenient to use as a Duo is a BookEndz docking station, from Pilot Technologies (612-828-6002). Using the BookEndz dock, which I am only coincidentally mentioning in this column two months in a row, is a perfect solution to the annoying problem of having to attach and remove lots of cables: keyboard/mouse, monitor, and printer cables; a power cord; and a phone line. The BookEndz dock holds all those cables in place, so all you have to do to connect and disconnect

them is slide your PowerBook in and out of the dock. It also saves wear and tear on the connectors, because it lines them up precisely and keeps you from wiggling them to get them in and out. (Admit it — you've jiggled them a



ILLUSTRATION / JOHN RITTER

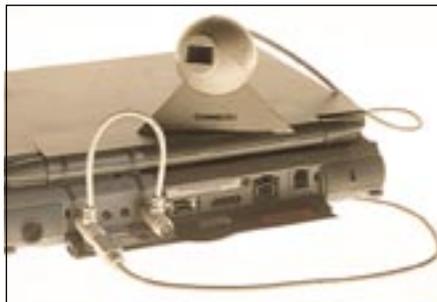
POWERBOOK SECRETS / QuickCam and 500-series PowerBooks, reunite

PUT TOGETHER TWO of the hottest things going — a 500-series PowerBook and the \$99 Connectix QuickCam digital camera — for, say, the video on a CU-SeeMe Internet session, and you might be disappointed. The connection between the QuickCam and a limited number of 520's and 540's doesn't work. (The problem is that the QuickCam relies heavily on external-port clocking, but some of the PowerBooks don't respond to the clocking correctly.) If you experience this problem, it doesn't mean that your PowerBook is defective; so far, the only compatibility problem has been with the QuickCam.

Connectix's response to the problem has been swift and consumer-friendly. Specially

updated software (version 1.0.3) does the trick in some cases; in others, you also need a special adapter cable that lets the device draw power from the ADB port. The adapter has a pass-through ADB port, so you can still connect an ADB device. Call Connectix (800-950-5880 or 415-571-5100), and talk to tech support to get one or both of these fixes. Connectix will give you a refund for the camera if you want to return it, but my recommendation is to get the fix.

For those users who update to version 1.0.3 of the software because of this problem, Connectix offers a one-year warranty from the date the update shipped and a 30-day money-back guarantee. / Rich Wolfson



time or two to rush the job along.)

Be aware that if you have a 500-series PowerBook, the BookEndz will prevent you from using the legs on it. You may have to rig up your own solution to give the PowerBook proper ventilation unless Pilot fixes the BookEndz.

The price for a BookEndz dock for a 100-series PowerBook is \$129; for a 500-series machine, it's \$175 with Ethernet pass-through and \$150 without. A version for the newest PowerBooks should be ready soon and will cost \$100 to \$150.

Monitoring the Setup

A pseudo Duo and a real Duo, although similar, are not equals. One of the more obvious advantages of having a pseudo Duo is that instead of having just one monitor, you get to use your external monitor and the PowerBook's monitor simultaneously. A real Duo has to be closed and inserted into a Duo Dock to be attached to the video (unless you're using it with a MiniDock, which has the ports of a standard PowerBook). But using an external monitor with a standard PowerBook isn't as simple as just plugging the monitor in and booting up the PowerBook. Here are some tips that may save you frustration:

- ▶ Turn on all the attached peripherals before turning on the PowerBook itself; otherwise, the PowerBook may not recognize some of the devices.
- ▶ When you first turn on your PowerBook after attaching an external monitor, nothing shows up on the monitor. You have to open the Monitors control panel in order to activate it.
- ▶ Don't run the PowerBook off its batteries when you're using your pseudo-Duo setup, or you'll run out of power quickly. Although an external monitor has its own power cord, the video card draws a significant amount of power from the PowerBook when a monitor is attached. (The power draw from the keyboard is another good reason to use the AC adapter to run your PowerBook.)
- ▶ Detach the video cable if you're not using your monitor. The PowerBook won't go to sleep if a video cable is attached — whether or not the monitor is on or even attached. You have to shut down to disconnect it.
- ▶ There's a slight chance that your PowerBook will overheat when you use it with a

monitor attached. Keep processor cycling (in the PowerBook control panel) turned on, so the processor is able to rest at every opportunity.

Pseudo Versus Real

If you're in the market for a new PowerBook and can't decide whether a pseudo or real Duo best meets your needs, here are some arguments to help you decide:

A non-Duo PowerBook limits you to a smaller monitor and a lower bit depth (number of colors or shades of gray). This is because you can't add VRAM to your pseudo-Duo setup, as you can to a Duo Dock. For your pseudo setup, don't plan to have more than 8-bit color (256 colors) on a 16-inch monitor and 4-bit grayscale (16 shades) on an Apple Portrait Display.

The Duo has an edge over the other PowerBooks on the desk not only because of the possibility of adding VRAM but also because the Dock provides NuBus slots and a spot for a math coprocessor (FPU). Once you remove the Duo from its Dock, though, it loses that edge over other PowerBooks.

For traveling, the Duo has only one advantage: It's lightweight. But it's light because it's missing so much: a floppy drive and an array of I/O ports. To make the Duo match up to other PowerBooks, all you need to do is add a MiniDock and a floppy drive.

The Right Match

Whether the pseudo-Duo setup is right for you or not depends on your needs. A Duo has certain obvious advantages over a pseudo setup. If having maximum video capability is of tantamount importance, if you need NuBus slots or a math coprocessor, or if you just want the lightest PowerBook you can get, then there's no substitute for a Duo.

But if you already have an all-in-one Mac or you're shopping for a PowerBook now, you can get most of the benefits of a Duo system without getting a Duo. And you'll be ahead of the game when you're traveling, because, for the price of a couple of extra pounds, you'll have a complete PowerBook system, including an internal floppy drive and a full array of I/O ports. 

Sharon Aker is still using her trusty PowerBook 170, with a BookEndz dock. Rich Wolfson finally traded in his old PowerBook 100 for a new Duo 280c.

NET TRAVELER / BY MICHAEL SWAINE



A Trip to the Mailbox

Learn how to subscribe to Internet mailing lists, and you'll never be out of the loop again.

YOU STILL REMEMBER the thrill of running out to the mailbox in anticipation of the latest issue of *Boys' Life* or *Tiger Beat*. You haven't felt it lately, since your mailbox seems to have turned into a repository for

catalogs and letters from Ed McMahon. But then you discovered Internet mailing lists.

Lists come to you via e-mail: through an Internet account or an online service such as CompuServe, eWorld, or America Online. Every day when you check your mail, there are the latest messages from the lists you've subscribed to. Like newsgroups, lists are often interactive discussions among people with similar interests. Sometimes, they're more like newsletters, written and distributed by the list owner. There are lists for everything from music to Macs. And the only thing you have to do to get on — *subscribe* — is think like a robot.

The Language of Lists. To subscribe, always send your request to a list server, rather than to the mailing list itself. In most cases, the server is a robot that accepts commands from you — in the body of a message. Server addresses usually look like `majordomo@host`, `listproc@host`, or `listserv@host`, where *host* is the name of the list's Internet site. To subscribe, you need to know the name of the list and the proper subscription command. You send a `majordomo` robot the message `subscribe listname`, but if it happens to be a `listproc` or `listserv` robot, send `SUB listname yourFirstName yourLastName`.

When in doubt, send your subscription request to `listname-admin@host`, with a message a human can understand. When you subscribe to a list, always save the welcoming message you receive. It typically explains everything from the purpose of the

list to the way to unsubscribe.

Essential Reading. You thrive on Mac info, so you send off a subscription request for `apple-Internet-users` to `listproc@abs.apple.com`. Next, check out the wide-ranging Info-Mac digest, at `listserv@ricevm1.rice.edu`. For the PowerPC News list, write `add@power.globalnews.com` (no message is required). Looking for the latest on FileMaker Pro, AppleTalk, or Macintosh multimedia? Check out the list of Macintosh lists at <http://rever.nmsu.edu/~elharo/faq/maillinglists.html>. If your Web browser supports forms, you can subscribe to lists through this site.

Digests and Filters. Some people find moderated lists (where the list owner decides what messages actually get in) more thoughtful but less responsive than unmoderated ones. One way a moderator can distribute a list is through a digest, in which many messages are bundled into one big message. This also keeps down mailbox clutter. The list's welcome message will tell you whether the list is available in digest form and how to get it.

You may soon notice that your e-mail box is swelling to the size of Montana, and you might begin to think some filtering would be useful. Happily, the commercial versions of Qualcomm's Eudora and InterCon's TCP/Connect mail readers let you do triage on all your incoming mail, routing all postings from Macintosh-related lists to one place, changing the priority tag on the folk-music list (`listserv@nysernet.org`, `subscribe folk_music yourName`), and so on.



You can even delete mail — unread — that doesn't meet your subject or author screen.

A good thing too. Because it's only a matter of time before Ed McMahon learns your e-mail address.

Tip of the Month

E-mail can do more than bring you the latest news and views through mailing lists: You can use it for almost anything you would want to do on the Internet. For example, you can retrieve the text of a World Wide Web page by sending its URL to `listproc@www0.cern.ch` (**send URL**). For an eye-opening explanation of all the things you can accomplish via e-mail alone, send the message **GET INTERNET BY-EMAIL NETTRAIN F=MAIL** to `listserv@ubvm.cc.buffalo.edu`.

Don't Know Where It's @?

MacUser maintains a list of frequently asked questions (FAQs) about the Internet, *MacUser* magazine itself, and this column specifically. Send mail to `faq@macuser.ziff.com`. *MacUser's* World Wide Web address is <http://www.macuser.ziff.com/~macuser/>. You can also reach me at `traveler@macuser.ziff.com`. ☐

BY CHRISTOPHER BREEN AND BOB LEVITUS



Help Folder

A sound scolding for a reader, what causes corrupted files, and the answer to what makes a Mac disobey commands.

Clobbered B-Tree

Q. What's a B-tree, and is there a fix for one that's corrupted? Norton Utilities tells me that this thing is corrupted and can't be repaired. To top it all, I have no backup of this disk. Is my data gone?

Clint Williams
Teaneck, NJ

CHRIS: Clint, I'm going to make a bad situation worse by admonishing you in front of several hundreds of thousands of readers. Ready?

What do you mean, you don't have a backup? At the very least, buy a couple of boxes of floppies and back up your important documents! You can replace your applications from the master disks, but when your data's trashed, it's gone, Daddy, gone.

The B-tree is a directory that tells your Mac where data is stored on the disk. If this directory gets corrupted, none of your data is lost but your Mac just doesn't know how to find it.

BOB: If you haven't already done so, try running Disk First Aid, which you'll find on the Disk Tools disk that came with your Mac. One of the things it can do is repair damaged B-trees. Chances are slim that Disk First Aid will work if Norton Utilities didn't, but since it's free and doesn't take long to run, it's worth a try.

CHRIS: If you have no success using Disk First Aid or Norton's Emergency Disk, it's time to shift into restore mode. Run Norton Utilities' Volume Recover, and follow the instructions for raising your entire disk from the dead.

If that doesn't work, the best you can do is try to recover individual files with Norton Utilities' UnErase or a utility such as Abbott Systems' CanOpener (see figure 1).

BOB: Or try CanOpener's free companion program, RescueTXT, which can recover stuff even CanOpener can't.

CHRIS: And later, while you're reformatting your disk and crying into a bucket, think about a backup strategy.

BOB: Which brings us to our subsequent epistle . . .

Files Corrupted Absolutely

Q. Exactly what is a corrupted file? A vendor told me that the reason a product's data file was corrupted was because I had an inadequate amount of RAM (9 MB) and hadn't saved often enough! What really causes corruption, and why doesn't it appear in the DOS world?

Linda George
Pittsburgh, PA

CHRIS: Corruption of the most vile sort does indeed occur in the DOS world. It's called Windows.

BOB: The DOS world experiences corrupted files as well. You can get them on any computer, including DOS and UNIX machines, Amigas, and Macs.

The most common cause of a corrupted file — a file with a damaged internal structure — is the computer crashing or freezing or your yanking the plug out of the wall in



figure 1 / **Data-rescue toolkit:** One of these products may help you retrieve data from a corrupted file.

the middle of a save. On the Mac, the System and Finder files are the most susceptible, because they're always open. But don't fool yourself — essential DOS and Windows files can also become corrupted.

The vendor you talked to had a lot of nerve saying insufficient RAM can cause file corruption. In fact, the only reason — other than a crash or a loss of power during a save — for an application's files to become corrupted is that the application has a bug. I advise you not to use any program that regularly corrupts your files.

CHRIS: Crashes are inevitable, and you never know when too much juice is going to slip down the power line or when your wiener dog will inadvertently jerk the power cord from the socket. So, I'll say it again — back up your disk regularly.

Hybrid CD-ROM

Q. I'd like to be able to access DOS files as well as Mac files on CD-ROMs. Unfortunately, my PC doesn't have a CD-ROM drive and I can't see DOS files on CD-ROMs while using my Mac. How can I access these files?

John Leong
Philadelphia, PA

CHRIS: It's a cinch with DiskTop (estimated street price, \$50), from the Prairie Group

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 ZiffNet/Mac,
MacUser's on-line service, and get a
reply from Bob (76004, 2076) or Chris
(72241, 1036). We pay \$25 – \$100 for
any undocumented tips we publish.
Send them to Chris.

(800-346-5392 or 515-225-3720). Set DiskTop's preferences to Technical, and open the CD-ROM from within DiskTop. Shazzam! Every file on the CD-ROM — even the DOS stuff — is now visible within DiskTop.

In order to use the DOS documents, you must copy them — again within DiskTop — to another disk. Then make them visible on your hard disk by highlighting them in DiskTop, choosing Get Info, and unchecking the Invisible box.

BOB: Another solution is to use System 7.5's PC Exchange control panel, which lets you see and manipulate the files of hybrid (DOS and Mac) or purely DOS CD-ROMs. Copying the files in System 7.5 is simpler than with DiskTop — just drag the files from the CD-ROM to your hard disk.

CHRIS: Oh sure, Bob, give him the simple answer.

By the way, John, just because these are DOS files doesn't mean they're completely useless to us Mackers. Some CD-ROMs contain WAV sound files and GIF picture files that Mac applications can read.

Boot and Switch

Q. When I try to boot my Mac from my external disk, the Mac asks if I want to rebuild the desktop. It must be because it thinks I'm holding down Command-Option (the key combination for a rebuild) on my third-party keyboard. I'm actually holding down Command-Option-Shift-Delete (the combination for starting from an external disk).

What can be causing the problem?

R. C. Stone
Red Lion, PA

BOB: It may be the third-party keyboard.

Some are slow to register pre-startup keystrokes, such as the ones for booting from an external disk. Many users of third-party keyboards report that they have this same problem when trying to zap the PRAM (by holding down Command-Option-P-R).

Try mashing down the keys earlier or later in the startup process. Trial and error is the key here. If that doesn't do it, try replacing the third-party keyboard with an Apple keyboard.

CHRIS: No matter how many times I suggest a solution based on a product from Now Software, I want it understood that the company has never, ever sent me a large Lindt white-chocolate confection, nor would I accept one if it did.

Now that we're clear on that little point, let me say that Now Utilities 5.0's Now Startup Manager lets you switch startup disks when you start your Mac. All you have to do is hold down the space bar when you start up and, when prompted, select the startup disk you want to use.

Customizing Dictionaries

Q. Is there a way of altering custom dictionaries? I purchased a third-party foreign-language dictionary for use with Microsoft Word, but it contains several misspellings. How can I open this dictionary and make corrections?

Godfrey Barnsley
Fort Lauderdale, FL

CHRIS: If the dictionary you got is formatted

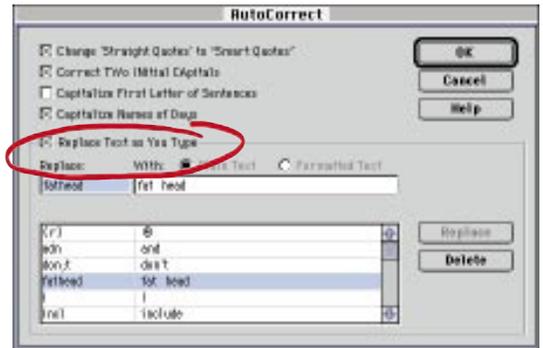


figure 2 / Word 6's AutoCorrect feature was designed to fix common spelling errors automatically. But it's also handy when you prefer a spelling of a word that's not in Word's dictionaries. Check the circled box if you want corrections entered as you type.

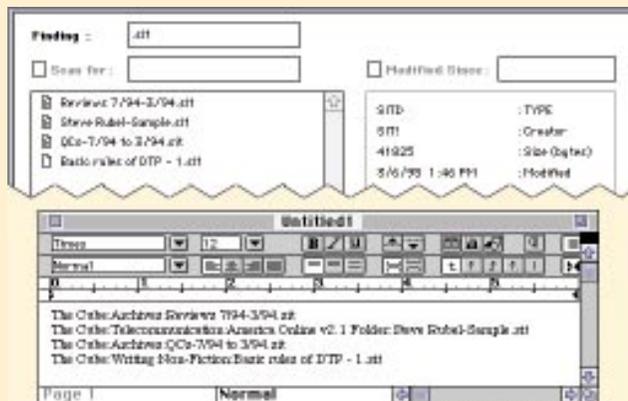
as a standard custom dictionary, just do this: Choose Preferences from the Tools menu in Word, select Spelling, select the custom dictionary from the list of dictionaries, click on the Edit button, and delete the offending words.

It's not quite so easy to *add* words to the dictionary. Yes, you can type these words into a document and painstakingly add each one as you spell-check. But in the long run, you'll save time by typing all your custom words into a new document, saving it, and then using a utility such as Daniel Azuma's shareware gem FileTyper to change the Type code to WDCD and the Creator code to WDSE. With these new codes, your document becomes a custom dictionary you can load into Word.

Unfortunately, I suspect that these simple solutions won't help you. Most commercial dictionary makers employ an encryption method to protect their intellectual property. This encryption makes the dictionary uneditable by casual users.

Even so, there is a workaround for Word 6 users — the AutoCorrect feature. This baby allows you to enter alternative spellings of words found in Word's other dictionaries. For example, if you prefer *fat head* to the traditional *fathead*, enter that information in the AutoCorrect dialog box, accessible from the Tools menu. In your case, you would enter the misspelled word from your foreign-language dictionary and the correctly spelled word.

TIPS / Now Utilities' Super Boomerang



A RECORD OF FOUND FILES

After pausing or completing a Find operation in Super Boomerang's Find dialog box, press Command-Option-Shift-C to copy the current list of found files to the Clipboard. Included in this list will be the complete pathnames to the files.

Michael Casdorff
Tech Support
Now Software

TIPS / Graphics

THE UNDOING OF PHOTOSHOP'S UNDO

When you're working with a jam-packed hard disk, Photoshop occasionally refuses to continue with even the simplest task because the scratch disk is full. More often than not, the designated disk is full due to the size of the Undo buffer. A simple way to remove the buffer's contents is to create and then close a new Photoshop document. This action flushes the buffer — as well as any chance you might have had to undo your last operation.

George Kopeczky
Honolulu, HI

Word will change the misspelled word as you type if you check the appropriate box in the AutoCorrect dialog box (see figure 2). So, although you probably can't alter your foreign-language dictionary, you can customize Word 6 to correct the dictionary's mistakes.

The Infectious Mac

Q. When I run Norton Utilities on my hard disk, it tells me that there's a virus in my Desktop file and that I should eliminate that file. I can't find the Desktop file, though. Where is it?

James Reisinger
Skokie, IL

BOB: Aha! We've caught you using System 6. I can tell by the type of virus you have — a WDEF virus — which doesn't spread on System 7. OK, I'll concede that you may not be the only one still using System 6, but you should consider switching, especially as it'll clear up this virus problem.

In the meantime, don't bother looking for the Desktop file. It's invisible. Although you can use a resource-editing program such as ResEdit to find it, it's easier to fix it by rebuilding your desktop. To rebuild, start up your Mac and hold down Command-Option until you see a dialog box asking if you want to rebuild the desktop.

Hang on, though — your troubles aren't quite over. Rebuilding gets rid of the virus on your hard disk, but every time you insert a floppy disk, you risk reinfection. This is especially true if you insert floppies you used when your Mac was infected. Installing a virus-protection program such as SAM (Symantec AntiVirus for Macintosh), Datawatch's Virex, or John Norstad's Disinfectant (freeware) on your Macintosh should prevent reinfection.

CHRIS: Unless you need the extraordinary options that commercial virus-protection programs offer (such as the ability to scan compressed files), download a copy of Disinfectant. It's free, and when new computer cooties are discovered, John Norstad and crew are usually the first on the block to offer treatment.

BOB: Although Disinfectant is a great piece of shareware, it's not for people who don't get online much. Disinfectant users must find out about any new viruses on their own and go online to download an updated version of the program.

The commercial programs, such as SAM and Virex, include a service that notifies you of new viruses. Within days of each new virus discovery, all registered owners get a postcard with simple instructions for updating the virus-protection program to protect against the new virus.

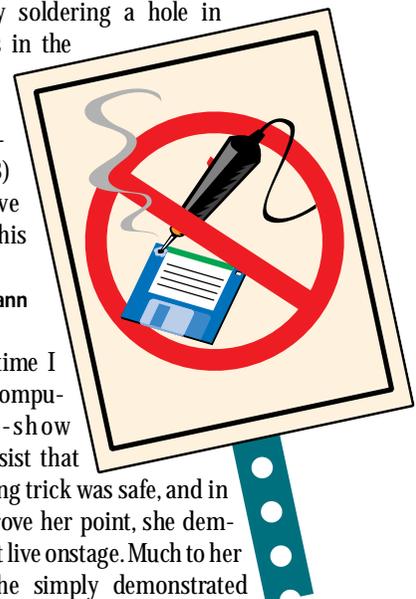
Floppy-Disk Magic Trick?

Q. I've heard that you can increase the storage capacity of double-density (800K) floppies by soldering a hole in their cases in the same spot where the high-density (1.4MB) floppies have a hole. Is this trick safe?

Kevin Lehmann
Brielle, NJ

BOB: One time I heard a computer-trade-show panelist insist that the soldering trick was safe, and in order to prove her point, she demonstrated it live onstage. Much to her chagrin, she simply demonstrated that this trick can cause you to lose your data — neither of the disks she operated on would initialize when she put them in a Mac.

I suggest that you don't do this. Soldering a hole will give you a disk with a better than average chance of failing, even if it does initialize. This is because the "cookie" (the floppy-disk-industry name for the magnetic disk inside the floppy case) was not designed for high-density data storage. It might work, but why risk it? Surely your data is worth the cost of new high-density disks, which are less than a buck apiece, even if they're preformatted. ☹



TIPS / System Software

CRISPER APPLE MENU

System 7.5's Apple Menu Options control panel has a couple of hidden features you can enable through ResEdit. With these modifications, you can add recently used folders to your Apple menu as well as consolidate all recently used items — such as files, servers, and folders — in one hierarchical menu. Follow these steps:

1. From within ResEdit, open the Apple Menu Options Prefs file, in the System Folder's Preferences folder.
2. Locate the TMPL resource numbered -4048. Using the Get Resource Info command (Command-I), enter `C&Jp` into the Name field.
3. Open -4048 of the resource named C&Jp. To add a recent folder to your Apple menu,

enter the number of items you'd like to keep track of (10, for instance) in the Folder Count field.

4. To consolidate all recent items into one Apple-menu item, enter recent items into the field labeled Recent Folder. Add a space to the beginning of the name to force the item to appear near the top of the Apple menu.

5. Save your changes, and restart your Mac.

A little cleaning up is necessary after this change. Just open the Apple Menu Items folder in your System Folder, and trash the Recent Applications, Recent Documents, and Recent Servers folders. The new Recent Items folder will appear when you first open a new application.

Anthony D. Saxton
Las Vegas, NV



You can find the shareware and freeware programs referenced in this article in the MacUser and ZiffNet/Mac areas on CompuServe and eWorld. See How to Reach Us for instructions on accessing ZiffNet/Mac.

Getting in Tune

From teaching you how to sing harmony to tuning your guitar, your Mac can be your guide to learning how to make music.

BY JAMES BRADBURY

SOME RESEARCHERS BELIEVE that musical talent may be more widespread than commonly thought. According to their theory, most of us have never developed our latent musical abilities because we were discouraged at an early age by the daunting requirements of technical virtuosity.

Personally, I just preferred reading a comic book to pounding out "Drums Along the Mohawk" on the piano for the umpteenth time.

Extended Keyboard Skills

If you've set your sights on tickling the ivories like Art Tatum or Vladimir Horowitz, forget it — you should have listened to mom and practiced more. But if your ambitions, like mine, are more modest (somewhere between Harry Connick, Jr., and Linda McCartney), there's reason to hope your Mac can make a difference.

Before you can get started, of course, you need to connect a keyboard (the musical kind) to your Mac. You need one that's *MIDI-compatible* (MIDI is a protocol that lets your Mac talk to electronic instruments and vice versa). Also required are a MIDI interface kit, such as MIDI Translator II (\$59.95), from Opcode (800-557-2633 or 415-856-3333), and a couple of MIDI cables (which cost about \$8 each and are available from any electronic-music dealer). The keyboard itself will set you back anywhere from \$400 to \$1,000 — spending the extra bucks for a higher-end model gets you features such as the ability to play multiple instrument voices simultaneously (not really necessary for learning to play the piano but a lot of fun the rest of the time), more-realistic sounds, and velocity sensitivity (when you hit a key harder, it sounds louder).

You don't have these kinds of



choices when it comes to software, however: The only significant keyboard-instruction package for the Mac is The Miracle Piano. It first hit the market some years ago as a proprietary hardware/software bundle (meaning you had to buy the special Miracle Piano keyboard). Designed with children in mind, the software offers soup-to-nuts piano instruction the '90s way — by turning the process into a series of video games.

In spite of its infomercial-like name and initial marketing, The Miracle Piano really does work, provided you're prepared to put in the requisite practice time. Currently, a Mac version — called The Miracle Piano Standalone — is available for \$129.95 and works with *any* MIDI keyboard. It's also being bundled with some Yamaha

Eventually, I played it enough to convince my folks that perhaps the world didn't need another Burt Bacharach after all. Back to comic books, which naturally led to a career in computer journalism.

Whatever *your* excuse might be, your Mac could hold the key to entering the world of music as an active participant. Whether you want to play the piano or write a hit song, there's software (and hardware) to help you get in tune.

connected to a paperback-sized box that, in turn, connects to a serial port on your Mac. Once you get the G-Vox properly positioned and calibrated, your Mac can "hear" what you're playing on the guitar and tells you if you're playing that G suspended 7th correctly. Lyrrus is also developing an optional MIDI interface that will enable you to control MIDI instruments with your guitar, for those of you who've always wanted to make your guitar sound like an oboe.

The G-Vox comes with a CD-ROM that contains a sample version of the Basics instructional program. The Basics program offers a series of video lessons and tips. There's also a floppy disk containing the first level of Tour, a Miracle Piano-style video game that teaches you the fretboard. Another floppy disk contains the full version of Riffs, which lets more-advanced students learn licks from nimble-fingered players such as Steve Morse and Adrian Legg. The full versions of Basics and Tour are only \$49.99 and \$59.99, respectively.

Hot tip: You don't actually need a G-Vox to use the Riffs Lite program, available

electronic keyboards. Be forewarned, though: MindScape (800-234-3088 or 415-883-3000), the current owner of the Miracle Piano technology, expects to sell the product line sometime soon — so The Miracle Piano's future is somewhat uncertain.

Six Strings Attached

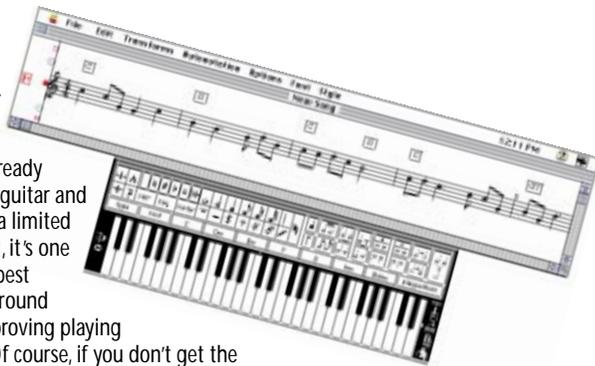
The piano is a respectable instrument, but the Stratocaster has always been several notches higher on the coolness scale. The **G-Vox** ▶, from Lyrrus (800-789-4869 or 215-922-0880), is a \$350 gizmo with a sensor you attach, with suction cups, under the strings and next to the bridge of your acoustic or electric guitar. The sensor is



The Two Dads

BY RIK MYSLEWSKI AND JIM SHATZ-AKIN

for \$49.99. So for those who already have a guitar and are on a limited budget, it's one of the best deals around for improving playing skills. Of course, if you don't get the G-Vox, you'll miss out on having the Mac tune your guitar for you . . .



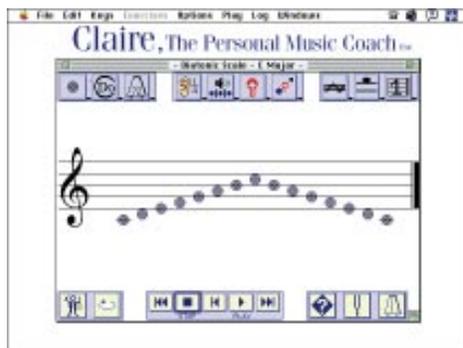
hobbyists are likely to find it a little *too* much exercise.

Singing Lessons

Anybody can sing. Whether anyone else can stand to listen is another matter. If the only close-harmony singing partner you can count on is your dog, you should check out **Claire** ▼ (\$129.95), a product from Opcode that takes you through a complete voice-training course. (It can also be used with a variety of instruments.)

Apart from a Mac, the only hardware Claire requires is a microphone (Apple's mikes work fine). Once you've gotten over the shock of discovering just how off-key you really are, you'll either start singing in tune or learn to keep your mouth shut whenever someone starts strumming a G-Vox'ed guitar by the campfire.

If, so far, this all sounds like too much fun and not enough like serious instruction, you need **Practica Musica** (\$140), from Ars Nova (800-445-4866 or 206-889-0927), which focuses on music theory. The software, used in conjunction with a MIDI keyboard, provides a thorough series of musical exercises, and the package includes a complete printed course in music theory. The best thing about **Practica Musica** may in fact be the well-written documentation — this is an area in which many other music programs fall far short of the ideal. Ultimately, programs such as **Practica Musica** are designed for serious music students. Home



Playing Around

Suppose you don't really care whether you can play an instrument at all. You just want to go straight to the good stuff: writing hit songs — or at least some good ad jingles. **Ars Nova's Song Works** ▲ (\$125), which works with either a regular or a MIDI keyboard, not only helps you create songs but can also suggest a melody or harmonization when you get stuck. **Song Works** is also great for figuring out how to play other people's songs, as I found when someone on the Internet asked for help figuring out the lead track on the new **Matthew Sweet** album. Even without an instrument handy, I was easily able to supply the missing chord, using **Song Works**.

Coda

With so many excellent musical tools available for the Mac, there's no reason why a lack of talent should hold anybody back. For a few hundred dollars, you can make the computer your accomplice in musical mayhem. And if you need a lead singer for your band . . . my dog's available. ☹

RIK: Congratulations! Thanks to you and Marcie, we have a new product tester for this month's category: Software for the Very Young.

JIM: Yup — Bailey Ruth Shatz-Akin. March 21, 1995; 7 pounds, 7 ounces; and an Apgar score of 9/9.

RIK: He's quoting Apgar scores! A dedicated benchmarker, even with birth-fitness data . . .

JIM: You longtime dads are so jaded.

RIK: In any case, while we wait for Bailey to master hand-eye-mouse coordination, let's start her off with **The Groove Thing**, from Big Top Productions. It displays a shifting kaleidoscope of shapes and colors, and she can change the images with her voice, using the Mac's microphone. A simple pattern with high-contrast colors might fascinate her.

JIM: Mac as crib-mobile.

RIK: Then we'll get her Cyan's **Manhole Masterpiece Edition** ▲.

JIM: The original software from the makers of **Myst**, right?

RIK: Right. This updated version is the same gentle interactive story, but it's now beautifully colored and rendered, and it's accompanied by lovely soothing music.

JIM: I need the music, the way Bailey's sleeping — or *not* sleeping.

RIK: You can enjoy it for a couple of years before she's ready for it — or for two of my daughters' favorites: Edmark's wonderful collections of witty, engaging imagination builders, **Thinkin' Things 1 & 2** ▶. As seven-year-old Roxanne says, they're "fresh!"

JIM: It's good to know that not all activity collections are created equal. The exceedingly pointless **Yearn 2 Learn — Peanuts**, from Imagesmith, gave me a bad introduction — and proved that quality characters don't necessarily mean quality software.

RIK: Remember their Red Baron game?

JIM: Right: You click on Peanuts characters in the "sky," and they simply fall off the screen. Why?

RIK: To quote Rox again, "Stale!"

The Groove Thing 🍌🍌🍌

Ages: All.

Price: CD-ROM, \$49.95 (list).

Shifting colors and patterns appear on your screen and change in response to your stereo, your voice, or built-in music. Adults who remember the 60s will also dig it, man.

Company: Big Top Productions, San Francisco, CA; 800-900-7529 or 415-978-5363.

Reader Service: Circle #423.

The Manhole Masterpiece Edition 🍌🍌🍌

Ages: 3 — adult.

Price: CD-ROM, \$49.95 (list).

Richly illustrated and scored, this gentle, witty, self-reading story of Mr. Rabbit and his pals lets even the youngest kids steer the plot.

Company: Cyan, Spokane, WA; 800-718-8887 or 509-468-0807.

Reader Service: Circle #424.

Thinkin' Things 1 & 2 🍌🍌🍌

Ages: 4 — 8 and 6 — 12 years, respectively.

Price: Floppy disks or CD-ROM, \$49.95 each (list).

Both excellent collections blend music, humor, engaging games, and creative activities. Difficulty levels increase automatically or can be adjusted.

Company: Edmark, Redmond, WA; 800-320-8378 or 206-556-8484.

Reader Service: Circle #425.

Yearn 2 Learn — Peanuts 🍌🍌🍌

Ages: 3 — 10 years.

Price: Floppy disks or CD-ROM, \$59.95 (list).

Charlie Brown, Snoopy, and the rest of the gang are nearly all that's good about this collection of uninteresting games and activities.

Company: Imagesmith, Torrance, CA; 800-876-6679 or 310-325-1429.

Reader Service: Circle #426.



The Game Room

BY BOB LEVITUS

NO GUNS OR VIOLENCE appear in this month's games, unlike in last month's gore-strewn mayhem. Nor were any animals harmed during testing, although my dog now cringes when he hears the Loony Labyrinth theme song.

Be careful, though: Glider Pro, Jigsaw Deluxe, and Loony Labyrinth are all highly addictive. Because the similarities end there, you'll get good variety if you add all three to your Mac's Games folder. Glider Pro ranks high on the creativity scale. If you're not already a jigsaw-puzzle fanatic, Jigsaw Deluxe may get you hooked. And Loony Labyrinth simply shouldn't be missed.

Glider Pro

Vertiginous Fun

GLIDER PRO is easy to learn but difficult to master. It's an updated version of Glider, a game that's been popular as shareware and commercial software for many years. Not only will this latest version make you feel as giddy as earlier versions did but it's also more challenging and allows you to use more creativity.

The basic premise hasn't changed: You guide a paper airplane through rooms in a house, flying over heating vents in the floor to gain height, while picking up prizes and avoiding hazards such as bouncing balls and flames.

Among the improvements in Glider Pro is the ability for two players to use the same keyboard simultaneously. Perhaps the most

radical change, however, is the addition of the Room Editor, which lets you design your own rooms. Once you've mastered flying through the built-in rooms in Glider Pro's house, you can use the Game Editor to create your own rooms and customize the difficulty levels. Or you can use rooms that other users have created, dozens of which are available on CompuServe and America Online.

Glider Pro is clever, lightweight fun and is by far the best Glider yet.



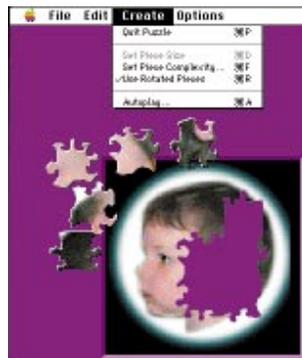
Jigsaw Deluxe

The Missing Piece

"JIGSAW DELUXE is just as challenging as a real puzzle, but you don't lose any pieces and you don't have to sacrifice the dining-room table." So says the jigsaw-puzzle expert of our household (my wife, who once completed the giant, 3-D Ludwig's Castle puzzle in a single weekend). Jigsaw Deluxe does everything System 7.5's Jigsaw Puzzle DA does, but Jigsaw Deluxe is more challenging and realistic. Both programs let you choose the picture and puzzle-piece size, but Jigsaw Deluxe also lets you rotate the pieces and choose the number of pieces and the complexity of the shapes.

Other nice features of Jigsaw Deluxe are "boxes" you can use to reduce screen clutter and a Clean Up option that arranges unplayed pieces into neat little rows.

My only complaint is that Jigsaw Deluxe includes just two measly,



uninspired puzzles for your \$20. The maker of Jigsaw Deluxe offers a CD-ROM with 120 puzzles, but you have to pay extra to get it. You can also create your own puzzles from any PICT graphics.

Loony Labyrinth

Pinball Pinnacle

LOONY LABYRINTH is the latest creation from those wild pinball superprogrammers called LittleWing, whose earlier pinball simulations include Tristan, Eight Ball Deluxe, and Crystal Caliburn. Like LittleWing's previous offerings, Loony Lab is stunning to look at and offers the adrenaline-pumping multiball play that makes



Cheat Sheet

BY ROMAN VICTOR LOYOLA

Pinball Wizardry

Want to be the "Tommy" of the 90s? Use these tips for Loony Labyrinth, and Pete Townshend could soon be knocking at your door.

- **Learn how to hold** the ball with your flipper, so you can aim the ball at any target.
- **To send a ball** toward the Loony ramp, hold the ball with the left flipper, let it go, and strike it just as it starts to roll into the center of the flipper.
- **Do the same** with the right flipper to get to the Labyrinth ramp.
- **To get to the Minotaur Chamber**, hold the ball with the left flipper, let the flipper go, and then strike the ball about a second later.

Glider Designer

Glider Pro's Room Editor can be a boon for wannabe interior decorators, but these custom-made PICT files often balloon so much that you end up with a house that takes up too much acreage on your hard disk.

- **To create smaller files**, use the Glider Pro Construction Set. It includes nine empty rooms with standard Glider Pro backgrounds, to which you can add your own artwork, furniture, and vents. By using backgrounds that are already in the game, you end up with files that are smaller than those with custom backgrounds. You can download the construction set from most online services, including CompuServe and America Online.

the game fast and furious.

Loony Labyrinth has voices that describe the action as it happens — "You've got a Mystery Feature" and "Labyrinth Advanced," for instance, both mean you received extra points for feats you've pulled off. (You can turn off the voices and all sound effects if you prefer.)

Like all the really great games, Loony Lab has a high just-one-more-try factor. ☹

GAME POINT

If you're going to buy only one game this month, get Loony Labyrinth. But don't get me wrong: Glider Pro and Jigsaw Deluxe are no slouches — if their premises tickle your fancy, get all three.

Loony Labyrinth

Price: \$35 (estimated street).
Company: StarPlay Productions, Boulder, CO; 800-203-2503 or 303-447-9562.
Reader Service: Circle #427.

Glider Pro

Price: \$35 (estimated street).
Company: Casady & Greene, Salinas, CA; 800-359-4920 or 408-484-9228.
Reader Service: Circle #428.

Jigsaw Deluxe

Price: \$20 (estimated street).
Company: Captain's Software, San Carlos, CA; 415-592-2485.
Reader Service: Circle #429.



What If . . .

LET'S SUPPOSE MICROSOFT HAD NEVER existed. I wrote a column once with that premise, and my conclusion was that things

wouldn't be much different. It may not have been true, but it was funny. More recently, I've wondered the same about Apple. What if the Mac had never been invented? What would I be writing about?

Scenario 1: Apple Computer never existed. A report on the industry might sound something like this today:

Intel has announced the iAPX532, the latest addition to its popular Ada-oriented family of microprocessors. Intel has doubled in size since the early days of the 4004 and the 8008, and its chips still dominate the CP/M world. The latest in its line of Super Eight chips, the 8080/series 10, screams with its 10-MHz performance and whopping 400,000-instruction-per-second power.

Since Zilog folded its tent after attempting to move the world into 16-bit technology with its Z-8000, Intel has dominated the scene. Industry old-timers are still mystified about why the microcomputer scene has never warmed up to 16-bit technology after 20 years of 8-bit dominance. When you talk to Intel engineers, though, they all say the same thing: "It's the installed base of software that matters. The computer world is dominated by 8-bit applications, and people are not going to change for incremental performance increases in a few apps. Besides, all the talented developers will continue to write for CP/M and the 8080-chip family, because that's where the action is."

OK, that sounds pretty gloomy. Maybe we should leave Apple in the picture but make it so there was never a Macintosh. In this scenario, Apple is still pushing the Apple II line of computers:

Apple Computer, despite pundits' predictions that the company would never survive the onslaught of the IBM PC, posted record

earnings this past year, with \$1.1 billion in sales, almost all of it to schools and homes.

The Apple II/series 50 is the dominant machine in those environments, despite what some critics see as severe limitations. The machine still does not use lowercase letters, and the floppy drive handles only 160K diskettes, whereas the latest IBM PC debuted in late 1994 with a hard drive that had a whopping 40 megabytes of off-line storage. Most observers could not believe that such a high-capacity hard drive was finally available to the public.

Apple asserts that hard drives will never be popular with the public at large and says it is working on a new floppy-disk technology that should double or even triple current capacity. "About all a user will ever need for program and data storage is 300 to 400K," says an Apple spokesperson.

After a board meeting at which questions were raised about why Apple Computer had not pursued the business market more aggressively, the company said in a press release that personal computers were simply not powerful enough for business tasks and that it was time the industry admitted it.

Gee, that sounds pathetic! Let's try this one: The company managed to bring out the Lisa computer with a GUI and it flopped. It then brought out the Macintosh, and instead of succeeding because of Steve Jobs' heavy promotion, it also flopped. The company then went into bankruptcy and has struggled ever since.

Apple Computer, just out of its third bankruptcy, debuted the Lisa VIII yesterday as a last attempt to reintroduce a graphical user interface to the public. Only a few reporters attended the event. It's well established that the public is not interested in a graphical-user interface, although a few computer experts still claim that using such an interface is the best and most modern way to operate a computer.

"It was never given a fair chance in the marketplace," says Jerry Gomez, an analyst at CompuQuest, a market-research firm.

"Wrong!" counters Bill Gates, the CEO of the world's largest software company, Microsoft. "Nobody wants a GUI, because GUIs don't work!"

Microsoft's 1994 sales were well over \$100 million, so when Gates talks, people listen. He claims that the GUI simply cannot be coded to work properly and that people prefer the simplicity and power of a single command line. Others agree. The gist of their argument is simple: "What could be easier than telling the computer what you want it to do by simply typing a line?" The whole GUI concept was flawed from the beginning, it seems.

Maybe I'm overly pessimistic about a future in which there's no longer any intense competition. I just have the sneaking suspicion that these scenarios could have become reality under some circumstances. The ongoing battle between the Mac and PCs running Windows is what has made this industry what it is today. Minimize competition, and see what happens. Stagnation is my guess. ☹

