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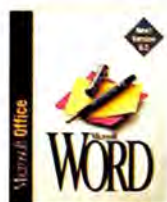
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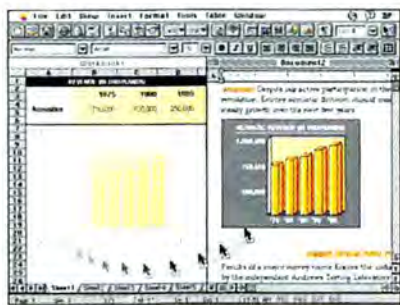


WOULD YOU SETTLE FOR

New Microsoft Office 4.2
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*It's never been this easy to
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Talk about being connected. But wait, you forgot you have a big presentation tomorrow morning. No problem. You're

Teh→The

*Now you see it. Now you
don't. Set AutoCorrect to instantly
fix your common typos.*

at one with your Mac. Just click a button in Word and automatically turn your document into a persuasive presentation in PowerPoint.*

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focus on
your work.
Instead of
the program
you're using.



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document into
a PowerPoint
presentation.

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Because you can easily share Office files between Macintosh

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and Microsoft Office 4.2 for Windows.[™] Without having to convert them.

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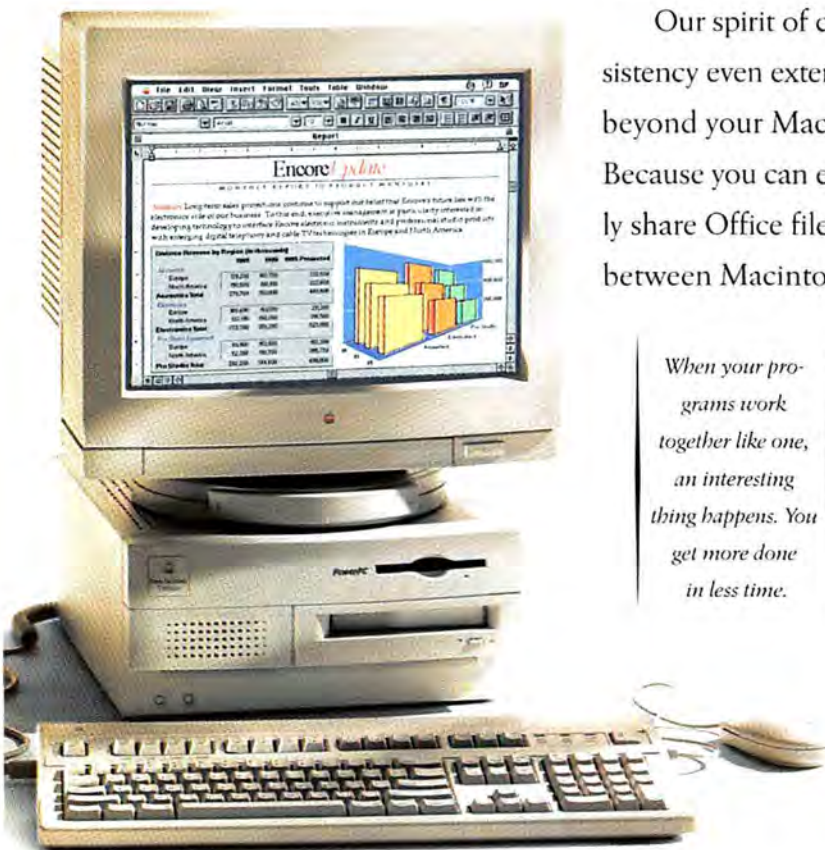


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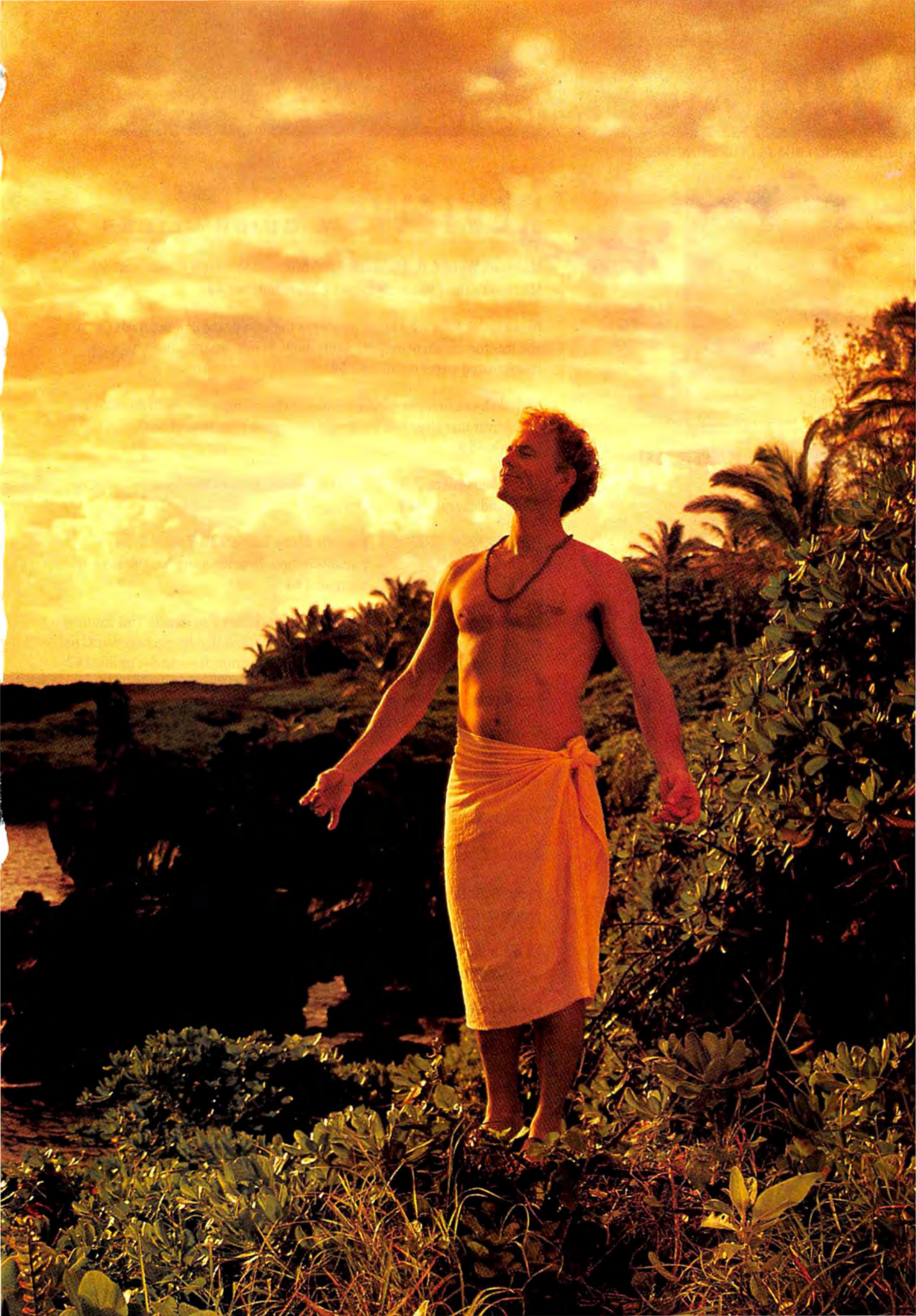
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Built for Speed

Double-speed, triple-speed, and quadruple-speed CD-ROM drives deliver the data.

MacUser ZD LABS IF YOU WANT TO CATCH the CD-ROM wave, you need a fast CD-ROM drive. MacUser Labs tested 26 of the latest — and discovered that triple- and quad-speed drives are not necessarily the fastest for all applications. We explain how to buy a drive that will fit your needs. BY CHERYL ENGLAND / 76



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Learning Power: Software for Kids

SURE, YOU WANT YOUR KIDS TO GET AHEAD, but how do you know which educational software will really give them an edge? Here are ten guidelines for buying the best packages for your children — plus must-have programs for every age group.

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The Ultimate Guide to Children's Software

BUNNIES, MONSTERS, PURPLE CONVERTIBLES. We've seen it all in our pursuit to provide you with the latest information on the current crop of software

packages for kids. More than 300 packages are represented here, each reviewed and rated. BY JIM SHATZ-AKIN WITH CONNIE GUGLIEMMO,

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MacUser ZD LABS APPLE'S NEW POWERPC-BASED Workgroup Servers are great machines for running native server-software programs — unfortunately, AppleShare is not yet one of them. Here's the latest info on when AppleShare is expected to go native as well as the results of our tests. BY HENRY BORTMAN / 110



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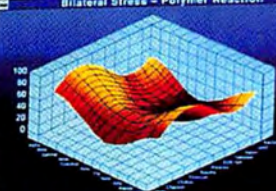
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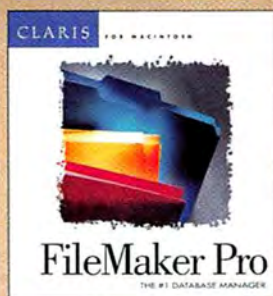
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LETTERS

What Difference?

ALTHOUGH I AGREE and empathize with the *spirit* of Ms. Canon's editorial ("What's the Difference?," September '94, page 17), it's ironic that she picks the new 630-series Macs as an example of "hot technology." The price/performance factor of these new machines is top-notch, but note the IDE drives, DRAM-based video, and 8-bit audio. Although these steps may be practical and efficient to stop a few PC-clone purchases, they can't be considered "pioneering new technologies."

I agree that Apple probably won't succeed by marketing only the leading edge of technology. But at some point, adopting cheaper technologies will start to erode the technical advantages we've come to expect from Apple.

David Brown
brown@stolaf.edu

MAGGIE CANON STARTED out saying something about Microsoft's Chicago, but then she left the topic completely so she could tout "Mac innovation." Having been impressed with the beta version of Chicago and being a Mac user who has spent equal time on a PC over the years, I have to say that Maggie has only added to the idea that Mac users are bigots. Chicago does wonderful things for the PC operating environment and narrows the gap between Macs and PCs. And after all, which company has

kept its platform closed to everyone else from the start?

Mike Starrett
STARRETMJ@aol.com

Plugged In

I FOUND YOUR introduction to the Internet ("Plug In to the Internet," September '94, page 86) interesting, but I'd like to make a few points.

Much of the appeal of the World Wide Web lies in a page with slick graphics; a modem-based SLIP or PPP connection will be sluggish beyond belief if you want to view graphics, however. It's misleading to let readers believe that they can somehow surf effortlessly between Web pages without enduring painfully slow transfer rates.

You also neglected to mention Nuntius, a superior thread-based newsreader, and TurboGopher, a Gopher client application that is probably the most useful Internet application I've ever come across.

Ben Suppe
ben@wanda.princeton.edu

COME ON, *MACUSER*. Can you stop insulting your readers' intelligence? Is it really necessary to insinuate that we're all incapable of comprehending text commands?

Surely anyone who needs to use FTP or Telnet has some level of technical skill — such as the ability to read. Many users find Mosaic and other attempts to defang the UNIX-based Internet excruciatingly redundant and slow.

Good computer technology, like good art, finds beauty in the unexpected and elegant use of form and function. Much of today's over-GUI-fied software is more reminiscent of a black-velvet Elvis than it is of the inspiring Monet of the original Mac. After all, if software really is easier to use just because it has some colorful icons on the screen, we would all be using Windows.

Mike Bauer
mpb4r@virginia.edu

YOU MISSED an important way of hooking in to the Internet: UUCP (UNIX-to-UNIX



OPEN FOLDER

Spider-Man's got nothing on Kenneth Simon, of Bloomington, Indiana. Kenneth described a scene he observed at a well-known store that stocks mostly Windows software. A dastardly salesman tried to convince a consumer not to buy a Mac, because "there isn't much software" for the Mac. "I wanted to don a cape and tights and be a MacHero," Kenneth says. "But instead, I stayed my meek self and walked out of the store." We know that the prospect of taking on Microsoft, a.k.a. The Incredible Bulk, must seem daunting, but buck up, Kenneth! As Spidey's alter-ego Peter Parker knows, with great power comes great responsibility.

An avenging MacHero is just what the kids of Hilton Head, South Carolina, need, according to 12-year-old Mark Yates. Mark complains that his teachers hoard the Macs and "use them for their own use," while students are limited to Apple II's. "How can people like me do something to change this?" he asks us. "How can you help us achieve this goal?" We suggest you challenge them to a winner-take-all game of Spectre VR, complete with QuickTime clips from *Lord of the Flies* and *Fast Times at Ridgemont High*. They'll eat your cyberdust.

If all else fails, try the direct approach. That seems to be the thinking of 13-year-old Morgan Harvey, of Portland, Oregon. Morgan sent us this plea via the Internet: "I am wondering if you have any spare Power Macs lying around your place. Any help in me getting a Power Mac would be greatly appreciated." Nice try, kid.

A love of the theater seems to be a common bond among *MacUser* readers — after all, nearly a dozen of them wrote in to inform Maggie Canon that *Guys and Dolls* is not set in Chicago, as she stated in her September column. As any true Damon Runyon fan knows, the musical actually takes place in New York. That was a typo, of course. She meant *GUIs and Dolls*.

Write to Letters

c/o MacUser
950 Tower Lane
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Foster City, CA 94404

To send your letter electronically via the Internet, MCI Mail, CompuServe, or ZiffNet/Mac (our on-line service), see "How to Reach Us," on page 4. 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.

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ASK DR. POWER MAC

WHAT DOES SOFTWARE being in native code mean, functionally, for the PowerPC chip? Can software written for ordinary, run-of-the-mill Macs run equally well on Power Macs? Are software companies calling their native software an upgrade or a new version?

Jilda Nettleton
via the Internet

/ Native software is code that has been compiled to take advantage of the PowerPC chip's greater performance. In most instances, older 680x0 programs can run on a Power Mac under emulation, which means the 680x0 instructions must first be translated into PowerPC instructions, adding to processing time. Under emulation, the Power Mac runs at about the speed of the low-end Quadras. Upgrades from 680x0 versions range from free to several hundred dollars, depending upon the developer.

WITH ITS POWER MAC accelerator, the 630 series will be able to run applications native on the PowerPC chip as well as 680x0 applications without emulation. If this is true, then the 630 is the only Mac I know of that you can upgrade to a PowerPC without giving up the 680x0 processor. Does Apple plan to make PowerPC boards for any other Macs that allow you to run 680x0 applications without emulation? If so, when, which models will be supported, and how much will they cost?

Michael G. Schabert
via ZiffNet/Mac

/ The Macintosh Processor Upgrade Card also works with the Quadra 605, the LC 475 and 575, and the Performa 470 and 570 series. Owners of the LC 520 or 540 or the Performa 550 or 560 can also use the card if they first upgrade their logic board to that of an LC 575 or Performa 570. The Processor Upgrade Card costs less than \$700 and should be available by the time you read this. It plugs in to the 68040 socket on the logic board, and the 68040 plugs in to a socket on the upgrade card. You can use either the 601 or the 68040, but you have to shut down and then reboot your Mac to switch from one processor to the other.

I BOUGHT a Power Macintosh Upgrade Card designed for all Centris and Quadra models except AVs. Then, last month, I sold my Quadra to a friend. Now I want to buy a new 630-series machine. Is my Power Macintosh Upgrade Card compatible with this new series?

Christian Dallaire
Jonquière, PQ, Canada

/ In a word, no.

Copy Protocol). Any of several UUCP packages can supply users with Internet e-mail and Usenet news, and since UUCP works by downloading all of your information at once and then closing the connection, users save money by minimizing their connect time.

Granted, UUCP doesn't let you use the World Wide Web, Gopher, FTP, or other nifty tools, but it lets you work when and where you want — in the vanpool on the way to work, or even on the beach!

Jatin Desai
jdesai@ilu.com

/ Good point, but the e-mail package Eudora can be used to read e-mail off-line regardless of your connection type. / JS

Stacked Deck

I HAVE TO DISAGREE with your recommendation of the HP LaserJet 4M Plus over the Apple LaserWriter Pro 630 ("Powerful Printing Partners," September '94, page 98). You give the HP printer a better customer-service rating, yet your own chart shows that HP does not provide toll-free support, whereas Apple does.

The 630 has PhotoGrade and FinePrint; the HP has nothing that compares. The 630 has 8 MB of RAM standard and the HP 6 MB. All this and the 630 still costs almost \$200 less. Yet the HP wins?

Jeff Gagne
PackerDev@aol.com

/ Both printers are excellent products, and our decision was a close call — HP's printer was faster, especially for graphics tasks, and offers better cross-platform options. Although Apple provides free support, callers may be placed on hold for more than 45 minutes. The printers use different ways of enhancing output — Apple uses PhotoGrade and FinePrint, and HP uses its Resolution Enhancement technology (RET). Finally, the way the two printers are designed means the LaserJet's 6 MB of RAM is equivalent to the 630's 8 MB. / CE

Swifter System Software

I REALIZE THAT there are only three to four hundred thousand Power Mac users, but speaking as one of them, I want to know: How fast is System 7.5 on a Power Mac? Your article on System 7.5 ("Apple's New System 7.5," September '94, page 79) made no mention of the speed at which System 7.5 runs. You have provided some good information to Power Mac users, but please

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CIRCLE 65 ON READER SERVICE CARD

don't ignore our desire to be fully *native*!

Bill Hase
via the Internet

/ There are very few new native parts to System 7.5. More native system-software components will appear next year. / SJS

Radius Responds

AFTER READING the results of *MacUser's* readership poll on monitors (November '94, page 102), I feel compelled to write and register my concern.

Frankly, Radius was surprised by the results of the survey as well as the tone of the text. The reported results contradict our own comprehensive, ongoing survey of users' satisfaction, not to mention the strong repeat business we consistently receive from our VARS, resellers, and customers.

Your readers can be assured that Radius is absolutely dedicated to providing the very best product and service to our customers. In fact, in June 1993, we introduced what is now known as the industry's single-best product warranty. Our Worry Free Warranty delivers on-site, overnight replacement of any defective Radius products. This program demonstrates Radius' total commitment to quality and customer satisfaction.

Additionally, demand for our SuperMac and Radius monitor products has skyrocketed over the past 18 months. This is a clear indication that customers are pleased with the performance and features of our monitors. We welcome any customer that has a question regarding our monitors, or any other Radius product, to contact our customer-service group at 408-434-1012.

We also look forward to working with *MacUser* and its research group to better understand the results of your poll and, if needed, to take immediate action to reinforce our commitment to our resellers and customers.

Charles W. Berger,
Chairman and Chief Executive Officer
Radius, San Jose, CA

Fuse Confusion

I'M ALARMED by your suggestions in "PowerBook Secrets" (September '94, page 149). Although your suggestion about PowerBook fuse replacement is technically valid, consider this:

- The fuse in the PowerBooks 140 to 180c

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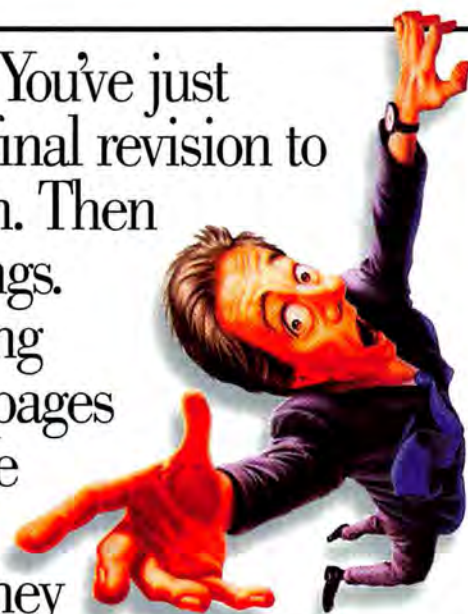
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CIRCLE 73 ON READER SERVICE CARD

It's 3:50 pm. You've just finished the final revision to the sales plan. Then the phone rings. "We're sending over 10 new pages of competitive info." Click. Good thing they lock the windows on this floor. You have to get it into the plan by the end of the day. What now?



CIRCLE 97 ON READER SERVICE CARD

Billions And Billions And Billions And Billions...of Colors.

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Performing like scanners priced somewhere in the stratosphere, the ScanMaker III's scans are so sharp, you will actually reduce the amount of time spent in post-scanning software to sharpen images. And its optical resolution of 600 x 1200 dpi (enhanced through software to 2400 x 2400 dpi) is great for enlarging small originals.

For accurate scanned color, DCR™ (Dynamic Color Rendition), Microtek's award-winning color calibration/correction system calibrates the ScanMaker III to a photographic industry-accepted calibration target creating a custom profile of your specific scanner. This ensures the most accurate color possible as you scan an image, so you spend a lot less time adjusting the color of your scans to match your originals.

Windows users also get Microtek's ScanWizard™, a drag and drop scanning utility for instant image management, faxing, and printing. The ScanMaker III also includes the full-version of Adobe Photoshop for complete image editing and color separations.

See why Microtek is the universally accepted leader in image quality. For more information about the ScanMaker III, DCR, or for the name of your nearest authorized Microtek reseller, call **1-800-654-4160**.



ScanMaker III shown with optional Transparent Media Adapter for scanning transparencies up to 8" x 10".



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CIRCLE 159 ON READER SERVICE CARD

requires a special soldering arrangement that uses heated air instead of a physical contact-type soldering iron. Using an older-style soldering iron is possible but usually damages the device.

- Even if the computer is not under warranty, this modification may compromise the "warrantable" status of the main logic board in the future.

- Less well known, and certainly less frequently mentioned, is the "exchangeable" status of the major modules of Apple Computer equipment. If any unauthorized modifications have been performed on those modules, Apple may decline to exchange the part. The price of replacing the module then rises sharply, because the normal pricing is based on an "exchange price," not an outright-purchase price. This increase ranges anywhere from about 50 percent to 300 percent.

- Your solution doesn't replace the defective power adapter (usually more than \$50).

Bob Dreano
cloudbust@aol.com

/ Replacing the fuse requires care, experience, and the right tools and should not be attempted by a novice. Because this repair does void the warranty, users are advised to exhaust all sanctioned avenues first. / RW

Wonderful World of Color

YOUR ARTICLE ON COLOR ("The Big Color Spin," September '94, page 129) was interesting and amusing, but I disagree with your identification of red, yellow, and blue as primary colors.

Since your article appears on a printed page, it was printed with cyan, magenta, and yellow (pigment primaries) plus a key color, usually black. When you were designing your layout on a monitor, however, the primaries projecting from your screen would have been red, green, and blue.

Citing red, yellow, and blue as primary colors is the sort of misinformation they give to you in kindergarten before they think you're ready to handle the truths of the real world.

John Rainbow Humphrey
john_humphrey@ncsu.edu

/ Which colors are considered primaries depends on who is looking at them. A photographer sees additive primaries (where red, green, and blue combine to make white light), and a printer sees subtractive primaries (where cyan, magenta, and



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CIRCLE 47 ON READER SERVICE CARD

You think she's finishing the proposal. She thinks you are. Surprise, neither one of you are. And it's 4 hours before the grant committee meets. Let's see, 16 new pages of data, 11 article reviews, 3,600 words sent by your partners in Istanbul. Who can type faster? Aaargh! What now?



CIRCLE 98 ON READER SERVICE CARD



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yellow inks combined should yield black but don't). A painter sees primaries as the paints from which all other colors can be mixed, hence red, yellow, and blue. In desktop publishing, all these definitions apply. / PP

Tick, Tick, Tick . . .

AFTER USING EWORLD for the past month, I may cancel the service. Despite its excellent interface and useful array of services, I strongly dislike the feeling of being "on the clock." Under the current pricing plan, users pay a flat monthly fee that includes two hours of non-prime-time usage; any time beyond that is billed at an hourly rate. CompuServe charges a flat monthly fee regardless of how much or when you use the service (for basic services).

Apple needs to seriously reconsider its pricing structure for eWorld services. "It does more. It costs less. It's that simple." That slogan should not be restricted to hardware.

Chris Bojrab
76500,1631@compuserve.com

The Infobahn Killer

IT'S QUITE REFRESHING to have such easy access to *MacUser* and its staff via the Internet, and, frankly, I am surprised to see that you still receive letters via snail mail.

Travis Bolton
t.bolton1@genie.geis.com

YOU CAN PRINT my electronic address if you want. Does this attract ax murderers?

David Aziz
aziz@stella.radiology.arizona.edu

/ We don't think so, David, but now you'll have the chance to find out. / PP

CORRECTIONS

Our review of RunWay Software (September '94, page 54) said that RunWay modified AppleTalk protocols; in fact, it is protocol- and network-independent.

In "Add-on Power for 500s" (September '94, page 145), the dimensions of the SlimPack500 battery should have been listed as 11 x 6.5 x .5 inches.

In our review of the In Focus PanelBook 530LS (September '94, page 39), the cost of the LiteTools II utility should have been given as \$165.

The phone number for Advanced Software, publisher of DateView and In-Touch (September '94, page 59), is now 515-225-9620.

MacUser

COMING SOON:



A TREASURY OF PERSONAL FINANCE SOFTWARE

Make your Mac accountable! The editors explore software for managing finances, taxes, on-line investing, checking, retirement planning, financial modeling, and much more! *MacUser* enriches the Macintosh market.

MACBENCH 2.0 / MAC UNIVERSE

It's big — and it's better! This February, *MacUser* introduces the updated MacBench 2.0 for the PowerMac. It's the ultimate standard for benchmark testing of Macintosh computers. The *MacUser* Labs experts test, review and give mouse ratings to all currently shipping Macs, comparing processors, FPU's, video, and SCSI performance. Also, tips and hints on how to deal with these important parts of your system. Don't miss this power-packed issue!

HIGH-CAPACITY REMOVABLES ON THE MOVE

Removable drive have hit the 200 MB mark! To celebrate, the Labs tests three high-capacity removable technologies for reliability and speed: Syquest, Optical and Bernoulli. What's best for what use, and what's compatible with lower-capacity media. Mouse ratings, too. Buyers depend on *MacUser*.

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CIRCLE 99 ON READER SERVICE CARD



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CIRCLE 86 ON READER SERVICE CARD



High-Tech Holidays

I'M STILL VACUUMING THE PINE needles from last year, but another holiday season is already looming

overhead like a giant inflatable Bullwinkle in the Macy's parade. I don't know what it's like in your household, but in mine, the grown-ups' holiday wish lists are not all cashmere sweaters and power drills. We also dream about technogoodies. You know, the little things: a PowerBook 540c, for example. Big brown-boxed Power Macs tied up with string — these are a few keenly coveted things.

Let's face it: No matter what they're celebrating, Americans can get a little caught up in a frenzy of consumerism during this season. Computer stores bustle with holiday shoppers buying everything from faux-leopard-skin PowerBook cases to video cards and memory upgrades.

For some, presenting a loved one with a few megs of RAM would be like gift-wrapping a DustBuster for your fifth wedding anniversary. For others, that gleaming foil packet of processing power would be as touching as 18-karat cuff links or a string of pearls. I guess I'm somewhere in the middle; our offices at *MacUser* are awash in the latest cool gear, but I'm always interested in sprucing up the home system for enhanced work and play (not necessarily in that order). For the discerning technophile on your list, I've collected a few holiday shopping suggestions.

At the top of my own list is a CD-ROM drive. Prices have tumbled into the pony-up-for-a-gift range, and buying one is a relatively inexpensive way to add a whole new dimension to a friend's or relative's computing experience. You shouldn't have too much trouble finding a good drive after you've read this month's cover story, "Built for Speed."

Once you're CD-ROM-ready, of course,

you can catch wave after wave of interesting content. My wish list contains titles like *American Visions*, from Eden Interactive (all about modern American artists); the *CD Companion Series*, from The Voyager Company (brushing up on classical music); and *Cosmology of Kyoto*, from Yano Electric (you have to see it for yourself). Our October '94 issue had reviews of these and other CD-ROMs. You can get many titles through mail-order houses, although they're increasingly popping up in retail outlets such as bookstores and record stores. (One of the great things about giving CD-ROMs is that they cost a mere \$13 to send via next-day air, a plus for those who celebrate Christmas Eve at the FedEx office.)

Moving from colorful content to colorful output, a color printer is tops on my husband Jeff's list, for his home office. I'm thinking I can barter with the neighborhood kids and let them make color printouts in exchange for chores, so the printer will pay for itself. Some of these kids have the business acumen of little Ross Perots, but the opportunity to see their digital graffiti in print will no doubt beguile them. So I may give the elves a green light on this one.

The best "good things in small packages" item I've come across is a pair of diminutive SoundWorks speakers, from Cambridge SoundWorks. Hook these 2-x-2-inch speakers (and separate subwoofer) to your Mac or

CD-ROM drive, and you can fill a room with basso profundo. Best of all, they don't even leave a fingerprint, much less a footprint, on your crowded computer desk.

Is there someone on your list who's been very good this year, a Sharper Image type who's forever in possession of the hippest gadgets? Apple's handsomely styled Quick-Take digital camera, although not exactly a bargain, is the most "fun" computer accessory to debut this year.

I'm not sure what I'd officially do with one, but I can promise you there'd be a passel of dog, cat, niece, and nephew shots in my image archives.

For as little as about \$20 a month (depending on your phone company and the type of line already installed), you may be able to give on-line adventurers their own

ISDN connection. Using your own ISDN line, with its large data capacity, is like heading out into the Internet backcountry in a Range Rover rather than on foot.

Choices, choices, choices. Maybe next year a true virtual mall will be at my disposal, one that lets me fondle the cashmere, play the CD-ROM, and sample the fruitcake. (Well, maybe we can do the fruitcake part by remote access.) And maybe this year, Jeff will sneak a Power Mac 6100 under the tree. Although the price is right, I'd say the odds of this happening are about on a par with his filling my stocking with the keys to a Mercedes convertible. In the meantime, I'll be out braving the store traffic, covered with turnstile bruises in hot pursuit of that perfect high-tech holiday gift. ☞

No matter what they're celebrating, Americans can get a little caught up in a frenzy of consumerism during this season.

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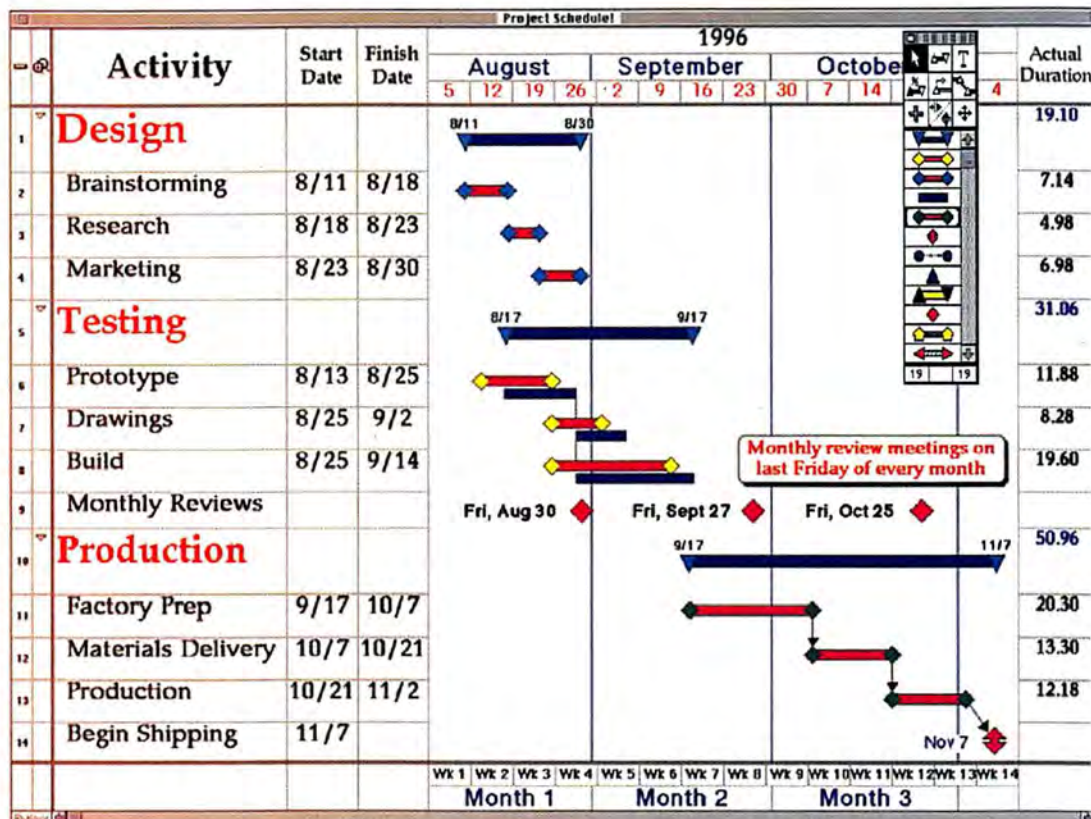
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Paper Chase

I DOUBT THAT I AM REVEALING any shocking secret here when I tell you that I think the magazine you're

now hanging your eyeballs on is pretty hot stuff. If it were any more so, it would quickly supplant our old friend Tabasco sauce as the key ingredient in zesty Tex-Mex cuisine, with cooks cautioned never to stir more than four pages into any one batch of chili.

But if I said that *MacUser* was the only thing I read each month, well, that would be a slight exaggeration. Why, every week my analog mailbox is flooded with newsweeklies such as *People* (folks, keeping up with current events is not a passive activity) and its more cerebral cousin, *Premiere*. But in addition to these, there are certain other computing-related publications that I think more people should know about. You ought to be able to find most of the following in the better magazine shops and bookstores in your area.

I happen to be a really big fan of *Flash* magazine (BlackLightning Publishing, Riddle Pond Road, West Topsham, VT 05086; waltervj@flashmag.com). I'm generally prejudiced against any publication with a lofty tagline such as *The Premier Journal of Desktop Printing*, but I can't fault the publishers here; they're just stating the obvious. Basically, if doing it involves a desktop printer at any stage, you can read about it in *Flash*. Selecting just three issues at random from my pile turned up articles on etching glassware, printing photographic halftones, perfect-binding your own books, printing on metal signs, repairing printers, and operating and promoting your own publishing miniempire. For me, it's good enough that each issue of a magazine teaches me at least two things I didn't know; *Flash* tops even that level, because every issue contains something I want to run out and try immediately, as my new set of *Prisoner*-style

etched "You Have Just Been Poisoned" lager glasses silently attests.

I'm getting a little sick of reading about the Newton, and not for the reasons you might suspect. I love my MessagePad and am rarely more than ten feet away from it, but good Lord, it's almost as if Apple has officially changed its name to "The Newton, Apple's Answer to the Edsel™." Nary a newspaper or magazine story mentions the Newton without a

phrase like that, even if the thing was used only as a murder weapon. And as Apple has subtly repositioned the MessagePad as a vertical-applications product, even (cough) major Macintosh magazines have cut back on their Newton coverage. Enter *Intelligent Newton Magazine* (50 Osgood Place, Suite 330, San Francisco, CA 94133; 415-433-2755 or inmagazine1@eworld.com), a slick and colorful bimonthly. Although the two issues I've seen were a little lean on practical, hands-on techniques (with the exception of an excellent Q&A column), *IN* is by far the best source I know of for Newton news, reviews, and product info. The magazine should be lauded for its regular coverage of shareware and freeware, a vital segment of the Newton scene. It also has a sense of humor, which I think ought to be encouraged.

2600 (2600 Enterprises, 7 Strong's Lane, Setauket, NY 11733; 516-751-2600 or 2600@well.sf.ca.us) is the only semicontroversial entry in this column; I've found that its subtitle, *The Hacker Quarterly*, tends to

put people off for various reasons. Yes, it does indeed often feature articles on weaknesses in system security and the machinery behind viruses. And sure, it often describes activities that are illegal, such as phone phreaking. I absolutely do not advocate any activity that may in some manner bum other people out or land your hinder

in jail. But let me explain with a story. At my college, we freshmen were assigned dorm mailboxes with two combination dials. It seemed like a pretty weak lock to me, and sure enough, after half an hour of experimentation, I had come up with a simple way to figure out the

combination of any locked mailbox merely by twiddling the dials a bit. Did I then conclude that the box was insecure and arrange for a P.O. box elsewhere? Yup. Did I share this information with friends? You betcha. Were they grateful? Uh-huh. So if you're about to angrily write in accusing me of contributing to The Hacker Menace, well, you have a right to your opinion. But personally, even though *2600* rarely discusses Mac topics, I like knowing the strengths and weaknesses of the locks, phones, and information services I use.

I know you longtime readers of mine aren't used to my talking about something just because I happen to think it's cool — man, I hate egotistical, self-indulgent columnists like that — but nonetheless, I can't let a topic like this sail by without working in a plug for one of my favorite regular comic books. I'll gloss over Neil Gaiman's exquisite *Sandman* series, simply because it has the might of DC Comics promoting it (although you'd do well to get

PROBLEM:

One issue of MacUser a month isn't enough.

SOLUTION:

Feed your head with these other cool rags.

to a comics shop and pick up any of the hardcover collections, particularly *Fables and Reflections*). And I want to mention Dave Sim's *Cerebus*, currently one of the best ongoing works of fiction of any stripe, but if you start in now, you've got 200 issues of the story to catch up on; suffice it to say that I think \$25 for the *High Society* reprint book (call 519-576-7820), one of eight so far, is a fine outlay of cash. Instead, I'll plug Martin Wagner's *Hepcats* (512-837-5545 or hepcats@eden.com). This comic book (PG-13, like the rest of the comics I've mentioned here) combines fine draftsmanship, humor, and a subtle and very human story line; it is fine work and should be encouraged, in my humble opinion.

After cowriting the Help Folder column for five years, I've seen more than my share of questions that go something like this: "I own and operate a candlepin-bowling alley in Portland, Maine. Do you know of any candlepin-bowling-alley-management software tailored toward New England operations, Maine in particular?" In the days before I had the common sense to keep the

quarterly *Macintosh Product Registry* (660 Beachland Blvd., Vero Beach, FL 32963) handy, I could only stutter and stammer; today I turn to the appropriate page and say that although Mr. Bowler is pretty nice, Let's Rent Shoes! 3.0 also lets you track bumper-pool operations and is available in a special Portland edition. Obviously, the publication's goal is breadth rather than depth, but even if you have no need to let your fingers do the walking for obscure titles, the *Registry* serves as a handy directory of the address and phone and fax numbers of nearly every Mac-related company you'd ever want to get in touch with.

Finally, a decidedly digital entry: Adam and Tonya Engst's utterly edible electronic Mac weekly, TidBITS. If all it offered were regular news, product reviews, and bug reports, it'd be a good resource, but when you add commentary that is consistently on the mark, writers who enjoy writing, and the fact that apparently everybody in the industry reads and supports this pub, it becomes a bit of a godsend. When you sweeten the pot by making it free to anybody who sends

e-mail to listserv@ricevm1.rice.edu containing the magic line SUBSCRIBE TIDBITS (your name here), well, then the urge to send the Engsts a whole box of fudge brownies becomes pretty difficult to resist. They're also archived (TidBITS, not the Engsts) at ftp.tidbits.com and elsewhere on-line, making them en masse a useful reference library.

Some of you have, no doubt, just read this entire column at the newsstand, not caring that this ain't a library, kid, and that *MacUser* can hardly afford to help me maintain my accustomed standard of living if all of its potential customers would rather just put down roots and read an entire bloody issue from start to finish for free rather than cough up a measly \$2.95. Well, here's your chance to erase that ugly bad karma and make good by purchasing not only *this* magazine but some of the others I've mentioned here as well. And if there are other cool mags I've missed, drop me a line by all means and tell me about it here at 950 Tower Lane, 18th Floor, Foster City, CA 94404 or at andyi@world.std.com. ☺

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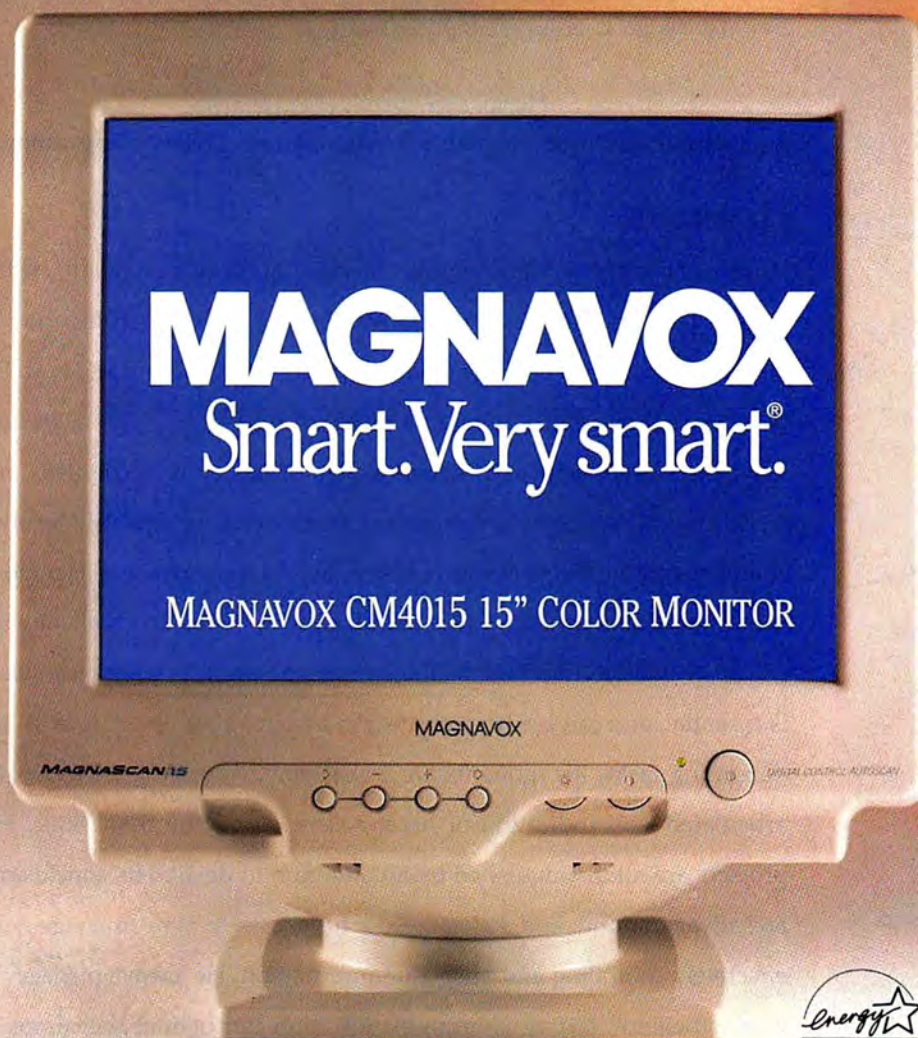
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EMPLOYEE EVALUATION

NAME: Chris Wolfe DATE PREPARED: 9-8-94

TITLE: Product Manager

DEPARTMENT: Account Management

OVERALL PERFORMANCE:

☒ Outstanding ☐ Commendable ☐ Satisfactory ☐ Needs Improvement

COMMENTS:

Chris has become an indispensable member of the account team. He has demonstrated a high level of motivation and enthusiasm for the job. Perhaps the most compelling evidence of this can be found in his ability to work independently, where he picks up new tasks easily with little need for supervision or instruction. He consistently recognizes and works around obstacles to maintain productivity. Consequently, he often completes assignments ahead of schedule. At a time when collaboration is more critical than ever, Chris has also proven to be an excellent team player. He works effectively with coworkers on projects where teamwork is essential, and can easily motivate and inspire others to achieve. When delegating tasks, his thoughts are well organized and his ideas clearly articulated – an indication of his excellent communication skills. His projects are all distinguished by an attention to detail. His conclusions are always sound and logical. And he excels in time management, effectively compiling and analyzing information. He always manages to work efficiently, setting an example for effort throughout the company. Promotion and appropriate compensation are recommended at this time.

Chris Wolfe

Employee's Signature

J. Bloom

Evaluator's Signature

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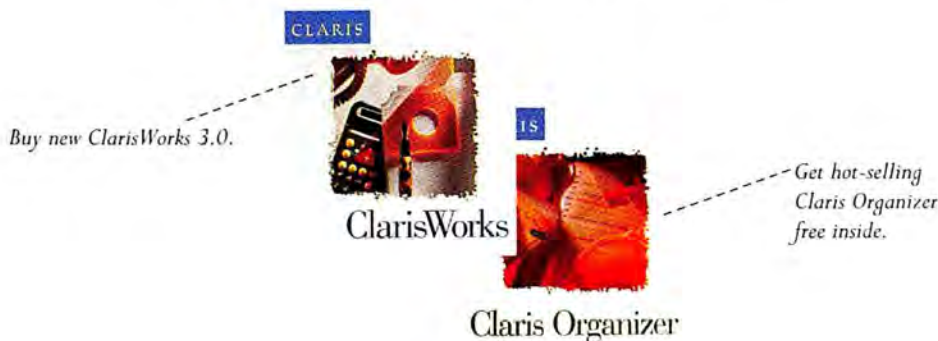
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SOMETIME IN THE NEAR FUTURE (next Sunday, A.D.), they're going to turn your work habits inside

out like a sock in the wash. Everything that was inside will be outside, everything that was up will be down, and you can bet the seams will show.

"They" are (a) Microsoft, (b) Apple and everybody else, or (c) an unholy alliance of the aforementioned. The mechanism of their manipulation will be called OLE, OpenDoc, both, or something else. You don't get a vote in any of this.

"Why me?" you ask, and it's a reasonable question just as long as you don't expect an answer. You have been doing a good job; everybody says so. Maybe they just don't like you.

Or maybe it's about embracing change. One of the reasons marketing people were put on earth is to convince you that whatever they convinced you was marvelous last month is crap today, so that you'll understand the necessity of buying this month's marvelous thing. As marketing people say, change is money.

Then again, OLE and OpenDoc might really be marvelous technologies. At least, that's what I believe.

Recently I endured a barrage of OLE and OpenDoc articles, presentations, white papers, whitewashes, demos, dog-and-pony shows, and debates you wouldn't believe (nor should you). I had to sit and watch them, and if I now concluded that OLE and OpenDoc are anything short of marvelous, I'd get such a case of cognitive dissonance that my head would turn inside out. Marvelous it is. They are.

I'll convince you. Start with this what-if scenario: What if documents, rather than application programs, were at the center of computer use? What if, instead of concentrating on the program and its interface and

features and quirks, you could just concentrate on the task at hand?

Now push that what-if a little further. Ever read a résumé that lists "Lotus" and "WordPerfect" as job skills? When a piece of software gets listed as a job skill, it has moved from the solution side to the problem side of the ledger. Lotus is really a job skill only for Buddhist monks. Document-centered computing would knock these bogus skills off résumés.

Or what about this: If you've got the tool for the job, why can't you use it on the document in front of you? Why can't any document be operated on by any tool and contain any kind of data: text, formulas, spreadsheets, pictures, sound, movies, 3-D walkthroughs and flybys, SimCity scenarios?

Those Special Parts

Push the what-if further, and the very concept of a data file begins to unravel. As long as computers have been around, a file has been an undifferentiated lump on a disk. But if the document is really at the center of things, a file becomes a rich structure of components. Files as we know them today need to go away, to be replaced by richly structured objects with internal directories providing access to components from outside: documents.

It doesn't really make much sense to free documents from bondage to applications if they remain shackled to one platform. So

these documents need to be movable across network connections from one computer to another of any brand, entirely transparently. A document is not a Word-for-Windows-version-3.0 file; it's just a document. Sort of like a piece of paper remains a piece of paper when you take it from California to Dublin.

That's document-centered computing, and that's what OLE and OpenDoc are all about. You love it, right?

Well, you should try, because it's coming. OpenDoc is right on track. Of course, there's already a locomotive named OLE barreling down that same track at full throttle, on a collision course. Things could get messy.

Why can't we all just get along? It's probably a Y-chromosome thing: You know what boys will be. Apple says that OpenDoc is SuperSoftware, more powerful than that locomotive; Microsoft says that OLE is SuperSoftware and that OpenDoc is just another face in a red jumpsuit; actually OLE and OpenDoc are both Transformers, battling by turning into each other. The feature lists change daily.

It's sad. These technologies for document-centered computing could coexist beautifully, but their proponents would rather deploy them like weapons. Maybe Jimmy Carter will take an interest in the situation.

Meanwhile, since none of the combatants is asking your opinion, there's no point in getting worked up about it. Repeat to yourself "It's just a show," sit back, and just relax. ☺

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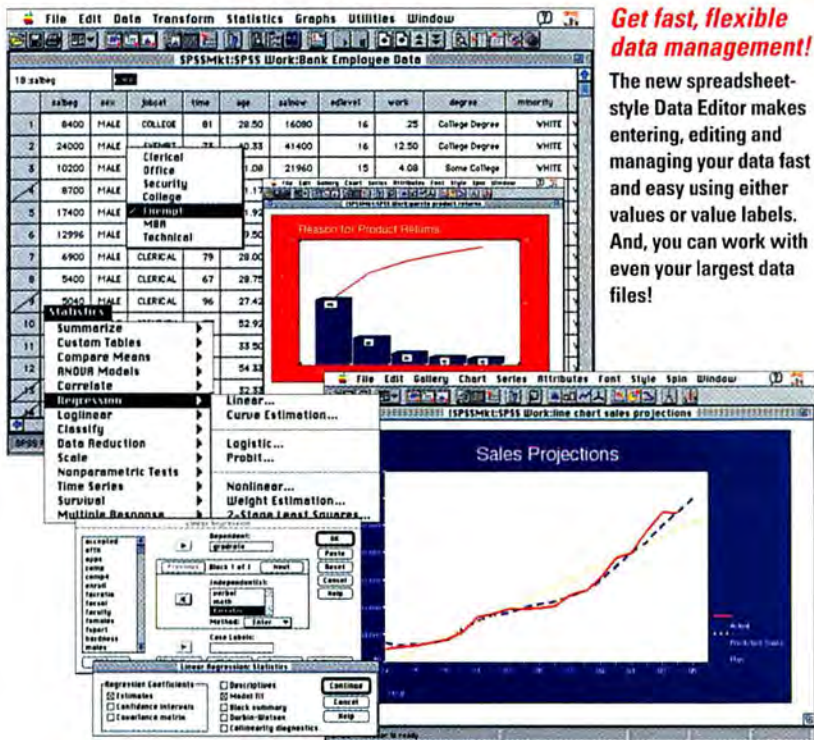
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NEW ON THE MENU

CPUS /

POWER MACS MOVE INTO MAINSTREAM

Performa 6100 series has PowerPC boost.

IT WAS INEVITABLE. Given the popularity of Apple's low-end Power Mac 6100 and the success of Apple's Performa line in the home and education markets, it was just a matter of time before Apple melded the Performa model with the PowerPC chip.

Say hello to the Performa 6100 series. Apple's newest Macs come in three basic configurations. Based on the same processor as the Power Mac 6100, all three models contain 8 MB of RAM, a 1.4-MB 3.5-inch floppy-disk drive, a double-speed CD-ROM drive, Apple's 15-inch Multiple Scan monitor, a 14.4-kbps Global Village fax modem, and a keyboard and mouse. System 7.5 ships preinstalled. The only difference among the three is the capacity of the hard-disk drive — 250 MB, 350 MB, or 500 MB.

For each of the three hardware configurations, you can choose between two software bundles. The small-business package includes ClarisWorks, Quicken, Now Up-to-Date and Now Contact, the American Heritage Dictionary, some games, some clip art, and a few CD-ROM titles. The home-oriented bundle includes Quicken and

Microsoft Works but leans toward CD-ROMs targeted at kids and software such as Mavis Beacon Teaches Typing, Kid Works, and Thinkin' Things.

Sounds appropriate for Performas so far, right? But if you're expecting rock-bottom Performa prices, be warned. At press time, Apple expected the street price for the 250-MB configuration to be a whopping \$2,600. For the 350-MB model, make that \$2,700, and for the 500-MB unit, figure on \$2,850. Even at these prices, they're quite competitive with their Windows counterparts. For example, a Zeos system with a 60-MHz Pentium processor and a configuration similar to a 500-MB Performa 6100's runs about \$2,300. But the Zeos doesn't include a modem or any software other than DOS and Windows.

Considering that people are already snapping up the Performa 570 series — 68040-based models that cost only a few hundred dollars less — the Performa 6100s could be a big hit. But in the markets in which Apple pushes the Performa, a few hundred dollars



is the difference between browsing and buying. And you'll have to get your words-per-minute rate up pretty darn high before PowerPC speed with ClarisWorks means a whole lot to you.

PowerPC Performas? A great idea. Let's hope the prices come down soon. 800-776-2333 or 408-996-1010. / Henry Bortman

Apple Unveils OS-Licensing Strategy

GET USED TO THIS LOGO. Apple is putting in place the pieces necessary to license its operating system. To give the operating system the kind of brand recognition enjoyed by Windows, Apple has officially dubbed the software Mac OS — bland, yes, but it's more enduring than Windows 95 — and given it a logo that will appear on the Mac's startup screen and on all packaging for hardware and software that supports Mac OS.

Without divulging details, Apple acknowledged that it has signed licensing agreements with at least six vendors and that the licensees would announce them. Apple's three-part plan provides licensees with Mac OS; necessary PowerPC hardware components; and support. Currently, a Mac OS-compliant product is defined as having 32-bit-clean architecture and being System 7.5-compatible.

With an eye to increasing its market share by 30 percent over the next three years, Apple has created a strategy that targets second-

tier PC manufacturers in markets and geographical areas outside its current reach and that leverages traditional Apple strongholds such as graphics, multimedia, and collaborative computing. For example, a likely licensing candidate might ship the bulk of its units in South Korea, where publishing is a big business.

Apple's licensing strategy will evolve over the next three years, as Mac OS and the hardware that supports it become compliant with the PowerPC Reference Platform (PReP) standard and move toward using industry-standard components. In theory, the PReP hardware standard enables software to run on various PowerPC platforms with little or no change in architecture, but according to Apple, the current PReP standard is incompatible with the Mac operating system and applications.

Expect to see the Mac OS logo on software boxes in the near future and on hardware within the next nine months. / Pamela Pfiffner



MacTM OS

COLOR PRINTERS /

HP UNDERCUTS THE COMPETITION

Color LaserJet is cheapest color laser printer yet.

COLOR LASER PRINTERS have been issuing forth at a steady clip this year, but the question on many potential buyers' minds is: What will Hewlett-Packard do? Wait no more. The eagerly anticipated HP Color LaserJet is here, and it's everything buyers expected, more and less.

Above all, it's the lowest-priced color laser printer yet. In its base configuration, the printer has a list price of \$7,295, although adding PostScript (\$799) and Ethernet/LocalTalk (\$429) brings the total price to about \$8,500 — about \$2,100 less than the QMS *magicolor* Laser Printer and \$850 less than the Xerox 4900 Color Laser Printer, both comparably equipped LocalTalk models. HP says its printer also offers the lowest price per page, about 9 cents for a page containing text and color graphics. And unlike the QMS and Xerox printers, which use a Hitachi engine, the Color LaserJet is based

on a Konica engine that transfers toner directly to the imaging drum rather than to an intermediate belt.

The HP printer's 300-x-300-dpi resolution is less than its competitors', but for HP's target audience, mainstream business users, that should be enough. Additionally, the printer can produce two dither patterns, controllable on the front panel or through the printer driver. Color-palette caching lets you store frequently used colors to speed up printing. Additionally, HP's Resolution Enhancement technology (REt) improves black type and lines.

The Color LaserJet can print four-color plain-paper output at 2 pages per minute (ppm), two-color output at 4 to 5 ppm, and four-color transparencies at 1 ppm. Black-and-white pages print at 10 ppm. The Color LaserJet creates a distinctive matte look that is different from the glossy output of the other two color laser printers. A 250-sheet input tray is standard, and an optional second paper tray provides a total capacity of 500 sheets. The printer handles legal- and ledger-sized paper for black-and-white printing only.

The Color LaserJet is powered by an AMD 29030 RISC processor and comes with 8 MB of RAM (upgradable to 72 MB). Robust and convenient connectivity features include automatic port, language, and network switching, which are pluses in a multiplatform environment. 800-752-0900 or 800-387-3867 (Canada). / Tony A. Bojorquez



LASER PRINTERS /

Apple Printer Targets Business Workgroups

NOT CONTENT TO CONCEDE the network-printer field to Hewlett-Packard, Apple has introduced a fast, 600-dpi office laser printer that's set to compete against HP's 4Si MX. Geared for multiplatform offices, the LaserWriter 16/600 PS offers a host of networking features and fax capabilities.

Because it's housed in the same casing as the Apple LaserWriter Pro 630, which it replaces, the 16/600 PS may look familiar, but its feature set compares to that of the 4Si MX, which costs about twice as much. The 16/600 PS costs around \$2,300, compared to \$5,299 for the 4Si MX and \$3,549 for the new LaserJet 4MV.

Network support for the AppleTalk, EtherTalk, NetWare, and TCP/IP protocols is standard via built-in LocalTalk, Ethernet, and parallel ports, all of which are simultaneously active and autosensing. A SCSI port lets you attach an external hard drive for additional font storage, and the printer also has a bay for mounting an internal half-height 245-MB hard drive (\$349).

The LaserWriter 16/600 PS contains a speedy, 25-MHz AMD RISC processor and 8 MB of RAM, expandable to 32 MB. Its Canon LBP-ZX print engine — the first time that engine's ever been used — can print 17 letter-sized pages per minute.

The printer's 600-dpi resolution is bolstered by FinePrint, Apple's type-enhancement technology. With the PhotoGrade option, which requires an additional 4 MB of RAM (\$269), the printer's output is comparable to images that have a 106-line screen and 122 levels of gray.

A PostScript or Group III fax option is available with the addition of the Apple Fax Card (\$299), which gives any user on the network the ability to send and receive faxes. 408-996-1010. / Pamela Pfiffner



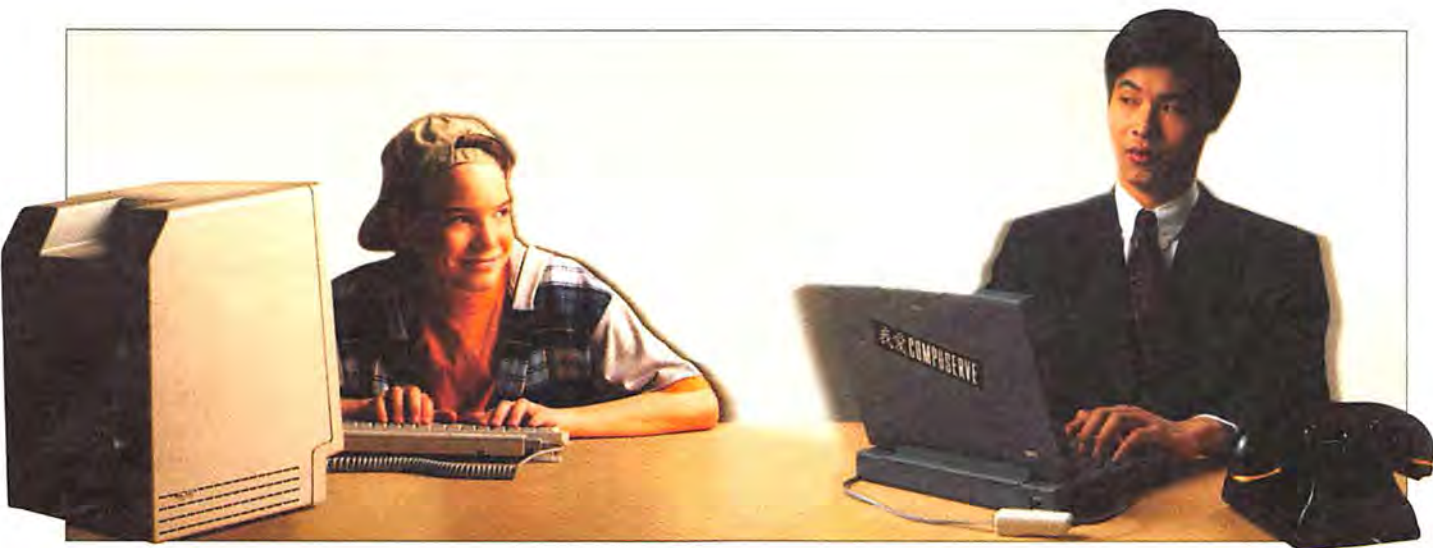
MACUSER/ZMAC UTILITY OF THE MONTH



More than Your Fair Share

THE FILE-SHARING FEATURES built in to System 7 are a boon to networked users, but once you've made your Mac available to the world, you have very little information on, or control over, the people who visit it. This month's ZMac Utility, ShareDevil, gives you a package of valuable tools that help you monitor your file-sharing activities. The application alerts you when people log on to your Mac. Using Apple's speech software, ShareDevil can even announce users by name as they log on and off. It also provides its own special file-sharing monitor window in which you can see the secret identities of guest users. Now you'll know not only whenever someone visits your shared Mac but also everything about the visitor.

Created by Robert Hess, ShareDevil 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



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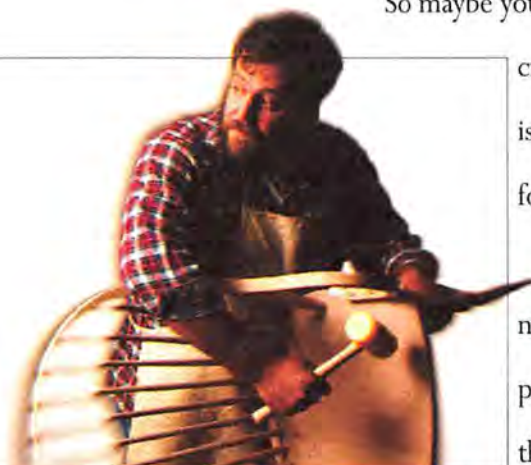
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POWER MAC UPDATE

POWERPC SCREAMER COMING

The 620 chip runs three times as fast as the 601.

THREE TIMES AS FAST. That's the expected speed gain of the PowerPC 620, the fourth chip in the PowerPC line that's off the drawing board, according to the Somerset Design Center, which designs processors. The 620 chip is aimed at the server and high-end workstation market and can process information three times as fast as the 601 processor that is found in today's Power Mac systems.

To achieve this stellar performance, the 133-MHz 620 has a 128-bit data path, processing instructions in 64 bits. Better yet, to maintain backward compatibility with other PowerPC processors, the 620 can run 32-bit and 64-bit applications at the same time. The PowerPC 620 also offers extensive support for SMP (symmetric

multiprocessing), allowing multiple chips to work together on a single task or provide faster performance in server applications.

But a threefold speed increase exacts its price in silicon. The 620 chip is about 2.5 times the size of the 601, measuring 311 square millimeters — slightly smaller than an average postage stamp. It will be the largest single processor in the world, boasting 7 million transistors, compared to the 601's 2.6 million.

The chip should be in production in the second half of 1995, but Apple's customers are unlikely to see it in a desktop machine anytime soon. Although pricing has not been announced, the chip will likely be too expensive for Apple to use in a standard Power Mac. / Sean J. Safreed



TECHNOLOGY UPDATE /

A Little Bit of Cache Can Go a Long Way

CHEAP PERFORMANCE BOOSTERS are the darling of power users. Doubling the clock speed is one way Power Mac 6100 owners can achieve 7100 or better speeds for peanuts. Installing a cache SIMM is another. Can a high-capacity cache SIMM offer the same bang for the buck as a clock-speed booster?

Cache SIMMs keep critical application data close at hand, so the central processor can function at optimum speeds. A variety of 256K cache SIMMs is available for the Power Macs, and Apple installs one in every 8100 (it's optional for the 6100 and 7100). A higher-capacity cache can deliver faster speed for certain applications. So when Apple lent us a 1-MB cache SIMM to compare with the Apple 256K cache, we were excited by the possibilities.

In several of our tests with graphics programs, the cache improved the 8100's speed by more than 10 percent, but overall the 1-MB cache offered little benefit over the standard 256K cache. Other applications (such as database programs) might show a greater

speed increase, but for graphics users, the results are clear. You can reach the same level of performance with a lower-capacity cache — and for a lower price — than shelling out more money for the 1-MB model. / SJS

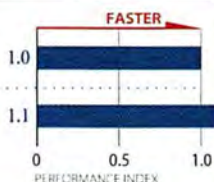
Power Mac Time Trials

WE TESTED a variety of graphics applications, including Photoshop, FreeHand, Infini-D, VideoFusion, and Painter X2 and averaged the results. We ran our tests on a Power Mac 8100 with its default 256K cache and then with the 1-MB cache SIMM installed. The monitor was set to 16 million colors. The chart shows normalized figures for the data. / SJS

MacUser ZD
LABS

Cache Cards

Power Mac 8100
with 256K cache
Power Mac 8100
with 1-MB cache



NATIVE POWER MAC APPLICATIONS

The following is a list of recently shipped native Power Mac applications.

Business		
Dynamics 2.0	Great Plains Software	701-281-0550
Excel 5.0	Microsoft	206-882-8080
FastPace Instant Contact	Foresight Technology	817-731-4444
Omnis 7 ³	Blyth Software	415-571-0222
Games		
LinksPro	Access Technologies	801-359-2900
Out of the Sun	Domark	415-513-8929
Multimedia		
VideoShop 3.0	Avid Technology	508-640-3032
Publishing and Graphics		
ATM 3.8	Adobe Systems	415-961-4400
Color Central 2.2	Aldus	206-622-5500
CSPI	Adobe Systems	415-961-4400
Fontographer 4.1	Altsys	214-680-2060
Gallery Effects	Aldus	206-622-5500
Sonar Pro 8.5 PPC	Virginia Systems	804-739-3200
3-D/CAD		
Blueprint	Diehl Graphsoft	410-290-5114
Collage 2.0	Specular	413-253-3100
Utilities		
Disk Doubler Pro 1.1	Symantec	503-334-6054
Norton Utilities 3.0	Symantec	503-334-6054
QuickKeys	CE Software	515-224-1995
SAM 4.0	Symantec	503-334-6054
Other		
VIP-C 1.5	Mainstay	805-484-9400
Warplanes	Maris Multimedia	510-652-7430

SimmStack Recycles RAM

HAVE A LOT OF RAM that can't be used in your new Power Mac? Now you can take your old memory with you, with Sermax's SimmStack SIMM converter. The SIMM converter lets you put four of the 30-pin SIMMs common in many Mac models onto a board that fits into the 72-pin slot in a Power Mac. The SimmStack has several on-board chips that minimize power consumption and buffer the composite memory, so it looks like a single 72-pin SIMM to your Power Mac.

Currently, the converter fits into any Power Mac 6100 or a 7100 without a CD-ROM drive. It performed without a hitch in our 6100 and 7100. It also fits into various Performa and Quadra models that have 72-pin SIMM slots. \$89. 212-410-1597. / SJS



PRINTERS /

LOW-COST INKJETS HIT THE MARKET

New models ready from Apple, Epson, and HP.

THE INFLUX OF INKJET PRINTERS continues, with updated printers from Apple and Hewlett-Packard and an innovative new model from Epson America.

Apple Color StyleWriter 2400. Apple's latest color inkjet printer has a new compact design. It also has faster speeds and better water-resistant and light-fast inks than its predecessor, the Color StyleWriter Pro. With this model, Apple has also

adopted a two-ink-cartridge setup — one with cyan, magenta, yellow, and black inks, for color printing, and one with only black ink, for monochrome printing. The 360-dpi Color StyleWriter 2400 prints monochrome pages at 3 pages per minute (ppm) and color pages at 3 minutes per page. The 2400 comes with a QuickDraw GX driver, ColorShare

file-sharing software, and a serial interface; a LocalTalk option will be available in January for less than \$125. Apple expects the printer to cost under \$525. 408-996-1010.

HP DeskWriter 540. The \$365 DeskWriter 540 replaces the DeskWriter 520 and 520c at the low end of HP's lineup. The 540 ships as a 3-ppm monochrome printer with a resolution of 600 x 300 dpi, but a color-cartridge-upgrade kit is available for \$49 (color resolution is 300 dpi, and the print rate is 3 minutes per page for color output). The 540 includes HP's RET (Resolution Enhancement technology), which sharpens line edges, and ColorSmart, which automatically selects the correct halftone settings. 800-752-0900 or 800-387-3867 (Canada).

Epson Stylus Color. Newly available for the Mac, this \$699 inkjet printer offers the unique ability to print images at 720 dpi on special paper for high-resolution output (\$25 for 200 sheets). The printer's default resolution is 360 dpi, on either plain bond or coated stock (\$21 for 200 sheets). According



to Epson, the printer's piezoelectric technology, which uses three print heads (one monochrome, two color), results in more-consistent color on the page. Out of the box, the QuickDraw printer is a serial device, but LocalTalk is an option for \$229. A QuickDraw GX driver will be available later this year. 800-289-3776 or 310-782-0770.

HP DeskJet 1200C/PS. HP has made several enhancements to its DeskJet 1200C/PS PostScript inkjet printer and lowered its price to \$2,479. The printer includes an out-of-ink sensor and automatic shutoff when ink cartridges are empty. Also available is a non-PostScript model, the 1200C (\$1,699), which includes HP's ColorSmart technology. A PostScript upgrade to the 1200C costs \$729, but ColorSmart does not currently work with PostScript. Print rates for each unit are 7 ppm in monochrome mode and 2 minutes per page in color. / Pamela Pfiffner

ClarisWorks 3.0 Adds Assistants

THE SLUGFEST BETWEEN Claris and Microsoft is reaching a fever pitch. After all, in 1993 Claris shipped more units than Microsoft, but Microsoft made almost twice as much money. Then Microsoft took aim at Claris' best-selling integrated application with Micro-

soft Works 4.0. Now Claris' return salvo is ClarisWorks 3.0.

ClarisWorks 3.0 responds to Microsoft Works by adding active assistance, easy-to-use templates, and address-book integration. Like Microsoft's Wizards, Claris' Assistants guide users through the process of creating documents, presentations, tables,

and so on, but unlike the competition's, Claris' technology is open, so Assistant modules can be added as Claris or other vendors develop them.

Rather than have a PIM built in to it, ClarisWorks offers integration with the recently released Claris Organizer, which is shipping with ClarisWorks until December 31. The program is also completely compatible with the Windows version, and it requires just 8 MB of hard-disk space for a full install. \$129; upgrade, \$59; trade-in, \$69. 800-544-8554 or 408-987-7000. / PP



ClarisWorks 3.0 includes active help, in the form of Assistants.

POWERBOOK PERIPHERALS /

The Mobile Dream Machine

YOU'RE NEVER OUT OF TOUCH if you and your PowerBook are connected to the \$1,595 AirCommunicator, a new cellular phone and data/fax modem from Air Communications.

Weighing in at one pound, the AirCommunicator is bulkier than most top-of-the-line cellular phones, but you do get a full-featured cellular phone, a reliable 14.4-kbps data/fax modem, and a battery that provides 15 standby hours or 2 hours of data transmission. A standard RJ-11 jack and an AC power pack (which powers the battery charger too) also let you use the AirCommunicator as your desktop modem. 800-247-3282 or 408-749-9883. / Rik Myslewski



PERSONAL FINANCE /

QUICKEN 5 MASTERS MONEY MATTERS

New version adds better planning and analysis.

PERSONAL FINANCE on the Mac has long been dominated by Intuit. Now Quicken 5, a new version of the company's popular money-management program, promises to lengthen Intuit's lead. Most of Quicken's new features are aimed at making the program even easier to use, with an emphasis on point-and-click and drag-and-drop instead of hunt-and-peck.

function allows you to see the results of various scenarios, and comparison reports make it easy to compare data for two time periods side by side.

Some of Quicken 5's niftiest tricks are subtle but slick: It automatically updates security prices if you have it call either a CompuServe account or Intuit's own 900 number (the latter at a cost of \$1 per minute). Also, Intuit's merger last year with tax-software company ChipSoft means that Quicken 5 now integrates many tax functions, including tax forecasting.

Although Intuit is rolling out versions of Quicken for DOS, Windows, and the Mac simultaneously, several new features are exclusive to the Mac, including the timesaving QuickCalc calculator, improvements to QuickFill transactions, and drag-and-drop transaction entry. Intuit has also announced plans for a native Power Mac version sometime next year, which should make balancing your checkbook even faster. Quicken 5 lists for \$49.95, with a \$29.95 upgrade offer. The Power Mac version, when available, will be a \$9.95 upgrade. 415-322-0573. / James S. Bradbury

Quicken's most obvious new feature is the Microsoft-style icon bar, an option giving single-click

access to frequently used functions. Icons are customizable and resizable.

More significantly, Intuit has added better ways to analyze and plan finances. An integrated calendar lets you schedule, enter (by dragging and dropping), or review all transactions for each month. A forecasting

COLOR MONITORS /

At NEC, X Marks the Dot

TO CELEBRATE the tenth anniversary of its MultiSync product line, NEC is releasing a new, X series of autosynchronous monitors. First, to eliminate confusing product names and display sizes, the monitors now range from the economical 15-inch XE15 to the XP21 21-inch power-user model.

Across the line, these models include NEC's OptiClear antistatic, antiglare screen coating; NEC's AccuColor color-adjustment controls; .28-millimeter dot pitch; Invar shadow-mask tubes; dual dynamic-beam focus for a sharp, bright image from the center to the corners; and adherence to MPR II emission guidelines.

All six of these new displays — the MultiSync XE15 (\$575), XP15 (\$695), XE17 (\$1,060), XP17 (\$1,295), XE21 (\$2,095), and XP21 (\$2,580) — have digital controls



with NEC's new On Screen Manager (OSM). OSM uses animations that show you each control's effect before you set it. And NEC goes one step further with its Monitor-Manager software, which allows you to make adjustments to display controls — and set automatic power-down time delays — directly from the Mac desktop. 708-860-9500. / Jeffrey S. Pittelkau



CD-ROMS /

The Next Generation

CAN'T GET ENOUGH of *Star Trek: The Next Generation*? While you're waiting for the feature film, check out *Star Trek: The Next Generation Interactive Technical Manual*, a new CD-ROM from Simon & Schuster Interactive. The \$69.95 disc takes you on a guided tour of the *Starship Enterprise*, narrated by Commander Riker (Jonathan Frakes). Its creators composited more than 15,000 photos of the TV-series set, using Apple's new QuickTime VR technology (see New on the Menu, September '94, page 31). You can travel around 12 rooms and along corridors, zooming in on objects to pick them up and inspect them. Of course, you can sit in Captain Picard's chair on the bridge. 800-983-5333; 212-698-7555 (fax). / Pamela Pfiffner

MacTools Goes Pro for Hard-Disk Repair

HARD-DRIVE GLITCHES unnerve Mac users more than just about anything else. A new version of MacTools offers sophisticated hard-disk recovery that aids disk-repair novices and veterans alike.

Automation is the name of the game in MacTools Pro 4.0. For low-level problems, the AutoCheck utility now includes the diagnostic facilities previously built in to Disk-Fix. AutoRepair now corrects most problems without any user involvement, and AutoCheck's logging features can help track down long-term problems.

Using the new QuickAssist utility is like having a disk-repair expert at your side. You select suspected problems to narrow the scope of what MacTools Pro tries to repair and thus speed up the process. MacTools Pro can't fix malfunctioning hardware, but it offers good advice on how to fix it. \$149.95; upgrade, \$49.95. 800-445-4208 or 503-690-8088. / Sean J. Safreed

NEW & NOTABLE

HARDWARE /

Prometheus ProModem 144e. Combining fax and data transmission with voice-mail features, the ProModem 144e has the capability to answer the telephone and store voice messages in as many as 99 voice mailboxes on your hard disk. The modem also offers 14.4-kbps fax/data capability and comes bundled with fax and terminal-emulation software. \$139. 503-692-9600.

Portrait Display Labs Portrait/15 Pivot. ▼

Featuring the same technology as Radius' Pivot series of monitors, the Portrait/15 Pivot's color screen has a .28-millimeter dot pitch and measures 15 inches diagonally. The monitor supports resolutions as high as 1,024 x 768 pixels and, in landscape mode, can display an entire letter-sized page without reducing the image. \$999. 510-249-0444.



Microtech P4000 and P9000. Geared toward storage-hungry users, the P4000 and P9000 hard drives offer 4 and 9 GB of storage space, respectively. The P4000 (\$3,499 external, \$3,434 internal) is a 3.5-inch hard drive based on Seagate's Barracuda mechanism. The P9000 (\$5,399 external, \$5,334 internal) is a 5.25-inch hard drive also based on a Seagate mechanism. 203-468-6223.

Global Village TelePort Gold II. A slimmed-down redesign of the TelePort Gold 14.4-kbps fax/data modem, the TelePort Gold II includes a simplified panel of status lights, a reduced price, and Global Village's Global-Fax software. \$179. 415-390-8200.

3M PF50 Notebook Privacy Filter. Business travelers working on confidential documents in public places are the target of this filter designed for portable computers. Weighing less than one pound, the filter lets a screen be seen only head-on and also reduces glare. \$119. 800-553-9215.

SOFTWARE /

Special Delivery 2.0. This multimedia-authoring system is for Mac users who don't need high-end scripting or programming capabilities. Enhancements in 2.0 include better control of QuickTime movies, better scrolling and button support, a polygon drawing tool, and ten new transition effects.

\$399. Interactive Media. 415-948-0745.

MarcoPolo 3.0. Integrated OCR capability and improved security highlight the new version of this document-management package. In an attempt to make file management easier, MarcoPolo's OCR engine now places recognized text in an image file, linking searchable text with scanned versions of documents. A new password scheme allows users to specify proxies who are authorized to scan in documents but prevents those proxies from reading other files. \$895. Mainstay. 805-484-9400.

The Musical World of Professor Piccolo. Teaching children about music is the goal of this multimedia CD-ROM, as the animated Professor Piccolo takes kids to the symphony, a jazz club, a music school, and other venues while providing information about music styles, theory, and history. \$70. Opcode Interactive. 415-494-1112.

Snap MAIL 2.0. The updated version of this e-mail package geared to small networks features improved connectivity. No dedicated e-mail server is required, although a server can be used for mail queuing. Gateways to the Internet, Microsoft Mail, and Lotus cc:Mail are available. Five-user pack, \$200. Casady & Greene. 408-484-9228.

Symantec AntiVirus for Macintosh (SAM) 4.0. This venerable virus-checking utility now runs native on the Power Mac and lets users automatically update it with information about the latest Mac viruses via modem. As well as scanning standard files, SAM can scan files in StuffIt, Compact Pro, Disk-Doubler, and Now Compress archives. \$99; upgrade, \$30. Symantec. 503-334-6054.

▼ **Marathon.** This native Power Mac 3-D action game from the maker of Pathways Into Darkness has 3-D texture-mapped graphics, a stereo sound track, and hordes of hostile aliens. As many as eight people can play at once on any LocalTalk or Ethernet network. \$70. Bungie Software. 312-563-6200.



Face to Face 2.0. The latest update to this collaborative document-markup tool lets Windows and Mac users edit documents jointly, offers improved modem support, and allows larger on-screen document windows. Version 2.0 allows conferencing over TCP/IP networks. Crosswise. 408-459-9060.

MACINTOSH PRICE INDEX

THE UNITED COMPUTER EXCHANGE index reflects average sales prices of new and used Macs as of August 30, 1994. Prices (except those for compact models and Performas) do not include a monitor or a keyboard. The United Computer Exchange is a national clearinghouse of used micro-computer equipment.

Mac Model	New	Used
Plus (1/20)	•	\$175
SE (1/20)	•	\$275
SE/30 (5/40)	•	\$550
Classic (2/40)	•	\$375
Classic II (4/40)	•	\$525
Color Classic (4/80)	•	\$725
LC (2/40)	•	\$325
LC II (4/40)	•	\$425
LC III (4/80)	•	\$550
Performa 475 (4/160)	\$1,499	\$1,250
Performa 550 (5/120)	\$1,799	\$1,550
II (5/40)	•	\$350
IIx (5/40)	•	\$450
IIcx (5/40)	•	\$450
IIci (5/80)	•	\$650
IIfx (8/160)	•	\$950
Ilv (4/80)	•	\$900
Quadra 605 (4/80)	•	\$700
Quadra 610 (8/230)	•	\$900
Quadra 650 (8/230)	•	\$1,450
Quadra 660av (8/230)	•	\$1,275
Quadra 700 (8/230)	•	\$1,450
Quadra 800 (8/230)	•	\$2,025
Quadra 840av (8/230)	\$2,599	\$2,300
Quadra 900 (8/230)	•	\$1,700
Quadra 950 (8/230)	\$3,599	\$2,400
Power Mac 6100 (8/160)	\$1,659	\$1,500
Power Mac 7100 (8/250)	\$2,829	\$2,525
Power Mac 8100CD (8/250)	\$4,259	\$3,775
PowerBook 100 (4/20)	•	\$625
PowerBook 140 (4/40)	•	\$750
PowerBook 145 (4/40)	•	\$875
PowerBook 145B (4/80)	•	\$1,000
PowerBook 160 (4/80)	•	\$1,200
PowerBook 165 (4/80)	•	\$1,250
PowerBook 165c (4/80)	•	\$1,450
PowerBook 170 (4/40)	•	\$1,325
PowerBook 180 (4/80)	•	\$1,800
PowerBook 180c (4/80)	•	\$2,125
Duo 210 (4/80)	•	\$825
Duo 230 (4/120)	•	\$975
Duo 250 (4/200)	•	\$1,500
Duo 270c (4/240)	•	\$2,150

• = 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 Mac-User 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.

There's the one where your ex-girlfriend
turns

into a rabid dingo and chases you and
you keep getting your feet stuck in some
weird mucky stuff
until finally

you reach a cliff above a river and
as you jump you see her mother waiting
for you below.

holding a weed-whacker.

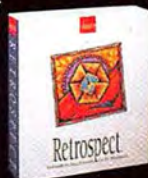
Then there's the one where it's 4:30
the day before your vacation and you
accidentally hit the delete button as you
attempt to print the 46-page
update you were supposed to show
your boss at 5:00.

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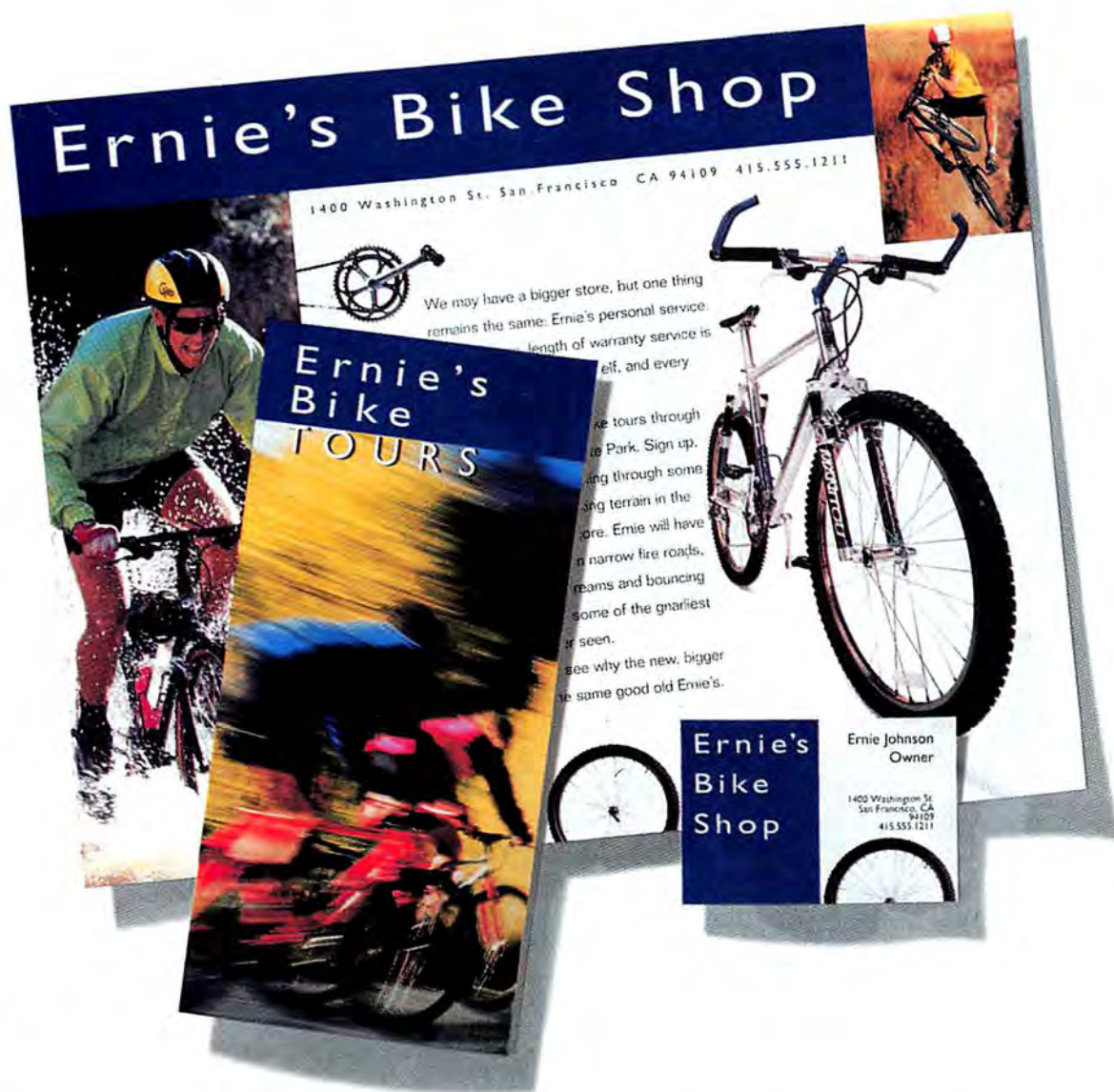


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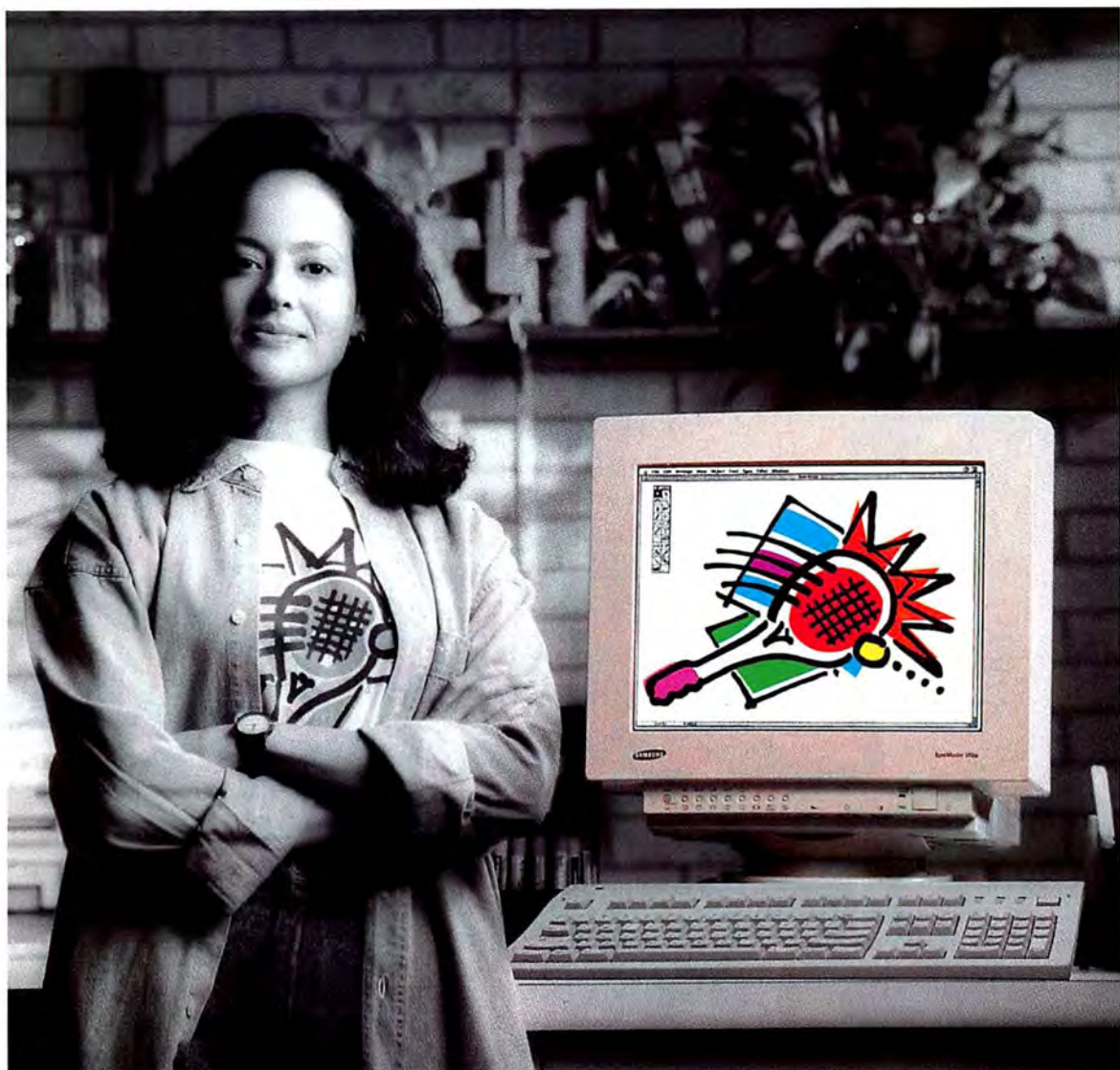
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Maximum Refresh Rate at Maximum Res. (Hz)	75	75	75	75
MPR-II (Low Radiation)	•	•	•	•
Power Management	•	•	•	•
Flat Square Screen		•	•	•
On-Screen Programming			•	•
Real Color Control				•
Warranty	2 Years	2 Years	2 Years	2 Years

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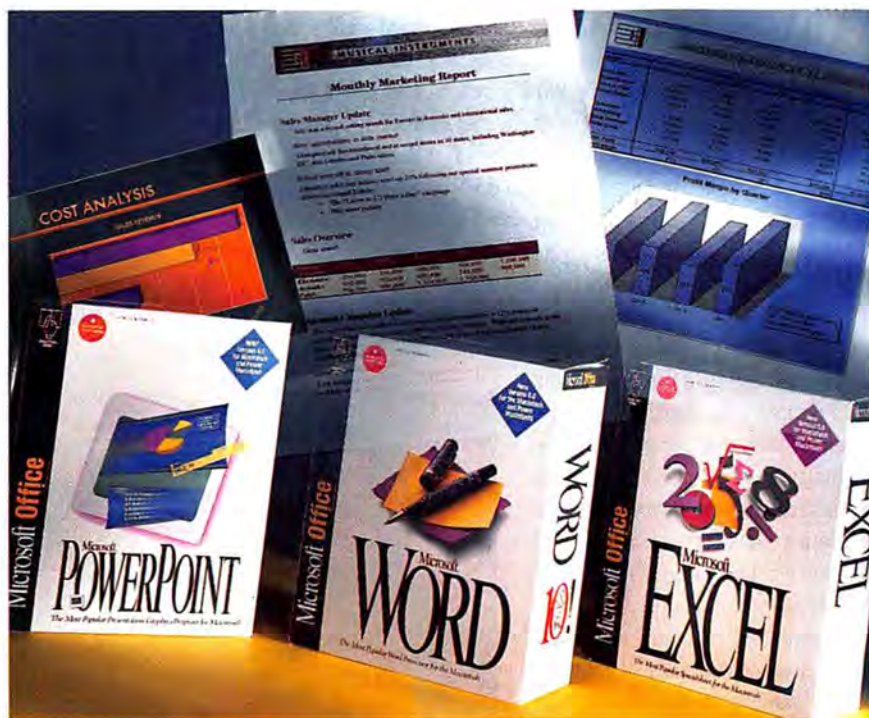
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REVIEWS & Quick Clicks



Microsoft Word 6.0, Microsoft Excel 5.0, and Microsoft PowerPoint 4.0 / Redmond revs the giants.

► Microsoft Word 6.0

MONOLITHIC IS THE WORD that readily comes to mind to describe Microsoft Word 6.0, but the latest incarnation of Microsoft's industrial-strength program is also the coolest word processor we've seen. Brimming with new features — some of them quite dazzling — Word 6.0 is definitely not for everyone. You need a fast, powerful Mac as well as lots of disk space and memory to run the massive Word at an acceptable clip,

but if you've got the system, Word has the goods.

If you have one of the older 680x0 Macs, such as an SE, a Classic, or a PowerBook 100, forget about Word 6.0. It won't run on your machine. Period. At the very least, the new Word requires an LC, but even then, it slogs along at a barely tolerable crawl. Even on 68030 Macs, its speed can be disappointing, especially if you're used to the more sprightly speed of previous versions. For memory, you'll need at least 8 MB to get the program running smoothly and you'll need even more if you plan to take advantage of its OLE (Object Linking and Embedding) 2.0 support.

The first thing you'll notice about Word is its classy new appearance. Nearly every window component, pop-up menu, dialog box, and button sports a slick 3-D look. And instead of one tool bar, it now has a set of

ten, so you have one-click access to all frequently used commands. To avoid clutter, you can hide or turn off any you don't need.

Beyond cosmetic enhancements, many existing features have been refined and improved. The convoluted Glossary command has been replaced with the more straightforward AutoText feature. The Undo command now traces your last 100 steps, so if you make a lengthy series of blunders, you can undo them all. If you undo too many, you can use the 100-step Redo command. The new Borders tool bar makes adding borders, rules, and shading to selected paragraphs much easier — you don't have to fish through a series of dialog boxes to find the options you need.

The headache of creating tables with Word has been greatly relieved by the addition of several Excel-like features. The Table AutoFormat command lets you pick from more than 30 preset table formats and apply them instantly. The Table AutoFit command, also borrowed from Excel, automatically resizes a table to fit the width of your page.

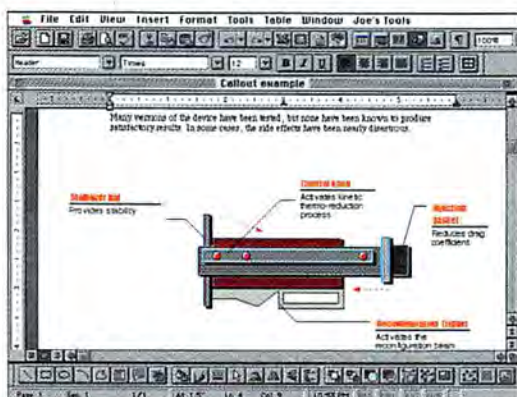
Word's Print Preview feature is also improved. You can now view thumbnails of multiple pages of a document, rather than viewing a couple of pages at a time. If you discover that your document is slightly longer than it's supposed to be, you can use the clever Shrink to Fit command, which automatically tightens text and adjusts fonts to squeeze a document onto one less page.

Other interface refinements are more subtle, but they make using the program a pleasure. For example, you can now apply formatting to a single word without selecting it — simply place the cursor anywhere within the word and choose the formatting options you want. Another neat subtlety is the AutoSelect feature, which automatically grabs a word at a time when you drag through text, making text selection easier.

In addition to refinements, Word 6.0 is packed with completely new features. You can now magnify a Word document and zoom in for a detailed look at your work.

Reviews Rating Key

- ★★★★★ Outstanding
- ★★★★ Very Good
- ★★★ Acceptable
- ★★ Poor
- ★ Seriously Flawed
- ★ Dangerous



You need a powerful Mac to run Word 6.0 at an acceptable speed, but the release is packed with great new tools. The callout feature lets you create lines and text boxes for labeling figures and tables.

Another welcome addition is support for character-level styles, so you can apply multiple styles to a single paragraph. In Word's Style pop-up menu, paragraph-level styles appear in boldface and character styles don't, so you can easily tell the two apart.

The AutoCorrect feature — which automatically corrects typos, such as *teh* for *the*, as soon as they appear on-screen and which you can train to correct your personal keyboard slips — is also a winner. You can set AutoCorrect to instantly convert designated abbreviations to expanded text entries too.

Additional highlights include Shortcut menus, which pop up on-screen and provide fast access to common commands; a complete macro-programming facility that lets you automate various functions; Bookmarks, which let you mark and name portions of a document so you can jump directly to them later; a type-styling tool called WordArt; and expanded drag-and-drop features that let you drag items from one document and drop them into another.

Word is now more customizable than ever, so you can get rid of commands and features you don't want or use. The previous version let you take your favorite commands, shortcuts, styles, and glossary entries and load them into a custom menu called the Work menu. With Word 6.0, you can add any number of new menus and call them anything you want.

With the Customize dialog box, you can turn any command into a keyboard shortcut, a menu item, or a tool-bar button. Conversely, you can remove any items you want from the menus and tool bars if you don't need them. You can create new tool bars or

rearrange the existing set. You can even design your own toolbar buttons from scratch. In fact, Word 6.0 has so many options that customizing it can be time-consuming. But when you've finished, you have a word processor tailored precisely to your needs.

We liked many of Word's new features, but not all of them met our expectations. AutoFormat is supposed to help you format documents with as little fuss as possible. It works by analyzing a document type and then formatting it automatically. Great idea, but the Word applies are repetitive and

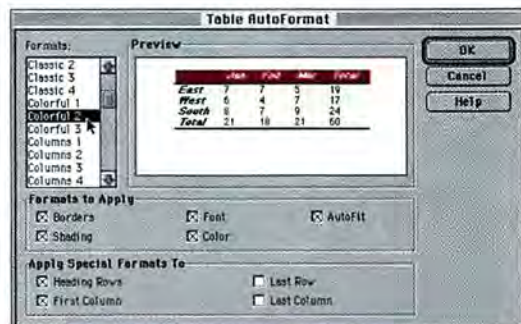
the formats Word applies are repetitively uninspiring. Type a business letter, for example, and Word will give you exactly three options for auto-formatting — a “classic” letter in Times, a “contemporary” letter in Helvetica, or a “typewritten” letter in Courier. That’s it. If you’re completely new to word processing, you may find this of some value, but savvy users won’t really benefit.

The same goes for Word's Wizards, which are designed to step you through the creation of typical business documents, such as fax cover sheets, memos, and letters. Although we found the Wizards in Excel and PowerPoint genuinely helpful, the Word Wizards seem condescending. Their step-by-step approach feels particularly silly if you're writing a simple letter or memo. And the boilerplate text that the Wizards plug in to documents is of limited use. How many business users are really going to send off professional letters filled with Microsoft's stock phrases? An example: "Although we can't promise that we will implement your suggestions, we appreciate them and will give them the serious consideration they deserve."

Another dud is Word's drawing tools. Sure, they've been enhanced, but we found that they are less sophisticated than the tools you get in the draw and paint modules of even entry-level integrated-software programs. There aren't any tools for creating blends, gradients, or Bézier curves. You cannot do anti-aliasing, and you're stuck with a limited color palette. In short, most of the drawing tools just aren't worth using.

The one notable exception is the new callout feature, great for creating text boxes and callout lines for labeling tables and figures.

Word 6.0 requires System 7.0 or later. A full installation requires at least 25 MB of hard-disk space. The so-called Typical installation, which includes the core program and key components such as the spelling and grammar checkers, thesaurus, and Help files requires 9.5 MB. A bare-minimum installation requires only 5 MB, but then you don't get many of the great features you paid for. The initial release did not include native Power Mac software, but a Power Mac version should be available by the time this review appears.



Creating tables is much less frustrating than before, with Word 6.0's Table AutoFormat command.

The Bottom Line

Microsoft has rolled dozens of new features and enhancements into Word 6.0. The result is one gargantuan program. It's safe to say that you need at least a Mac IIci for barely acceptable performance, and even then, you may get impatient waiting for things to display. For those who have a 68040 Mac with hard-disk space to burn, however, we recommend Word 6.0 — it truly is the last word in word processing.

/ Joseph Schorr

Microsoft Word 6.0

Rating: ★★★★★

Price: \$300 (street).

Pros: Excellent tools for formatting and proofing documents. Supports character-level styles. Highly customizable.

Cons: Sluggish on older Macs. AutoFormat feature and Wizards of limited value. Lackluster drawing tools.

Company: Microsoft, Redmond, WA;
800-426-9400 or 206-882-8080.

Reader Service: Circle #401

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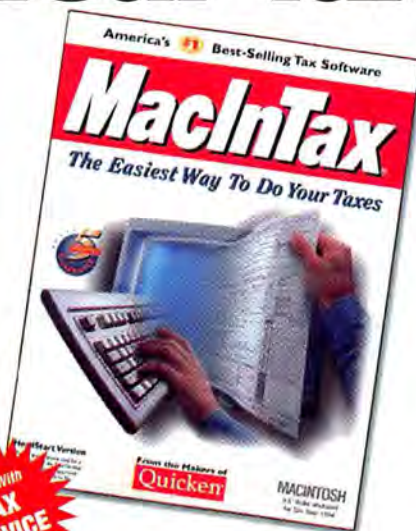
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6 The Exceeded Guideline

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► Microsoft Excel 5.0

TO BOLDLY GO WHERE no spreadsheet program has gone before appears to be the goal of the latest release of Microsoft Excel. Version 5.0 boasts Wizards that help you work smarter, PivotTables that let you create different views of your data simply by dragging and dropping data headings, and new tools that make charting less frustrating than with previous versions. What's more, the new Excel ships with native Power Macintosh software in the box, so if you're lucky enough to have a Power Macintosh, you'll be able to run processor-intensive tasks at a much snappier pace than with the previous version running in emulation mode or with the 680x0 version of Excel 5.0 running on a non-Power Macintosh machine.

Keeping Tabs

Even though Excel remains a vast, complex application, Microsoft has done a lot

to make the new release easier to use than previous versions. Excel 4.0's overly hierarchical menu structure, for example, made many simple formatting and analysis functions cumbersome. As you tackled a task, every step generally required a trip to the menu bar and a brief holdover in a dialog box. By contrast, Excel 5.0's menus and tab dialog boxes help streamline many operations. Case in point — in place of version 4.0's six separate cell-formatting commands, each with its own dialog box, Excel 5.0 provides a single dialog box with six labeled tabs — click on a tab, and you'll be in business.

In the "it's about time" department, Excel finally supports in-cell editing, so you can double-click on a cell and edit its contents without having to move the cursor to the formula bar at the top of your worksheet. Not only is this easier but it also allows you to use different formatting for each character in a cell. You can even add superscripts and subscripts.

Version 5.0's Wizards also help make the program easier to use. The Tip Wizard, for example, watches the way you work and offers expert tips on shortcuts and alternative methods. We found the Tip Wizard's advice genuinely helpful for accomplishing unfamiliar tasks. And if you're really set on doing something your way rather than the Wizard's, the Wizard can take a hint. It's smart enough to stop bothering you with the same suggestion if it sees you haven't



New data-management tools abound in Excel 5.0. With the AutoFilter command, you can have Excel create selection criteria for each field in a list and place the criteria in a drop-down menu at the top of each column. To filter the data, simply make a selection from the menu.

adopted its method. ToolTips, which display helpful descriptions of Excel's many tool-bar buttons when you pause the cursor over a button, are also a plus.

To help keep you organized, Excel 5.0 places all related worksheets, chart sheets, macro sheets, and Visual Basic program modules into a workbook. Workbooks employ the same organizer tabs you see in

dialog boxes, so you can easily view and manipulate all the sheets in a workbook. Workbooks offer several other advantages as well — you can sum rows and columns across different worksheets, for example, and specify the same format for some or all of the worksheets in a workbook.

Chart Smarts

Microsoft added the ChartWizard to the previous version of Excel, but as anyone who has struggled with the program's charting module knows, the ChartWizard served only to eliminate some potholes — the road remained pretty rough.

One of the thorniest problems was the separate window that you had to open in order to edit the charts you placed into worksheets, which made editing rather cumbersome. No more — Excel 5.0 allows you to edit charts directly from within worksheets. Moreover, the new version gives you more-direct control over the elements in a chart. Position them simply by dragging; resize them by double-clicking to select them. You can also create objects, including text boxes for annotations, and add them directly to charts, using Excel's drawing tools.

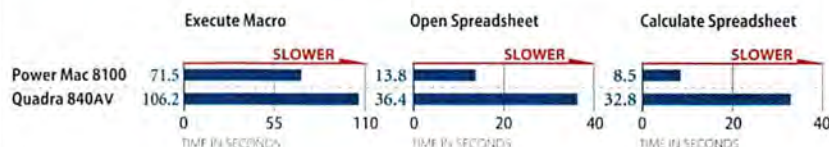
Another welcome addition is the Insert New Data command. How many times have you gone to the trouble of creating a chart, only to find that you needed to add a new data series? Excel 5.0 makes this easy: Simply select the new data range, and either drag and drop it onto the chart or use a menu command. Excel will automatically update and redraw the chart.

A real boon for chart jockeys is version 5.0's customizable AutoFormat gallery, which allows you to save frequently used

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Power Mac users can expect zippier spreadsheet performance with the native Power Mac version of Excel 5.0, which ships in the new package, than can Quadra owners using the 680x0 version.



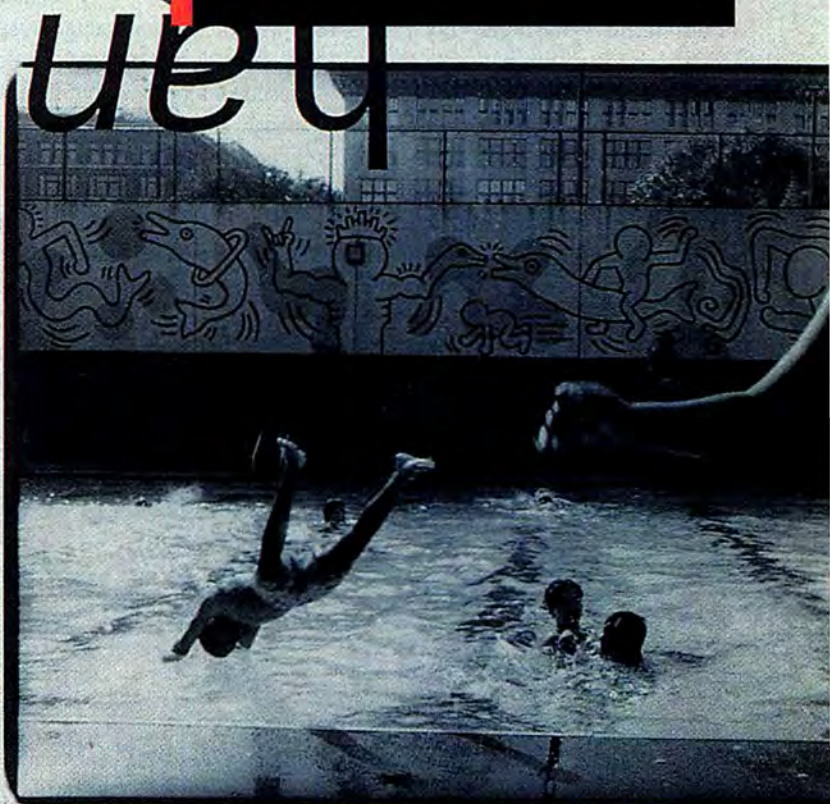
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ich Village, a movie crew is time-tripping 30-odd years into the past to film "Raging Kids holler from a rooftop as the cameras follow Robert DeNiro (playing LaMotta). le with the actor playing LaMotta's brother. Around the pool, women in one-piece pical shirts play cards. DeNiro has eyes for only one: the platinum blonde who sits . The camera moves in for a close-up of her legs...and director Martin Scorsese calls,



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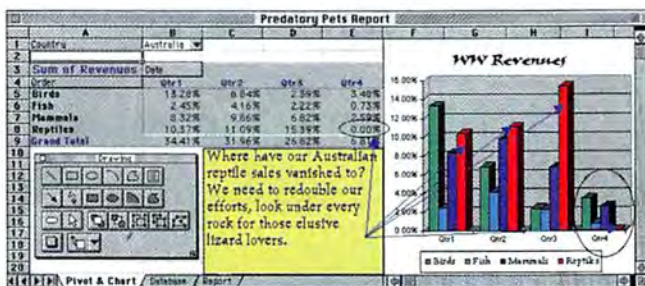


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Working with charts is easier than before, with Excel 5.0. You're no longer stuck with an awkward separate window for editing them, and you can use Excel's drawing tools to manipulate chart objects directly.

chart formats and apply them to other charts, much as you use style sheets in a word processor.

Last but not least, in this version, Microsoft has added a long list of analysis and display enhancements, including error bars, trend lines, curve fitting, and a new doughnut chart.

Data Management

Even though many Excel aficionados use the program to manage lists of data, data management has been one of its weakest

aspects. We were glad to see that the new version boasts a variety of major improvements in this area.

The award for the most innovative new feature goes to the PivotTable, a dynamic reporting tool. PivotTables can automatically summarize the data in a table across multiple variables. Even better, you can produce whole sets of reports with different views of your data simply by dragging and dropping data headings within a PivotTable.

For example, with the previous version of Excel, if you wanted to summarize your quarterly sales first by product and then by country, you had to go through a painstakingly complex series of queries. With a PivotTable, you can have Excel automatically produce totals and subtotals by any variable as well as produce running totals

or percents. The PivotTable Wizard guides you step by step through setting up a PivotTable.

Another nice feature that helps you manage your list data is Excel's ability to automatically select the data ranges and summarize fields in the list when you're creating a database, so you don't have to go through a lengthy setup process.

At the same time, you can easily create subsets of a list with a click of the mouse. First, you use the AutoFilter command, which prompts Excel to create selection criteria for each field in a list and then place the criteria in a drop-down menu at the top of each column. To filter the data, you simply choose a category from the drop-down menu, and Excel does the filtering. Those who do complex queries will find this feature especially powerful.

The ability to create automatic subtotals is another time-saver. When you select groups of data in a list, Excel automatically calculates subtotal and grand-total values, so there's no need to manually sort data and insert formulas. The program also outlines

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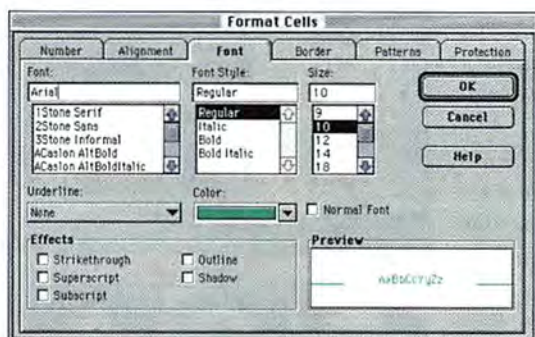
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Tabbed dialog boxes in Excel 5.0 make it faster and easier to get to related commands.

data lists for you, so you can readily see how they're organized and hide and show detail data.

Down to the Basics

Despite the flexibility of Excel's macro language, Microsoft has taken the brave step of replacing it with a brand-new one — Visual Basic for Applications (VBA) — in version 5.0. Not to worry: VBA is able to call your old macros and even make use of them as subroutines.

It's easy to understand why Microsoft

recommends VBA over the previous macro language for creating custom applications. VBA is a robust object-oriented language that includes a simple editing environment and a built-in debugger. Because many features of Excel 5.0 are implemented as objects, VBA can manipulate them directly. Another advantage is that you can construct a library of Excel objects to share with other

Microsoft applications, such as Word and Project. Our one big disappointment with Excel 5.0 is that it still doesn't implement Cut, Copy, and Paste commands in standard Macintosh fashion. That means that you cannot leave items on the Clipboard for later use — Excel erases them as soon as you invoke another command. And our one continuing pet peeve is that Excel has the annoying habit of reversing the order of the data whenever it creates a bar chart from spreadsheet data.

The Bottom Line

Crammed with so many powerful features, menus, commands, and dialog boxes, Excel will probably never be easy to use. With version 5.0, however, Microsoft has done an admirable job of simplifying many of the program's tasks. Also, many features are cleverly implemented and innovative. If you're an Excel 4.0 user, you'll find Excel 5.0 well worth the \$99 upgrade price. If you're new to spreadsheeting, rest assured, version 5.0 throws a lot fewer obstacles in your path than previous versions. / Clay Andres

Microsoft Excel 5.0

Rating: ★★★★★

Price: \$300 (street).

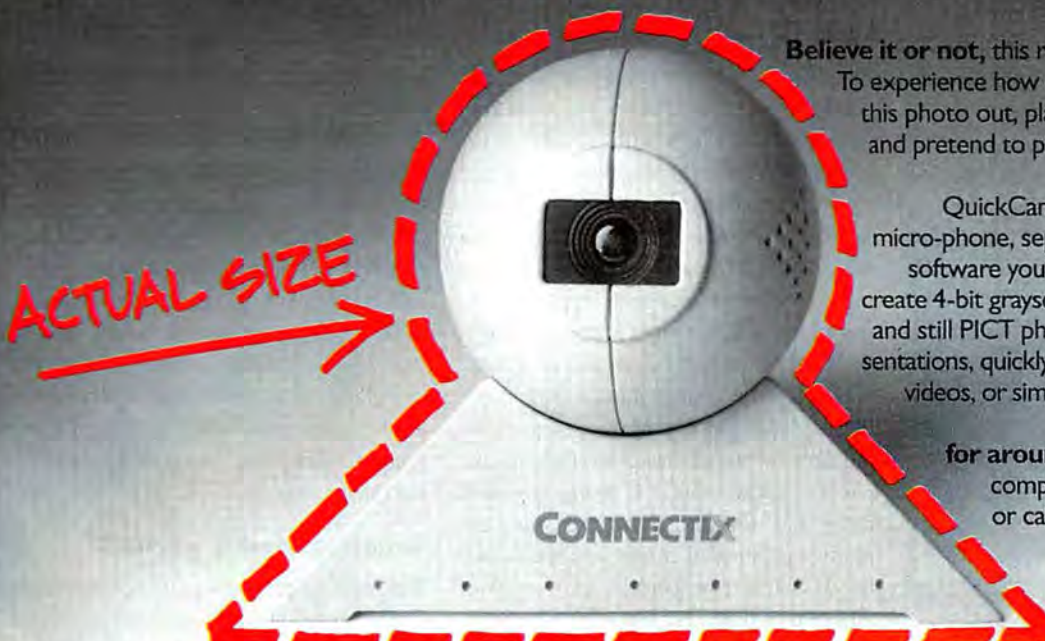
Pros: More streamlined interface. Helpful Wizards. Vastly improved data-analysis and -management tools. Object-oriented programming environment.

Cons: Nonstandard cut, copy, and paste.

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► Microsoft PowerPoint 4.0

A BLANK SCREEN can be a scary thing, especially if you're trying to create a business presentation that's due — well, yesterday. And with over 16 million colors, a type foundry's worth of fonts, and an enormous supply of clip art at your fingertips, it's all too easy to come up with the Design from Hell. Fortunately, help is on the way with the latest release of Microsoft's presentation-software package. PowerPoint 4.0 comes with built-in interactive Wizards that assist you not only in achieving a professional look for your presentation but also in creating effective content.

Make Your Point

Installing PowerPoint is easy, but you need plenty of disk space — a complete installation (including clip art and a 9.2-MB folder of miniapplications and resources) requires about 32 MB. You also need a good supply of memory — we recommend at least 16 MB if you plan to run the miniapplications.

When you launch PowerPoint, it presents you with five choices for creating your presentation: You can use either the AutoContent or Pick a Look Wizard for guidance, you can use a template or an existing presentation's format, or you can open to that scary blank page.

The AutoContent and Pick a Look Wizards are essential parts of Microsoft's highly touted IntelliSense technology, which aims to put an expert guide into PowerPoint (as well as into Word and Excel). Initially we were skeptical about just how effective

IntelliSense could be, but PowerPoint's Wizards sold us. They really work, especially if you're not an expert at creating presentations from scratch.

The AutoContent Wizard displays a progressive series of dialog boxes that poses questions about the type of presentation you want to create — one that sells, recommends, or communicates a plan or idea, for example. Based on your answers, the Wizard builds a basic presentation structure, complete with sample text. All you do is replace the sample text with your own information. The Pick a Look Wizard provides similar smarts for creating the right design for your presentation and automates common tasks such as applying templates and adding page numbers to handout pages.

If you're wedded to an outliner for creating presentations, you'll probably find PowerPoint's outliner adequate. For those who need more-powerful tools, however, Microsoft has done an excellent job of integrating PowerPoint with Word 6.0's outliner. By clicking on PowerPoint's Report It button, you can export your PowerPoint outline as an RTF Word document, launch Word 6.0, and load the converted file as an untitled document. When you've perfected your outline in Word, you can use Word's Present It button to reverse the process, sending the outline back to PowerPoint.

OLE, OLE

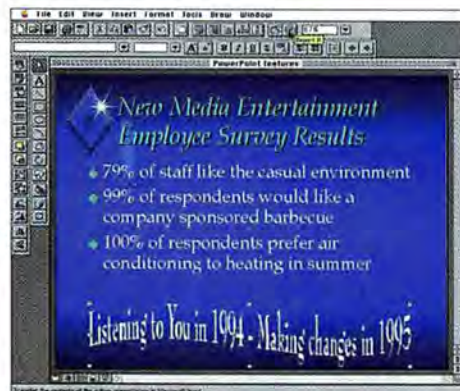
Once you've created the basic content and design of your presentation, you're ready to enhance your slides with visuals. Using Microsoft's OLE technology, you can embed equations, charts, enhanced text, and Word tables — all fully editable from within PowerPoint. The package provides several miniapplications designed especially to work with OLE — there's Microsoft Graph, Org Chart, Equation Editor, and WordArt.

Graph should satisfy most of your charting needs, and it's one of the easiest charting tools we've seen. It supplies the requisite pie, bar, stacked, and 3-D charts as well as radar and doughnut charts. If you need more-sophisticated charts, you can embed Excel charts (worksheets too) in your PowerPoint slides. For text effects, we especially liked the WordArt type-styling application, which lets you create logos and titles by rotating and distorting text.

For images, you can insert EPS, PICT,



Wizards and Cue Cards help you get your presentation up and running in a flash. With the AutoContent Wizard, you can even get help creating effective content.



Professional-looking presentations are even easier to create than before with the latest release of Microsoft PowerPoint. A welcome bonus is the WordArt miniapplication for creating and adding special text effects to slides.

and TIFF files. The PowerPoint package comes with more than 1,100 clip-art images, which you can customize once you've placed them in a slide. To fine-tune the look of your slides, PowerPoint now lets you rotate objects and text. The new Nudge feature lets you precisely position objects by moving them one pixel at a time.

For attention-grabbing special effects, PowerPoint provides several options. You can choose from more than 40 transition effects as well as create slides that let you present bullet points one at a time by clicking the mouse.

Practice Makes Perfect

When you're ready to practice your completed presentation, PowerPoint helps you get the timing just right for each slide. As you cycle through the slides, the program can keep track of how long each slide is displayed and set the timing accordingly. If you

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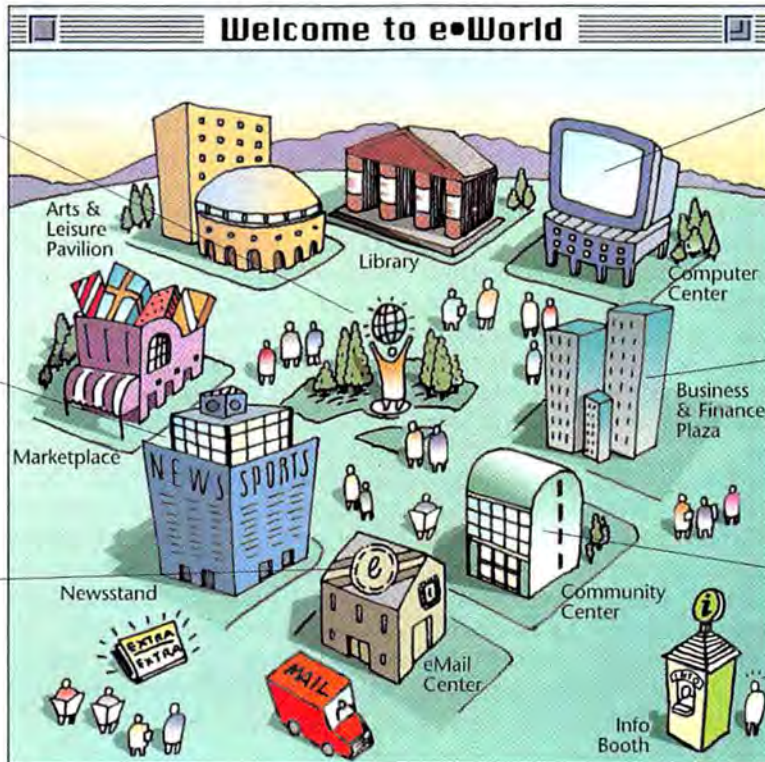
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Office Politics / the yeas and nays of Microsoft Office 4.2

SURE, MICROSOFT OFFICE is a bargain. Where else can you get a full-featured word processor, spreadsheet program, presentation software, and mail program for less than \$500? But the concept behind Office 4.2 is far more ambitious than bundling Microsoft Word 6.0, Excel 5.0, PowerPoint 4.0, and Mail. The real goal is to make the programs work together seamlessly via Microsoft's OLE. To a large extent, Microsoft achieves its goal, but Office users should be prepared to encounter some rough spots along the OLE highway.

The Good News. Microsoft has done plenty to make moving among Office applications easier. For starters, the three core programs look and act more alike than ever. Beyond that, the Office package includes something you don't get when you buy Word, Excel, and PowerPoint separately: The Microsoft Office Manager system extension, which provides on-line help for cross-application functions. It also adds a new menu to the menu bar that lets you easily launch the programs and switch among them.

In addition, all three programs are equipped with OfficeLinks, which do the work of shuttling information among applications. For example, the Excel Worksheet tool in Word lets you drag out an Excel worksheet within a Word document without having to think about launching Excel. Tools such as these help you exploit the integration of the Office environment but save you from concerning yourself with what's going on under the hood.

The Bad News. For this go-around, OLE 2.0's drag-and-drop facilities show some disappointing inconsistencies. For example, you can drag a draw object from Excel to Word but not from Word to Excel. Even more confusing, you can drag selected text from Word into a PowerPoint slide but *not* into a PowerPoint outline. These inconsistencies leave you guessing about when you can use drag-and-drop embedding and when you can't. Furthermore, Microsoft's OLE-based drag-and-drop is incompatible with System 7.5's Drag and Drop,

which many Macintosh applications will support. This means that you won't be able to drag data between these applications and the new Office programs.

The problem is compounded by seemingly contradictory on-line help. If you double-click on an Excel chart embedded in a Word document, Excel's tools appear and you get a message in the status bar that says, "Double-click chart to edit." But when you follow those instructions, you're presented with a dialog box that says you *can't* edit a chart in place.

Finally, in our tests, dragging and dropping across applications produced some wildly unpredictable results. A small spreadsheet of ten rows by four columns and a small-scale chart object dragged into a Word document each grew into a full-page object — we had to manually scale them down. In several cases, the scaling of an Excel object embedded in a Word document went haywire after we tried to edit it. Microsoft's tech support suggested several possible reasons for the glitches, but ultimately, our problems remained unsolved.

And then there's the issue of memory. You can't take advantage of Office's tight integration unless you can actually run all the applications simultaneously — and each *one* of them requires a bare minimum of 2 to 4 MB of application RAM. Office is bundled with a free copy of Connectix's RAM Doubler, for good reason — without it, many OLE features would be virtually impossible to use on a Mac equipped even with 8 MB of RAM.

Still, despite these glitches, much of Office's drag-and-drop technology works quite well. It's downright exhilarating to be able to select a range of cells in Excel and drag them into a Word or PowerPoint document. Likewise, dragging Excel charts into Word and PowerPoint can make the creation of presentations and reports much easier. That kind of integration, when it works, is what makes Microsoft Office 4.2 add up to more than the sum of its parts. / Joseph Schorr

decide you want to cover a topic in more depth, you can use PowerPoint's drill-down feature to add buttons to slides that branch to other applications, so you can display a table in Word or a worksheet in Excel.

PowerPoint's help system is another big plus for novices. Cue Cards provide step-by-step instructions on how to accomplish common but sophisticated tasks such as adding QuickTime movies or changing colors in a color scheme.

Overall, we were much impressed with PowerPoint 4.0, so much so that it's replaced Aldus Persuasion as our favorite presentation program. Although Persuasion 3.0 is feature-rich — it offers navigation features and basic animation tools, neither of which PowerPoint has — its less than intuitive interface and poorly implemented floating palettes limit its usability. We much prefer PowerPoint's tool bars and helpful Wizards.

And for those who are working in cross-platform environments, PowerPoint offers

near-seamless transfer of presentation files between PowerPoint for the Macintosh and PowerPoint for Windows, an ability that Persuasion can't match. The one hurdle to watch out for if you plan to exchange presentations between Macs and PCs is fonts — be sure to use mirror font families that are available on both platforms. Note also that QuickTime movies don't play correctly when transferred to a Windows machine.

Our one minor complaint with PowerPoint is that it's quite sluggish when you're running it with the miniapplications, such as Graph and WordArt. The initial release of PowerPoint 4.0 is for 680x0 Macs only, although a native Power Macintosh version should be available by the time this review appears.

The Bottom Line

Feature-packed and boasting a level of cross-platform compatibility that no other presentation application is able to match,

PowerPoint 4.0 is a clear winner in its class. If you want to spend more time on your presentation and less time deciphering how your software works, PowerPoint is for you. From content to presentation design, PowerPoint's Wizards offer invaluable guidance, so you don't have to be an expert to get polished results. And if you're already familiar with Word and Excel, you'll feel right at home with PowerPoint's menus and tool bars. / Blake Roberts

Microsoft PowerPoint 4.0

Rating: ★★★★★

Price: \$300 (street).

Pros: Feature-rich. Easy to use. Special text-manipulation features. Can rotate text and graphics. Cross-platform-compatible.

Cons: Sluggish when running miniapplications.

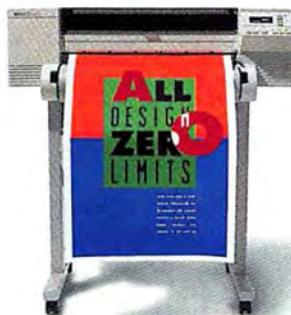
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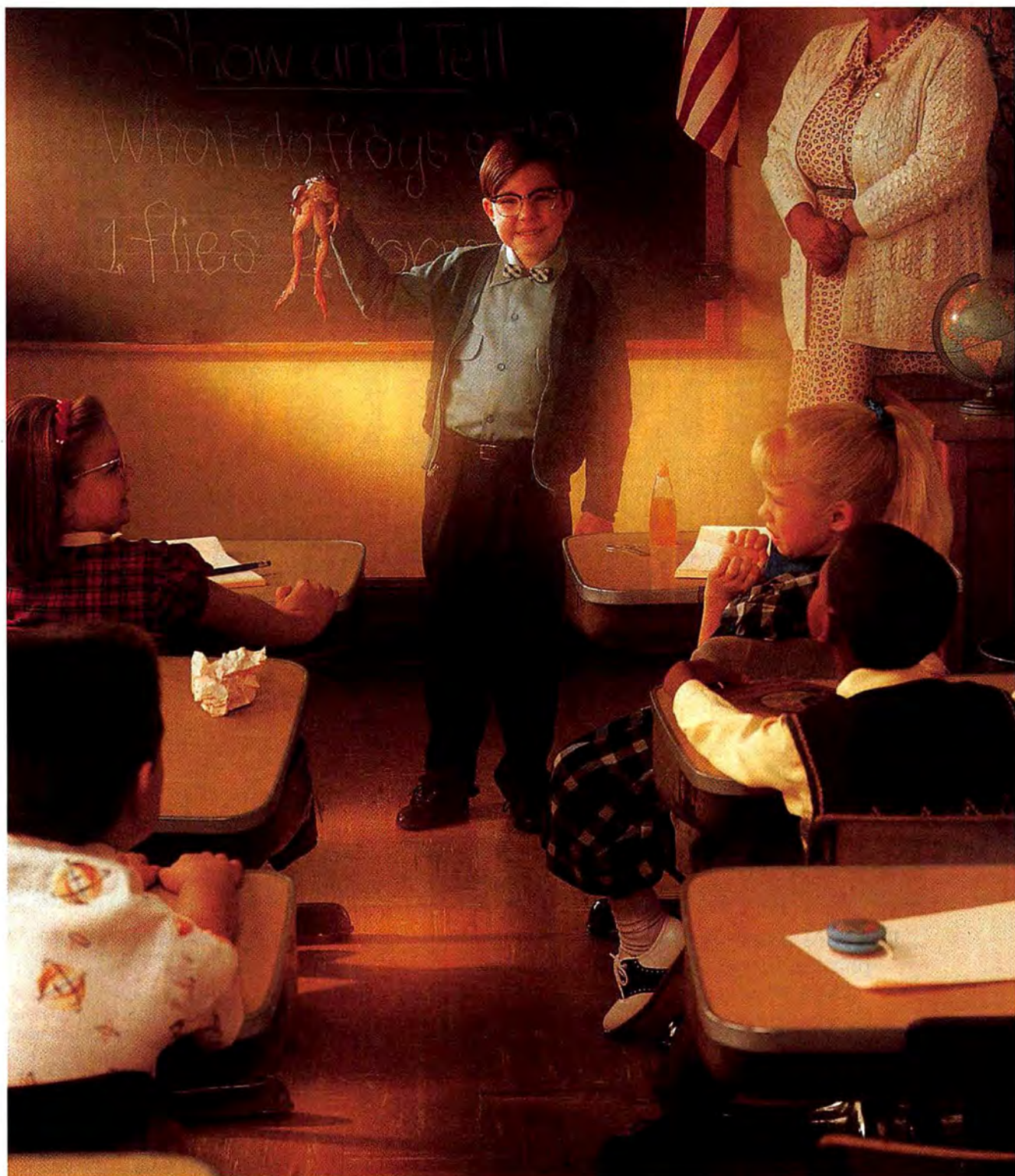
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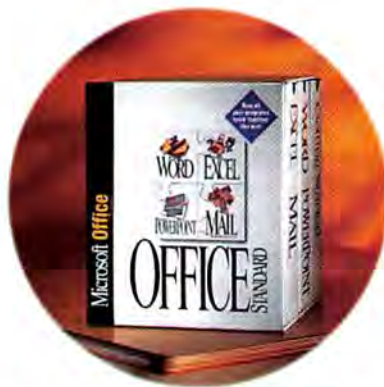
Finally, use Rehearsal to practice your presentation against the clock. So you're sure to cover your points in the allotted time.

The fact is, PowerPoint 4.0 is so easy to use, you may already know how. Why? Over 100 PowerPoint tasks are done exactly the same way in Microsoft Excel and Word. And now with OfficeLinks, you can turn

a Word 6.0 document into a presentation in PowerPoint with a click.

All told, new PowerPoint 4.0 makes presenting effectively a snap. So visit a retailer, or to find one near you, call (800) 871-3267, Department 6HA. And you'll once again master the art of show-and-tell.

Microsoft PowerPoint 4.0 is the latest version of the most popular presentation graphics program for the Macintosh. Part of the Microsoft Office family.



Microsoft Office

HP LaserJet 4MV / HP stakes out new turf in the office-printer arena.

BILLED AS A NEW CLASS of laser printer, the 600-dpi, 16-ppm Hewlett-Packard LaserJet 4MV sits squarely between its two closest



siblings — the LaserJet 4Si MX departmental printer and the LaserJet 4M Plus workgroup printer. The new LaserJet is tailored for workgroups that don't require the muscle of the high-priced LaserJet 4Si MX, which costs \$5,299, but do want a higher-volume and speedier printer than the \$2,479 LaserJet 4M Plus. Priced at \$3,549, the LaserJet 4MV boasts an impressive set of features: PostScript Level 2 support; high speed; I/O buffering for print spooling; excellent output quality; built-in networking features; and last but not far from least, tabloid-sized-paper handling.

The Engine That Could

What allows the 4MV to handle a heavier workload than the 4M Plus is its new Canon engine, which has a duty cycle of 35,000 pages per month, compared to 20,000 for the 4M Plus' engine. The 4MV is also equipped with a fast, 33-MHz Intel i80960 sCF RISC processor and plenty of RAM — 12 MB, expandable to 44 MB.

If printing to your office printer reminds you of waiting in line at the bank during your lunch hour, the 4MV will make you think the bank added another teller. The printer's I/O buffering acts like a cache, so the 4MV can spool print jobs while it's processing. For each megabyte of memory you install, the printer reserves 100K as a buffer. Although the buffer doesn't necessarily speed printing, it does cut down on the amount of time your Mac is tied up while it's processing print jobs.

You expect high-quality output from a 600-dpi printer, and the 4MV delivers that and more. You get crisp text, sharp lines, and rich blacks. And the 4MV's support for 122 levels of gray enables it to print especially impressive gray-scale images. Photographic images boast sharp detail and smooth transitions from light areas to dark. Of course, like other HP laser printers, the 4MV comes with the company's Resolution Enhancement technology, for smoothing

angles and curves of text and graphics.

Networking features are yet another strong point. The 4MV comes standard with HP's JetDirect card for LocalTalk and Ethernet (BNC and 10BASE-T). It additionally has an HP Bi-Tronics parallel interface. All of the ports are active simultaneous-



Smaller and cheaper than most departmental printers, the 16-ppm HP LaserJet 4MV nonetheless has enough muscle and speed to handle the printing needs of very large workgroups.

ly, and the printer automatically switches between PostScript Level 2 and PCL 5.

Another welcome and long-overdue feature from HP is a SCSI port, which lets you connect a hard drive to the printer for font storage. The one drawback is that you must use the user-installable internal 1.3-inch 42-MB hard drive that HP provides — you can't use any other brand of internal drive, and external drives aren't supported at all.

Workgroup printers are switched on almost constantly, so it's nice to know that the 4MV comes with energy-saving features. The printer meets EPA Energy Star standards, and the Power Save adjustable timer reduces the amount of power the printer uses when it's idle.

Setup is a snap. The software installer places the driver, PPDs, and other utilities and files in their proper places on your hard disk. You can configure the printer's options via its easy-to-use front control panel or via the driver or utility software.

The 4MV's paper handling is workgroup-capable. The printer comes with a

built-in, adjustable 100-sheet multipurpose tray for envelopes and other assorted paper sizes as well as with two removable 250-sheet cassettes — one for letter-sized and the other for tabloid-sized paper (you can use only one cassette at a time). HP also offers an optional universal-sized 500-sheet feeder that fits under the printer.

Sibling Rivalry

To find out how much faster the 4MV is than its popular sibling the 4M Plus, we used MacUser Labs' standard suite of laser-printer test documents. Our test platform was a Quadra 650 with 8 MB of RAM and built-in Ethernet.

As we expected, the 4MV outperformed the 4M Plus by a wide margin, especially when we were printing complex PostScript files — the 4MV printed our one-page Illustrator document and four-page Page-Maker document in less than half the time of the 4M Plus.

When we compared the image quality from the two 600-dpi printers, we found that they had similar output, although the 4MV's beefed-up gray-scale support gave it the edge for photographic images.

The Bottom Line

If your workgroup's printing needs have grown beyond the capabilities of a printer such as the 4M Plus, you'll definitely want to consider the HP LaserJet 4MV. It's faster and more rugged, and it comes with networking features already built in. Its output quality is exceptional, particularly for gray-scale images. All in all, the 4MV prints sharp but it does a good job of blurring the line that separates workgroup and departmental printers. / Roman Victor Loyola

HP LaserJet 4MV

Rating: ★★★★★

Price: \$3,549 (list).

Pros: Excellent output quality. Gray-scale enhancement. Flexible paper handling. SCSI port for hard drive.

Cons: Supports only one brand of internal hard drive. External hard drives not supported.

Company: Hewlett-Packard, Santa Clara, CA; 800-752-0900 or 800-387-3867 (Canada).

Reader Service: Circle #404.

Digital Ocean Grouper 100LT / Wireless networking with radio waves.

BY USING DIRECT-SEQUENCE, spread-spectrum radio technology, the Digital Ocean Grouper 100LT connects Macs and printers, cutting the twisted-pair umbilical cord that has traditionally connected LocalTalk networks. Without the constraints of physical wiring, you can place LocalTalk nodes in locations that were previously inaccessible.

Mobile Networking

The Grouper 100LT is a radio transceiver that you can connect to any Mac through its LocalTalk port and that can transfer files to any other Grouper 100LT transceiver in



The Digital Ocean Grouper 100LT lets you connect your PowerBook to your network without wires.

the same network zone. Digital Ocean provides a mounting kit that allows you to attach the Grouper 100LT's wedge-shaped case to the underside of your PowerBook. The Grouper 100LT adds 22 ounces to the weight of your laptop Mac. You can also use the Grouper 100LT with desktop Macs, although we recommend placing the device on top of the monitor or on a bookshelf, for better network-signal reception.

The Grouper 100LT's software consists of a control panel and a system extension. The control panel allows you to configure the Grouper 100LT as a hub, a remote device, or a dynamic hub. As a dynamic hub, the Grouper 100LT exhibits its flexibility: Special circuitry monitors signal strength and switches hub-management responsibilities between Grouper 100LTs for optimal throughput. The system extension monitors network activity on each Grouper 100LT for most machines flawlessly, but it caused our Power Mac 8100 to crash on startup. Digital Ocean's tech-support representatives suggested that we remove the Grouper 100LT's extension until the company has a fix.

The Grouper 100LT has three levels of security. On one level, each Grouper 100LT can be configured to communicate only

with specific other Grouper 100LTs, which identify themselves by factory-assigned numbers. You can also use the AppleShare security architecture and Digital Ocean's optional encryption package.

Communication speeds between Grouper 100LTs were slower than they were between conventionally wired LocalTalk nodes. In our tests, a 33K file took 10 to 15 seconds to transfer between Grouper 100LTs; on a wired network, transferring the file took less than 3 seconds. Transferring a 1-MB file took more than 4 minutes, much longer than between the wired nodes, which took only 1 minute, 35 seconds.

Product specifications claim that the Grouper 100LT has a maximum range of 800 feet, but for typical office setups, we found network reliability and integrity inconsistent beyond 300 feet. And the Grouper 100LT won't allow you to get a tan and e-mail your colleagues at the same time, because building walls and atmospheric interference make outdoor use impossible.

The Bottom Line

The Grouper 100LT is an innovative product that lets you reconfigure your network dynamically and optimize throughput easily. However, its bulky design and slow LocalTalk throughput compared to a wired network limit its practical usefulness to small-file transfers and e-mail correspondence. / Blake Roberts

Digital Ocean Grouper 100LT

Rating: ★★

Price: \$699 (list).

Pros: Reliable wireless connectivity. Dynamic hub configuration optimizes devices' throughput.

Cons: Bulky. Extension crashes Power Mac 8100 on startup. Large files transfer slower than on a wired LocalTalk network.

Company: Digital Ocean, Lenexa, KS; 800-345-3487 or 913-888-3380.

Reader Service: Circle #405.

POUR IT ON!

The new Fractal Design Painter[®] 3 upgrade is filled with a lineup of really cool features with something for everyone! Snazzy new stuff like the Image Hose[™], the super-natural way to literally spray paint with selected images. Or new professional multimedia and video capabilities that include frame-by-frame animation, rotoscoping and full compatibility with QuickTime[®] and Video for Windows[®].

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CIRCLE 24 ON READER SERVICE CARD

Adobe Dimensions 2.0 / Pump up flat graphics with this simple 3-D program.

ADOBE DIMENSIONS turns your 2-D art into 3-D without the price or learning curve of a 3-D graphics package. As with its previous version, you can use it to add 3-D effects to artwork created in standard drawing packages. And with its latest release, Dimensions has graduated into a stand-alone 3-D application, offering basic drawing tools and new time-saving features.

With the new pen and text tools, you can first draw source images and create text in the 2-D window and then move the images to the 3-D window and apply 3-D effects to them. The drawing tools aren't as sophisticated as those in Aldus FreeHand or Adobe Illustrator, but they do allow you to draw basic shapes and create headlines within Dimensions, often saving you from having to bounce between programs for every alteration.

The Art of 3-D

Working with Dimensions' 2-D and 3-D windows is fairly straightforward, although it takes a bit of practice to start thinking about how to create a 3-D design if you're unfamiliar with the process. To create a bottle, for example, you draw a profile of half the bottle in the 2-D window and click on the Apply button to send the profile to the 3-D window. Then, in the 3-D window, you select Revolve from the Operations menu. In the ensuing dialog box, you set the rotation angle to 360 degrees and click on the Apply button. A 3-D black-and-white wire-frame bottle, ready for coloring, scaling, and positioning, appears in the 3-D window. Alternatively, you can extrude a 2-D image, such as text, into the third dimension by using the Extrude command and designating a depth.

One of Dimensions' best features is the ability to automatically show changes you make in the 2-D window in the 3-D window. So if you shorten the neck of your bottle,



New 2-D tools let you create text and basic shapes from directly within Adobe Dimensions, so you don't need a separate program. You can then apply 3-D effects by extruding or revolving 2-D objects.

its corresponding 3-D image will adjust accordingly. Change fonts, sizing, or even the words of text in the 2-D window, and you will instantly see the results in the 3-D one. Any changes you've made in the 3-D window to such aspects as positioning, lighting, and surface properties remain intact. Confusingly, however, changing the fill color in the 2-D window doesn't affect the 3-D image.

You can create, name, and edit custom colors in Dimensions 2.0, either by mixing your own colors in CMYK or by importing custom colors from Illustrator documents. You can now also shade an object with any color; previously, you could use only black for shading.

Dimensions' 3-D effects aren't as rich as those you can create with more-expensive 3-D graphics programs, but on the other hand, Dimensions' designs save in Illustrator format, so you are able to edit them in Illustrator, FreeHand, or Canvas.

Another new convenience in version 2.0 is multiple levels of undo, limited only by the amount of RAM you allocate to the program. Unlike other programs, which ask you to set the *maximum* number of previous designs you want preserved in memory, Dimensions lets you set the *minimum*. If you run short of RAM, Dimensions will prompt you to save your design.

Selective Rendering

Rendering an image in any 3-D program is time-consuming. In Dimensions 2.0, you can render just a part of an image, to get a preview of what your surface will look like. You can also cancel the render at any point. And for those who have a Power Macintosh, the native version of Dimensions harnesses the PowerPC chip's impressive processing power, for quicker image previewing and rendering.

Overall, Dimensions is easy to use, particularly for extruding 3-D text. In the 3-D window, you can choose from a variety of rendering levels, viewing angles, and perspectives. For other work, however, Dimensions' interface can get cluttered and confusing. For instance, to change the text color and font on a bottle label, you have to juggle the 2-D and 3-D windows and a pair of palettes and use the text as well as the selection tools.

The Bottom Line

Dimensions is a super program for easing artists used to traditional drawing programs into the realm of 3-D art. It gives you a quick way to create 3-D logos, headlines, and illustrations. The drawing tools new in version 2.0 make Dimensions complete — you no longer have to use a separate program to create text and basic shapes.

/ Shelley Cryan

Adobe Dimensions 2.0

Rating: ★★★★★

Price: \$199 (list).

Pros: New 2-D drawing tools. Changes to 2-D designs automatically reflected in 3-D designs. Support for custom colors and color shading.

Cons: Cluttered and cumbersome interface for some designs.

Company: Adobe Systems, Mountain View, CA; 800-833-6687 or 415-961-4400.

Reader Service: Circle #406.

Pinnacle Micro Tahoe-230 Optical Drive

Traveling light with 230 MB.

IF YOU TRAVEL with huge files and create even more when you're on the road, Pinnacle Micro has a portable optical drive for you. Weighing only 1.8 pounds, the Tahoe-230 can hold as much as 230 MB on a 3.5-inch erasable cartridge and runs on either AC power or its own battery.

Travel-Sized Storage

The Tahoe-230 is a state-of-the-art magneto-optical drive that can read from and write to 128-MB and 230-MB cartridges and fits into a small, stylish case. The drive uses a fast SCSI-2 interface capable of read rates as high as 5 MB per second in synchronous-burst mode and 1.47 MB per second sustained.

On average, it has a seek time of 28 milliseconds, about twice as long as a hard drive's seek time but respectable for a magneto-optical drive and quite a bit shorter than that of a CD-ROM drive.

The 1.4-x-4.8-x-8-inch drive comes with a SCSI-2 driver for installation in your System Folder and PMO Formatter, a utility for initializing, formatting, and partitioning cartridges. PMO Formatter also lets you password-protect cartridges.

Cabling Dilemma

One drawback of any SCSI-2 device is the cable and its connector, which doesn't mate with standard Mac SCSI peripherals' 50-pin connections. The Tahoe-230 comes with a SCSI-2-to-25-pin Mac cable, which means the drive has to be the first external device on your desktop Mac's SCSI chain. You can't use this cable with your PowerBook, nor can you use your PowerBook's HDI-30 SCSI connector cable with this drive. Other cables are available from Pinnacle for \$29.95 that let you connect the drive to a PowerBook or install the Tahoe-230 in the middle of a SCSI chain. You can also get a 25-pin-to-HDI-30 SCSI converter, such as APS' SCSI Boy for \$19.95.

If you plan to use the Tahoe-230 primarily for traveling, you might be interested in the optional \$199 Traveler's Kit, which includes a SCSI-2-to-PowerBook cable, a rechargeable NiCd battery for the Tahoe-230,



About the size of a hardback book, the Tahoe-230 is perfect for travel. However, in order to attach it to your PowerBook, you need to buy cables separately.

a battery charger, and a carrying case for the drive and the battery. The battery weighs a little bit more than a pound, which means it's almost as heavy as the drive, but it can power the drive for more than three hours. And because you can boot your PowerBook from a cartridge in the Tahoe-230, you can add a few hours to your PowerBook's battery life by not accessing the PowerBook's hard disk — if you're willing to live with the slower access speed of a magneto-optical drive.

The Bottom Line

Of course, the Tahoe-230 costs more than an internal hard drive, but it does offer unlimited data storage on safe, reliable magneto-optical cartridges and is nicely sized for travel. Its small size will save you desktop space when you get back to the office.

/ John Rizzo

Pinnacle Micro Tahoe-230 Optical Drive

Rating: ★★★★★

Price: \$999; Traveler's Kit, \$199; 230-MB cartridge, \$69 (list).

Pros: Small size. Fast SCSI-2 interface.

Cons: Bundled cable only attaches to desktop Macintosh. Slower than hard drive.

Company: Pinnacle Micro, Irvine, CA; 800-553-7070 or 714-727-3300.

Reader Service: Circle #407.

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Color-It! 3.0 is now shipping and MacWeek says "At 149.95, Version 3.0 is an economical paint program with a variety of powerful tools."



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CIRCLE 111 ON READER SERVICE CARD

DateBook & TouchBase Pro Bundle

Bright PIM features dimmed by sluggish performance.

MANAGING A SLEW of contacts and appointments is a daunting chore, but these days there's no dearth of PIMs (personal information managers) to help with the workload. One of the latest releases, a bundle of the veteran TouchBase Pro contact manager and DateBook Pro calendar programs, features a long list of impressive enhancements as well as tighter integration between the two programs than the previous versions offered.

But the new features tax resources and program design. The programs are simply not as nimble nor as easy to use as earlier versions. The DateBook & TouchBase Pro Bundle requires at least 2.2 MB of RAM, and the speed of both programs on a 68030-based Mac is decidedly unimpressive. Both programs feel sluggish, and several of the interface elements are more awkward than they should be.

TouchBase Pro 4.0

With a well-designed set of tools for entering, searching, and sorting detailed contact information, TouchBase Pro is the stronger of the two programs. The new version provides fields for two addresses, three phone- or fax-numbers (with one-button autodialing), and notes and appointments (which you can link to your DateBook Pro calendar).

You can also attach documents created with other applications to any record and launch the documents from within TouchBase Pro. In addition, TouchBase Pro now supports 16 customizable fields — including 2 number fields, 2 date fields, and 4 check boxes — which you can name as you please to

store more-detailed contact information.

As in the previous version, you can use a variety of shortcuts to speed data entry. For example, you can create a default list of values for any field and then enter values into records either via a pop-up menu or by typing an abbreviation that you've defined. However, you must enter default values one at a time — a rather tedious process — into a disappointingly clumsy dialog box.

The best new feature is the ability to link TouchBase Pro contacts quickly and easily to your DateBook Pro calendar, using drag-and-drop (you need System 7 for this to

work). To link a contact directly to an appointment on your DateBook Pro calendar, you simply drag the contact's name to a date on the calendar.

You enter information for each contact record into fields in six groups, which you can collapse and expand as needed. For example, when you're not looking at linked calendar events or information in custom fields, you can collapse those groups and display only the information you need in the record window.

That's convenient, but we found TouchBase Pro's customizing features surprisingly limited. You cannot rearrange fields in detail windows or delete fields you don't use, such as those for a fax number or a salutation. In addition, you can't customize the font, size, or style of text in your list view. And although you can resize and re-

arrange the columns in your list view, you can't eliminate any of them — you're stuck with all 15 columns, even if you use only a handful.

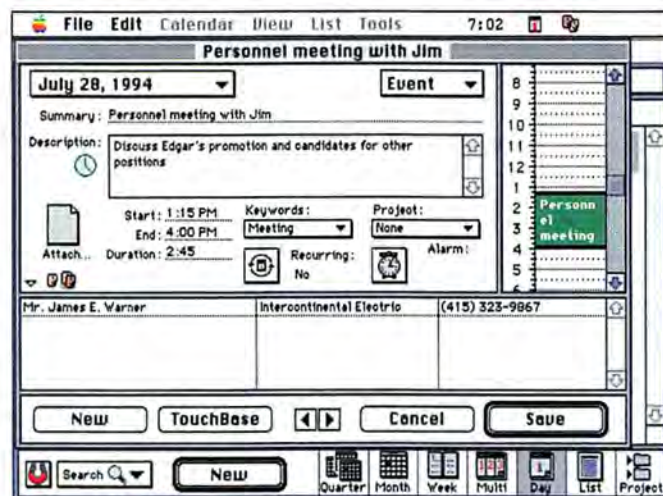
For fast access to your TouchBase Pro data, an extension displays a TouchBase icon in your menu bar. Clicking on the icon lets you view frequently used contact information and dial phone numbers, but you can't search for a contact without launching TouchBase Pro.

DateBook Pro 4.0

DateBook Pro offers all the standard features you'd want in a calendar program, plus a few extras. It lets you create memos, to-do items, and appointments and display them in several views — daily, weekly, monthly, and quarterly.

You can search for scheduled items based on specific criteria and display the found items in a list. New to this version is the project view, a handy feature that lets you attach a project name to each item and then group items related to the same project in a folder.

Like TouchBase Pro, DateBook Pro is surprisingly inflexible. For example, you can't



By simply dragging and dropping, you can link a contact in TouchBase Pro (top) with an appointment in DateBook Pro (bottom).

select the font, size, or style of text in your list view. And although you can mark a group of consecutive days with a banner, you can't reposition the banner on the date cells (it stays anchored to the lower half) nor can you drag it to another location on the calendar.

You can create item categories (personal, business, and so on), but you can't differentiate the categories by using various text styles and colors in calendar views. Even though you can set criteria for searches, there's no way to filter the monthly calendar view so that it displays only those items that meet a certain criterion.

Like TouchBase Pro, DateBook Pro includes an extension that adds an icon to the menu bar. Click on the icon, and you get the DateBook menu, which lets you quickly add calendar items and set alarms without launching DateBook Pro itself.

From the menu, you can also open Mini DateBook, a small window that lets you see a day's worth of appointments or to-do items. You can't set repeating events with the DateBook menu, however, and you must

use two dialog boxes if you happen to want to create a new event and then link an alarm to it.

Even worse, you can't edit or delete events without launching the full application. In contrast, the Reminder extension that comes with rival calendar program Now Up-to-Date places the day's pending items right on the menu itself — rather than in a separate window — and you can edit events and set linked alarms without launching the program.

Last but not least, DateBook Pro turned out to be slightly buggy. Alarms worked inconsistently, and a weird glitch in the Edit Custom Lists dialog box caused our Macintosh to beep when we typed Next Week into a search field (the beeping continued until we clicked on the Cancel button).

The Bottom Line

The DateBook & TouchBase Pro Bundle represents the next logical step for Aldus: a calendar program hooked to a contact manager with drag-and-drop links that offer definite advantages to people who

frequently juggle both types of data (and who doesn't?).

But the two programs' good-looking interfaces and genuinely useful tools are, unfortunately, compromised by poky performance and several clumsily implemented features. It's safe to say, however, that with the addition of a little polish, a few modest enhancements, and a boost in speed, the DateBook & TouchBase Pro Bundle could prove to be a winning combination. / Joseph Schorr

DateBook & TouchBase Pro

4.0 Bundle

Rating: ★★

Price: \$89.99 (street).

Pros: Good data-entry shortcuts. Drag-and-drop links between calendar and contacts.

Cons: Sluggish. Inability to customize text in list view. Some features awkwardly implemented.

Company: Aldus Consumer Division, San Diego, CA; 800-888-6293 or 619-658-0111.

Reader Service: Circle #408.

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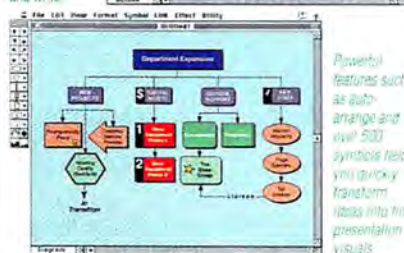
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Live Picture / HSC raises the bar for image editing on the Mac.

IMAGING PROFESSIONALS looking for a more productive way to edit huge image files on the Mac may want to consider HSC's Live Picture. Although it lacks many of the amenities of more-general-purpose image editors such as Adobe Photoshop, Live Picture lets you manipulate and composite large images with unprecedented speed.

If the Shoe FITS

Based on the innovative FITS (Functional Interpolating Transformational System) technology, the \$3,995 Live Picture speeds the image-editing process by creating a mathematical record, in place of pixel information, of the operations you perform on a scanned image. The mathematical description that Live Picture sends to the screen allows you to preview the effects of your editing operations without time-consuming pixel manipulation.

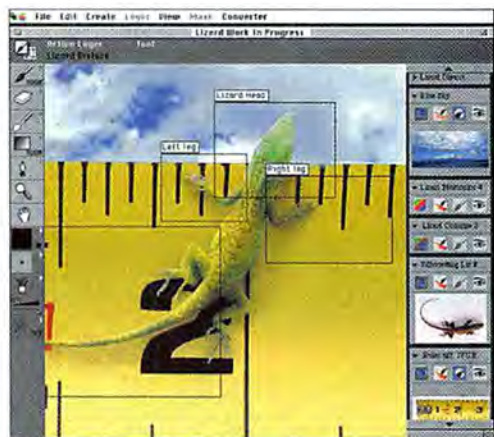
Before Live Picture can work with your source images, it must first convert them into its own proprietary format, called IVUE. Using Live Picture or the separate LP Converter utility that comes with the package, you can convert Photoshop 2.5, EPS, and Scitex CT files. Once Live Picture has converted a file, the file is about 30 percent larger than the original. Converting a 40-MB Photoshop 2.5 file into IVUE format took a little more than three minutes on our Quadra 950.

When you've finished editing an image, Live Picture generates the document's actual pixels in a separate postprocessing session. The program generates TIFF, Photoshop 2.5, EPS, and Scitex CT files, at the resolution you specify. Postprocessing sessions can be time-consuming, depending on the size of the file and the final resolution, but the speed boost for editing, combined with Live Picture's support for extremely high-resolution final images, helps compensate for the lengthy postprocessing sessions.

All of your editing operations are stored on separate layers — a real boon when you

want to apply a process to one area of an image without affecting the others. There are 11 types of effects layers, including an image-distortion layer and one layer each for monochromatic and multicolor painting, silhouetting, cloning, blurring/sharpening, and color correction. A collection of standard editing tools (scale, rotate, and crop) is also available for each layer.

Live Picture's layering technology makes the program well suited for image compositing. It's easy to position multiple image elements independently, moving them to the foreground and background, duplicating and grouping them, and so on. Each



Live Picture's layering technology makes the program a good choice for image composition.

layer comes with two editable masks — one for controlling transparency and one for controlling image boundaries. In addition, for creating masks from scratch, there are pen, freehand, and basic-shape tools. Or you can paint directly into the mask layers to create custom masking effects.

Because you can specify any resolution for the elements and documents you create with Live Picture, the program can be valuable for a variety of sophisticated imaging applications. For example, when you paint with Live Picture's paintbrushes, the program displays brush strokes at screen resolution but can render them at a much higher resolution for final output. Likewise, Live Picture does a good job of rescaling bit-mapped images to very large sizes (poster-to wall-sized documents, for example)

SCREEN IMAGE COURTESY OF DE SALVO PHOTOGRAPHY

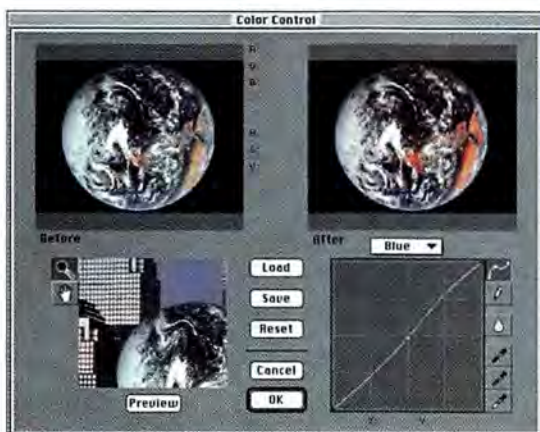
while maintaining excellent image quality.

For those who work with multiple high-resolution images, Live Picture provides excellent tools for creating chrominance and luminance masks. It's especially good at minimizing "color spill" on objects that are moved from one background to another. We were also impressed with Live Picture's unique incremental-undo capability — you can undo any brush effect by selectively erasing it. Another strength is the program's support for 48-bit precision for painting and color-correction tasks.

Live Picture's strengths for manipulating high-resolution images are unmatched, but the program has several drawbacks. Graphics and prepress professionals — Live Picture's target audience — will find several key features missing. The program lacks an Unsharp Mask filter, essential for professional-quality image sharpening, and the current version has no CMYK color-correction facilities — all color-correction tools are based on the RGB color model. (HSC says it plans to add CMYK support to a future upgrade.) Moreover, in spite of its high price tag, you're limited in what you get with the package. No plug-in filters are available, and Live Picture offers no support for interchannel math effects.

Finally, two other functions — cloning and painting — can present problems. For cloning, you can't take samples from two areas and apply them to a single target area, a frustrating limitation for serious retouching tasks. For painting operations, Live Picture's brushes apply strokes in a decidedly unorthodox fashion. As you drag a brush across the screen, you see the paint trail created by the brush on the fly but you don't see the active brush area or the lead edge of the brush until you release the mouse button or stylus. This method works well for quick brush strokes, but it's a serious liability if you want to move the brush slowly — say, for fine retouching of images.

As you'd expect of a high-end graphics program, Live Picture has a prodigious appetite for processor power and memory. We recommend a Mac Quadra with 64 MB of



Color-correction controls in Live Picture are similar to Adobe Photoshop's, with one key difference — Live Picture's controls lack CMYK support.

RAM for serious work. A native Power Mac version of Live Picture is in the works and should be available by the time this review appears. We tested a beta version and found it considerably faster across the board than the 680x0 version. For the most time-consuming chore, the final pixel-processing build, the Power Mac version was on average three times as fast as the 680x0 version.

Live Picture comes with two good tutorials — one on-line and one on videotape — and a helpful reference manual. Unfortunately, the program is dongle-protected.

The Bottom Line

If you're a graphics or prepress professional who frequently works with hefty image files of 150 MB and more, you'll find Live Picture useful for image compositing and for some types of special-effects work. But for more-conventional graphics tasks, most users won't find a compelling reason to empty their wallets for Live Picture — Adobe Photoshop and Fractal's Painter continue to provide capable and far less expensive alternatives for most image-editing and special-effects operations. / David Biedny

Live Picture 1.5.5

Rating: ★★★★★

Price: \$3,995 (list).

Pros: Adept at handling large image files. Good compositing tools.

Cons: No Unsharp Mask filter. Lacks CMYK support. Unorthodox brushes.

Company: HSC Software, Carpinteria, CA; 805-566-6699.

Reader Service: Circle #409.

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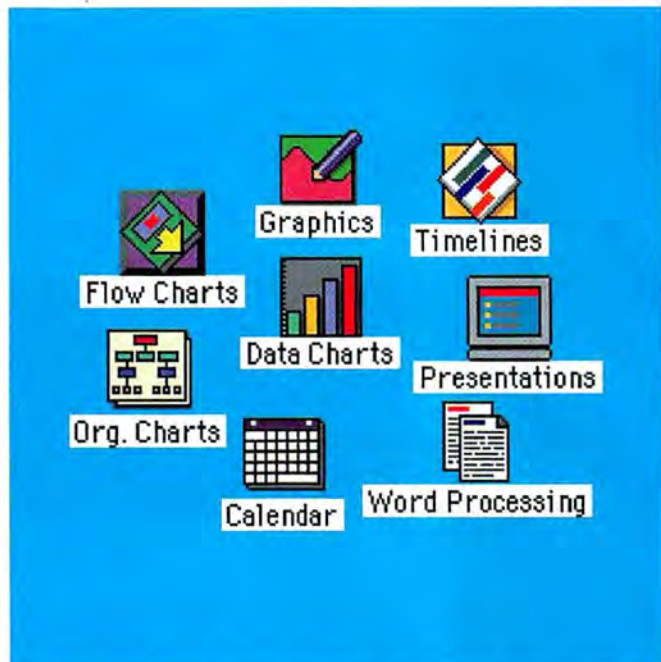


Dealer prices may vary. [†]Cable not included. ^{**}Offer applies to all new microWriter and microLaser printers if returned in good condition.

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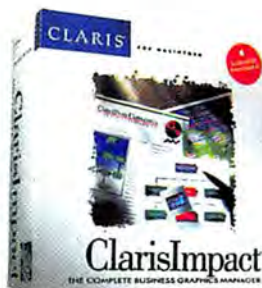
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ClarisImpact was awarded four stars by Macworld magazine and four stars by MacUser magazine in their respective June 1994 issues; it was awarded the Buyers Assurance Seal by InfoWorld magazine in the April 4, 1994 issue. *The regular suggested retail price for ClarisImpact is \$199; special introductory price offer good now through January 31, 1995 when purchased direct from Claris only. Introductory price available in the U.S. only. Available in Canada for \$199 by calling 1-800-361-0075. Pricing subject to change. Reseller price and terms may vary. © 1994 Claris Corporation. All Rights Reserved. Claris is a registered trademark, and ClarisImpact, the ClarisImpact design and Simply powerful software are trademarks of Claris Corporation.

Kodak DCS 420 / Digital photography

NEWS-BUREAU PHOTOGRAPHERS may never see the inside of a darkroom again. The Kodak DCS 420 digital camera takes pictures at 1,524-x-1,012-pixel resolution with 36-bit color (12 bits per RGB channel), and you can review them almost instantly on your Mac.

The camera looks and works almost exactly like the Nikon N90, an advanced 35mm camera. It has a powerful range of functions, such as the ability to flash-sync at $1/250$ second and record as many as five pictures in about 3 seconds onto a 13.8-x-9.2-centimeter CCD (charge-coupled device). In the field, you can store the images on a removable PCMCIA hard-drive card; in the studio, you can plug the camera directly in to your Mac. The camera comes with a Photoshop plug-in that lets you review and delete your photos and download them for color correction. Each photograph contains important exposure data such as your shutter speed and the lens aperture. You can even record your own comments as you snap photos, since the camera has a microphone and the ability to record brief audio notes.



Same Lens, Different View. The camera has Nikon's standard F mount, so you can easily change lenses and add your own accessories. However, lenses don't work exactly the same on the DCS 420 as they do on the Nikon N90. Since the CCD uses only a portion of the 35mm image area, focal lengths are extended. For instance, the 24mm lens that comes with the camera effectively works as an 85mm lens. Your telephoto lenses almost triple in magnification — a 200mm lens works as a 500mm lens — but since an 18mm lens works like a 50mm one, the camera can't take wide-angle pictures. You can set your camera to record images as if you were using 100 to 400 ISO film; a slower-ISO film records less digital noise and results in a better image.

The Kodak DCS 420 brings electronic photography closer to the image quality and control that professional photographers need. However, its drawbacks as well as its five-digit price limit its practical use to news bureaus that need to get images onto a news wire pronto. / Peter Alan Gould

Kodak DCS 420 ★★★ / Price: \$10,995 (list). Company: Eastman Kodak, Rochester, NY; 800-235-6325 or 716-724-6888. Reader Service: Circle #410.

Automap Road Atlas / Waiting for inexact directions

POTHoles WON'T BE your only problem if you try using Automap for driving directions. Automap creates written directions — including a map, driving distance, and estimated driving time — between any 2 of 120,000 locations in North America. When asking for directions, you can also tell Automap where you want to stop over, which roads you prefer, and which roads you want to avoid. But although Automap can come up with directions to even the tiniest towns, it's slow and awkward to use and the directions frequently have frustrating gaps.

The directions in Automap usually recommend the quickest route, but it is also able to create alternative routes if you wish. However, directions for a 200-mile trip told us to take roads called No Name and Unknown. The manual didn't have any advice on dealing with such information, but the company's customer-support staff said that although Automap can't name every road, you should be able to spot the unidentified road by landmarks and by keeping an eye on your mileage. Automap can direct you only to a town or an area of a city, not to an individual

street or address, and it can't give you interstate exit numbers or names.

Bottleneck Traffic. Using the application is frustrating as well. We reviewed version 2.0.4, which is supposed to be faster than earlier versions, but the on-screen redraw of the maps is still slow, even on a Quadra. To make things worse, the entire map is redrawn, layer by layer, whenever any parameter is changed or when you scroll through the map window. Pressing the Escape key halts the redraw, but this doesn't help when you want to view the map.

The map window has 12 icon buttons, but you have to flip through the manual to figure them out, since they don't have labels and even Balloon Help doesn't identify them. You can't change the font or type size of the written directions, and you can copy only a picture of the written directions to another application — you can't copy anything from Automap as text.

A software road guide is a good idea and, supplemented with a good commercial atlas, Automap might offer useful suggestions about your route. But if that's all you need, you might find that an AAA membership is a better bargain. / Joseph O. Holmes

Automap Road Atlas 2.0.4 ★★ / Price: \$60 (street). Company: Automap, Bellevue, WA; 800-440-6277 or 206-455-3552. Reader Service: Circle #411.

Writing Coach / Queries to quicken your prose

EXPRESSING WHAT YOU want to say is difficult, even for those well versed in standard English usage. By breaking a writing task into bite-sized pieces, Writing Coach unleashes effective writing.

Writing Coach is a diverse collection of 62 worksheets for Word 3.0 and 5.1, WordPerfect 2.0 and 3.1, and ClarisWorks 2.0. Each worksheet has a series of prompts and probing questions to help you create business correspondence, compose memos, and even write a review.

Invisible Inspiration. Deleting the prompts leaves behind an arrangement of your ideas, which you can develop into a finished piece. Writing Coach works nicely with Word 5.1, which lets you add a Show Hidden Text button to your tool bar and toggle between showing and hiding the prompts. Unfortunately, it can't do the same with ClarisWorks or WordPerfect.

If you have ever found yourself short of words and already have a confident grasp of syntax, Writing Coach is a superb tool for helping you get your ideas onto paper. / Eden Maxwell

Writing Coach 1.0 ★★★ / Price: \$89 (list). Company: WritePlace Software, Eugene, OR; 800-264-7936 or 503-484-6380. Reader Service: Circle #412.





PhotoMatic / Photoshop in autodrive

PHOTOMATIC, A MACRO UTILITY for Adobe Photoshop, offers some distinct advantages over using a general macro utility such as CE Software's QuicKeys.

PhotoMatic appears as a menu item in Photoshop, and you create a macro by letting PhotoMatic record your actions in Photoshop. You can then play that macro script and apply those same actions to any Photoshop document.

Breathing Room. PhotoMatic and QuicKeys have the same weaknesses: For instance, if you check a check box while recording, PhotoMatic will uncheck it when you play the macro script back for the first time: To a macro, actions are like toggling a button, and whether that causes a switch to go on or off is irrelevant. On the other hand, PhotoMatic is noticeably better than QuicKeys at pausing when Photoshop is processing large files with slow operations such as applying distortion filters — the utility doesn't run ahead of itself trying to execute commands while a process is still under way.

PhotoMatic also has some special talents for advanced batch processing. For example, you can drag several files or a folder of files and a macro script on top of the PhotoMatic icon, and PhotoMatic automatically applies the macro to all the files and saves the modified files to a separate folder. If you have several copies of PhotoMatic, you can install them on remote Macs on a network and process a batch of files remotely, using a macro recorded on your own machine.

For those who use Photoshop and don't have macros set up already, PhotoMatic can give their Photoshopping some smarts.
/ David Biedny

PhotoMatic 1.01 ★★ ★ / Price: \$199 (estimated). Company: DayStar Digital, Flowery Branch, GA; 800-962-2077 or 404-967-2077. Reader Service: Circle #413.



La Cie Joule System Snazzy, stylish SCSI storage

TIRED OF TANGLED SCSI cables and power cords? Sick of seeing your desk covered with a hodgepodge of SyQuest, DAT, and hard drives? Then let the La Cie Joule modular storage system clean it up for you.

All-in-One. A series of drive cases and mounts and a cap that ties them all together

make up the Joule system. Its base is a SCSI device in a black plastic case with a permanent mount and a removable top cap. You can opt for a top cap with either a 25-pin connector for connecting your Mac or a 50-pin connector for adding the Joule system to the end of your SCSI chain. You add drives by removing the top cap; attaching a new mount; sliding the new drive, in its case, into the mount; configuring the SCSI ID on the back of the case; and replacing the top cap. The SyQuest- and DAT-drive cases in the Joule system have hinged front covers, so the stack of drives has a consistent look.

A single power switch on the base unit turns all the drives in the Joule system on via their mounts. The mounts also pass the SCSI signal along to the other devices, so you don't need additional SCSI cables. Pulling out a drive, even in the middle of the stack of drives,

even if the system is turned on, does not interrupt the SCSI chain. (Don't try this at home, however; you *can* lose data.) Each drive case has a power LED; additional LED lights on the base indicate termination and activity status.

Locked in Place. The system locks securely. The mounts separate each drive from the others in the stack by about a quarter of an inch, to prevent the drives from overheating. Currently, you have to buy all of your components from La Cie, so you're limited to Quantum hard-drive mechanisms and sizes; La Cie does not sell empty cases for drives you may already own.

With its elegant design and black plastic casing, the Joule system will appeal most to those interested in clutter-free modern styling.
/ Roman Victor Loyola

La Cie Joule System ★★ ★★ / Price: Base unit without drives, \$199; 340-MB Quantum hard drive with base unit, \$359 (list). Company: La Cie, Beaverton, OR; 800-999-0143 or 503-520-9000. Reader Service: Circle #414.

Bridge Deluxe with Omar Sharif and PowerPOKER / New card games lay it on the table

ALTHOUGH THE MAC'S first card-player programs were simple affairs, the latest offerings are more challenging.

Two of the most popular — Bridge Deluxe with Omar Sharif and PowerPOKER — include on-line instructions and help, digitized voices, computer scorekeeping, and 256-color graphics.

Bridge Deluxe. When it comes to complexity, nothing holds a candle to bridge. MacPlay's Bridge Deluxe with Omar Sharif (who supplies the voice narration as well as considerable game expertise) has tutorials and analytical tools combined with a library of instructional hands to help you learn bridge if you're a novice. But if you want to learn the intricacies of the game, you should invest in a book such as *Common Sense Bidding* or *Modern Bridge Conventions*, both by Bill Root. The computer opponents aren't especially brilliant, but they do provide excellent beginning and strong intermediate play — and a bridge club on every Mac.


PowerPOKER. Electronic Arts' PowerPOKER is a tour de force; it could be subtitled "everything you ever wanted to know about poker — and then some." You can play against as many as five computer opponents and see QuickTime videos of their faces. Each opponent learns your betting (and bluffing) habits as the hands play out, and as a result, you're always assured of a challenging game.

PowerPOKER includes more than 70 poker variants, from five-card draw to black Maria. If that's not enough, you can create your own variant by using the included sophisticated poker scripting language. If you'd rather match wits against human opponents, try playing PowerPOKER over a LocalTalk network. Voluminous statistics, record tracking, and unattended-play options let you test game variants or hone your poker-playing skills for that trip to Vegas.

/ Jeffrey Sullivan

Bridge Deluxe with Omar Sharif ★★ ★★ / Price: \$59.95 (list). Company: MacPlay, Irvine, CA; 800-736-5738 or 714-553-3530. Reader Service: Circle #415.

PowerPOKER 1.0 ★★ ★★ / Price: \$49.95 (list). Company: Electronic Arts, San Mateo, CA; 800-245-4525 or 415-517-1717. Reader Service: Circle #416.

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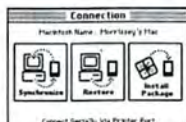
To find out more, call 800-365-3690, ext. 100, for the Newton dealer near you. Or check out an on-line service for the

interactive demo found on the Newton forum†. Either way, you'll find that instead of giving you more technology, Newton gives you something you can really use: help.

Newton. It's there when you need it. 



Newton connects to Windows.
With the Newton Connection Kit for Windows, you can easily exchange information with your Windows-equipped PC.

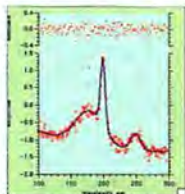


Downloading, updating and backing up information between your Newton and your computer is as easy as plugging in.

Newton connects to Macintosh.
The Newton Connection Kit lets you work with your Macintosh via serial connection or your AppleTalk® network.



*MacLinkPlus Library, a product of DataViz, Inc. **Available summer 1994. ConversionPlus Library, a product of DataViz, Inc. †Look for the on-line Newton demonstration on the following services: AppleLink, America Online, CompuServe and the Internet. In Canada, call 800-665-2775, ext. 910, for information. © 1994 Apple Computer, Inc. All rights reserved. Apple, the Apple logo, AppleLink, AppleLink, Mac, Macintosh and Newton are registered trademarks of Apple Computer, Inc. The lightbulb logo and MessagePad are trademarks of Apple Computer, Inc. ACT! is a registered trademark of Symantec Corporation. Dynodex is a registered trademark of Portfolio Software, Inc. Lotus and 1-2-3 are registered trademarks of Lotus Development Corporation. Microsoft is a registered trademark of Microsoft Corporation.



Igor Pro 2.01 / WaveMetrics' sound analyses

IMPROVED CONTROL OVER 2-D graphs, better importing and exporting, automatic data acquisition, and support for QuickTime and Apple events are only a few of the additions in this new version of Igor, WaveMetrics' scientific graphing and data-analysis program.

Igor Pro is designed for 2-D numerical analysis and plotting and provides a wide variety of numerical transformations, including Fourier transforms, basic curve fitting, data smoothing, and histograms. With Igor Pro's tools, you can handle large amounts of data and produce publication-quality charts and graphs quickly, thanks to the program's powerful engine for data analysis and display.

Waves of Data. Igor Pro excels at waveform arithmetic, making it an ideal analysis-and-visualization tool for those working with sound. In fact, Igor Pro was originally designed to manipulate waveform data only, and it still refers to arrays of numbers as waves.

Igor Pro is not limited to the evenly spaced data points that make up classic waveforms, however: The program can analyze any numerical data that fits the Cartesian coordinate system.

You have much more control over your graphs with Igor Pro 2.01 than with the previous version. You can produce histograms, polar charts, line charts, and a greater variety of point charts, with or without interpolated curves. You can now have multiple axes, use disproportional scaling, and rotate text. You can create your own macros, controls, and analyses by using Igor Pro's Pascal-like

programming language, or you can compile data from C applications directly into the program. And if you have data-acquisition equipment attached to your Mac, Igor Pro can take in data in real time and analyze it on the fly.

Muscle-Bound. Fully installed, Igor Pro takes up about 8 MB of hard-disk space. Although this version of Igor Pro has a few tweaks that make it more efficient, such as not redrawing each time you change your view, you'll still be much more comfortable running the program on a fast, FPU-based Mac — say, a Quadra 610 or better. You can't use the Power Mac's FPU, but a native Power Mac version should be available by the end of the year. / Don Crabb

Igor Pro 2.01 ★★★★★ / Price: \$495 (list). Company: WaveMetrics, Lake Oswego, OR; 503-620-3001. Reader Service: Circle #417.

MyAdvancedInvoices / The one-stop invoice shop

IF YOU HAVE A SMALL service-based business, you may consider invoicing a necessary bother. Without it, you don't get paid, but dealing with cross-referenced ID numbers, partial payments, past-due accounts, discount rates, and tax calculations can be a time-consuming headache. The easy-to-use MyAdvancedInvoices lets you enter, print, and track a list of invoices as well as generate quotes and convert the quotes to invoices if they're accepted. Its basic window has fields for billing and shipping information, purchase-order numbers, payment terms, as many as 44 line items per



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MyAdvancedInvoices 1.1 *** / Price: \$59.95 (list). Company: MySoftware, Palo Alto, CA; 800-325-3508 or 415-473-3600. Reader Service: Circle #418.

Better Homes and Gardens Healthy Cooking CD Cookbook and MasterCook Mac / Computer cookery

AS IF OUR COFFEE SPILLS and sticky fingers don't endanger our Macs enough, cookbook software now threatens to subject them to spattering grease, steam, and bubbling béchamel as well.

Multimedia Meals. Better Homes and Gardens Healthy Cooking CD Cookbook lets you select its more than 400 recipes by type of dish (such as vegetable dishes or desserts), calorie count, preparation time, nutritional information, or alphabetical order. In addition to cooking directions, each recipe comes with a photo of the finished dish, a shopping list you can print out, links to short videos of basic cooking techniques, and optional accompanying music. But the HyperCard-based program is slow, and you can't add your own recipes.

Masterful Menus. MasterCook Mac, in contrast, is fast, sleek, and versatile. There are four cookbooks in all (Family Favorites, Famous American Chefs, Kitchen Classics, and Bartender's Guide), and you can choose the type of recipes you'd like to see from a dis-

parate list of categories, such as beef dishes or ethnic cuisine. Click on a recipe name that appears, and you see its recipe card. You can also search for recipes by combining criteria such as preparation time, nutritional guidelines, and ingredients you want to use. You have more than 1,000 recipes to consider, from Midwestern basics to Middle Eastern cuisine. You can also create your own cookbooks and include your own recipes in the program.

Just Desserts. The sugary coating of multimedia video clips and music in the Healthy Cooking CD Cookbook can't hide its deficiencies in features and speed. MasterCook Mac, however, is a well-balanced digital dish that should please the palate of Mac gourmets.

/ Gregory Wasson

Better Homes and Gardens Healthy Cooking CD Cookbook ** / Price: \$39.95 (street). Company: Multicom Publishing, Seattle, WA; 800-850-7270 or 206-622-5530. Reader Service: Circle #419.

MasterCook Mac 1.0.6 **** / Price: \$29.95 (list). Company: Arion Software, Austin, TX; 800-444-8104 or 512-327-9573. Reader Service: Circle #420.

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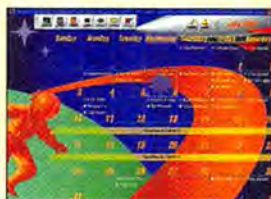
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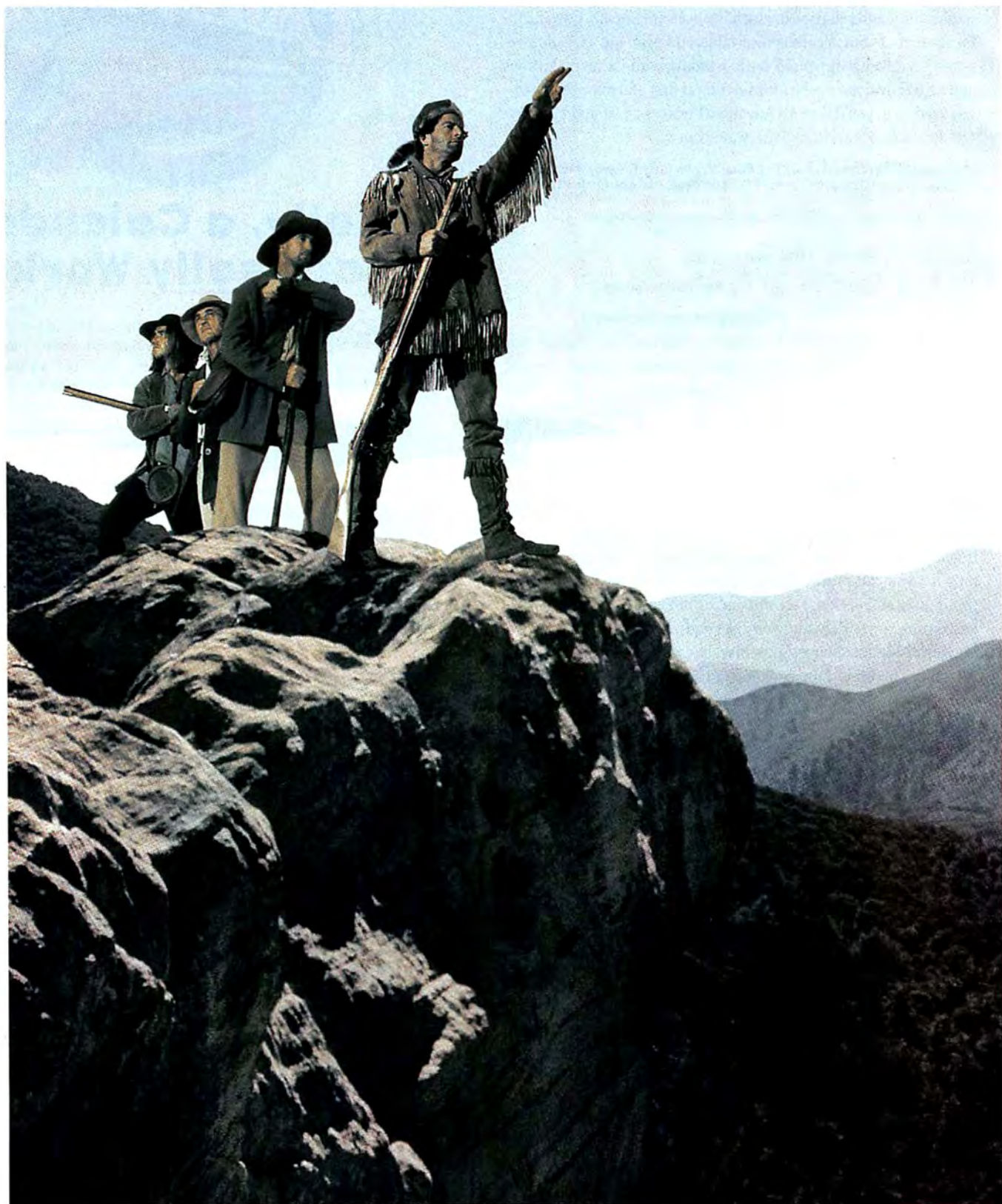
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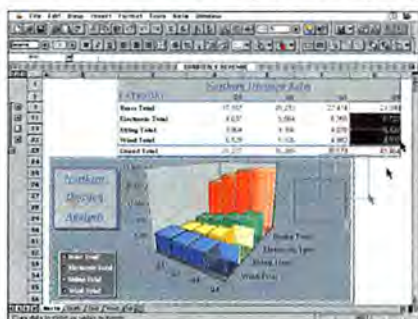
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Built for Speed

Thinking of splurging on a state-of-the-art CD-ROM drive? Here's a look at 26 choices. **By Cheryl England**

HERE'S A LITTLE GAME FOR YOU. In your best whining, nasal voice say, "But it's so slow-w-w-w." Good. Now that you've got that out of your system, you're ready to buy a CD-ROM drive.

Although today's crop of CD-ROM drives are faster than earlier models, they're still slow compared to hard drives. For example, in our tests, copying a large graphics file from one of the fastest CD-ROM drives to an average-speed 300-MB hard drive took 49 seconds; copying the same file between two average-speed hard drives took about 37 seconds.

Yet over 70 percent of the new Macs Apple currently sells in the U.S. have a CD-ROM drive built in, and the company sells an external version, the AppleCD 300e Plus. The great success of CD-ROM technology can be attributed to the proliferation, over the last couple of years, of inexpensive, high-quality CD-ROM titles; also, many vendors have begun shipping applications on CD-ROM. These days, a CD-ROM drive is almost as much a requirement for your system as a modem is.



PHOTOGRAPHY / FRED STIMSON

So given that Apple has a reputation for producing quality products and given the good track record of the AppleCD 300, is there any reason to buy a CD-ROM drive from another vendor? To answer that question, we tested 26 drives from 20 vendors. We also tested two older Apple drives — the Apple CD 150 and the AppleCD 300 — to provide reference points. We ran each drive through our standard obstacle course — speed tests, tech-support tests, and a thorough evaluation of features and pricing. In the end, we found that Apple's

AppleCD 300e Plus (internal or external) is indeed a winning product — but it isn't the only one you should consider.

Spinning Round and Round

Most of the CD-ROM drives sold today use *double-speed*, or *dual-speed*, mechanisms. Early CD-ROM drives, such as Apple's AppleCD 150, used mechanisms that spun CD-ROMs fast enough to ensure that about 150K of data per second passed under the drive's read head — a speed identical to that of the audio-CD mechanisms on which early CD-ROM drives were based. Double-speed drives do what their name implies — spin CD-ROMs twice as fast as the original drives, ensuring that about 300K of data passes under the drive's read head every second. The drives still slow to 150K per second for playing audio, however.

Of the 26 CD-ROM drives we tested, 22 have double-speed mechanisms; the other 4 have either triple- or quadruple-speed mechanisms. As you might guess from their monikers, these drives spin discs at three and four times the rate of the original single-speed CD-ROM drives, respectively. (Again, these drives slow to 150K per second for audio.)

These newer, faster-spinning drives also cost more. For example, triple-speed drives from MacWarehouse and Spin Peripherals cost at least \$200 more than double-speed drives from these same companies. Quad-speed drives are even pricier. The two we tested — FWB's hammerCD 4X and NEC's MultiSpin 4x Pro — have street prices of around \$900 and \$750, respectively. In comparison, street prices of double-speed drives average about \$400.

But do triple- and quad-speed drives run significantly faster than double-speed drives? Not necessarily. How fast a CD-ROM drive can deliver data to you depends not only on the spin rate but also on the type of CD-ROM data you need to read and the software driver you use.

Asking Questions

To find out how fast the drives operate under typical conditions, we ran two tests with popular CD-ROM titles. In the first test, we timed how long it took the drive to turn three pages in Living Books' *Just Grandma and Me*. In the second test, we used Grolier Electronic Publishing's *The New Grolier Multimedia Encyclopedia* and timed how long it took to search for instances of the word *person* and then scroll through the list of results.

When we analyzed our results, we found a few surprises. First, the triple- and quad-speed drives were not clear speed leaders. The fastest of these drives, the FWB hammerCD 4X, was essentially as fast as the five fastest double-speed drives (the AppleCD 300e Plus, Chinon CDA-535, DGR Tornado CD-ROM Drive, MacConnection MDS Chinon 535, and MacProducts Magic CD). Two — the NEC MultiSpin 4x Pro and the MacWarehouse PowerUser Pro 3x — were clearly midpack players. The fourth drive, the Spin Triple Speed, placed almost last in both tests.

Second, we noticed that drives that had identical mechanisms did not always perform identically. For example, several drives contain the Toshiba XM-3401 mechanism, yet their speeds were in the top-of-the-line range to the middle-of-the-road range or worse.

Armed with a long list of questions, we called numerous technical experts within our own labs as well as within the CD-ROM

The Bottom Line

MacUser ZD LABS YOU'RE IN LUCK: If you're shopping for a CD-ROM drive, you'll find plenty to choose from. You should pick a drive mainly for performance, price, customer service, and case design and construction. Shop carefully. There are some real bargains.

⊕ = OUTSTANDING

● = ACCEPTABLE

⊖ = POOR

PRICE/
PERFORMANCE
CUSTOMER
SERVICE
CONSTRUCTION
AND DESIGN

★★★★★ Chinon CDA-535



The compact CDA-535 (\$379 list, \$370 street) takes up far less desk space than most other external CD-ROM drives, yet it has a full feature set. Speed is top-notch, as is the company's customer support. We don't like setting the SCSI ID via DIP switches, however — a true nuisance when you're moving a drive from Mac to Mac.

★★★★★ AppleCD 300e Plus



Fast, inexpensive, and very well designed — that sums up what we like most about the 300e Plus (\$369 list, \$340 street). It comes with excellent documentation, good driver software, a nifty tray for loading discs, and the high-speed mechanism Apple builds in to new Macs.

	PRICE/ PERFORMANCE	CUSTOMER SERVICE	CONSTRUCTION AND DESIGN
★★★★★ DGR Tornado CD-ROM Drive	⊕	⊕	⊕
★★★★★ MacConnection MDS Chinon 535	⊕	⊕	⊕
★★★★★ MacProducts Magic CD	⊕	⊕	⊕
★★★★★ MacConnection MDS Toshiba 3401	●	⊕	⊕
★★★★★ Mirror Toshiba 4101	⊕	⊕	●
★★★★★ APST 3401	●	⊕	●
★★★★★ APST 4101	●	⊕	●
★★★★★ CD Technology PortaDrive 4100A	●	⊖	⊕
★★★★★ ClubMac 2x CD-ROM Drive	⊖	⊕	●
★★★★★ Kintronics CDR 1950S Mac	●	⊕	●
★★★★★ Liberty 115 CD Portable	⊕	●	●
★★★★★ MacWarehouse PowerUser Pro 2x	⊕	●	●
★★★★★ MacWarehouse PowerUser Pro 3x	●	●	●
★★★★★ MicroNet Advantage CD 650	●	⊕	●
★★★★★ Plextor DM 5028	●	●	●
★★★★★ PLI CD-ROM MS Drive	●	⊕	●
★★★★★ Toshiba XM-3401E1	●	●	●
★★★★★ CD Technology PortaDrive 3401	●	⊖	●
★★★★★ CMS Platinum II CD-ROM	●	⊖	●
★★★★★ FWB hammerCD 4X	⊖	⊕	●
★★★★★ NEC MultiSpin 4x Pro	⊖	●	⊖
★★★★★ Spin Double Speed	⊖	●	⊖
★★★★★ Spin Triple Speed	⊖	●	⊖
★★★★★ Toshiba XM-4101L1	●	●	⊖

Listing is alphabetical within groups of equal mouse ratings.

Designer Drives / separating the good from the bad

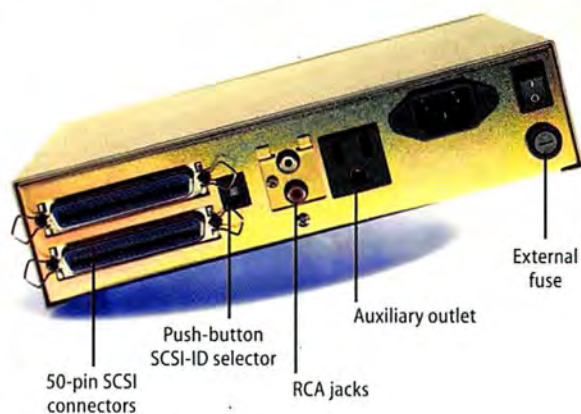
FORM FOLLOWS FUNCTION, or so the saying goes. Some drives not only work well but also include a few design niceties. Other drives, however, are built in some rather user-unfriendly ways. Here are examples of both types.

FEATURES THAT WORK



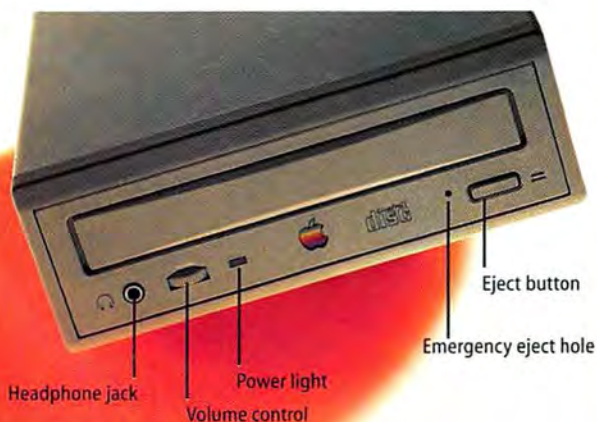
GOOD / Loading a CD-ROM

Some drives dispense with those easy-to-lose caddies and instead use a simple, plastic built-in tray for loading discs.



GOOD / Back-Panel Features

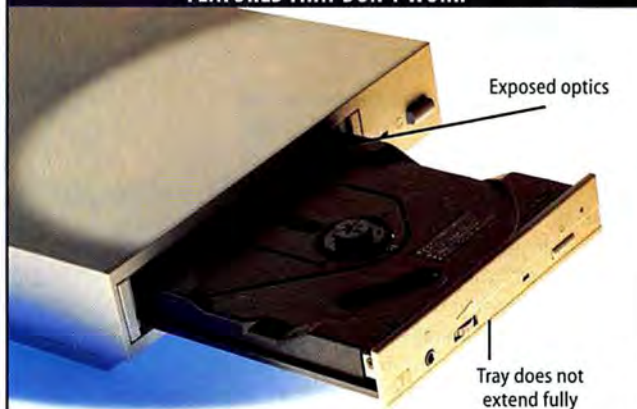
No drive has everything, but if you care about ease of installation and connectivity options, look for a drive with these features.



GOOD / Front-Panel Design

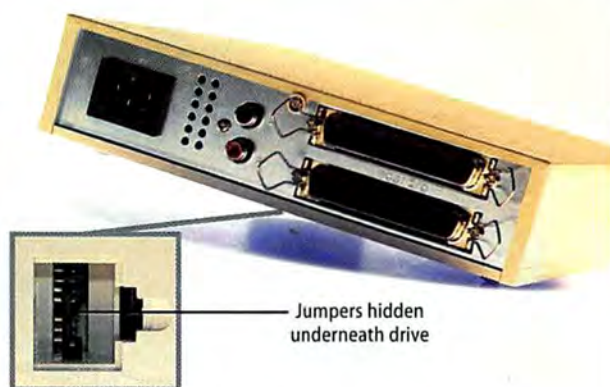
The front panel on the AppleCD 300e Plus has a simple, uncluttered design; its features are easy to use and understand.

FEATURES THAT DON'T WORK



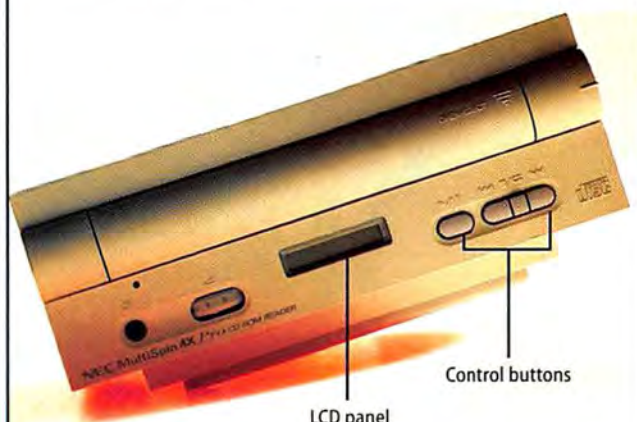
BAD / Loading a CD-ROM

Drives based on the Toshiba XM-4101 mechanism have a CD drawer that doesn't eject completely and that exposes the drive's optics.



BAD / Back-Panel Features

The Toshiba XM-4101L1 requires you to set its SCSI ID and termination with annoying jumpers — inconveniently located under the drive.



BAD / Front-Panel Design

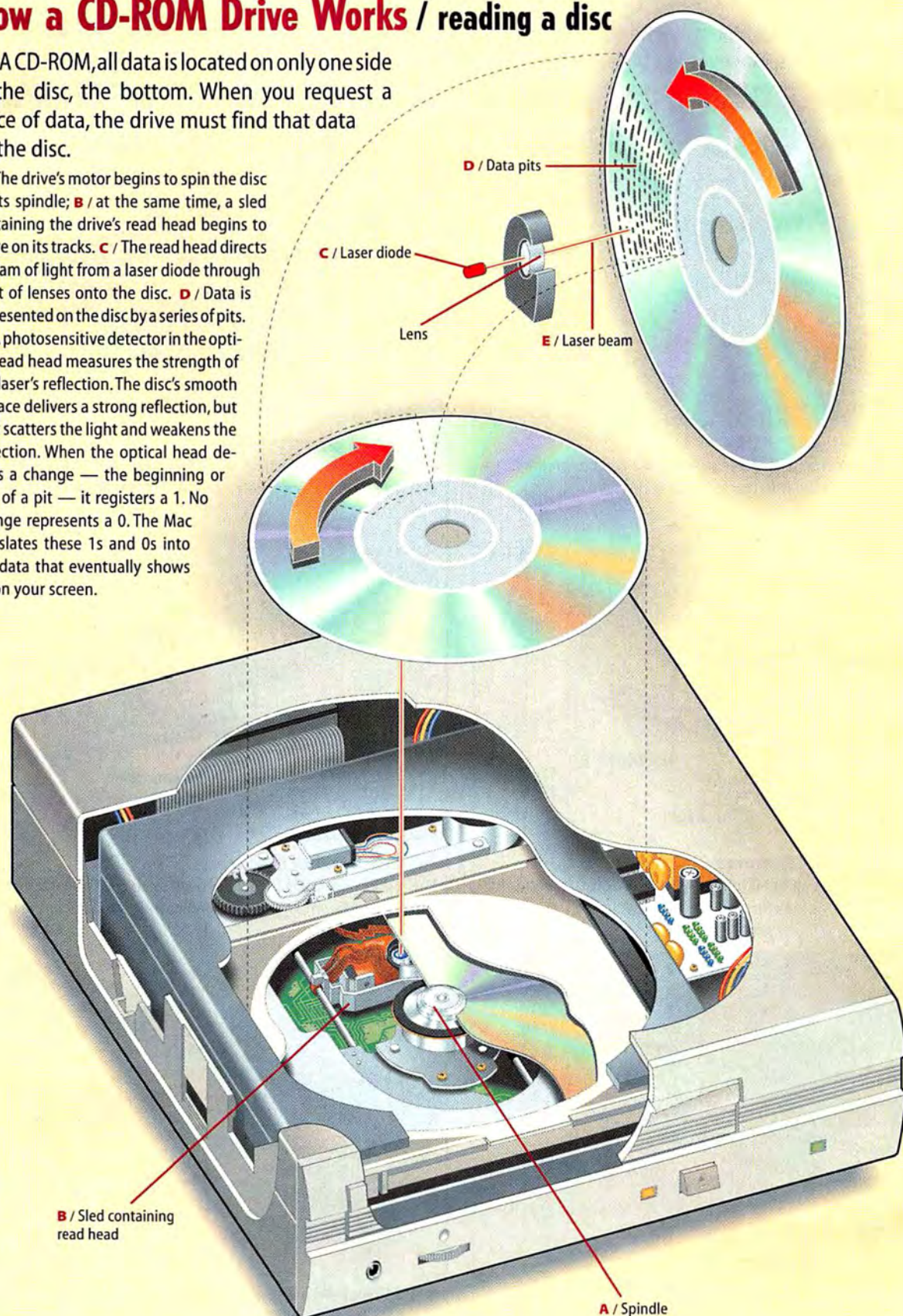
The NEC MultiSpin 4x Pro's gadgetry looks impressive, but the control buttons are small and the LCD panel is hard to read.

How a CD-ROM Drive Works / reading a disc

ON A CD-ROM, all data is located on only one side of the disc, the bottom. When you request a piece of data, the drive must find that data on the disc.

A / The drive's motor begins to spin the disc on its spindle; **B** / at the same time, a sled containing the drive's read head begins to move on its tracks. **C** / The read head directs a beam of light from a laser diode through a set of lenses onto the disc. **D** / Data is represented on the disc by a series of pits.

E / A photosensitive detector in the optical read head measures the strength of the laser's reflection. The disc's smooth surface delivers a strong reflection, but a pit scatters the light and weakens the reflection. When the optical head detects a change — the beginning or end of a pit — it registers a 1. No change represents a 0. The Mac translates these 1s and 0s into the data that eventually shows up on your screen.



industry. We played phone tag; we listened to lengthy, detailed explanations; and we heard a bunch of bad analogies. In the end, we came up with this summary of what makes a CD-ROM drive fast — or slow — and why.

Finding Answers

Puzzle #1: Why doesn't a CD-ROM drive's spin rate seem to make a difference?

Both the Page Turn and the Encyclopedia Search tests involve moving lots of small files from the CD-ROM to the Mac. In the case of the Encyclopedia Search test, the files that have to be moved (the articles found during the search) are on different physical segments of the CD-ROM. Thus, for this test, the drive's *access time* — how long it takes to find a file — influences speed more than the drive's transfer (or spin) rate.

In the case of the Page Turn test, each character on a page — a bird, a flower, or a starfish, for example — is stored separately. However, unlike in the Encyclopedia Search test, these elements are adjacent to each other on the disc. But because the elements are so small, the higher transfer rate of a quad-speed drive makes it only minimally faster. Suppose that all of the elements required for a single page in *Just Grandma and Me* occupy 1.8 MB of disc space. A double-speed drive, with a transfer rate of 300K per second, would take 6 seconds to deliver the data. A quad-speed drive would take 3 seconds — not exactly awe-inspiringly less. In addition, the Finder overhead associated with reading multiple small elements negates some of the speed gains from higher transfer rates.

To find out if the quad-speed drives fare any better when handling large, contiguously placed files, we ran the FWB hammerCD 4X (a quad-speed drive) and one of the fastest double-speed drives, the AppleCD 300e Plus, through three more tests. When copying a 12.5-MB Photoshop file from a CD-ROM to a hard disk, we found that the FWB hammerCD 4X actually took 3 seconds (5.5 percent) longer than the AppleCD 300e Plus. When opening the same file

from a CD-ROM, we found that the FWB hammerCD 4X took 2 seconds (2.7 percent) less than the AppleCD 300e Plus. Since each test took 50 seconds or more to perform, a 2- or 3-second difference is negligible. Informal tests with a variety of other titles also failed to show any significant speed advantage for the quad-speed drive.

Only when we used DiskTop, PrairieSoft's file-management utility, to copy the 12.5-MB Photoshop file from a CD-ROM to a hard disk was the FWB hammerCD 4X noticeably faster. The AppleCD 300e Plus took 49 seconds, whereas the FWB hammerCD 4X took only 32 seconds — 35 percent less time. Since DiskTop uses all of the Finder's available memory when copying, it can ask for data in larger chunks, thereby giving the quad-speed drives more of a chance to flaunt their higher transfer rate.

Puzzle #2: Why do drives that have identical mechanisms perform so differently?

Fortunately, the answer to this question is straightforward: Driver software can have a significant impact on a CD-ROM drive's speed. Drivers are small programs that allow the Mac and the CD-ROM drive to communicate with each other. Most drive vendors do not write their own software drivers but license them from developers. Some drivers are also sold separately by their developers.

In general, drives that use FWB's CD-ROM ToolKit, CharisMac's AllCache, or proprietary drivers from Apple and Chinon performed best overall. But there's a "gotcha": Four drives — the ClubMac 2x CD-ROM Drive, DGR Tornado CD-ROM Drive, MacProducts Magic CD, and PLI CD-ROM MS Drive — come bundled with CharisMac's CD-ROM driver extension. Three of these drives — the DGR Tornado, the MacProducts Magic CD, and the PLI CD-ROM MS Drive — use identical Toshiba XM-3401 mechanisms. Yet although the DGR Tornado and the MacProducts Magic CD topped our speed charts, the PLI CD-ROM MS Drive placed near the bottom of the midpackers. The ClubMac 2x CD-ROM Drive, which uses a slow (and inexpensive) NEC CDR-210 mechanism, placed almost dead last in our Page Turn and Encyclopedia Search tests.

5 Questions to Ask a CD-ROM-Drive Vendor / smart shopping

1. Does the drive come with everything I need to set it up?

To get an external drive up and running, you need driver software, a SCSI cable, a power cord, and possibly a terminator. Internal drives require driver software. These items aren't expensive — it's just more convenient if you can get everything you need when you buy the drive.

2. Does the drive have RCA jacks?

The most convenient method for playing audio CDs on your drive requires RCA jacks. With RCA jacks, you can hook up an amplifier and speakers to the drive or you can connect amplified speakers such as Apple's AppleDesign Powered Speakers. You can then listen to music through the speakers or through headphones. (If the drive has a headphone jack, you can listen to audio CDs via headphones — but you can't hear the sounds on multimedia CD-ROMs through the headphones.)

3. Does the drive have a tray or a caddy for loading discs?

If you're the only person who will be using the drive, then either type of loading mechanism is fine. But if you have kids or if you must share the drive, then a tray-loading drive is your best bet. Caddies can get lost and can get stuck in the drive if the lids are not closed all the way.

Note, however, that some tray-loading mechanisms are better than others. The AppleCD 300e Plus' tray is a simple plastic holder. Drives that use a Toshiba XM-4101 mechanism, however, have trays that only partially eject and must be pulled out the rest of the way. In addition, these trays contain exposed optics that can be ruined if food or liquid is dropped onto them.

4. What special features does the drive have?

This open-ended question gives vendors a chance to better explain their products. For example, a drive may sport an auxiliary power outlet — handy if you have a lot of peripherals. Or it may have switchable termination, thereby eliminating the need for a terminator block.

5. Do you offer a money-back guarantee?

If you don't need the drive right away, get the vendor to send you the terms of its money-back guarantee in writing. That way, you'll know exactly how long you have to return the drive, under what conditions you can return it, and who pays the return postage. And always remember to pay by credit card — credit-card vendors may be able to resolve any disputes you have with a drive vendor later.

Closer investigation revealed the reasons for this seemingly inconsistent performance: Both the DGR Tornado and the MacProducts Magic CD include CharisMac's AllCache software *as well as* CharisMac's standard driver extension. AllCache, a caching driver, provided a significant speed boost to the Tornado and the Magic CD. (For more on caching software, see the "Speeding Up Your Drive" sidebar.)

In or Out — Which Way to Go?

Although a CD-ROM drive's speed should be one of your most important considerations, you also need to decide whether to get an

internal or external drive. An internal drive doesn't take up any desk space, and once your dealer has installed it, you don't have to worry about cables or SCSI connections. On the other hand, internal drives can't be moved between computers easily and, if they malfunction, you'll need to take your Mac to a dealer or have a certified technician remove the drive for you. Most important, an external drive works with any Mac; an internal drive requires a 5.25-inch half-height bay that can be accessed from the front of the Mac.

If you opt for an external drive, you'll need to factor the construction and design of the drive's case into your buying decision. In general, the drives we tested had simple, well-designed boxes. Cases

figure 1

Comparing CD-ROM Drives / what they have and how they perform

MacUser ZD LABS Price, features, and speed are the three most important criteria to consider when you purchase a CD-ROM drive. To help you pick a drive, we've listed each drive along with some of its key features. We've also included the current list and street price for each drive. Note that in many cases, these two prices are the same — that's because many drives are sold directly by the vendor.

To help you figure out a drive's speed, we've listed the drives in order

of overall speed, from best to worst. We've also included detailed charts showing how each drive performed in two of our tests. These two tests — Page Turn, turning three pages in Living Books' Just Grandma and Me, and Encyclopedia Search, searching Grolier Electronic Publishing's The New Grolier Multimedia Encyclopedia for the word *person* and then scrolling through a list of 890 results — exemplify common uses for CD-ROM drives.

	List price	Street price	Mechanism	Drive speed	Driver vendor	Internal version	Tray loading	Emergency eject hole	RCA jacks	External fuse/auxiliary power outlet
MacProducts Magic CD	\$353	\$353	Toshiba XM-3401	2x	CharisMac	●		●	●	●
DGR Tornado CD-ROM Drive	\$358	\$358	Toshiba XM-3401	2x	CharisMac	●		●	●	●
✓ Apple AppleCD 300e Plus	\$369*	\$340	Matsushita	2x	Apple	●	●	●	●	
FWB hammerCD 4X	\$1,099	\$910	Plextor PX-43CH	4x	FWB			●	●	
✓ Chinon CDA-535	\$379	\$370	Chinon CDS-535	2x	Chinon			●	●	
MacConnection MDS Chinon 535	\$340	\$340	Chinon CDS-535	2x	FWB	●		●	●	●
Mirror Toshiba 4101	\$249	\$249	Toshiba XM-4101	2x	FWB		●	●	●	●
Liberty 115 CD Portable	\$549	\$549	Toshiba XM-3401	2x	FWB			●	●	
Kintronic CDR 1950S Mac	\$552	\$480	Hitachi CDR-6750	2x	Hitachi	●		●	●	
CMS Platinum II CD-ROM	\$739	\$570	Chinon CDS-535	2x	CMS	●		●	●	
MacConnection MDS Toshiba 3401	\$400	\$400	Toshiba XM-3401	2x	FWB	●		●	●	●
Toshiba XM-3401E1	\$419	\$419	Toshiba XM-3401	2x	OMI	●		●	●	
CD Technology PortaDrive 3401	\$700	\$575	Toshiba XM-3401	2x	OMI	●		●	●	
NEC MultiSpin 4x Pro	\$824	\$755	NEC 4x	4x	Adaptech ^o			●	●	
MacWarehouse PowerUser Pro 3x ^o	\$499	\$499	NEC 510	3x	FWB			●	●	
APST 3401	\$439	\$439	Toshiba XM-3401	2x	OMI	●		●	●	
Plextor DM 5028	\$409	\$375	Texel	2x	Trantor	●		●	●	
Toshiba XM-4101L1	\$360	\$305	Toshiba XM-4101	2x	OMI	●	●	●	●	
PLI CD-ROM MS Drive	\$743	\$510	Toshiba XM-3401	2x	CharisMac	●		●	●	
APST 4101	\$299	\$299	Toshiba XM-4101	2x	OMI	●	●	●	●	
CD Technology PortaDrive 4100A	\$500	\$500	Toshiba XM-4101	2x	OMI		●	NA		
MicroNet Advantage CD 650	\$529	\$504	Sony CDU-561	2x	Trantor			●		
MacWarehouse PowerUser Pro 2x ^o	\$199	\$199	NEC CDR-210	2x	FWB		●		●	
Spin Triple Speed	\$499	\$499	NEC 510	3x	Spin			●	●	
ClubMac 2x CD-ROM Drive	\$199	\$199	NEC CDR-210	2x	CharisMac	●	●		●	
Spin Double Speed	\$299	\$299	NEC CDR-210	2x	Spin		●		●	

✓ MacUser RECOMMENDS

*You can get this drive bundled with AppleDesign Powered Speakers II, headphones, and five CD-ROM titles for \$479.

¹Via DIP switches.

^oAt press time, MacWarehouse said it is replacing the PowerUser Pro 2x with a triple-speed drive for \$199 and the PowerUser Pro 3x with a quad-speed drive for \$399.

were metal or sturdy plastic and, in general, tended to be a bit larger than hard-drive cases. All the drives had a power or activity light and headphone jacks, and except for the NEC MultiSpin 4x Pro, all had 50-pin SCSI connectors.

But the similarities ended there. You can find RCA jacks — useful if you want to listen to audio CDs — on the back of most drives; exceptions include the CD Technology PortaDrive 4100A and the MicroNet Advantage CD 650. On some drives, RCA jacks do not have labels for left and right nor do they use standard red and white coloring — check before you buy, and save yourself some installation hassles.

And, like hard drives, some CD-ROM drives have standard push-button or rotary-wheel SCSI-ID selectors, whereas others, such as the Chinon CDA-535 and the Kintronics CDR 1950S Mac, use arcane DIP switches. Some drives also make you use DIP switches to set termination — offenders here include the Kintronics CDR 1950S Mac, the NEC MultiSpin 4x Pro, and the PLI CD-ROM MS Drive. At least NEC stamps the DIP-switch settings onto the back of its MultiSpin 4x Pro. The Toshiba XM-4101L1 regresses one step further from DIP switches by forcing you to change termination and the SCSI ID via jumpers under a panel on the bottom of the drive.

Front-panel controls vary widely among drives too. All CD-ROM

Most of the drives were average performers, taking 12 to 14 seconds for the Page Turn test and 105 to 112 seconds for the Encyclopedia Search test. A few with outstanding speed ran through our tests faster and a few with poor speed ran considerably slower. None of the drives, however, can match a hard drive's speed when accessing data.

Triple- and quad-speed drives don't fare any better, despite their higher transfer rate, than the fastest double-speed drives for these

typical tasks. Even when we ran the quad-speed drives through other tests — such as opening a large Photoshop file and copying a large file to a fast hard drive — they were not noticeably faster. Until quad-speed drives drop in price, we recommend that you opt for a double-speed drive with a good third-party driver such as CharisMac's AllCache or FWB's CD-ROM ToolKit or a drive that comes with a proprietary driver, such as one from Apple or Chinon.



[†]NEC will soon be bundling Casa Blanca Works' DriveCD with its drives.

^{**}Via jumpers under the bottom of the drive.

drives offer volume controls, although only a few, such as the AppleCD 300e Plus, MacWarehouse PowerUser Pro 3x, NEC MultiSpin 4x Pro, and Spin Triple Speed, indicate the current volume setting on a scale of 0 to 10. The NEC MultiSpin 4x Pro has an LCD display that gives you a rich variety of performance, audio, and diagnostic information — but the LCD panel is too small and too inconveniently located for easy viewing. (NEC claims that upcoming drives will have an LCD panel that is more brightly lit and that uses larger graphics.) The MultiSpin 4x Pro also gives you buttons for playing, pausing, repeating, and picking a track from an audio CD.

If portability is important to you, you have four choices: the CD Technology PortaDrive 3401 and 4100A, the Liberty 115 CD Portable, and the Chinon CDA-535. The 3-pound Liberty 115 CD Portable comes in a sturdy, compact, black 9.5-inch-long by 6.75-inch-wide case and has all the controls and connectors you find on a larger drive. The Chinon CDA-535 is about the same size as the Liberty drive and has similar features, but it requires a slightly bulky power brick. The CD Technology PortaDrive 3401 is even smaller and lighter than the Liberty and Chinon drives, but it comes with a huge power brick that's a bit larger than a standard office tape dispenser.

Only CD Technology's PortaDrive 4100A is truly portable, at 8 inches long by 5.5 inches wide and weighing about a pound. You can get a handy battery pack (the Sega GameGear battery pack) that can run the drive for about two hours. This drive looks a lot like a portable audio-CD player — you even open it from the top to load a disc — but it includes only one 50-pin SCSI connector and lacks RCA

jacks. Also, like other CD-ROM drives, it is susceptible to breakage if dropped.

The Little Things

You should also consider the extras some drives give you. Nearly all the drives we tested can handle multisession Photo CDs, Kodak's CD format for storing photos on-disc. In addition, all can play audio CDs.

The most widely used method of loading a CD-ROM into a drive is with a *caddy*, a plastic case into which you slip a CD-ROM before inserting it into the drive. Although caddies generally work well, sometimes they're less than convenient. First, they have been known to just up and walk away from their owners' desks. Second, if you (or more likely, your kids) insert a caddy without closing its lid all the way, you'll expend precious time, energy, and bad verbiage trying to pry the caddy out without harming the drive.

Recently, several vendors have begun using trays that are more like the ones used in audio-CD players. The AppleCD 300e Plus, ClubMac 2x CD-ROM Drive, MacWarehouse PowerUser Pro 2x, and Spin Double Speed have a simple plastic tray that slides out easily and extends far enough so that you can drop a disc in. Drives that use a Toshiba XM-4101 mechanism, however, have a tray that does not fully extend, forcing you to pull it out the rest of the way. In addition, these trays include exposed optics, which can be damaged if you drop food or liquid on them. Granted, not too many adults are likely to ruin a drive in this way, but kids can easily put sticky fingers onto the exposed optics.

Speeding Up Your Drive / what driver software can do



IT TAKES ONLY A FEW MINUTES of using a CD-ROM drive to discover that it accesses data more slowly than your hard drive. Is there any way to speed up a CD-ROM drive? Several vendors claim that their software drivers can help.

We tested six software drivers to see just what kind of speed gains you can — or can't — expect. Two of the products — FWB's CD-ROM ToolKit and CharisMac's AllCache — came bundled with one or more of the drives we tested. The other four drivers — Casa Blanca Works' DriveCD, Insignia Solutions' RapidCD, MacPeak's SpotCD, and ShirtPocket Software's SpeedyCD — were not included with any of the drives. Each of the drivers can be purchased separately. (NEC will soon be bundling a custom version of DriveCD with its drives.)

Our first step in evaluating the driver software was to pick the CD-ROM drives on which we wanted to run the Page Turn and Encyclopedia Search tests. We ended up with eight drives — four of these drives were ones that topped our speed charts, and four were some of the slowest ones. We made sure we included a representative sampling of single-, double-, triple-, and quad-speed drives.

Next we studied each driver's documentation and called each driver vendor's tech-support staff to help us decide on the optimal settings for each driver. All the drivers use *caching* to improve a CD-ROM drive's speed. (Caching drivers allocate a user-specified amount of Mac RAM for storing frequently used CD-ROM data. The Mac can retrieve data more quickly from RAM than from the CD-ROM.)

Configuring the drivers wasn't as easy as we'd hoped. Most vendors recommend different settings for different types of applications. For

example, graphics-intensive CD-ROMs often benefit more from larger cache sizes than text-intensive discs. We spent hours experimenting with various cache sizes for each driver and each test. In the end, we used cache sizes of 256K to 512K.

Our final test results weren't nearly as impressive as we'd hoped either. For the group of fast drives — drives that already included solid driver software — we found that the caching drivers were more likely to hurt speed than improve it. The only exceptions were with CharisMac's AllCache and ShirtPocket Software's SpeedyCD.

CharisMac's AllCache includes a database of optimized cache sizes for about 24 popular CD-ROM applications — including one of our test discs, Living Books' Just Grandma and Me. Overall, this driver gave drives the biggest speed boosts. (CharisMac recently shipped a new caching driver, CD AutoCache, that not only sets optimized cache sizes for certain discs but also offers an automatic feature that analyzes each disc you use and creates optimal sizes for it.)

ShirtPocket Software's SpeedyCD is not really a driver — it's a control panel that stores a CD-ROM's directory to your hard disk, thereby making Finder information available more quickly than it would be if left on the CD-ROM. You need as much as 3 MB of contiguous space on a hard disk to use SpeedyCD's directory cache. In our tests, SpeedyCD provided marginal improvements for two of the fast drives and three of the slow ones.

For the slow drives, the speed improvements were greater. Every driver improved the speed of the double-speed drive. Only two of the drivers, however, helped the AppleCD 150 single-speed drive — and

A few drives come bundled with CD-ROMs, but the quality of what you get varies widely. Some companies bundle discs full of product demos. Others bundle one or two old, less popular titles. A couple of vendors include useful bundles. Plexor ships its DM 5028 with four popular titles, including Grolier Electronic Publishing's The New Grolier Multimedia Encyclopedia and Software Toolworks' The San Diego Zoo Presents . . . The Animals! When you purchase the AppleCD 300e Plus, you get your choice of 3 titles from a 30-disc list of popular products. (For \$479, you can get the Apple Multimedia Kit, which includes the AppleCD 300e Plus, AppleDesign Powered Speakers II, headphones, and five CD-ROMs.)

The Importance of Good Service

As always, we recommend that you take a company's tech support into consideration when purchasing a CD-ROM drive. *MacUser's* customer-service evaluation included a test of tech-support responsiveness and a check of each vendor's service policies. We gave big points to vendors whose staff provided quick responses and correct answers when we made our anonymous phone calls. We gave extra credit for toll-free tech support, a money-back guarantee, a multiyear warranty, and weekend or after-hours support.

Companies can promise you the world, but it does you no good unless they can deliver. To see how well companies respond to users in need, we made anonymous calls to their tech-support lines, asking questions typical new users might face: Why don't the CD-ROMs I insert show up on my desktop? Why has my computer started crashing more frequently since I installed my CD-ROM drive? When

I try to eject a disc from the drive, the Mac says I can't, because the disc is being shared — what's going on?

We measured response time and noted whether our questions were answered correctly or not. We were generally pleased with the competent and helpful service we got. In fact, quite a few vendors answered all three of our questions correctly and quickly. Most of these vendors received an Outstanding rating for tech support (see the "Bottom Line" sidebar). Vendors that received an Acceptable rating answered at least two of our questions correctly and had reasonable waits on hold.

Only a few vendors received a Poor rating. Apple, which builds an excellent product, fails miserably at supporting it. Callers to the company's central support center (which handles all Apple products) are greeted with a recording indicating that a 45-minute wait is typical. We never got through during the 15 minutes we allotted for each call, so we flunked Apple entirely. Fortunately, Apple's documentation is outstanding and the software is easy to use.

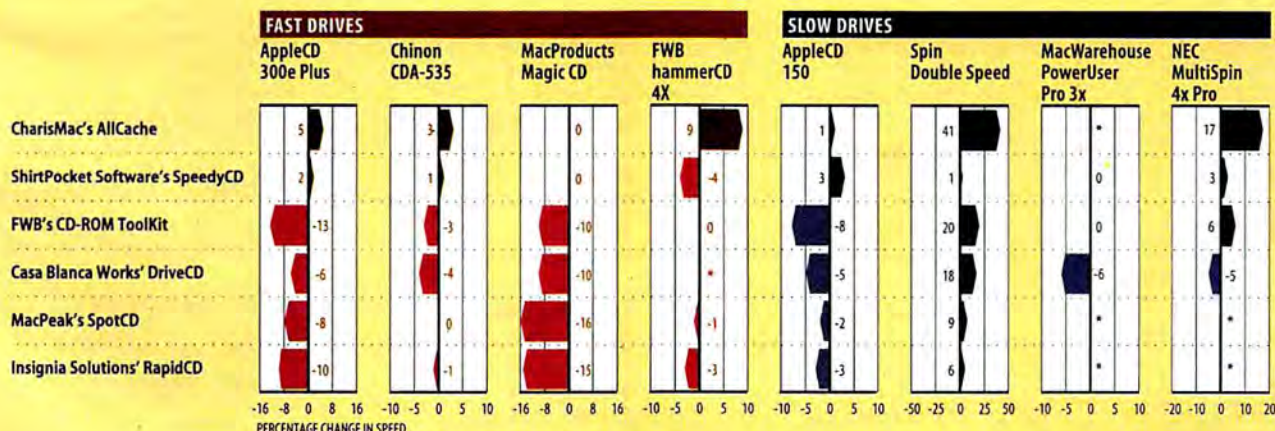
CMS also did poorly, due to its convoluted support scheme. First, you call a 900 number (a \$10 charge) to get a reference number that you then use when you call the actual support line. This scheme may present a real problem for users whose companies block access to 900 numbers. On a positive note, CMS did answer all three of our questions correctly.

CD Technology's tech-support staff, on the other hand, was difficult to reach and failed several times to return calls as promised. When we finally did reach the representatives, it wasn't worth the wait: They failed to answer our questions correctly.

that speed increase was marginal. Some of the drivers had not yet been updated for compatibility with the triple- and quad-speed drives.

Our conclusions? Although good driver software can provide a significant speed boost for your CD-ROM drive, buying a third-party driver is rarely a wise investment. This is particularly true if your drive already

includes a good driver. Apple products, for example, benefit little from third-party drivers, because the drivers Apple includes are optimized to work well with the mechanisms. A caching driver *can* help when the bundled driver is poor — but we suggest that you purchase a drive that includes a solid driver in the first place.




Can a third-party driver speed up your drive? To find out, we tested six drivers on eight drives (four fast ones and four slow ones). A quick glance at the pointers in this chart shows that, in most cases, third-party drivers don't help — and may even harm — your drive's speed. The pointers going to the left indicate the percentage of speed *decrease*, and the ones going to the right indicate the percentage of *increase*, compared to the drive's speed with its bundled driver.

Best Buys

At the end of our evaluation process, we came to a couple of conclusions. First, most drives are solid, well-built products that work just fine (although a few can't outrun the AppleCD 150). Second, double-speed drives currently represent the best bargain. Third, triple- and quad-speed drives cost significantly more and, in most cases, don't outperform the fastest double-speed drives. Of the 26 drives we tested, 7 garnered a four-mouse or better rating. We found that these drives offered the best combination of price, performance, and design currently available. Two — the AppleCD 300e Plus and the Chinon CDA-535 — edged to the top of our list, however.

We can't help but like the AppleCD 300e Plus, despite Apple's poor showing in our tech-support tests. The drive is fast and reasonably priced and has a simple, easy-to-use design. The tray for loading CD-ROMs makes this drive perfect for office, home, or school. If you're buying a new Mac, get the internal version of the AppleCD 300e Plus built in. If you have a Mac without a built-in drive, we suggest putting the AppleCD 300e Plus high on your list of choices.

If you're looking for a compact drive, we suggest the Chinon CDA-535. A full-featured, well-designed drive, the CDA-535 is a reasonably priced speed leader. You can't get an internal version of this drive, however. (You can purchase an internal version of the MacConnection MDS Chinon 535, another of our top-rated drives.) If, however, you want a truly portable drive, then check out the CD Technology PortaDrive 4100A, a tiny, lightweight drive designed like an audio-CD player.

Be sure to shop around. We found good reasons to buy any one of several drives. For example, if you want a very low-cost drive, check out the Mirror Toshiba 4101 or the MacWarehouse PowerUser Pro 2x. Or if you already have storage products from a vendor you trust, you may want to continue using the same brand. Armed with smart-shopper savvy and our test results, you should be able to easily pick out a winning drive. 

Cheryl England is a *MacUser* senior editor. Alan Chan, an associate project leader at ZD Labs, managed the testing for this report.

Directory / vendors of CD-ROM drives and drivers tested

CD-ROM-DRIVE VENDORS

Apple Computer

Cupertino, CA
800-233-4846
408-996-1010

APS Technologies

Kansas City, MO
800-235-2753
816-483-6100
816-483-3077 (fax)

CD Technology

Sunnyvale, CA
408-752-8500
408-752-8501 (fax)

Chinon America

Torrance, CA
800-441-0222
310-533-0274
310-533-1727 (fax)

ClubMac

Irvine, CA
800-258-2622
714-768-8130
714-768-9354 (fax)

CMS Enhancements

Irvine, CA
800-788-4267
714-222-6000
714-222-0556 (fax)

DGR Technologies

Austin, TX
800-235-9748
512-476-9855
512-499-0888 (fax)

FWB

San Francisco, CA
415-474-8055
415-775-2125 (fax)

Kintronics

Elmsford, NY
800-431-1658
914-347-2530
914-347-2588 (fax)

Liberty Systems

San Jose, CA
408-983-1127
408-243-2885 (fax)

MacConnection

Marlow, NH
800-800-0002
603-446-7711
603-446-7791 (fax)

MacProducts USA

Austin, TX
800-622-8271
512-476-5295
512-499-0888 (fax)

MacWarehouse

Lakewood, NJ
800-255-6227
908-367-0440
908-905-9279 (fax)

MicroNet Technology

Irvine, CA
714-453-6100
714-453-6101 (fax)

Mirror Technologies

Edina, MN
800-654-5294
612-830-1549
612-832-5709 (fax)

NEC Technologies

Wood Dale, IL
800-632-4636
708-860-9500
800-366-0476 (fax)

Plextor

Santa Clara, CA
800-886-3935
408-980-1838
408-986-1010 (fax)

PLI

Fremont, CA
510-657-2211
510-683-9713 (fax)

Spin Peripherals

Newton Upper Falls, MA
800-466-1200
617-965-9882
617-965-6257 (fax)

Toshiba

Irvine, CA
714-457-0777
714-583-3133 (fax)

CD-ROM-DRIVER VENDORS

Casa Blanca Works

Greenbrae, CA
415-461-2227
415-461-2249 (fax)

CharisMac Engineering

Newcastle, CA
800-487-4420
916-885-4420
916-885-1410 (fax)

FWB

San Francisco, CA
415-474-8055
415-775-2125 (fax)

Insignia Solutions

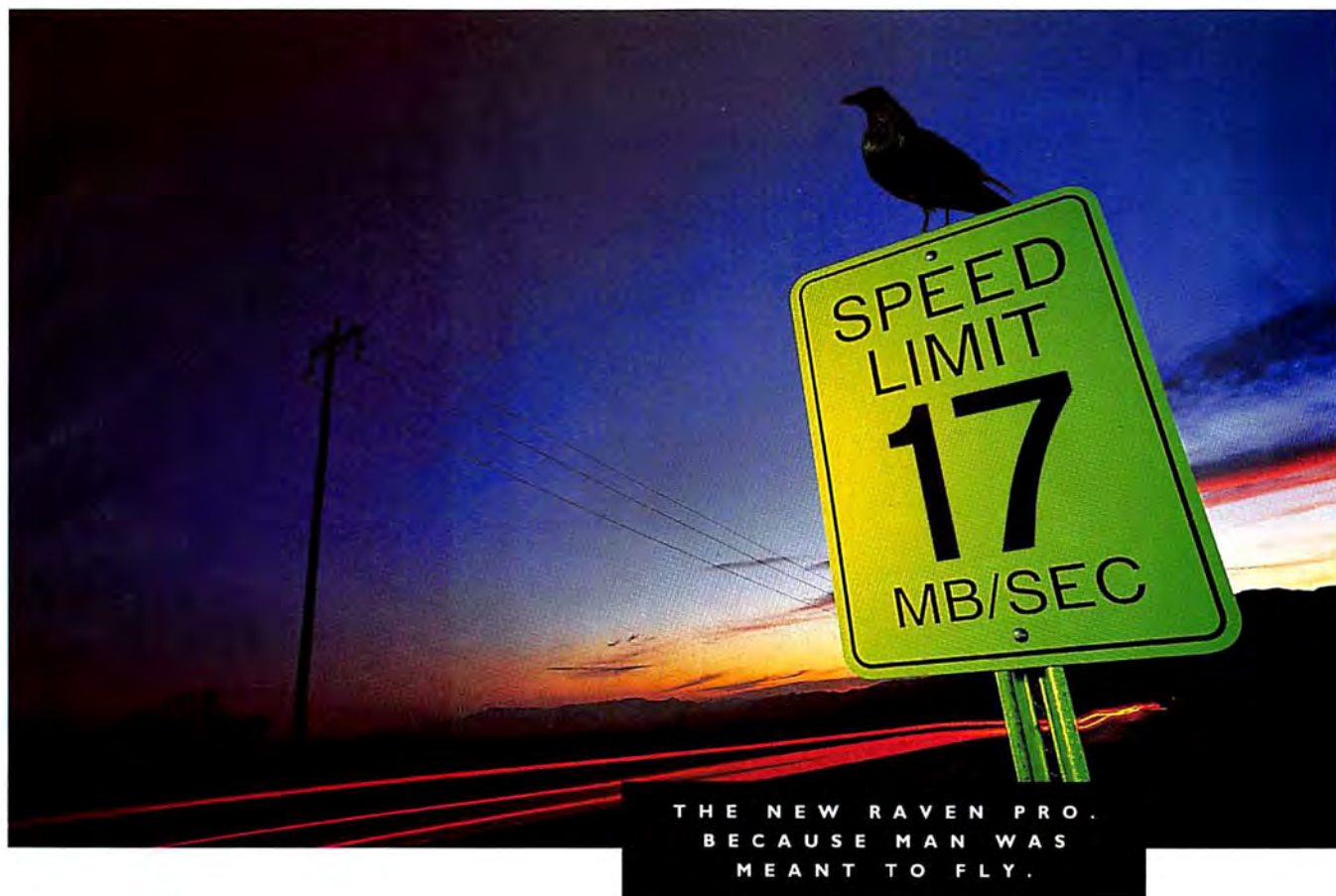
Mountain View, CA
800-848-7677
415-694-7600
415-964-5434 (fax)

MacPeak

Austin, TX
512-327-3211
512-327-9553 (fax)

ShirtPocket Software

Mesa, AZ
602-966-7667
602-894-9136 (fax)



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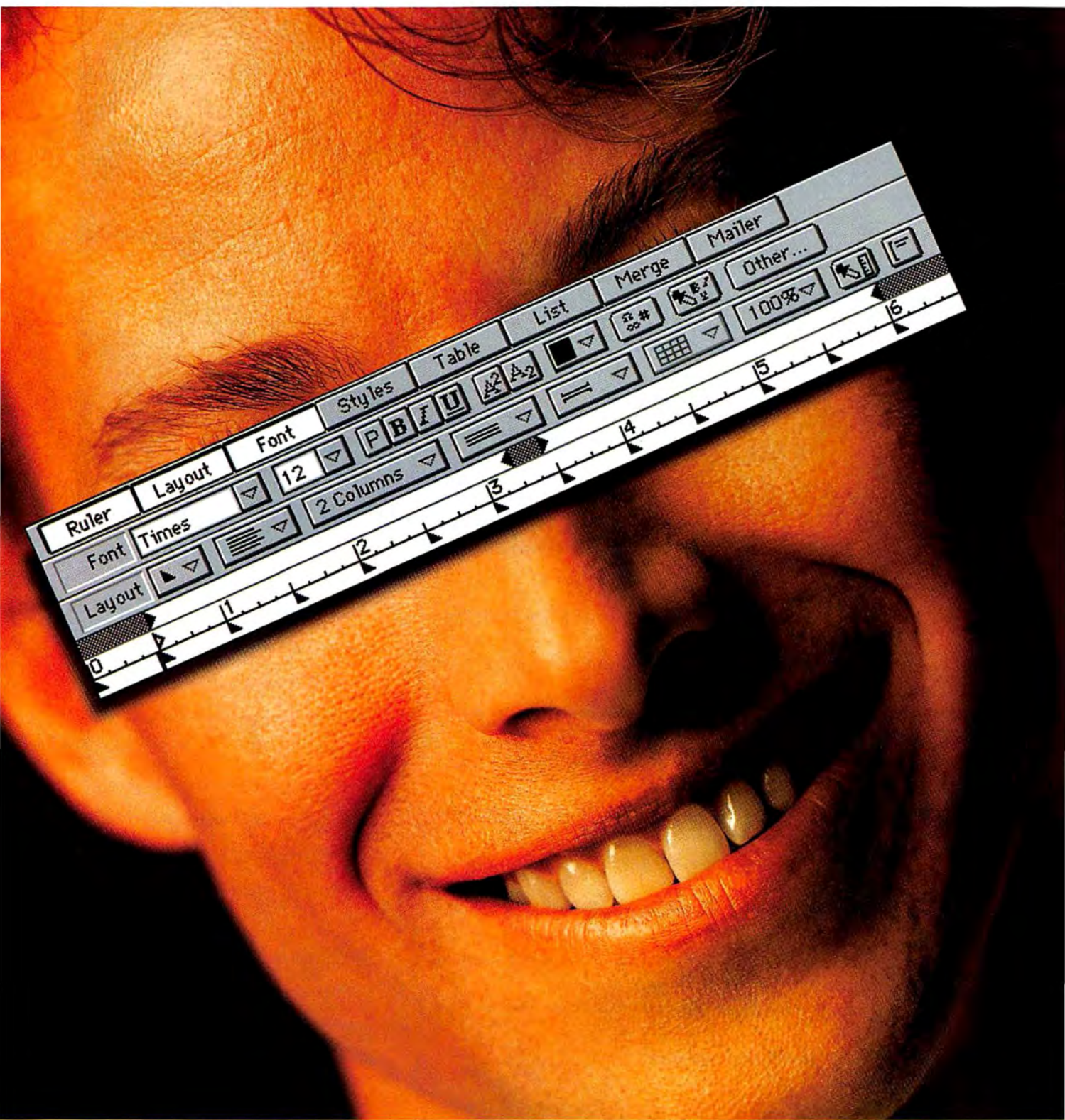
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editing—even math functions—it's all right there. Click. Our customizable
button bars put your favorite tools right there, too. Like spell checking.
Grammar checking. Our integrated drawing program. Whatever
you want. There's even buttons for common tasks like



bulleted indents. So you'll seldom have to do anything. Besides click. (And type, duh. This is a
word processor.) But you can do other cool stuff, too, like run QuickTime.™ Or WordPerfect native
on the Power Macintosh®. So visit your local reseller or **call us at (800) 526-2296 for our \$99* com-
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shorter, it'd be as easy as our interface. Click.

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Learning Power: Software for Kids



10 rules to follow when choosing educational software for your kids. By Joseph Schorr

GETTING A KID TO SIT DOWN in front of a Mac is easy; choosing the right software can be hard. More than 300 educational programs are available for the Mac — and over half of them have been released within the last 18 months. How do you choose the ones that educate or inspire and weed out the ones that condescend or bore?

Narrowing your choice to a specific educational discipline helps, but only slightly: Want to teach your daughter or son math? How do you pick the right program from a shelf crammed with KidsMath, Math Ace Jr., Math Dodger!, Math Rabbit, Math Town, MathTeam, Mathville, Millie's Math House, Treasure MathStorm, Turbo Math Facts — and a few dozen others? Most of the boxes are emblazoned with attractive characters, claims of educational integrity, and endorsements from official-sounding organizations, but how can you tell which box contains the software that's best for your child?

It's no wonder so many parents and educators feel overwhelmed.

A Wealth of Choices

A decade ago, only a few children's programs existed, and most were little more than automated flash cards — HyperCard stacks of multiple-choice or fill-in-the-

blank questions that spit out a score based on the user's answers.

Times have changed. "Everybody and their sister is making software right now," says Warren Buckleitner, a veteran of 900 reviews of children's software and publisher of the *Children's Software Revue*, which is a bi-monthly newsletter that focuses exclusively on educational applications.

Today's options are much broader — and more exciting — than those early drill-and-practice programs. Even today's digital flash cards have improved dramatically — and they've been joined by interactive storybooks, multimedia reference works, animated adventure games, and kid-oriented versions of "grown-up" applications such as word processors and spreadsheet programs.

Along with these different categories of educational programs come different approaches to the learning process. Some programs, such as simulation or exploration software, don't focus on facts and figures; instead, they let children explore an environment (a foreign country, an ocean, a rain forest, or even another planet) at their own pace and then draw their own conclusions from the experience. This process helps children develop general cognitive skills.

PHOTOGRAPHY / LEON HAND MODELS / ALEXA SIERRA ROGERS, BRUCE BROWN





Other programs take a more didactic approach. Although they have the look and feel of games, they're designed to teach and/or drill specific facts or academic skills. In Great Wave Software's NumberMaze, for example, players make their way through the labyrinth of a medieval castle by solving increasingly complex math problems. In The Learning Company's Reader Rabbit series, children score points by successfully matching words and pictures, recognizing letters of the alphabet, and mastering basic phonics.

In the middle ground between exploration and didactic software lie such hybrids as Edmark's excellent series of early-learning games. Mixing free play with educational content, these programs encourage independent reasoning while subtly reinforcing academic fundamentals.

Goal- and plot-oriented games such as those in the Carmen Sandiego series, from Brøderbund, and the Swamp Gas series, from Inline, expose children to information about geography, history, or science. The objective of these programs is to take potentially dry information, such as multiplication tables or state capitals, and weave it into a video-game-like format that keeps the Nintendo generation riveted to the screen.

Still another category of products includes junior versions of adult programs, such as Microsoft's Creative Writer and Brøderbund's Kid Pix 2. These are purely creative tools — the same kinds of programs adults typically use — but they feature interfaces designed specifically with children in mind. These types of programs aren't educational in the strictest sense of the word — they don't actively instruct or drill the child — but they promote creative expression by giving children

the tools they need in order to write, draw, or paint or even to assemble multimedia productions.

Finally, there are programs that combine elements of all these categories. Such programs may contain a suite of activities that includes skill-based games, free exploration, and tools for creating original works of art. Interactive storybooks such as those in the Brøderbund Living Books series or the Discis Kids Can Read series, for example, operate on two levels: They let children work on reading skills while following the narrative of a story, and they also allow them to explore the story's contents by clicking on objects in pictures to uncover hidden surprises or additional information.



10 RULES for Choosing the Right Children's Software

Excellent educational products do exist. Follow these guidelines, and you'll be able to separate the wheat from the chaff — and avoid wasting \$40 on something your child will use once and then ignore.

RULE #1: Try before you buy.

Most children's software is packaged to look irresistible, but the programs themselves are often disappointing. If you ignore everything else in this article, remember this one tip: Make sure whatever you buy comes with a money-back guarantee — and return software that doesn't hold your child's interest. Better yet, try to preview

The Bottom Line / a surefire shopping list of the best children's software

EXCELLENT KIDS' SOFTWARE IS AVAILABLE for the Mac. Choose carefully, however, or you may waste your money — or, even worse, your kid's precious time. We evaluated more than 300 children's educational applications to make our recommendations of the top five children's programs in each of three developmental categories. For a full listing of near winners, also-rans, and products to avoid, see "The Ultimate Children's Software Guide."

PRESCHOOLERS / 4 Years Old and Under

- **Beginning Reading** (Sierra On-Line, \$49.95)
- **Just Grandma and Me** (Brøderbund/Living Books, \$39.95)
- **Millie's Math House** (Edmark, \$35)
- **The Playroom** (Brøderbund, \$34.95)
- **Putt-Putt Joins the Parade** (Humongous Entertainment, \$49.95)

These five programs combine elements necessary to win and hold a preschooler's ever shifting attention, including lots of sensory stimuli — bright colors, music, and sounds — and simple interfaces that don't

require reading skills. Appealing, supportive characters, such as Putt-Putt, the endearing convertible in Putt-Putt Joins the Parade, and Bananas and Jack in Beginning Reading help kids make friends with the Mac. Millie's Math House also introduces a new friend, Millie the Cow, and lays the groundwork for important quantitative skills. The Playroom and Just Grandma and Me promote a variety of basic skills in warm, comfortable settings. Play testing has proved that these five programs have what it takes to engage prereaders — and has shown that they remain favorites into the early school years.



programs before you buy. A growing number of stores allow customers — including kids — to test-drive educational software. Also, many public libraries have children's reading areas equipped with Macs loaded with best-selling programs. Take advantage of these resources, and if possible, let your child spend a little time with a program before you buy it.

If you have a CD-ROM drive, you can also pretest kids software by using the KidSoft catalog (800-354-6150 or 408-354-6100), which includes a kids' activity book and a CD-ROM containing demo versions of many — but by no means all — Mac children's programs. If you don't have a CD-ROM drive, buy one; some of the best children's software is available only on CD-ROM.

RULE #2: Make sure it's fun.

Simply put, an educational program should be at least as alluring as a toy; if a program isn't fun and entertaining, your child probably won't want to use it and its educational value will be lost. Carter's cardinal rule for evaluating children's software is simple: "Ask yourself if it beats a stuffed animal. If it doesn't, buy the stuffed animal."

The fun factor is particularly important with drill-type programs, which can be repetitious and boring.

"There is definitely a place for drill-and-practice, but it should be fun," says Sally Bowman Alden, executive director of the Computer Learning Foundation. "The programs that work build the practice sessions around some kind of game. And they make the game play enticing. The kid is motivated, is given a reward, and gets a chance to advance in the game."

RULE #3: Insist on interactivity and exploration.

Look for programs that allow children to build, create, and manipulate their environment rather than programs that simply tell a story. As one of our eight-year-old testers complained when using a not-very-interactive storybook, "I can't do anything *wrong!*"

"The most successful programs have a child operating in an exploration and discovery mode where there's not just one answer but different ways to do things," observes Alison Elliot, codirector of the Kids' Software Project at Boston's Computer Museum. "You learn by doing. The more a program involves children as active participants — actually creating something on the computer — the more they are engaged."

Interactive learning games and simulations that follow this model are successful because they don't get stale after repeated use; every experience the child has with these programs can be a little different. They're also popular, because they give children the satisfaction of building on past experience to solve problems; kids can draw conclusions and make things work better each time they go back to the programs.

A program's open-endedness and flexibility are far more important in the long run than great-looking graphics or slick animation. "Some front ends are flashy and impressive, but the longevity is pretty limited, because the software does the exact same thing every time you use it," Buckleitner says. "That's a fatal mistake with software. Kids like to build things, create, make things happen, be in control."

RULE #4: Make sure the interface is "childproof."

When reviewing programs for his newsletter, Buckleitner uses what he calls the "pound on the keyboard" test; he or another tester randomly strikes keys with a program running. Well-designed programs handle the abuse without crashing.

In addition to being fail-safe, the program should have an interface that's clean, easy-to-understand, and responsive. Because children — especially preschoolers — have short attention spans, the program should provide immediate feedback when a child clicks on a button or presses a key. Beware of programs that present young users with a blank screen as sequences are loaded into memory; a

EARLY READERS / 5 to 8 Years Old

- **The Cat Came Back** (Sanctuary Woods, \$39.95)
- **Cosmic Osmo and the Worlds Beyond the Mackerel** (Cyan, \$49.95)
- **Kid Pix 2** (Brøderbund, \$39.95)
- **Thinkin' Things** (Edmark, \$40)
- **Treasure MathStorm** (The Learning Company, \$42)

At this age, youngsters still enjoy point-and-click exploration, but they're also developing reading and writing skills and are ready to begin creative activities on the computer. Early readers will spend hours with programs that allow self-directed, creative play. Thinkin' Things and Cosmic Osmo and the Worlds Beyond the Mackerel each reward exploration with inventive, challenging activities. Kid Pix 2 is great for inspiring — and rewarding — artistic creativity. The Cat Came Back is a handsomely told story that boosts reading skills, and Treasure MathStorm leads kids through an adventure that reinforces math concepts.

LATER READERS / 9 to 12 Years Old

- **Dinosaurs!** (Microsoft Home, \$59.95)
- **The Multimedia Workshop** (Davidson & Associates, \$79.95)
- **Odell Down Under** (MECC, \$59.95)
- **SimCity 2000** (Maxis, \$44.95)
- **Where in the World is Carmen Sandiego?** (Brøderbund, \$49.95)

Older kids are quickly discovering the complexity of the world around them and are ready for simulations and games that integrate various concepts and academic disciplines. First-person games such as Where in the World is Carmen Sandiego? and simulations such as Odell Down Under and SimCity 2000 let them acquire knowledge through experience. Kids in this age group also enjoy browsing through information-rich programs such as Dinosaurs! and experimenting with powerful, expressive tools such as The Multimedia Workshop. Well-executed products such as these five offer much to challenge and stimulate older kids.



seemingly dead black screen is distressing to any computer neophyte, let alone a five-year-old.

Finally, look for an interface that's friendly and non-threatening. What does the program do when a child clicks in the wrong area or gives a wrong answer? Does it just beep or relentlessly insist that the child "try again"? Good programs have creative, funny, interesting ways of directing children toward a correct response without making them feel as if they're computer-incompetent. A good example is Edmark's Millie's Math House, in which the result of a wrong answer is as entertaining as that of a right answer. And remember that deliberately giving a wrong answer just for fun can be a valid learning experience — after all, the child must know the correct response in order to avoid it on purpose.



an audience for what they create. Sit down and do things with them, showing support and belief in what they do."

Choose software that can involve you as a parent. For example, detective-style programs such as *Where in the World is Carmen Sandiego?* lend themselves to group play; you can help your child gather information for deciphering clues. On the other hand, beware of programs that require constant parental maintenance. If your child must rely on you simply to operate the program, it's going to be frustrating — for both of you.

"Educational games should allow parents to enter into the space in which the kid is learning and share that space," Carter says. "Otherwise, you're buying an automated tool for children that eliminates the parents from the learning process."

If you remain involved, you can extend the life of a program by helping children discover features they didn't know were there. "It's worth revisiting some of the software and interacting with children to make sure there's not something they haven't tried," says Elliot. "Or one activity that didn't engage them at first might suddenly click."

Also, check to see if the program has a parents' mode that lets you fine-tune the level of difficulty or adjust its interface for children of different ages. Such controls can give the software greater longevity and enhance its educational value. Another legitimate question: Can you turn off the program's background music, thus preventing yourself from going bonkers when your kid decides to play for hours at a time?

Buckleitner also suggests putting the computer in a central part of the house — perhaps in a corner of the kitchen or family room — rather than in the basement, to foster interaction. "That can make it more of a shared activity," he says.

RULE #7: One size doesn't fit all.

If you have two or more children of different ages, look for programs that appeal to a wide range of ages; not all do. Brøderbund's *The Backyard* is engrossing to a preschooler but would probably bore a 10-year-old to tears. On the other hand, *Kid Pix 2*, also from

RULE #5: Think beyond your Mac.

Choose programs that have a life away from the computer — that is, those that encourage noncomputer activities and interests. Kids love it when they can use the computer to create and print projects of their own. They can use Microsoft's Creative Writer to print greeting cards and party banners, for instance. MECC's *Storybook Weaver* allows children to design and print a book. With Brøderbund's *Kid Cuts*, children can make hats, masks, and paper dolls by printing them, cutting them out, and coloring them. Humongous Entertainment packages activity books, crayons, and toys with its preschool software, and Edmark's manuals provide suggestions for non-Mac activities for you and your kids that reinforce what the kids are learning from their software explorations.

RULE #6: Get involved — then stay involved.

All the experts we talked to say the same thing: A parent's involvement shouldn't end with choosing the software and installing it. The computer can be an effective teacher, but it shouldn't be used as a baby-sitter.

"It's not only selecting the software [that's important]," Elliot says. "It's also being involved with the kid's experience at the computer, whether that means playing some games with them or being

Sex and Violence / *software can feed biases*

MOST EDUCATIONAL SOFTWARE is designed to teach basic skills such as reading, math, problem solving, and so on. But along with those exercises in elementary phonics and proper fractions, software packages for kids might be imparting a few subtle lessons you didn't count on — lessons in sexual stereotypes, racism, or the use of violence.

"Don't think children's software has a higher order of being just because it's on a computer," says Michael Carter, a developer of children's software. "Parents should be wary of characters who aren't ones they want their children to emulate."

The good news is that in evaluating more than 300 programs for "The Ultimate Children's Software Guide," we found no examples of the gratuitous gore or sexually exploitative material that appear occasionally in the video-game world. In fact, violence was scarcely an issue at all, unless the innocent, PacMan-like

gobbling of MECC's *Word Munchers* and *Number Munchers* makes you queasy. Even the Mario Brothers, whose video-game antics are decidedly slapstick, take a highbrow route in their role as educators in programs by The Software Toolworks.

We did, however, note some subtle stereotyping. The most common offenders are probably retellings of classic stories that reflect outdated stereotypes. In EA's *Kids' Peter Pan* CD-ROM, for example, the creaky story still involves the sword-wielding Peter and scruffy "Indians" rescuing a helpless female from bad men.

A more pervasive form of gender bias is what one of our software testers called "the pretty-bow factor," in which female characters are presented as exclusively dainty and demure — surrounded by flowers and lace — whereas male characters are bold, assertive, and associated with weapons or powerful machinery. Games that allow kids to create scenarios should be flexible enough that any character can use any prop;



Brøderbund, can be equally entertaining to a 4-year-old and a 14-year-old — although the younger and the older kids will use it in very different ways. Also, bear in mind that the age-group recommendations on the box aren't always accurate: Try to have *all* the kids who'll use the program check it out in advance.

Similarly, if you want a program that will hold your child's attention for months or even years, look for software with activities that require increasingly higher levels of skill. Drill-based programs should automatically get harder as the child masters the material. If you have several kids of different ages and academic levels, look for programs that save settings files for different users: Each child enters his or her name at the start of a session, and the program begins at the skill level at which the child left off the last time.

RULE #8: Listen to the experts.

Take advantage of resources that provide assistance in evaluating children's software. For \$24 a year, you can subscribe to the bimonthly *Children's Software Revue* (313-480-0040), which includes announcements of new products and reviews a dozen or so programs in every issue. The newsletter also maintains a current list of the top-rated programs. The publication's editors also offer a database of children's software titles on America Online. To access it, enter the Newsstand area on AOL and choose Home PC from the list of publications. Select the Search Children's Database option to enter the Children's Software Finder, where you can search for software by typing keywords.

Another valuable resource is the Computer Learning Foundation (415-327-3347), a nonprofit organization that encourages the use of technology in education. It provides several resource guides and publishes an annual report that includes guidelines for parents on selecting educational software.

RULE #9: Choose content carefully.

Some games and simulations contain characters you may not want your children associating with (see the "Sex and Violence" sidebar). "If you think a guy in a program has a snotty attitude, then don't let your kid play with him on the computer," Carter says. "Look at educational software with a discriminating eye, just as you do with movies, books, or strangers."

stories should offer well-rounded characters of both genders.

Another problem is the use of exclusively Caucasian characters in many programs. Programs for younger children, such as Brøderbund's Living Books series and Edmark's "... House" series, avoid this pitfall through the use of animal (and endearing monster) characters. For older kids, who may find funny animals uncool, a good solution is *first-person* games and explorations, in which the player doesn't appear on-screen at all; the child *is* the player, and the Mac screen displays what the child sees. However, even in first-person games, it can be tough to find secondary characters of color.

Although we recognize that programming constraints can make it impractical to include male and female characters of all racial and ethnic backgrounds, some companies are making an effort to do so. Mystery Tremendum's graphically limited Moriarty's Return, for example, uses



essentially the same face for every character the player meets but acknowledges diversity with variations in hairstyle, clothing, and skin tone.

Actually, the biggest problem parents encounter with children's software isn't content-related: It's the risk that kids will get hooked on the stimulation of the computer screen and then be drawn away from educational games into flashier and less redeeming ones. Partly because of this risk, even enthusiastic supporters of educational software believe there should be limits on the time children spend at the keyboard. "I don't think it's healthy for kids to spend three hours at a shot dragging and clicking a mouse," cautions Warren Buckleitner, publisher of the *Children's Software Revue* newsletter.

The bottom line: Although Mac software can be a real asset to any child, it can't replace a grown-up's guidance in shaping attitudes about sex roles, violence, or any other aspect of intellectual development.


RULE #10: Don't underestimate basic hardware requirements.

Your kids may not be power users, but some children's programs — particularly those on CD-ROM — require more Mac horsepower than you might expect. When buying software, first make sure you have the appropriate hardware; many popular programs require at least a 68030-based Mac, a double-speed CD-ROM drive, and a 13-inch monitor that supports 8-bit (256-color) video. Before you buy, test the software on your own equipment or on a comparable Mac. Remember, kids generally have *less* patience than adults. If you think a program's performance is slow, your kids will probably be even less forgiving and consider it a dud.

A Bright Future — If You Know What to Look For

We reviewed and rated more than 300 programs for "The Ultimate Children's Software Guide" to give you a head start on finding the right educational software for your child. In addition, we also picked our five favorite programs for each of three age groups — preschoolers, early readers, and later readers — and listed them in the "Bottom Line" sidebar.

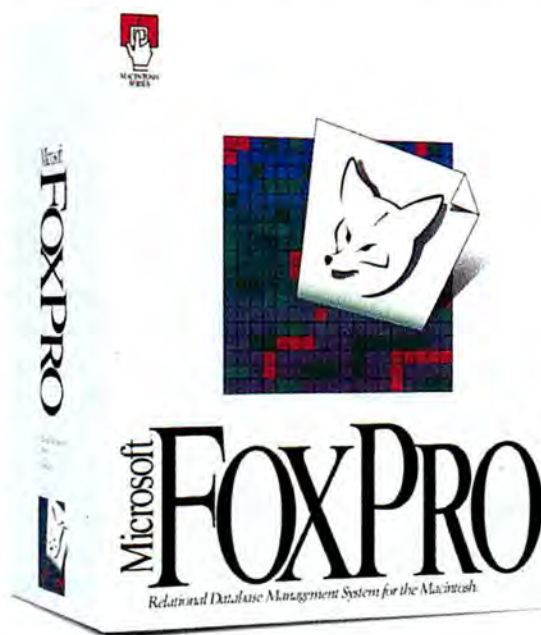
New educational software is being released every month, and the flow is increasing, which makes choosing appropriate software for your children even tougher. Using the rules above will help you sort out the winners from the losers.

Among the new releases, there will surely be even better tools for teaching and inspiring children. "We're left with the feeling of real excitement as educators and parents," Buckleitner says. "The computer is an open-ended vehicle for the delivery of very neat stuff. I can take a child with the lowest self-esteem, give him a program such as Kid Pix 2, and completely change his feelings about himself," Buckleitner says. "That's what it's all about." 



Joseph Schorr is a Mac writer and consultant and the proud father of a six-year-old daughter, who served as one of dozens of volunteer software testers for this article.

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The Ultimate Guide to **Children's Software**

If you have a kid, know a kid, or are just a kid at heart, you'll find exactly what you're looking for among these
 300 children's software packages.

THEY'RE COMING TOO FAST. You can't test them all yourself. You don't even have time to comb the shelves of your favorite software store and read the blurbs on all the boxes.

New children's software is appearing more rapidly than ever. Some of it's good — a lot of it isn't. We know. We've waded through 300 kid's applications, clicking on bunnies, rabbits, critters, monsters — and the occasional talking purple convertible. Armed with the considered opinions of our crack staff of preteen and preschool testers, we can confidently point you toward the best in children's software and warn you about which applications to avoid.

In the following pages are minireviews of all 300 of the titles we tested. The titles are listed by category, in order of decreasing mouse rating; within groups of equal mouse ratings, the titles appear alphabetically by product name. Age-group recommendations are the vendors'. Icons indicate whether each program is available on floppy disk (■) or CD-ROM (⊙). Prices are suggested retail, as supplied by the vendors; those vendors that do not issue suggested prices supplied estimated retail prices, which are designated by an asterisk (*). A directory with contact information for each vendor appears after the reviews.

By the time you read this, a raft of new kids' software titles will be appearing for the holiday season. If you'd like to evaluate them with the same criteria we used, read "Learning Power: Software for Kids," in this issue, and learn how to review children's programs for yourself.

By Jim Shatz-Akin

with Connie Guglielmo, Rik Myslewski, and Joseph Schorr



PRESCHOOL

★★★★ Thinkin' Things

Edmark, 4 - 8 yrs, \$40.

This inspired collection of witty, entertaining, and surprisingly sophisticated brain-building activities is, quite simply, the finest children's software ever released.

★★★★ The Playroom

Broderbund, 3 - 6 yrs, \$34.95.

This time-honored favorite is still one of the best collections of learning games for younger children.

★★★★ Fatty Bear's Fun Pack

Humongous Entertainment, 3 - 8 yrs, \$29.95.

Five fun games, each with four levels of difficulty, provide hours of brain-teasing fun for small fry.

★★★★ Foo Castle

O'Connor House Software, 3 - 10 yrs, \$59.95.

Alphabet games, jigsaw puzzles, dot-to-dots, and clock-reading give prereaders many hours of fun in this highly interactive castle.

★★★★ Kids Basics: My Silly CD of Counting

Discis Knowledge Research, 3 - 6 yrs, \$29.95.

Funny illustrations and rhymes introduce the numbers 1 - 10 and effectively cover counting and rudimentary addition; self-reading text boosts word skills too.

★★★★ KidsTime Deluxe

Great Wave Software, 3 - 8 yrs, \$49.95.

Five activities and a colorful, responsive interface make this an above-average early-learning tool.

★★★★ Putt-Putt's Fun Pack

Humongous Entertainment, 3 - 8 yrs, \$29.95.

Young children can play six games — including a nifty animated checkers match — at four levels of difficulty.

★★★★ Richard Scarry's Busy Town

Paramount Interactive, 3 - 6 yrs, \$49.95.

Characters from best-selling children's author Richard Scarry teach simple math concepts and introduce things in the everyday world.

★★★★ Stickybear's Early Learning Activities

Optimum Resources, 2 - 6 yrs, \$59.95.

Six straightforward activities, a clean interface, and good speech support introduce letter and number recognition, colors, and shapes.

★★★★ Allie's Playhouse

Opcode Interactive, 3 - 8 yrs, \$39.95.

Loads of activities await prereaders, who can explore Allie's Playhouse with their choice of six real-kid narrators, who provide on-line help as needed.

★★★★ The Backyard

Broderbund, 3 - 6 yrs, \$34.95.

A limited range of pleasant activities for preschoolers, but a somewhat disappointing sequel to The Playroom.

★★★★ Kids Basics: My Silly CD of ABCs

Discis Knowledge Research, 3 - 6 yrs, \$29.95.

Silly scenes crowded with critters who share the same initial make this an amusing (and alliterative) alphabetical bestiary.

★★★★ Kids Basics: My Silly CD of Opposites

Discis Knowledge Research, 3 - 6 yrs, \$29.95.

Bunny and Hippo introduce opposite-pair words in this amusing, interactive read-along book.

★★★★ T.J. Finds a Friend

Media Resources, 4 yrs - adult, \$29.95.

An entertaining and lighthearted — if somewhat unpolished — way to impart useful advice about avoiding child abduction.

★★★★ The Treehouse

Broderbund, 5 - 8 yrs, \$34.95.

This ambitious collection of occasionally hard-to-understand activities may confuse younger users.

★★★★ VroomBooks: Four-Footed Friends

T/Maker Company, 3 - 8 yrs, \$49.95.

An exceptionally fine interface can't mask the inadequacy of this multilingual CD-ROM's content.

Foo Castle's daffy king rules over a host of preschool games, including jigsaw puzzles and dot-to-dots.



★★★★ The Big Bug Alphabet Book

AVTEX Interactive Media, 3 - 6 yrs, \$39.95.

Sometimes-unappealing insects teach kids letter recognition, emphasizing shapes.

★★★★ Daisy's Castle

Great Wave Software, 3 - 7 yrs, \$59.95.

Prereading learning games in a medieval-castle setting suffer from an overly formal approach and a clumsy interface.

★★★★ Kids Basics: My Silly CD of Colors

Discis Knowledge Research, 3 - 6 yrs, \$29.95.

Cute animal rhymes and illustrations introduce basic colors; page-corner icons meant to illustrate paint blending to form secondary colors are not adequately explained, however.

★★★★ Preschool Parade

Nordic Software, 3 - 6 yrs, \$39.95.

Clicking on each of the many marchers in an appealing cartoon parade reveals an activity; unfortunately, most of the activities are dull

matching games that go on indefinitely, with no rewards for the player.

★★★★ Yearn 2 Learn - Snoopy

ImageSmith, 3 - 10 yrs, \$64.95.

Multiple-activity program featuring Snoopy offers good math and musical activities, but the face-drawing activity falls flat.

★★★★ Peter's Magic Adventure

Arborence, 5 - 8 yrs, \$29.95.

Multilingual, highly interactive, but ultimately pointless exploration suffers from spotty sound quality and a few disturbing animations.

★★★★ Peter's Numbers Adventure

Arborence, 5 - 8 yrs, \$29.95.

Interactive exploration teaches number recognition but not what the numerals represent: There's virtually no counting.

★★★★ Reader Rabbit's Ready for Letters

The Learning Company, 2 - 5 yrs, \$35*.

Cloying, simplistic games suitable only for the youngest, least experienced prereaders.

★★★★ Yearn 2 Learn - Peanuts

ImageSmith, 2 - 10 yrs, \$64.95.

Peanuts characters teach basic math, reading, and geography, but interface flaws make the program nonintuitive.

★★★★ Peter's Alphabet Adventure

Arborence, 3 - 5 yrs, \$29.95.

Dull activities mar this variation on the each-letter-stands-for-an-animal theme.

★★★★ Ping and Kooky's Cuckoo Zoo

EA Kids, 3 yrs - adult, \$49.95.

An infuriating mishmash of unimaginative animations, grating music, and condescending voices that purports to teach preschool skills.

READING

★★★★ Beginning Reading

Sierra On-Line, 3 - 7 yrs, \$49.95.

Wonderfully realistic talking toys Bananas and Jack effectively balance fun and reading-skills instruction; children are able to choose their own difficulty level.

★★★★ WiggleWorks

Apple Home Learning, 3 - 8 yrs, \$51.60.

Three amusing picture books with engaging activities: Prereaders can hear them read aloud; older kids can rewrite and color them.

★★★★ Alphabet Blocks

Sierra On-Line, 3 - 7 yrs, \$49.95.

Crisp, fluid animation and sound keep these basic letter-recognition exercises fun and lively.

★★★★ The American Heritage Talking Dictionary

SoftKey International, 5 yrs - adult, \$59.95.

Elegant interface and audio pronunciations for over 200,000 words; includes Roget's II Thesaurus.

★★★★ Bailey's Book House

Edmark, 2 - 6 yrs, \$35.

An engaging, if somewhat limited, collection of linguistic games and activities for beginning readers.

★★★★ DaisyQuest

Great Wave Software, 3 - 7 yrs, \$59.95.

Easily navigable, attention-holding game offers lots of learning about phonetics and sound recognition.

★★★★ Mind Castle: The Spell of the Word Wizard

Lawrence Productions, 8 - 13 yrs, \$59.95.

In this well-done vocabulary-building game, you solve word puzzles to escape a wizard who has turned you into a frog.

★★★★ Word Attack 3

Davidson & Associates, 10 yrs - adult, \$49.95.

Good vocabulary-building game, with difficulty settings for grade-schoolers through high-schoolers prepping for the SATs.

★★★★ ABC with Hickory and Me

Western Publishing Company, 3 - 8 yrs, \$24.

Appealing graphics and large text make this simple alphabet-learning program a stimulating game for younger kids.

★★★★ Alfoobet

O'Connor House Software, 3 - 8 yrs, \$59.95.

Point-and-click adventure contains plenty of creative, educational activities, but the amateurish interface may confuse users.

★★★★ Bookworm Electronic Books

Communication and Information Technologies, 11 - 14 yrs, \$59.95.

Well-crafted digital books embellish literary works with animations, sound, and graphics.

★★★★ Community Exploration

Jostens Home Learning, 5 - 10 yrs, \$59.

As kids explore buildings in an imaginary town and click on objects, they see and hear corresponding words and descriptions in this effective, if static, vocabulary builder.

★★★★ Deluxe Reader Rabbit 1

The Learning Company, 3 - 6 yrs, \$49*.

Overly cute and unpolished animations hinder enjoyment of these word games, but good support info is a bonus to parents.

★★★★ MacReader

Gessler Publishing Company, 10 - 15 yrs, \$59.95.

No-frills program for students who want to improve reading skills; exercises test comprehension and work to boost reading speed.

★★★★ ReadingMaze

Great Wave Software, 3 - 7 yrs, \$59.95.

Routine maze game in which children advance by solving increasingly complex reading puzzles.

★★★★ Spell Dodger!

Arcadia Productions, 7 - 14 yrs, \$39.95.

Spelling drills presented through fast and fun — but sometimes repetitive — arcade game.

★★★★ Super Solvers Midnight Rescue!

The Learning Company, 7 - 10 yrs, \$42*.

Simple but entertaining mystery game in which kids gather clues through easy reading-comprehension exercises.

★★★★ Home Sweet Home

Jostens Home Learning, 4 - 9 yrs, \$39.

Minimally interactive three-part language-skills builder won't inspire much repeat play: It reads the story of a family's trek to a new house, tests story comprehension, and introduces new words in a tepid exploration module.

★★★★ Me, Myself, and I

Jostens Home Learning, 4 - 9 yrs, \$39.

Rigidly linear three-part reading-skills builder reads the story of a girl's first soccer game, tests story comprehension, and introduces new words in a minimally interactive exploration module.

★★★★ Monker's Spelling Submarine

Western Publishing Company, 3 - 8 yrs, \$24*.

This overly cute series of games provides a simple setting for learning spelling, word rhyming, and letter sounds.

★★★★ Reader Rabbit 1

The Learning Company, 3 - 6 yrs, \$42*.

This letter-recognition program needs a lot of parental help to get kids started.

*** Spelling Blizzard

© Sierra On-Line, 9 - 12 yrs, \$49.95.

Good animation livens up this drill game, but the action tends to bog down occasionally and you aren't able to customize the program's word list.

*** Spelling Jungle

© Sierra On-Line, 7 - 10 yrs, \$34.95.

To advance in this engaging game, you must spell words by collecting letters in an ever harder series of arcade-style obstacle courses and then pass spelling quizzes; a wizard offers helpful tips.

*** Stickybear's Reading Room

Optimum Resources, 4 - 8 yrs, \$59.95.

Poor sound quality hampers this otherwise charming — if simple — word-skills builder for young readers.

*** Super Solvers Spellbound!

The Learning Company, 7 - 12 yrs, \$42*.

An entertaining — if not entirely successful — attempt to enliven spelling drills with simple word games.

*** Reader Rabbit 2

The Learning Company, 5 - 8 yrs, \$42*.

Tedious and repetitive game that offers little encouragement to young readers.

*** Word Munchers

MECC, 6 yrs - adult, \$29.95.

Munch the words that have certain characteristics to avoid hungry troggles in this graphically primitive arcade game.

MATH

*** Millie's Math House

Edmark, 2 - 6 yrs, \$35.

Using this program is a wonderfully entertaining way to learn counting, sequential and spatial relationships, and simple logic from the world's cutest cow.

*** KidsMath

Great Wave Software, 3 - 8 yrs, \$49.95.

Eight entertaining math-related activities teach basic math skills, from counting to fractions; instructions can read themselves, but prereaders need parental help.

*** Castle of Dr. Brain

Sierra On-Line, 12 yrs - adult, \$29.95.

Adventure game leads players through a mad scientist's castle and features funny, tricky math and science puzzles.

*** The Cruncher

Davidson & Associates, 10 yrs - adult, \$59.95.

Spreadsheet for children handles all the basic mathematical functions and enables you to jazz up your worksheets by using stickers and sound.

*** Early Math

© Sierra On-Line, 3 - 7 yrs, \$49.95.

Friendly, articulate alien helps children with basic math skills in four cleverly animated, albeit simplistic, game activities.

*** Math Town

Optimum Resources, 5 - 10 yrs, \$59.95.

Solving problems in Math Town's buildings yields fun Stickybear animations; highly encouraging program works in English or Spanish.

*** Mathville

Didatech Software, 12 - 16 yrs, \$67.

There's nothing fancy about its graphics or presentation, but this program takes a simple, painless approach to learning math.

*** Touchdown Math series

Gamco Education Materials, 5 - 11 yrs, \$79.95.

This fast-paced game challenges players to make touchdowns by solving increasingly complex math problems as the clock counts down.

*** Treasure MathStorm

The Learning Company, 5 - 9 yrs, \$42*.

One of the best integrations of game play and math drill, in which the problems get harder as you progress through an entertaining adventure.

*** Countdown

The Voyager Company, 4 - 10 yrs, \$29.95.

Three visually effective counting games (each presented in five languages) that help develop children's computation and estimation skills are

marred by a lackluster HyperCard-based interface.

*** Decimal & Fraction Maze

Great Wave Software, 8 yrs - adult, \$59.95.

Progress through a somewhat crude garden maze by solving increasingly complex math problems.

*** MacKids Turbo Math Facts

Nordic Software, 5 - 12 yrs, \$49.95.

Earn money to buy and race sports cars by making your way through increasingly difficult math drills; well-designed, snappy interface.

*** MathTeam!

Philosoft, 5 - 12 yrs, \$60.

Colorful, fast-moving race game drills math skills; the faster you come up with the correct answers, the closer you get to the finish line.

*** Mathville Jr.

Didatech Software, 10 - 13 yrs, \$67.

Simple, dry, black-and-white program presents word problems and numerous examples to aid kids who need extra help in understanding math.

*** Mathville 1, 2, 3

Didatech Software, 6 - 10 yrs, \$67.

Lots of simple black-and-white graphics help youngsters, aided by their teachers or parents, grasp the fundamentals of counting, adding, and subtracting.

*** NumberMaze

Great Wave Software, 5 - 12 yrs, \$59.95.

Effective drill-based game has players answer math questions in order to progress through an increasingly challenging medieval maze.

*** 123 with Hickory and Me

Western Publishing Company, 3 - 8 yrs, \$24*.

Teaching kids to count and recognize numbers is the goal of this nicely illustrated and easy-to-follow game.

*** Super Solvers OutNumbered!

The Learning Company, 7 - 10 yrs, \$42*.

A mildly diverting mystery game in which you earn clues by solving simple math problems hidden in a cartoon TV station.

*** Fraction-oids

Mindplay Educational Software, 8 yrs - adult, \$69.99.

Respectable arcade game in which you pilot a spaceship, avoiding enemies and freeing imprisoned aliens; to obtain fuel, you have to solve fraction problems.

*** Math Dodger!

Arcadia Productions, 7 - 14 yrs, \$39.95.

Pac-Man-like game emphasizes arcade skills over math: Challenge Room poses math problems to be solved for extra points.

*** MathKids Clock Shop

Nordic Software, 5 - 12 yrs, \$57.95.

Sharp interface, sound effects, music, and speech make this program's straightforward time-telling drills entertaining.

*** Math Rabbit

The Learning Company, 4 - 7 yrs, \$42*.

Useful but not particularly compelling set of math exercises for the very young.

*** Monker's Math Factory

Western Publishing Company, 3 - 8 yrs, \$24*.

A series of simple games provides a fun way for kids to learn the basics of addition and subtraction.

*** The Secret Island of Dr. Quandary

MECC, 8 yrs - adult, \$49.95.

Solve tricky math and logic puzzles to escape a mad scientist's island in this sometimes confusing game.

*** Batter Up! 2000

Discovery Entertainment Software, 5 yrs - adult, \$59.95.

Baseball-theme math program corrects wrong answers so quickly that kids are tempted just to enter any number to advance the game.

*** MacKids Coin Critters

Nordic Software, 5 - 12 yrs, \$57.95.

Kids may learn to count their pocket change, but they won't have much fun doing so.

*** Math Ace Jr.

Magic Quest, 4 - 8 yrs, \$35*.

Vivid graphics give this collection of mathematical games quite a bit of eye appeal, but the sometimes

confusing interface detracts from the fun.

*** Number Munchers

MECC, 8 yrs - adult, \$29.95.

This uninspired arcade-style math drill forces kids to solve simple math problems or be eaten by a troggle.

*** Discover Time

Gamco Education Materials, 5 - 12 yrs, \$79.95.

A pirate treasure hunt is the backdrop for this time-telling game, but once they've found the booty, kids probably won't care to play again.

*** Math Arcade Games

Orange Cherry/New Media Schoolhouse, 7 - 14 yrs, \$39.95.

Three frustratingly slow, dull arcade games that purport to teach basic math.

*** Money Challenge

Gamco Education Materials, 5 - 11 yrs, \$79.95.

An unengaging program asks kids to tally up money and then "rewards" them with a tedious tic-tac-toe game that requires at least two players.

*** Word Problem Square Off series

Gamco Education Materials, 5 - 15 yrs, \$79.95.

"I have six bananas. Bob ate two. How many are left?" gets boring quickly, even as kids seek to uncover the mystery phrase.

GEOGRAPHY

*** Where in the USA is Carmen Sandiego?

Broderbund, 8 yrs - adult, \$39.95.

Detective adventure teaches U.S. geography and history with a crisp interface and top-notch animation and sound.

*** Where in the World is Carmen Sandiego?

Broderbund, 8 yrs - adult, \$49.95.

If you know geography, you'll enjoy searching for Carmen — and if you don't, you'll enjoy learning it.

*** The Amazon Trail

MECC, 8 yrs - adult, \$59.95.

Players learn about the wonders and perils of the South American rain forest as they travel upriver on expeditions.

*** Canada Geograph

MECC, 9 yrs - adult, \$59.95.

Everything you always wanted to know about Canada, including colorful maps and socioeconomic data for kids doing detailed reports.



*** Mario Is Missing

Software Tool Works, 7 - 12 yrs, \$39.95.

An engaging global scavenger hunt in which plumber Luigi has to recover stolen landmarks and answer tricky questions about them in order to rescue his brother Mario.

*** Swamp Gas Visits Europe

Inline Designs, 6 yrs - adult, \$49.95.

Help guide Swamp Gas, an alien adventurer, around a map of Europe, and earn a chance to play witty, nonviolent arcade games; variable skill levels.

*** Swamp Gas Visits the USA

Inline Designs, 6 yrs - adult, \$49.95.

Good graphics and sound distinguish this fun-to-play geography game; variable skill levels.

*** World Discovery

Great Wave Software, 8 yrs - adult, \$59.95.

The interface isn't terribly refined, but this geography quiz game is responsive, flexible, easy to customize, and challenging.

Crosscountry USA

Didatech Software, 10 - 15 yrs, \$79.

An 18-wheel truck travels to 180 cities across the country, uncovering facts about each; maps show distances and routes between destinations.

The Learning Discovery: Earth Treks

Magic Quest, 9 yrs - adult, \$35*.

Informative but visually primitive and sluggish HyperCard stack with a world-tour quiz game and an exploration module.

Moriarty's Return

Mysterium Tremendum, 9 yrs - adult, \$59.95.

Catch-the-crook game weaves historical and geographical information into a collection of fact-gathering adventures.

Travelrama USA

Zenda Studio, 7 yrs - adult, \$39.95.

Slick-looking geography game in which players traverse a map of the U.S. looking for postcards of noteworthy sites.

Nigel's World

Lawrence Productions, 7 - 12 yrs, \$49.95.

Geography game with an uneven mix of gorgeous photos and clunky-looking graphics and animation.

HISTORY

The Oregon Trail

MECC, 10 yrs - adult, \$49.95.

An outstanding adventure/simulation program that acquaints players with the difficulties of traveling the Oregon Trail in the mid-1800s.

Headline Harry and the Great Paper Race

Davidson & Associates, 10 yrs - adult, \$59.95.

Humorous and challenging adventure game in which you search for clues needed to write headlines for major events in U.S. history.

Discovering America

Lawrence Productions, 5 yrs - adult, \$29.95.

Loads of detailed pictures and sound effects enliven this historical adventure that turns you into a Spanish explorer.

Hawaii High: The Mystery of the Tiki

Sanctuary Woods Multimedia, 8 - 12 yrs, \$40*.

Jennifer and Maleah, two modern girls, search for a missing ancient treasure while learning about the history of Hawaii.

The Learning Discovery: Time Treks

Magic Quest, 9 yrs - adult, \$35*.

HyperCard-based exploration of world history includes maps, time lines, and a game-play format that is genuinely challenging but weak graphically.

China: Home of the Dragon

Orange Cherry/New Media Schoolhouse, 9 yrs - adult, \$39.95.

A poor interface and a lack of cross-referencing tools limit the value of this impressive collection of text and images about China's people, culture, and history.

Time Traveler CD

Orange Cherry/New Media Schoolhouse, 10 yrs - adult, \$59.

A poor interface detracts from this survey of civilization from 4000 B.C. to the 1990s.

Annabel's Dream of Ancient Egypt

Texas Caviar, 5 - 9 yrs, \$39.95.

The ho-hum story of a cat who journeys to ancient Egypt and picks up some information about the opera *Aida* along the way.

Annabel's Dream of Medieval England

Texas Caviar, 5 - 9 yrs, \$39.95.

Annabel the cat gets a look at the Middle Ages; content may be too sophisticated for kids.

SCIENCE AND NATURE

Life Story

Sunburst Communications/Wings for Learning, 8 yrs - adult, \$129.

One of the earliest and highest-quality examples of

interactive multimedia, recounting the discovery of DNA.

Odell Down Under

MECC, 8 yrs - adult, \$59.95.

Open-ended, visually dynamic, humorous, and informative simulation lets players experience life as a fish in the Great Barrier Reef.

Sammy's Science House

Edmark, 4 - 8 yrs, \$35.

Teaches kids that science is a way of thinking, not an imposing morass of numbers and facts — and that it's fun, to boot.

Where in Space is Carmen Sandiego?

Broderbund, 12 yrs - adult, \$34.95.

Young detectives are able to increase their knowledge of astronomy while searching for clues to stop superthief Carmen from pillaging the entire solar system.

Archibald's Guide to the Mysteries of Ancient Egypt

Swift International, 6 - 12 yrs, \$39.95.

Friendly, fascinating, low-key tour of ancient Egyptian culture explains how mummies were made and how to read hieroglyphics.

Coral Kingdom

Sunburst Communications/Wings for Learning, 8 yrs - adult, \$129.

Stunning visuals, detailed narration, and excellent supplemental reference materials guide exploration of a coral reef, its biology, and its ecology.

Dinosaur Adventure

Knowledge Adventure, 3 yrs - adult, \$69.95.

Rich, interactive exploration of paleontology and dinosaurs, with great instructional activities; prereaders may need help.

Dinosaurs!

Microsoft Home, 8 yrs - adult, \$59.95.

Beautifully illustrated, polished reference with a good interface; great for browsing but lacking in activities.

Fun Physics

Knowledge Revolution, 12 - 18 yrs, \$65.

Fascinating Newtonian construction set with a surprisingly simple interface makes it easy to build complex physics simulations.

Interactive Physics II

Knowledge Revolution, 12 yrs - adult, \$249.

Powerful motion lab lets you conceive and run physics experiments — but you'll be lost without the 269-page manual.

Kid's Zoo

Knowledge Adventure, 3 - 6 yrs, \$69.95.

Fun, informative activities include identifying lots of baby animals by sound, name, or close-ups of various body parts.

Leonardo the Inventor

InterActive Electronic Publishing, 12 yrs - adult, \$49.95.

Animations and 3-D renderings of sketches from da Vinci's notebooks highlight this handsome, if occasionally cursory, survey of Leonardo's scientific and artistic work; skip the pointless games.

Prehistoria

Grolier Electronic Publishing, 9 - 18 yrs, \$69.95.

Handsomely designed, easy-to-navigate, and well-organized interactive reference work on prehistoric life.

Space Adventure

Knowledge Adventure, 5 yrs - adult, \$49.95.

This highly interactive, if somewhat text-intensive, survey of our understanding of space from ancient times through modern exploration includes great photos and indexing.

Dinosaur Discovery

Applied Optical Media, 4 yrs - adult, \$59.95.

Well researched and referenced, this detailed look at more than 150 dinosaurs is best for older kids keen

to know all there is to know about dinosaurs.

Forever Growing Garden

Media Vision, 3 - 10 yrs, \$49.95.

Nifty sounds and beautiful graphics may inspire kids to plant a virtual flower or vegetable garden, but only the most diligent will stick around until harvest time.

The Learning Discovery: Ecology Treks

Magic Quest, 9 yrs - adult, \$35*.

Responsive, challenging HyperCard-based exploration game is graphically unsophisticated but packed with information.

Morgan's Trivia Machine

Morgan Interactive, 7 - 14 yrs, \$34.95.

Hip, humorous trivia game focuses on science, history, and geography and includes plenty of photos and movies.

Multimedia Animals Encyclopedia

Applied Optical Media, 4 yrs - adult, \$49.95.

Well-referenced encyclopedia contains visual, text, and audio annotations on about 2,000 animals but may overwhelm kids looking for just an introduction to zoology.

Multimedia Audubon's Mammals

Creative Multimedia, 5 yrs - adult, \$49.99.

Dry but functional CD-ROM presentation of the classic animal reference work.

Multimedia Birds of America

Creative Multimedia, 5 yrs - adult, \$49.99.

CD-ROM version of the famous Audubon reference work, enhanced with digital recordings of bird songs.

National Geographic Society:

Dinosaurs/Whales

Discis Knowledge Research, 4 - 9 yrs, \$36.95.

Twin-CD-ROM pack offers fine artwork and a great vocabulary-building setup: Point at a photo, and a word for the object you've picked appears.

Planetary Taxi

The Voyager Company, 8 - 14 yrs, \$39.95.

Offbeat interactive game allows children to explore astronomy as they drive a taxi through the solar system.

Smithsonian Institution Dinosaur Museum

Software Marketing, 8 yrs - adult, \$59.95.

Great graphics — but even more text — cover three dino eras, including the Jurassic, and offers a tough quiz section; 3-D glasses are underwhelming.

A World Alive

The Voyager Company, 5 - 15 yrs, \$39.95.

Well-organized reference covers the habitat, classification, and behavior of over 100 animals, with QuickTime video of each.

Adventures with Oslo: Tools and Gadgets

Science for Kids, 5 - 14 yrs, \$59.95.

A robot named Oslo, accompanied by too-cutesy music, introduces kids to the hows and whys of everything from doorknobs to tools.

Butterflies/What Air Can Do

Discis Knowledge Research, 6 - 9 yrs, \$36.95.

Gorgeous butterfly photos are the main draw in this twin-CD-ROM set; both selections offer *National Geographic* photos with rather flat self-reading text.

"Cell" Ebration

Science for Kids, 5 - 8 yrs, \$289.

A very simplistic introduction to cell biology for kids, filled with colorful but primitive graphics and audio that can be heard in English or Spanish.

Dinosaur Safari

Creative Multimedia, 8 - 12 yrs, \$29.95.

Journey back in time to photograph dinosaurs and uncover information on dinosaur classification; a confusing interface detracts.

Forces and Motion

Science for Kids, 7 - 11 yrs, \$289.

Cartoon characters and upbeat music introduce the basic forces of the universe as well as inventors who explored these concepts.

National Geographic Society:

Farm Animals/Spiders

Discis Knowledge Research, 6 - 9 yrs, \$36.95.

Intricate webs and great magnified photos of spiders are the primary appeal in this twin-CD-ROM package; self-reading text and photos that identify



The legendary superthief plunders the planets in Where in Space is Carmen Sandiego?

themselves make for limited interactivity.

*** National Geographic Society: A Tree Through the Seasons/Birds and How They Grow

© Disc Knowledge Research, 6 - 9 yrs, \$36.95.

Eye-catching National Geographic photos of nestlings and adult birds enhance this two-disc set. The text reads itself, and when you click on objects in photos, they display and say their names.

*** Scavenger Hunt Adventure Series: Africa

© Swede, 6 yrs - adult, \$49.95.

A picture-taking safari in a virtual African landscape teaches interesting facts about African animals, but the quality of the hand-painted artwork is poor.

*** Simple Machines

© Science for Kids, 8 - 12 yrs, \$289.

Simple graphics introduce kids to basic machine concepts; quizzes help reinforce learning.

*** Undersea Adventure

© Knowledge Adventure, 5 yrs - adult, \$69.95.

Unspectacular art quality and a sluggish interface detract from activities and solid sea-life information based on Jacques Cousteau's writings.

*** Zurk's Learning Safari

© Soleil Software, 3 - 7+ yrs, \$49.95.

Pretty but not very compelling exploration of Africa's Serengeti plain offers lots to discover, but using a lion cub as a cursor doesn't quite work.

*** Davidson's Zoo Keeper

© Davidson & Associates, 6 yrs - adult, \$59.95.

Interactive zoo adventure weaves animal facts and photos into the journey, but the interface is weak and the plot repetitive.

*** Earthcare Interactive

© Wayzata Technology, 3 - 9 yrs, \$39.

A sluggish interface and poor sound quality detract from the presentation of four nicely illustrated, ecologically oriented books.

*** How Things Grow

© InterActive Electronic Publishing, 8 - 12 yrs, \$39.95.

Minimally interactive, crudely illustrated, and wont to introduce new terms minus definitions, this title aims at teaching basic botany.

*** Superstar Science CD

© Orange Cherry/New Media Schoolhouse, 9 - 14 yrs, \$79.

Extremely limited user participation hampers this exploration of the physical sciences.

CREATIVE TOOLS

**** Kid Pix 2

© Broderbund, 3 - 12 yrs, \$39.95.

A brilliantly inventive drawing program for kids of all ages — reason enough to buy a home Mac.

**** Amazing Animation

© Claris Clear Choice, 5 - 14 yrs, \$59.

An engaging hands-on program with ready-made sounds, characters, and scenes lets kids create their own stories and animations.

**** Art Center

© EA Kids, 3 yrs - adult, \$49.95.

Electronic paper dolls, coloring book, stickers, and paint program with an easy-to-use interface and enough variety to keep children entertained.

**** Draw to Learn

© Draw to Learn Associates, 5 - 10 yrs, \$39.95.

Rembrandt Worm takes kids step by step through the process of drawing nine dinosaurs from basic geometric shapes — using pencil and paper.

**** Kid Cuts

© Broderbund, 4 - 12 yrs, \$29.95.

Using basic art tools, kids create masks, puppets, hats, and other objects that can be printed and cut out for hours of noncomputer play.

**** Kid Pix Fun Pack

© Broderbund, 3 - 12 yrs, \$19.95.

A well-done series of add-on designs and projects that extend the value of Kid Pix 2.

**** Kid's Studio

© CyberPuppy Software, 8 - 12 yrs, \$35*.

A simple, nonintimidating multimedia-integration program with clip art and photos lets you create self-running multimedia presentations.

**** The Multimedia Workshop

© Davidson & Associates, 10 yrs - adult, \$79.95.

Well-designed word processor, paint program, and QuickTime-video editor includes lots of clip art, photos, and movies.

**** My Own Stories

© MECC, 8 - 14 yrs, \$49.95.

An enormous array of images enables young authors to easily illustrate their stories with colorful people, places, and things.

**** Print Shop Deluxe

© Broderbund, all ages, \$49.95.

Well-designed basic desktop-publishing package for creating signs, cards, banners, and calendars.

**** Storybook Weaver

© MECC, 6 - 12 yrs, \$49.95.

This powerful program lets you write stories, illustrate them with editable pictures, and even attach sounds to images, but the interface is somewhat confusing.

**** The Writing Center

© The Learning Company, 7 yrs - adult, \$65*.

Easy-to-use, powerful word processor with clip art, photos, and great project-organization tools.

**** The Colorforms Computer Fun Set

© Gryphon, 3 - 10 yrs, \$49.

Versatile program lets kids place colored shapes and letters on supplied backgrounds or ones they draw themselves.

**** Creative Writer

© Microsoft Home, 8 - 14 yrs, \$49*.

Snazzy word processor with easy-to-use on-line help and lots of fun gizmos to stimulate creativity.

**** Davidson's Kid Works 2

© Davidson & Associates, 4 - 12 yrs, \$59.95.

Integrated application includes a nonintuitive paint module and icon maker as well as a great word processor that can read text aloud and substitute icons for words.

**** Fine Artist

© Microsoft Home, 8 - 14 yrs, \$49*.

Paint program includes good on-line help and fun project ideas, but painting tools are limited.

**** Hands-on Multimedia for Kids

© Media Tech, 8 - 18 yrs, \$29.95.

Step-by-step program introduces kids to multimedia and shows how to create HyperCard stacks and use the HyperLogo language.

**** Kid McGee

© Lawrence Productions, 8 - 13 yrs, \$59.95.

Color and rearrange characters in this add-on activity program for Broderbund's Kid Pix 2 or Davidson & Associates' KidWorks 2.

**** Kid Pictures

© Creative Pursuits, 3 - 10 yrs, \$29.95.

Fifty simple graphics that kids can color and use to create stories in Broderbund's Kid Pix 2 or Davidson & Associates' KidWorks 2.

**** Kid Rhymes

© Creative Pursuits, 3 - 10 yrs, \$29.95.

Add-on to Broderbund's Kid Pix 2 or Davidson & Associates' KidWorks 2 provides pleasant Mother Goose images and activities.

**** KidsWorld Screensaver Construction Set

© Bit Jugglers, 6 yrs - adult, \$59.95.

Kids can create their own screen savers by placing animated figures and props against a variety of backgrounds.

**** Animals with an Attitude

© Toucan Software, 8 - 15 yrs, \$49.95.

A cartoonish collection of animal-character clip art and backgrounds for creating stories, minibooks, posters, and signs.

**** Best of K-12 Graphics

© Software Sense, 5 - 18 yrs, \$99.95.

Over 2,000 color and black-and-white clip-art images, from simple line drawings to photographs.

**** Dinosaur Days

© Toucan Software, 8 - 12 yrs, \$49.95.

A variety of childlike dinosaur drawings and backgrounds to use in creating stories and books.

**** Dinosaur Park

© The Cute Company, 5 yrs - adult, \$49.95.

Cartoon clip-art images and sounds of dinosaurs

for use in posters, signs, stories, newsletters, and slide shows.

**** Easy Book

© Tom Snyder Productions, 5 - 12 yrs, \$79.95.

Easy-to-use book-publishing program with a non-standard interface and a limited feature set.

**** EasyBook

© Chickadee Software, 5 - 12 yrs, \$59.95.

Simple book-design and -writing application has meager features.

**** Graphics for Holidays & Seasons

© Creative Pursuits, 5 yrs - adult, \$49.95.

More than 100 predictable holiday and seasonal images to be used with Broderbund's Kid Pix.

**** Hello Kitty Big Fun Art

© Big Top Productions, 3 - 8 yrs, \$24.95.

Computer coloring book featuring Hello Kitty and friends includes a scrapbook and a slide show that let you save and "animate" scenes. The coloring tools and "rubber stamps" are straightforward, but the saving procedure is confusing.

**** Hello Kitty Big Fun Deluxe

© Big Top Productions, 3 - 8 yrs, \$54.95.

Single package combines Hello Kitty Big Fun Art, Shapes and Numbers, Piano, and Story Making (described individually elsewhere in this guide).

**** Hello Kitty Big Fun Piano

© Big Top Productions, 3 - 8 yrs, \$24.95.

Hello Kitty has little to do with this program, which teaches simple songs on a hard-to-play on-screen toy piano.

**** Hello Kitty Big Fun Shapes & Numbers

© Big Top Productions, 3 - 8 yrs, \$24.95.

In this gentle, if somewhat monotonous, pair of activities, Hello Kitty teaches counting skills and basic shapes and colors; three levels of difficulty.

**** Hello Kitty Big Fun Story Making

© Big Top Productions, 3 - 8 yrs, \$24.95.

By making choices, kids alter the plots of two self-reading Hello Kitty stories and sometimes end up with strange, abrupt endings.

**** K-12 Graphics Collection

© Creative Pursuits, 5 yrs - adult, \$69.95.

More than 350 well-drawn, detailed color PICT files,



organized into 20 categories, that should suit most kids' school-report needs.

**** Kap'n Karaoke

© WordPerfect Main Street, 4 - 10 yrs, \$49.95.

Easy-to-use program provides music and lyrics so you can sing 20 tunes, from "Twinkle, Twinkle" to "Live and Let Die."

**** Maps for Kids

© Software Sense, 4 - 8 yrs, \$14.95.

More than 85 basic color maps of countries and U.S. states; can be edited in any program that can open PICT files.

**** Pow! Zap! Ker-Plunk: The Comic Book Maker

© Toucan Software, 8 - 15 yrs, \$49.95.

This complex drawing/animation program emphasizes plot development and includes lots of ready-to-use art.

**** Storybook Maker

© Jostens Home Learning, 4 - 9 yrs, \$39.

Kids place figures and objects in scenes and write stories about them. Artwork, recycled from Jostens' interactive stories, often suggests a single activity, narrowing creative choices.

★★: The Flintstones Coloring Book

ImageSmith, 2 - 10 yrs, \$19.95.

Thirty images of the Bedrock bunch, with tools to color them on-screen or print them; for a few bucks more, you can buy a full-scale paint program.

★★: My First Colorforms

Gryphon, 3 - 6 yrs, \$49.

Colorforms on the Mac is a great idea, but the clutter and complication in this interface may bewilder and frustrate young users.

★★: Word Weaver

Humanities Software, 8 - 12 yrs, \$595.

Word processor for students; supports printing options for big books, newspapers, and newsletters.

★★: HyperCard Projects for Kids

Ventura Educational Systems, 10 - 17 yrs, \$29.95.

This series of interactive projects to teach kids about HyperCard suffers from several technical flaws, including Sound Manager problems.

★★: Macademic

Quantum Leap Technologies, 8 yrs - adult, \$149.

A collection of 224 MB of freeware and shareware clip art, educational programs, utilities, and games of extremely uneven quality.

INTERACTIVE STORYBOOKS**★★★★: Beyond the Wall of Stars**

Creative Multimedia, 8 - 14 yrs, \$49.99.

Thoughtful science-fiction adventure story in which players shape the plot by making key decisions that require logic and critical-thinking skills.

★★★★: The Cat Came Back

Sanctuary Woods Multimedia, 7 - 11 yrs, \$40*.

A mischievous cat journeys around the world in this engaging reading, drawing, and music-learning program that works in English, French, or Spanish.

★★★★: Fatty Bear's Birthday Surprise

Humongous Entertainment, 3 - 8 yrs, \$49.95.

Help a generous, resourceful bear outwit a mischievous puppy and prepare a birthday party for the little girl who loves them.

★★★★: Living Books: Arthur's Teacher Troubles

Living Books, 6 - 10 yrs, \$40*.

The number-two installment in the Living Books

interactive-storybook series recounts the grade-school trials and tribulations of a shy but bright young aardvark.

★★★★: Living Books: Just Grandma and Me

Living Books, 3 - 8 yrs, \$40*.

The brilliant animated storybook that launched the CD-ROM revolution. Read the story, or have it read to you in English, Spanish, or Japanese, and then click to discover hidden animated surprises.

★★★★: Living Books: Little Monster at School

Living Books, 3 - 8 yrs, \$40*.

Exceptional interactivity, seamless animation, and a funny story that teaches the lesson that all people have special talents of their own make this disc an enduring winner.

★★★★: Living Books: Ruff's Bone

Living Books, 3 - 8 yrs, \$40*.

The hippest, wittiest interactive storybook in the Living Books series follows intrepid Ruff as he chases his bone into outer space, under the sea, and elsewhere.

★★★★: Big Anthony's Mixed-Up Magic

Putnam New Media, 5 - 10 yrs, \$42*.

Big Anthony, a well-meaning but impulsive apprentice to a kindly witch, creates confusion and then sets things right in this well-drawn interactive story; he also teaches simple magic tricks.

★★★★: Living Books: Arthur's Birthday

Living Books, 6 - 10 yrs, \$40*.

Arthur the aardvark overcomes another social crisis in this follow-up to the slightly more satisfying Arthur's Teacher Troubles.

★★★★: Living Books: Harry and the Haunted House

Living Books, 3 - 8 yrs, \$40*.

Poor sound-syncing and an overdependence on dialogue that isn't in the read-along text burdens this otherwise enjoyable Living Book; bonus CD-audio tracks are a real treat.

★★★★: Living Books: New Kid on the Block

Living Books, 6 - 12 yrs, \$40*.

Interactive-story illustrations introduce beginning readers to Jack Prelutsky's humorous poetry and the fun of rhyming and wordplay.

★★★★: Living Books: The Tortoise and the Hare

Living Books, 3 - 8 yrs, \$40*.

The familiar story of persistence beating overconfidence is recounted in a richly animated storybook format.

★★★★: The Manhole Masterpiece Edition

Cyan, 3 yrs - adult, \$49.95.

Gentle music and whimsical images reward young users who explore this lovely — although static — world.

★★★★: The Wanderoos Go Exploring

Optical Data Interactive, 3 - 8 yrs, \$49.95.

Pocket and Tails, two kangaroos that kids can dress up, guide you through a colorful world of plants, animals, places, and people.

★★★★: The Wanderoos Go to Town

Optical Data Interactive, 3 - 8 yrs, \$49.95.

Further adventures of two popcorn-loving kangaroos on their trip to a richly detailed town; includes four kids' songs.

★★★★: Willy Wabbit & His Magical Books

Great Bear Technology, 4 yrs - adult, \$49.95.

Spend time with Willy Wabbit inside his colorful tree house, where he lets you choose among six books that provide fun, facts, and music.

★★★★: Always Arthur

Media Vision, 3 - 10 yrs, \$49.95.

Arthur, an ordinary dog, is the hero of this well-drawn interactive story that includes some basic reading activities.

★★★★: Buster's First Thunderstorm

Media Vision, 3 - 10 yrs, \$49.95.

A nicely illustrated interactive story about a puppy has a charming plot line; best suited for younger kids.

★★★★: The Christmas CD

Queue, 7 - 14 yrs, \$49.95.

This set of a dozen self-reading holiday stories includes one on the Biblical Nativity and one on the first Hanukkah, but it focuses mainly on Santa. It also includes a "publisher" module that allows kids

to reuse artwork that appears in the stories.

★★★★: Favorite Fairy Tales

Queue, 7 - 10 yrs, \$49.95.

Thirteen self-reading tales, with good voice characterizations but weak, minimally animated illustrations. Includes a set of comprehension quizzes and a clip-art story publisher in addition to text-only versions of more than 100 Hans Christian Andersen stories.

★★★★: Gus Goes to CyberTown

Modern Media Ventures, 3 - 8 yrs, \$49.95.

A singing dog teaches basic academic skills in this colorful, if unpolished, offering.

★★★★: Hilary & the Beast

Tom Snyder Productions, 5 - 9 yrs, \$59.95.

A fun and well-realized interactive story that follows brave Hilary as she rescues a beast from a traveling circus.

★★★★: I Saw a Strange Little Man

Visionary Media, 6 - 11 yrs, \$39.95.

Short story includes a free-form exploration of a well-rendered 3-D landscape, but minimal interactivity is disappointing.

★★★★: Kids Can Read: The Paper Bag Princess

Discis Knowledge Research, 5 yrs - adult, \$29.95.

A pleasant story about a smart, strong-minded little girl in a well-illustrated storybook with a straightforward interface.

★★★★: Kids Can Read: Somebody Catch My Homework

Discis Knowledge Research, 7+ yrs, \$29.95.

Some audio surprises and a fun collection of poems about the hardships of being a kid make this an above-average self-reading book.

★★★★: Kids Can Read: The Tale of Benjamin Bunny

Discis Knowledge Research, 7+ yrs, \$29.95.

Beatrix Potter's delightful story and illustrations concerning Peter Rabbit getting into a jam with his worldlier cousin, Benjamin, make for a handsome self-reading book.

★★★★: Kids Can Read: The Tale of Peter Rabbit

Discis Knowledge Research, 7+ yrs, \$29.95.

This interactive read-along version of Beatrix Potter's story and illustrations is a fine introduction to this classic for young readers.

★★★★: Kids Can Read: Thomas' Snowsuit

Discis Knowledge Research, 6+ yrs, \$29.95.

Winning musical accents accompany this tale of a stubborn kid tangling with his mother, teacher, and school principal in this funny, but not particularly interactive, offering.

★★★★: A Silly Noisy House

The Voyager Company, 3 - 8 yrs, \$49.95.

Kids explore a house inhabited by teddy bears. Graphics and animations are minimal, but lots of hidden surprises keep things entertaining.

★★★★: Sitting on the Farm

Sanctuary Woods Multimedia, 7 - 11 yrs, \$40*.

Not just a bug, but a whole menagerie of creatures, disrupts a picnic lunch in this charming, funny, multilingual story.

★★★★: The Swiss Family Robinson

Orange Cherry/New Media Schoolhouse, 8 yrs - adult, \$49.

The familiar island-survival tale, condensed to 20 nicely illustrated (but primitively animated) pages, with hypertext dictionary entries for many of the words.

★★★★: 20,000 Leagues Under the Sea

Orange Cherry/New Media Schoolhouse, 8 yrs - adult, \$39.95.

Adaptation of Jules Verne's text includes a hypertext glossary and sea-life information but only limited interactivity; the graphics range from poor to very good.

★★★★: Who Wants Arthur?

Media Vision, 4 - 12 yrs, \$59.95.

The adventures of Arthur the dog are at the heart of this quaint, charmingly illustrated story, but interactivity is limited.

★★★★: The Adventures of Pinocchio

Orange Cherry/New Media Schoolhouse, 8 yrs - adult, \$39.95.

Rich artwork enhances a fine retelling of the puppet-boy tale; unfortunately, interactivity is confined

**But Wait, There's More**

DOZENS OF FREE AND LOW-COST educational shareware programs are available in Library 1 of ZiffNet/Mac on CompuServe and in the Education library of ZiffNet/Mac on eWorld, and many of these programs are appropriate for children. For example, Jim Allison's AlphaBoat, pictured here, uses sound, color graphics, and speech to teach the alphabet. Use the keyword AlphaBoat to search for it on-line. (It requires a monitor with a resolution of at least 640 x 480 pixels.)

You can find out more about educational shareware programs on ZiffNet/Mac. See page 4 for details on how to access ZiffNet/Mac.



to just three "Living Pages" and some irrelevant quizzes.

*** Aesopolis

© Quantum Leap Technologies, 3 yrs - adult, \$99.

Twenty of Aesop's fables, hosted by a sometimes cloying central character who explains each tale's moral.

*** Alice in Wonderland

© Queue, 8 - 13 yrs, \$49.95.

Lackluster adaptation of Carroll's classic, with poor artwork. Includes comprehension-quiz option and unabridged text-only versions of *Alice's Adventures in Wonderland* and *Through the Looking Glass* plus nifty clip-art-based scene creator.

*** Amanda Stories

© The Voyager Company, 3 - 6 yrs, \$39.95.

Unpolished but endearing picture-book stories with a simple, intuitive interface.

*** Interactivity Pack: The City Mouse & the Country Mouse

© InterActive Electronic Publishing, 3 - 6 yrs, \$29.95.

Despite the name's implication, the well-known story of rodent culture clash isn't very interactive, and the artwork is ho-hum. Includes a coloring book you can print, crayons, and an audiocassette of the story.

*** Interactivity Pack: Goldilocks & the Three Bears

© InterActive Electronic Publishing, 3 - 6 yrs, \$29.95.

The familiar tale, with uninspired illustrations, reads itself; when you click on objects, they display (and say) their names. Includes a coloring book you can print, crayons, and an audiocassette of the story.

*** Interactivity Pack: The Tortoise & The Hare

© InterActive Electronic Publishing, 3 - 6 yrs, \$29.95.

The fable, with lackluster artwork, reads itself; objects in pictures identify themselves when you click on them. Includes a coloring book you can print, crayons, and an audiocassette of the story.

*** Jack & the Beanstalk

© Tom Snyder Productions, 5 - 9 yrs, \$59.95.

Kids guide Jack up the beanstalk in this simple, colorful version of the classic fairy tale.

*** Kids Can Read: Aesop's Fables

© Discis Knowledge Research, 10+ yrs, \$29.95.

Ten of the well-known lesson-laden tales briefly told in self-reading format; illustrations range from poor to very good.

*** Kids Can Read: Cinderella

© Discis Knowledge Research, 8+ yrs, \$29.95.

Self-reading version of the familiar story has lackluster art but a fitting musical soundtrack.

*** Kids Can Read: Heather Hits Her First Home Run

© Discis Knowledge Research, 7+ yrs, \$29.95.

There's more suspense than the title suggests in this enjoyable, if static, sandlot drama.

*** Kids Can Read: A Long Hard Day on the Ranch

© Discis Knowledge Research, 7+ yrs, \$29.95.

Self-reading book features a young cowboy's tall tales, with humorous illustrations of his exploits — and telltale "photographs" of real life.

*** Kids Can Read: Moving Gives Me a Stomach Ache

© Discis Knowledge Research, 7 yrs - adult, \$29.95.

This fine story about a young boy's reactions to moving on is well illustrated; its click-on-the-object-and-see-the-word interactivity is unimpressive, however.

*** Kids Can Read: Mud Puddle

© Discis Knowledge Research, 6+ yrs, \$29.95.

A little girl battles a cagey mud puddle that continually pounces on her and gets her dirty in this whimsical point-at-the-picture-and-hear-the-word talking book.

*** Kids Can Read: Scary Poems for Rotten Kids

© Discis Knowledge Research, 7+ yrs, \$29.95.

Lighthearted "horrible" poetry with humorous art presented in a minimally interactive self-reading-book format.

*** Oscar Wilde's The Selfish Giant

© Sanctuary Woods Multimedia, 3 - 6 yrs, \$40*.

This charming story that reads itself reveals some

hidden surprises on every page and also has games and an odd collection of mythological information.

*** Shelley Duvall's It's a Bird's Life

© Sanctuary Woods Multimedia, 3 - 8 yrs, \$40*.

Shelley Duvall and her colorful parrots star in a rather limp read-along story with several games and puzzles.

*** Victor Vector & Yondo: The Cyberplasm Formula

© Sanctuary Woods Multimedia, 8 - 13 yrs, \$40*.

An interactive comic book in which kids help Victor Vector and his St. Bernard, Yondo, escape thugs, make friends, and track down a vital formula.

*** Wallobee Jack: The Bingi Burra Stone

© WordPerfect Main Street, 4 - 10 yrs, \$29.95.

More entertaining than educational, this interactive cartoon allows you limited opportunities to shape the plot.

*** Wallobee Jack: The Thai Sun Adventure

© WordPerfect Main Street, 4 - 10 yrs, \$29.95.

This adventure game/story, based in the jungles of Thailand, lets you determine the outcome but has few interactive moments.

*** Whale of a Tale

© Texas Caviar, 5 - 9 yrs, \$39.95.

Nicely illustrated sea adventure is fun the first few times through but lacks enough interactivity for extensive repeat play.

*** The Amazing Spectacular Ordinary Bottle

© Visionary Media, 6 - 11 yrs, \$39.95.

The nicely illustrated, inventive story encourages imagination in children, but the low level of interactivity proves disappointing.

*** Animal Tales

© AVTEX Interactive

Media, 4 - 7 yrs, \$49.95.

Six stories aim to enrich kids' emotional development, but the stories are barely interactive and few kids will simply sit, watch, and listen.

*** Peter Pan: A Creative

Reader Product

© EA*Kids, 5 - 9 yrs, \$49.95.

Slow, unresponsive interface detracts from adventure in which child directs PaintBox Pals to help Peter thwart Captain Hook.

*** The Tell-Tale Heart

© Discis Knowledge Research, 12 yrs - adult, \$29.95.

Sparsely illustrated read-along version of Poe's tale is well narrated but pointless: Buy the book, or get it on audiotape.

*** The Ugly Duckling

© Morgan Interactive, 3 - 8 yrs, \$19.95.

Mediocre graphics, uninspiring design, and a sluggish interface detract from this update of the classic story.

*** McGee

© Lawrence Productions, 2 - 5 yrs, \$24.95.

Interactive storybook with low-quality graphics, few options, and little for children to explore.

*** McGee at the Fun Fair

© Lawrence Productions, 2 - 5 yrs, \$24.95.

Interactive picture book features ugly, jagged artwork; interactivity is limited and repetitive.

*** McGee series: McGee, McGee at the Fun Fair, and Katie's Farm

© Lawrence Productions, 2 - 5 yrs, \$49.95.

There's little to recommend the tours of a house, fair, and farm in these stories for prereaders.

*** Slater & Charlie Go Camping

© Sierra On-Line, 3 - 8 yrs, \$34.95.

Exceptionally poor graphics and irritating, relentless music mar this pale imitation of the Living Books series of interactive storybooks.

*** The Wind in the Willows

© Orange Cherry/New Media Schoolhouse, 8 yrs - adult, \$39.95.

Crude illustrations, minimal interactivity, and a paucity of dialogue rob Mole and his friends of their enduring charm; read the book.

JUST FOR FUN

**** Putt-Putt Joins the Parade

© Humongous Entertainment, 3 - 8 yrs, \$49.95.

The ultimate in warmhearted fun; help the world's cutest convertible earn his way into the Cartown's big parade.

**** SimCity 2000

© Maxis, 10 yrs - adult, \$44.95.

Realistic, habit-forming simulation puts older kids in charge of a city's development, managing everything from highways and railroads to taxes.

**** Spelunx

© Broderbund, 5 - 12 yrs, \$34.95.

Explore an astonishingly rich and colorful underground world that's filled with a variety of ingenious, witty activities.

**** Baseball's Greatest Hits

© The Voyager Company, 8 yrs - adult, \$49.95.

Even young fans will enjoy this comprehensive collection of baseball images, stats, QuickTime clips, and audio excerpts.

**** Cosmic Osmo and the Worlds Beyond the Mackerel

© Cyan, 5 yrs - adult, \$49.95.

The original CD-ROM exploration game is still black-and-white; still features an overweight alien; and is still witty, wacky, and wonderful.

**** DinoPark Tycoon

© MECC, 8 yrs - adult, \$59.95.

Open-ended simulation puts you in charge of a dinosaur park; it is challenging enough to appeal to adults as well as children.

**** Eagle Eye Mysteries in London

© EA*Kids, 7 yrs - adult, \$49.95.

Two amiable young sleuths guide players through interesting cases set in London.

**** Eagle Eye Mysteries: The Original

© EA*Kids, 7 yrs - adult, \$49.95.

Easy-to-play detective game entails interviewing crime witnesses, collecting clues, and identifying suspects.

**** The Even More Incredible Machine

© Sierra On-Line, 11 yrs - adult, \$49.95.

Addictive puzzle game challenges its users to build Rube Goldberg-style contraptions by using such components as bowling balls and mouse-wheel generators.

**** Scooter's Magic Castle

© EA*Kids, 5 - 8 yrs, \$49.95.

Discover an entertaining collection of games as you explore in and around an activity-filled castle.

**** Crossword Creator, Letter Drop, Wordsearch Creator

© Centron Software Technologies, 9 yrs - adult, \$149.95.

Create and solve crossword puzzles or word searches or arrange falling letters into words; includes Roget's II Electronic Thesaurus.

**** The Lost Tribe

© Lawrence Productions, 8 yrs - adult, \$49.95.

Older children may enjoy the challenge of this idiosyncratic adventure game, or they may be turned off by its complexity and odd sense of humor.

**** MacKids WordSearch Deluxe

© Nordic Software, 5 yrs - adult, \$69.95.

Simple program allows you to create and solve your own word-search puzzles. Easy to learn and use.

**** Rodney's Wonder Window


© The Voyager Company, 3 yrs - adult, \$39.95.

This eccentric collection of artist Rodney Alan Greenblatt's oddball stories and activities will entertain, bore, or annoy — it's all a matter of taste.

**** Super Munchers

© MECC, 8 yrs - adult, \$49.95.

Fast-paced trivia game is easy to play and appeals to a broad range of child and adult users, with skill levels ranging from beginner to genius.


Putt-Putt, a lovable roadster, is a gentle companion for preschoolers.

Wacky Jacks

© Zenda Studio, 7 yrs - adult, \$39.95.

Annoying music mars otherwise enjoyable "game show" with games featuring slider puzzles, a tic-tac-toe trivia quiz, and games based on Hangman and Concentration.

Alien Arcade

© Luxenberg Software, 5 yrs - adult, \$49.95.

These six easy, witty, nonviolent arcade games were first published in the Swamp Gas series; no educational value — just fun.

The Chaos Continuum

© Creative Multimedia, 12 yrs - adult, \$39.95.

Program provides dramatic visuals, stereo sound, and a weapon that allows you to zap enemy guards with an energy blast but does not provide a lot of education.

Game Collection

© Quantum Leap Technologies, 5 yrs - adult, \$49.

Disc is packed with hundreds of games, but there's not a lot to learn here.

Isaac Asimov's The Ultimate Robot

© Microsoft Home, 8 yrs - adult, \$59.95.

Excerpts from Asimov's robot writings and QuickTime clips of famous movie robots enhance a lackluster "robot construction set."

Dinosaur Kids Game Pack

© Discovery Entertainment Software, 5 yrs - adult, \$59.95.

A ho-hum collection of simple games (including tic-tac-toe, Hangman, and Concentration), every one adorned with a dinosaur motif.

King Arthur's Magic Castle

© Orange Cherry/New Media Schoolhouse, 5 yrs - adult, \$39.95.

A jumble of four activities of varying quality and little educational value.

Total Baseball

© Creative Multimedia, 10 yrs - adult, \$29.95.

This comprehensive baseball reference is primarily a book on disc, with pages and pages of text few kids would read.

SPECIALIZED**Language Discovery**

© Applied Optical Media, 4 yrs - adult, \$39.95.

A well-designed multimedia introduction to 1,000 words in English, French, German, and Spanish, with pictures and audio pronunciation.

KidDesk

© Edmark, 2 - 10 yrs, \$30.

Terrific Finder replacement lets each child have a personal, password-protected desktop; you can even scan in kids' pictures and leave messages on their "answering machines."

Kid Keys

© Davidson & Associates, 4 - 8 yrs, \$39.95.

An engaging, well-crafted program in which a talking dragon and other colorful characters teach children the alphabet and how to use the keyboard.

Launch Pad

© Berkeley Systems, 3 - 10 yrs, \$30*.

Colorful Finder replacement limits kids' access to grown-ups' files and applications; includes kids' DAs.

Learn French with Asterix

© Gessler Publishing Company, 10 - 16 yrs, \$79.95. This collection of more than 400 cartoon drawings of Asterix, that brave Gaul warrior, teaches intermediate-to-advanced French.

Learn to Speak Spanish/Learn to Speak French

© HyperGlott Software, 11 yrs - adult, \$149 each.

These colorful all-in-one language courses use sound, music, and QuickTime to show language usage in real-world contexts.

The Musical World of Professor Piccolo

© Opcode Interactive, 8 yrs - adult, \$39.95.

A great introduction to music exposes kids to musical styles from classical to rock and provides a lot of music theory as it entertains.

STASH, the Study Tool

© Thayer Software, 11 yrs - adult, \$59.95.

A neat, nimble kit for creating flash cards: Simply type in cue/response cards, and then use the

program to review the information.

VroomBooks: Stradiwackius

© T/Maker Company, 3 - 8 yrs, \$49.95.

Beautifully rendered images in addition to witty, well-performed music help compensate for the limited content of this multilingual music-education CD-ROM.

Family Bible Rhymes

© Bible Land Software, 5 yrs - adult, \$59.

Seventy four-line poems, with fine animated illustrations, recount Old Testament stories in read-along or fill-in-the-blank mode; original scriptural citations included. Sluggish, especially on single-speed CD-ROM drives.

FoolProof Desktop Security

© SmartStuff Software, all ages, \$39.

Simple system extension locks folders, files, and volumes on the desktop without hiding the Finder from the kids.

Kid's Typing

© Sierra On-Line, 7 - 12 yrs, \$49.95.

Friendly, articulate ghost leads children through keyboard exercises that become progressively more challenging.

La Guillotine

© Gessler Publishing Company, 10 - 15 yrs, \$34.95.

Pronunciation guides and games give beginning to intermediate students a good start on French, Spanish, and German vocabulary.

Professor MAC

© Individual Software, 12 yrs - adult, \$39.95.

Teaches desktop basics, the Macintosh operating system, and network and communications tools; provides understandable explanations and follow-up quizzes.

Language Explorer

© Nordic Software, 5 yrs - adult, \$57.95.

Matching animated picture tiles to the corresponding words makes it fun to build Spanish, French, German, or English vocabulary; five difficulty levels keep it challenging.

Adventures in MusicLand

© Dr. T's Music Software, 8 - 13 yrs, \$39.95.

Characters from Alice's Adventures in Wonderland teach music history and fundamentals in this unspectacular program.

All The Right Type

© Didatech Software, 10 - 18 yrs, \$79.

A basic typing-drill program for students who are serious about learning to type.

Berlitz Think and Talk Series

(French, German, Italian, Spanish)

© HyperGlott Software, 8 yrs - adult, \$199.

Comprehensive written and spoken drills (seven CDs per language); HyperCard-based interface is graphically unsophisticated and can be confusing.

Chinese Writing Tutor

© HyperGlott Software, 8 yrs - adult, \$59.95.

Easily navigable, black-and-white HyperCard stack uses animation to show the pen strokes required for creating basic characters.

Japanese Easy Kana

© HyperGlott Software, 8 yrs - adult, \$99.

HyperCard stack provides basic introduction to Hiragana and Katakana writing and pronunciation.

Japanese Kanji Master

© HyperGlott Software, 8 yrs - adult, \$149.95.

Straightforward drills cover the pronunciation, writing, and meaning of Japanese Kanji characters.

Mario Teaches Typing

© MacPlay, 5 yrs - adult, \$39.

It's that annoying little plumber again — but this time he's entertaining kids while they slog through the drills necessary to learn an important skill.

Spanish, French, German, Chinese, Russian

Pronunciation Tutor

© HyperGlott Software, 8 yrs - adult, \$59.95.

Friendly, if dry, drills and ample use of sound make these stacks useful for mastering pronunciation.

Tense Tutor Series

(French, German, Italian, Spanish)

© HyperGlott Software, 8 yrs - adult, \$59.95.

Straight, no-frills drills in the form of HyperCard stacks.

Word Torture Series (French, German, Italian, Japanese, Russian, Spanish)

© HyperGlott Software, 8 yrs - adult, \$49.95.

HyperCard stack drills vocabulary and allows you to customize vocabulary lists and practice translating to and from English.

Quick Study

© Software Solutions, 4+ yrs, \$69.95.

Templates for on-line tests, with spartan layouts of text boxes and radio buttons, let parents create drills for their kids.

UltraKey

© Bytes of Learning, 8 yrs - adult, \$49.95.

An abundance of simple (and cutesy) graphics tells you where to place your fingers for typing and makes the process dull and tedious.

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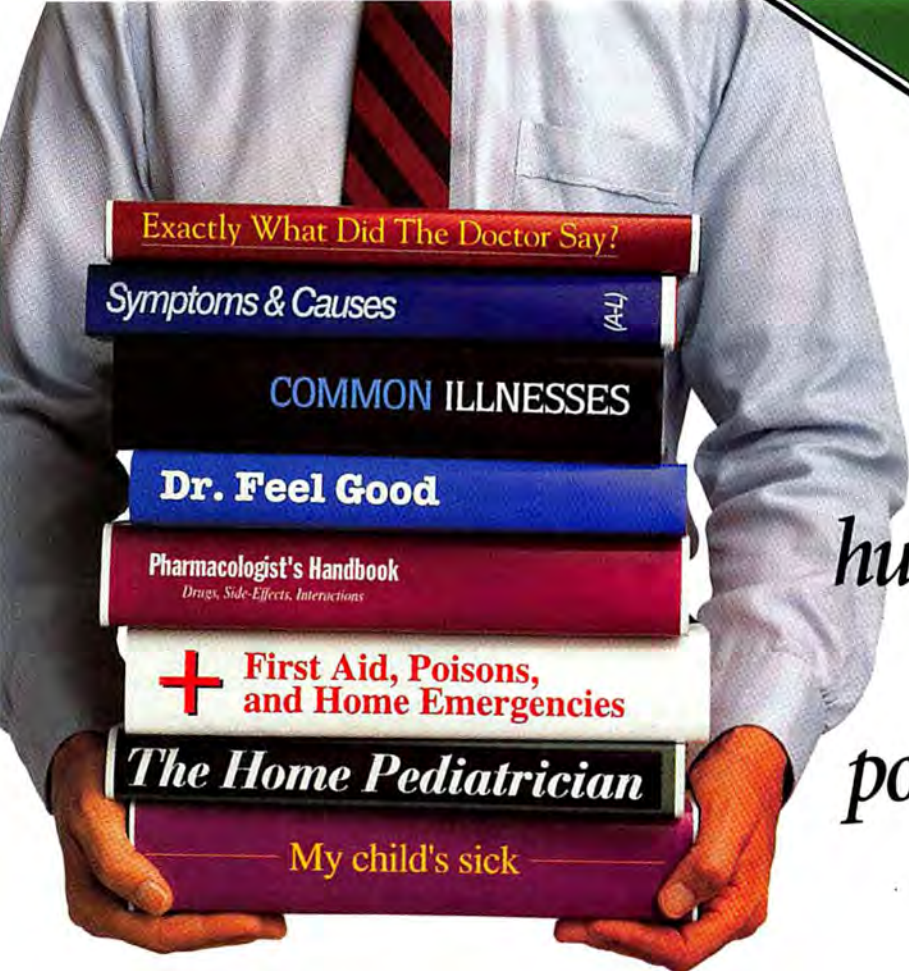
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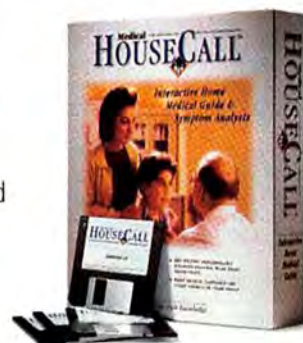
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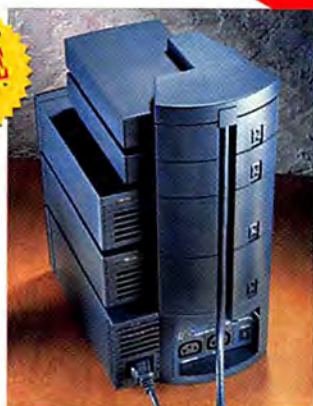
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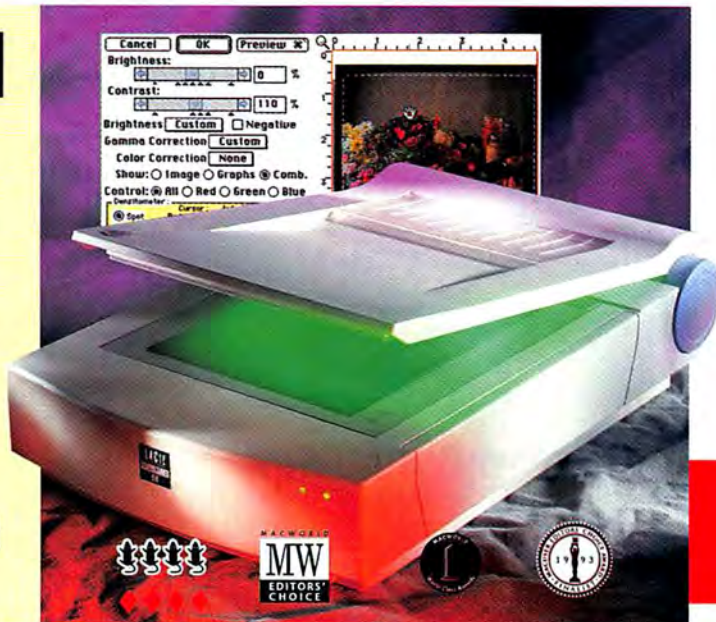
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PowerPC Workgroup Servers: Worth the RISC?

Apple's new Workgroup Servers make speed demons of native PowerPC applications — but not AppleShare.

IF THERE'S ONE THING Power Macs are known for, it's speed. AppleShare file servers, on the other hand, have not historically been noted for their zip. So, back in March, when the Power Macs first shipped, one couldn't help but wonder, Where's native AppleShare?

Apple's first answer — "No comment" — was not too exciting. But Cupertino did inform the buying public that unlike most 680x0 applications for the Mac, the then current version of AppleShare — along with Apple's other server products, PowerShare and AppleSearch — was not compatible with the Power Mac. They didn't run on the new machines, even under emulation.

A couple of months later, the company came out with a better answer. Apple began shipping the PowerPC-based Workgroup Servers 6150, 8150, and 9150. All three run System 7.1.2, the same system that desktop Power Macs run. And most configurations come bundled with a new PowerPC-

compatible version of AppleShare, version 4.0.2, that runs under emulation.

Of course, AppleShare is not the only server software that can run on the new Workgroup Servers. In fact, as we found out when we brought them into our lab, other server software products, such as Retrospect Remote, 4D Server, and FileMaker Pro Server, that are available in native PowerPC versions are better candidates than AppleShare for use on the new servers.

The Specs

But we're jumping the gun. First let's take a look at what you find in the box when you open up one of these new PowerPC servers. The Workgroup Server (WS) 6150 has the same form factor, the same logic board, and the same 60-MHz PowerPC 601 processor as the Power Mac 6100. (This is also the form factor of the 68040-based Workgroup Server 60.) The WS 8150, in turn, has the same form factor, logic board, and 80-MHz

By Henry Bortman



figure 1

Product Specifications / the configurations

	CPU clock speed	No. of NuBus slots	Installed RAM	L2 cache	Hard-drive capacity	CD-ROM drive	DAT drive	AppleShare 4.0.2	Retrospect Remote 2.1	List price
Workgroup Server 6150	60 MHz	1*	8 MB	256K	500 MB	●		●		\$4,219
Workgroup Server 8150	80 MHz	3	16 MB	256K	1,000 MB	●	●		●	\$7,459
Workgroup Server 8150	80 MHz	3	16 MB	256K	1,000 MB	●	●	●	●	\$8,499
Workgroup Server 9150	80 MHz	5	16 MB	512K	1,000 MB [†]	●	●		●	\$9,229
Workgroup Server 9150	80 MHz	5	16 MB	512K	1,000 MB [†]	●	●	●	●	\$10,269

*Requires installation of NuBus adapter card.

[†]Has room for two 1-GB hard drives.

601 processor as the Power Mac 8100. (The WS 8150 also has the same form factor as the 68040-based WS 80.)

The WS 9150 is a bit of a hybrid. Its case is the same as that of the WS 95+, to enable maximum internal hard-drive expansion (as many as eight internal storage devices can be crammed into the 9150/95+ case). But the WS 9150's logic board is nearly identical to that of the WS 8150, containing the same 80-MHz PowerPC 601. The only difference between the two boards is that the WS 9150's has five NuBus slots and the WS 8150's has three (see figure 1).

Those who are familiar with the WS 95+ might wonder about the WS 9150's operating system. The WS 95+ ships with A/UX, Apple's version of UNIX, and a special version of AppleShare, AppleShare Pro. According to Apple, the advanced features

of A/UX, which AppleShare Pro takes advantage of, enable the WS 95+ to run applications faster than other Workgroup Servers. Our previous tests showed the WS 95+ to be the fastest 68040-based server (see "Choosing the Right Server," May '94, page 102). But the WS 9150 can't run the A/UX operating system. Apple doesn't yet have a version of UNIX that can run on the PowerPC processor. PowerOpen, the UNIX implementation for PowerPC computers being developed jointly by Apple and IBM, isn't due until "sometime in 1995," as Apple is fond of saying. And Apple hasn't said when it might offer a version of AppleShare optimized to run under PowerOpen. So, for the foreseeable future, expect the WS 9150 to run version 7.1.2 of the Mac operating system and AppleShare 4.0.2 — just like the WS 6150 and 8150.

A Slow Profile

OK, let's sum up: We've got three new PowerPC-based Workgroup Servers but no native version of AppleShare to take advantage of them. So now two new questions come to mind: Just how fast is AppleShare when running under emulation? And if AppleShare isn't faster on the new Workgroup Servers, what are they good for?

To find out how fast AppleShare 4.0.2 runs under emulation, we brought the Workgroup Servers 6150 and 8150 into ZD Labs' network test shop. As reference points, we also tested AppleShare 4.0 running on the Workgroup Servers 60 and 80. (We didn't test the WS 9150, which is virtually identical to the WS 8150, nor did we retest the WS 95+, which we tested in our May file-server-software roundup.)

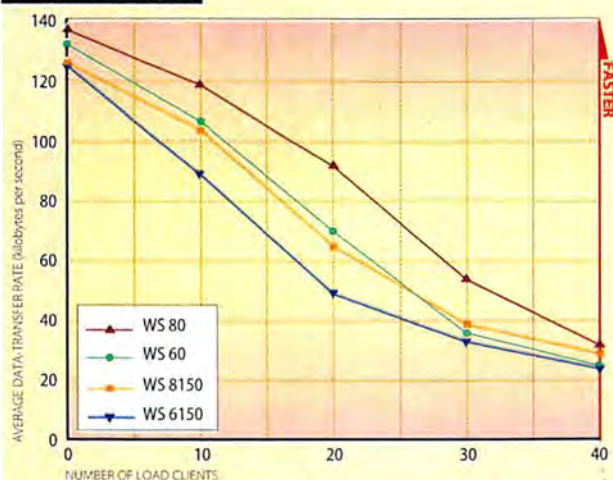
We didn't have high expectations for the

figure 2

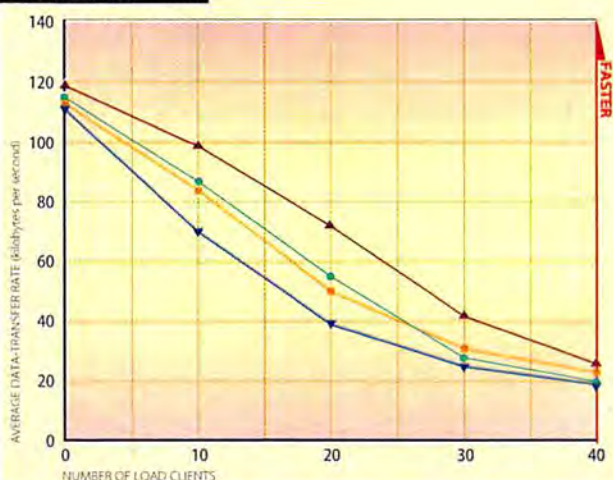
MacUser ZD LABS Small-File Transfers / typical of a small office

When we simulated a busy office network with as many as 40 active users transferring mostly small (10K) files, we found that the new PowerPC-based Workgroup Servers transferred data at an average of only 87 percent of the speed of their 68040-based counterparts.

FILE AND FOLDER READS



FILE AND FOLDER WRITES



WS 6150 and 8150. Most application software that runs under emulation on Power Macs doesn't win high marks for speed. So we didn't expect the PowerPC-based Workgroup Servers to outshine their 68040-based counterparts, the WS 60 and 80. What we found was that, when transferring small files, they were significantly slower (see figure 2). On average, the WS 6150 transferred our test files at around 87 percent of the rate of the WS 60. The WS 8150 did a bit worse still in comparison to its 680x0 counterpart, transferring our test files at an average of 83 percent of the rate of the WS 80. Only in isolated cases did either of the PowerPC-based Workgroup Servers outperform its 68040 counterpart, and then only by a few percentage points. In the worst case, reading our test folder under heavy load conditions (30 or 40 clients), the WS 8150 slogged along at around 50 percent of the speed of the WS 80. On some tests, it was even slower than the WS 60.

The second test configuration was typical of a desktop-publishing environment in which users work with large graphics files. Because the networks in these areas are usually smaller than office networks, we used a maximum of 12 load clients in this configuration (we tested with 0, 3, 6, 9, and 12). Each load client repeatedly wrote one 500K file to the server and read five 500K files from it and then paused 15 seconds

before starting over. (In real-life usage, people perform more read operations than write operations.) With this background activity, we measured the data-transfer rate of the test client while it was reading or writing first a single 20-MB file and then a 20-MB folder filled with 500K files.

In this situation, the PowerPC-based Workgroup Servers did better in relation to their 68040 counterparts than they did with the smaller files. Our test client was able to read the file and folder from the WS 6150 at an average of 93 percent of the rate of the WS 60 and ran neck and neck with the WS 60 on write operations (see figure 3). The WS 8150 didn't fare quite so well on these tasks. It averaged around 86 percent of the WS 80's data-transfer rate on reads and moved data just a shade slower than the WS 80 (98 percent) on writes.

Our conclusion: If you're in the market for an AppleShare file server today, spend your money on a 68040 model. Take the \$1,500 to \$1,700 extra you'd spend for a similarly configured PowerPC-based Workgroup Server and spend it on RAM or hard-drive storage. Or a trip to Hawaii.

Saving Graces

This does not mean, however, that PowerPC-based Workgroup Servers have no place on today's networks. For certain server applications — those that run native on a

Power Mac — the new Workgroup Servers shine. Several vendors have announced native versions of their products that they claim will be significantly faster on the PowerPC-based servers.

ACI US and Claris have each released native PowerPC database-server applications. ACI US believes that users can expect to see the native PowerPC version of its 4D Server relational-database software run two to five times as fast on Apple's new Workgroup Servers as the 680x0 version running on the earlier WS machines. To encourage sales, Apple and ACI US have announced a special "soft bundle" deal, good through the end of 1994: an on-the-spot rebate of \$650 to \$1,000 for customers who simultaneously purchase a WS 8150 or 9150 and 4D Server software. Claris is offering a similar deal: a \$750 rebate to those who purchase its native PowerPC FileMaker Pro Server at the same time as a WS 6150, 8150, or 9150.

Several other vendors are also shipping native PowerPC versions of their server-based packages. Aldus has a native version of its Color Central and TrapWise products. ON Technology has shipped a native version of its Meeting Maker XP software. And Dantz has a native version of Retrospect Remote (which is bundled with the WS 8150 and 9150).

To get a taste of how these optimized server applications perform on the new

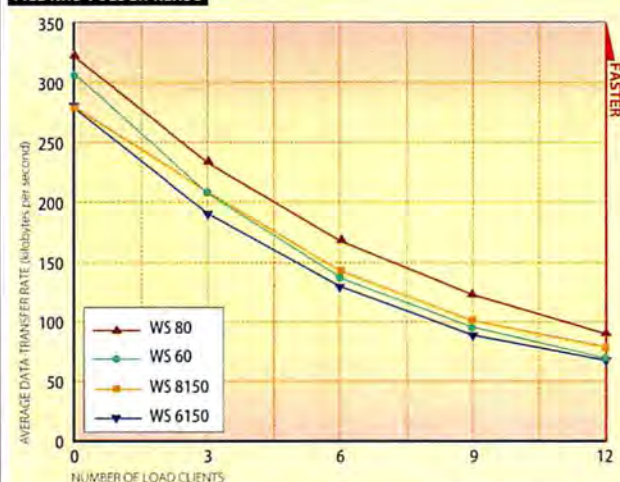
figure 3



Large-File Transfers / typical of a desktop-publishing office

When we simulated a desktop-publishing shop with as many as 12 users transferring large files, we found that, on average, the WS 6150 and 8150 did slightly worse than the WS 60 and 80 on file reads and just broke even with them on file writes.

FILE AND FOLDER READS



FILE AND FOLDER WRITES

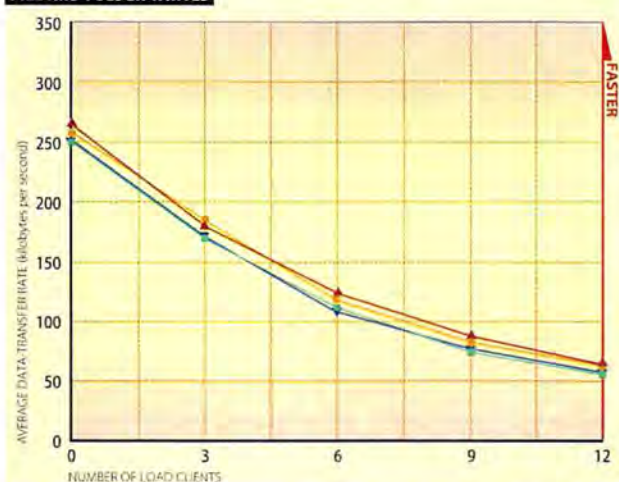


figure 4

MacUser
LABS

Retrospect Remote / PowerPC speeds backup



Native server software does perform well on the new Workgroup Servers. We used Retrospect Remote to perform a network backup of five clients and a server and found that the WS 8150 running the native PowerPC version was as much as 3.3 times as fast as the WS 80 running the 680x0 version. The native software particularly outshone the 680x0 version when we turned on the calculation-intensive compression and encryption options.

Workgroup Servers, we tried out Dantz's Retrospect Remote 2.1 on a WS 8150, comparing it with its 680x0 version running on a WS 80. We distributed 1.75 GB of data from a server to five clients and performed several backups, using various optional settings. We first measured the speed of Retrospect Remote with all options off, then turned on software compression only, then encryption only, and finally both compression and encryption.

The results were impressive. Even with both software encryption and compression turned off, the WS 8150 outperformed the WS 80 by nearly 30 percent (see figure 4). At the other end of the spectrum, with both encryption and compression turned on, the WS 8150 finished the backup in just over three hours, but the WS 80 took nearly eight and a half hours. The WS 8150 showed the biggest speed advantage with encryption, but not compression, turned on — it was 3.3 times as fast as the WS 80.

Where's Native AppleShare?

Well, after all that testing, we knew a lot more about the new Workgroup Servers. But we still didn't have an answer to our original question: "Where's native AppleShare?" Since you've been patient, though, we'll share with you the tidbits of information we have gathered on the subject. A word of caution, however: This is speculation.

The problem is, it's not enough for AppleShare itself to run native. If that were all, Apple might have accomplished the task by now. But, being network file-server software, AppleShare relies heavily on two parts of the operating system that are not yet themselves native: the AppleTalk protocol stack and the Mac filing system. Even if a native AppleShare were available, without a native AppleTalk protocol stack and Mac filing system, AppleShare might not benefit much from running on a PowerPC-based server. It would be constantly calling on the AppleTalk protocol stack and the Mac filing

system, which would cause the system constantly to switch into and out of emulation — a recipe for slow performance.

System 7.5 is no help on this score. Apple doesn't plan to make the entire Mac operating system native until it ships its next major system-software release, code-named Copland, which the company says will be out in "the second half of 1995." (Bookies in Vegas are giving good odds for a New Year's Eve ship date — or later.) In the case of the Mac filing system, unfortunately for AppleShare, this makes sense, because Apple is making major modifications to the filing system for Copland. Porting the current filing system to run native would be a waste of engineering resources.

But a native AppleTalk protocol stack may come sooner. As with the filing system, Apple is completely overhauling the networking portion of the Mac's operating system. This includes recoding the AppleTalk protocol stack to run native on the PowerPC. But what if a native AppleTalk protocol stack, even without a native Mac filing system, gives native AppleShare enough of a boost to make it worth releasing? In that case, AppleShare on PowerPC-based Workgroup Servers might become a viable proposition as early as the first half of 1995.

In the meantime, if you're looking to run AppleShare, stay away from the WS 6150, 8150, and 9150. They're great machines for running server software that can take advantage of them, and the list of such software is growing. But for AppleShare, stick to the WS 60, 80, and 95+. You'll save money, and you'll get better performance. ☐

Henry Bortman is MacUser's technical director.

Net Tests / how we simulate real-life networks

TESTING NEW WORKGROUP SERVERS requires new tools. We used a new version of our file-server test software to perform our comparisons between PowerPC-based servers and 680x0-based servers. This new software, like its predecessor, initiates a series of reads and writes between a specified number of "load clients" and the server being tested. These load clients create a prescribed level of background activity on the server. Once all the load clients are active, we time a series of larger file or folder transfers between the "test client" and the server and then calculate the data-transfer rate for the test client. This process answers the question, On a busy network, how fast can a user copy a file or a folder to or from the server? We repeat these tests several times, increasing the number of load clients for each round, and measure how server performance is affected. Our software uses AppleScript and the

scriptable Finder to automate this process, closely simulating actual Finder file copying over a network.

In addition to using a new version of our test software, we introduced two new user configurations for the testing we did for this report. The first simulated a busy office network in which as many as 40 users were transferring small text files. In this configuration, each load client read five 10K files from the server and wrote one 10K file to it, paused 15 seconds, and then repeated the sequence. While this background activity was going on, the test client transferred first a 5-MB file and then a 2.5-MB folder filled with 10K files. The second simulated a desktop-publishing environment that had fewer users (just 12 load clients) who transferred larger files (500K). The test client transferred a single 20-MB file and then a 20-MB folder filled with 500K files.

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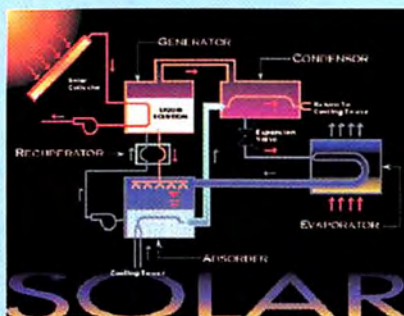
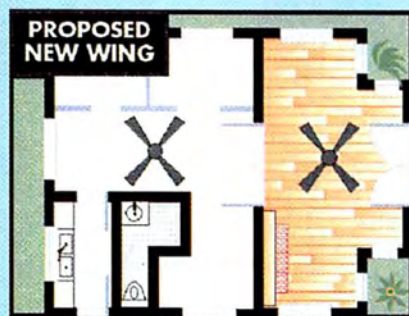


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DIGITAL PHOTOGRAPHY is getting the stamp of approval from one of the biggest names in cameras. Nikon's cameras have served as the base units for a variety of third-party camera backs that contain the CCD arrays to capture images digitally. But now Nikon has teamed up with Fuji Film to design two all-in-one single-lens-reflex digital cameras.

Nikon designed the E2 and E2s to act and feel like traditional cameras, with a

familiar form factor, interchangeable lenses, and automatic focus and exposure controls. Unlike other digital cameras, Nikon's units offer a full-field view that doesn't distort the focal length, so wide-angle lenses perform as they should. Most Nikon f-mount lenses work with the E2 and E2s.

The cameras' resolution of 1,280 x 1,000 pixels is lower than that of the competing Kodak DCS 420. But Nikon has massaged the settings for aperture and shutter and film speed to more closely resemble using



film. The \$10,000 E2 captures one frame per second, and the \$15,000 E2s captures three fps. You can store as many as 84 images on each camera's 15-MB PCMCIA card and then download them to the Mac via a serial-cable connection or with a PCMCIA-card reader. 516-547-4200. / Pamela Pfiffner

On-Line Service Lets You See More

ACQUIRING IMAGES on-line is fast and convenient, but it often requires costly connect time while you search for the files you *really* want. Easing that frustration is the goal of Seymour, a new on-line stock-

as in Massachusetts. If you want to modify a search, you can drag an image onto the query palette. Seymour then calls up similar images based on mood, location, color, and other factors.

After making a selection from more than 200,000 images from agencies such as Magnum

Photos, Black Star Publishing, Hulton Deutsch, and Impact Visuals, you download a 72-dpi watermarked version. You get high-resolution digital images either via telephone lines or through the mail on

a CD-ROM or a SyQuest cartridge. You can also opt for a conventional transparency or print sent directly from the stock agency.

The ordering procedure mimics that of traditional stock photo agencies, with pricing based on use. Seymour costs \$175 per station, which includes three free hours of connect time, after which per-minute charges kick in. PNI says a typical search costs about \$20. 703-558-7680. / PP



photography service from Picture Network International (PNI).

Unlike catalogs based on keywords that are either too narrow or too inexact, Seymour is based on what PNI calls natural-language processing, which interprets query context. For example, it knows that a query about "summer sports in New England" applies to photographs of sailing, fishing, and golfing in Boston, Cape Cod, and Martha's Vineyard as well



Pantone's Palette Picker

CREATING COLOR PALETTES is a snap in most graphics applications, but getting spot colors to look the same from one application to another isn't. Pantone's \$199 ColorDrive application offers a way to centrally manage color palettes and improve the color fidelity of Pantone simulations on desktop color printers and on-screen.

To create a ColorDrive palette, you drag swatches from any Pantone color-reference library, custom color palette, or default library from a commonly used application. After selecting the target output device, you export the color palette to ColorSync-compliant applications that support Apple's extensible Color Picker. ColorDrive exports palettes in the native formats of many applications or as EPS documents. 201-935-5500. / PP

Adding Tools to PageMaker

LONG LOST IN THE SHADOW cast by QuarkXPress XTensions, Aldus PageMaker Additions are starting to come into their own. Extensis' PageTools, a \$129 collection of ten plug-ins, improves PageMaker's usability. PageTools' PageBar Addition gives PageMaker a customizable icon bar with buttons for just about every PageMaker function imaginable. PagePrinter lets users select pages to print by previewing them and offers the option of printing only the pages that have been modified since the last print job. PageRulers allows the creation of any number of rulers in a document (as opposed to the one margin ruler PageMaker provides), and PageMover lets users cut or copy items and paste them elsewhere without leaving the page they're working on.

503-274-2020. / Jason Snell



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Golly GX

GX fonts bring new levels of typographic sophistication to desktop publishing, but will we ever realize the promise behind the technology? Here's the inside scoop on the next wave in type. BY KATHLEEN TINKEL

DO YOU NEED ANOTHER font format? Does anyone? Apple thinks so, and it has come up with a humdinger in its GX fonts, combining typographic richness with computer intelligence and desktop convenience.

GX is not actually a new font format, at least not in the sense that PostScript Type 1 and TrueType are formats. GX fonts are part of QuickDraw GX (enhanced ROM routines that handle the Mac's screen imaging, color, graphics, text, and printing), introduced with System 7.5. Although developed as a

system extension to TrueType, the GX technology works with both digital font formats (including multiple masters), which means your existing type libraries won't become obsolete. Using Type 1 fonts under GX requires upgrading them, however: System 7.5 includes a utility called Type 1 Enabler that adds the sfnt resource to Type 1 fonts. TrueType fonts already contain sfnt resources.

But to get the most from GX, you need fonts programmed to take advantage of the technology. Such smart fonts contain extra features that previously were available only in certain applications or through typographic gymnastics. On top of that, these new functions depend on support from GX-savvy applications. Programs that are not GX-savvy cannot make use of a GX font's special features.

And here's the bad news: None of the programs you're likely to use to set type are currently GX-savvy, including desktop-publishing mainstays such as Aldus PageMaker, QuarkXPress, Adobe Illustrator, and Aldus (soon to be Altsys) FreeHand; word processors such as Microsoft Word, Claris' MacWrite Pro, and Novell's WordPerfect; and font editors such as Altsys' Fontographer and Ares' FontMonger. A few adventurous developers *are* incorporating GX to boost their share of the DTP market with GX-savvy versions of their programs. These companies include Manhattan Graphics (Ready,Set,Go! GX), Pixar (Typestry 2), and British newcomer SoftPress (UniQORN). Fortunately, Apple has included a simple text editor called GX-Write with its system-software update to facilitate immediate use of the GX fonts that ship with System 7.5.

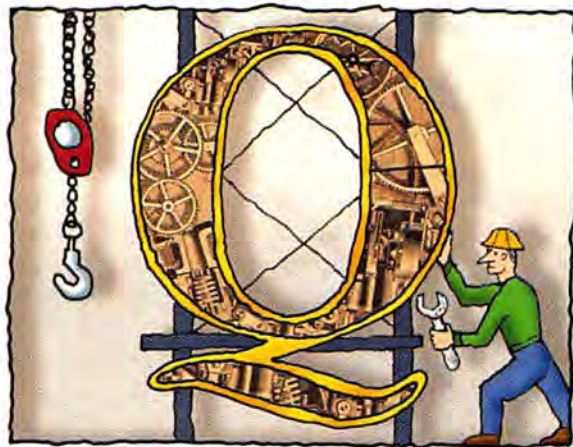
An application under development by Apple and The Font Bureau showcases GX's

potential. It allows designers to incorporate GX fonts, QuickTime movies, and OpenDoc components into a single document (see figure 1). In this scenario, GX fonts might take on the attributes of QuickTime animations, for instance.

The First GX Fonts

Apple ships 4 GX font families with System 7.5: Hoefler Text, Apple Chancery, and Skia (developed under grants from Apple by Jonathan Hoefler, Bigelow & Holmes, and Matthew Carter, respectively) as well as Adobe's Tekton GX. In addition, Adobe (415-961-4400) is working on GX versions of Adobe Garamond and Callisch Script. ITC (212-371-0699) and Bitstream (617-497-6222) have collaborated on 11 additional GX families: Amerigo, ITC Anna, Bernhard Modern, Bernhard Tango, ITC Charter, Chianti with Italic, Mr. Earl and the Snowcaps, ITC Highlander, ITC Newtext, Oranda Condensed, and ITC Studio Script.

Linotype-Hell (800-633-1900) plans to release its entire library in GX format on a CD-ROM containing the familiar Mac core set, including Courier, Times, Helvetica, and Avant Garde. Galapagos Design Group (617-497-5626), a spin-off from Bitstream that includes most of the people who developed the ITC/Bitstream GX fonts, is bringing out Kristen GX. The Font Bureau (617-423-8770), which has done much of the



**If you
want to
walk the
walk
you got**

To Talk
GX

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figure 1 / **The Font Bureau's** David Berlow designed this GX type specimen, using a prototype application that's GX-, QuickTime-, and OpenDoc-savvy. The application, which is being codeveloped by The Font Bureau and Apple, allowed Berlow to scale the GX fonts Millenium, Sloop, and Giza to exactly fit the allotted space.

Apple Chancery: Gather ye rosebuds while ye may.

Bernhard Modern: Gather ye rosebuds while ye may.

ITC Anna: GATHER YE ROSEBUDS WHILE YE MAY.

ITC Newtext: GATHER ye ROSEBUDS while ye MAY.

Kristen: GATHER YE ROSEBUDS WHILE YE MAY.

Mr. Earl and the Snowcaps: Gather ye ROSEBUDS while ye may.

Sloop: Gather ye rosebuds while ye may.

production work on the GX fonts for the other firms, is also releasing two font families, Millenium and Giza, this fall, and will release others — such as the graceful script Sloop — when demand warrants (see figure 2).

Except for Adobe's fonts, all of these are TrueType GX fonts. Monotype (312-855-1440) will release the extensive Bullmer GX font family in Type 1 GX format before the end of the year.

Worth the Wait?

Why are fonts being developed for use in applications that don't yet support them? The answer is easy — GX fonts have extraordinary potential:

Huge character sets. Elegant features such as swash characters and old-style figures that today require laboring with expert and alternate sets to access them can be built in to a single GX font (see figure 3), which can have as many as 65,000 characters, compared to the current limit of 256 per Mac font. In addition to easier access to special characters, this means that we can have automatic pairwise kerning of characters — swash caps and regular lowercase text, for example — that formerly were in two separate fonts and thus had to be kerned manually (or remain unknerned).

Unlimited type styles. GX also expands the Mac's limited definition of a type family (plain, italic, bold, and bold-italic). The new format supports as many styles as a type designer can envision. It's common for a traditional type family to have three or four weights, all with italics; many also have corresponding condensed faces, and some include related display faces or a titling font. In the past, this complexity has led to a confusion of names in font menus, but GX fonts incorporate style variations gracefully.

Multiple-master variations. GX fonts are also capable of supporting style variants like those found in Adobe's multiple-master fonts, but the fonts are potentially much simpler to use, with no need to create an "instance" (a faux screen font) for each desired style. A GX-savvy application will let you select a range of text and change its font-design features — the characters' weight, width, or degree of ornamentation, for example — perhaps simply by manipulating a slider (see figure 4). Of the first GX fonts, Skia makes good use of letterform variations, changing weight (light to heavy) and width (condensed to extended).

Font designers can also use stylistic variations to achieve optical scaling — to adjust characters depending on their size (compensating for the way the eye perceives relative mass and space at different visual scales). Optical scaling is particularly useful for typefaces with very fine lines — Didot, for example. Ordinary scalable TrueType or Type 1 fonts can reproduce characters legibly in a wide range of sizes, but the details are less graceful at the size extremes. Hairlines tend to look heavy at

large sizes and may disappear altogether, depending on output resolution, when small. A GX font can be designed to manage this transparently so the user always sees a fine line where one is intended.

Glyph substitution. A GX font can be programmed to replace standard letterforms with special context-sensitive glyphs. Apple makes a clear distinction between characters — letters of the alphabet, numerals, symbols, and the like — and glyphs (their typographic representation). There can be many glyphs for a given character. GX intelligence swaps in the appropriate glyph depending on the context — replacing an ordinary *e* with an *e* that has a terminal swash when it falls at the end of a word, for example.

Obvious targets include automatic substitution of ligatures for *fi*, *fl*, *ffi*, and so on or designed fractions for numeral-virgule-numeral. Hoefler Text and Linotype-Hell's Avant Garde each make especially effective use of character substitution — for example, GX restores the alternate characters Avant Garde was known for before it lost them on the desktop.



figure 3 / One way to access the specific attributes in a GX font such as Hoefler Text is to simply highlight a feature set in a GX-savvy application such as Apple's GXWrite. Context-sensitive glyph substitution enables GX fonts to automatically insert real fractions, terminal swashes at the ends of words or lines, and other special features.

figure 2 / GX fonts can be programmed to contain stylized attributes such as swash and alternate characters previously found in separate font sets. Shown are, top to bottom: Apple Chancery, Bernhard Modern, ITC Anna, ITC Newtext, Kristen, Mr. Earl and the Snowcaps, and Sloop. These fonts are also sold in TrueType and Type 1 formats.

Pair kerning. Type 1 and TrueType fonts may include kern-pair values, but before GX fonts, software had to support pair kerning. High-end page-layout and drawing programs — and by now most of the good word processors — honor kern pairs when they find them, but most business programs, including spreadsheet programs, database programs, and other non-typographic programs, do not. QuickDraw GX brings universal access to pair kerning, supported at the operating-system level. If you use GX fonts to do database publishing in FileMaker Pro, the type will be well spaced.

Tracking. With conventional fonts, tracking is controlled by page-layout applications. GX fonts have tracking tables built in, so a type designer can control how letters fit together not only at the size the type was designed for (usually 12 point for text and 24 or 72 point for display) but also throughout the size range. Apple has provided for three tracks; Hoefler Text uses one of them (normal).

Ductile characters. GX supports the use of characters that are smart enough to expand or contract within designed-in limits to help justify lines. This is classical typography — in fact, Gutenberg's first fonts included alternate characters for the same purpose, but they gradually disappeared in the rush to efficiency over beauty. GX — potentially, at least — brings it back, with the computer doing the work. Ductility is a requirement for Arabic scripts, but it can also be used to good effect in our Latin fonts. Unfortunately, none of the first font releases have taken advantage of it.

Type as object. GX fonts are objects in QuickDraw GX. You can bind GX fonts to a path and skew, rotate, use perspective on, and make other transformations to them.

What's Next?

The good news is that GX fonts provide unparalleled typographic richness, but the bad news is that without demand, cool technology flounders. Today, several circumstances stand in the way of the widespread acceptance of GX:

Lack of software. As of early September, few GX-savvy programs are on the horizon. Developers of the popular DTP applications seem to be waiting to see if users ask for GX support, so it may take a year (or more)



before we can use our familiar page-layout, illustration, and font-editing software with the new fonts.

No cross-platform support. Software developers are not just being stubborn. Full support for GX would require massive rewriting of their programs, a costly step they're reluctant to take, especially if QuickDraw GX runs only on the Mac. But Apple still hasn't said if it will make GX technology available for other platforms. In fact, Microsoft is developing TrueType Open, an extension to TrueType only for Windows users, that will, in effect, create yet another font format.

Shortage of GX fonts. Where will new font releases come from after the first wave of GX fonts? Except for Linotype-Hell, which has developed GX-font tools for internal use, developers lack commercial GX-capable font-development tools. (Most are using a collection of utilities provided by Apple.) None of the tools now used for building digital fonts (including URW's Ikarus and Adobe's Build Font as well as Fontographer, which is used by most independent designers and smaller foundries) support the complexity or variety of character sets of GX fonts.

Besides, can the foundries afford to produce new fonts on their own, without Apple's subsidies and heavy promotion? GX fonts are larger and more complex than standard Type 1 and TrueType fonts (read: more expensive to create) at a time when users seem to expect to pay less for type, perhaps only pennies a font.

What Breeds Success?

Users' wailing, teeth gnashing, and table thumping will not make GX fonts succeed. Old-fashioned market demand will do the trick. But will sufficient demand materialize? It's too early to tell.

As we frequently hear, users tend to resist change, but most of us adapt to new technology when there is a good ratio of

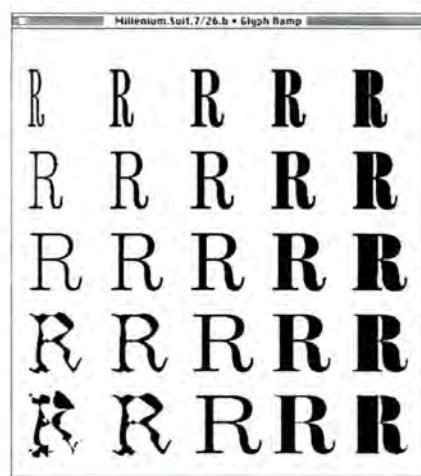


figure 4 / **GX fonts can contain** any number of styles. Matthew Carter's Skia has built-in attributes for weight and width that can be manipulated with a slider in Apple's GXWrite (top); David Berlow's version of Millenium has stylistic axes for weight; width; contrast; and "quake," which controls character disintegration (bottom).

benefits to cost (which includes the investment in mastering new technology, converting existing files, and so on). If users respond to GX by setting aside their regular DTP software for such GX-savvy programs as UniQORN and Ready,Set,Go! in visible numbers and then vote with their wallets by buying third-party GX fonts, type makers and application developers will respond.

In the meantime, font and software companies aren't ignoring Apple's new technology. Most of the foundries, including smaller ones, have formed a consortium with some DTP-application developers to find a way to make the richness of the GX font format work across platforms. They're also pushing to call the format Plus Fonts, to distinguish its identity from Apple's proprietary technology.

So, do we get a new font-format standard? Only time will tell. ☞

Kathleen Tinkel writes frequently about design and prepress for bunches of magazines.

There is nothing like the feeling of losing your data. There is nothing like booting up to find that your twenty-page conference report has burned to a crisp. Or watching a month's worth of virus-infected spreadsheets go up in smoke right before your eyes.

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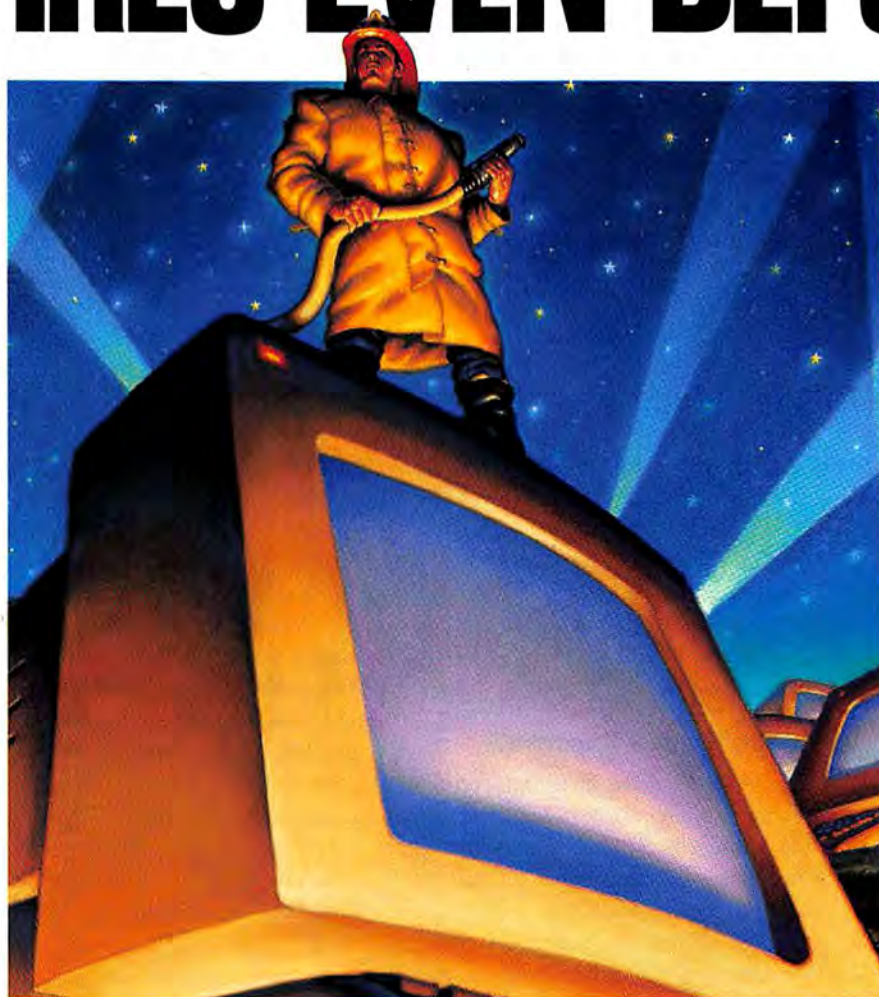
This being the way things are, at Symantec we subscribe to the theory that the best way to deal with a disaster is, well, to prevent it in the first place. Which is the very reason for our newly updated Norton Utilities® and SAM®. In a word, they're proactive. But to put it more poetically, this improved

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◆ ◆ ◆ The enhanced Filesaver feature proactively and consistently works to maintain your system at premium health by scanning in the background for early signs of trouble. This new

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greatest level of protection against new viruses as they are discovered.

The new SAM also scans for and destroys viruses in more types of compressed files than any other antivirus software can. SAM covers DiskDoubler, Compact Pro, Stuffit, and Now Compress. This ensures your ability to detect and eliminate a virus in any compressed file.

And for all of you who have a healthy appreciation for speed, the

means accelerated scanning speed, greater productivity, along with even more transparent protection.

What it shakes out into is that improved Norton 3.0 and SAM 4.0 now provide your Mac with the ultimate available levels of proactive protection against data loss. It's all rather amazing.

Then again, maybe all of these advancements are not so amazing. After all, Symantec is, of course, the proven industry leader when it comes to Mac data repair and recovery and virus protection.

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improved SAM is also the faster SAM. The 4.0 version scans for viruses significantly faster than its predecessor. Which makes virus protection more seamless and less disruptive to your work flow.

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Dark Shadows

Add soft, spooky drop shadows to text or graphics in Adobe Photoshop. BY JANET ASHFORD

YOU SEE THEM EVERYWHERE: Soft-edged drop shadows that make text look as if it's floating over a background. These ubiquitous drop shadows draw on Adobe Photoshop's channel and filter functions. One channel selection sits on top of a duplicate that's been shifted slightly with the Offset filter. The shadow's soft edges are a result of using the Gaussian Blur filter. This technique also works for adding a soft drop shadow behind a graphic. Unlike using the automatic drop-shadow features found in many publishing applications, this technique gives you more control over the shadow's placement and appearance. There are a couple of ways to make drop shadows in Photoshop, and features that are new in Photoshop 3.0 promise to simplify the process. But until you get your hands on the new version, here's one way to make drop shadows in Photoshop 2.5.

Janet Ashford writes regularly about graphic arts for *MacUser* and other magazines and in books.

1. Creating a background. An effective way to use drop shadows is against a neutral background, but here we set them on another graphic. In Photoshop's RGB color mode, color a scanned image of water and, using the circular marquee tool and the Inverse command (Select: Inverse), crop it to a circle. Scale and rotate a Zapf Dingbats arrow so that it fits in the center, and then apply a stroke to the selected circle.

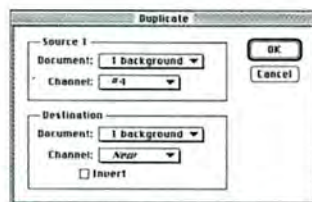
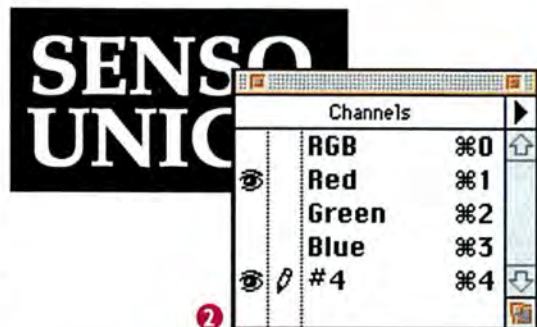
2. Saving a type selection to a channel. Use the Channels palette (Window: Show Channels) to open a new channel, which appears as #4. Click on the far-left column beside the red channel to bring up its eye icon (not the pencil icon). With black as the current color, type and center the text (here it's Italian for *one way*). Turn off the red channel, by clicking on the eye icon. Now back in channel #4, deselect the black-filled type outlines (Select: None) and then invert them (Image: Map: Invert) to produce white letters on a black background.

3. Creating a duplicate. Use the Duplicate command (Image: Calculate: Duplicate) to send an exact copy of the mask in channel #4 to channel #5. Channel #4 is Source 1, and the Destination Channel is New, which becomes channel #5. The Document should be the same in both cases.

4. Offsetting and blurring. In channel #5, use the Offset filter (Filter: Other: Offset) to move the entire image 8 pixels down and 8 pixels to the right. Now apply a Gaussian blur (Filter: Blur: Gaussian Blur) with a radius value of 8 pixels to make nice, soft edges.

5. Creating the shadow. Return to RGB mode (click on the letters on the Channels palette), and load channel #5 into the image (Select: Load Selection: #5). The blurred type outlines should be selected. To darken them, open Levels (Image: Adjust: Levels) and slide the right slider on Output levels to the left. An alternative way is to change the brightness and contrast (Image: Adjust: Brightness/Contrast). You can reapply either of these settings to the selected outlines over and over until you get the degree of darkness you desire. Notice the effect of the shadows on the background.

6. Adding the type. To finish, load the selection in channel #4 into the image (Select: Load Selection: #4). While the selected type is still active, use the Fill command (Edit: Fill) to color the letters, here a soft pink, at 100-percent opacity.



"...It works like a coloring book for baby gods: not too complicated but potently powerful. Pixar Typestry 2 is a winner."

Kenneth Grey – Desktop Video World

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"T2 has no equal in 3D type programs. It has the deepest animation features, the lushest quality, the best interface, world-class documentation and technical support."

Kenneth Grey – Desktop Video World

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Neal Weinstock – Post

"Typestry offers a spectacular range of surface, shadow, and lighting possibilities, and it includes a library of editable Looks – texture, bump and environmental maps – that will knock your socks off."

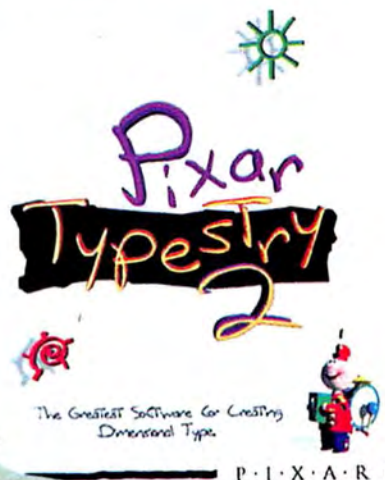
Lynda Weinman & Jack Biello – Publish

Pixar Typestry 2 turns fonts and Adobe Illustrator designs into production quality 3D images. Pick from lots of impressive appearances and special effects to make stunning still images or professional animations. It's miraculously easy and way too much fun.

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Packing a Preflight Tool Kit

Specialized tools make it easy to check PostScript files for errors before costly high-resolution printing. BY BOB SCHAFFEL AND CHUCK WEGER

Last month we talked about PostScript "preflight" — the process of analyzing files before committing to high-resolution output. Although much of preflight checking simply requires common sense and a systematic approach, specialized tools can help you streamline your preflight process.

Preflight applications can be used on both sides of the design/production fence; the earlier in the process preflight checking is performed, the less expensive it is to correct errors. Some preflight tools are stand-alone applications, and others are used with desktop-publishing programs. Let's look at four general types of preflight tools.

Document-analysis tools. By reading an application's files to generate a report on a document, these utilities help ensure that all elements of the document are in place and ready for output. QuarkXPress' Collect for Output feature prepares a list of document-specific information such as fonts needed, graphics contained, colors created, style sheets used, color-management profiles chosen, trapping values specified, and more. Preflight pioneer Aldus CheckList 2.5 (\$40; 206-622-5500), a stand-alone utility for PageMaker, functions similarly, checking as many as eight files simultaneously.

Imagemaster simulators. Because imagemasters need PostScript instructions tailored to a specific machine, you may get PostScript errors if you proof or print a file intended for one imagemaster on another device. For example, the setpageparams operator is required for most imagemasters, but it's not even defined for laser printers. An imagemaster simulator, however, lets you set up a document for an imagemaster but proof it on a laser printer without altering the document setup or changing the printer type, which may affect other bits of the PostScript code as well.

LaserCheck (\$199), from Systems of Merritt (205-660-1240), sizes a document

to fit within a smaller area in the center of the proof page. Around this image area, LaserCheck prints some useful information about fonts, RIP parameters and setup, and processing time. If there's a PostScript error, LaserCheck will report it and print as much of the page as has been successfully processed. This is helpful, because it not only indicates the troublesome code but can additionally help you locate the offending element. CheckPost (\$250), from NineBits (distributed by Working Software, 408-423-5696), acts as an imagemaster simulator but it requires you to make a PostScript output file first; it also functions as a PostScript parser.

PostScript parsers. These utilities extract document information from the actual output code you create by printing the PostScript code to a disk file. Some parsers give you only a general list of fonts. Others allow you to check procedural code, colors, and EPS graphics. The disadvantage of PostScript parsers is that if the original document is large, the PostScript code can be voluminous. Download Mechanic (\$249), from Acquired Knowledge (619-587-4668), presents a full range of information culled from the PostScript code. It can also download PostScript to a proofing device and analyze it for problems.

Soft proofers. This type of preflight utility creates a screen rendering of a document from the output code. Soft proofers have built-in PostScript interpreters that rasterize the document to the monitor, ensuring that all the document elements process correctly. They also indicate how much processing time to expect at high resolution.

Transverter Pro (\$395), from TechPool (216-382-1234), has a viewer module that uses a proprietary interpreter to display pages on a monitor. But you have to save your document as a PostScript output file first. Panther Proof (\$195), from Pre-Press



Direct (201-887-8000), uses the Adobe CPSI software PostScript interpreter. Because you can set Panther Proof up as a Chooser-level device, you don't create a separate PostScript file, and you can configure it to mimic the processing behavior of a variety of imagemasters.

Other applications are usable for preflight checking, even though that's not their intended purpose — take, for instance, Adobe Acrobat (\$595; 415-961-4400). Running a file's PostScript code through the Acrobat Distiller creates a PDF (Portable Document Format) file that can be used as a soft proof. The PDF file may also be distributed as an electronic proof to a client who has an Acrobat reader.

Island Trapper, the high-end color-trapping application from Island Graphics (\$4,495; 415-491-1000), contains its own PostScript interpreter. If an overly complex document fails to print, Island Trapper can simplify paths and "flatten" the file so that it may print successfully.

Which of these tools should you have? The ideal preflight tool doesn't yet exist. Different jobs require different tools, and you need to balance the cost of your preflight tool kit against the expenses incurred when pages don't print correctly. ☐

Bob Schaffel is technology director of the Professional Prepress Alliance, a trade organization of pioneering service providers. Chuck Weger is an independent consultant and publisher of the *Photoshop Monitor* newsletter.

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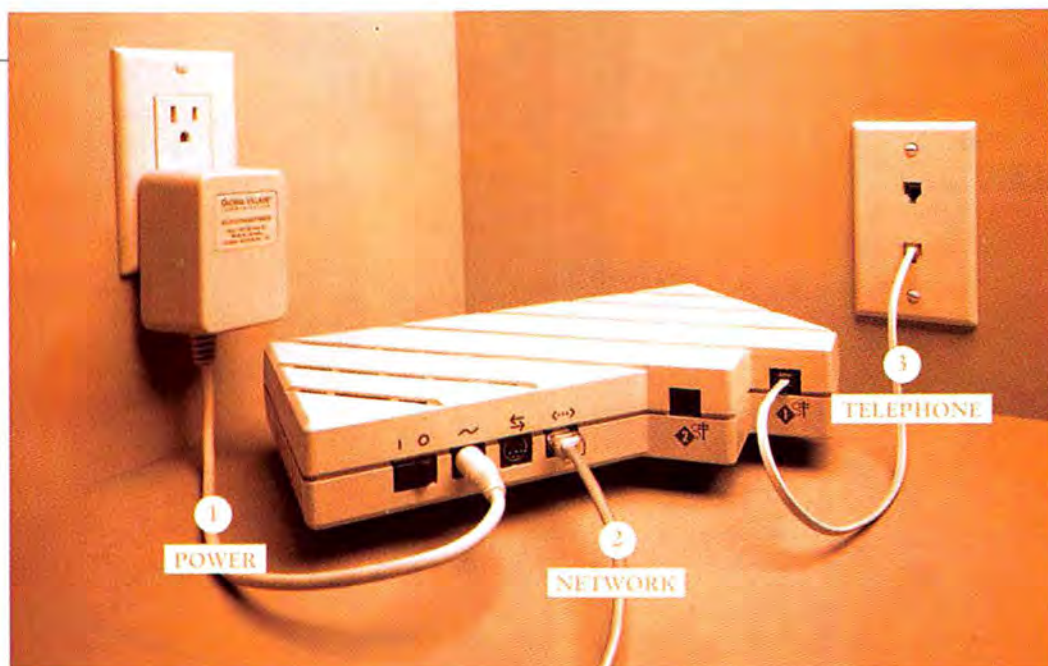
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Free output sample, call 800/835-6100, Ext.1020.

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CIRCLE 121 ON READER SERVICE CARD



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Setting up OneWorld Fax is just as easy. It's completely plug-and-play, because all the hardware (even a 68302 processor), software, modems, and network connections are integrated. And unlike typical fax servers, you won't even need an additional Mac.

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Manager administration software lets you customize the server from any Mac on the network. And gives you a detailed log to track usage. OneWorld Fax lets you grow, too. Making it easy (there it is again) to add new communications capabilities by upgrading the software, exchanging modems, and adding memory.

So what, you may ask, will all this convenience wind up costing me?



Truth is, it can actually save you money. To find out how much, call us at 1-800-736-4821, ext. 3448, and we'll send you a free demonstration disk with a customizable fax-savings analysis. Making OneWorld Fax every bit as easy to justify as it is to install and use.



GLOBAL VILLAGE
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HANDS ON Networking

REMOTE ACCESS /

PPP OPENS UP MULTIPROTOCOL DIALING

THAT VERSATILE NEW long-distance-network-connection standard Point-to-Point Protocol (PPP) is finally reaching the Mac market, in products such as the TribeLink remote-access server (\$1,995), from Tribe Computer Works (510-814-3900), and the MicroRouter 1000R remote-access router (\$1,695), from Compatible Systems (303-444-9532).

The TribeLink, which has eight serial ports for dial-in and one Ethernet AUI connector, uses PPP instead of Apple Remote Access Protocol (ARAP) because of PPP's greater versatility, security, and speed. PPP supports multiple network-layer protocols, including TCP/IP and IPX, so TribeLink users can dial in to the Internet or a NetWare network as well as to an AppleTalk network (NetWare capability

is \$295 extra). Users should find Internet access faster over PPP than over ARAP, since the IP packets aren't encapsulated in AppleTalk packets. PPP has built-in authentication protocols, and its support for dial-out connections and LAN-to-LAN routing will allow Tribe to offer these capabilities as options.

For LAN-to-LAN routing, Compatible's MicroRouter 1000R offers PPP support in an economical remote-access Ethernet router. It supports wide-area transmission of IPX, TCP/IP, AppleTalk, and DECnet protocols and automatically dials remote connections. The MicroRouter has one three-media Ethernet port and two RS-232 ports (one is for out-of-band management). Compatible also offers a \$995 PPP-based router, the MicroRouter 900i, for users who just want to connect to an Internet service provider. / Karen J. Ohlson



GOING TO GRACELAN



MANAGING MULTIPLE MACS on a network? TechWorks (800-224-6623 or 512-794-8533) can help, with new upgrades to GraceLAN Network Manager, Asset Manager, and Update Manager.

Network Manager gathers information about network devices and the configurations of users' Macs and PCs. Version 3.5 (\$795) recognizes the add-in SNMP module (\$595), which enables Network Manager to report information from SNMP devices. Version 3.1 users can get the 3.5 upgrade with the module.

You can store the collected data in Asset Manager 2.0 (for 1 user, \$995; for 10 users, \$6,495; upgrade, \$195), an inventory-management database. Multiple users can read and update information simultaneously in this new client/server version, bundled with ACI US' 4D Server. Asset Manager 2.0 also keeps track of PC systems.

Update Manager 2.0, due by year's end, will include scripting, so you can limit software installations to only those Macs on the network that meet specified conditions. It will also support System 7.5's Drag and Drop and software distribution via PowerTalk. / John Rizzo



NETWORK PROTOCOLS /

Apple Beefs Up Basic Networking

HERE'S GOOD NEWS for all Mac-network managers: Apple's new upgrades of its AppleTalk Connection and TCP/IP Connection packages provide important new features and offer performance improvements as well.

The major addition to AppleTalk Connection for Macintosh 1.1 (for 1 user, \$39; for 20 users, \$49) and TCP/IP Connection 2.0.4 (for 1 user, \$59; for 20 users, \$69) is MacSNMP, which makes SNMP information on Macs and

printers accessible from SNMP-network-management consoles running on Macs, PCs, and UNIX machines. Apple includes its own SNMP console and Management Information Bases (MIBs) in AppleTalk Administration for Macintosh 1.1 (\$199) and TCP/IP Administration for Macintosh 2.0.4 (\$199).

In addition to MacSNMP, both Connection packages include improved drivers and utilities that boost network performance and support Power Macs more efficiently. / JR

INFORMATION SERVICES /

NovaLink Adds New Links

TRUE TO ITS NAME, the latest version of ResNova Software's NovaLink Professional adds more linking capabilities — for linked documents as well as World Wide Web links — to the BBS-server product.

Beyond the information distribution, e-mail, real-time chats, and cross-platform AppleSearch and Internet access of previous versions, version 4.0 has a World Wide Web gateway for all users connected to your server. It also enables you to create hypertext messages and files via HTML (Hypertext Markup Language), which allows the embedding of sound and QuickTime movie



files in linked documents. In addition, the new version of the server software is Power Mac-native, and the client software now has an identical graphical interface for Windows and Mac users.

At press time, ResNova had not set pricing for version 4.0, which it expects to release by the end of the year. 714-379-9000. / Nancy Peterson





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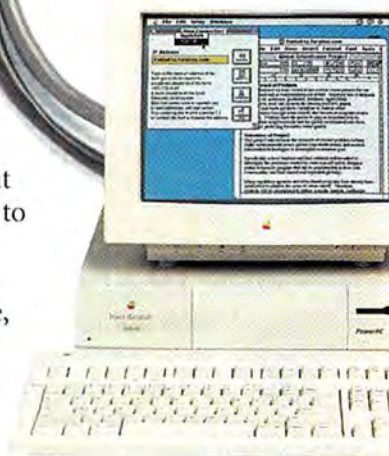
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Shopping for Internet Access

If you want a personal connection to the Internet, you need a service provider — but how do you find the right one? Here are the essential questions to ask to make sure you find Mac-friendly, cost-effective Internet access. **BY SHELLY BRISBIN**

WHEN YOUR FRIENDS tell you how great it is to be on the Internet, do you ever wonder how they got there? To get yourself onto the Internet, you need an account on a host computer that's connected to the Internet by means of a dedicated data circuit and UNIX and TCP/IP software. Turning your Mac into such an Internet host computer is a possibility, but it's a complicated proposition. If you're an individual user without connections to a company or university that can provide you with an Internet account, your best bet is to dial in to a host belonging to an *access provider*, or *service provider* — an organization that, for a fee, allows you to dial in and log on to its host computers with a user name and password. Access providers don't usually offer content (files to download, on-line weather reports, and shopping, for example); rather, they provide a portal through which you travel to explore the Net. (For a discussion of what you can find on the Internet, see "Plug In to the Internet," September '94, page 86).

There are alternatives to this type of Internet access provider. For example, most on-line services allow you to send and receive mail from the Internet (CompuServe charges for this service, but most other on-line services do not), and most offer shareware libraries with Internet tools

as well as information about what's on the Net. America Online also offers access to the more than 5,000 Internet newsgroups, and Delphi provides access to all features of the Internet at reasonable rates, although without a graphical user interface. Some bulletin-board systems run by individuals or user groups can also reach the Internet's newsgroups. However, none of these alternatives gives you the flexibility of full Net surfing that you get from an Internet access provider.

Picking the right access provider for your budget and expertise is one of the biggest challenges a new Internet user faces. Internet access costs vary quite a lot, not only according to the services you choose but also by the type of account and amount of time you spend on-line. Here are the essential questions you should ask your potential service provider before you sign a contract: **Can I use a Mac interface?** Whether you'll access the Internet by using UNIX commands or with a Mac-like graphical user interface (see figure 1) depends on the type of account you get. A text-based account, called a *shell account*, or *terminal-access account*, is more difficult to learn and use than a graphical interface, but it's also less expensive and easier to set up. Expect to pay a one-



time setup fee of about \$25 plus a flat rate of approximately \$15 to \$30 a month, which enables you to use your account as much as you like.

If you want to use the same Internet services with a Macintosh interface, you'll need a service provider that can provide a SLIP (Serial-Line Internet Protocol) or PPP (Point-to-Point Protocol) account. SLIP and PPP require you to install a few pieces of software on your Mac. This software includes Apple's MacTCP (included with System 7.5) and a SLIP or PPP access utility such as InterCon Systems' InterSLIP or InterPPP (included with InterCon's TCP/Connect II product).

In addition to an initial setup fee, many providers charge slightly more for SLIP or PPP access or add hourly charges to a flat monthly fee. Although prices vary widely, expect to pay \$1 to \$2 per hour for access time. The service provider may also establish a minimum charge of \$20 a month, with several hours of free access before the hourly charge kicks in. SLIP and PPP are usually priced identically, so if you have a choice, pick PPP, which is more efficient.

Do you offer a flat-rate plan? Although flat rates are fairly standard for shell accounts, you can sometimes find a flat rate for a SLIP or PPP connection too — if you do, snap it up. Using a graphical interface to access the Internet will slow you down, causing your hourly charges to mount. A flat rate of \$30

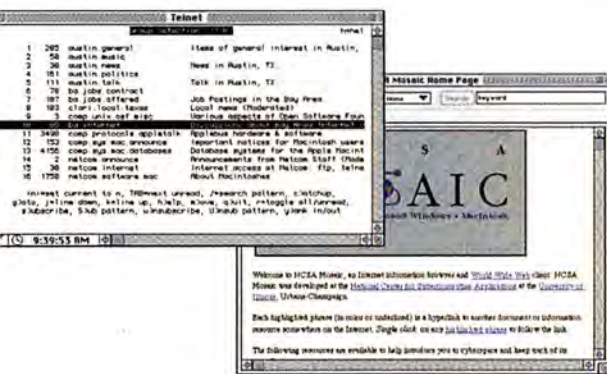


figure 1 / Which type of interface do you want? The two types of Internet accounts you can get from your service provider use vastly different interfaces. A shell account (left, here using Software Ventures' MicroPhone Pro) is cheaper but requires you to learn UNIX commands. A SLIP or PPP account (right) allows you to use a Mac-like graphical interface; the example in this case is Mosaic, which features hypertext links.

per month may sound more expensive than \$20 a month plus \$2 per hour, but if you spend just one hour a day on-line (or 20 hours a month), the hourly account will produce a \$60 bill at the end of the month.

To determine whether flat-rate or hourly charges are best for you, think about the amount of time you plan to spend on-line. Keep in mind that at first you will need to spend a good deal of time exploring the Net, determining what interests you and what doesn't. After a while, you may decide that you need to visit only a few newsgroups and Web sites and use e-mail. If you plan to use FTP to access files or to play on-line games, a flat rate is almost essential.

Do you charge for disk space? Check how much free host disk space you get for your base rate and how much extra disk space costs. Many services let you know how much disk space you're using when you log in, so it's easy to take preventive measures to ensure you don't rack up extra disk-storage costs. You can usually avoid extra charges if your e-mail volume is low to moderate and you don't transfer files to your Internet host machine. Shell-account users can avoid extra charges by saving everything to the Mac instead of the host machine. If you have a SLIP or PPP account, it's unlikely that you will use enough host disk space to be charged extra.

Can I dial in with a local call? Internet access providers range from small firms with one Internet-connected host to large firms with a network of host computers and connections around the nation. If you choose a smaller provider, make sure the company has a local number for you to call.

If you need to reach your Internet account when you're traveling, using a national or regional provider that offers local phone-access points in several area codes is a great way to avoid long-distance charges. For Example, NetCom, based in San Jose, California, and HoloNet, based in Berkeley, California, have points of presence (POPs) around the country.

Are your services accessible? An Internet connection does you very little good if you get a busy signal most of the time. Some service providers have been unable to keep up with the exponential growth of the Internet. You need one that will add new phone lines, equipment, and technical-support staff as demand increases. It's a good idea to ask


some questions about your provider's capacity, such as how many dial-up phone lines are available for a given area code. Also inquire about the number of hosts: Your access may be slowed down by an overloaded host machine even if the phone line you need isn't busy. Although service from a big-time access provider may cost more than service from a smaller one, the larger provider may be easier to reach, since larger providers often have more phone lines in heavily populated areas.

Is the support staff Mac-savvy? Your Mac skills won't do you much good if you have a shell account, so you may need to rely on the provider's support staff and resources to help you learn the basic UNIX commands for reading your news and e-mail. It helps if the support staff is familiar with the questions Mac users typically ask.

You'll want a Mac-savvy support staff for a SLIP or PPP account as well; setting up MacTCP and other software is tricky, and the setup varies with every Internet-access provider. The best providers understand

how MacTCP and SLIP/PPP software work on the Mac and what configuration problems commonly occur. If the provider does not have Mac expertise, you may find configuration a chore. Written instructions and telephone support are important considerations, whether you have UNIX-like shell or Mac-like SLIP/PPP access. Many providers also have newsgroups dedicated to user concerns.

Net Results

Whatever type of Internet access account you get, the goal of your Internet service provider should be to get you past the setup and learning stages as quickly as possible. You'll know if you've picked the right access provider if it is cost-effective, transparent, and helpful, enabling you to spend most of your on-line time exploring the vast resources of the Internet. 

Shelly Brisbin is a *MacUser* associate editor. She has been exploring the Internet since 1990 and still hasn't seen everything.

FINDING A PROVIDER / a short list

INTERNET PROVIDERS aren't usually listed in your local telephone directory. You can find lists of providers in several books about the Internet, including Adam Engst's *Internet Starter Kit for Macintosh* (Indianapolis: Hayden Books, 1993). If you have friends on the Internet, ask if they can get you one of the lists of service providers found in various newsgroups and at FTP sites. The most widely known, the PDIAL list by Peter Kaminski and the nixpub list by Phil Eschallier, can also be found on ZiffNet/Mac on CompuServe (Library 7 of DownTech) and eWorld (Software Center from ZiffNet/Mac, Networking & Telecom). You can even ask your friends to post a request for recommendations on alt.internet.services or alt.internet.access.wanted, newsgroups for those seeking access to the Net.

Here is a sample list of providers from around the country. / Shelly Brisbin and John Rizzo

Nationwide

HoloNet

Voice: 510-704-0160
Access: 224 cities
Services: FTP, PPP, SLIP, and Telnet

East

CRL Network Services (see West)

NEARnet

Voice: 617-873-8730
Access: Boston; Nashua, New Hampshire
Services: DNS, e-mail, feeds, SLIP

NetCom Online Communication Services

Voice: 408-554-8649
Access: East and West Coast, Chicago, and Denver

Services: DNS, feeds, FTP, FTP space, Gopher, PPP, shell, SLIP, Telnet, and WAIS

Midwest

Msen

Voice: 313-998-4562
Access: southeast Michigan
Services: FTP, Gopher, PPP, shell, SLIP, Telnet, and WAIS

NetCom Online Communication Services (see East)

South

CRL Network Services (see West)

The Black Box

Voice: 713-480-2685
Access: Houston area
Services: FTP, PPP, shell, SLIP, Telnet, and UUCP

RealTime

Communications

Voice: 512-451-0046
Access: Austin, Texas
Services: feeds, FTP, Gopher, shell, SLIP, Telnet, and UUCP

West

CRL Network Services

Voice: 415-381-2800
Access: in Arizona: Glendale, Phoenix, Scottsdale, and Tempe; in California: Los Angeles, Orange County, Sacramento, San Francisco Bay Area, San Jose, and Santa Rosa; in Texas: Austin, Dallas, Houston, San Antonio; also Atlanta, Boston, New York City, St. Louis
Services: feeds, FTP, Gopher, shell, SLIP, Telnet, WAIS

Internet Direct

Voice: 602-274-0100

Access: Phoenix, Salt Lake City, and Tucson
Services: FTP, PPP, shell, SLIP, Telnet, and UUCP

NetCom Online Communication Services (see East)

Portal Communications

Voice: 408-973-9111
Access: Cupertino, Mountain View, and San Jose, California
Services: BBS, feeds, FTP, shell, Telnet, and UUCP

Canada

UUNET Canada

Voice: 416-368-6621
Access: 7 Canadian cities
Services: PPP, SLIP, Telnet, and UUCP

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★★★★★ —MACWORLD, August 1994

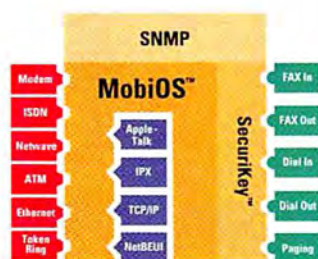
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1st Place, "Great bundle with bargain price—our winner was a favorite with testers." —PC Computing, June 1994.

CIRCLE 67 ON READER SERVICE CARD

After This, You'll Think Of Remote Access Servers In One Of Two Ways.



DaynaLINK for ARA is a mobile networking platform built on Dayna's multi-tasking MobiOS operating system, allowing all industry protocols and services to be added with PCMCIA-based software modules. Each module can be independently managed via SNMP, and SecuriKey security software lets you control access to available services.

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DAYNALINK'S ADVANTAGES: *PCMCIA Type II and Type III compatibility, hot swappable data links, high performance RISC-based processing, trouble-shooting light panel and Dayna's Two-Year Warranty and 24-Hour Replacement Program.*

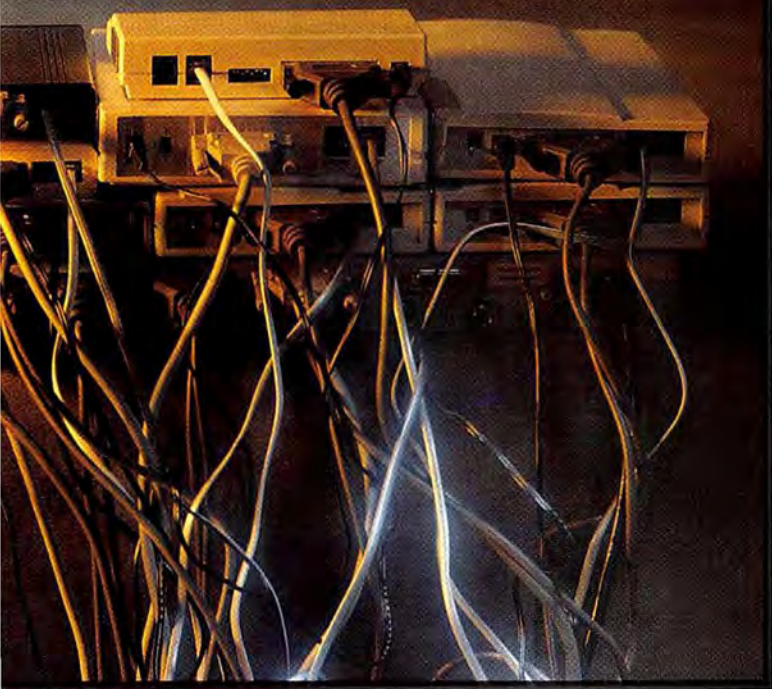
Introducing DaynaLINK.[™] The First PCMCIA-Based Mobile Access Server.

A remote access server that uses PCMCIA technology is a pretty startling innovation.

Especially when you realize it helps you avoid the rat's nest of cords that come with exter-



State Of Shock.



nal modem servers. Not to mention the inflexibility of those with proprietary internal modems.

But if you think simplifying dial-in remote access is all there is to DaynaLINK for ARA, you're in for a bigger surprise. This patented technological breakthrough utilizes the multi-tasking MobiOS[™] operating system, which will soon let you add such protocols as TCP/IP, IPX and NetBEUI, as well as services like dial out, fax in, fax out, paging, and both local and wide area wireless access. All as easily as popping in a PCMCIA card.

Which is precisely why we call DaynaLINK a Mobile Access Server. Any remote access server can give you dial-up network access once your mobile users finally find a place to connect. But only DaynaLINK is designed to cover you down the road by supporting cordless and cellular wireless networking. Now that's what we call mobile access.

Consider the added value SecuriKey[™] security software provides, and the new DaynaLINK Mobile Access Server will leave you feeling rather comfortable about your network's future. Instead of shocked.

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But the real happy ending to this story is that new SoftWindows for Macintosh now runs Windows faster than ever on your 040 Mac. In fact, up to 30% faster!

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CIRCLE 154 ON READER SERVICE CARD

Finessing File Translation



With the right tools, your Mac can read just about any PC file and translate Mac files into DOS, Windows, and other formats — but maybe not on the first try. BY JOHN RIZZO

ALL THE INFORMATION-high-way gadgetry in the world isn't worth a microchip if you and your cybercorrespondent can't read or write each other's languages. Sophisticated networks can bring a foreign file right to your desktop, but they won't help you when your Macintosh says there's no application available to open the file.

Some applications can read or write in other applications' or platforms' file formats, but there are still dozens of Mac and PC formats that can be read only by the applications that created the files in those formats — or by file-translation programs.

The goal of file translation is to take a file in one format and create an identical-looking file in another format that's completely editable and printable. How close you get to this goal depends on the quality of your translator and the complexity of the file. For example, graphics files tend to be much more complicated than text-based ones (such as database, spreadsheet, and word-processing files), so they're more difficult to translate correctly. Having the right translation tool can make the job much easier.

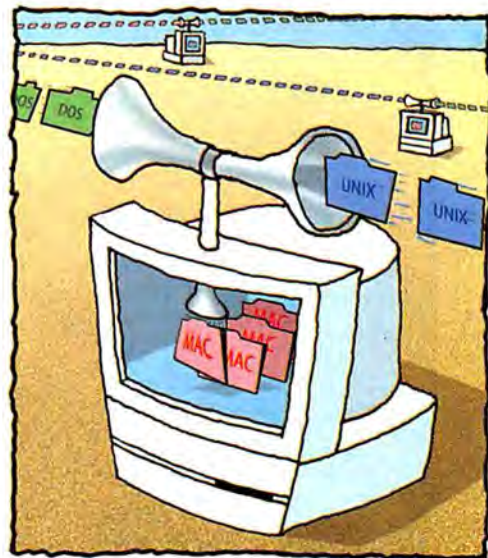
Translation Tool Box

Tools for translation begin with Macintosh Easy Open, which Apple is finally including in its system software with System 7.5. Macintosh Easy Open is not a translation

program, but it makes translation easier by replacing the Finder's "document x could not be opened" message with a dialog box listing the applications and translator programs on your hard disk that can open your file (see figure 1).

Buyers of the System 7.5 Upgrade Kit (\$39.99 for System 7.1, \$19.99 for System 7 Pro), from Apple (800-769-2775 or 408-996-1010), also get MacLinkPlus/Easy Open Translators, created by DataViz (800-733-0030 or 203-268-0030). Unfortunately, these translators aren't included if you get System 7.5 free with a new Mac; you have to purchase the package (which includes Apple's Macintosh Easy Open) separately for \$109. A version called MacLinkPlus/PC Connect (\$199) adds a Mac-to-PC serial cable and a file-moving utility. Another translation-package option is Word for Word (\$149), from MasterSoft (800-624-6107 or 602-948-4888), which also includes Macintosh Easy Open.

MacLinkPlus and Word for Word are general-purpose file translators, digital Rosetta stones that provide thousands of conversion combinations among Mac and PC word-processing, database, spreadsheet, page-layout, and other formats. MacLinkPlus supports more Mac formats as well as some UNIX ones, whereas Word for Word supports more PC formats (see the "Choosing a Translator" sidebar). Although each translator supports a dozen or so graphics



formats, heavy users of graphics may be better served by translator programs that specialize in graphics.

Text to Text

With MacLinkPlus and Word for Word supporting so many file formats, it's difficult to define the better package. I tested both on PC files that contained bold and italic characters; right and left justification; indents; columns; headers; and more-complex elements such as footnotes, tables, embedded graphics, and multiple fonts.

Although MasterSoft claims that Word for Word's translations are more accurate than MacLinkPlus', I found that both did a good job of translating word-processing files. The closest I came to getting a perfect translation was with a MacLinkPlus conversion of an Ami Pro for Windows document into Microsoft Word for Mac format. The translation converted all the formatting but changed the fonts to Times. Each translation package did a good job of converting WordPerfect for Windows documents to Word for Mac format, producing the correct fonts with only minor formatting errors.

I also tried using the Claris XTND translators, which you access from the Open and

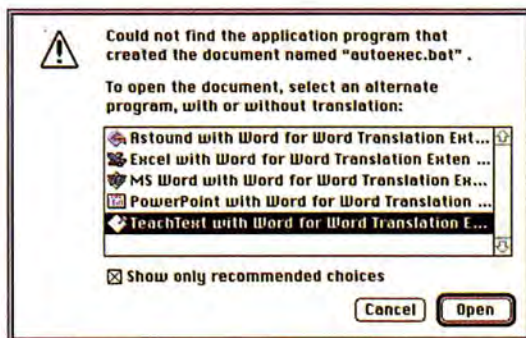


figure 1 / If you're tired of double-clicking on PC files and getting a message that the document can't be opened, you'll be glad that Apple has included Macintosh Easy Open in System 7.5. Macintosh Easy Open replaces the annoying message with a list of translators and applications on your hard disk that can open your file.

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Save As dialog boxes in XTND-compatible applications. The resulting translations were clearly inferior; columns, embedded graphics, and many formatting elements disappeared in the translation. Fortunately, you can use MacLinkPlus' translators with XTND — just drop MacLinkPlus into the Claris Translators folder.

Graphic Details

Graphics-translation software tends to specialize in either the raster or the vector file types (for an in-depth discussion of graphic file formats, see "Graphically Speaking," January '94, page 145). Raster, or bit-mapped, file formats (such as TIFF on the Mac and BMP on the PC) define pictures by mapping the location and color value of each pixel in the image. Vector formats, such as EPS and PostScript, contain objects defined by mathematical equations.

A third type of graphics file, called a *metafile*, contains elements of both types but is usually treated as containing either raster or vector graphics. PICT and its Windows equivalent, WMF (Windows Metafile), are metafiles that applications often treat as containing raster graphics. The Windows metafile CGM (Computer Graphics Metafile), on the other hand, is usually treated as containing vector graphics.

Raster Masters. DeBabelizer Toolbox (\$399), from Equilibrium Technologies (415-332-4343), converts among raster formats and PICT. It supports over 55 raster formats on Macs, PCs, and Silicon Graphics and Sun workstations, as well as Atari and Amiga formats. It also supports many formats used in multimedia production, including the Macromind Director format, QuickTime movies and stills, EPS bit maps, JPEG, and Kodak's Photo CD. In addition, it supports 3-D bit-mapped rendered images created in software from Alias, Electric Image, Softimage, and Wavefront. Plus, it contains image-editing features such as filter interpolation with Photoshop plug-ins, palette manipulation, and color reduction.

For more-modest needs, try DeBabelizer Lite (\$129), which supports all the same formats as DeBabelizer Toolbox, except for 3-D rendered images. DeBabelizer Lite lacks the extensive image-editing features of DeBabelizer Toolbox, but it does let you use Photoshop plug-ins and tweak file attributes for selected areas of a file.

A more specialized raster translator is PICTure This! (\$149), from FGM Software (800-783-7428 or 703-478-9881). It converts raster images from Sun, Silicon Graphics, Amiga, and PC machines into Mac PICT format. You can use its translators from within Photoshop, Canvas, and XTND-compatible applications.

PICTure This! and the DeBabelizer programs do a good job with raster formats, although I did notice some changes in color and line width with these products.

Vector Victor. If you need to translate among vector formats or from vector to raster formats, your best bet is to use Transverter Pro (\$395), from TechPool Software (216-382-1234). It includes some high-end tweaking tools that let you convert between RGB and CMYK color as well as set an image's color bit depth and resolution. You can also convert fonts to outlines and select an outline path by specifying several points.

You can convert PC vector files to Mac raster format without Transverter Pro, but the method for doing so has problems. You export the file from the PC graphics application in a PC raster format and then bring this format to the Mac and convert it to a Mac raster format, using a raster translator. Simple enough, but I found that this method resulted in illegible text in several cases. I also had problems with the black dropping out of some images that had gone through this process when I tried to print them from MacDraw and Aldus Persuasion on a PostScript color printer. I decided that I was better off bringing these files to the Mac in PC vector format and translating them with Transverter Pro.

The Future of File Translation

File translation has definitely improved in recent years, but we're still far from hassle-free sharing of files. I'd like to see file translation built in to the system software, as Taligent is doing with its operating system — Apple may be taking note. Although the features of Apple's Gershwin operating system (scheduled for release in 1996) aren't yet set in concrete, I wouldn't be surprised to see a virtual Rosetta stone becoming standard in every Mac. ☐

MacUser technical editor John Rizzo is the author of *MacUser Guide to Connectivity and How Macs Work* (Ziff-Davis Press).

Choosing a Translator / see which apps read which formats

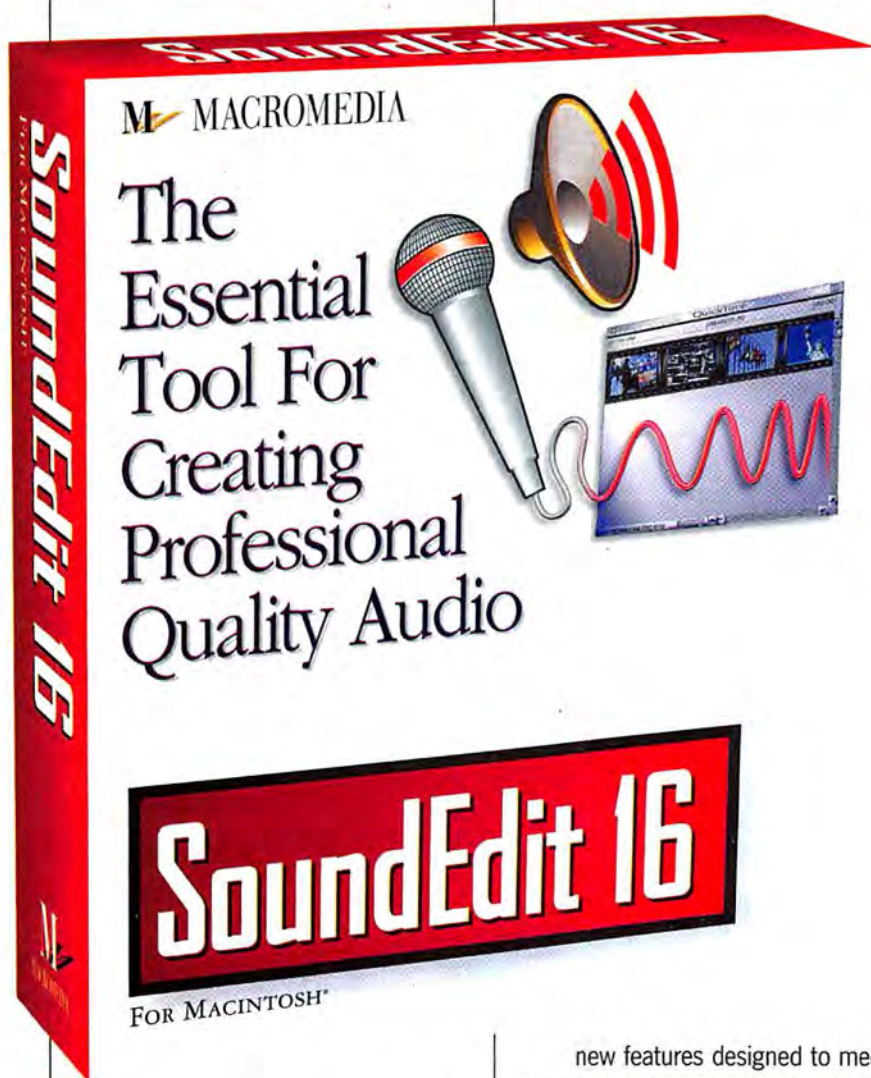
To find out which graphics and word-processing file formats the most-popular file translators support, just check the appropriate columns and rows in the table. In addition to files in the formats shown here,

Word for Word and MacLinkPlus are able to translate files in dozens of other types of formats, including spreadsheet, database, and page-layout formats.

	DeBabelizer	MacLinkPlus	PICTure This!	Transverter Pro	Word for Word
Word processing					
Mac		ClarisWorks, MacWrite (4.5, 4.6, 5.0, II, Pro), MS Works (2 & 3), Nisus, Word (3, 4, 5, 6), WordPerfect (1, 2, 3), WriteNow (2 & 3)			MacWrite (4.5, 4.6, 5.0, II), Word (3, 4, 5), WordPerfect (1, 2, 3), WriteNow 3.0
PC		Ami Pro, ClarisWorks, DCA-RTF, MS Works (DOS & Windows), MultiMate, Office Writer, Professional Writer, RTF, text, Word (DOS & Windows), WordPerfect (DOS & Windows), WordStar, XyWrite III			Ami Pro, Digital DX, DisplayWrite, Framework (III & IV), HP Advance Write Plus, IBM Writing Assistant, Legacy, Lotus Manuscript, MASS-11 PC, MultiMate, MultiMate Advantage (I & II), Office Writer, PeachText, PFS: First Choice, PFS Write Version C, Professional Write, Q&A Write, RapidFile, Samna Word, Signature, Total Word, Volkswriter, Wang OC, Windows Write, Word (DOS & Windows), WordPerfect (DOS & Windows), WordStar, XyWrite (III, III Plus, IV, Windows)
Graphics Raster (bit-mapped)					
Mac	Alias PIX, Clipboard,* EPS, GIF, MacPaint, Photoshop, PixelPaint,* QuickTime movies,* QuickTime stills, RIFF,* Scrapbook, Startup Screen, TGA, ThunderScan*, TIFF		MacPaint,* Photoshop,* PixelPaint,* RIFF, Targa,* TIFF	TIFF	TIFF
PC	BMP, DPaint ANIM,* Dr. Halo CUT, Electric Image EIDI, EPS, FLC,* FLI,* GIF, IFF, IMG, Lotus PIC,* MSP Type 1, PCC,* PCP,* PCX, Pictor,* Targam TGA, TIFF, WPG*	BMP, PCX, TIFF, WPG	BMP,* CUT,* GEM IMG,* GIF,* IFF/ILBM,* Lotus BIT/RLE,* PCX,* Photoshop,* RIX,* Targa,* TIFF* Visilog IMG*		BMP, EPS preview, GIF, PCX, SDW, TIFF, WPG
UNIX	SGL Image files, SGI Alias PIX, Sun RAS, XWD,* X11 (bit mapped)*		Apollo GPR,* SGI RGB,* Sun RAS,* X11 (bit mapped & XWD)*		Sun RAS
Graphics Vector (object)					
Mac		EPS	EPS*	EPS, Illustrator (88, 1.1, 3.0), PostScript (Levels 1 & 2)	
PC		EPS	EPS*	EPS, PostScript (Levels 1 & 2)	
Graphics Metafile					
Mac	PICT1, PICT2	PICT1, PICT2	PICT1, PICT2		PICT1, PICT2
PC	CGM, WPG	CGM, WMF	CGM*		CGM, WPG
Graphics Other / multimedia					
	Abekas,* Atari DEGAS,* Atari NEO,* Atari Spectrum,* BOB, Commodore C64,* Commodore IFF,* JPEG,* Macromind Director, Photo CD,* PICS (animation), Pixar, QDV, raw RGB, RLE			can view any PostScript print file	JPEG*

*Application reads the format but doesn't write it. *Application writes the format but doesn't read it.

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The Database Dilemma

ARE YOU OUTGROWING your flat-file database but reluctant to go relational? Here's how to tell if a relational structure is for you — and how to make the switch. **BY BRUCE ONDER AND JEFFREY SULLIVAN**

Your flat-file database — say, one created with FileMaker Pro or Panorama — was easy to set up and it's easy to use, but you may not be as happy with it as you used to be. Some tasks may seem awkward, or it's becoming unmanageably large and slow. You may have reached the stage where a flat-file database can't handle what you want it to do. Maybe it's time to go relational.

How do you know if your data is begging for a relational structure? Here are some telltale signs:

You're using repeating fields within a

record — for example, Item1, Item2, and so forth in the record of a customer order — and wasting space, because not all customers order the maximum number of items each record can accommodate (or you're having to use multiple order records because some customers order more).

You're wasting time entering the same data over and over — for example, reentering address information for regular customers each time they place a new order.

Your database is getting too big and becoming too slow. You'll find that the larger a database gets, the longer it will take to

search, sort, and filter entries in it.

There may be some things you can do to improve your current database and avoid switching to a relational one, such as using the Lookup feature in FileMaker Pro to have one database look up data in another. However, such features are called *pseudo-relational* for good reason — they're not as powerful as true relational features.

The Relational Advantage

The biggest difference between a flat-file and a relational database, and the reason the latter can be much more efficient and flexible, is that a relational database isn't limited to a single record structure (that is, a structure in which all records have the same set of fields). Instead, it consists of multiple linked *tables*, each of which is like a single flat-file database with its own particular structure. Because you can break a

relational database down into smaller linked tables that supply information to each other, you can structure relational databases more efficiently. Although flat-file-database programs often have the ability to do simple data "lookups" between one database and another, the rich and complex programming environment that characterizes relational-database programs allows data integration that's much more sophisticated.

For example, let's say you have an order-entry system in a database like the one shown in figure 1a. As you can see, there is room in the record for each order to contain five ordered items. You're likely to waste space with such a system, because many orders will consist of fewer than five items — in those cases, the fields will remain

THE RICH AND COMPLEX programming environment that characterizes relational-database programs allows sophisticated data integration. But before you make the commitment to go with a relational database, consider the cost in time and money.

empty but continue to take up allocated space. For orders of more than five items, you'll waste space again, having to fill in multiple records and duplicating information, such as the order number, all of your customer information, and the order date. Besides wasting space, this system leaves you with forms that, when printed, tend to look unprofessional, because of blank fields and duplicated records.

In a relational database, you can put each

ordered item into its own table and link it to information in other tables, as shown in figure 1b. By keeping information in separate tables, you have to repeat only the data in linked fields, such as the order number and customer ID; you can avoid rekeying all the customer data. Also, since all the information is linked, it can appear together in a printed invoice, for example.

The relational system in this example is more flexible and efficient than the flat-file

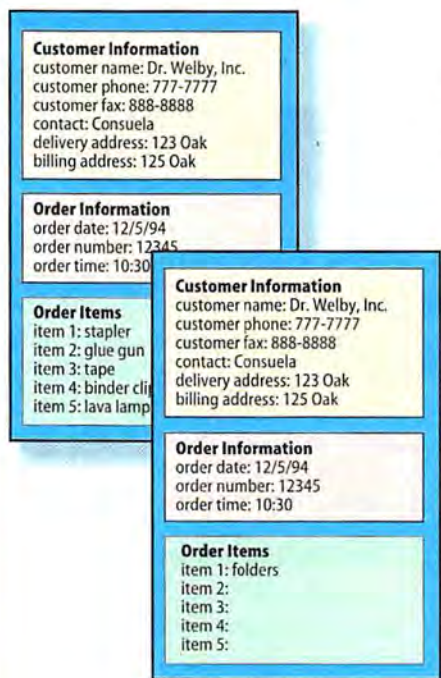
figure 1

Flat-File Versus Relational Databases

Flexibility and efficiency are two key benefits of a relational-database structure. Because you can link record structures (called tables) of different types, you have the flexibility to, say, have any number of

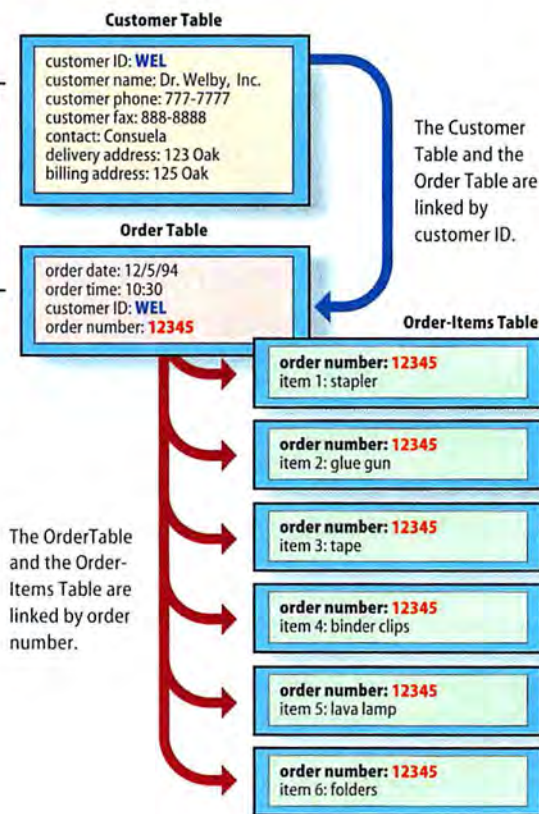
items in an order. In a flat-file database, there's no way to accommodate a variable number of items per order without wasting space and possibly repeating data unnecessarily.

a. Flat-File-Database Structure



For more than five items, you must create a second record. With fewer than five items per record, you waste space.

b. Relational-Database Structure



You can have as few or as many items as you want without wasting space.

system, because it can accommodate any number of ordered items, it doesn't allocate unneeded space, and you duplicate little information. If you have many records, these improvements can give you an organized, fast database rather than one that's slow, large, and difficult to use.

Making the Move

Before you make the commitment to go with a relational database, it's important to consider the cost in time and money. Unless you can find an existing relational database that will work for you (always an option worth considering, since many vendors of database programs include sample databases with their products or can point you toward third-party databases that might meet your needs), you're in for a significant amount of programming, whether you do the programming yourself or contract the work out. Besides the cost of the database program itself, you will need time and money to train those who will use the finished database, as well as resources for making changes and fixes to the database in the future.

If these costs are not prohibitive and you feel you do indeed need a relational database, the next question to answer is, Who should do the work of designing and building your relational database? Should you create it yourself, perhaps using one of the more accessible of the relational-database programs (see the "Choosing the Right Database Program" sidebar), or should you farm out the work to a contractor?

Unless you're already a database programmer, you're going to need time to learn the fundamentals of database programming and relational modeling and more time to learn the specifics of the environment to which you're converting. This learning time may be a good investment if you plan to create additional databases in the future and if you want to maintain and make changes to them yourself.

If you simply want to convert your current database and get on with your work, however, it may be best to hire someone to design and implement a new version for you. Database programmers' rates vary widely, based on the local market and available talent pool, but the fee you pay will almost certainly be lower than taking the time to get up to speed yourself.

CHOOSING THE RIGHT DATABASE PROGRAM

AS IMPORTANT AS deciding whether or not to switch to a relational database is deciding which database program fulfills your needs best. Here's a basic guide to help you narrow down the choices:



4th Dimension 3.1

For Mac-only workgroups and companies that need multiuser capability. (If you plan to add Windows users in the future, 4D may still work for you; ACI US plans to ship a Windows version in the first half of 1995.) It should be easy to find a Mac-savvy 4D programmer. (4D, \$895; 4D Compiler, \$1,000; 4D Runtime, \$195; 4D Server, \$1,195 for two users. ACI US, 800-384-0010 or 408-252-4444.)



4D First 1.1

For power users of flat-file databases who would like to develop their own databases and for those on a tight budget who don't need a complicated, sophisticated relational database. 4D First databases lack multiuser capabilities, but you can convert them to 4th Dimension later if you decide to move up. (4D First, \$99. ACI US, 800-384-0010 or 408-252-4444.)



FoxPro for Macintosh 2.5

For workgroups and offices that need multiuser capabilities across multiple platforms (Mac, DOS, Windows, and/or UNIX). Developers tend to be on the PC side, so you'll probably have to work with some non-Mac-like features. (FoxPro, \$495; Professional Edition, \$695. Microsoft, 800-426-9400 or 206-882-8080.)



Helix Express 2.0

For Mac-only workgroups and for users who would like to try programming with a graphical programming language. Initial ease of programming may turn into difficulty if your needs become more sophisticated. (Helix, \$589. Helix Technologies, 800-364-4354 or 708-465-0242.)



Omnis 7³

For corporate, cross-platform offices that need client/server capabilities. It gives you connectivity with Windows, Windows NT, OS/2, and HP-UX and is going to add Solaris and AIX connectivity. Omnis developers are rarer than 4D or FoxPro developers. It's not for those on a tight budget. (Omnis, \$5,000. Blyth Software, 800-346-6647 or 415-571-0222.)

You should get bids from prospective contractors, reflecting how much time and effort will be needed to implement your specifications. The bids should be either a flat fee or an hourly projection with a cap on hours billable to the project. Otherwise, you'll have no idea how much the system will cost or how long you'll have to wait for it. It's also a good idea to get an estimate up front of the cost of future changes and adjustments to the database. Make sure to specify who will be responsible for bugs that are found.

In order to get a realistic bid, develop a written specification that describes in detail what you want the conversion to accomplish. In our example, we primarily want the order-entry system to allow any number of order items and to limit redundant information regarding customers and inventory items. The specification should also include

report forms, such as invoices, and other components of the flat-file system you want the contractor to convert.

To speed up the process and so you can catch errors early on, ask the contractor to deliver the database program to you in stages, such as the customer-information part first. That way you can enter live data right away, test the software for bugs, and identify inconsistencies with your written specification.

Switching to a relational database is no light task, but if you're frustrated with your current system, the change may save you money, make your office run more smoothly, and preserve your sanity. ☐

Bruce Onder is a software developer and technical writer. Jeffrey Sullivan is a regular *MacUser* contributor and former programmer. Besides collaborating on database articles, they write screenplays together.



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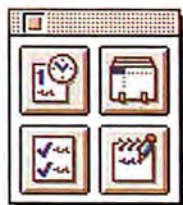
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New for the Road



Hot new PowerBook products weren't easy to find at the 1994 Boston Macworld Expo, but a savvy columnist can always spot trends — and offer help for the latest 540c problem. BY SHARON ZARDETTO AKER

NEXT TIME YOU'RE on a long flight with your color PowerBook and the charming youngster behind you has been kicking the back of your seat for upwards of 90 minutes, invite the little monster forward to play with Art Explorer, the terrific new kids' paint-and-play program, available for around \$50 from Aldus' Consumer Division (our old friend Silicon Beach), at 800-888-6293 or 619-558-6000.

I knew I was in trouble when that was the only opening paragraph I could come up with after scouring Macworld Expo in Boston for interesting new PowerBook products to write about. There's not much really exciting news for PowerBooks. Does that mean the market, and the PowerBook itself, is stable or stagnant? Maybe it's just that the honeymoon's over now and we're dealing with the actual marriage — which can go either way over time.

There are new and interesting PowerBook models, of course, but even that tack for this month's column went off in the wrong direction, with my new 540c half

dead out of the box. I'll provide some tips for its problem later, but first let's take a quick look at the current trends in PowerBook hardware and software as reflected at the show — trends I plan to discuss in depth in future columns.

Battle of the Batteries

A battle of the batteries — external batteries, that is — is definitely going on, with four companies now making slim external models of the type VST Systems introduced with its ThinPack. And each company occasionally indulges in that favorite tactic of politicians: Don't sell yourself on your good points, sell yourself on your competition's bad points — or on whatever might be perceived as your competition's flaws, whether or not they really are problems. The mild mudslinging I saw as I went from booth to booth was amusing but surely not effective advertising. At least, I hope not. The only development in this arena — besides the addition of offerings from BTI (800-982-8284 or 213-728-7874) and Lind (800-659-5956 or 612-927-6303) to those from our



old friends VST (508-287-4600) and Technöggin (800-305-7936 or 513-321-1777) — is the development of even larger and heavier, but longer-lasting, external batteries and models specifically designed for the 500-series PowerBooks. By the time you read this, both Lind and VST will have battery chargers available for the 500-series PowerBooks' smart batteries as well.

MO Better Storage

I rarely back up when I'm on the road, because the work I do while traveling isn't crucial and I'm not frequently away from my desk machine for long periods. But I set myself the task of looking into on-the-road backup systems for those of you who do

POWERBOOK SECRETS / managing the Power Manager

IF YOU'VE EVER WONDERED what controls power-management activities on the PowerBook (such things as sleep, power-saver mode, backlight level, and battery-charging functions), the answer is simple: It's a custom chip called the Power Manager. The Power Manager has its own set of operating instructions and its own memory. But sometimes its memory settings get corrupted, causing problems such as batteries refusing to charge completely.

Luckily, resetting the Power Manager isn't hard. Nothing in RAM survives a Power Manager reset, though, so save all of your work — plus the contents of any RAM disks you might be using — and shut down before you start.

For a 100-series PowerBook, reset the Power Manager by unplugging the AC power and removing the internal battery and then letting the PowerBook sit for five minutes. If your PowerBook is a 160, 165, or 180, you're done. If

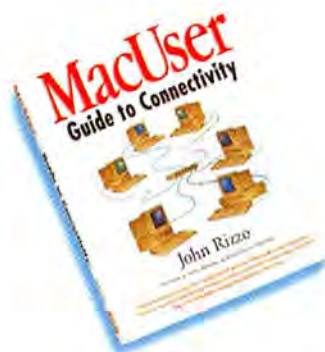
you have another 100-series model, there's one more step before you replace the batteries and start up: Press the reset and interrupt buttons simultaneously, keeping them pressed for 10 seconds. On the 100 model, pressing both buttons is no problem; on the others, it's a feat — but easy enough to do by bending a paper clip into a U-shape so you can poke both buttons at once (see photo).



Duos and 500-series PowerBooks are less complicated. On a Duo, just hold in the rear power switch for 45 seconds. On a 500-series PowerBook, press the Command, Control, Option, and power keys all at the same time.

Add resetting the Power Manager to your list of general maintenance and fix-it routines, along with zapping PRAM and such. You'll find it a useful technique for solving some of the more nebulous but annoying power-related problems on your PowerBook. / Rich Wolfson

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CIRCLE 17 ON READER SERVICE CARD

heavy-duty work away from the office.

There's always the option of getting a small (in dimensions, not capacity) external hard drive — perhaps even a PCMCIA hard drive, such as the 420-megabyte model recently announced by Integral Peripherals (303-449-8009), if you've got a 500-series PowerBook — but even a PCMCIA hard drive doesn't allow for easy



figure 1 / Wireless networking is happening for PowerBooks, with Dayna, Digital Ocean, and Photonics showing products for this purpose at the Boston Macworld Expo. Photonics' Cooperative transceiver, shown here, turns your PowerBook into a node on an instant infrared LocalTalk network, for \$295.

data transfer to your desktop Mac.

It seems to me that getting a removable-media drive is a good approach here. But a SyQuest drive is almost as big as the PowerBook itself, and a cartridge is a little bigger than a PowerBook battery — although an 80-MB drive on a PCMCIA card that holds 2-x-2-inch cartridges is rumored to be on the way from SyQuest (see September '94, page 30).

All in all, I was quite happy to see a battery-driven MO (magneto-optical) drive from Sony (800-472-7669 or 201-930-7796) that was about the size of a Walkman and used 2.5-inch disks. This \$600-to-\$800 drive (price depends upon configuration) was not expected to ship until November of this year or later. On the other hand, Pinnacle Micro (800-553-7070 or 714-727-3300) has an AC- or battery-powered 230-MB MO drive that's available today for about \$1,000 — and it's only slightly larger (1.4 x 4.5 x 8 inches).

Instant, Portable Networks

The Cooperative wireless networking products from Photonics (800-997-2326 or 408-955-7930) were among the few things at the

Macworld expo that really captured my interest. The Cooperative transceiver (\$295) attaches to your PowerBook's printer port and to the ADB port or a battery for power (see figure 1). It uses a diffuse infrared signal to zap data at LocalTalk speed to other transceivers within a 25-x-25-foot room. The signal doesn't have to be aimed — it caroms off walls, ceiling, floor, and furniture, staying within the room to create your own private network. To link your infrared network to a wired network, you can buy the \$49 Cooperative Access adapter.

For more, higher-end wireless options, you can turn to Dayna or Digital Ocean. At the expo, both companies were showing radio-based Ethernet adapters for 500-series PowerBooks, and Dayna's is available in a PCMCIA format (see "Ethernet in the Air," November '94, page 143). These companies also offer LocalTalk adapters at more than twice the price of Photonics' adapter but also offering substantially longer-distance roaming ranges.

On the Software Side

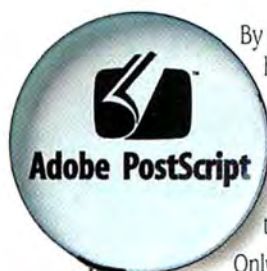
It looks like everyone's realized that, in most ways, the PowerBook is "just" another Macintosh, now that it's grown beyond its original memory and disk-capacity limitations. And when it comes to software, there's little offered that's PowerBook-specific, other than battery-management utilities. In fact, at the expo's PowerBook seminar, when a woman asked the panel to recommend the five best utilities for the PowerBook, there was a pause, and I knew exactly what the panelists were thinking: There aren't five PowerBook utilities, total, never mind five "best." *MacWEEK* columnist Don Crabb finally answered, "There's only one — PBTools."

Actually, the battery-management-software contest has two finalists — PBTools, from VST, and CPU (Connectix PowerBook Utilities), from Connectix (800-950-5880 or 415-571-5100). But there was mysteriously no mention of CPU at the Connectix booth; if you asked about it, you could get a private showing on a PowerBook. Who knows? Perhaps the improvements to PowerBook system software and the consistently high recommendations for PBTools are making CPU less attractive and less worthy of Connectix's selling time.

File-syncing software, which should be a

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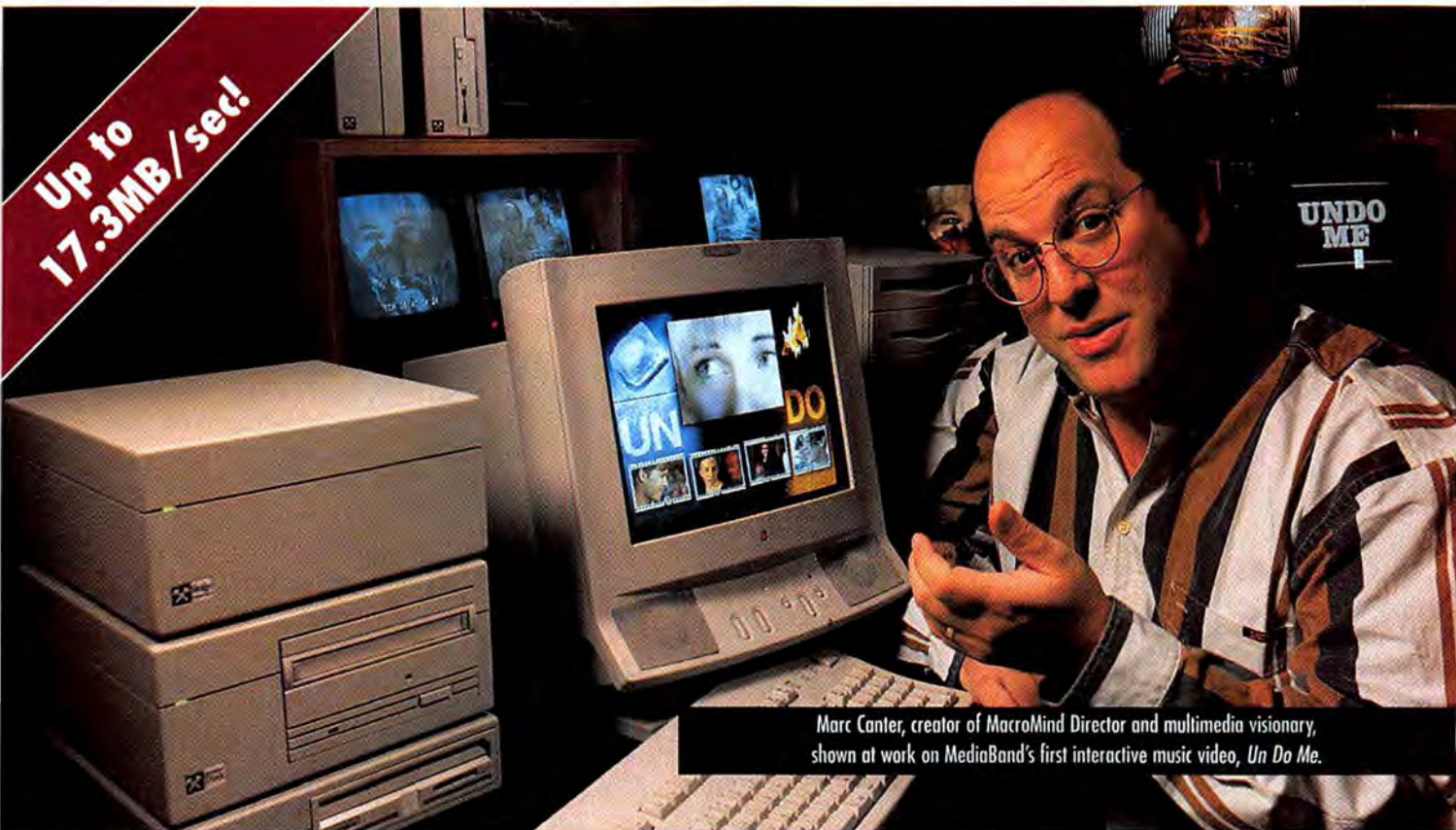
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CIRCLE 127 ON READER SERVICE CARD

How Do You Build The World's Fastest Digital Video Empire?



Marc Canter, creator of MacroMind Director and multimedia visionary, shown at work on MediaBand's first interactive music video, *Un Do Me*.

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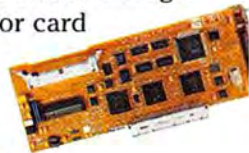
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12.4MB/sec and 17.3MB/sec on the Quadra[®] 840AV. Are the industry's fastest sustained transfer rates the only reason multimedia visionary, Marc Canter, chose the new SledgeHammer[™] II and SledgeHammer Wide arrays from FWB? No. Capacities of up to 17.4 gigabytes were important. And his other SledgeHammers got top marks from him as they had from MacWEEK, MacUser and Macworld. But for his new MediaBand digital music video projects, the measure he applied first was RAID speed. That's why he applied the Hammer.[®]

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RANDOM FREEZING is endemic among 540c models; it's caused by a flaw in a Motorola chip on the daughterboard. By the time you read this, replacement boards should be in plentiful supply, so if you've got the random-freeze problem, call Apple SOS at 800-767-2775 for a free fix.

popular and necessary category for PowerBook users, seems to have lost its initial importance — not one of the expo panelists, for instance, uses any of the available programs.

Finally, the software issue that's most important to me and to many other PowerBook users: Version 6.0 of Microsoft Word promises to avoid hitting the disk every 20 seconds or so, the way Word 5 does. The release of 6.0 is a few weeks away as of this writing; we'll see how much improved it is!

Unfreezing a PowerBook 540c

When the array of PowerBook products turned out to be limited, I thought I'd switch the topic of this column to the 500-series PowerBooks. In fact, I finally have a

loaner 540c (if you're going to borrow something, you might as well get the best). Folks, this machine has a to-die-for screen. Ten minutes into using it, I decided I was never sending it back voluntarily. But after 20 minutes of use, the machine froze. And again after 40 minutes. And intermittently thereafter, often enough to make the machine basically useless.

Random freezing is endemic among 540c models; it's caused by a flaw in a Motorola chip on the daughterboard. By the time you read this, replacement boards should be in plentiful supply, so if you've got the random-freeze problem, call Apple SOS at 800-767-2775 for a free fix.

While you're waiting for the fix, though, you're in a bit of a dilemma: How do you get

out of a freeze on a machine that you can't turn off because it's not responding to a keyboard press of the power key and has no reset/interrupt switches? Try pressing the Command, Control, and power keys simultaneously; that's the equivalent of pressing the reset switch on a Macintosh that doesn't have one. And if that doesn't work, unplug the computer and remove both batteries. Either procedure kills whatever's in RAM, but, hey, at least you'll get your computer back.

You can also cut down on the frequency of crashes by turning processor cycling off (to access the appropriate setting, Option-click on the Easy/Custom toggle in the PowerBook control-panel window). Naturally, by preventing the PowerBook from going into its rest state during periods of activity, you'll be using more battery power — but at least you won't be crashing! ☹

Sharon Zardetto Aker is looking forward to getting her new PowerBook 540c into working condition before the loaner period expires. Rich Wolfson is finally preparing to retire his PowerBook 100 for one of the new Duos.

"RAM Doubler is the best new software"

Macworld Magazine, 9/94



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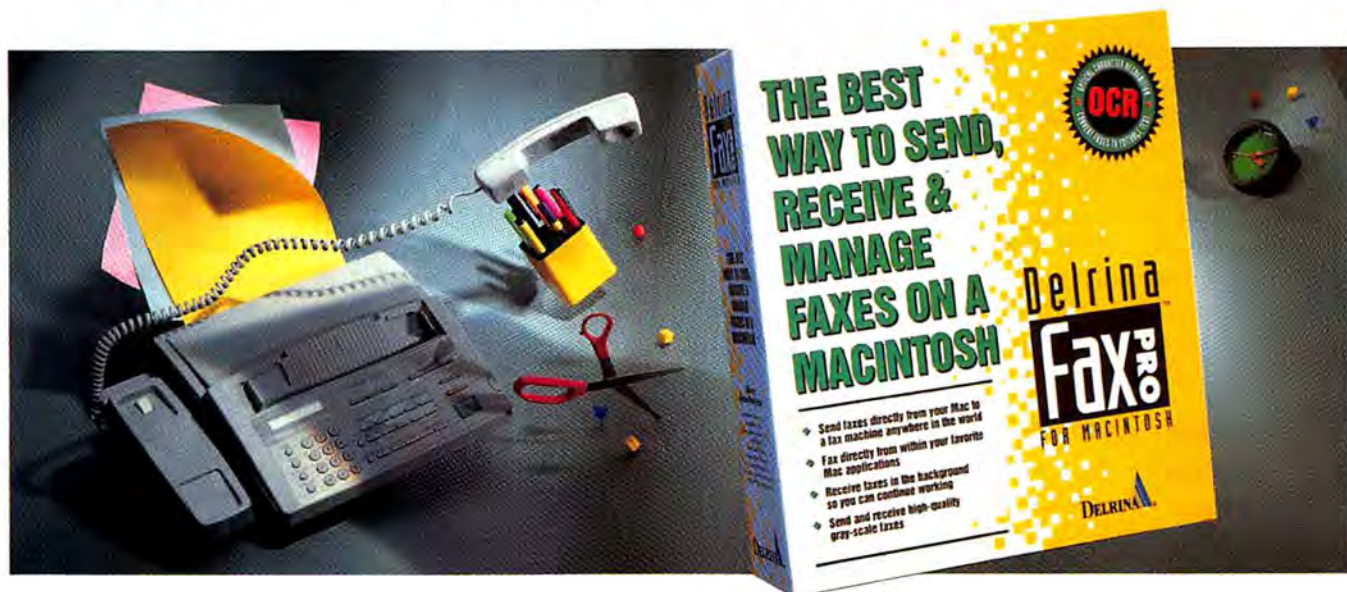
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CIRCLE 62 ON READER SERVICE CARD

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Help Folder



Apprehend extensions responsible for Mac slowdown, make your Mac imitate your handwriting, and find out the easiest way to print books.

BY ANDY IHNATKO AND BOB LEVITUS / TIPS COMPILED BY CHRISTOPHER BREEN

Startups That Slow Down

Q. Proliferating extensions and control panels slow down my Mac so much that I'm starting to doubt their usefulness. Does anyone make a utility that monitors extensions' use of the CPU so I can tell which ones to disable?

Dave Combs
via CompuServe

BOB: Even though I don't know of a program that does exactly what you want, there are a few shareware and freeware programs that do at least part of the task. You might start with a nifty little freeware application by Linda Custer called CheckTicks (available on-line; see end of article). It indicates how busy your CPU is at any given time. Using it to evaluate each control panel and extension's impact is time-consuming, but here's how to do it:

1. Start up your Mac while holding down the Shift key to disable all extensions and control panels.
2. Run CheckTicks, and write down the timing it gives you.
3. Use an extension manager, such as Casady & Greene's Conflict Catcher or Now Software's Startup Manager, to turn off all extensions and control panels, except the one you want to evaluate, at startup.
4. Restart.

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 Andy (72511, 204). We pay \$25 - \$100 for any undocumented tips we publish. Send them to Christopher Breen (72241, 1036).

*. . . BUT WERE AFRAID TO ASK



Q. Every Mac book I've read says I should have an "emergency disk" with a System and the Finder on it. Well, how do I make one? Those things are too big to copy from my hard disk, and even the Installer can't make a System Folder that will fit on one disk.

Joey McLyon
Austin, TX

ANDY: Before I respond, let me say how glad I am that fictional characters such as yourself are once again flooding the Help Folder mail room with questions that may be incredibly basic, profoundly twisted, or otherwise too embarrassing to submit under one's own name. You are the backbone of this great nation. Stand tall.

Onward. Not all versions of system software can be installed directly on one floppy disk. Although there are ways to pare a System Folder down to bare essentials, why bother? Apple's done it for you in the form of the Disk Tools disk, which probably shipped with your Mac. If you didn't get one, it's time to buy a fresh version of new system software at your friendly neighborhood software store.

The Disk Tools disk contains bare-bones System and Finder files as well as the oft underappreciated Disk First Aid utility; it is able to boot your Mac when none of your hard disks can. Every Mac owner on this oblate spheroid ought to have some sort of bootable diskette — such as Disk Tools — within spitting distance.

5. Run CheckTicks, and write down how long it took this time.
6. Subtract the first timing from the second to see the effect of your extension or control panel on your Mac's performance. The higher the number, the worse the impact.

Although this technique requires a lot of restarting, it will show you which files have the worst effect on your Mac.

A faster method, although further from your goal, is to get rid of memory-hogging extensions. You can use the shareware Sym-bionts (available on-line) to tell you how much RAM each startup file uses.

ANDY: I'd boil the process down to this:

1. Install the suspect extension.
2. Restart your Mac.
3. If your system seems to slow down, remove the extension.
4. Jump on its installation disk.
5. Repeat step 4.

Although it would be pretty easy for someone to write an application that would

check system performance before and after installation of an extension or control panel, it's unlikely that such a program would give you a fabulously useful answer. There are so many ways software can affect a Mac's performance, you'd really have to check the performance of the logic board and its interfaces with just about everything to know whether or not a startup file was slowing you down overall.

If your Mac has started to poop out on you and a startup file is causing the problem, it shouldn't be hard to figure out which one's at fault, as long as you followed the sane advice of installing extensions one at a time.

Handwritten Fonts

Q. Where I can get a good handwritten font?

Cindy Malsuete
Roanoke, VA

ANDY: If you mean, How can I have a font

Bert I. Gordon:*A Man And His Muse 1947-1962**Dr. Forrester, This book changed my life. - TV's Frank**Get a life, Frank. - Dr. F*

figure 1 / **Choosing the best-looking** handwriting font is subjective. These favorites of the Help Folder columnists are, from top to bottom, Monoline Script Bold and Monoline Script, from Monotype; SigJocelyn, from Signature Software; and Tekton, from Adobe (the latter is shipping with System 7.5).

made from my own handwriting? you can do it yourself with a scanner (or a graphics tablet or a Newton) and a font-editing program such as Fontographer (\$495), from Altsys (800-477-2131 or 214-680-2060). But doing so will require an uncertain amount of labor and probably lots of grain alcohol.

If you want to go an easier route, send Signature Software (800-925-8840 or 503-386-3221) a writing sample, and the company will make a font for you in less than a month. The price is \$49.95 for a printed font and \$99.95 for a cursive font with connected letters that change according to the letters they follow and precede.

If you simply mean, I think more people would fall for my pyramid scam if it looked as though the letter were written by hand, you may be interested in obtaining Signature Software's PenPals and SuperScripts (\$29.95 for a printed font, \$49.95 for cursive), an inexpensive collection of natural-

looking handwriting fonts. Although there are also plenty of homemade handwriting fonts in shareware libraries, they tend to be rather poorly designed. Signature's fonts are worth the dough.

If what you really want to find out is, Where can I get a font with a handwriting-ish feel to it? that is a highly subjective matter. I dig Monoline Script, from Monotype (312-855-1440). It has an old feel but isn't over-used like Tekton.

BOB: Tekton is the most gorgeous hand-lettered-looking font ever. I don't care if everyone — and I do mean everyone, now that Apple is including it with System 7.5 — is using it, I love it. And now it's free. It's everything you wish Geneva were. Judge for yourself (see figure 1).

Making Booklets

Q. Any tips on how to lay out and print booklets with Microsoft Word? I run security for a concert arena, and I'd like to be able to hand my people event information to refer to throughout the night in booklet form rather than as a stack of papers.

Roger Williamson
Van Nuys, CA

ANDY: Roger, not to be a complainer or anything, but I worked for hours on an in-depth explanation of free techniques for creating booklets (which would have won me a Pulitzer), only to find out about ClickBook (\$69.95), from BookMaker (800-766-8531 or 415-354-8161). It's a printing utility that

formats text from just about any program into booklets. You can choose from almost two dozen formats, including DayMaker formats. And it's disgustingly simple to use.

I'm told it's more appropriate for casual projects, such as making my 6,000-record comic-book database into a booklet, than for professional booklet production.

If you want a free solution, call Microsoft technical support and they'll fax you a helpful instruction packet on using Word to create books. If you want to do it the simple way, give BookMaker a call.

BOB: Making booklets in Word might get easier with version 6, but in the version I'm using, it's an exercise in frustration. If Andy says ClickBook is simpler, that's good enough for me.

One of the only drawbacks to ClickBook, according to the *MacUser* editor who reviewed it, is that it doesn't preserve the exact formatting of your page. It rescales type to make it fit the page size you choose. If you already own PageMaker or QuarkXPress, you might prefer using the built-in book-making features. They're not as simple to use as ClickBook, but they do maintain your exact formatting.

Pixelate Your Picture

Q. Is there any way to print out a scanned image at the maximum zoomed-in view? (I want to print the picture with exaggerated pixels.)

Gregory J. Ryan
Wall, NJ

BOB: You must be one of those artists, or something — most people want to *reduce* the jaggies. If you want them, however, I do

TIPS / Hardware**AUTOPOWERING PERIPHERALS**

If you want to have the peripherals hooked up to your Mac switch on simultaneously when you press the keyboard's power-on button but you don't want to pay \$119 for Sophisticated Circuits' PowerKey, here's a less expensive solution: the \$50 Radio Shack Auto Power Controller (part number 61-2781). [We found ours on sale for \$30. — Ed.] You can plug as many as five devices, including your Mac, in to it. When

you power up the one you've chosen as the *control* device, the other four devices turn on as well. (The Auto Power Controller also provides surge protection and an extra outlet that's permanently switched on.)

Even though you can't schedule automatic startups, as you can with

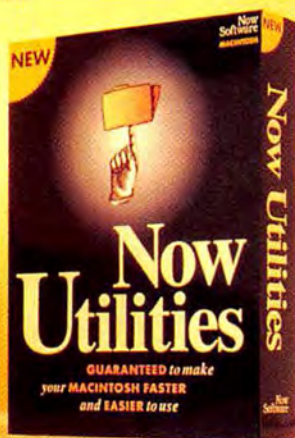


the PowerKey's software, you can schedule automatic shutdowns. All you have to do is make sure your Macintosh is plugged in to the *control* switch and use a program such as CompuServe Navigator with the built-in capability to shut down your Mac after completing its duties. When your Mac shuts down, every device plugged in to the controller will shut down at the same time.

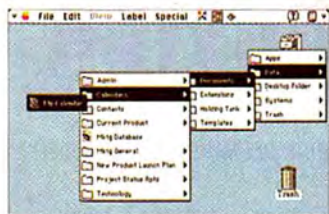
For applications that don't have autoshtutdown, the \$10 shareware program Shutdown Items, from John Covele, does the same thing.

David H. Brown
Falcon Heights, MN

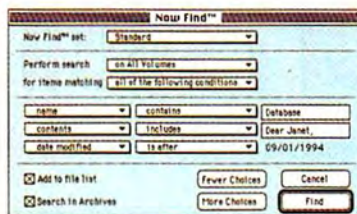
NEW!
Version 5.0



Think of it as the missing piece of the apple.



Organizing files is easier than ever—just click on a folder and hierarchical menus appear so you can just drag and drop.



The powerful Find lets you quickly locate the file you're looking for, based on up to 10 criteria—and even searches inside archives.

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The new version sports a time-saving interface that makes features more accessible. You can create custom menus, jump directly to applications, or locate any misplaced files lickety-split.

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The original version won countless awards and praise from the experts. Not ones to rest on our laurels, we've spent the last year rethinking, refining and adding major features as well as subtle enhancements. New Now Utilities 5.0. Accelerated for Power Macintosh.™ Introductory street price under \$70, after that \$89. Upgrades available for just **\$39.95 until November 15, 1994.** Call 1-800-689-9425 today, or see your dealer.





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figure 2 / **You can keep the jaggies** for effect by enlarging an image in a graphics program. To fit it on the page for printing while maintaining the pixelated look, reduce it to a size that's not exactly the same as the original.

have a couple of tricks up my sleeve for you.

The easiest is to use your scanning software to enlarge the picture on your screen. Then use the Mac's built-in screen-capture utility (Command-Shift-3) to take a picture of it. If your image is larger than your screen, move on to the next trick.

Trick #2 requires a graphics program that can open your scanned image and either rescale it or apply a "pixelating" filter, such as the Mosaic filter in Photoshop. If you don't have such a filter, you can use just about any graphics program to rescale the image. Scale the image up, and reduce it again to fit it on a single page for printing. Reduce it to a slightly larger or smaller size than the original, so you'll still get the pixelated look. (See figure 2, a scanned, pixelated image of me).

ANDY: I've seen you pixelated before, but only at MacWorld Expo parties. How are the other members of The Village People getting along these days?

BOB: That just happens to be my best hat, custom-made by Manny Gammage at Texas Hatters (where LB) bought his hats! I don't make fun of your goofy photojournalist vest, or whatever that thing is you wear.

One last point: If you're using Photoshop, keep in mind that by default it will try to smooth your image when you resize it. All you have to do to get the look you want is go to Preferences and choose General. Then, in the resulting dialog box, choose Nearest Neighbor from the Interpolation pop-up list.

We All Scream for Big Screens

Q. I recently rediscovered a great system extension called Stepping Out II. Unfortunately, it doesn't work with System 7. Is there an updated version, and if so, how can I get it?

Brian Jyrondsen
Buras, LA

ANDY: For those of you unfamiliar with this six-year-old bit of software, Stepping Out was an incredibly ginchy (meaning utterly swell) utility that tricked the Mac into using a desktop larger than your actual monitor. You could be using a 640-x-480-pixel screen, for instance, but when you held down a specific key and moved the pointer past the edge of the screen, countless acres of fresh real estate would scroll into view, just as though you had a two-page display connected to your Mac.

Alas, the maker of Stepping Out, Berkeley

Systems, discontinued the product long ago. Don't go away, though — there's free-ware that's even better: Virtual Desktop, part of AWOL Utilities by Ross Brown. AWOL gives you all the functions of Stepping Out plus kick-butt navigation tools. Besides turning your desktop into the Ponderosa, you can get desktop scroll bars; switch to Full View for an aerial picture of your desktop; or best of all, install *doors* that teleport you to a specific area. For instance, one click brings up all of my Finder windows, another brings up ZTerm, and yet another takes me to my favorite collection of utilities.

You can download AWOL Utilities from any on-line service, contact the author directly at ab026@freenet.carleton.ca, or send a floppy disk and a self-addressed stamped disk mailer to AWOL Software Productions, P.O. Box 24207, 300 Eagleston



Drill it.



Solder it.



Replace it.

TIPS / PowerBook

STURDIER BACK DOOR

The tab hinges are prone to breaking off the door on the 100-series PowerBooks. If yours have broken, use a small drill (such as a modeling drill) to drill new holes where the old hinges used to be. Then, with wire snippers, cut short lengths of paper clips to use as replacement hinges. Glue them into the holes with strong glue, and the door will never break off again.

Corbett Enders
Surrey, BC, Canada

ONE MORE DOOR TRICK

If one of the small tab hinges has broken off your PowerBook's back door, straighten a standard paper staple with needle-nose pliers. Holding the staple with the pliers, use a hot soldering iron to heat it for about 30 seconds. Then force the hot staple into the edge of the door where the tab used to be — it should go in easily. Let it cool for a few minutes, and then trim it to the right size. Now you can pop the door back in.

Mark Federoff
Tumacacori, AZ

[A commercial product that solves this problem is the PowerDoor (\$19.99), from The AVO Company (408-283-0890). The PowerDoor is simply a replacement door with cutouts for the power-on button and the RJ-11 jack, so you can keep the door closed most of the time. It works with the PowerBook 100 series, except for the model 100, and with the PowerBook 500 series. — Ed.]

EASY-ACCESS TRACKBALL

The retaining ring that holds a Duo's trackball in place is notoriously difficult to twist off — which makes trackball cleaning hard. Try using some rubber finger pads, from any stationery store, on your thumbs to get a good grip.

Mike Delugg
via ZiffNet/Mac

Road, Kanata, ON K2M 2C3, Canada. Make it as easy on Ross as possible — format the floppy before you send it.

Desktop Color Recovery

Q. My Performa's desktop patterns, in the General Controls control panel, have lost their color! Ever since my Mac crashed while I was changing my desktop background pattern, all of my color patterns are black-and-white. How can I get back my color patterns?

Mark G. Cichra
Independence, OH

BOB: Try the easiest solution first: Zap your PRAM (parameter RAM) by holding down Command-Option-P-R while starting up your Mac. Parameter RAM is a small part of your Mac's RAM that remembers settings such as time, monitor bit depth, and desktop patterns while your Mac is turned off.

ANDY: You might also try opening the Monitors control panel, switching to Grays/Black


& White, clicking on any desktop pattern in General Controls, and then returning to the Monitors control panel and clicking on the color depth you want. Through various misadventures, your Mac can get confused about what the proper desktop pattern is supposed to be. When that happens, it switches to black-and-white until the aforementioned Monitors control-panel procedure slaps it back to its senses.


BOB: If neither of these methods work, you'll have to resort to the Apple Restore program, which came with the Performa, to restore your System file and General Controls control panel from the backup you made when you received your Performa.

What? You didn't follow the manual's instructions to create a backup? You're in deep stuff. Since Performas don't come with system-software disks, you'll have to beg, borrow, or steal copies of the System file and General Controls file from someone else's copy of System 7.0.1p to replace yours.

Newton Correction

ANDY: Allan Marcus, of Atomic Software, offered a couple of corrections to my answer on how to reclaim wasted space from your Newton's memory heap ("Newton Memory Lapses," September '94, page 162).

First, his excellent heap-management utility, Removelt!, is actually a \$5 piece of shareware and not freeware as I originally reported. Second, although my method does indeed work, he offered an embarrassingly simpler one: Do a complete backup, and then press the Reset button while holding down the power button. This wipes clean your Newt's memory, including any detritus from using applications. After a restore, you will be right as rain — and you might even wind up with some more free heap space. 

 You can find the programs referenced in this article in the MacUser and ZiffNet/Mac areas on CompuServe and eWorld. See page 4 for instructions on accessing ZiffNet/Mac.

TIPS / Internet

SENDING MAIL

Here are a couple of solid guidelines for sending e-mail in the wild and woolly world of the Net. Internet addresses typically take the form *user name@domain name.top-level-domain name*, where *domain name* represents the service provider and the top-level domain is the

type of organization — for example, in *FredMertz@aol.com*, *com* stands for *commercial* concerns. Other common top-level domains you may want to reach include *gov* (government), *edu* (universities), *mil* (military), *net* (network), and *org* (nonprofit organizations).

Most on-line services accept and use this address format (see table at left), but the formats for CompuServe and Fidonet require further explanation.

To send mail to someone on CompuServe from the Net, use a user ID instead of a user name. Also, substitute a period for the comma that comes in the middle of the user ID (for instance, 72241.1036@compuserve.com).

To send messages from CompuServe out over the Net, simply add INTERNET: to the beginning of the net address; an example is INTERNET:LucyCarmichael@macuser.ziff.com (you no longer have to type a > symbol before INTERNET:).

To send a message to Fidonet, you must write the recipient's address backward and insert one-letter codes. For example, Joe Blow is at zone 1, net 113, node 718, point 2. Therefore, 1:113/718.2 is Joe's Fidonet address. To reach Joe from the Net, type Joe.Blow@p2.f718.n113.z1.fidonet.org. — do note that *node* is abbreviated as *f*, not *n*, which is the abbreviation for *net*.

Kevin Savetz
Arcata, CA

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MCI Mail	userID@mcimail.com*	At the To: prompt, type username (EMS) At the EMS: prompt, type INTERNET At the Mbx: prompt, type user@domain
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*Three MCI Mail address types can receive mail from the Internet: username (Ethel_Mertz@mcimail.com), userID (1234567@mcimail.com), or a combination of both (Ethel_Mertz/1234567@mcimail.com).



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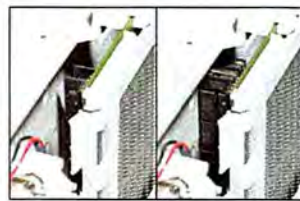


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100 MB	3.5"	11 ms	4500	128K	195	265	
140 MB	3.5"	11 ms	3600	128K	235	295	
200 MB	3.5"	12 ms	4500	128K	279	339	

PS drives include a 2 year factory warranty and are SCSI 1 & 2 compatible.

GO Power Book Drives							
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160 MB	2.5"	17ms	1 Year	335	415		

Empire and Pro Series							
Capacity	Size	Seek	RPM	Cache	Int.	Ext.	
40 MB	3.5"	9.5 ms	5400	512K	Call	Call	
80 MB	3.5"	10 ms	4500	512K	385	445	
100 MB	3.5"	10ms	5400	512K	640	700	
140 MB	3.5"	9.5 ms	5400	512K	825	885	
200 MB	3.5"	10 ms	4500	512K	995	1055	
280 MB	3.5"	9.5 ms	5400	512K	1135	1195	

Empire and Pro drives include a 5 year factory warranty.

MICROPOLIS							
Capacity	Size	Model	Access	RPM	Cache	Int.	Ext.
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7 GB	3.5"	M2217	10 ms	5400	512K	895	955
1 GB	3.5"	Taurus-2	8.5 ms	7200	512K	Call	Call
6 GB	5.25"	M1936	11 ms	5400	256K	1875	1975
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6 GB	5.25"	M1936AV	11 ms	5400	512K	1925	2025

Micropolis drives include a 5 Year (HOT SWAP) Warranty.

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Capacity	Size	Model	Access	RPM	Cache	Int.	Ext.
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9 GB	3.5"	Hawk 2	9ms	5400	512K	1265	1310
2 GB instock	3.5"	Hawk 4	9ms	5400	512K	2120	2180
4 GB	3.5"	Barracuda 2	8ms	7200	1024K	1295	1355
2 GB instock	3.5"	Barracuda 4	8ms	7200	1024K	Call	Call
4 GB Elite 3	5.25"	ST 43400N	10ms	5400	512K	2045	2145
GB Elite 9	5.25"	ST 410800N	11ms	5400	512K	Call	Call

All Seagate drives include a 5 year factory warranty.

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Capacity	Model	Access	RPM	Cache	Int.	Ext.	
0 MB	M2622	9ms	4500	512K	\$310	\$370	
0 MB	M2624 F/A	9ms	4500	512K	Call	Call	
2 GB	M2694ESA	8.5 ms	5400	512K	650	710	

All Fujitsu drives include a 5 year factory warranty.

HEWLETT PACKARD							
Capacity	Model	Access	RPM	Warranty	Int.	Ext.	
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4 GB	C2490	8.5 ms	5400	5 Year	1195	1255	
35 GB	C3010	11 ms	5400	5 Year	1975	2075	

IBM							
Capacity	Model	Access	RPM	Warranty	Int.	Ext.	
10 MB	94G2646	12 ms	4500	2 Year	\$320	\$380	
20 MB	94G2647	12 ms	4500	2 Year	455	515	
0 GB	70G8492	11 ms	5400	5 Year	730	790	
0 GB	70G8493	9 ms	5400	5 Year	1245	1305	

NEC							
Capacity	Model	Access	RPM	Warranty	Int.	Ext.	
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MICROPOLIS					
Capacity	Model	Size	Access	Int.	Ext.
1.2GB	2210	3.5"	10ms	\$640	\$700
1.7GB	2217	3.5"	10ms	\$895	\$955

Seagate					
Capacity	Model	Size	Access	Int.	Ext.
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FUJITSU

Capacity	Model	Access	RPM	Warranty	Int.	Ext.
230 MB	DynaMo	30ms	3600	2 Year	N/A	\$965

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Capacity	Model	Transfer	RPM	Warranty	Int.	Ext.
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20-50 GB	1553A	60 MB/min.	4mm	3495	3595

Exabyte

Capacity	Model	Transfer Rate	Media	Int.	Ext.
2-5 GB	8205	263 KB/sec.	8mm	\$1485	\$1535
5-10 GB	8505	500 KB/sec.	8mm	2175	2275
20-50 GB	101	1 MB/sec.	8mm	CALL	CALL

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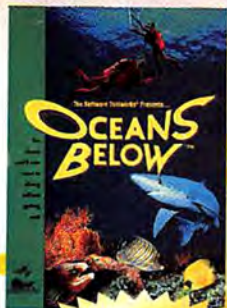


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SyncMaster™ 4Ne ELECTRONICS 15" Color Monitor

The SyncMaster 4Ne offers Macintosh and PC users a low radiation 15" monitor that provides superb image quality with reduced distortion - thanks to its flat square screen. With a .28mm dot pitch, it offers a very high resolution: 1024 x 768. This SyncMaster carries the EPA Energy Star logo, which attests to its compliance with lower power consumption standards. In addition, it features a power saving mode that complies with VESA guidelines. The SyncMaster 4Ne delivers the sharp, high quality images required for Macintosh and PC applications, including presentation graphics, desktop publishing and multimedia. It offers an unlimited palette of colors, so charts, graphics and illustrations come to life. The SyncMaster is also backed by a two-year warranty.

- Up to 1024 x 768 resolution
- .28 mm dot pitch
- Digital (one touch) picture controls
- Tilt-swivel base

Includes Mac Adapter



\$349⁹⁹



SyncMaster™ 17GL 17" Color Monitor

- 1280 x 1024 (max. res.) at 60Hz refresh rates
- .28 mm dot pitch
- INVAR shadow mask
- Tilt-swivel base

Includes Mac Adapter



\$749⁹⁹

64989

The SyncMaster 17GL is the ideal monitor for general business, desktop publishing, multimedia or entry-level CAD applications. This high performance monitor has a large viewing area with a small footprint for easy integration into an existing desktop system. Also included is a power saving mode that complies with VESA guidelines. The SyncMaster 17GL features a flat square CRT with Invar Shadow mask for sustained brightness levels, and its Dynamic Focus provides optimum focus across the large 17" viewing surface. Additional features include an On-Screen Display that makes it easy to carry out precise adjustment of screen geometry. The SyncMaster 17GL is also covered by a full two-year warranty.



For the most exacting visual applications, Samsung offers the top-of-the-line SyncMaster 17GLs. This 17" flat-square monitor offers ultra-precise, sharp images—even in the corners—thanks to its .26mm dot pitch and extremely high resolution. The SyncMaster 17GLs carries the EPA Energy Star logo, which attests to its compliance with low power consumption standards. Outstanding features of this display include an On-Screen Display that makes it easy to carry out precise adjustments and a power-saving mode that complies with VESA guidelines. It has up-front digital controls for easy image adjustments, as well as a special AR coating to limit glare while maximizing focus. The 17GLs is covered by a two-year warranty.

SyncMaster™ 17GLs 17" Color Monitor

- 1600 X 1200 (max. res.) at 60Hz refresh rates
- .26 mm dot pitch
- INVAR shadow mask/New Anti-Reflective coating
- On screen color temp control
- Tilt-swivel base

Includes Mac Adapter



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64988



SyncMaster™ 15GL 15" Color Monitor

- 1024 x 768 at 76Hz refresh rates
- .28 mm dot pitch
- Digital (one touch) picture controls
- Tilt-swivel base

The SyncMaster 15GL is a full-featured 15" monitor that provides superb image quality with reduced distortion—thanks to its flat square screen. The 15GL carries the EPA Energy Star logo, which attests to its compliance with low power consumption standards. It delivers extra sharp, high-quality images required for Macintosh applications or any high-end tasks such as presentation graphics or desktop publishing. Additional features of the SyncMaster 15GL include a power saving mode that complies with VESA guidelines. The 15GL also complies with stringent MPR-II safe-emission standards and comes with a two-year warranty.

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64991



Includes Mac Adapter

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64990

SyncMaster™ 14GL 14" Color Monitor

- 1024 x 768 at 76Hz refresh rates
- .28 mm dot pitch
- Digital (one touch) picture controls
- Tilt-swivel base

The SyncMaster 14GL is Samsung's flagship 14" color monitor. It's designed to meet the requirements of all Macintosh applications. This full-featured display offers users a combination of excellent screen performance and an advanced ergonomic design. All screen images are stable and flicker-free for easy on the eyes viewing. The SyncMaster 14GL meets all of today's environmental and safe workplace requirements x by adhering to the Swedish MPR-II guidelines for lower ELF and VLF emissions and EPA Energy Star requirements for power consumption. In addition, Samsung's attention to production quality has been awarded ISO 9001 certification, and the SyncMaster 14GL is backed by a two-year warranty.



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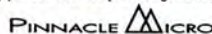
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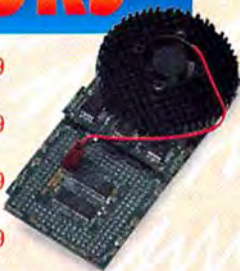
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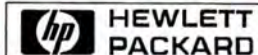
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1. For how many micro computers do you buy products? (check one)

☐ 01 1-4 ☐ 02 5-49 ☐ 03 50+

2. Your primary job function is: (check one)

☐ 01 Administrative ☐ 03 Engineering/R&D
☐ 02 MIS/DP, Communications ☐ 04 Finance/Accounting
☐ 05 Marketing/Sales Systems, Programming ☐ 06 Computer Dealer/VAR

3. For which of the following products are you involved in selecting brands/models to be bought by your company or organization? (check all that apply)

4. Which of the following products have you bought in the last 6 months? (check all that apply)

SOFTWARE:
Accounting ☐ 01 ☐ 01
Spreadsheets/Financial Planners ☐ 02 ☐ 02
Project Managers/Planners ☐ 03 ☐ 03
Word Processors ☐ 04 ☐ 04
Database Managers ☐ 05 ☐ 05
Graphics/Presentation Software ☐ 06 ☐ 06
Integrated Software ☐ 07 ☐ 07
Communications ☐ 08 ☐ 08
Utilities ☐ 09 ☐ 09

HARDWARE:

Modems ☐ 10 ☐ 10
Scanners ☐ 11 ☐ 11
Microcomputers ☐ 12 ☐ 12
Printers/Plotters ☐ 13 ☐ 13
Monitors/Displays ☐ 14 ☐ 14
Storage ☐ 15 ☐ 15
Add-in Boards ☐ 16 ☐ 16
Networking ☐ 17 ☐ 17

5. If so, what function do you serve in the buying process? (check all that apply)

☐ 01 Initiation/ Determine Need
☐ 02 Selection of Brand and Model
☐ 03 Selection of Source
☐ 04 Authorization
☐ 05 Other

6. Over the next 12 months, how much will your organization spend on computer products or services? (check one)

☐ 01 over \$5 million ☐ 05 \$50,000 - \$99,999
☐ 02 \$1 - \$5 million ☐ 06 \$10,000 - \$49,999
☐ 03 \$500,000 - \$999,999 ☐ 07 under \$10,000
☐ 04 \$100,000 - \$499,999

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4. Which of the following products have you bought in the last 6 months? (check all that apply)

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 Accounting
 Spreadsheets/Financial Planners
 Project Managers/Planners
 Word Processors
 Database Managers
 Graphics/Presentation Software
 Integrated Software
 Communications
 Utilities

- Q3** **Q4**
☐ 01 ☐ 01
☐ 02 ☐ 02
☐ 03 ☐ 03
☐ 04 ☐ 04
☐ 05 ☐ 05
☐ 06 ☐ 06
☐ 07 ☐ 07
☐ 08 ☐ 08
☐ 09 ☐ 09

HARDWARE:

- Modems
 Scanners
 Microcomputers
 Printers/Plotters
 Monitors/Displays
 Storage
 Add-in Boards
 Networking

- Q3** **Q4**
☐ 10 ☐ 10
☐ 11 ☐ 11
☐ 12 ☐ 12
☐ 13 ☐ 13
☐ 14 ☐ 14
☐ 15 ☐ 15
☐ 16 ☐ 16
☐ 17 ☐ 17

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☐ 04) Authorization
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☐ 02) \$1 - 5 million ☐ 06) \$10,000 - \$49,999
☐ 03) \$500,000 - \$999,999 ☐ 07) under \$10,000
☐ 04) \$100,000 - \$499,999

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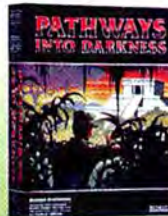
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G-VOX Education Bundle

Take private guitar lessons right on your computer with the G-VOX bundle. You get the G-VOX Pickup that hears what you're playing; the Belt Pack that converts your guitar sounds into an electric signal your computer understands; plus several Riffs software titles that take you from finger exercises all the way to Rock and Jazz. Manufacturer: Lyrrus

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Model railroad hobbyists will love this sophisticated program. Develop fully detailed railroad layouts with straight-aways, curves, turnouts etc. Add scenery-buildings, rivers, signals, tunnels, and more.

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Norton Utilities is a powerful collection of tools for protecting and recovering data on your Macintosh or Power Macintosh system. It scans for disk errors in the background, plus automatically notifies you when maintenance is recommended. Should disaster strike, it includes all the tools you need for complete data recovery and disk repair.

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Item# UTI 0584
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Quantum

The Quantum Daytona Series are high capacity 2.5-inch hard disk drives that provide unmatched mass storage solutions for the Apple PowerBook. The drives have advanced performance features like ShockLock, that provides maximum protection against non-operating shock.

Capacity	Access	Internal	External
2.5" Portable Drives			
256MB	17ms	\$285	\$405
514MB	17ms	\$469	\$589

Value/Entry Level

3.5" Low Profile			
170MB	14ms	\$179	\$239
270MB	12ms	\$195	\$255
340MB	12ms	\$225	\$285
540MB	12ms	\$279	\$339

Value/Performance

3.5" Low Profile			
730MB	11ms	\$379	\$439

The Quantum Empire Series are low-profile, 3.5-inch hard disk drives designed to meet the most demanding performance and reliability standards of work-group servers and disk arrays. Performance-enhancing features on all four drives include Optimized Recording of Command Algorithm (OCRA) firmware.

High Performance/Capacity

3.5" Low Profile			
1080MB	9.5ms	\$629	\$689
1400MB	9.5ms	\$819	\$879
3.5" Half Height			
2100MB	9.5ms	\$1139	\$1199

Seagate



\$1339
Barracuda 2 Internal

FIVE Year Warranty

ClubMac 30 DAY MONEY BACK GUARANTEE

Unformatted Capacity	Model	Description	Access Time	Actual MAC Capacity	Internal	External
3.5" Half Height						
2.4GB	ST12400N	Hawk 2	9ms	2000MB	\$1279	\$1339
4.3GB	ST15230N	Hawk 4	9ms	4000MB	\$2139	\$2199
1.7GB	ST11950N	Barracuda 1	8ms	1350MB	\$1379	\$1439
2.5GB	ST12550N	Barracuda 2	8ms	2050MB	\$1339	\$1399
4.3GB	ST115150N	Barracuda 4	8.5ms	4000MB	\$2469	\$2529
5.25" Full Height						
3.4GB	ST43400N	Elite-3	11ms	2750MB	\$2149	\$2249
9.1GB	ST410800N	Elite-9	11ms	8600MB	\$3769	\$3869

Seagate drives include a 30-Day Money Back Guarantee and a FIVE Year Warranty.

CD-ROMs

ClubMac 2X CD-ROM

- Dual Speed CD-ROM Reader
- 320ms average access time
- 300KB/sec data transfer rate
- 64K data buffer
- Caddy-less design
- LED lights, headphone jack and RCA jacks
- Kodak PhotoCD (Multisession) compliant
- Includes Amibis driver software
- 50,000 hours MTBF and ONE Year Warranty

\$199



NEC

NEC MultiSpin 4Xe CD-ROM

Designed for high-performance CD-ROM applications, multimedia development and networks, the NEC MultiSpin 4Xe features a data transfer rate **FOUR TIMES** faster than single speed CD-ROM readers (600KB/sec) and a 220ms access time. You can get information faster, see smoother animation and video, and keep network traffic flowing freely. The NEC MultiSpin 4Xe includes a Mac interface, tutorial CD, and driver software.

\$499



NEC MultiSpin 2V (available in gray) 320ms access time, 300KB/sec transfer rate	\$249	\$299
NEC MultiSpin 3Xp Plus 240ms access time, 500KB/sec transfer rate	\$399	\$499
NEC MultiSpin 4Xe 220ms access time, 600KB/sec transfer rate	\$499	\$599
ClubMac Dual-Speed 320ms access time, 300KB/sec transfer rate	\$199	\$299
ClubMac Quad-Speed 220ms access time, 600KB/sec transfer rate	\$439	\$539

NEC MultiSpin CD-ROM Readers carry a TWO Year Warranty. ClubMac CD-ROM Readers carry a 30-Day Money Back Guarantee and a ONE Year Warranty.

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Media	Qty 1	Qty 10	Qty 20
44MB	\$57 each	\$56 each	\$55 each
88MB	\$67 each	\$65 each	\$63 each
200MB	\$79 each	\$78 each	\$77 each
105MB	\$55 each	\$53 each	\$51 each
270MB	\$65 each	\$63 each	\$61 each

SyQuest Cartridges carry a FIVE Year Warranty.

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ClubMac 30 DAY MONEY BACK GUARANTEE

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FREE
Formatted Cartridge

ClubMac 200MB Removable



\$488
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ClubMac 270MB Removable



\$489
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ClubMac Removable Drives

	Internal	External
5.25" ClubMac 44MB	\$179	\$219
5.25" ClubMac 88MB	\$328	\$368
5.25" ClubMac 200MB	\$448	\$488
3.5" ClubMac 105MB	\$259	\$299
3.5" ClubMac 270MB	\$449	\$489

All drives include SCSI Director Formatting software, ONE FREE Cartridge, necessary cables for "plug-and-play" and documentation. All SyQuest drives include a 30-Day Money Back Guarantee and TWO Year Warranty.

ClubMac OPTICAL Drives

ClubMac 230MB Olympus Optical

Move up to the next generation in MO storage with the 3.5-inch 230MB Olympus drive. With higher performance and expandable 230MB capacity, the Olympus drive offers the ultimate in removable storage solutions.

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- 30-Day Money Back Guarantee and a TWO Year Warranty
- 256KB data buffer memory, 128KB cache
- 50,000 hours MTBF
- FREE formatted optical disk

Optical Drive	Size/Capacity	Seek Time	Internal	External
ClubMac Optical	3.5" 230MB Olympus	28ms	\$865	\$895
ClubMac Optical	3.5" 230MB Fujitsu	30ms	\$865	\$895
Fujitsu Dynamo	3.5" 230MB	30ms		\$929
MaxOptix Tahiti III	5.25" 1.3GB	19ms		\$2499

ClubMac Optical includes ONE cartridge, 30-Day Money Back Guarantee and a ONE Year Warranty. (Olympus Optical includes a TWO Year Warranty.)

OPTICAL MEDIA	3.5" 128MB	3.5" 230MB	5.25" 594MB	5.25" 652MB	5.25" 1.2GB	5.25" 1.3GB
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ClubMac TAPE BACKUP Drives

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- Bundled with Retrospect Backup Software
- ONE Year Warranty

Capacity	Model	Format	Media	Internal	External
1-2GB	Exabyte 2501	QIC-121	EX-HC2000	\$579	\$629
2.0GB	ClubMac DAT	DDS	60m, 90m	\$739	\$789
2-4GB	ClubMac DAT/DC	DDS-DC	60m, 90m	\$929	\$979
4.0GB	ClubMac DAT/2	DDS-2	60m, 90m, 120m	\$999	\$1049
4-8GB	ClubMac DAT/2DC	DDS-2DC	60m, 90m, 120m	\$1139	\$1189

ClubMac DAT and DAT/DC drives include Retrospect v2.1 Backup Software, ONE 90 Meter Tape and a TWO Year Warranty. Exabyte Tape Backup drives carry a ONE Year Warranty. The ClubMac DAT/2 drive includes Retrospect Ramata v2.0 (3-Pack) Network Backup Software, ONE 120 Meter Tape and a ONE Year Warranty.

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220-221

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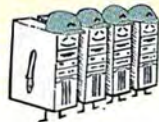
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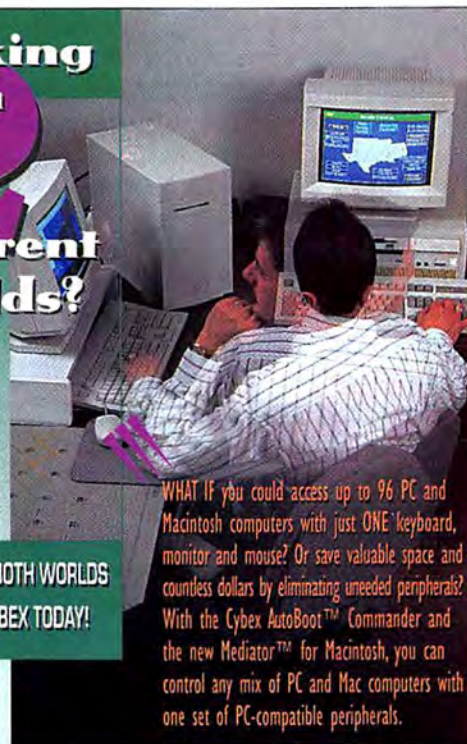


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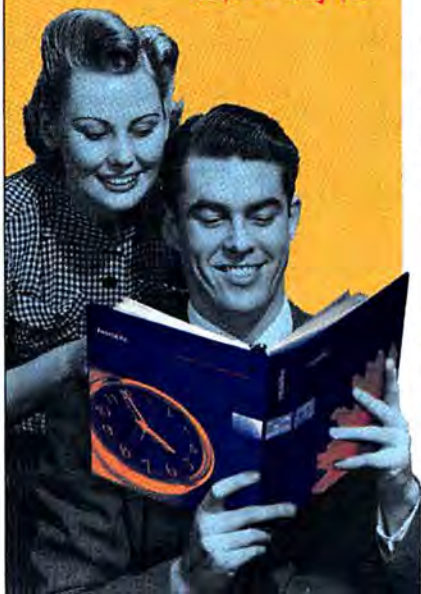
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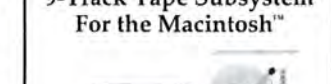
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Time's A-Wasting

AS WE ROLL INTO 1995, everyone believes that it will be a year of reckoning for

Apple. The company must make some hard decisions to prevent Microsoft from foisting its vision of the way things should be on all of us. Luckily, Apple is staying on top of the technology curve as best it can.

It is expected to launch its version of the PReP (PowerPC Reference Platform) machine, jointly developed (to a point) with IBM, in February. It will be a Power Mac that incorporates a 604 chip (a screamer) and a PCI bus that will be able to accommodate cheap PC adapter cards.

Missing from this scenario are two important elements that have been subjects of speculation: IBM making a similar machine using the same standards and Apple licensing the Mac operating system to IBM.

Even though Apple has announced a limited OS-licensing program, we can assume that many makers of PowerPC machines — almost all of them Taiwanese — will copy the IBM version of the PReP standard. This is because, as I was told by an executive from Mitac, a Taiwanese company, "In Taiwan we subscribe to the Microsoft-software strategies." This means we'll see Windows NT — and only Windows NT — running on the generic IBM-type PowerPC machine.

IBM desperately needs a Mac OS license so it can release its PowerPC machine with

something more to offer than a Microsoft operating system. IBM has been working on an operating system called the Workplace OS but is unable to complete the thing on time.

So do you think IBM will

get the Mac OS license from Apple? Unlikely.

This, of course, means that the Microsoft Windows NT operating system is likely to dominate the PowerPC platform on the IBM side. And how long do you think Microsoft is going to wait before it begins to port Windows NT to the Mac? Half an hour, maybe?

Once this happens, Apple is dead in the water, as it loses control of its own platform. As you read this, Microsoft is doing an amazing end run around the industry by forcing all developers to code for the 32-bit Windows 95 (formerly Chicago) operating system. If developers don't do so, they won't get to use the Windows logo. The fallout is that since this code can be effortlessly ported to Windows NT, a recompile for the PowerPC means that suddenly a PowerPC machine running under Windows NT has ten times as many apps as the Mac. All the Windows apps will be there! Furthermore, 99 percent of Mac apps are already running under Windows. Finally, NT is multitasking. Who, I ask you, will be running the Mac OS when this option is available?

Once the Mac operating system has been cut out of the loop, we're looking at a Windows NT/generic-PowerPC-machine world. Apple now has to compete on an even footing with Taiwanese clone makers that will lowball the company out of business.

Well, maybe not, if Apple gets its act together. Here's what it must do:

Apple must quickly develop a version of the Mac OS for the IBM PowerPC machine. This means a relocatable version of the Apple ROM that can be loaded off the hard disk and some sort of kludged support for the IDE (Integrated Device Electronics) hard-

disk-drive interface (perhaps in the form of a SCSI device). It should offer the package to IBM for one year for free! Thereafter, Apple can make and sell it in shrink-wrap to all purchasers of PowerPC machines. If it's wisely priced at \$49, everyone who buys a Taiwanese clone machine will buy a copy. If 10 million PowerPC machines are sold, the OS will bring in half a billion dollars.

That's *all* there is to it. Although Apple likes to see itself as a hardware company with software aspirations, it has to realize that it is, in fact, a software company. Apple's own software is so good that people buy expensive hardware to run it.

The only other company to successfully sell a computer with a proprietary OS in this market was North Star in the late '70s. But once a platform



shift occurred and companies were jockeying for position, North Star was done for. The installed base for CP/M had become so large that North Star users eventually switched to CP/M on their North Star computers. The CP/M programs went to the next platform, and North Star died from neglect.

The same fate awaits Apple. Curiously, many believed that the North Star DOS and the company's excellent BASIC language were far superior to the combo of CP/M and MS-BASIC. But since North Star would not release the OS for use on other machines, it was eventually capsized by a lack of apps.

Apple executives must take a look at how North Star faded into oblivion. This is the key to understanding what will certainly happen to Apple if it doesn't get its OS onto PowerPC machines coming out of Taiwan and onto the PowerPC machines IBM is trying to get out the door. ☞





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