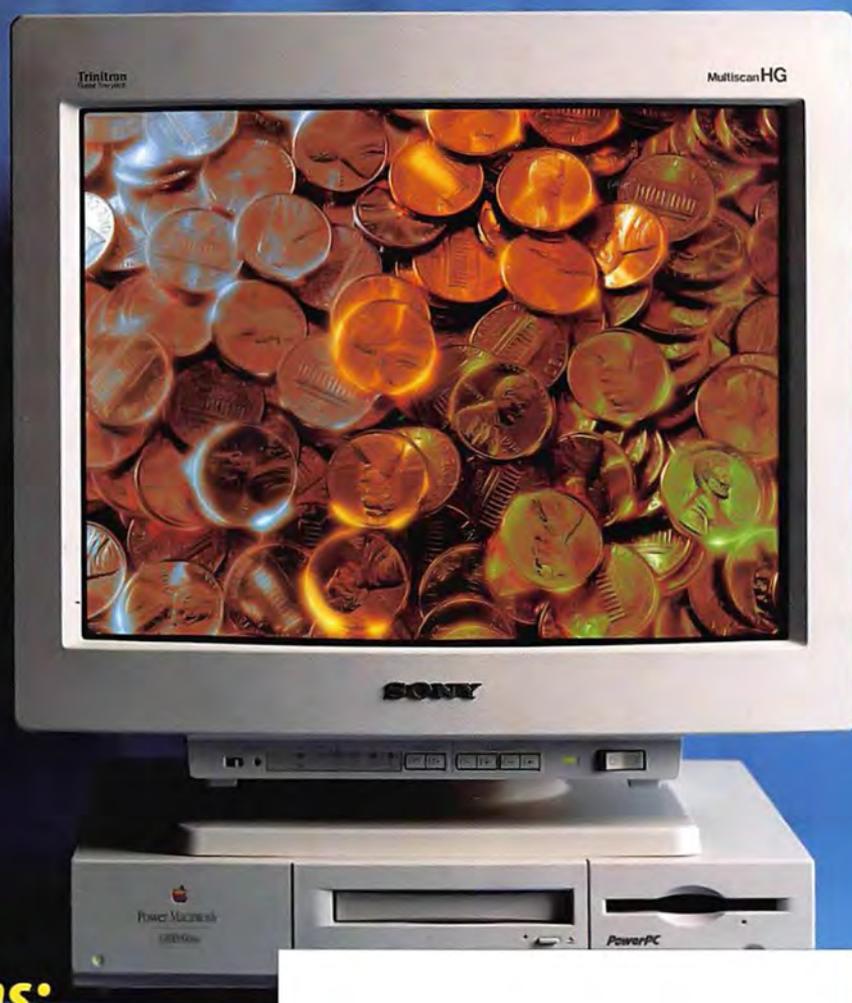


JUNE 1994 / \$2.95

Mac User

57 Big-Screen Bargains

Brilliant
Color That
Won't Bust
Your Budget



PLUS

Power Mac News

**Record Your Own
CDs and CD-ROMs**

**Top Draw Programs:
FreeHand vs. Illustrator**

Apple's New System 7.5

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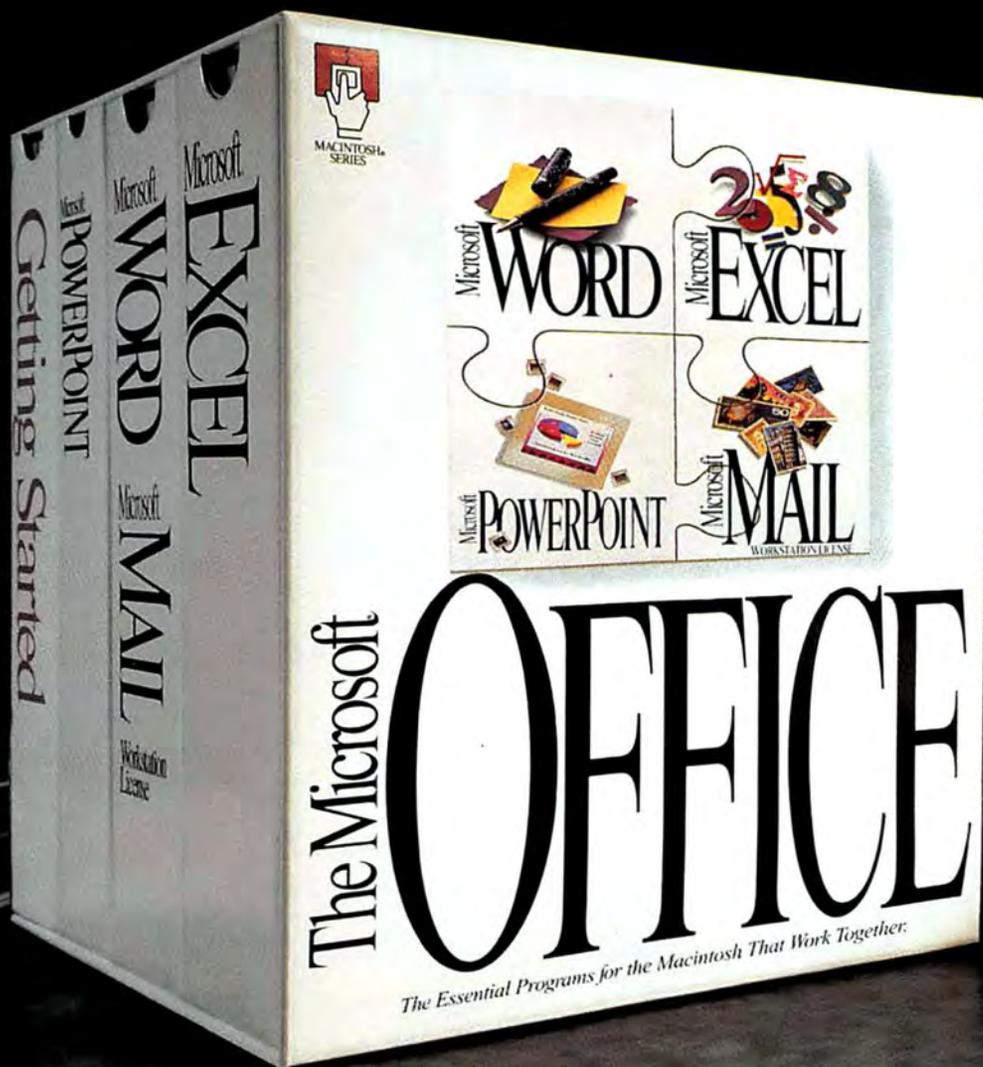
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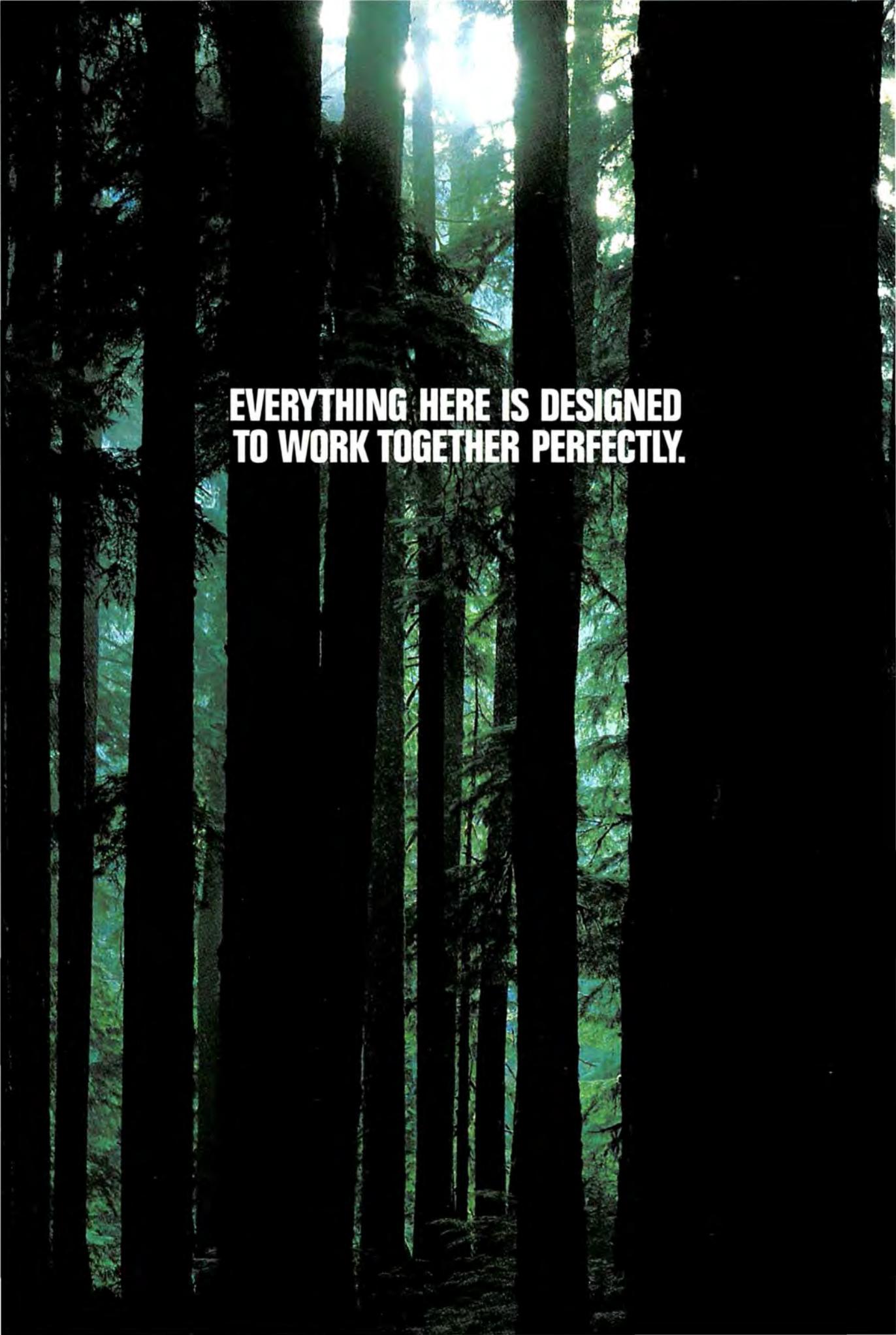
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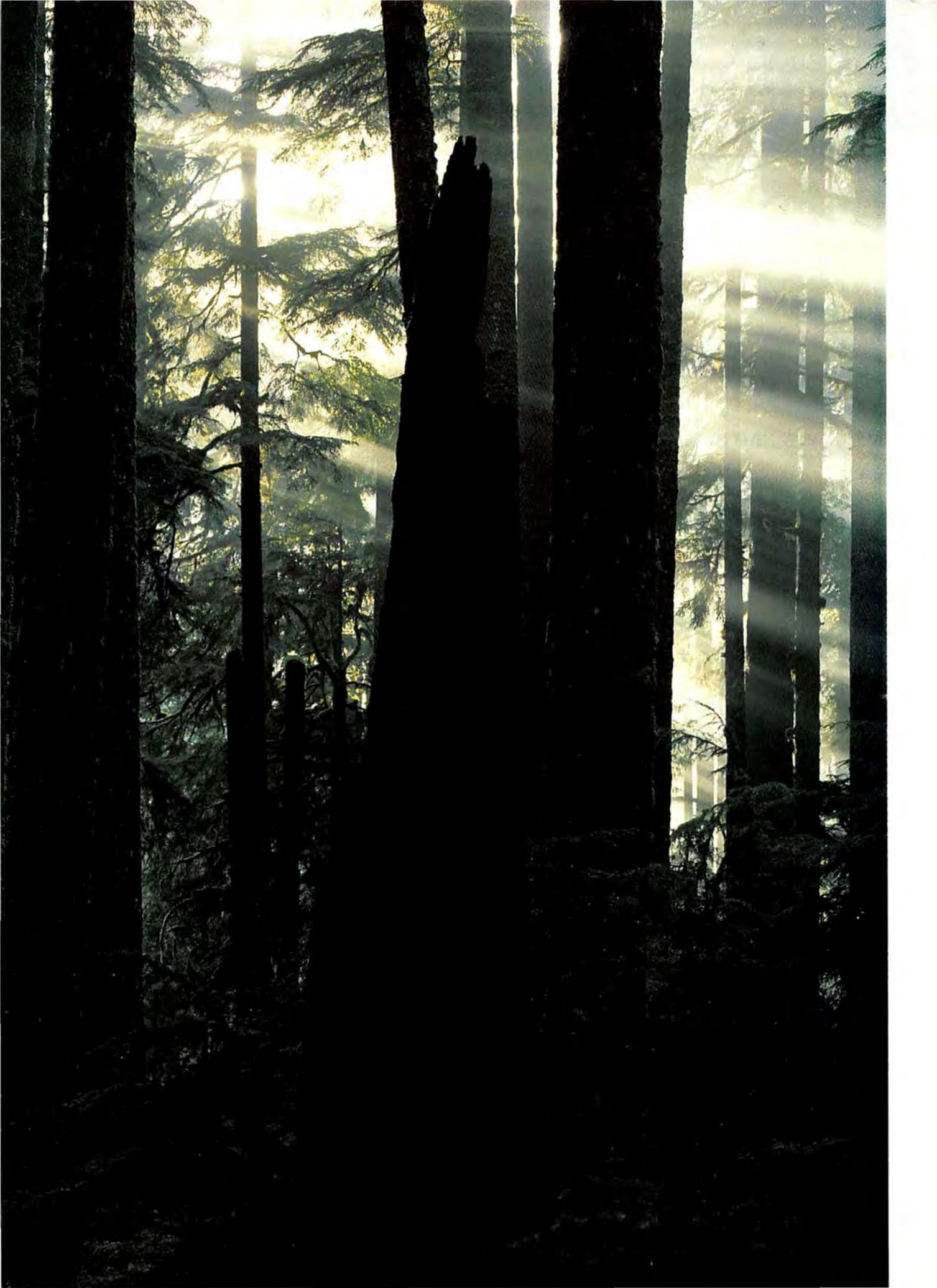
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IMITATE NATURE.**



A vertical photograph of a forest. The image is dominated by dark, vertical tree trunks that create a strong sense of depth and perspective. Sunlight filters through the canopy at the top, creating bright, glowing areas and casting long, soft shadows. The overall color palette is a mix of deep greens, browns, and bright whites from the sunlight. The text is centered in the upper half of the image.

**EVERYTHING HERE IS DESIGNED
TO WORK TOGETHER PERFECTLY.**



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FRED STIMSON

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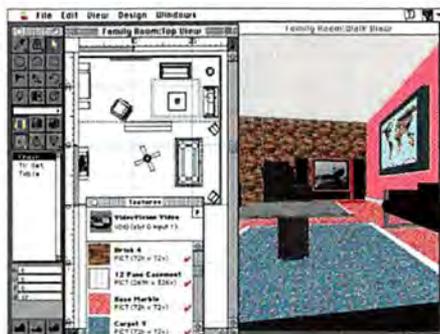
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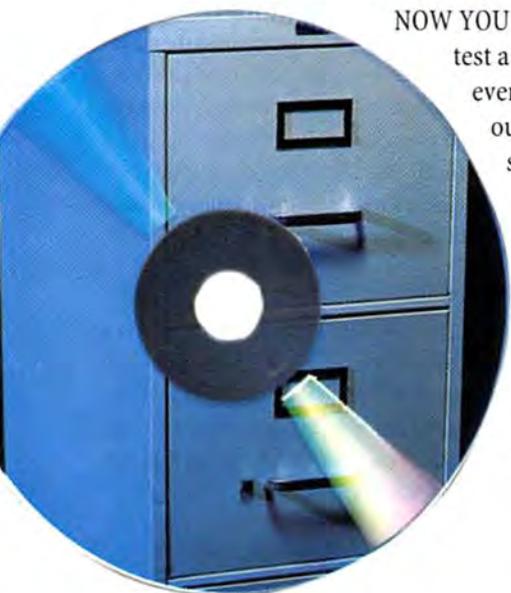


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MacUser Labs Make Your Own CD-ROMs

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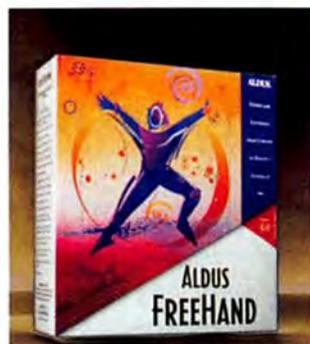
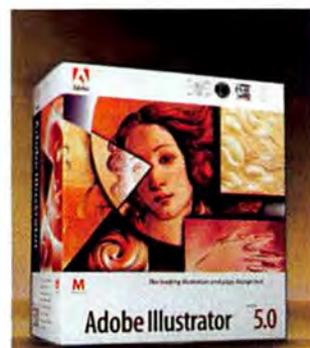
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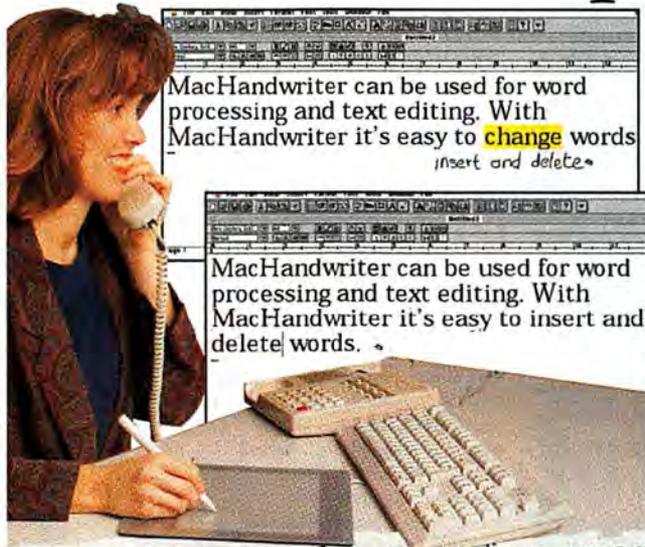
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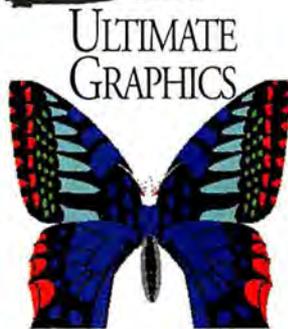


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LETTERS

Yesterday and Today

NOW THAT THE POWER MACS are coming out, Maggie Canon asks what we're going to do with "yesterday's Macs" (March '94, page 23). How about this radical idea: If they're doing the job you need them to do, keep them! When the machine wears out or the job changes, *then* you buy a newer model.

I have nothing against progress. But that hardly means that the machines millions of us use every day are suddenly suitable only for "low-level employees" or unemployed friends, for tax write-offs, or for trying to rope IBM users into the fold.

Those of us who use computers in the real world may be disinclined to junk our old computers simply because the new ones have "unbeatable price/performance." It's a little like someone who uses a car only for taking his kids to school suddenly buying a Ferrari because it's on sale.

Michael Kortchmar
Southold, NY

RECYCLE YOUR OLD MAC to your local schools. Students are still using TRS-80s and Apple II computers. It's a rare school that provides most of its students with access to a Mac. If our children are to become computer-literate, they need to use computers that reflect current trends in technology. It isn't just the inner-city schools; it's all of them. We need all the help we can get.

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Write to Letters

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Teach Thyself

APPLE REALLY NEEDS to get on the ball if it wants to retain the education market, if the performance of my Apple education representative is any kind of indicator. My school recently moved from Apple IIe's to \$60,000 worth of Dell PCs. My Apple representative told me that Apple doesn't want to get into a Macintosh-versus-PC features contest, even though the other side is certainly doing it.

Most public-school teachers in the U.S. are computer-illiterate. They are pushovers for a gee-whiz presentation, and all they seem to understand are catchphrases such as *networking speed*, *networked CD-ROMs*, and *cost per CPU*. The lack of a sound card and easy, cheap color expansion means nothing to them. The thought of choosing DOS over System 7 for an elementary school defies belief. (Unbelievably, twice as many teachers at my school voted against the Mac as for it!)

The erosion of the Mac education market is worth serious attention. The idyllic scattering of laurel leaves must be replaced by a serious, hard-nosed approach.

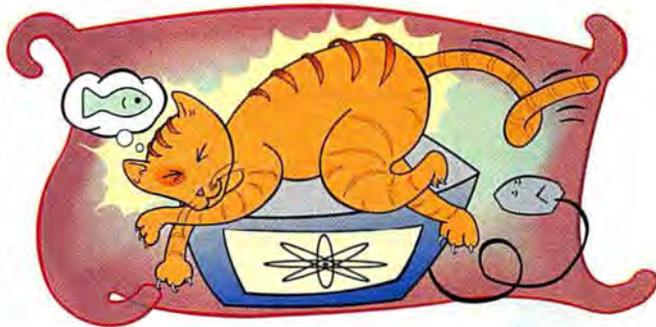
Trey Yancy
via ZiffNet/Mac

True Multitasking

SURE, I KNEW THAT my PowerBook 170 was versatile, but I never knew exactly *how* versatile until the Northridge earthquake hit.

The quake shook me awake while it was still pitch-black outside. The electricity was out, and because my flashlight was somewhere in the dark kitchen amid piles of broken glass, I needed another source of light. My trusty PowerBook was next to me, so I used the light from its display as a flashlight first to help me locate my car key and then to illuminate the way down three flights of stairs and into the dark garage, where I was able to get my other flashlight from my car.

I guess you could really say that my PowerBook showed me the way! Just try



OPEN FOLDER

Inquiring minds flock together, or something like that. In the March '94 Help Folder (page 158), Andy Ilnatko said that "Jackdaws love my big sphinx of quartz" was the shortest sentence that contained the alphabet and complied with all rules of grammar. Not so, writes Adam Stolfi, of Fort Worth, Texas. "A few years ago, *The Guinness Book of Records* offered this: 'Mr. Jock, TV quiz Ph.D., bags few lynx.' Not only does it make *some* sense, but it's only 26 letters long!" Thanks, Adam. This could turn into a cottage industry. After all, if we can have a program that's an anagram maker (Karma Manager), why not have one that writes short, grammatically correct sentences containing every letter of the alphabet?

Monitor emissions are a hot topic, if responses to our February story on safe monitors are anything to go by. Talk of MPR, TCO, ELF, VLF, and so on may raise the hairs on the backs of our necks, but monitors do exert a certain animal magnetism. "Cats will be cats, and these concerns mean nothing compared to a warm, cozy place on top of our Mac," writes Andrea Schembri, of Whitby, Ontario, Canada. "Is our cat Zoe safe to snooze, or shall we boot her off until she gets the error message?" When she starts to glow in the dark, you'll know why they call them cathode-ray tubes.

Dysfunctional displays are also on the mind of Jordan Corredera, of Miami, Florida, who loses all sense of punctuation when describing the inch-here, inch-there approach to measuring monitor dimensions: "When I found out that my new 14-inch color display was really only 11.5 inches I was mad I mean OK take off one inch but take off three and you're lying and what really surprised me was that a SuperMac SuperMatch 17T was only 14.75 inches I mean the people who thought they were getting a 17-inch monitor got what I thought I was getting something has to be done." Couldn't have said it better I think.

• OUTPERFORMS 486 AND PENTIUM, CHECK .

• MACINTOSH SOFTWARE RUNS FAST, CHECK .

• POWER MACINTOSH SOFTWARE SCREAMS, CHECK .

• WORKS WITH MS-DOS, CHECK .

• WORKS WITH WINDOWS, CHECK .

• BUILT-IN ETHERNET, CHECK .

• RISC PERFORMANCE AT A NON-RISC PRICE, CHECK .

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Of course, Apple's plug-and-play philosophy of personal computing makes moving to Power Macintosh as easy at the hardware level as it is at the software level.

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Agfa-Gevaert N.V.	Microsoft Word
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Aldus PageMaker	Oracle7
Aldus Persuasion	QuarkXPress
Alias Sketch!™	Radius RocketShare
auto•des•sys form•Z	Radius VideoVision Studio
Claris ClarisWorks	RasterOps Horizon 24
ClarisImpact	Ray Dream Designer
Electric Image Animation System	Scitex Corporation Ltd.
Fractal Design Painter	Specular International Infini-D
Frame FrameMaker	Strata StudioPro
Graphisoft ArchiCAD	SuperMac cards and peripherals
Great Plains Dynamics Release Two	VideoFusion
Insignia Solutions SoftWindows	Virtus WalkThrough
Language Engineering LogoVista E to J	Wolfram Research Mathematica
Leaf Systems	WordPerfect 3.0
Lotus cc:Mail	WordPerfect Office

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Of course, nothing beats a hands-on demonstration, something your authorized Apple reseller will be happy to arrange. For the name of the one located nearest you, call 800-732-3131, ext. 600.

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The difference in Macintosh applications rewritten to take advantage of RISC is equally dramatic. Adobe Photoshop 2.5, for example, can run up to 4 times faster than it can performing the same tasks on a Macintosh Quadra®. This makes any Power Macintosh ideal for processing-intensive jobs in design, graphics,

From left, the Power Macintosh 8100/80, Power Macintosh 7100/66 and Power Macintosh 6100/60.



publishing, engineering, architecture or multimedia.

Power Macintosh	6100/60	7100/66	8100/80
Processor	PowerPC 601	PowerPC 601	PowerPC 601
Speed	60 MHz	66 MHz	80 MHz
Memory	8MB to 72MB	8MB to 136MB	8MB to 264MB
Expansion slots	1 PDS or NuBus	3 NuBus	3 NuBus
Hard disk storage	160MB or 250MB	250MB or 500MB	250MB to 1GB
Video support	DRAM	DRAM, VRAM 1MB to 2MB	DRAM, VRAM 2MB to 4MB
Networking	Ethernet	Ethernet	Ethernet
Apple Price	From \$1,819	From \$2,899	From \$4,249

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In addition to software accelerated for its RISC architecture, a Power Macintosh will also run almost all of the thousands of Macintosh personal productivity applications that run on System 7.

Many Power Macintosh configurations also come bundled with SoftWindows, software that enables Power Macintosh to run hundreds of off-the-shelf MS-DOS and Windows programs at 386 and 486 performance levels. This makes it easy for a Power Macintosh to work side by side with the

running Excel on your flashlight!

Brian Gamberg
El Segundo, CA

/ We're glad you're safe and sound. Lucky for you it wasn't a Newton. / JB

These Toolish Things

THE FOUR-MOUSE RATING Gary Kratzer gives Central Point's MacTools 3.0 (March '94, page 47) must be based on the list of features the program contains. If Kratzer had considered the difficulty of using those features, the rating could not have been more than two mice.

MacTools 3.0a contains an integrated virus checker, but this software is almost a virus in itself. I am going to install Central Point's bug-fix version, 3.0b, and work through the problems only because I, like Kratzer, love the feature set.

William Morgan
via ZiffNet/Mac

Digging in the Discs

ONE OF THE MOST CREATIVE artists of our time, Peter Gabriel, is using the Mac to push music, art, and video to new limits, and you were generous enough to devote an entire third of a page to his new CD-ROM title (New on the Menu, March '94, page 43).

Wow.

People such as Gabriel, Todd Rundgren, and others who creatively and extensively use the Mac should be featured in your magazine. I think many of your readers are interested in seeing more than just product reviews, buyer's guides, press releases, and a few how-to sections. I know I am.

Doug Davila
Chicago, IL

Margins of Error

SONY IS PLEASED and honored to have received the MacUser RECOMMENDS seal for its CPD-1730 ("In Search of the Safest Monitor," February '94, page 92). However, I would like to bring to your attention several inaccuracies:

- Your review, based on testing conducted by ZD Labs, indicates that the CPD-1730 does not meet MPR II guidelines. This monitor has, in fact, received TUV Rheinland certification and fully complies with MPR II guidelines. Your findings conflict with other test data from ZD Labs reported elsewhere. In addition, Sony's CPD-1604S

should not have failed your MPR II tests. This monitor incorporates a cancellation coil that enables it to fall well within the magnetic VLF and ELF requirements for MPR II.

- Contrary to statements made in the story, all Sony Trinitron monitors, including the CPD-1730 and CPD-1604S, have an anti-glare screen coating. This information is stated clearly in the monitors' documentation and news releases; it was also provided to *MacUser*.

- All Sony Trinitron monitors come with a standard warranty: one year for parts and labor, two years for the tube. Your feature chart indicates (in a footnote) that only the tube for the CPD-1730 and CPD-1604S is covered by a warranty.

Thomas J. Rizol, Vice President
Component & Computer Products Group
Sony Electronics, San Jose, CA

/ The chart containing the results of our monitor-emissions tests was misleading. To be considered compliant with MPR II guidelines, a monitor must fall within the MPR II limit on all tests performed. The monitors (including the Sony CPD-1730) that were listed as having failed some MPR II tests were actually within the margin of error in one or more of ZD Labs' tests. The Sony CPD-1730, for example, received a borderline score on the VLF electric-field test while meeting MPR II guidelines in all other tests conducted. In addition, the monitors labeled as having failed all MPR II tests actually may have failed only one of the tests ZD Labs performed. We regret the confusion.

The other ZD Labs test mentioned above stated that the Sony CPD-1730 did meet MPR II guidelines in testing performed for VLF and ELF magnetic-field emissions, but the tests did not address electric fields and therefore did not indicate whether the monitor was fully compliant with MPR II. / SB

The Check's in the Mail

YOUR DISCUSSION of printing checks with financial-management programs ("Easy Money," March '94, page 109) is almost deceptive in what it omits. For a financial-management program to fully live up to its promise of being a true time-saver as well as helping you get a handle on your finances, you really must use it to print checks. What your review failed to mention is that Intuit's checks for Quicken are prohibitively expensive, especially in small quantities — the cheapest order is \$57.95, plus shipping and handling, for 500. Even for those people who

buy 2,000 checks at a time, the checks cost more than twice as much as regular personal checks. The cost of checks is essential information to have in making a decision about a financial-management application.

Dirk Mouw
via ZiffNet/Mac

IN EXPLAINING HOW CheckFree works, you state that "it mails a paper check the old-fashioned way." This is misleading. Where possible, CheckFree obtains agreements with financial institutions that accept electronic transfers. Where such capability does *not* exist, CheckFree is forced to send paper checks. This is why some "electronic" payments must be printed and mailed and therefore why CheckFree had to establish a procedure whereby it needs your payment information five days in advance.

Jim Altemose
via the Internet

Death, Beauty, and Taxes

I'M BAFFLED by the conclusions of Joseph Schorr's review of Andrew Tobias' TaxCut and MacInTax (March '94, page 50). If TaxCut offers better tax advice than MacInTax and the main purpose of these programs is to get you through the tax season, why does the latter program get a better review? Ah, yes, a better interface.

So I'll be doing my taxes, a task that makes me look greener than the Incredible Hulk, and I'll have a question and will consult MacInTax. I will still be puzzled. But it looks prettier. I have better access to its features. If the screen display bothers me, I can change the typefaces. I'll have *this* to share with the IRS when I get audited.

I know we Mac users can get caught up with interfaces. But to give a program a lower rating because it lacks aesthetics — even when its contents are better than the competition's, as your own reviewer claims — seems silly.

Xavier Yaffar
via ZiffNet/Mac

/ Weighed equally, content would certainly edge out form in an evaluation, but in this case there was only a slight difference in content but a substantial difference in form. The tax help available in TaxCut is more useful than the advice contained in MacInTax — but only modestly so. On the other hand, the MacInTax interface is significantly more flexible and easier to deal with than TaxCut's. / JS

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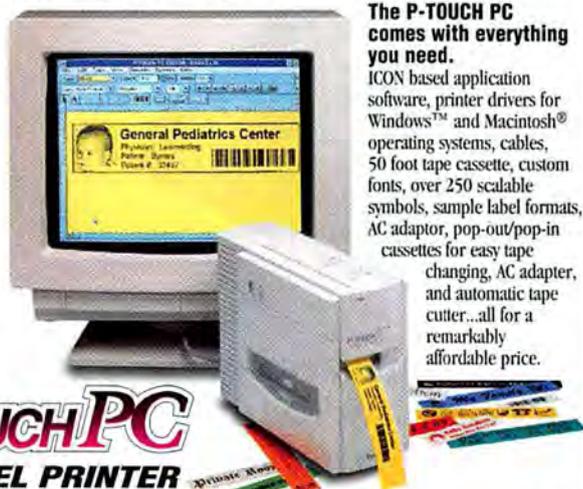


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LETTERS

Copy Cats

ANDY IHNATKO'S COLUMN about copyrights ("Do You Copy?" March '94, page 25) was very welcome. Andy summarized many of the points that I and my colleagues at the magazine I work for constantly need to keep in mind. For this reason, I plan to make copies of the article for everyone at work so they can... uh... .

I mean, I plan to circulate the issue of *MacUser* to everyone. (Whew.)

Stuart Goldman, *Sky & Telescope*
via ZiffNet/Mac

C++ Fails

MICHAEL SWAINE'S REVIEW of Symantec C++ (March '94, page 58) mentions "rough edges" that "mar Symantec's state-of-the-art development tool." In my opinion, he overlooked some of the roughest edges.

When I look at Symantec C++, I don't compare it to the company's THINK C. I compare it to Symantec's THINK Pascal, which is vastly superior. It appears I'm not the only programmer with this point of view, because I've noticed an incredible number of third-party editors, debuggers, and other additions available for Symantec C/C++.

Symantec would do a tremendous service to the Macintosh developer community if it simply transplanted the editor and debugger from THINK Pascal into its C/C++ package.

Fred Johnson
via ZiffNet/Mac

It's This Simple

IT MUST TRULY be a brave new world. Communism falls. Clinton wins. And I didn't gag at your resident gadfly John Dvorak's column on Apple's current slogan ("Business as Usable," March '94, page 234).

John, although you're not totally in love with the "It does more. It costs less. It's that simple" slogan, you missed the last part — the one that says, "It's that simple."

Give Apple credit: The last couple of campaigns have reinforced simplicity. Who knows? If this keeps up, the next thing Apple will do is introduce a new line of processors that smoke the Pentium chip and do it at half the price.

Michael Fischer
via CompuServe

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Poor Claris. Once again, Canvas™ is running circles around MacDraw® Pro. In fact, they are still trying to catch up to Canvas 3 while we've added dozens of new features and enhancements to create Canvas 3.5. Like 3-D extrusions of text and graphics, enveloping of text and graphics, smart lines, fine kerning, fractals, automatic concentric circles and spirals, and a tool loader that allows you to add tools as you work. There's even a versatile pressure-sensitive freehand Bézier pen tool. And Canvas 3.5 has really outdone itself with new improvements including object blends, binding of text to shapes and curves, Bézier text conversions, and macro windows. Which is just the beginning, because Canvas also includes all the great features of 3.0 like custom parallel lines and curves, our unique SmartMouse™, and more. Comparing Canvas to the competition is like comparing a superbike to a tricycle. And only Canvas is self-upgrading, allowing you to add new tools, effects and file translators at will. Last but not least, while MacDraw Pro is idling somewhere back in the Dark Ages, Canvas features seamless file sharing with its recently released Windows version. Add it all up, and it's **NEITHER WOULD WE.** Canvas. For the gives you the ride **easy to see that it's time to shift gears to ultimate in value and performance, Canvas of your life. So go ahead and hop on.**

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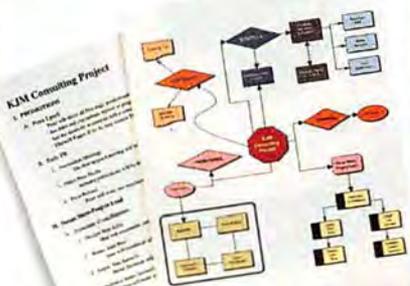


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OverXTNDED

A MISCONCEPTION found its way into "When Word Processors Will Do" (February '94, page 143). The article states that "Nisus supports anything you can paste from the Clipboard — in other words, not much." This is simply not true. You can import anything for which you have an XTND translator. You access the XTND Open dialog box via Nisus' File menu, and we even supply translators for EPS, PICT, RTF, MacPaint 2.0, MacWrite II, Microsoft Word, and several internationally localized formats.

**Edwina Riblet, Director
Marketing & Communications
Nisus Software, Solana Beach, CA**

Off the Charts

I MUST TAKE ISSUE with several of the contentions in "The Right Excel Chart" (March '94, page 149), by Jason Snell. First, the notion that Excel's 3-D pie charts "tend to look better than flat pie charts" may be true for *USA Today* but not for someone wishing to provide an unbiased representation of data. Adding a nonexistent dimension to the plot adds nothing, and viewing 2-D information at an angle skews the importance of categories, depending on where they are on the chart.

Second, Snell's statement that "line charts... suggest that a change occurs at every point" is just plain wrong. Data points show the actual data; lines are merely an aid to the eye.

**Peter Copeland
Houston, TX**

/ It's certainly true that anyone who needs to present data in a completely unbiased way should avoid 3-D charts and that 3-D charts should be used sparingly and with caution. But often, especially in business presentations, a chart is meant only to illustrate a simple trend graphically — and a 3-D chart may be more attractive to the eye than a flat chart. / JS

We're All Doomed

I REMEMBER BUYING my first family computer. Sitting on the seller's desk was a little smiling box with a "thingie" attached. We didn't buy the smiling box; we bought an Apple IIe the seller wanted to liquidate. That smiling box meant that the computer we got for a deal (\$2,000) was obsolete. You could get an accelerator card that put the Mac's power into a IIe, but the IIe was still obsolete.

The moral of this story is that even if you

install a PowerPC upgrade in your current computer, it is still obsolete, and in a few years, the Mac and its users and related publications will go the way of the Apple II and its publications.

**Joseph Slomka
via ZiffNet/Mac**

/ There is one fundamental difference between your examples: Apple didn't design the Macintosh to be an evolution of the Apple II family — it was a completely different beast to begin with. On the other hand, the PowerPC-based Power Macs are still Macs, despite their having different processors at their hearts. The Mac is not going away, and it certainly won't because of Apple's transition from the 680x0 to the PowerPC. / SCS

X-Ray Eyes

SOME COMMENTS in Help Folder (November '93, page 209) stimulated the thoughts of my colleagues and me regarding the effect of X rays and magnetic fields on floppy disks. So we did a rather extensive literature search, which provided some useful information, and carried out tests of our own.

Attached you'll find a paper describing our study. Most important, our conclusions indicate that airport metal detectors and X-ray scanners have no effect on digital data stored on floppy disks.

**Joel E. Gray
Rochester, MN**

/ The paper, published in the November 1993 issue of *Radiology*, states "we can find no reason to believe that airport X-ray scanners or metal detectors can erase magnetic media." In recognition of the authors' mention of Help Folder in a footnote, we hereby accept their findings. / BL

CORRECTIONS

The correct toll-free phone number for Reality Technologies ("Easy Money," March '94, page 109) is 800-346-2024.

The correct toll-free phone number for Ring of Fire (Desktop Publishing, April '94, page 109) is 800-900-0990.

In "Low-Cost Color Scanners" (February '94, page 129), the price of the La Cie Silverscanner II was calculated with Adobe Photoshop 2.5 included. La Cie has since stopped bundling Photoshop with that scanner.

The Fargo Primera review (March '94, page 56) gave the printer a speed rating of 2.5 pages per minute. The correct speed rating is 2.5 minutes per page, or .4 page per minute.



If you're always looking for faster and better ways to get things done, take a look at the all-new IN CONTROL 3.0. It's the complete planner and organizer for the Mac that can get you totally organized. (Honest!) You see, IN CONTROL is the only Personal Information Manager that combines the award-winning, multi-column Action Outliner™ with full-featured daily, weekly and monthly calendars. The result? You can throw away those little yellow stickies, make short work of long to-do lists and bury that dog-eared calendar.



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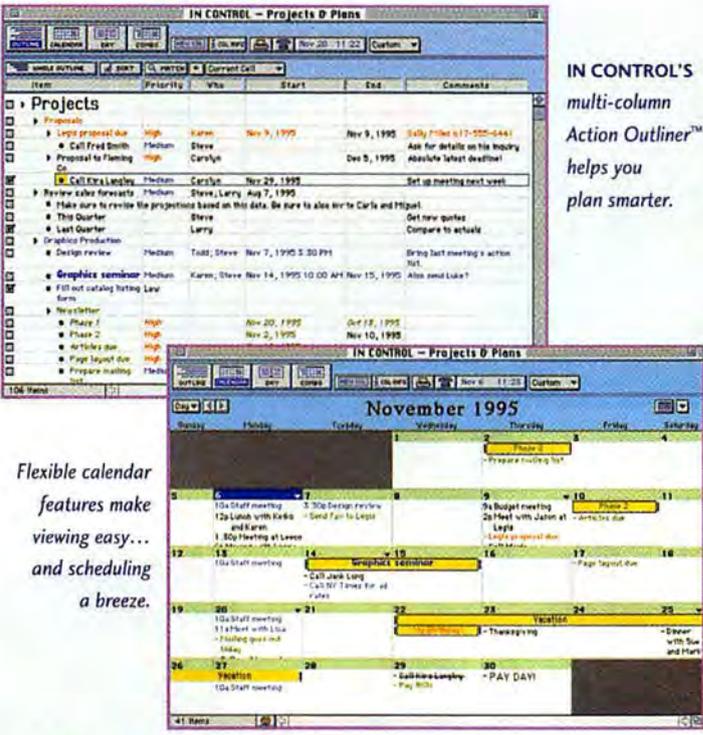
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The new HP DeskWriter 310 printer.

Desk



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DESKTOP TO GO.

OFFICE:

When selecting a printer for the office the most important factor to consider is print quality. In the office, producing clear, sharp, professional looking output is more than a luxury, it's a necessity. Another factor to consider is the amount of space the printer will take up on your desk.



CLIENTS:

Business travelers often find themselves called upon to take care of important details while visiting the client's office. When that occurs, it's best to have immediate access to as many resources as possible. Be sure that someone at your home office is familiar enough with your personal files that they can quickly find anything you need. A portable computer can be a highly effective way to store a wealth of files in a compact unit that can be accessed easily.

HOTEL:

A hotel can be a very peaceful, distraction-free environment for getting work done. And, since many hotels cater almost exclusively to business travelers, you'll find they are usually well prepared to assist you with all your business travel needs. Copy machines, fax machines and, in some hotels, personal computers are available to help you get work done when separated from the conveniences of the home office.

HOME:

For any reason or another, it's sometimes impossible to avoid having to bring work home. Occasionally there simply isn't enough time in the day to finish all your work while at the office. It is, of course, hard on people who prefer the convenience of home when working on certain tasks. Whether it's book-keeping or letter-writing, it's important to have the equipment and space you need at home to get work done.



optional.



Print high-quality black & white or color wherever you want to work.

Hewlett-Packard is proud to present the DeskWriter printer that doesn't require a desk. The HP DeskWriter 310 is small and light enough to let you print anywhere. At the office, at home or on the road. And it gives you sharp, 300-dpi print quality, in black & white or color.

The HP DeskWriter 310 costs only \$379,* yet it comes loaded with 35 scalable fonts, along with a new lightweight, multi-voltage power adapter. It prints portrait and landscape on plain paper, transparencies or labels, and it uses HP's own inkjet technology for clear, crisp output at up to three pages per minute.

If that's not enough for you, a whole family of optional accessories is available, including a color kit for just \$49, and a multi-page sheet feeder for easier desktop printing.

HP has managed to fit everything you could want into a little printer package. To see for yourself, look in the Yellow Pages, or call 1-800-552-8500, Ext. 7857 for the name of the HP dealer nearest you.

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With support for both IPX and ARA in one device, the NetConnect-RAS is the perfect remote access server for users of PCs and Macs.



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CIRCLE 86 ON READER SERVICE CARD



Yank the Clipper

WATCH OUT: YOUR PRIVACY IS in peril. The United States government seeks the ability

to eavesdrop on your telephone calls, read your e-mail, and browse your database files. This Orwellian scenario is more than just a vague threat: It's the official position of the current administration. It hasn't happened yet, but it's looking like a real possibility.

Naturally, this prospect has provoked a raging debate both on the nation's information networks and in the power corridors of Washington, D.C. On one side are civil-liberties proponents and computer companies. On the other side is the government. What they're fighting about is the Clinton administration's recent declaration that all electronic communications with federal agencies will be required to use a data-security technology called Escrowed Encryption Standard, better known as the Clipper chip. The administration is also encouraging businesses (telephone companies, for example) to install the Clipper chip in their communications devices. The big question is, will the government eventually move from encouraging compliance to mandating it, essentially giving itself a key to your front door — at least your *digital* front door?

The Clipper chip, designed by the National Security Agency and the National Institute for Standards and Technology, is based on an encryption algorithm that theoretically will protect communications data from eavesdropping hackers and industrial spies. But providing a means for individuals and companies to safeguard their data is not all the government has in mind. Surveillance and detection becomes easier for the government, while it supposedly becomes harder for the bad guys. That's because current encryption standards, which are used by many U.S. and overseas companies, resist tapping even by the feds.

The Clipper, on the other hand, is designed with a "back door" that makes it easy for law-enforcement agencies to monitor voice and data communications. The keys to the back door will be held in escrow by two independent parties, whose identity the government plans to announce this summer. As with conventional wiretaps, access to the back-door keys won't be granted unless criminal behavior is suspected and a court order is obtained. Of course, it takes only one judge to grant such an order.

The justification for the Clipper chip is that the government needs the ability to catch criminals and thwart terrorists. That certainly sounds reasonable, but how many criminals and terrorists will be dumb enough to use a phone or computer system they know the government can monitor? Most will simply use other encryption schemes to accomplish their ends. Seems to me that this leaves mainly businesses and private citizens to monitor.

Many institutions, individuals, and corporations (including Apple and other computer makers) contend that the Clipper chip imperils the Fourth Amendment's guarantee of privacy, because the technology lends itself so easily to domestic surveillance.

But even if you set aside the issue of whether the government can really be trusted with so much power over our personal communications, several aspects of

the policy don't add up. For instance, the government refuses to reveal the algorithm on which the Clipper technology is based. Doing so would enable business users to ascertain just how secure the algorithm really is. Revealing the algorithm wouldn't reduce the Clipper's effectiveness (all other major encryption algorithms are public), so why keep it a secret?

Economic issues have also come to the surface. American hardware and software manufacturers are already hindered from selling products overseas that have high-level encryption schemes, because these products are classified as munitions. Special licenses (red tape, in other words) must be negotiated. Adoption of the Clipper-chip encryption technology would further jeopardize the ability of U.S. companies

to compete internationally. Although the government says it would put products using the Clipper chip on the fast track for approval for foreign sale, what foreign customers will want to purchase products that give the U.S. government access to their most sensitive data?

To be sure, data security is critical to business and government. And I seriously doubt there is a government-level conspiracy to spy on all private citizens. But I do think that the government should open more discussion to the public and seek a strategy that balances the government's legitimate needs with individual and corporate rights to privacy. Because these rights are a lot easier to defend *before* we've lost them. ☞

How many criminals and terrorists will be dumb enough to use a phone or computer system they know the government can monitor?

A simple demonstration of PhotoFlash software.

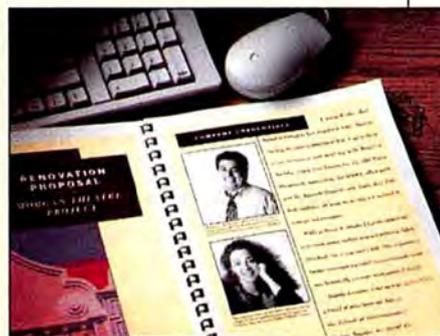
(A complicated demonstration isn't possible.)



1. Find a photo. The PhotoFlash Brouser makes it easy to view and pick a photo—they're all stored here, whether you got them from a CD, scanner or digital camera.



2. Enhance it. Crop, rotate and resize a picture with easy-to-use tools. Dust and scratch removal is automated, too. You can instantly preview adjustments you've made.



3. Place it. With a point and click, PhotoFlash automatically places the picture in your work. You can also record and automate the tasks you do most often.



You used to have to spend a lot—and then learn a lot—before you could work with photos on your computer. Now there's PhotoFlash™ software from Apple.

PhotoFlash is easy to use. It helps you organize pictures, enhance them and drop them into your work. It's fast (screamingly fast on a Power Macintosh™). It's memory efficient. And it's just \$279.* Call 800-538-9696 to locate your authorized Apple reseller. You'll get the picture right away.

Apple 



Child's Play

WALKING THROUGH TOYS R US

last week, innocently pursuing those new Aliens vs. Predator

action figures, I was stopped short at aisle number 10.

There I saw an entire row of toys so warped, so twisted in their purpose, so singularly evil in their design as to cause me to collapse sideways into an entire display of unsold *Last Action Hero* merchandise. Before this, I had scoffed — no, openly sneered — at the idea of a “harmless” toy stunting a child’s psychological development, of unwittingly scarring him or her for life. But no more. My eyes were opened.

It wasn’t the new 2-liter-capacity Super Soaker XP250 water pistol, which filled me with revulsion at the realization that nothing remotely so cool had been available in my day. I passed the Big Plastic Gun, which can be disassembled into 19 smaller guns, knives, and weapons, without a blip. It wasn’t even the row of Barney dolls, those upholstered alien pods that suck the souls of innocent children, convert them into pure energy, and beam them across inter-dimensional space to fuel the mighty armored star freighters of the feared I’luffVu’Uluffmi Empire. No, the items in question, accompanied by a sign filled with big, friendly letters, bore the following words:

PRECOMPUTERS FOR CHILDREN. Allow your kids to acquire basic skills TODAY that will give them a competitive head start on the technological world they will face tomorrow.

As I crawled out from under the pile of Jack Slater soft toys, alternating waves of horror and nausea washed over me: These folks actually want you to cough up a hundred bucks for a keyboard and a little LCD display, with the intent of force-feeding your tykes an acceptance of a user interface and

methodology of computing that was state-of-the-art back when Ted Kennedy was a viable presidential candidate? Absurd. Especially because for less than half that much, you can give your kids current computer skills they can use all their lives — and you don’t even have to leave the toy store. All the following items are genuine; all prices are not necessarily accurate.

Perhaps the most basic skill a computer owner can master is the art of Beating Your Head Against Your Desk Over and Over Again. Not only does it serve as a dandy metaphor for most of the human/computer interactive experience but it’s also essential for reaching that dreamy, other-worldly state of consciousness that signals you’re in the proper frame of mind for understanding the logic behind Excel’s macro-language syntax. Doctors also assert that the buildup of prelobalneurological scar tissue acts as an effective barrier against radiation from leaky monitors. The Little Tikes Playcraft Table (\$32.99), with its forgiving, plastic surface, has precisely enough “give” to afford safety and comfort for kids’ softer crania while still affording enough of a challenge to prepare them for the Formica surfaces of most office furniture.

[For God’s sake, you know he’s only kidding about having your kids pound their heads against things, don’t you? — Ed.]

Nickelodeon Gak Splat (\$3.99) is an effective tool when you’re giving your child his or

her first Big Talk about the facts of life, specifically when you get around to the “this is your brain, this is your brain on Windows” part.

Sooner or later, your son or daughter will have to make that landmark First Phone Call for Software Technical Support, and when they do, they’ll thank you for buy-

ing them the Fisher-Price Buttons ’n Bells Phone (\$9.99). Yes, just press this little marvel up against your ear, and three hours later, you will swear you have been placed on hold by any one of dozens of our nation’s largest and most prestigious software publishers. Simply burn a \$10 bill (not included) every five minutes and play a cassette of “Afternoon De-

light” (not included) to complete the fabulous on-hold experience. Get one for the car seat too!

Etch A Slate

We’ve all been big fans of Ohio Art’s Etch A Sketch (\$7.99), but do you know that while you’ve been making utterly wretched circles and triangles, you’ve also been learning about pen-based workslate technology? Yes, with the addition of a matte-black paint job and the application of a discreet Apple logo, that familiar toy can teach your child two important lessons. First, most computers will erase all of your data if you even so much as turn them upside down and shake vigorously, so regular backups are essential. Second, if you teach them the phrase “Oh, this is the new workslate-sized Newton. Haven’t you seen one yet?” they’ll learn the real secret of

PROBLEM:

You’re worried that your kids could fall behind the high-tech curve.

SOLUTION:

Get toys that teach ‘em what computing is really like.

cutting-edge technology: It doesn't really matter if it works or not, as long as you have one and your coworkers don't.

The beloved Parker Brothers board game Monopoly (\$13.99): Make up your own Bill Gates joke here — go ahead, it's easy and fun!

Mr. Potato Head and Mrs. Potato Head (\$5.99 each) have been leading lives of quiet

monogamy for decades. Now, for your child, they can serve as examples of everything a software or hardware product should be. Each was constructed with object-oriented techniques, using fully interoperable and interchangeable modules; regular product upgrades are offered by the manufacturer and may be installed by users without violation of the warranty; there is a huge

installed user base, and the manufacturer has supported the product for decades; and finally, each provides equal opportunities for men and women. Oh, and the torso section opens up for storage.

A childhood spent playing Hungry Hungry Hippos (\$14.99) provides a myriad of skills for the budding entrepreneur — in fact, a simple analysis of basic game technique comes in quite handy for attempts to understand the latest round of corporate buyouts, layoffs, and extinctions in the computer industry.

Your son or daughter attends a major computer trade show for the very first time. They approach the glitzy booth of a large software publisher and attempt to ask technical questions of the personnel at the perimeter, only to receive vacuous smiles in return. Confused? They won't be if they've spent time practicing beforehand with Hollywood Hair Barbie and Ken (\$4.99 each). From the big hair to the outrageous fashions, these two paragons of professional public relations both seem to scream out, "Let me make a note of your question and get back to you later."

Finally, there's the Little Tikes Play and Learn Clock (\$4.99). Staring at its stationary hands for half an hour uninterrupted is essential for developing that critical sixth sense of doom that an application isn't merely taking a long time to print your document and you're in for another rollicking 11 hours of work.

Real-Life Lessons

Computer education is in danger of becoming the piano lesson of the new generation, and personally, I feel that anything you instill in your kids beyond a fundamental curiosity and lack of fear of technology is just gravy.

When my niece and nephew come of age, they won't receive Training Computers. They'll receive CD-ROM-based Sega game machines, to instill in them a belief that high technology is a profoundly cool thing, and they'll also receive an Apple II Plus computer, in the interests of addicting them to the prospect of tinkering with a magical little box that is under their complete control from top to bottom.

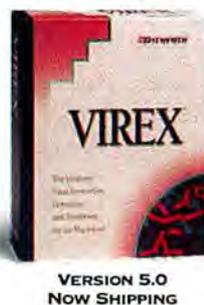
This approach made me the man I am today — which, admittedly, is where the whole theory breaks down. 



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first Virex upgrade on disk absolutely FREE.

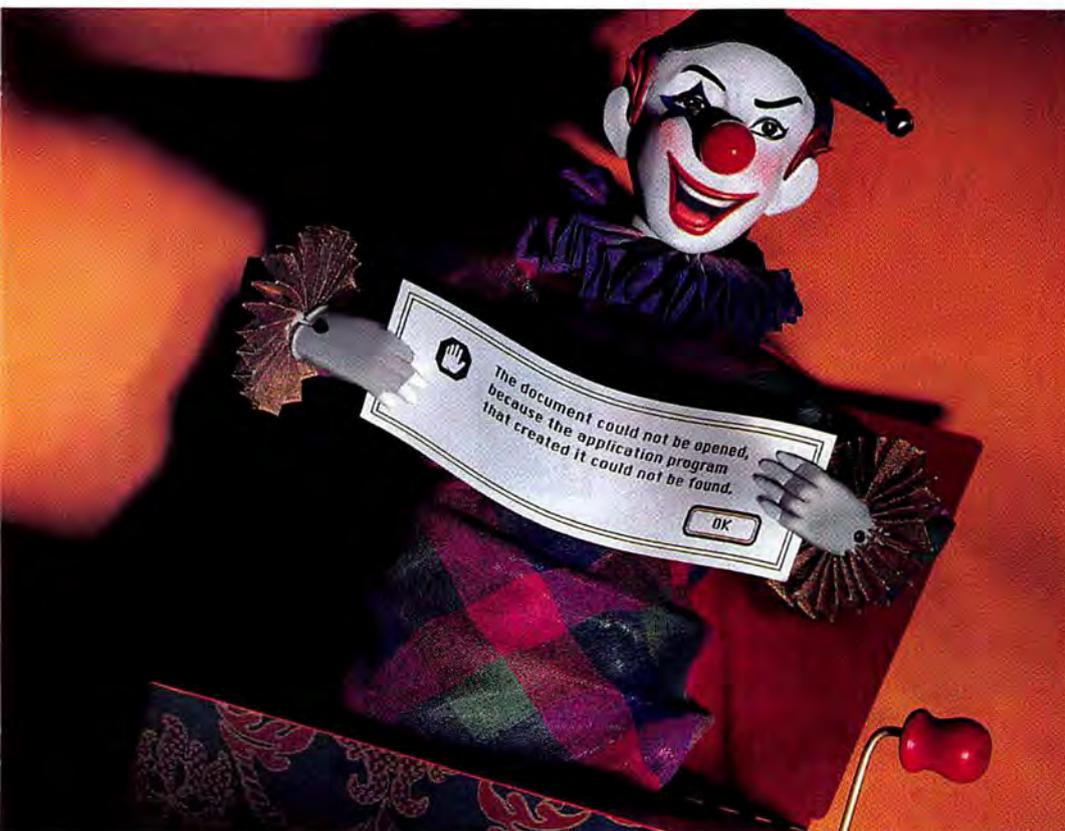
Ask your retailer for Virex, or call us for more information on our volume purchasing programs. Because once you put Virex to the test, it'll be time for SAM to hit the road.

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*In a head-to-head test conducted on a Macintosh IIfx, scanning 79 megabytes of files (1,571 files) on a 230 MB hard drive. Results may vary but, in all tests, Virex was dramatically faster. †SAM is a registered trademark of Symantec Corp.

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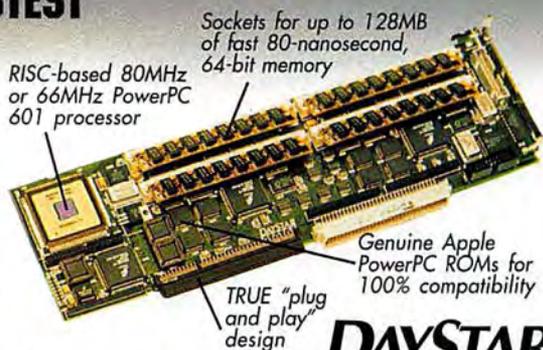
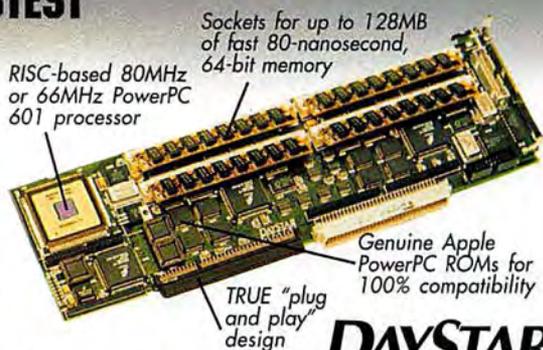
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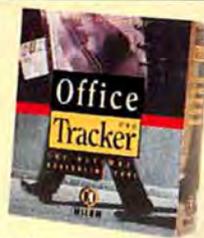
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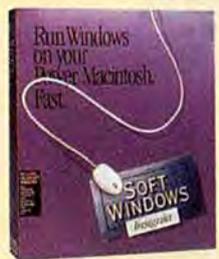
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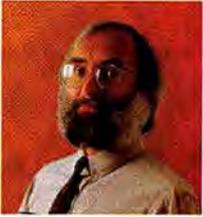
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The Twilight Zone

ADDING A POWER MAC TO MY home-office network shouldn't have triggered any unpleasant

surprises — we've all heard how compatible the new machines are supposed to be. But, then, this patchwork network of mine is always surprising me. Never as much, though, as when I saw the unfamiliar dialog box that showed up last month . . .

There are no zones on this network, I thought as I stared at the message. So what was this odd zone that had suddenly appeared? Investigating, I found nothing but a small file named APPLPRES.HOM, which proved to be a list of telephone numbers.

APPLEPRES.HOM? Could I be looking at the home telephone number of Apple president Michael Spindler? But why several different numbers?

I dialed the first one.
"Michael."

Having expected to get an answering machine at best, I was caught off guard but stammered my name and asked if he would be willing to talk about — the first thing that came to my mind — the layoffs and belt-tightening he had instituted.

"If you wish."

"Some people familiar with Apple's culture were surprised. What motivated the layoffs?"

"I believe that a company is a business, not a social institution. It must demand competence and contribution from its employees and must have proper controls."

"Some allude to a Germanic influence at Apple; is that unfair?"

"Next week, I *will* be attending the Wagner opera."

I chuckled politely. "Do you see any need for further reorganization?"

"To me, there is excessive emphasis on titles and high salaries."

"Have you taken any action on that?"

"I quit."

Say what? "Excuse me, Mr. Spindler?"

"Spindler? Who's Spindler? This is Mike Scott."

I disengaged as politely and quickly as I could. Mike Scott! These numbers must really be old. Scotty resigned as Apple president in 1981. Odd that he wouldn't even know who Spindler was. Talk about out of touch! Still, some of his ideas seemed right on. I dialed the next number.

"Hello?"

I recognized that voice.

"Hello, Mr. Sculley. Mike Swaine here, from *MacUser*. Just wondering if I could ask you something about Apple. I know you probably don't . . ."

But he seemed eager to talk. I decided to quiz him on the Power Macintosh, which he had seen through development but hadn't been on board to see launched.

"What's happening now," I said, "replacing the processor, rewriting the system software — seems ambitious and risky."

"We set for ourselves the awesome goal of changing our entire product line."

"And Apple is now in the middle of that process. Why take such a gamble?"

"It will decide whether Apple will remain a leader in the personal-computer industry or become one more promising company whose bright star quietly darkened and burned out."

"High stakes. And if Apple remains a leader, how will this transitional year be perceived?"

"It was the year when Apple raised the world's expectations of what a personal computer should be."

"Because the Power Macintosh will support new kinds of applications and more immediacy in the user interface?"

But he didn't seem to know what a Power Macintosh was. I quickly eased my way out of the call, realizing, but not believing, what was going on. These were not just old phone

numbers. I was apparently tapping into the past somehow. Every word I was hearing from these ex-presidents of Apple was something they had actually said, but years earlier. Scott, in 1981. Sculley, it must have been in 1985. And everything they said was equally true in 1994. Wrenching reorgs, massive layoffs, and gambling the company

on insanely hyped products had always been and would always be Apple's way.

There was one last number. I just had to call it.

"Hi. You've reached the voice-mail system of Bill Gates, president of Apple Computer. It's 3:45 P.M., Pacific Standard Time, October 31, 2001. Please leave a voice message, and Bill's agent will call you back."

I hung up the phone and shut down my machine. That was weeks ago, and I've never seen that file or that zone again. I'm not sorry.

A file of telephone numbers appears and disappears. A set of keys dropped in the dust along the information highway. Keys to a company on a treadmill in time, always reaching for the brass ring of the future and grabbing a link to the past. A link forged in the Twilight Zone. ☞

Gambling the company on insanely hyped products has always been and will always be Apple's way.

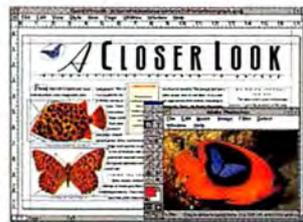


It's time to stop

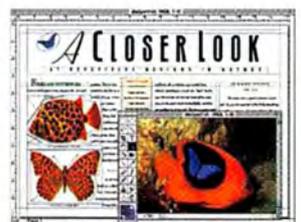


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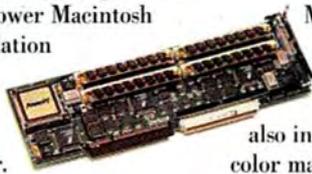
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Quadra 700, 900	50 MHz	80 MHz
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Memory expansion	0 MB	128 MB [†]
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Quadra 700	68 MB	196 MB
Centris 650	136 MB	264 MB
Quadra 650, 800	136 MB	264 MB
Quadra 900, 950	256 MB	384 MB
Cache size available	1 MB	1 MB [†]
Direct access to 64-bit memory	No	Yes
Upgradable to next generation PowerPC	No	Yes
Graphics utilities included—		
Native Photoshop extension	No	Yes
Photoshop scripting	No	Yes
Color management	No	Yes

DayStar's PowerPC upgrade for the Quadra 650, 700, 800, 900, 950 and Centris 650.

DayStar designed the PowerPro 601 for the graphics professional seeking the maximum in PowerPC performance. You save time and money compared to purchasing a new Power Macintosh system. And, if emulation is too slow, the PowerPro lets you restart as a 68040 based Mac computer.



Developed in cooperation with Apple Computer, the PowerPro 601 has actual PowerPC ROM chips. So, you get the same functionality and compatibility as Apple's own solutions.

Faster than Apple's upgrade card, the PowerPro 601 also offers up to 128 MB of additional memory expansion that

combines automatically with your Mac's motherboard memory.

For Photoshop users, we include DayStar's revolutionary PhotoMatic scripting utility, and a broad family of filters that run Adobe Photoshop 2.5.1 faster than on a Power Macintosh 8100/80 and up to double the speed of Apple's upgrade card! For Quark and Photoshop users, we also include DayStar's ColorMatch color management solution. That's over \$600 of software, free!

As always, when you buy from DayStar, you will have access to the next generation of PowerPC technology through our cost saving upgrade programs.

So, take the fast road to PowerPC. Call DayStar today.

Adobe
charged

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DIGITAL

* Approximate street price. Source: Dealers. ** The speed varies between 40 and 66 MHz on Apple's Power Macintosh upgrade card, depending upon the motherboard speed of the Macintosh in which it is installed.

[†] Optional; not required for operation.

CALL FOR AN IMMEDIATE FAX BROCHURE! 1-800-984-4511 DOCUMENT #4006

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CIRCLE 93 ON READER SERVICE CARD

NEW ON THE MENU

SYSTEM SOFTWARE /

APPLE CHARTS COURSE FOR FUTURE OPERATING SYSTEM

Four major releases slated in next three years.

APPLE'S SYSTEM SOFTWARE will one day provide users with intelligent assistance, a richer graphics model, seamless inter-application operation, and better integration into non-Mac networks, according to plans outlined by Apple. The net result is that the Mac will become even easier to use.

The evolution of the Mac operating system will take place in roughly four stages over the course of the next three years:

System 7.5. In a few months, Apple will introduce its next major release of the Macintosh OS. System 7.5 will include a slew of new features as well as components formerly sold separately, such as PowerTalk. Out of the box, it will run on PowerPC Macs as well as on 680x0 Macs. To avoid the confusion brought about by its predecessor — available as System 7 Pro and System 7.1 — this release will not be offered in two versions.

System 7.5 will include QuickDraw GX, in both PowerPC and 680x0 flavors; a scriptable Finder, controllable from AppleScript or from UserLand's Frontier; PowerTalk; MacTCP, the Mac version of TCP/IP; and PC Exchange and Macintosh Easy Open, to facilitate interoperability with x86 platforms. System 7.5 will also include a new help system, called Apple Guide, which steps users through tasks rather than simply explaining menu and button functions.

OpenDoc. Later this year, Apple will release the Mac implementation of OpenDoc, a software technology that will be an addition to system software. The philosophy behind OpenDoc is to move away from giant, monolithic applications toward smaller software components that perform single tasks well and work together seamlessly.

Copland. During 1995, Apple is going to

release system software that has OpenDoc built in. Code-named Copland, it will provide memory protection for Mac software: If a single application crashes, it won't affect other software running on that machine.

1994	1995	1996	
System 7.5 <ul style="list-style-type: none">• Runs on 680x0 and PowerPC• QuickDraw GX• Scriptable Finder• PowerTalk• MacTCP• Apple Guide	OpenDoc <ul style="list-style-type: none">• Component software• Component docs• Runs on Mac OS, Windows, UNIX, OS/2	Copland <ul style="list-style-type: none">• Microkernel-based• Memory protection• Enhanced cooperative multitasking• New I/O	Gershwin <ul style="list-style-type: none">• Microkernel-based• Preemptive multitasking• Intelligent assistance

The Mac OS' current cooperative multitasking system — in which applications essentially share the CPU — will be enhanced. Both of these features rely on a microkernel

(software that manages CPU resources), offered for the first time in Apple system software.

Finally, Copland will include a new I/O architecture that begins to take advantage of the PowerPC's horsepower. By the time Copland is released, more of the OS will be running native, resulting in more speed boosts for Power Mac owners. Apple may make Copland available for non-Apple PowerPC systems that conform to the PowerPC Reference Platform specification. **Gershwin.** In 1996, Apple will release an operating system code-named Gershwin. Based on a more advanced version of the microkernel, it will offer preemptive multitasking — in which the OS doles out time to applications — and also make the system more easily portable to other hardware platforms. Apple's focus on user-centered design will bear further fruit in this release: Sophisticated user assistance — including active help systems, more-scriptable system software, greater customizability of users' working environments, and agent technology — is going to be built right in. / Stephan C. Somogyi

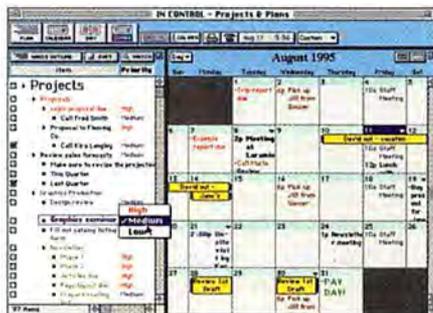
BUSINESS TOOLS /

IT'S TOTALLY IN CONTROL

IN CONTROL EARNED ITS REPUTATION as a powerful and elegant outliner and to-do-list manager. Now with beefed-up calendaring and integration features, In Control moves closer to serving as a one-stop tool for organizing outlines, appointments, and projects.

Attain put basic calendar features into In Control 2.0 last year but has rewritten the calendar module for version 3.0. Besides using monthly, weekly, and daily calendar views, users can define views that show only those items associated with a particular project. Because the calendar is tightly integrated with the to-do list, items can carry over from day to day in the calendar view. You can also add events to the calendar without using a dialog box.

But improved calendaring is only one aspect of In Control 3.0. Other new features include the ability to drag and drop items among modules; enhanced printing; and a new lookup feature that uses Apple events to let you view or retrieve data from other databases created with such programs as FileMaker Pro, TouchBase Pro, Now Contact, and Dynodex. \$129.95 (volume discounts); upgrade from 2.0, \$34.95. 800-925-5615 or 617-776-1110. / James Bradbury



TELECOMMUNICATIONS /

GLOBAL VILLAGE OFFERS COMM UNITY

New fax and remote-access systems combine familiar software with flexible network options.

GLOBAL VILLAGE BUILT its business on personal communications, with its PowerBook and desktop-Mac modems. Now the firm brings multiple users into the telecom fold with its OneWorld family of servers, which provides network fax and ARA (Apple Remote Access) dial-in services.

The **OneWorld Fax Server** comes in two configurations: a LocalTalk version with a single modem (\$999) and a 10BASE-T Ethernet version with two preinstalled modems (\$1,499). Each server comes with a 30-user license for the fax client software; additional

Global Village has added to its existing fax client software a few network-specific features, such as the ability to check where an outgoing fax is in the queue. The initial release of the OneWorld Fax Server software supports fax sending only. The faxes are sent as soon as you create them — no spooling is performed on the server. The fax client software talks directly to the server and doesn't require an e-mail package to move faxes over the network. This allows the OneWorld Fax software to provide access based on users and groups. The fax software operates in the background, though, so the user's Mac isn't tied up while sending.

The **OneWorld Remote Access Servers** come in the same hardware configurations as the Fax models, except that they have 19,200-bps PowerPort/Mercury modems. The single-port LocalTalk version costs \$1,199, and the dual-port 10BASE-T Ethernet version sells for \$1,899. The OneWorld Remote Access Servers support ARA 1.0 and 2.0.

The OneWorld Servers' flash ROM can be upgraded over a network via included management software. Future versions of OneWorld Fax software are slated to add support for spooling and the use of multiple ports simultaneously for large fax transmissions. 800-736-4821 or 415-390-8361.

/ Stephan C. Somogyi

UTILITIES /

SAFEGUARD YOUR MAC

SECURING YOUR MAC from prying eyes, especially in crowded offices, is the goal of new utilities from Claris and Symantec.

Safety Suite, from Claris' Clear Choice division, cobbles together a dozen utilities into a single package. Safety Suite's security functions include password-protected file encryption; "document shredding" which triple-erases trashed files permanently; and a chime that alerts you when someone has connected to your Mac via System 7's file sharing.

Safety Suite also protects you from your own mistakes — it backs up documents when your Mac is idle, autosaves files every few minutes, records your keystrokes in case there's a system crash, and lets you "undelete" documents you've recently trashed (but *not* shredded). \$99. 408-727-8227.

The **Norton DiskLock 3.0** is a new version of Symantec's venerable password-based security program. DiskLock requires users to enter a password before being given access to a Mac's hard disk. Because the program uses driver-level security, nobody can get to your hard disk by booting your system from a floppy. DiskLock doesn't work with driver-level compression programs, however.

DiskLock 3.0 also comes with two drag-and-drop applications that allow users to automatically encrypt and decrypt files and folders, keeping them secure even when the disk isn't locked. \$129. 503-334-6054.

/ Jason Snell



user packs and site licenses are available. The single-port server is upgradable with the addition of another PowerPort/Bronze II modem, a Global Village PowerBook fax modem.

MACUSER/ZMAC UTILITY OF THE MONTH



A DESKTOP WITH A VIEW

BID FAREWELL TO monitor monotony with BackSplash II, an extension for Systems 6 and 7 that lets you install a PICT image as your desktop backdrop. This new version of BackSplash can change the desktop picture while you work, scale images to precisely fill the screen, and tile images to cover the desktop.

BackSplash II is available exclusively on ZiffNet/Mac and from the ZiffNet Selections area on AppleLink; it was created by Mike Throckmorton, author of Serial of Champions and Finder's Keeper. ZiffNet/Mac members can download BackSplash II free of connect-time charges until May 25, 1994, by typing GO MACUTIL. After that, you can find the file BACKSP.SIT in Library 3 of the MacUser Forum (GO MACUSER). On AppleLink look for BackSplash II in ZiffNet Selections:MacUser Software:Utilities. / Mark Simmons

CD-ROMS /

STOCK YOUR DIGITAL BOOKSHELF

SHRINK YOUR REFERENCE ESSENTIALS into three slim, multimedia-packed CD-ROMs from Microsoft. The aptly named Bookshelf (\$99) combines a dictionary, thesaurus, book of quotations, atlas, almanac, volume of popular history, and concise encyclopedia. Encarta (\$139) offers a 26,000-article encyclopedia enhanced with animations, video clips, and sound clips. Cinemania (\$79.95) offers movie excerpts and 23,000 reviews. 800-426-9400 or 206-882-8080. / Karen J. Ohlson



LET THE GAMES BEGIN

The battle heats up with new PowerPC and Pentium chips.

THE POWER MACS ARE HERE, but just a week before their introduction, Intel countered their arrival with new chips of its own — more Pentiums and the DX4. A month later, the Power PC alliance parried with a faster 601 and the brand-new 604 processor. This jousting may lead you to wonder: What's the score?

Intel's new DX4 chip is the latest incarnation of the 486. Despite its name, the DX4 runs at three, not four, times the speed of the computer's system bus. (According to Intel, the chip was so named because the DX4's cache is twice as big as that of its predecessor, the 486DX2.) Destined for low-cost desktop machines, the DX4 also has all the power-saving features needed for laptops. As a result, the DX4 and the PowerPC 603 processor will compete head-to-head in the same markets.

The real fun starts with the Pentium. Its initial 60- and 66-megahertz incarnations were large — and



therefore expensive — and consumed lots of power. The second-generation Pentiums, code-named the P54Cs and available in 90- and 100-megahertz versions, are smaller, faster, and more energy-efficient. The P54C should additionally be more widely available than its predecessor.

In terms of raw performance, the initial Pentium and the PowerPC 601 are comparable when running at the same clock speed. So the new Pentium chips might seem to take the lead in speed — but not for long.

Announced in early April, the 100-megahertz PowerPC 601 is the result of a new manufacturing process that makes the 601 even smaller while enabling lower power consumption and faster clock rates.

Then, in late April, Apple, IBM, and Motorola jointly introduced the PowerPC 604, the second-generation processor for desktop PowerPC machines. It also runs at 100 megahertz but is about 60 percent faster than the 100-megahertz 601. Compared to the 100-megahertz Pentium, it's also 60 percent faster when running integer code and more than twice as fast when running floating-point code. Don't expect to see 604-based Power Macs until 1995, though.

Today, with the 601 and Pentium chips competing at all levels, the 601 wins on price. But the 604 puts the PowerPC consortium a leap ahead of Intel, which doesn't plan to have its Pentium successor, code-named the P6, available until 1995.

POWER MACS /

MORE PRODUCTS FILL POWER MAC PIPELINE

MORE THAN 150 VENDORS are releasing products for the Power Macs. Here are a few recently announced Power Mac programs:

Business Tools. Microsoft Office 4, which contains new versions of Word, Excel, and PowerPoint; Microsoft Works 4.0; and Fox-Pro 2.6 for Macintosh will all go native this summer. 206-882-8080.

ON Technology's Meeting Maker XP, a cross-platform group scheduler, will be ready for Power Macs in the second quarter. 617-374-1400.

3-D/Multimedia. Alias Sketch! 2.0, a brand-new version of Alias' 3-D-modeling and -rendering software with 50+ new features, will ship this summer in 680x0 and PowerPC versions. 416-362-9181.

CoSA, a division of Aldus, said its native version of After Effects 2.0 would ship before June. 401-831-2672.

Maris' RedShift "personal planetarium" CD-ROM will ship with software for three platforms — Power Macs, 680x0 machines, and Windows-based systems — on the same disc. 510-652-4746.

Graphics. Canto Software's client/server graphics-database program goes native as Cumulus PowerPro. It also adds AppleScript

support, interapplication drag-and-drop, and other new features. 415-431-6871.

Productivity. Aladdin Systems is readying native versions of its products StuffIt Deluxe, InstallerMaker, and SpaceSaver. 408-761-6200.

The Power Macs' speed makes possible applications that weren't practical on slower Macs. One example is Language Engineering's E to J software, which translates English to Japanese much as OCR software interprets faxes today. 617-489-4000.

Fun. In its native mode, Maxis' SimCity 2000 city simulator will have a snappier user interface, and you won't have to leave a city running overnight to see the effects of your planning. 510-254-9700. / SCS

WORD OF MOUTH

"IT'S RAMBO. It's a Ferrari.

It's Rambo in a Ferrari." / Jon Fitch, Rocket Scientist, Apple Computer, describing the new Power Macs

BUSINESS AFFAIRS /

ADOBE AND ALDUS FORM A DTP MEGAMERGER

TWO OF THE MOST POWERFUL forces in the desktop-publishing — and the Mac-software — industry, Adobe Systems and Aldus, recently announced their intent to merge. Current Adobe heads John Warnock and Charles Geschke will assume the titles of chairman/CEO and president, respectively, of the as-yet-unnamed hybrid company. Paul Brainerd, who stepped down as president of Aldus in August, will become a board member.

The merger of the creators of PageMaker and PostScript is intriguing. In recent years, these pioneers in paper-based DTP have embraced multimedia authoring and digital delivery. Aldus acquired the multimedia firms CoSA and Digital F/X, whose products will bolster Adobe's Premiere. As the developer of the Acrobat suite of document-distribution products, Adobe gains access to Aldus' stable of prepress products, recently padded by the acquisition of Compumation, a firm specializing in work-flow solutions. Above all, Aldus gains marketing muscle for regaining turf lost to QuarkXPress. What isn't clear is how "Aldobe" plans to support rivals Adobe Illustrator and Aldus FreeHand — or whether government agencies will let them. Shareholders of both firms will vote on the merger in July. / Pamela Pfiffner



INPUT DEVICES /

BUILDING A BETTER TRACKBALL

TIRED OF MOUSING AROUND, but conventional trackballs give you a pain in the neck — and wrist? Logitech's new TrackMan trackball for the Macintosh (\$139) combines an ergonomic design and high-resolution optics for greater ease in navigating your desktop.

Resembling the Philadelphia Phillies' logo turned on its head, the TrackMan boasts a slick design that lets you rest your palm on the case while using your thumb on the trackball and other fingers on three mouse buttons. The TrackMan ships with Logitech's MouseKey software, which allows you to customize button functions. Southpaws are currently out of luck: The TrackMan is designed exclusively for right-handed users. 800-889-0063 or 510-795-8500. / Jason Snell



NUBUS BOARDS /

CARD ENDS GAME ENVY

ENVIIOUS OF THE content cornucopia available for entertainment-oriented platforms such as CD-I (CD-ROM Interactive) but don't want to buy a new machine? You won't have to, with the MediaPlayback, a CD-I NuBus card from I²M (International Interactive Media). Plug this full-length card in to any NuBus-capable Mac equipped with an AppleCD 300 CD-ROM drive, and you can play CD-I titles and VideoCDs on your Macintosh.

If you haven't yet heard of CD-I or VideoCD, you're sure to. Developed by Philips and popular in Europe, CD-I discs are a rich source of game, travel, and entertainment titles. VideoCDs, a standard for movies on CD-ROM, contain 75 minutes of video apiece. MPEG compression allows VideoCDs to rival laserdisc quality in most instances.

The MediaPlayback has ports for composite and S-video output as well as a serial port (for a game controller) and an audio

port. A daughtercard holds the chips necessary to decompress MPEG video and audio. A version of the card that works only with the AppleCD 300 and is geared to developers is available for \$1,200, but a consumer version that works with a wide range of CD-ROM drives will be ready this fall for around \$500. 203-226-8923.



/ Sean Safreed

STORAGE DEVICES /

NEW SYQUEST DRIVES READ OLD CARTRIDGES

CARTING AROUND MEGABYTES of data is more efficient on high-capacity cartridge drives. But when SyQuest made the jump from a 44-megabyte to an 88-megabyte mechanism, some users were stuck with old cartridges that wouldn't work with drives based on the new mechanism. With its new 5.25-inch cartridge mechanism, SyQuest increases capacity to 200 megabytes without sacrificing compatibility.

Available in drives from vendors such as Micronet, PLI, and FWB, the SQ5200C can read all three standard SyQuest cartridge sizes: 44 megabytes, 88 megabytes, and the new 200-megabyte size. Although prices will vary from vendor to vendor, SyQuest estimates that the new drives will cost as little as \$599, with 200-megabyte cartridges costing just over \$100 each. SyQuest, 510-226-4000; Micronet, 714-453-6000; PLI, 510-657-2211; FWB, 415-474-8055. / JS

MONITORS /

APPLE'S NEW DISPLAY

HOT ON THE HEELS of the introduction of its first multisync monitor in March comes Apple's second multiple-resolution monitor, the Apple Multiple Scan 17 Display.

The Multiple Scan 17 sports a Trinitron screen that measures 16.5 inches diagonally, and the monitor supports resolutions as high as 1,280 x 1,024 pixels.

The monitor comes with the Energy Saver control panel, which automatically dims the display when the Mac is idle. \$1,069. 800-776-2333 or 408-996-1010. / JS

MACINTOSH PRICE INDEX

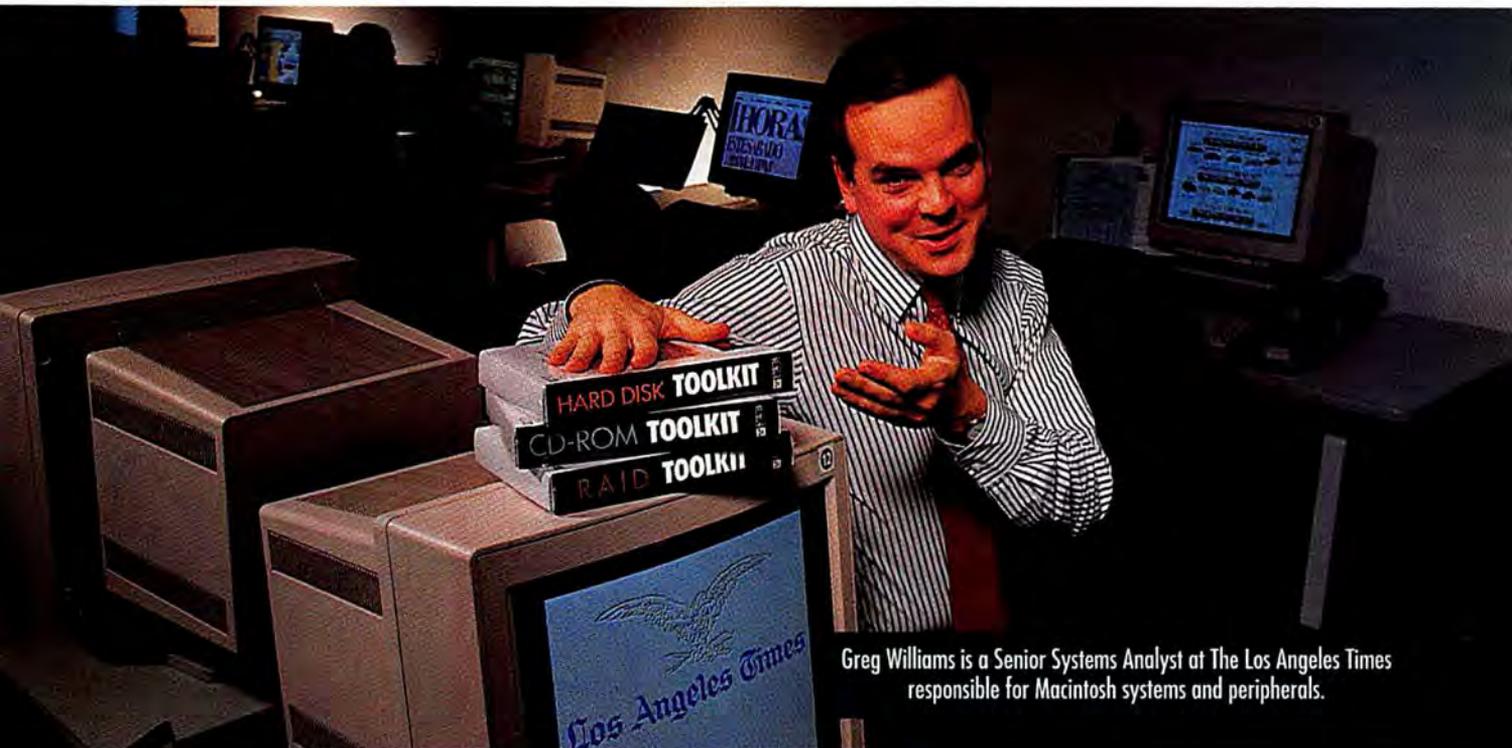
THE UNITED COMPUTER EXCHANGE index reflects average sales prices of new and used Macs as of March 7, 1994. Prices (except those for compact models) do not include a monitor or a keyboard. The United Computer Exchange is a national clearinghouse of used microcomputer equipment.

Mac Model	New	Used
Plus (1/20)	*	\$275
SE (1/20)	*	\$375
SE/30 (5/40)	*	\$700
Classic (2/40)	*	\$475
Classic II (4/40)	*	\$600
Color Classic (4/80)	\$999	\$700
LC (2/40)	*	\$375
LC II (4/40)	*	\$475
LC III (4/80)	\$767	\$600
II (5/40)	*	\$425
IIsi (5/40)	*	\$550
IIx (5/40)	*	\$750
IIcx (5/40)	*	\$550
IIci (5/80)	*	\$800
IIfx (8/160)	*	\$1,350
IIvx (4/80)	*	\$875
Centris 610 (4/80)	*	\$950
Centris 650 (8/230)	*	\$1,575
Centris 660av (8/230)	*	\$1,600
Quadra 605 (4/80)	\$899	\$725
Quadra 610 (8/230)	\$1,779	\$1,450
Quadra 650 (8/230)	\$2,069	\$1,775
Quadra 660av (8/230)	\$1,899	\$1,700
Quadra 700 (8/230)	*	\$1,450
Quadra 800 (8/230)	\$2,399	\$1,950
Quadra 840av (8/230)	\$3,079	\$2,675
Quadra 900 (8/230)	*	\$1,800
Quadra 950 (8/230)	\$3,599	\$3,125
Portable (1/40)	*	\$375
PowerBook 100 (4/20)	*	\$700
PowerBook 140 (4/40)	*	\$875
PowerBook 145 (4/40)	*	\$1,000
PowerBook 145B (4/80)	\$1,349	\$1,100
PowerBook 160 (4/80)	*	\$1,375
PowerBook 165 (4/80)	\$1,699	\$1,400
PowerBook 165c (4/80)	*	\$1,375
PowerBook 170 (4/40)	*	\$1,350
PowerBook 180 (4/80)	\$2,199	\$1,775
PowerBook 180c (4/80)	\$2,549	\$2,100
Duo 210 (4/80)	*	\$1,075
Duo 230 (4/120)	\$1,529	\$1,225
Duo 250 (4/200)	\$1,999	\$1,725
Duo 270c (4/240)	\$2,799	\$2,475

* = discontinued model

For more pricing information on these models and on configurations not listed, call 800-755-3033 or 404-955-0569, or find it on ZiffNet/Mac, in Library 1 of the MacUser Forum (GO ZMC:MACUSER), as UCEIDX.WRD (Microsoft Word format) and UCEIDX.TXT (ASCII text format); on AppleLink, look for it in ZiffNet Selections:MacUser Software:Reference.

How Does The L.A. Times Manage Its Storage Jungle?



Greg Williams is a Senior Systems Analyst at The Los Angeles Times responsible for Macintosh systems and peripherals.

Open FWB's ToolKit.

Hard Disk ToolKit
— 1991 Best Storage Product Finalist



CD-ROM ToolKit
— MacUser Magazine



Hard Disk ToolKit
— MacUser Magazine



It's a jungle out there, particularly at the deadline-driven L.A. Times. That's why they chose FWB's ToolKit family of Disk Management Software. According to Senior Systems Analyst, Greg Williams, who manages that jungle: "It was a critical decision. We have hundreds of Macs of every kind, and hundreds of storage devices from dozens of manufacturers. They must all deliver 'round the clock, or the Times can't."

It started with FWB's Hard Disk ToolKit. Says Greg: "It has the three things we need every day. One, assured compatibility in a chaotic world of storage brands and technologies. Two, powerful tools that guarantee top drive performance and provide easy and efficient control over those drives. And three, compatibility with Apple's new Power Macintosh, because ToolKit software is fully SCSI Manager 4.3 compliant."

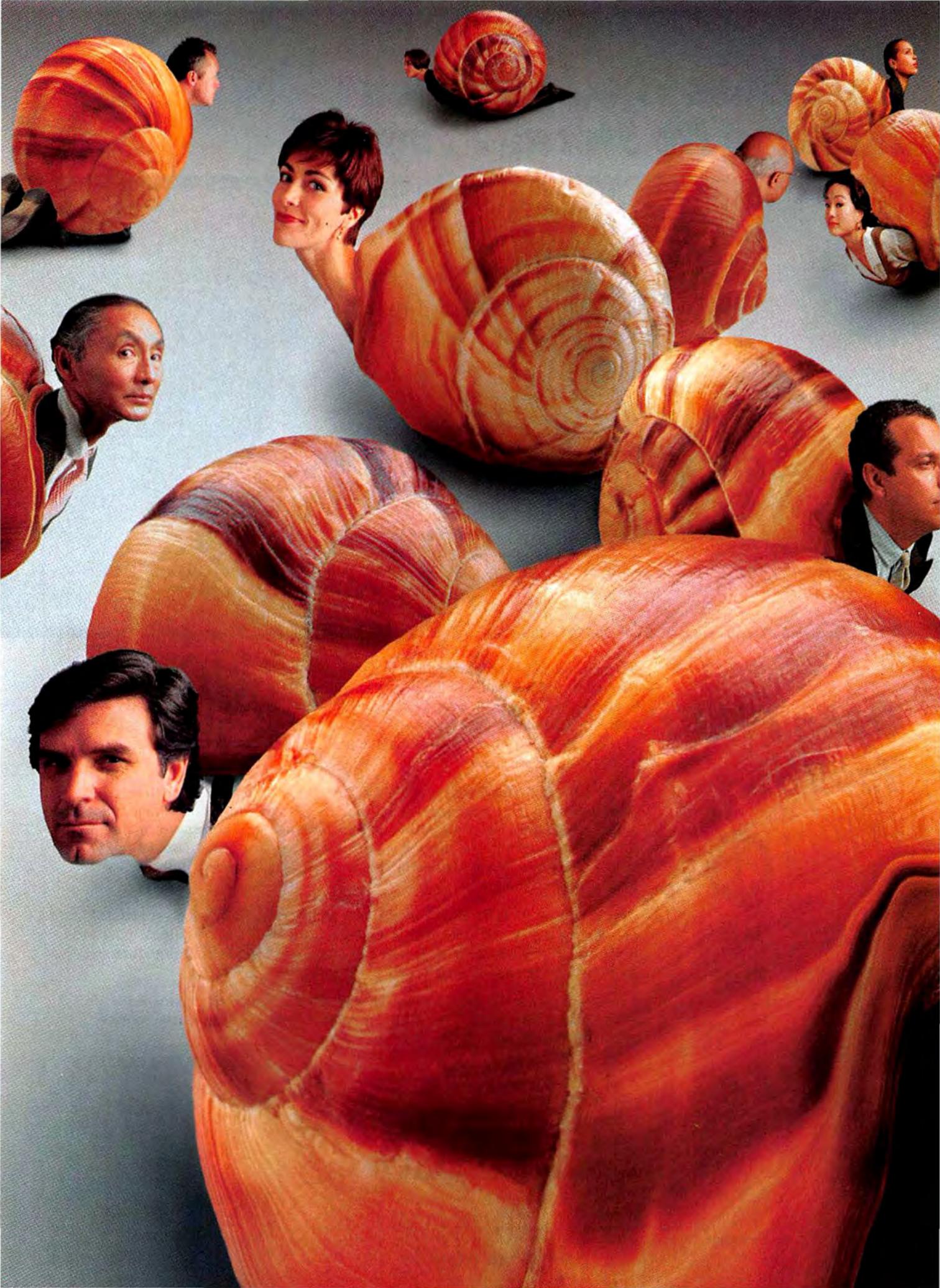
Greg also uses RAID ToolKit to convert his existing drives into high-speed disk arrays on a number of Quadra 950s, taking advantage of RAID 0 data striping and RAID 1 mirroring capabilities. And he just installed CD-ROM ToolKit to increase power and performance for the Times' CD-ROM drives.

Your deadline may be approaching. So whether it's one drive, or thousands, do what the L.A. Times did: *Open FWB's ToolKit*. Call 415.474.8055 for the reseller nearest you.



Call FWB at (415) 474-8055,
or fax us at (415) 775-2125.

HAMMER



INTRODUCING OneWorld Fax NETWORK FAX SERVER

Talk about perception versus reality. Like something out of a science fiction movie, faxing came into being to move documents along at the speed of light. But in reality, "moving" hasn't been the activity most associated with faxing. "Waiting" has. Waiting for the document to print. Waiting in line. Waiting for the fax to go through. A situation where things can get so bottlenecked, an entire office can be reduced to a crawl.

Well, at Global Village Communication, we're happy to report a way to get everyone up to speed again.



And because OneWorld Fax sends faxes in the background over the network, you don't tie up your computer when faxing. You keep right on working.

You save money, too: Printing costs fall when you fax from your computer. Phone bills can be reduced since faxes can be scheduled to take advantage of off-peak phone rates. And, of course, you save valuable time.

And if all this news weren't good enough, OneWorld Fax is easy to install. Everything you need—all the hardware and software—is built into a single,

THE PROMISE OF FAX MACHINES IS TO HELP PEOPLE WORK AT A FASTER PACE. THEN, OF COURSE, THERE'S THE REALITY.

With something we call OneWorld™ Fax, the fax server that lets everyone on a network of Apple Macintosh computers fax right from their desk.

With OneWorld Fax, everyone in the office can send faxes—to one person or to many—with just a few clicks of the mouse. It's as easy as printing, thanks to the industry-acclaimed GlobalFax™ software used in OneWorld Fax.

self-configuring package smaller than a toaster. Anyone can install it, in a matter of minutes.

But, before you go, here's something else to consider: OneWorld Remote Access—a complete, easy-to-use ARA server for providing access to AppleTalk networks from remote Macintosh and PowerBook computers.

So. There you have it. Two ways to get everyone in your office up to speed again. Now isn't it time you got moving? For more information and for the Global Village dealer nearest you, call 1-800-736-4821, ext. 3246.



GLOBAL VILLAGE
COMMUNICATION

CIRCLE 23 ON READER SERVICE CARD

©1994 Global Village Communication, Inc. Global Village Communication, the Global Village Communication logo, GlobalFax, and OneWorld are trademarks of Global Village Communication, Inc. AppleTalk™ Remote Access is licensed from Apple Computer, Inc. All other brand names are trademarks of their respective companies. A special thank you to the snails who graciously lent their shells, and the Wee-Fit Clothing Outfitters for their ingenious turtleneck sweaters which kept the snails warm until their homes were returned.

DisplayMaker

DisplayMaker Professional shown with Big Ink high-capacity ink system.

HERE'S PROOF...



DisplayMaker Starting At Only \$19,995

...WHY MORE THAN 700 SERVICE BUREAUS HAVE CHOSEN DISPLAYMAKER™



Super-large-format, PostScript™ color printing. That's what you get with LaserMaster's® Big Color™ Digital Printers. It's easy to see why hundreds have chosen DisplayMaker and DisplayMaker Professional—the proof is in the product and the performance.

Proof—The Product

With output that's 36 inches wide by almost any length, the DisplayMaker line offers the best and easiest way to produce Big Color prints. And it has the features professionals demand:

- Photographic-quality output
- ColorMark™ Color-Management System
- PostScript Level 2 compatibility
- 235 pre-installed typefaces

Plus, DisplayMakers attach quickly to Macintosh® and IBM®-compatible computers and print directly from all popular illustration, photo-manipulation, and desktop-publishing applications.

Proof—The Performance

When it comes to high-volume printing, nothing beats DisplayMaker Pro's performance. The Big Ink™ Delivery System increases its ink capacity 10-fold and reduces ink costs up to 70 percent! And with DisplayMaker Pro's Advanced Color Server, you're in control of print jobs and consumables management.



The hand-held Big Ink Calibrator, included with the DisplayMaker Pro.

It's easy to see why LaserMaster's DisplayMaker printers are the choice of so many professionals. Prove it to yourself and call LaserMaster today! Ask about our complete, fully integrated Big Color WorkStation, too.

"I waited about three days to make up my mind. I waited two days too long. I wasted two days worth of profits."

Tom Welsch, President
Visual Horizons, Inc.

"This is the first product that I have had in my store that I can literally walk down the street and sell to every business."

David Kempton, Manager
Kinko's Copies

"After only six weeks of actual production, I have already paid for half of my initial investment, if I include all the mounting and laminating I have done as a result of the output."

Robert Evans, President
EPI Graphics

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Fax: **612-944-1244**

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730

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CIRCLE 66 ON READER SERVICE CARD

REVIEWS & Quick Clicks

FoxPro 2.5 for Macintosh / Microsoft enters the relational-database market with a vengeance.

LEAPFROGGING SEVERAL version numbers to reach parity with DOS and Windows versions, FoxPro 2.5 for Macintosh is a relational-database-management system that's packed with features and honed for speed. It also hits the market at a remarkably low \$99 introductory price (going up to \$495 after June), but don't let that price fool you — FoxPro is *not* an entry-level system. It's a professional development environment, with all the power and complexity such an environment requires.

Packed with Power

FoxPro's programming language is tremendously rich. It incorporates all the constructs found in structured programming languages such as C and Pascal, including loops, conditionals, subroutines, arrays, local and global variables, and parameter passing by value or reference. FoxPro also supports the use of HyperCard-style XFCNs and XCMDs.

In support of this powerful language, the FoxPro environment provides a strong collection of developer tools, including a program tracer and a source-code debugger that supports break points and watch values. FoxPro's source-code analysis makes your code easier to understand (by diagramming the flow of control, for example), and FoxPro's formatting tools make your code easier to read as well.

Reviews Rating Key

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

Tools such as the screen and menu editors work graphically, so you can create the interfaces for your applications by drawing elements such as buttons and boxes for menus. The Report Writer provides a straightforward process for creating reports, and the



Relational Query By Example (RQBE) window makes creating database queries easier than in any other Mac database program.

Veteran users of FoxBASE+, FoxPro's predecessor, will have to adjust to FoxPro's more object-oriented style of programming. FoxPro lets you associate small pieces of programming code (called snippets) with buttons, menus, and fields in your application — so that a script runs when a button is clicked, for example. The ability to create a library of objects with code snippets will make developers significantly more productive.

Developers will also appreciate FoxPro's Professional Edition, which adds distribution, connectivity, and external-library-construction kits to the Standard Edition reviewed here. The distribution kit lets you create royalty-free stand-alone applications from your FoxPro programs. The client/server connectivity kit allows you to use FoxPro applications as front ends to Open Database Connectivity and Apple DAL-

compatible database servers. The external-library-construction kit lets you integrate code libraries written in external languages such as C and assembly language into your FoxPro applications.

Mellow Migration

Another benefit of FoxPro is cross-platform compatibility. Provided you aren't using any platform-specific features, any application created in any version of FoxPro can run on any other FoxPro system, including Mac,

FoxPro's handy Quick Screen Wizard helps you create functional and attractive screens for database tables. You answer questions about how you want the table to look, and FoxPro builds the screen for you.



DOS, and Windows, with UNIX compatibility coming later this year.

Of course, FoxPro DOS applications don't look very good on a Mac; to address this problem, FoxPro for Macintosh has a special transporter that converts an application created for one platform's interface into one that uses the current platform's interface conventions. A DOS application, with its simulated buttons and line-drawn boxes, is converted into a Mac application with Mac-style buttons, pop-up menus, and windows. Applications ported from Windows look

considerably more like Mac applications, but they too can be transported to use Mac-specific fonts and other elements not available under Windows. Conveniently, FoxPro keeps track of each platform's interface in the same file, so the same application can run with a DOS, Mac, or Windows interface. FoxPro allows conditional code execution (using environment variables to find out which platform is currently running), so your application can use platform-specific features such as AppleScript and OLE for Windows — and still run on all platforms.

To help developers facing another tricky migration — from FoxBASE+ — Microsoft provides a migration program that transforms FoxBASE+ programs into corresponding FoxPro applications. The results aren't perfect, but the program does get you most of the way there and it gives developers a great hands-on tutorial on the substantial differences between FoxBASE+ and FoxPro. Version 2.6 of FoxPro for Macintosh, expected to be available by late summer, will also add conversion capabilities for dBASE applications and files.

Speed Thrills

Speed is one of FoxPro's major selling points. FoxPro uses a proprietary query-optimization technology called Rushmore to provide blazing speed on sorts, queries, and indexing. The DOS and Windows versions are consistently ranked faster than all competitors, and FoxPro for Macintosh looks to continue that trend — even before the native PowerPC version becomes available, with the 2.6 release.

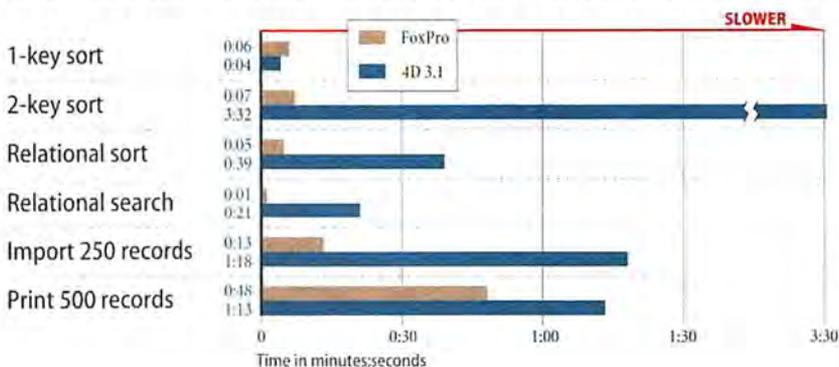
In our tests with a 10,000-record database on a Centris 610, we found FoxPro to be significantly faster than competitor 4th Dimension, from ACI US, in most tasks. The exceptions were nonrelational searches (searches within one file), which each program accomplished in less than one second, and single-key sorts — seldom performed in FoxPro, because most users save indexes for simple sorts. Otherwise, 4D took anywhere from 50 percent longer (to spool 500 records to print) to 30 times as long (to do a file sort based on two keys).

Heaps of Help

FoxPro's on-line help system, which is context-sensitive, provides a thorough and handy reference to FoxPro's environment

Fast Like a Fox

Speed being FoxPro's claim to fame, we weren't surprised to see FoxPro perform most tasks much faster than 4D could with an equivalent 10,000-record database. Nonrelational searches, not shown here, were very fast in both programs — less than one second per search.



and programming language. The help application — based heavily on the help system for the Windows version — runs separately from FoxPro, communicating with FoxPro via Apple events. FoxPro also provides Balloon Help for most parts of the development environment and lets you create Balloon Help for your applications.

Another useful component of FoxPro is Wizards, which, as in other Microsoft products, automate complex tasks. FoxPro includes Wizards for creating reports, display and entry screens, and graphs (Graph Wizard is similar to the graphing Wizards offered in other Microsoft products, such as Excel and Word). Version 2.6 of FoxPro will add Wizards for queries, tables, and mail-merge.

Documented Problems

The single biggest problem with FoxPro is the documentation. There's certainly no shortage of it — with more than 2,000 pages spanning eight books — but the content is extremely inconsistent and poorly organized. Users who are already familiar with xBase development will find FoxPro's documentation sufficient as a reference; others — even software developers experienced in other languages — will want to seek out one of the many excellent third-party books on FoxPro programming.

Like all other development environments, FoxPro has some bugs. They tend to be context-dependent rather than general, and you can readily fix them once you've identified them. Bear in mind that despite

the 2.5 version number, FoxPro's Mac-specific code is really in version 1.0. As with FoxPro versions for other platforms, expect a series of patches to be released by Microsoft to address these issues.

Our only other quibble is with the sample applications that come with FoxPro. Too many of them are simply ports of FoxPro applications written for DOS or Windows. Mac developers would welcome more examples implementing Mac-specific features in FoxPro.

The Bottom Line

FoxPro 2.5 for Macintosh is an outstanding relational-database-management system, offering power, speed, and cross-platform compatibility. Although the documentation could be much better, the work required of a developer to get up to speed is well worthwhile. We strongly recommend that developers — both Mac-only and those with cross-platform needs — take a look at FoxPro when choosing their database-development environment. / Jeffrey Sullivan

FoxPro 2.5 for Macintosh

Rating: ★★★★★

List Price: Through June, \$99; after June, \$495; Professional Edition, \$695.

Pros: Powerful and flexible. Extremely fast. Excellent cross-platform compatibility.

Cons: Complexity. Poor documentation.

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

Reader Service: Circle #401.

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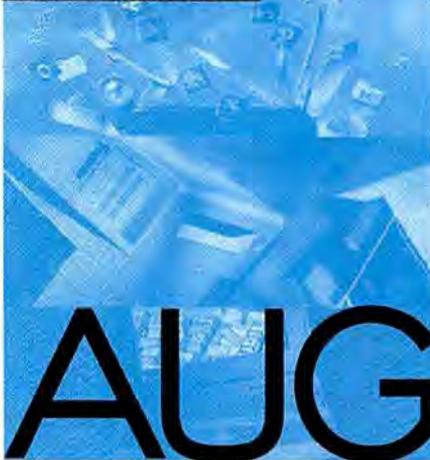


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THE MORE POWERFUL POWERBOOK

This August, MacUser suggests optimal baseline PowerBook systems — and peripherals — for specific users such as students and traveling business presenters. Also, configurations are suggested for those who use their PowerBook as a secondary machine, primarily communicating with the home office, and business users whose PowerBook is their main system. MacUser puts the power into PowerBook buying.

DPI: DEPARTMENTAL PRINTERS INVESTIGATED

MacUser examines 9 departmental printers, which produce 15+ pages per minute. These 600 dpi, monochrome models are tested for speed, features, durability, efficiency, cross-platform capabilities, installation, ease of use, image quality, technical support and compatibility with the LaserWriter 8.1. All printers are mouse rated. MacUser helps buyers get to the bottom line.

MULTIMEDIA AUTHORIZING TOOLS

MacUser compares two top multimedia authoring tools. They examine each program's ability to produce simple presentations and complex multimedia applications with and without the programming language. They also take a look at cross-platform development. MacUser is a well authored tool for Macintosh buyers.

**AUGUST AD CLOSE:
MONDAY,
MAY 23RD, 1994**

ClarisImpact / Easy-to-use, versatile software takes you over the hurdles of creating polished business graphics.

IF DAUNTING BEST DESCRIBES your experience with creating sophisticated business graphics, then ClarisImpact may be for you. Until now, if you wanted to combine several types of elements — a spreadsheet chart, a timeline, and an organization chart, for example — in a single report, you were probably forced to juggle several graphics applications plus a word processor to piece together a document. Add a presentation-software package if you created slides or an on-screen presentation.

Enter ClarisImpact, which rolls the major features of several specialized business-graphics applications into one software package. By design, ClarisImpact won't give

fill colors and patterns, line widths, text formatting, and drop shadows.

To create a model, you simply select the correct model tool and click in the drawing area. A dialog box appears with a variety of model-specific options. Once you've made your selection, ClarisImpact draws the model, complete with placeholders you replace with your own information.

Among the model-specific options you can select is Model Style, a cornerstone of ClarisImpact's ability to help you get polished results quickly. This feature stores format options such as colors, text formatting, and line widths. By making the same style choices across different models, you can create a consistent look for your presentations and reports.

To enhance the look of a model, you can use ClarisImpact's element styles. For example, to highlight holidays on a calendar, you select the target date and click on the desired style in the floating Element Styles palette. Be aware that some element styles for calendars obscure text and many rely on color as a key design feature. This can be a problem if you're printing in black-and-white. ClarisImpact supplies a variety of element styles for each model, and you can also create and save your own styles.



With ClarisImpact, you can easily create a variety of good-looking business graphics and combine them in a report or presentation. Working with report documents is much like working with word-processing documents.

you the high-end features of the more powerful specialized applications. Instead, it focuses on accessibility and versatility, enabling you to quickly and easily create polished business graphics to communicate your plans and ideas.

Model Program

The well-designed ClarisImpact interface makes learning the program a snap. A tool panel houses basic drawing and text tools as well as tools for creating the program's seven basic chart types (called models): calendars, data charts, flowcharts, organization charts, outlines, tables, and timelines. A style bar under the main menu bar provides handy access to styling tools for specifying

One thing that makes ClarisImpact so easy to use is the consistency of its menus and tool bar across models. The only interface element that changes whenever you switch models is the menu bar's second-to-last item, which contains model-specific features.

ClarisImpact may be easy for graphics novices to learn and use, but it's no lightweight. The program offers some relatively sophisticated features. The organization-chart model, for example, offers loads of flexibility. Once you've set up a model, you can add and delete job positions at any level you want, rearrange positions by dragging them around, and change the chart's orientation. Connector lines react intelligently to

modifications, saving you from tiresome cleanup work. Another time-saver is ClarisImpact's ability to automatically align organization-chart boxes with each other.

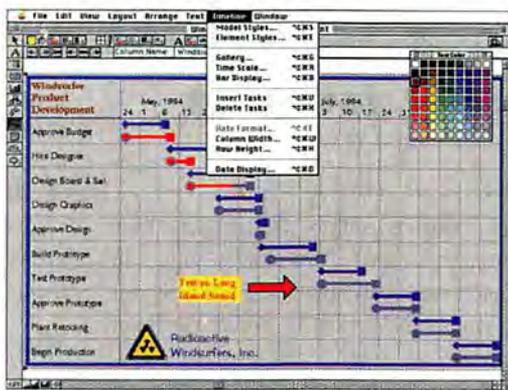
Although ClarisImpact's data-charting capabilities aren't on a par with those of DeltaPoint's DeltaGraph Pro3 or Microsoft Excel's charting module, they're nonetheless very serviceable. The data-chart model offers permutations of eight chart types, including standard pie and bar charts as well as high/low and pictogram charts. The best feature of the data-chart

model is the ease with which you can edit data, which the program displays in a table directly below the chart. By clicking on a button, you can display or hide the table. Alternatively, to view the value of any chart element, such as a bar, data point, or pie slice, you click on it and the program displays its value in the model bar above the chart. To change the value, you simply enter a new number in the model bar and the chart changes to reflect the new value.

As you create and edit models, you work with three types of documents: drawing, presentation, and report. Drawing documents come with optional grids that help you position objects accurately. Working with report documents is much like working with word-processing documents. The page size stays constant, and you can add headers, footers, and text columns. Presentation documents come with basic slide-show features for on-screen presentations or for output to overhead transparencies or 35mm slides. Templates are included, but unfortunately, there's no run-time player.

If you find you still need the features of a specialized program for your report or presentation, you can export finished ClarisImpact models in a variety of formats. ClarisImpact supports Claris XTND technology and lets you save in the CGM, EPS, MacDraw, MacDraw Pro, and PICT formats.

The package comes with a healthy assortment of clip art and supports the following formats for placing data, text, graphics, and movies created with other programs: BMP, CGM, DRW, DXF, EPS, IGES, MacDraw II, MacDraw Pro, MacPaint, MacWrite II, Microsoft Excel, Microsoft Word, PCX, PICT, PICT2, QuickTime, TIFF, and WMF.



Creating timelines is a snap with ClarisImpact. When you switch to another chart type, or model, the tool bar and menu bar remain consistent, with the exception of the second-to-last menu.

Accessibility and versatility aside, ClarisImpact exhibits a few rough edges. Data tables are displayed with a transparent background, which allows items behind them to peek through. This makes it difficult, and sometimes impossible, to read data. And in the timeline model, when you insert an event, formatting for the new event doesn't match that of the others if you've altered their format previously.

ClarisImpact requires a Mac Plus or better running System 6.0.7 or later. You need System 7 Tune-Up with System 7.0 or 7.0.1. Claris recommends 2 megabytes of application RAM, but we believe 3 megabytes is more realistic. A compatible Windows version is promised for later this year.

The Bottom Line

ClarisImpact is a welcome new kind of program, especially for those who are all thumbs when it comes to creating good-looking business graphics. It has a few rough edges, but its friendly interface and time-saving features ensure that ClarisImpact won't collect dust on your software shelf. / Shelley Cryan

ClarisImpact 1.0

Rating: ★★★★★

List Price: \$399.

Pros: Well-designed interface. Versatility. Creates good-looking charts quickly and easily.

Cons: Data tables can be hard to read. Inconsistent formatting in timelines.

Company: Claris Corp., Santa Clara, CA; 800-544-8554 or 408-727-8227.

Reader Service: Circle #402.

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CIRCLE 32 ON READER SERVICE CARD

Agfa StudioScan / Agfa gets the picture with its new high-quality, low-cost color scanner.

IF YOU'VE CONSIDERED adding a color scanner to your desktop setup, the time has never been better. Most well-known scanner makers have introduced low-cost flatbed models, many with street prices close to \$1,000. But the hottest news comes from Agfa, long renowned for its midrange scanning systems. The company's new StudioScan is a low-cost color flatbed scanner that outclasses the competition in a variety of ways.

Plug-in Play

Although most of what you buy with a scanner is hardware, the bundled software can make or break the scanner's success in terms of ease of use, speed, and image quality. When it comes to software, the StudioScan really shines, especially compared to competing scanners that don't bundle any Photoshop plug-ins. Agfa provides not one but *two* Photoshop plug-ins with the StudioScan — FotoSnap is a tool for novices that borrows heavily from Light Source's popular Ofoto-software interface, and FotoLook is a highly configurable tool for power users.

FotoSnap's appeal lies in the simple-to-use front end it gives the StudioScan. You select your output device from a preset list, and the plug-in does the rest. Based on a prescan, the software calibrates density levels, calculates optimal resolution and bit depth for the intended output, and crops the image.

For highly specialized controls, you typically had to look to high-cost professional scanners. No longer — the StudioScan's FotoLook plug-in provides many sophisticated features, including white-point/black-point settings, DMin/DMax, and custom exposure controls.

FotoLook also lets you make a trade-off between speed and image quality. In our tests, scanning a 4-x-5-inch photograph in 24-bit color at 300 dpi took 88 seconds with StudioScan's Optimize Speed option. Without this option, the scanner yielded less respectable results — more than 2.5 minutes for the same image. However, our jury of

color experts couldn't discern any differences between the two images, suggesting that in almost all cases you'll probably want to enable the option for optimal scanning speed.

To see how the StudioScan stacks up against the competition in other areas, we put it through the same rigorous tests we used in our most recent comparative review of scanners (see "Low-Cost Color Scanners," February '94, page 129). For testing color-image quality, we scanned two types of photographic images and printed them to a Tektronix Phaser IIsdx dye-sublimation printer. We compared the results with images scanned with the \$1,599 La Cie Silverscanner II — the top-rated scanner in our review.

We found that for our first test image, characterized by highly saturated bright colors and a gradient background, the StudioScan outperformed the Silverscanner II by a wide margin in terms of image quality. However, it delivered less impressive results for our second test image, a photo with a wide range of skin tones. For this type of image, as well as for line art, the La Cie scanner delivered higher-quality scans. Still, the StudioScan is far ahead of many of its competitors, offering excellent color matching, density, sharpness, and overall image quality.

In our objective tests, we evaluated the StudioScan's resolution (true optical capabilities plus the effectiveness of software resolution enhancement), sensitivity to gray, optical-character-recognition (OCR) capabilities, light-source stability, and color balance. In each of these areas, the StudioScan performed at or above expected levels for a scanner in its price range.

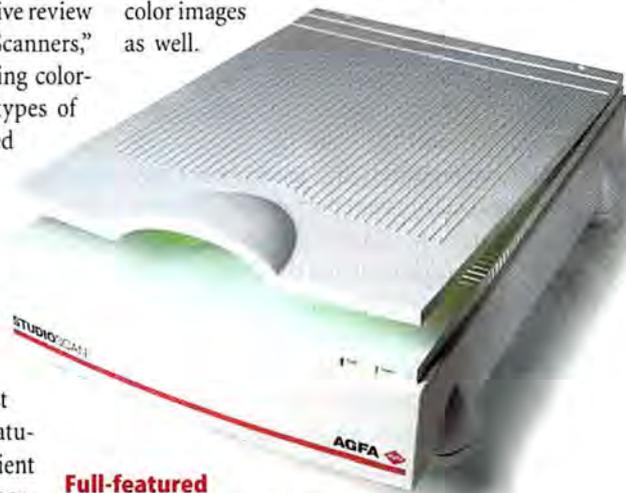
One other feature that distinguishes the StudioScan from its competitors is the black nonreflective inner surface of its lid. In addition to reducing light bounce through thin originals, the dark lid gives the StudioScan a leg up when you are using the autofind/

autostraighten routines in FotoSnap or Ofoto.

A minor inconvenience is the StudioScan's single 50-pin SCSI connector, which forces it to be at the end of the SCSI chain. Of course, you can purchase a dual-head SCSI cable to get around this problem. Agfa ships the StudioScan with a pass-through terminator and a standard SCSI cable.

The Bottom Line

We expect low-cost scanners to perform well for line art, but the StudioScan extends its considerable talents to highly saturated color images as well.



Full-featured software and high-quality color scanning set Agfa's low-cost StudioScan apart from the competition.

However, if you work with images in which skin tones or other midrange tones predominate, you won't find the StudioScan as impressive. Nonetheless, the software that ships with the scanner is a big plus — it will please power users and novices alike. Overall, the StudioScan comes out far ahead of most of the other scanners in its price range. / Anita Epler

Agfa StudioScan

Rating: ★★★★★

List Price: \$1,150; transparency option, \$500.

Pros: Inexpensive. Excellent-quality scans for highly saturated colors. Full-featured Photoshop plug-ins.

Cons: Single SCSI port. Mediocre-quality scans for midrange tones.

Company: Agfa Division of Miles, Inc., Wilmington, MA; 800-685-4271 or 508-658-5600.

Reader Service: Circle #404.

ALLright Enhancements / MSA's mixed bag of productivity utilities ranges in quality from satisfying to so-so.

WHEN A NEW SYSTEM 7 utilities package arrives on the scene, the obvious question is, Do we *really* need another one? MSA obviously thinks so, judging by its recent release of ALLright Enhancements. A package of nine modules and a management application, ALLright Enhancements claims to improve your productivity by making your Mac easier to use.

Four Favorable Modules

The most instantly useful module for anyone on a large network is Printers, which lets you switch printers without going to the Chooser. You can add keyboard command equivalents so you can switch printers just by pressing a couple of keys.

The also-helpful Copies module, based on MSA's popular CopyRight extension, lets you copy in the background, copy multiple items to multiple destinations, and schedule copies for simple backups. Don't expect faster copying, though. You get the *perception* of speed, because copies happen in the background, but our informal tests showed that Copies' copies can actually be slower than the Finder's.

The Extensions module is also useful. Like other extensions managers, it lets you turn extensions and control panels on and off as well as save sets for different computing needs — a particularly helpful feature lets you toggle "families" of related extensions on and off with one master control.

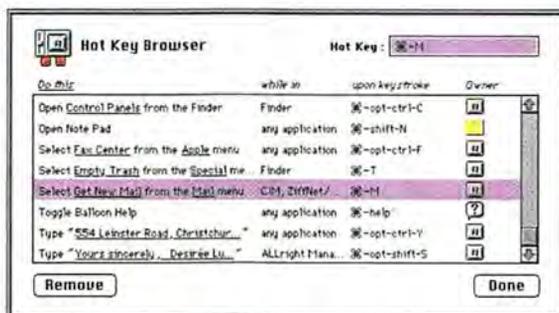
A fourth intriguing module is Notes, which adds a digital Post-it notepad to your desktop. Beyond the usual uses for such a notepad — saving phone numbers and jotting down sudden inspirations — you can also attach a note to a folder so it opens automatically (in Notes or TeachText format) when the folder is opened.

Wannabes and Filler

We found ALLright Enhancements' other modules less successful in comparison to utilities already on the market.

The Menus module adds several features intended to make your Apple menu more useful (hierarchical menus, reordering

capabilities, and font customization). However, after you've added applications, folders, files, and DAs to your Apple menu, you end up with an unmanageably long list packed with cascading hierarchical menus. We prefer the concept used in Now Menus (part of Now Utilities), which lets you add pull-down menus to your menu bar to accommodate frequently accessed files and applications.



The best and worst of ALLright Enhancements are found in the Keys module: It gives you a quick and easy-to-learn way to create keyboard command equivalents, but it's so limited that most users will outgrow it quickly.

The Directories module, like Now Utilities' Super Boomerang, adds Finder commands such as Rename and Get Info to the Open and Save dialog boxes. It also lets you navigate among recently opened files and folders from within the dialog box. These are useful capabilities, but they don't go beyond what is already available in Super Boomerang and other products.

We also can give only qualified approval to the Keys module, which lets you create keyboard command equivalents for selecting menu items; clicking on buttons; typing text; and opening documents, folders, or applications. It's true that most users are intimidated by full-featured macro programs, but this module is so limited (you can create only simple one-step macros) that users will probably outgrow it quickly.

The remaining two modules — Sounds and Balloons — add little to the package. Sounds enables you to assign different sounds to events on your machine, such as ejecting a floppy disk and shutting down. In our experience, this gimmick gets old fast.

The Balloons module lets you toggle Balloon Help on or off with a keyboard command equivalent, another unremarkable feat.

An Accommodating Attitude

MSA has clearly tried to make ALLright Enhancements fit everyone's work style. You can access the modules from the menu bar, the Apple menu, or a tool bar; you can also turn off any modules you don't want. If you share your Mac with others, you can each save your preferences individually — and PowerBook users can save different settings for different locations.

As we went to press, the company came out with a maintenance upgrade of the

product (version 1.01) that fixed some incompatibilities with other programs. In general, though, we found the original product stable, with no extension conflicts and only one glitch: Modules did not open when accessed from the ALLright menu. The solution (which you won't be able to find in the manual) is to update the directory by opening and then closing the Modules folder. If that

doesn't work, then rebuild the desktop.

The Bottom Line

ALLright Enhancements is a solid product that fulfills its mission of enhancing productivity and smoothing over some of System 7's rough spots. Its ease of use makes it most suitable for new Mac users. We found its features too limited for power users, however. And at a list price that's only \$20 less than the much fuller-featured Now Utilities 4.0, it's not the bargain you might think. / Victoria von Biel

ALLright Enhancements 1.0

Rating: ★★

List Price: \$129.

Pros: Good extensions manager and background-copying capabilities. Easy switching among networked printers.

Cons: Limited capabilities for the price.

Company: MSA, Inc., Pittsburgh, PA; 800-366-4622 or 412-471-7170.

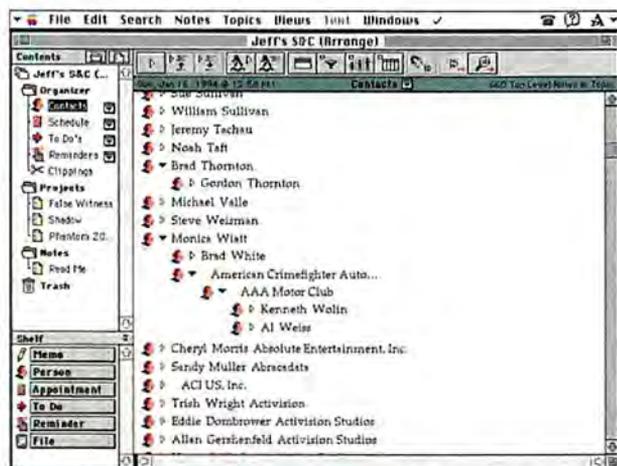
Reader Service: Circle #405.

Arrange / Common Knowledge gives frustrated PIM users more-flexible ways to arrange their lives.

PINNING ITS HOPES on the theory that you know best how to organize your life, Common Knowledge has introduced a personal information manager called Arrange. Arrange gives you unprecedented flexibility in the types and organization of the information you manage. Although missing a few

daunting to PIM newcomers (fortunately, Arrange comes with a wide variety of handy templates).

In order to organize notes, you collect them into topics, which are also customizable. Although a few predefined topic types exist — such as Schedule topics to



Arranging information your way is easy in Arrange. This hierarchical view of a group of contacts is just one example of the many ways you can customize information in Arrange, with varying amounts of effort.

key features, Arrange has strong potential for users unsatisfied with current PIMs.

Flexible Arrangements

Every chunk of information you store in Arrange is called a *note* — basically a collection of fields, like a record in a database. Arrange includes five predefined types of notes — Memo, Person, Appointment, To Do, and Reminder — which can contain free-form text and graphics. Notes can contain note-link fields, which relate one note to other notes; you can also link notes to files.

Although Arrange's notes may sound similar to items in other PIMs, they're far more flexible. You can customize the number and type of fields on a note-by-note basis (for example, including e-mail fields for only those contacts who have e-mail addresses). Arrange also lets you create new note types, a feature that provides tremendous flexibility for power users and in-house developers, although it may seem

Appointment notes and Contacts topics to handle Person notes — any topic can contain any note types. You can display a topic's notes in list or outline form, arranging them hierarchically if you choose; you can also sort and filter the notes, saving useful filters as views that can be updated automatically or on command. Some topics come with predefined views, such as the calendar in the Schedule and Reminder topics.

Arrange normally uses a single window to display all of its information: A large area on the right displays the Topic view, and two panes on the left side of the window display an outline view of the topics in a file and a list of the note types in the current document.

Bonus Features

In addition to a predictably flexible import and export facility, Arrange provides Grabber, a control panel that's like a cross between the Clipboard and a screen-capture utility. You can bring it up in any Mac program to "clip" text and graphics and store them in an Arrange file — even when Arrange isn't running. These items go into a Clippings topic, from which you can move them to any other note or topic.

We were pleased to discover that Common Knowledge provides toll-free technical support in addition to several on-line addresses. We found its tech support accessible and useful. Arrange's documentation

is also accessible, providing both a tutorial and in-depth information.

PowerBook users will enjoy Arrange's light touch on the hard disk, although the program's recommended RAM allocation of 2.5 megabytes is a bit hefty. Arrange runs on any Mac using System 6.0.7 or later.

Mis-Arrangements

Although Arrange 1.1 is stable, it does have some shortcomings. For instance, it doesn't support phone numbers as a native field type or automated phone dialing (a standard feature in most PIMs). Automatic text formatting in fields is missing as well. In addition, although Arrange includes Reminder notes, it doesn't support alarms for them (or for any other notes).

We also felt that Arrange could use a tune-up. Although its occasional slowness is understandable, given the wide range of views and on-the-fly filters, there is clearly room for improvement. Fortunately, an upgrade, Arrange 1.5, should be shipping by the time you read this and will be available in a Power Mac version. Common Knowledge claims it will address the shortcomings noted here and add many new features

The Bottom Line

Providing outstanding flexibility and customizability, Arrange offers you a better way of handling your personal information — your way. As you might expect, taking advantage of Arrange's power does take some effort, but if you currently use several PIMs to build the collection of features you need (or if you can't find a PIM you like), that effort is well worth it.

With the more noteworthy missing features (such as phone dialing and alarms) expected to be added in version 1.5, along with a minor speed tune-up, Arrange could well become the best kind of PIM — the kind that people use. / Jeffrey Sullivan

Arrange 1.1

Rating: ★★★★★

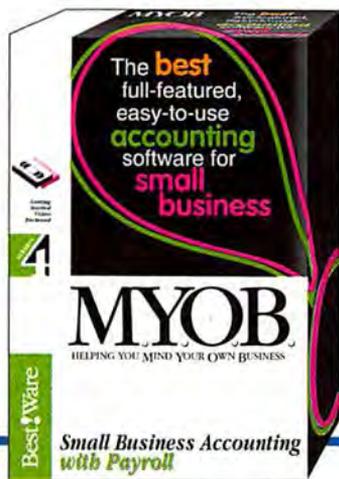
List Price: \$349.

Pros: Extremely flexible and customizable.

Cons: Lacks phone dialing, automatic field formatting, and alarms. Occasionally sluggish.

Company: Common Knowledge, Inc., Palo Alto, CA; 800-954-3800 or 415-325-9900.

Reader Service: Circle #406.



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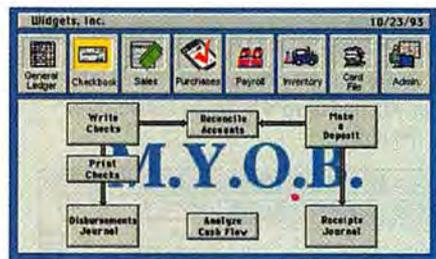
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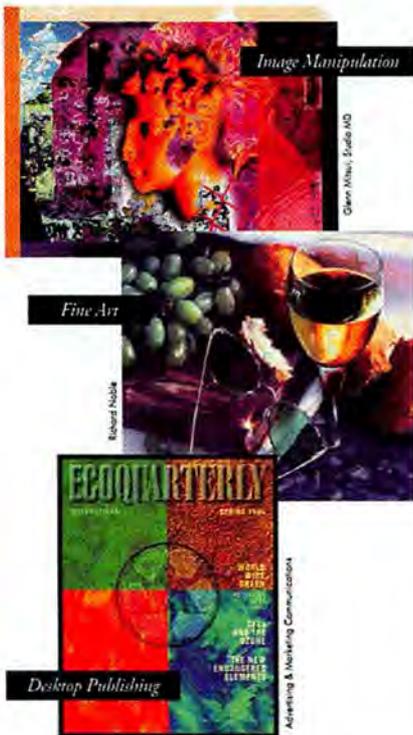


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CIRCLE 24 ON READER SERVICE CARD

wildcard searches from its standard entry box, but the other two require you to enter a command that brings up a dialog box.

All three dictionaries also let you search the entire contents of the dictionary, using keywords. The American Heritage and Random House let you build simple queries (the American Heritage also includes a scrolling list of categories you can use to narrow the search), and the OED comes with a full-blown query language.

Keyword searches can be time-consuming. A simple search to locate words with definitions containing *computer* and *person* took close to a minute and resulted in 34 entries with the American Heritage. The Random House found 73 entries but took more than four minutes. The OED retrieved 27 words in a blazing 15 seconds but required a formal query.

In fact, the OED's search capabilities are stunning in their speed and thoroughness but, like much of this lofty work, beyond the needs of most users. You can search the entire text of the dictionary or single out definitions, etymologies, or quotations. You can search by date, author, title, or parts of speech. You can even do proximity searches that retrieve all entries with definitions containing a specific word that occurs within 32 words of another. However, you can't do a comparative search without building a query — a time-consuming process.

Here's how it's done: First, you type your request, using the query language; save the query as a separate file; and choose the Run command. The manual warns that complex queries may take more than 15 minutes. Results are saved in a separate file. You can view, print, or use the resulting file to construct additional queries. Although the power of the OED's searches is manna for scholars, casual users are likely to find the query process cumbersome. Another drawback is the OED's unattractive and confusing interface.

Most features of the American Heritage and Random House dictionaries are self-explanatory. The Random House package doesn't even provide a manual, although its on-line help and Balloon Help is complete. The American Heritage teams on-line help and Balloon Help with a small but helpful 32-page manual. The OED comes with on-line help, a 100-page manual, and a 70-page guide to the dictionary.

The Bottom Line

An on-line dictionary is a handy reference for those who rely on their Macs as a primary writing tool. And with the recent explosion in CD-ROM titles and drives, it's more likely than ever that users will have the hardware required for CD-ROM-based reference works, such as the Random House Unabridged Dictionary and the OED.

Of the three on-line dictionaries reviewed here, the OED is the most remarkable and monumental, but its high price and unattractive interface limit its appeal.

For those who haven't purchased a CD-ROM drive, the floppy-disk-based Deluxe American Heritage Dictionary is a solid work that's extremely simple to use. It is also an ideal tool for PowerBook users. The CD-ROM-based Random House Unabridged Dictionary is more complete than the American Heritage, but its interface isn't as well designed. / Clay Andres

Deluxe American Heritage Dictionary, Third Edition

- Rating: ★★★★★
- List Price: \$129.
- Pros: Simple interface.
- Cons: Requires 14 megabytes of disk space.
- Company: Softkey International, Inc., Cambridge, MA; 617-494-1200.
- Reader Service: Circle #408.

Oxford English Dictionary (Second Edition) on CD-ROM

- Rating: ★★★
- List Price: \$895.
- Pros: Exhaustive content. Powerful search capabilities.
- Cons: Expensive. Confusing interface. Complex query language.
- Company: Oxford University Press, New York, NY; 800-451-7556 or 212-679-7300.
- Reader Service: Circle #409.

Random House Unabridged Dictionary, Second Edition

- Rating: ★★★★★
- List Price: CD-ROM, \$79; book, \$100; bundle, \$159.
- Pros: Comprehensive.
- Cons: Somewhat clumsy interface.
- Company: Random House Reference and Electronic Publishing, New York, NY; 800-733-3000 or 410-848-1900.
- Reader Service: Circle #410.



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Virtus WalkThrough Pro / Create explorable 3-D worlds enhanced with textures and QuickTime movies.

THE CREATION of easy-to-navigate 3-D worlds of virtual buildings and spaces has long been the forte of Virtus WalkThrough, which has gained a strong following with architects and filmmakers. Now, with Virtus WalkThrough Pro, you can add static as well as dynamic texture maps to those 3-D worlds. Plus, thanks to WalkThrough Pro's impressively fast rendering, you can explore these texture-enhanced worlds at a reasonable pace — and you'll be able to do so at real-time speed when Virtus releases the PowerPC version of the program, announced shortly before press time.

Making Worlds

WalkThrough Pro's working environment is fairly intuitive, even for users who aren't accustomed to working in a 3-D program (although basic 3-D skills help you get the most from the program). WalkThrough Pro's learning curve is relatively short compared to that of more-traditional 3-D tools, and the clear and informative documentation makes the process as painless as possible.

In WalkThrough Pro, you create virtual spaces consisting of objects — walls, floors,

complete with clearly arranged menus and tool palettes. The main tool palette changes options intelligently as you select windows. When you're in an object-editing window, you get tools for creating, editing, and adding textures to objects; when you're in the rendered Walk View window, the palette includes position and focal-length controls for the virtual camera.

WalkThrough Pro's tools for creating 3-D shapes and objects are more than adequate. Although they don't provide the flexibility of modeling options found in more-specialized modeling programs such as StrataVision 3d, they serve perfectly well for most architectural and space-design tasks. A variety of 2-D shape tools (circles, rectangles, polygons) and specialized extrusion tools (straight, rounded, pointed) makes it easy to create a wide array of 3-D shapes. Additional tools enable you to change shapes at the vertex level and slice chunks away from shapes to create asymmetrical forms. Surface-editing options let you add 2-D elements (such as doors and windows) to 3-D surfaces.

Although you cannot group objects hierarchically in WalkThrough Pro, the program's principle of containment makes grouping unnecessary in many cases: Objects placed inside a larger object (such as furniture inside a room) are instantly treated as "children" of the larger object — move the room, and the furniture follows. If you need complex objects that can't be created with the available tools, you can import DXF objects created in other 3-D-modeling applications.

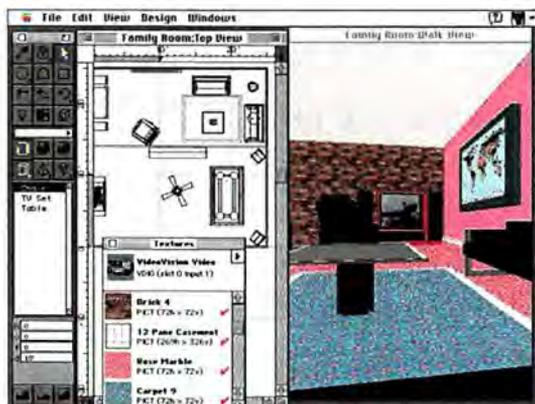
Textures and TVs

The main new feature that differentiates WalkThrough Pro from WalkThrough is the ability to apply bit-mapped texture maps

(PICT files) and QuickTime movies to objects in scenes. (The ability to take snapshots in TIFF and Illustrator formats is also new in WalkThrough Pro, but you can't apply images in these formats as textures.) The QuickTime option in particular opens up many new possibilities for making your model more dynamic — for example, showing a changing outdoor scene through a window or creating a virtual TV that plays a movie as you walk by it. WalkThrough Pro also supports direct digitization of Quick-



For your instant gratification, WalkThrough Pro comes with a large assortment of premade objects. To add an object to the current scene, you simply drag it from the Library window into the scene.



Bring your 3-D environment to life by applying live video or a QuickTime movie to one of the surfaces as a texture. WalkThrough Pro also lets you apply PICT textures.

windows, furniture, and more. You can assign textures to objects and place lights in and around them. When you're done, it's easy to take a 3-D walk through the design.

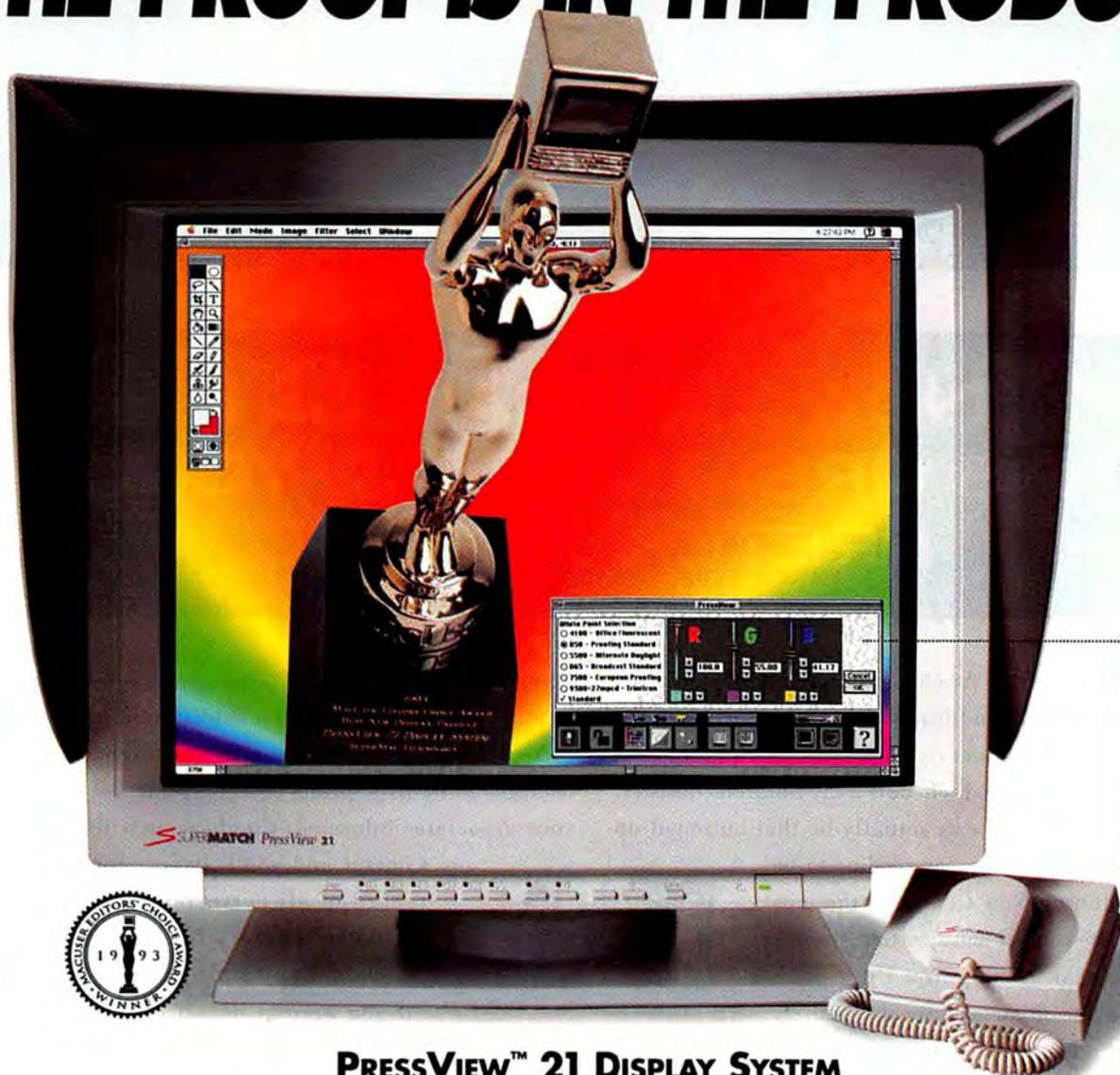
The program presents an uncluttered interface to help you perform these tasks,

Time via standard VDIG drivers (although this feature isn't mentioned in the manual), so you can pipe in video and play it on an object in real time.

The basic controls for mapping textures onto surfaces are not as sophisticated as we would like — they're not precise, and they lack visual cues for texture placement — but the speed at which the textures are rendered onto objects is just short of astounding. In our test with a Macintosh IIx, we were surprised at the decent playback speed of a QuickTime movie placed on a complex object.

The program comes with a workable set of sample textures from third-party texture vendors such as Form & Function and Pixar. When you combine these textures with all the sample items included with the software — everything from basic environments to complex architectural demos — plus extensive libraries of furniture and other objects, you can put a realistic-looking world together quickly. Objects can also be set to varying degrees of translucency, for making glass effects.

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Whizzing Through Space

Once all the elements of a scene are in place, you select the Walk View window and use the mouse to move forward, backward, right, and left through the 3-D space. By pressing Shift or Option while you move the mouse, you can look up or down, rise or sink, or slide or roll to the right or left — making it easy to turn your walk-through into a fly-through. You can set WalkThrough Pro to record your movement for playback within the program or save a tour to disk as a QuickTime movie — perfect for sending to people who don't own WalkThrough Pro.

Naturally, increasing the number and geometric complexity of objects decreases the rendering speed in the Walk View window, but it's generally no problem, because the speed is so good to begin with. Although Virtus recommends using a 68040 Mac for optimum speed, we had no problems navigating through some elaborate test environments on a Mac IIx, which is 68030-based. Virtus opts for speed over maximum visual quality; the visual quality of the rendering is good for the intended purpose but doesn't equal the quality you get with a dedicated Phong or ray-tracing renderer. If you need high-quality rendering, you can save WalkThrough Pro worlds as DXF files and render them with finer detail or smoother shading in an external rendering program such as Strata's StrataVision 3d or Specular International's Infini-D.

The Bottom Line

Architects and others who want to create easily tourable 3-D environments will find no competition for Virtus WalkThrough Pro. Decent performance, easy-to-use tools, and good support from a company committed to extending the usefulness and flexibility of its products make WalkThrough Pro a hands-down winner. / David Biedny

Virtus WalkThrough Pro 1.0

Rating: ★★★★★

List Price: \$395.

Pros: Fast rendering. Easy-to-use interface. PICT and QuickTime texture mapping. Variety of bundled object libraries.

Cons: Imprecise mapping controls.

Company: Virtus Corp., Cary, NC; 800-847-8871 or 919-467-9700.

Reader Service: Circle #411.

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CIRCLE 11 ON READER SERVICE CARD

CA-Cricket Presents III / Presentation software that doesn't dazzle but gets the job done.

BARGAIN HUNTERS looking for an inexpensive presentation-software package may find what they need in CA-Cricket Presents III. At \$129, it's less than half the price of Microsoft PowerPoint or Aldus Persuasion. But you get what you pay for — Presents III is tailored for entry-level users who are willing to forgo many of the slick presentation

importing data from a spreadsheet.

A document in Presents III comprises frames, each of which represents a slide in your presentation. Like most other presentation-software packages, Presents III lets you produce a self-running full-screen slide show, complete with transitional effects. In addition, you can create speaker notes and

handouts based on each frame. The program also lets you export your presentation as a QuickTime movie for use in other applications.

To create a presentation, you begin by either typing text directly into individual frames or importing text, graphics, movies, and sounds created in other applications. The program imports files in AIFF, EPS, MacPaint, PICT, QuickTime, Scrap-

book, and resource SYLK, and text formats.

You can also create text for your presentation with the Dyno NotePad DA, a basic outliner from Portfolio Software that ships with Presents III. As you create your outline, Dyno NotePad lets you expand and collapse topics and subtopics and drag them into the order you want.

Once you've created your presentation in outline form, it's easy to convert it to slides by using the Auto Presents command. Presents III grabs all the topics and subtopics in your outline and automatically inserts them into the proper slides. Although the Dyno

NotePad outliner is competent, it's not as convenient to use as the built-in outliners in Persuasion and PowerPoint.

Whether you use the Auto Presents command or not, you can format a presentation quickly by applying one of the 72 templates included with the package. Presents III templates add decorative frames and flourishes to your presentations, but overall, we found them fairly unimpressive. Most are very plain 2-D designs, and they can be awkward to work with. If you decide to switch templates after you've already applied one to a series of frames, for example, you must manually delete each element of the old template.

Show Time

When you're ready to show the finished presentation, you can set Presents III to play slides automatically, moving from slide to slide at intervals you specify. You can also opt to advance slides manually with a mouse click.

Presents III provides 14 transition effects, but we found most of them disappointing. Overall, they lack elegance and polish. The dissolve, for example, is not smooth and cinematic. What's more, you are unable to control the speed of the transitions, so you can't create a slow dissolve or a fast wipe.

Presents III lacks a few other features that would be useful in building eye-catching slide presentations. It doesn't have automatic-drop-shadow or bulleted-text options. Also, you can't create builds within a single slide (builds are a common presentation technique for creating titles and subtitles that pop into place in sequence). You can apply gradients to frame backgrounds, but the gradients are limited to two colors. And, unlike PowerPoint, Presents III doesn't



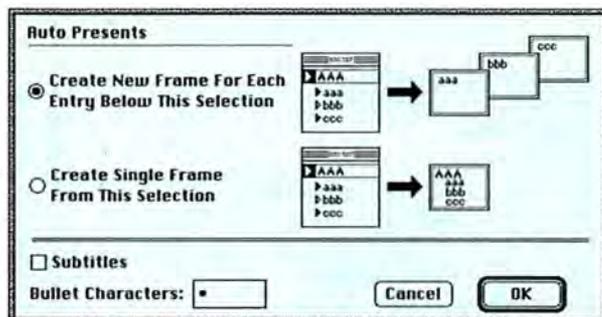
The inexpensive CA-Cricket Presents III delivers all the basics for creating business presentations, but its templates (such as the one shown here) are a disappointment.

features found in the more expensive presentation-software packages.

Sound Features

CA-Cricket Presents III may be a no-frills package, but you'll be equipped with all the basic tools you need in order to create an effective presentation with a minimum of fuss. And some of the program's features are surprisingly powerful. For example, Presents III lets you add sounds in snd and AIFF formats to individual slides — a feature both PowerPoint 3.0 and Persuasion 2.1 lack. The latter programs let you add sounds only after you've recorded them in QuickTime format.

Other strong points are Presents III's support for QuickTime, so you can add movies to slides, and typographical tools that enable you to fine-tune text in a variety of ways, including by kerning. You can also generate eight types of 3-D charts by entering data directly into a Presents III table or



With the Auto Presents command, CA-Cricket Presents III automatically transforms an outline into a series of slides.

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CIRCLE 82 ON READER SERVICE CARD

support the use of path-based animation, so you can't create titles that appear to fly in from off-screen.

Limited Playback

Although you can add prerecorded sound to presentations as well as record sounds directly, Presents III's playback capabilities are limited. You can't have an extended sound — a piece of background music, for example — play back for more than a single slide. You also can't make a sound loop within a single slide, and you can't play back more than two sounds at a time. As for QuickTime, you can include imported movies in frames, but you can't make a movie loop within a single slide or set a movie to play on demand.

Several interface flaws detract from Presents III's overall ease of use. The magnification tool, for example, lets you zoom in and out, but the program doesn't tell you the level of your current magnification, which can make it hard to gauge the size of objects and text. Also, you can work in the black-and-white Sketch Display mode, which speeds screen redraw, but you must turn this feature off every time you want to play back a piece of your presentation.

A plus for entry-level users is Presents III's excellent on-line help, which provides step-by-step instructions for each command. The Presents III package comes with three disks of clip art and a handful of music clips you can add to the slides you create.

The Bottom Line

The presentations you create with CA-Cricket Presents III won't dazzle audiences, but the program is a solid value if you require only the basics in a presentation-software package. It's straightforward, effective, and easy to learn. / Joseph Schorr

CA-Cricket Presents III 1.0

Rating: 

List Price: \$129.

Pros: Inexpensive. Supports QuickTime and snd-resource and AIFF files. Easy to learn.

Cons: Can't create builds. Lackluster transition effects and templates. No built-in outliner.

Company: Computer Associates, Islandia, NY; 800-255-5224 or 516-342-5224.

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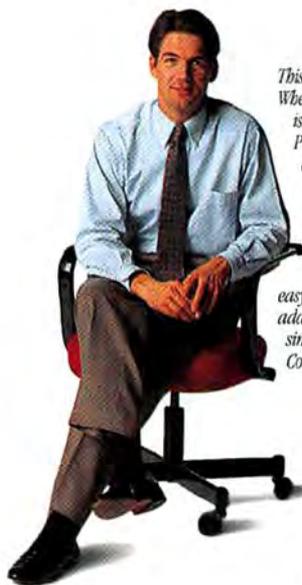
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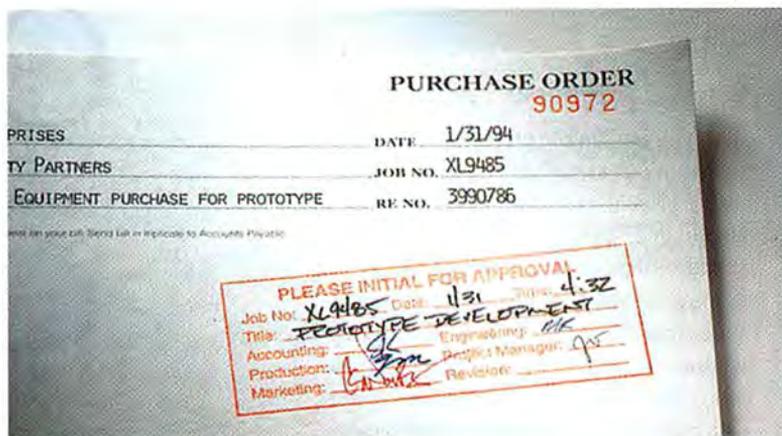
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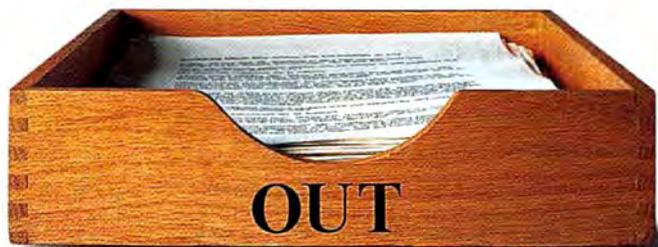
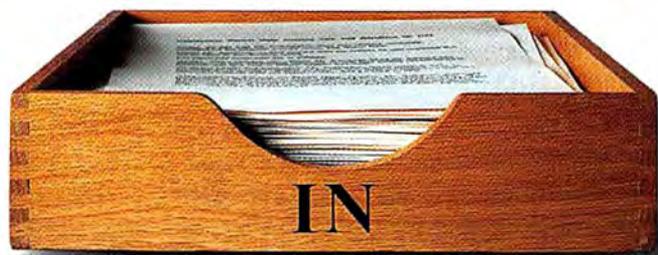
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PowerTalk comes standard with System 7 Pro. PowerShare Collaboration Servers software is available separately.

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PowerBook File Assistant / Simple file syncing and system tweaks

ONE OF APPLE'S FIRST FORAYS into the software-utilities market, PowerBook File Assistant is a low-end file synchronizer accompanied by a few extra utilities from System SoftwareLand.

Just the Basics. "Low end" is not a put-down here; it merely means you won't have a lot of choices when you're setting up links between folders and files on your PowerBook and their counterparts on your desktop machine. A full-fledged file-syncing program such as PowerMerge or FileRunner lets you work with sets of files specified by sophisticated rules — for example, "Everything in this folder except for files whose names include Copy." In contrast, low-end utilities match up specific files or entire folders unconditionally.

File Assistant has an impressively neat interface for performing all the basic file-syncing tasks. You indicate which folder on one disk should be

matched with which folder on the other disk, set the link for either or for both directions, and let it go. If you install File Assistant's Finder replacement (version 7.1.1), you can set up links just by dragging the appropriate folders into the File Assistant window.

While syncing files, the program notifies you if a file has been modified on both disks since the last sync; it also asks whether you want files deleted from one folder if they've been deleted from the other. File Assistant is also smarter than the Finder about replacing a file with one of the same name if they have different creation dates — it doesn't do it, on the assumption that they're not the same file. File Assistant's one minor flaw is that it's too easy to set the syncing process in motion; you just click on the arrow between two files you've linked — right near where you click to select the linked pair for editing.

Bonus Extras. The File Assistant package includes several small extras. There's a cursor finder and thickener plus keyboard commands for putting the drive and the system to sleep. You also get three mildly tweaked System 7.1 control panels: PowerBook Display, for screen dimming; the AutoRemounter, which works even on the 140 and 170 models; and a Memory control panel that provides a "persistent" RAM disk that's rebuilt automatically after a shutdown.

For those who don't need sophisticated controls over file syncing, File Assistant is the best low-end option around. And it's obviously an Apple product — not because you get system software but because the multilanguage licensing agreement is longer than the documentation. / Sharon Zardetto Aker

PowerBook File Assistant 1.0 / List Price: \$79. Company: Apple Computer, Cupertino, CA; 800-538-9696 or 408-996-1010. Reader Service: Circle #413.

Jump Raven / Futuristic CD-ROM adventure

ECO-WARRIORS WHO HAVE CD-ROM DRIVES will jump at the chance to play Jump Raven, a CD-ROM game from CyberFlix that combines arcade action, crisp graphics, and an ecologically conscious plot to create a fast-paced, futuristic adventure.

Diabolical DNA Heists. In a world reminiscent of the film *Blade Runner*, terrorists are capturing the valuable DNA of extinct species. As

Jump Raven, a renegade hovercraft pilot, you must rescue the samples by battling the terrorists and searching the streets. The animation that pulls you into the story has a smooth, dark, futuristic feel, and the characters you encounter along the way add a comical touch to the arcade action.

Weapons and Wisecracks. The game's help function clues you in on how to proceed. You can select your weaponry, background music (grunge, hip-hop, techno, or metal), and copilot (the choices range from a wisecracking Eddie Murphy type to a Valley girl straight from Moon Zappa land).

Some players may be annoyed that Jump Raven requires about 10 megabytes of hard-disk space (into which some of the game is offloaded to provide a faster data path) or that it's not particularly P.C. (attaining biodiversity through violence?). What Jump Raven lacks in political correctness, however, it makes up for in humor and pizzazz. / Roman Victor Loyola

Jump Raven 1.0 / List Price: \$69.95. Company: CyberFlix, Knoxville, TN; 615-546-1157. Reader Service: Circle #414.



Xplora 1 / Playing in Peter's world

GIVEN HIS EARLY adoption of video as a creative tool, it's no surprise that Peter Gabriel is one of the first musicians to embrace interactive forms. Xplora 1, a new CD-ROM produced by Brilliant Media

and Real World Multimedia, provides access to music and videos from Gabriel's album *US*, a Gabriel discography with sound clips, a world-music sampler, a behind-the-scenes look at Gabriel's Real World Studios, and much more.

Content over Form. The most-interactive elements in Xplora 1 — which include pluckable musical instruments, a mixing board that lets you mix your own version of "Digging in the Dirt" (but that you can't operate two-handed), and some simple puzzles (assembling Gabriel's face, searching for backstage passes) — are interesting but not groundbreaking. More compelling to us was the QuickTime content, including innovative videos for songs such as "Steam" and "Kiss That Frog" and interviews with the directors.

Click Those Lips. The interface, although visually stunning, provides far too little navigational aid. There's no main map, no index, and no help function besides the Gabriel head that pops up occasionally to say such things as "Just click your mouse." It's hard to remember that, for instance, the dark-blue square takes you to Gabriel's face and the lips take you to the *US* videos.

Although Xplora 1's creators haven't perfected the art of interactivity, they've made an intriguing start. Gabriel fans, world-music buffs, and anyone who appreciates artfully made videos will enjoy this CD-ROM. / Karen J. Ohlson

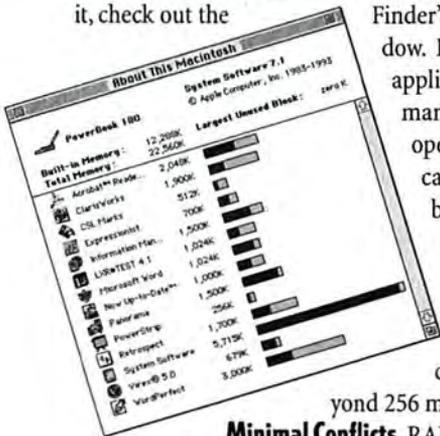
Xplora 1 1.0 / List Price: \$59.95. Company: Interplay Productions, Inc., Irvine, CA; 800-736-5738 or 714-553-6655. Reader Service: Circle #415.

RAM Doubler / The name says it all

WHEN A CLAIM SEEMS too good to be true, it probably isn't. Or so we thought before we tried RAM Doubler, an inexpensive software utility that claimed it would double our RAM with no significant loss in performance — and actually did so.

As Easy as Pie. Run RAM Doubler's one-step Installer and restart, and — presto — your RAM is exactly doubled. If you don't believe it, check out the

Finder's About This Macintosh window. Even better, start launching applications and discover how many more you can now keep open simultaneously. Only two caveats apply to the RAM doubling: You must have 32-bit addressing turned on for your doubled RAM to exceed 16 megabytes, and RAM Doubler can't increase your doubled RAM beyond 256 megabytes.



Minimal Conflicts. RAM Doubler is compatible with all 68030 and 68040 Macs — including PowerBooks — that have at least 4 megabytes of RAM originally. And more important, it probably won't cause conflicts with your other software. True, it does have some problems with Photoshop and a few other programs that use nonstandard methods of memory management. We know of a

few control panels that don't work with RAM Doubler. And we (as well as some other users we contacted) had occasional system crashes that were apparently related to using the program. Still, such problems are definitely rare. Usually RAM Doubler works wonderfully; many users have reported no problems at all. In terms of both compatibility and simplicity, RAM Doubler far outdistances OptiMem, a competing memory-enhancing utility.

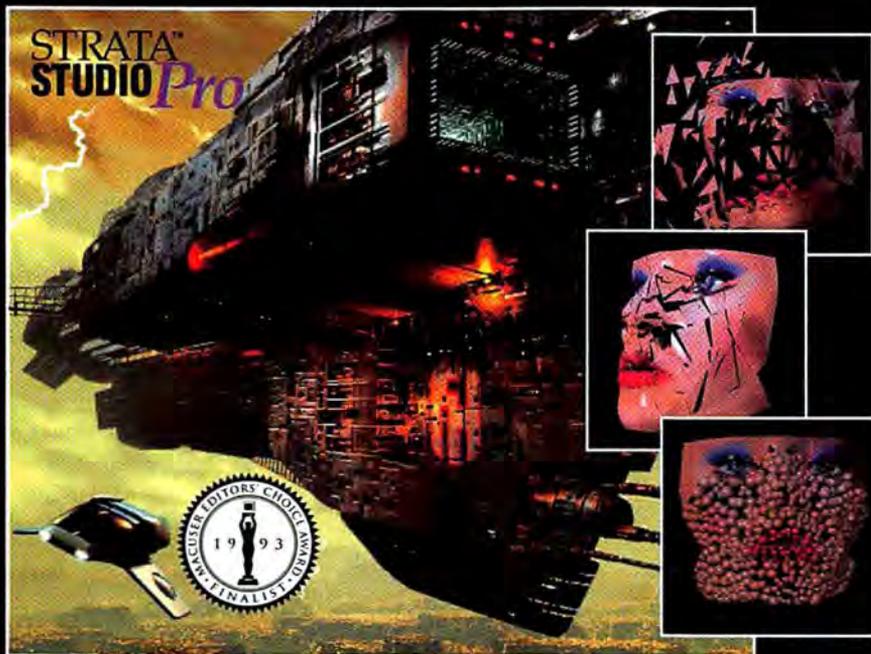
Pushing the Limits. RAM Doubler had almost no perceptible effect on the speed of the Macs we tested, except when we opened enough applications to approach the limits of the available RAM after doubling. At this point, applications often took at least twice as long as usual to launch. Display redraw also slowed down, but not enough to be more than a minor inconvenience in most cases.

How It Works. RAM Doubler accomplishes its magic through a combination of methods: reclaiming unused memory assigned to applications; compressing information in memory; and if all else fails, swapping to the disk (although this should occur only rarely if you have at least 8 megabytes of undoubled RAM). Thus, RAM Doubler doesn't require the hefty amount of disk space that System 7's virtual memory does. And RAM Doubler works with System 6 as well as with System 7.

Overall, RAM Doubler is a spectacular success. If you need more RAM (and who doesn't?), RAM Doubler may well be the best investment you'll make this year. / Ted Landau

RAM Doubler 1.0 ★★★★★ / List Price: \$99. Company: Connectix Corp., San Mateo, CA; 800-950-5880 or 415-571-5100. Reader Service: Circle #416.

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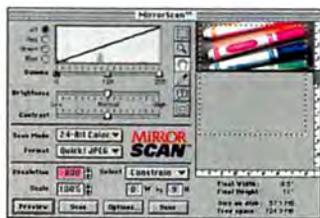
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Macworld
July 1993
Full-page Display

Portrait displays have long been a favorite of desktop publishers and writers, but until now, you were limited to monochrome. The new Mirror Color Portrait Display is the result of countless requests for an affordable color monitor that could display an entire page. It works with the built-in video of newer Macs, as well as many standard video boards (including the Mirror Tornado board, of course.)

Colorful Value

The Mirror Display line also includes our best-selling 14, 16, & 20-inch Color models, and our standard-setting 15 & 19-inch monochrome displays. Models are available for most Macs.



MacUser
February 1994
16-Inch Trinitron

Big Color Performance

If you use a Macintosh for design, illustration or image-processing, the new Mirror 21-inch Color display is for you. It's brilliant color, superb sharpness and 1152x 870 resolution will satisfy the most demanding user, and it's low price make it irresistible. This display actually puts itself into low-power "sleep" mode when there is no user present!



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MacUser
July 1993



Two Page Display Full Page Display

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Media: MRMR0694

MacUser**Labs**

Big-Screen Bargains

There's never been a better time to move up to a full-sized monitor — and there's never been a more exhaustive evaluation of your choices than this report.

By Katie Barnes and Brian Fikes

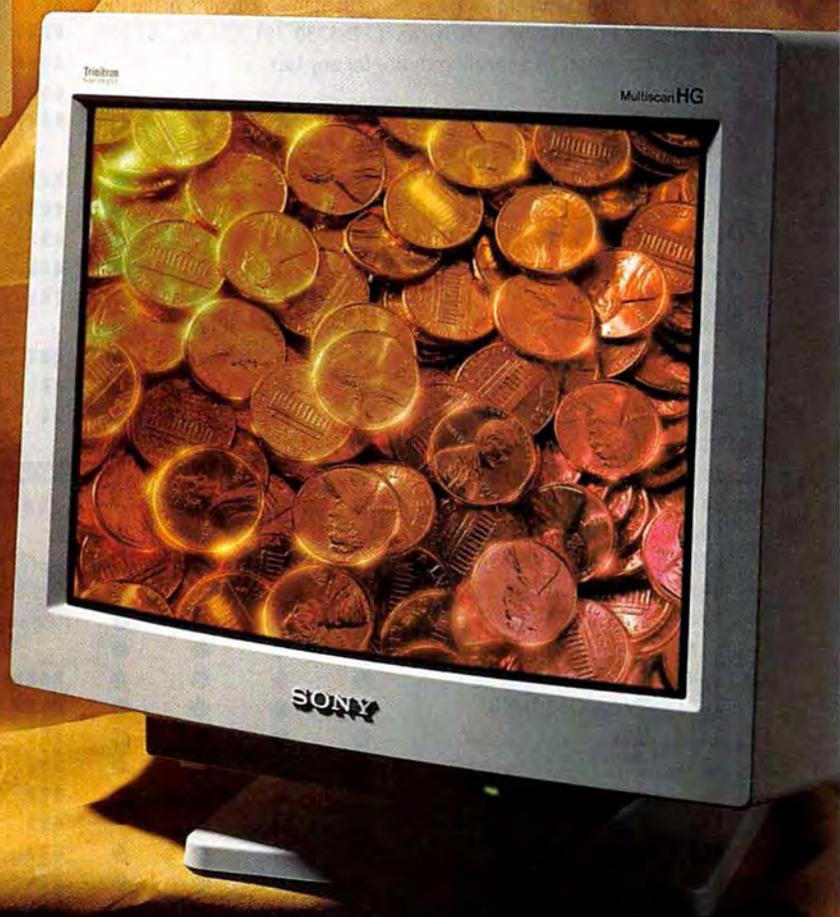
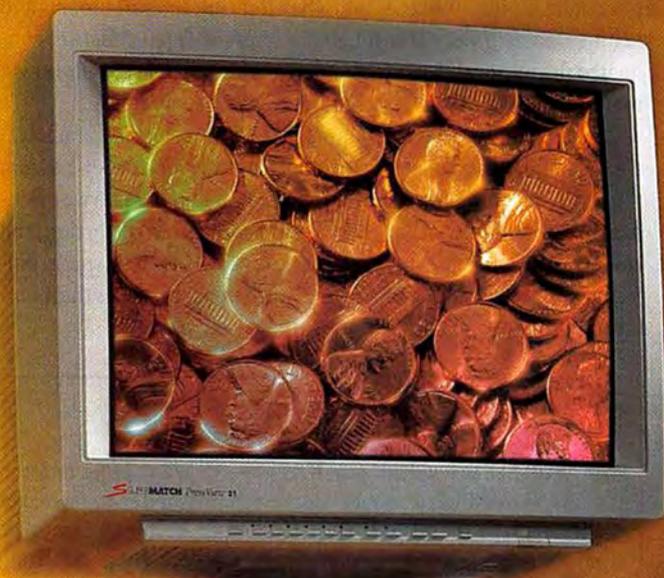
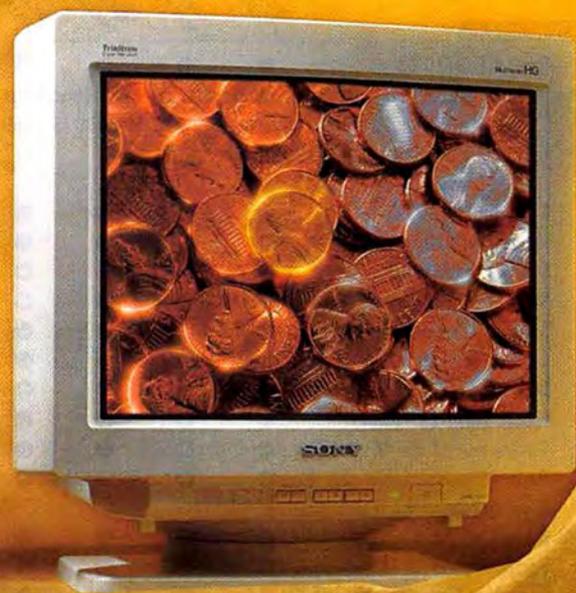
IF YOUR MAC MONITOR IS CRAMPING YOUR STYLE, you're not alone: Many users are moving up to bigger screens. A recent *MacUser* survey discovered that this year more users plan to invest in large-screen monitors than in the familiar 14-inch standard size.

If you're a business user, a single step up — to a 16-inch monitor — will ease that crowded feeling. But if you're a desktop publisher or graphics professional, 16 inches is still cramped — you need more room for full-page layouts and expansive Photoshop images. It may be time for you to roar into the twenties — 20- and 21-inch monitors, that is.

The news is good for Mac users looking to move up to bigger monitors: Large-screen monitors have improved in quality and dropped in price considerably in recent years. Today you can buy a high-quality 17-inch monitor for what a comparable 13-inch monitor cost just a year or two ago.

What's more, most of today's monitors are *autosynchronous* — they support multiple resolutions and work with PCs as well as Macs — good news for mixed-platform workgroups that need to standardize on one monitor. Many also offer digital controls that “remember” your settings for each resolution.

As larger monitors increase in popularity, more and more monitor vendors



COLOR MONITORS

are jumping on the Mac-monitor bandwagon. The result is lower prices and better service — and a bewildering array of models and features. To help you cut through the forest of detail, *MacUser* conducted the most extensive evaluation of Mac-capable monitors ever undertaken, evaluating 57 monitors from 23 companies.

ZD Labs' advanced test equipment — spot meters, color analyzers, and emissions detectors — enabled us to separate the best from the rest. Our testing concentrated on image quality, which we evaluated in terms of focus, sharpness, and freedom from distortion, and color quality, which we measured in terms of brightness, spatial uniformity, and color range and tracking (the number of shades the monitor can produce and the accuracy with which it does so).

We also looked for useful, easy-to-use controls; clear, thorough documentation; frugal power use; low electrical and magnetic emissions; and a firm's dedication to customer satisfaction.

One Size Doesn't Fit All

If extra maneuvering room is the chief reason to buy a bigger monitor, logic dictates that everyone's ideal should be a panoramic 21-inch model, right? Well, not exactly: The best screen size for you depends on the kind of work you do, how much cash you're willing to part with, and even how much room you have on your desk.

A spacious, 20- or 21-inch display is optimal if you do desktop publishing or graphics work and need to view large page spreads.

The Bottom Line

WHAT YOU SEE ON-SCREEN MATTERS more than any other factor in choosing a color display, so our evaluation emphasized image and color quality. We also considered value, ease of use, power consumption, electromagnetic emissions, and customer service before selecting three favorites from this impressive field.

- ⊕ = OUTSTANDING
- = ACCEPTABLE
- ⊖ = POOR

16- AND 17-INCH MONITORS

★★★★★ **Sony Multiscan CPD-1730** ⊕ ● ⊕ ⊕
Outstanding value and excellent image quality make the 17-inch Sony Multiscan CPD-1730 (\$1,329 list, \$1,100 street) an appealing choice for any task.

	PRICE/ PERFORMANCE	CUSTOMER SERVICE	IMAGE QUALITY	COLOR QUALITY
★★★★★ Mitsubishi Diamond Pro 17	●	●	●	⊕
★★★★★ Nanao FlexScan T560i	●	⊕	⊕	●
★★★★★ NEC MultiSync 5FGe	●	⊕	●	●
★★★★★ NEC MultiSync 5FGp	●	⊕	⊕	●
★★★★★ Nokia Multigraph 447B	●	●	⊕	●
★★★★★ RasterOps Sweet 16	●	⊕	●	●
★★★★★ Altima V-Scan 70	●	●	●	●
★★★★★ E-Machines T16 II	●	●	●	●
★★★★★ Mag InnoVision DX-17F	⊕	●	●	●
★★★★★ Mirror 16" Trinitron	●	●	●	●
★★★★★ Mitsubishi Diamond Scan 16	●	●	●	●
★★★★★ Nanao FlexScan F550i	●	⊕	●	⊖
★★★★★ Nanao FlexScan F550iW	●	⊕	●	●
★★★★★ Nanao FlexScan F560iW	●	⊕	⊕	⊖
★★★★★ Philips Brilliance 1720	●	●	●	●
★★★★★ Relisys VividView 16	⊕	●	●	⊖
★★★★★ Sampo AlphaScan 17e	⊕	⊖	●	●
★★★★★ Sceptre P766D	⊕	⊖	●	●
★★★★★ Sigma ErgoView 17	●	●	●	●
★★★★★ Sony Multiscan 17se	●	●	●	●
★★★★★ Tatung CM-17MBD	●	●	●	●
★★★★★ ViewSonic 17	●	●	●	⊕
★★★★★ CTX 1760LR	●	⊖	●	●
★★★★★ Ikegami CT-17A	⊖	●	●	●
★★★★★ Mitsubishi Diamond Scan 17FS	●	⊕	●	⊖
★★★★★ Orchestra Tuba	⊕	⊖	●	●
★★★★★ SuperMac SuperMatch 17•T	●	●	●	●

Listing is alphabetical within groups of equal mouse ratings.

20-INCH MONITORS

★★★★★ **Sony GDM-2038** ● ● ⊕ ⊕
Low emissions and good image quality (excellent focus and bright, vivid color) make the Sony GDM-2038 (\$2,859 list, \$2,310 street) a top 20-inch monitor.

	PRICE/ PERFORMANCE	CUSTOMER SERVICE	IMAGE QUALITY	COLOR QUALITY
★★★★★ E-Machines E20	⊕	●	●	●
★★★★★ Ikegami CN-20A	⊕	⊖	⊕	●
★★★★★ Sigma ErgoView 20	●	●	●	⊕
★★★★★ Sony GDM-2036S	●	●	●	⊕
★★★★★ SuperMac SuperMatch 20 Plus	⊕	●	●	●
★★★★★ E-Machines T20	●	●	●	●
★★★★★ Ikegami CT-20D Maxi-Sync	●	⊖	●	⊕
★★★★★ Nanao FlexScan T660i	●	⊕	●	●
★★★★★ Radius IntelliColor Display/20	●	⊕	●	●
★★★★★ Radius PrecisionColor Display/20v	⊕	●	⊖	⊕
★★★★★ RasterOps 20T Multiscan	●	⊕	●	●
★★★★★ Sampo AlphaScan LE	⊕	⊖	●	●
★★★★★ SuperMac SuperMatch 20•T XL	●	⊕	●	●
★★★★★ Ikegami CT-20HB	●	⊖	●	●
★★★★★ Mitsubishi Diamond Scan 20 Plus	●	⊕	●	⊖
★★★★★ RasterOps 20/20 Multimode	●	⊕	●	⊖
★★★★★ Sampo AlphaScan LC 20"	⊕	⊖	⊖	⊖
★★★★★ Ikegami CT-20A Maxi-Sync	⊖	⊖	⊖	●

21-INCH MONITORS

★★★★★ **SuperMac SuperMatch PressView 21** ● ⊕ ⊕ ⊕
Abundant features and good image quality make the SuperMac SuperMatch PressView 21 (\$3,999 list, \$2,370 street) great for graphics and publishing pros.

★★★★★ Nanao FlexScan F760iW	●	⊕	●	⊕
★★★★★ Nanao FlexScan F780iW	●	⊕	⊕	●
★★★★★ IBM 21P	●	⊕	●	●
★★★★★ Mitsubishi Diamond Pro 21T	●	⊕	●	●
★★★★★ Nokia Multigraph 445M	●	●	●	●
★★★★★ Nokia Multigraph 445X	⊖	●	●	●
★★★★★ RasterOps 21" Color Display	●	●	●	●
★★★★★ ViewSonic 21	●	●	●	●
★★★★★ NEC MultiSync 6FGp	⊖	⊕	⊖	●

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really only
two reasons
to buy
your next
workgroup
printer
from Apple.

It does more.

It's economical. In keeping with the EPA's Energy Star program, the LaserWriter Select 360 seriously cuts energy waste. In its "sleep" mode, it automatically reduces energy consumption by as much as 78%.

It's precise. The new LaserWriter Select 360 can turn out graphics and text with 600-dots-per-inch clarity. So photographs are sharp, and even the smallest legal type is crisp and legible.

It's award-winning. The April 1994 Macworld just gave the LaserWriter Select 360 its highest rating. Cited as pros for the printer were its "excellent performance" and "low cost." Cited as cons: "None."



Macworld, April 1994



MacUser, April 1994

It's fax-capable. With the Adobe PostScript Fax option, any Mac® or PC user on the network can send a fax. It's as easy as printing. And because it's PostScript, the quality of the fax is distinctly improved, even when it's sent to a regular fax machine. You can receive faxes at the printer, too.



The feature-packed LaserWriter Select™ 360.

It's compatible. The LaserWriter Select 360 works in Macintosh or Windows environments — or both simultaneously. It switches automatically between PCL 5 and Adobe® PostScript™ Level 2 jobs, so users never have to think about reconfiguring.

It's flexible. Two paper trays (250-sheet letter-size and 50-sheet multipurpose) make printing first-page letterheads simple. Plus, you've got options for 250- and 500-sheet trays, as well as a 30-envelope cassette.

It's fast. With a RISC processor at its heart, the LaserWriter Select 360 prints up to 10 pages per minute — faster than the Hewlett-Packard LaserJet 4M, whether you're printing simple Macintosh® text or complex gray-scale documents.*

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TO: Staff
FROM: Ernesto Sunico
DATE: October 23, 1993

NEW EMPLOYEES



LINDA LANGE

Linda is from, believe it or not, Newton and Sanborn, she's moving from our 23rd floor of our building. So Linda's been her riding up in the elevator and wondering why we did it's introduce her before, it's because she was one of Pippin's LL, where she inspired her AISA. She will be joining our the bank to all stars of our "Top You Later" people.

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But if you work in 24-bit-color mode (millions of colors) and don't have a fully loaded Power Mac 8100/80, you'll need to buy a video card to drive a display of that size (see the "Pick a Card" sidebar).

A 16- or 17-inch monitor will serve you well if you spend your day writing proposals or crunching spreadsheet data. Also, if you're doing newsletter-scale publishing work or you want millions of colors from a Mac Quadra 700 or better without incurring the expense of a video card, a 16- or 17-inch monitor should do just fine.

Incidentally, the video-tube sizes for 16- and 17-inch monitors are identical and the monitors have a comparable usable display area (the part of the screen that lights up and displays an image); as vendors roll out new versions of their 16-inch models, many are rechristening them 17-inch units — they aren't really growing, they're just being *called* bigger.

Looking Good

Once you've decided on your monitor's size, your main concern should be how easy the monitor is on your eyes. To evaluate the monitors accordingly, we measured each monitor's geometry with a Microvision SpotSeeker III spot meter, an instrument that can sense deviations of as little as one mil — or a thousandth of an inch — and used a second instrument, a Minolta Color Analyzer CA-100, to measure color quality. Monitors were tested at one of three standard Mac resolutions, or *pixel dimensions* (the number of pixels displayed horizontally and vertically on the screen): 832 x 624 pixels for 16- and 17-inch models, 1,024 x 768 pixels for 20-inch models, and 1,152 x 870 pixels for 21-inch models.

Sharp Focus

If you work at your Mac for hours at a time, good monitor image quality is essential. For business professionals, this means crisp text and easily readable numbers, even at small type sizes. For graphic artists and desktop publishers, it means well-defined line art and photo images. For every user, it means less eyestrain and fewer headaches.

The most important indicator of focus is modulation transfer function, or MTF (see the "Closer Look" sidebar). MTF, which is expressed as a percentage, rates a monitor's ability to accurately represent 1-pixel-wide alternating black and white lines. The higher the percentage, the better the monitor's ability to distinguish fine details. A score of 50 percent or higher is considered acceptable, and more than half the monitors tested made the grade.

The 17-inch Nanao FlexScan T560i had the best overall MTF score, at 66 percent. Among the 20- and 21-inch monitors, the Nanao FlexScan F780iW was the top performer. The NEC MultiSync 6FGp and the Sampo AlphaScan LC 20", with MTF scores under 35 percent, might make you reach for the aspirin.

Misconvergence and pincushioning are less important than MTF, but both also influence image quality. Misconvergence results from misalignment of a color display's red, green, and blue electron guns and can manifest itself as bright *halos* at the edges of on-screen objects. Misconvergence is usually most apparent at the corners of a display, where proper gun alignment is most difficult to achieve.

All the monitors turned in acceptable misconvergence scores (see the "Closer Look" sidebar), but those monitors with the highest degree of misconvergence — especially the Radius PrecisionColor

Trends / *higher resolution, more control*

EVEN AS THEY DROP IN PRICE, Mac color monitors are growing more versatile and economical — and their features are becoming easier to use.

Super resolution comes to the Mac. Super resolution (1,600 x 1,200 pixels) has reached the Mac, with the new Thunder II GX-1600 video card (\$3,999), from SuperMac. The 12-inch NuBus card supports 24-bit color on *super-res* displays. Not coincidentally, SuperMac recently introduced its own super-res monitor, the SuperMatch 21-T XL.

Power management is becoming a monitor must. Apple's recently announced Multiple Scan 17 and Multiple Scan 20 monitors come with a programmable Energy Saver control panel, which lets Power Macs and Mac LC IIIs or later power down the monitor after a period of CPU inactivity.

Nanao's newest monitors snooze by means of a special version of Berkeley Systems' After Dark screen saver (free by mail from Nanao to registered Mac users). The 1,600-x-1,200-pixel VisionMaster 21 line of monitors, from IDEK (215-957-6543), uses an infrared motion sensor: When the operator is away, the monitor naps.

Monitor controls gain flexibility and ease of use. Apple's new Multiple Scan monitors include a revamped Monitors control panel that lets you switch resolutions without restarting; look for compatibility with future third-party monitors.

Nokia's latest Multigraph models — the 21-inch 445M and the 17-inch 447X — let you adjust more than 19 settings with just four buttons, via a scrolling on-screen menu stored in the monitor's ROM. IDEK's VisionMaster Pro 21 offers a palm-sized remote control that adjusts 27 monitor settings. / Patty Ames

Display/20v, with an overall error of 9.6 mils — approach most users' irritation thresholds. The top performer was the 17-inch Sony Multiscan CPD-1730; the 20-inch Ikegami CN-20A and the 21-inch SuperMac SuperMatch PressView 21 were also outstanding.

Pincushioning is distortion that appears as the bowing or curving of straight lines — especially at the edges of on-screen images. To find out which monitor displayed the squarest squares, we measured the aggregate pincushioning of three horizontal and three vertical lines on each screen. Normally, pincushion errors are not noticeable until they exceed 15 mils; a deviation as high as 30 mils is considered tolerable. Almost all the monitors we tested fell well within the acceptable range for pincushioning, and the rock-solid 17-inch NEC MultiSync 5FGp had by far the best results.

Misconvergence and pincushioning tend to increase with monitor size and can also increase over the life of your monitor, so look for controls that let you compensate for these problems, especially on a 20- or 21-inch monitor.

Color Quality

The most important components of good color quality are a screen's maximum usable brightness, the uniformity of that brightness across the screen, and color tracking — the precision with which the monitor represents successive shades in the color spectrum.

All aspects of color quality are extremely important if you're a graphics pro or a desktop publisher, but if you're a general business user, color range and tracking are less crucial. However, keep your

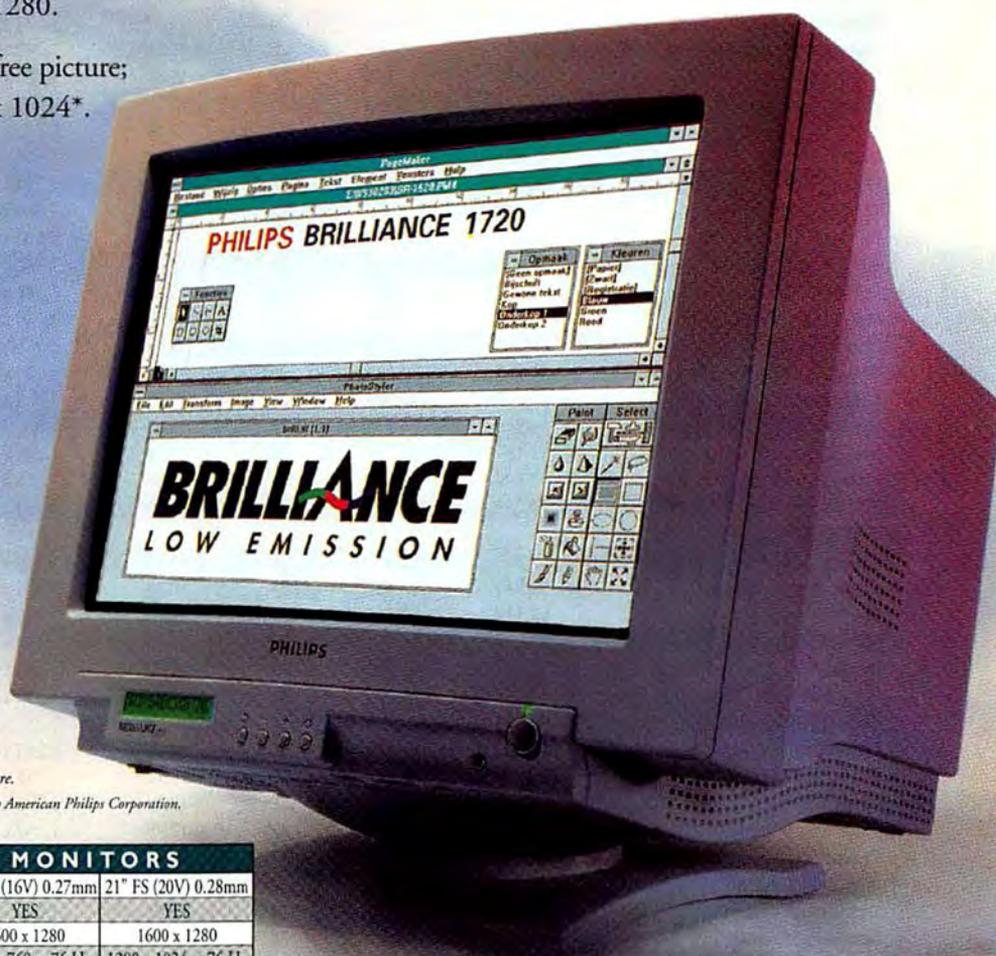
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- High resolution up to 1600 x 1280.
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- Flat square screen with fine 0.27 dot pitch.
- EBU phosphor screen displays realistic, brilliant colors.
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- Low emissions comply with MPR-2 standards.

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*Actual refresh rates may vary by video controller and/or software.

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PHILIPS BRILLIANCE MONITORS			
CRT	15" FS (14V) 0.28mm	17" FS (16V) 0.27mm	21" FS (20V) 0.28mm
MPR-2 VLF/ELF	YES	YES	YES
MAX. RESOLUTION	1024 x 768	1600 x 1280	1600 x 1280
OPTIMUM RESOLUTION	800 x 600 at 75 Hz	1024 x 768 at 76 Hz	1280 x 1024 at 76 Hz
MAC RESOLUTION	832 x 624 at 75 Hz	1024 x 768 at 75 Hz	1152 x 870 at 75 Hz
DOT RATE	75 MHz	135 MHz	150 MHz
SCAN RATE (H)	30-58 KHz	30-82 KHz	30-82 KHz
SCAN RATE (V)	50-100 Hz	50-120 Hz	50-160 Hz
AUDIO INPUT	YES		
DIGITAL CONTROL		YES	YES
WARRANTY	3 YEARS	3 YEARS	3 YEARS

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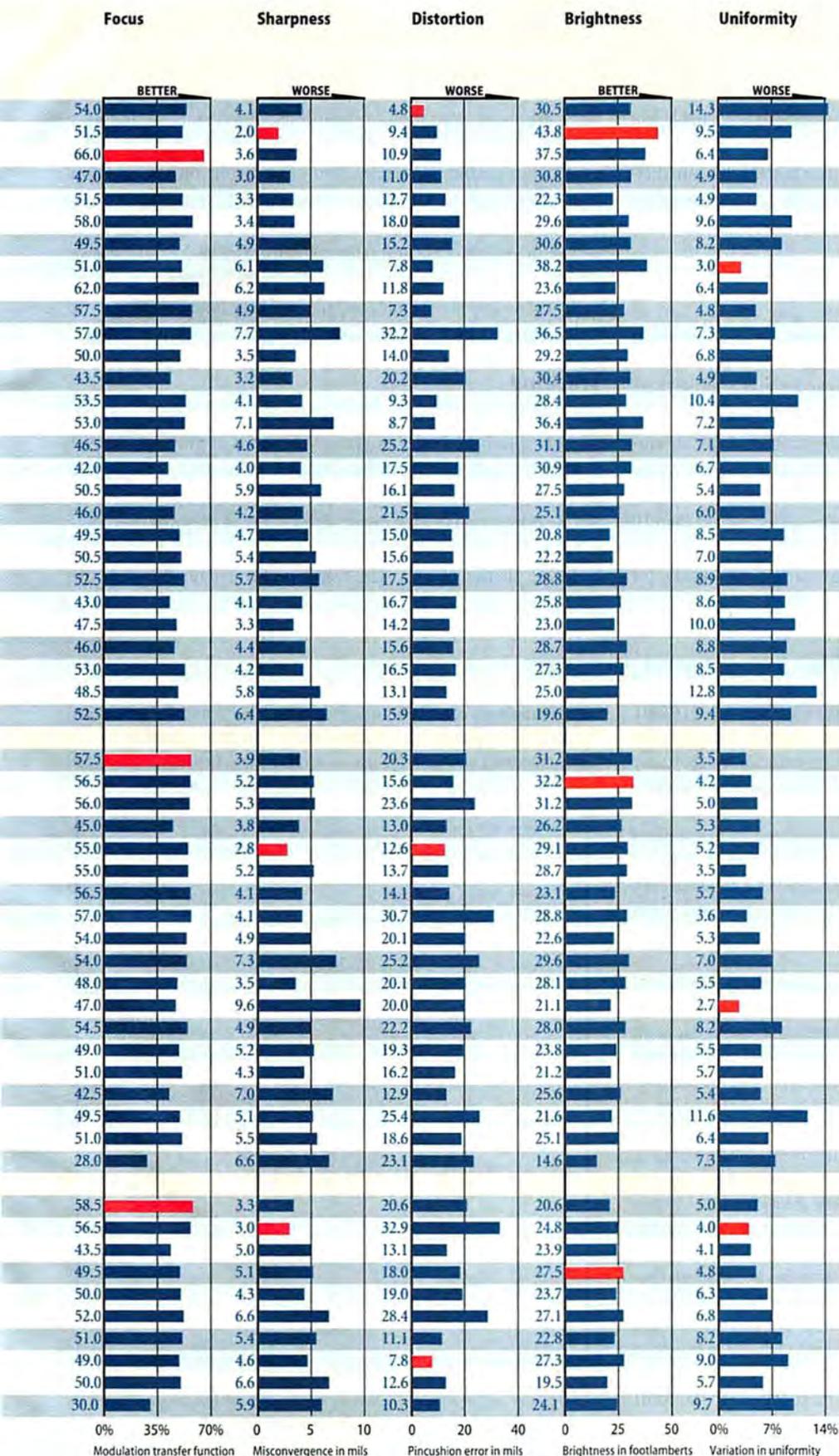
A Closer Look / *the facts you need to pick the right monitor*



	List price	Street price	Dot pitch in mm	Active screen size (diag.) in inches	Maximum resolution in pixels	Tube type	Controls
16- AND 17-INCH MONITORS							
NEC MultiSync 5FGp	\$1,455	\$1,370	.28	15.38	1,280 x 1,024	shadow mask	digital
✓ Sony Multiscan CPD-1730	\$1,329	\$1,100	.25	16.13	1,024 x 768	aperture grille	digital
Nanao FlexScan T560i	\$1,999	\$1,700	.25	15.63	1,280 x 1,024	aperture grille	digital
Nokia Multigraph 447B	\$999*	\$920*	.26	15.50	1,280 x 1,024	aperture grille	digital
E-Machines T16 II	\$1,399	\$1,200	.26	16.00	1,280 x 1,024	aperture grille	digital
Nanao FlexScan F560iW	\$1,599	\$1,490	.26	15.25	1,600 x 1,200	shadow mask	digital
NEC MultiSync 5FGe	\$1,155	\$1,100	.28	15.38	1,024 x 768	shadow mask	digital
Mitsubishi Diamond Pro 17	\$1,499	\$1,175	.25	15.75	1,280 x 1,024	aperture grille	digital
RasterOps Sweet 16	\$1,099	\$1,020	.28	14.94	832 x 624	shadow mask	analog [†]
Ikegami CT-17A	\$2,195	\$1,995	.26	15.75	1,280 x 1,024	aperture grille	digital
Sampo AlphaScan 17e	\$1,095	\$765	.28	15.38	1,280 x 1,024	shadow mask	digital
Sony Multiscan 17se	\$1,499	\$1,195	.26	15.88	1,600 x 1,200	aperture grille	digital
Mirror 16" Trinitron	\$999	\$999	.25	15.25	832 x 624	aperture grille	analog
Altima V-Scan 70	\$1,095	\$1,000	.26	15.88	1,280 x 1,024	shadow mask	digital
ViewSonic 17	\$1,199	\$1,010	.27	15.50	1,600 x 1,200	shadow mask	digital
CTX 1760LR	\$1,099	\$780	.28	15.38	1,280 x 1,024	shadow mask	digital
Tatung CM-17MBD	\$999	\$875	.28	15.00	1,280 x 1,024	shadow mask	digital
Philips Brilliance 1720	\$1,399	\$1,170	.27	15.63	1,600 x 1,200	shadow mask	digital
Sigma ErgoView 17	\$1,349	\$1,035	.25	16.00	1,280 x 1,024	aperture grille	digital
Sceptre P766D	\$929	\$880	.26	15.50	1,280 x 1,024	shadow mask	digital
Mag InnoVision DX-17F	\$849	\$849	.26	16.00	1,280 x 1,024	shadow mask	digital
Nanao FlexScan F550iW	\$1,399	\$1,225	.28	15.13	1,280 x 1,024	shadow mask	digital
Mitsubishi Diamond Scan 16	\$1,169	\$875	.28	15.00	1,024 x 768	shadow mask	digital
SuperMac SuperMatch 17-T	\$1,249	\$1,045	.26	15.75	1,024 x 768	aperture grille	analog
Orchestra Tuba	\$995	\$995	.26	15.25	1,600 x 1,200	shadow mask	digital
Nanao FlexScan F550i	\$1,199	\$1,120	.28	15.50	1,280 x 1,024	shadow mask	digital
Relisys VividView 16	\$899	\$800	.28	15.88	1,024 x 768	shadow mask	digital
Mitsubishi Diamond Scan 17FS	\$1,299	\$1,085	.28	15.69	1,280 x 1,024	shadow mask	digital
20-INCH MONITORS							
✓ Sony GDM-2038	\$2,859	\$2,310	.30	19.13	1,280 x 1,024	aperture grille	digital
Sigma ErgoView 20	\$2,999	\$2,400	.31	19.13	1,600 x 1,200	aperture grille	digital
Sony GDM-2036S	\$2,579	\$2,045	.30	19.13	1,280 x 1,024	aperture grille	digital
E-Machines E20	\$1,899	\$1,590	.31	18.00	1,152 x 870	shadow mask	analog
Ikegami CN-20A	\$1,995	\$1,595	.31	18.88	1,280 x 1,024	shadow mask	analog
Ikegami CT-20D Maxi-Sync	\$2,695	\$2,000	.31	19.25	1,280 x 1,024	aperture grille	analog
SuperMac SuperMatch 20-T XL	\$2,999	\$2,515	.30	19.13	1,280 x 1,024	aperture grille	digital
RasterOps 20T Multiscan	\$2,869	\$2,480	.30	19.13	1,280 x 1,024	aperture grille	digital
E-Machines T20	\$2,899	\$2,645	.30	19.13	1,152 x 870	aperture grille	digital
Radius IntelliColor Display/20	\$3,199	\$2,460	.30	19.13	1,600 x 1,200	aperture grille	digital
SuperMac SuperMatch 20 Plus	\$1,949	\$1,740	.31	17.75	1,152 x 870	shadow mask	analog [†]
Radius PrecisionColor Display/20v	\$2,199	\$1,780	.31	18.75	1,280 x 1,024	shadow mask	digital
Ikegami CT-20HB	\$2,295	\$1,850	.31	18.63	1,280 x 1,024	aperture grille	analog
Sampo AlphaScan LE	\$1,995	\$1,675	.31	18.75	1,600 x 1,280	shadow mask	digital
Nanao FlexScan T660i	\$2,799	\$2,470	.30	19.13	1,600 x 1,200	aperture grille	digital
Ikegami CT-20A Maxi-Sync	\$2,995	\$2,395	.31	19.25	1,280 x 1,024	aperture grille	analog
Mitsubishi Diamond Scan 20 Plus	\$2,599	\$2,085	.31	19.00	1,280 x 1,024	shadow mask	digital
RasterOps 20/20 Multimode	\$1,869	\$1,595	.31	19.00	1,152 x 870	shadow mask	digital
Sampo AlphaScan LC 20"	\$1,395	\$1,145	.31	18.75	1,280 x 1,024	shadow mask	analog
21-INCH MONITORS							
Nanao FlexScan F780iW	\$3,999	\$3,170	.26	19.75	1,600 x 1,200	shadow mask	digital
✓ SuperMac SuperMatch PressView 21	\$3,999	\$2,370	.28	19.88	1,360 x 1,024	shadow mask	digital
Nanao FlexScan F760iW	\$2,499	\$2,250	.28	19.75	1,600 x 1,200	shadow mask	digital
Mitsubishi Diamond Pro 21T	\$2,999	\$2,360	.31	19.75	1,280 x 1,024	aperture grille	digital
RasterOps 21" Color Display	\$2,749	\$2,400	.28	18.88	1,152 x 870	shadow mask	analog [†]
Nokia Multigraph 445X	\$3,225	\$2,775	.25	19.63	1,600 x 1,200	shadow mask	digital
IBM 21P	\$2,245	\$2,210	.31	19.00	1,600 x 1,280	aperture grille	digital
ViewSonic 21	\$2,199	\$1,900	.25	19.75	1,600 x 1,200	shadow mask	digital
Nokia Multigraph 445M	\$2,475 [‡]	\$2,030 [‡]	.25	19.63	1,280 x 1,024	shadow mask	digital
NEC MultiSync 6FGp	\$2,535	\$2,380	.28	19.63	1,280 x 1,024	shadow mask	digital

* A TCO-compliant version is available for \$1,425 list, \$1,090 street. [†] This is a fixed-resolution monitor and has only brightness and contrast controls. [‡] A TCO-compliant version is available for \$2,775 list, \$2,390 street.

✓ MacUser RECOMMENDS



STATISTICS DON'T TELL the whole story, but they're a good place to start when choosing a monitor. *Dot pitch* is the distance between the phosphor dots that make up an image — generally speaking, the smaller the dot pitch, the crisper the image. The *active screen size* varies widely. A monitor's *maximum resolution* can be achieved only if your Mac — or your third-party video card — is up to the task. Among the two *tube types*, shadow-mask tubes have caught up to aperture-grille tubes in quality and — because their vertical and horizontal lines are more equally focused — can be superior for some CAD and DTP work. Finally, digital *controls* offer more flexibility than analog ones, especially when you're working in multiple resolutions.

You'll find more-extensive information on the features of these monitors in the Special Reports section of Library 1 in the MacUser Forum on ZiffNet/Mac (for information on how to access ZiffNet/Mac, see page 4 of this issue).

Image quality and color quality are a color monitor's most visible traits. The monitors in these charts are ranked in order of overall performance for each size category. The best performer in each test is indicated by a red bar.

The first three charts represent image quality, as assessed by a Microvision SpotSeeker III spot meter. *Focus* is measured in terms of a monitor's MTF (modulation transfer function) — the crispness of alternating black and white lines. A monitor's *sharpness* is determined by its lack of misconvergence, which is dependent on the accuracy of the monitor's electron-gun alignment. Pincushioning is a form of *distortion* that warps straight lines.

The final two charts represent elements of color quality, as determined by a Minolta Color Analyzer CA-100. Maximum usable *brightness*, or luminance, has an effect on the richness of colors — 25 footlamberts is adequate for most situations. Spatial *uniformity* — even brightness across a monitor's screen — is important to color fidelity.

COLOR MONITORS

eye out for a monitor with high maximum usable brightness.

Brightness, or *luminance*, is measured in units called footlamberts and represents the highest amount of light a monitor can cast before it begins to lose focus. A maximum-usable-brightness score of about 25 footlamberts is adequate for a bright working environment, but higher scores portend a long, useful life: Brightness inevitably fades as a display ages, and extra footlamberts will enable you to adjust for this loss over time.

The brightest display we tested, the 17-inch Sony Multiscan CPD-1730, had loads of brightness to spare, with its 43.8 footlamberts. The Sampo AlphaScan LC 20", at 14.6 footlamberts, was too dim for comfortable work in most environments.

Bright and Even

Related to brightness, and even more important to color quality, is spatial uniformity — the consistency of brightness across the surface of the screen. For desktop-publishing and graphics pros, "hot" or "cold" spots on-screen can lead to image-editing errors.

ZD Labs' Minolta Color Analyzer CA-100 measured spatial uniformity as the percent variation in brightness across each monitor screen; the smaller the percentage, the more uniform the brightness. The brightness of most of the monitors varied by less than 10 percent, the smallest error most people can perceive.

The Radius PrecisionColor Display/20v earned top marks for

overall screen uniformity, and only four monitors — the Altima V-Scan 70, Mitsubishi Diamond Scan 20 Plus, Relisys VividView 16, and NEC MultiSync 5FGp — had blotchy screens.

The MultiSync 5FGp did extremely well on all the other tests but came in dead last (by a great margin) on spatial uniformity. This unexpected failure points out an important truth: More than any other Mac peripheral, each monitor is a finicky individual — the next MultiSync 5FGp on NEC's assembly line might have exhibited somewhat better spatial uniformity. Thus, test results on a single unit aren't always representative of every monitor of the same make and model. The SuperMac SuperMatch PressView 21, for example, presented an extreme case of quality variance: The first PressView we got had so much image distortion that it was unusable. We sent it back, just as any user would, and the excellent image quality of its replacement earned the PressView our highest recommendation.

Tracking

Color tracking is an important measure of how consistently a monitor can reproduce shades of gray as the levels of gray are stepped down in increments from white to black. Consistent gray shades are created by a monitor's red, green, and blue electron guns firing in precise proportion to each other, without any of the guns overpowering another. Poor tracking causes a monitor to exhibit color tints at darker shades of gray. The worst performer on this test, the

Emissions Tests / *best and worst performers*

MacUser Labs

YOU SHOULD BE FOLLOWING THE DEBATE about whether electromagnetic emissions generated by your Mac's monitor are harmful. Some experts say not to worry until there is proof of the danger; others advise minimizing your exposure until the question is resolved.

If you subscribe to the latter attitude, choose a monitor that adheres to one of the two industry standards for monitor emissions — MPR II or TCO — developed in Sweden and gaining acceptance worldwide. Each specifies acceptable levels of emissions in the ELF (extremely low frequency, 5 hertz to 2 kilohertz) and VLF (very low frequency, 2 kilohertz to 400 kilohertz) ranges.

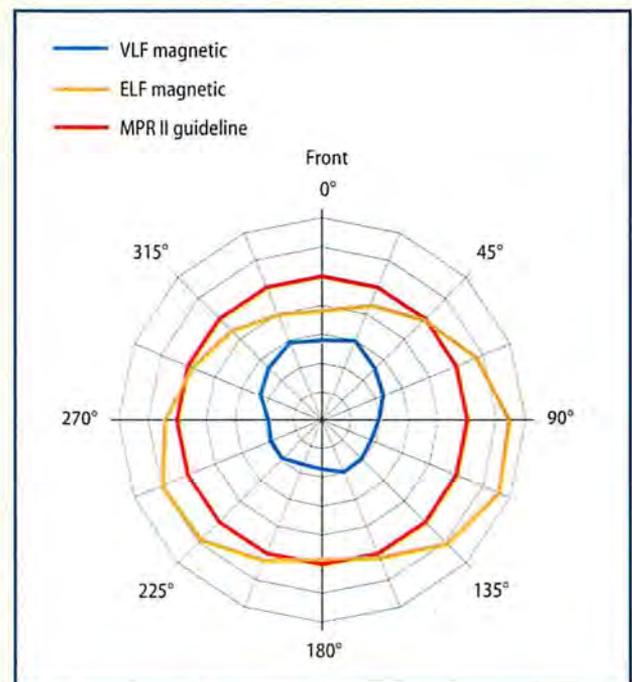
MPR II, the older standard, is the one most commonly touted by vendors who claim low-emission status. The newer TCO standard is stricter: It requires the same minimal intensities as MPR II (250 nanoteslas, or nT, for ELF emissions; 25 nT for VLF) but calls for measurements to be taken 30 centimeters (11.8 inches) from the monitor rather than 50 centimeters (19.7 inches), as required for MPR II.

We tested each of the 57 monitors, using ZD Labs' Combinova magnetic-field meters, and found only 8 that didn't meet MPR II guidelines: the Ikegami CN-20A, CT-20A Maxi-Sync, CT-20D Maxi-Sync, and CT-20HB; Mitsubishi Diamond Scan 20 Plus; Relisys VividView 16; Sampo AlphaScan LC 20"; and Sceptre P766D. Each manufacturer was aware of this — none claimed that these models met MPR II requirements. (You'll find emission-test results for all 57 monitors in the Special Reports section of Library 1 in the MacUser Forum on ZiffNet/Mac.)

If you want the ultimate in protection from ELF and VLF — even though the jury is still out on their effects — stick with Nanao monitors: the FlexScan F780iW, T560i, and T660i models all boast TCO compliance, and our tests confirmed that they meet this strict standard.

/ Katie Barnes and Brian Fikes

Most monitors comply with Sweden's MPR II VLF and ELF emissions guidelines. Only a few — such as the Ikegami CN-20A — fall outside the recommended limits. Still fewer — among them the Nanao FlexScan



Worst: Ikegami CN-20A

The highest emission levels came from the Ikegami CN-20A. Ikegami makes no claims that this monitor meets any low-emission guidelines.

RasterOps Sweet 16, cast a rosy glow as it faded to black — again, a possible individual fault, because the Sweet 16 monitors we've tested in the past exhibited far better color tracking.

For high-end graphics work, we recommend a monitor with at least 90-percent color-tracking accuracy. All but nine of the monitors we tested achieved this high level of performance. The exceptions were the 16- and 17-inch RasterOps Sweet 16, Nanao FlexScan F550iW, and Nanao FlexScan T560i; the 20-inch RasterOps 20/20 Multimode, SuperMac SuperMatch 20 Plus, Nanao FlexScan T660i, Sampo AlphaScan LC 20", and Sampo AlphaScan LE; and the 21-inch Nokia Multigraph 445X. (Full tracking-test results are available in the Special Reports section of Library 1 in the MacUser Forum on ZiffNet/Mac. See page 4 of this issue for information on how to contact ZiffNet/Mac.)

Poor color tracking is not a terminal state: You can correct it with a color calibrator and companion software; anyone doing serious graphics work should consider purchasing a calibrator. Several monitor vendors sell calibrators for between \$400 and \$800; SuperMac includes its professional-model one (\$799) with the SuperMatch PressView 21.

A calibrator is also useful for adjusting color temperature — a setting that determines how white your monitor's *white point* is. Publishing pros frequently set their white points to match the lighting conditions under which printouts will be viewed, in order to

improve output accuracy. Several of the monitors we evaluated include digital settings for multiple temperatures, including the broadcast standard, 6,500 Kelvin; the U.S. proofing standard, 5,000 Kelvin; and the Sony Trinitron factory setting, 9,300 Kelvin.

Kick the Tires

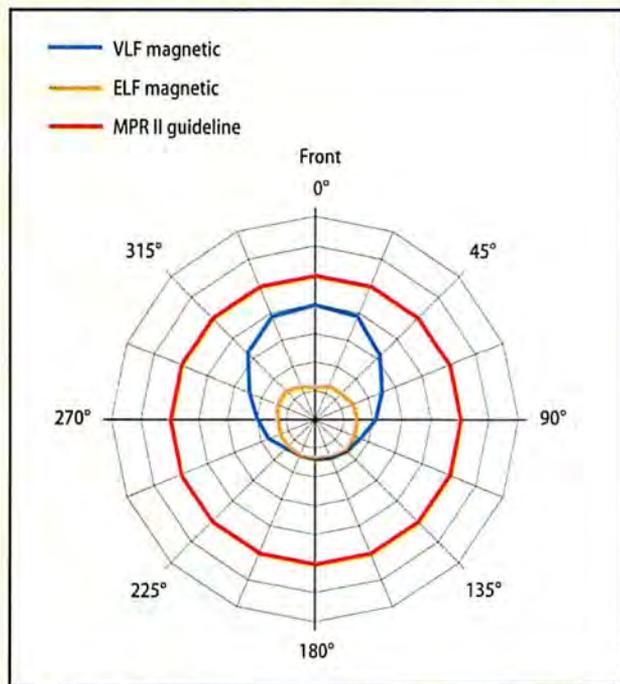
Before you buy your monitor, try to inspect the individual unit you plan to purchase — and avoid dealers that have a no-return policy. Most manufacturers strive for consistency, but our experience has shown that individual monitor quality can vary considerably. Make sure you know up front whom you can turn to — the dealer, the vendor, or the authorized service contractor — if you have problems with your monitor.

Aside from image quality, you should study the monitor's controls carefully. Look for digital controls, and avoid setups that prevent you from observing the screen while making adjustments. Bear in mind that you have to be able to understand the controls easily to use them: If you need to consult a manual every time you change a setting, you probably won't make full use of your adjustment options.

Of all the monitors we evaluated, Nanao's had by far the best controls: well labeled, easy to use, and conveniently located at the bottom front. On the other hand, to make some adjustments to the Mitsubishi Diamond Pro 17, you must activate the Advanced Adjustment mode by restarting the monitor while pressing two buttons.

F780iW — go beyond the MPR II recommendations to meet the stricter TCO standard.

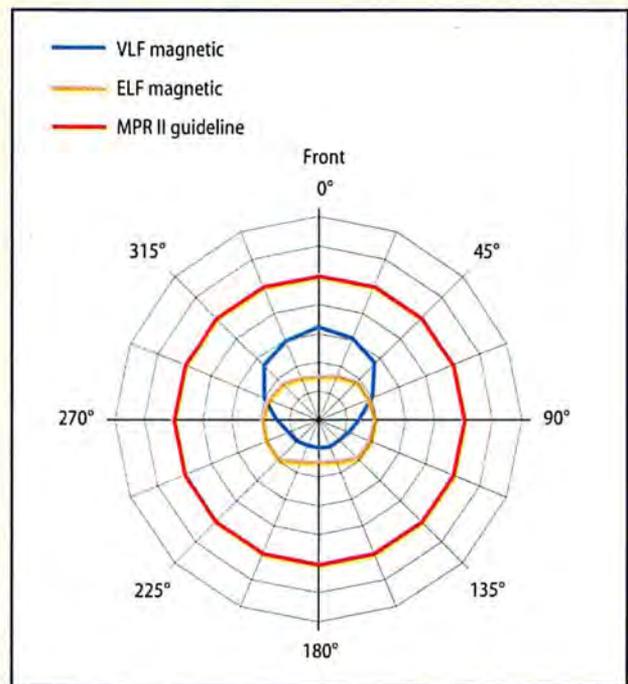
The top of each chart (0 degrees) represents the front of the monitor,



Best: Nanao FlexScan F780iW

This model had the lowest overall emission levels of any monitor we tested, due to exceptionally low ELF emissions.

and the red ring represents the maximum emission intensity permitted under MPR II guidelines. Results lying inside the red ring meet the MPR II standard.



Typical: SuperMac SuperMatch 20-T XL

This monitor, like a majority of the monitors tested, exhibited emissions within the MPR II guidelines.

Pick a Card / boosting 24-bit-color performance

IF YOU'RE A GRAPHICS or desktop-publishing professional who works with 24-bit color on a large monitor, you may be able to read this entire report in the time it takes your Mac to finish a complex Adobe Photoshop operation. It's not just your Mac's processor that's slowing you down — your Mac's built-in video circuitry simply can't keep up with the demands of complex image processing. It needs some help.

One powerful aid is an accelerated-video card. We evaluated four of the most advanced: the Apple Macintosh Display Card 24AC, E-Machines Ultura LX, Radius PrecisionColor Pro 24X, and SuperMac Thunder II GX•1360. We tested each to get an idea of how well it boosts your Mac's video performance and looked at each card's method of boosting Photoshop filters and effects with DSP (digital signal processor) technology.

The 24-Bit Bite

Sophisticated color work pushes Macs to their performance limits, especially if you use one of the 20- or 21-inch monitors that lets you tackle a big job all at once. Twenty-four-bit-color work especially benefits from QuickDraw acceleration: Even the fastest Mac must put other tasks on hold to process the QuickDraw functions required for routine scrolling, dragging, and scaling in 24-bit mode. Video accelerators boost screen-redraw speeds — and overall system performance — by offloading QuickDraw tasks from the CPU. (We've discovered that even the new Power Macs benefit from QuickDraw acceleration.)

How Much Faster?

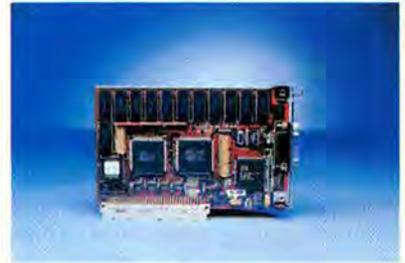
We tested each of the four cards in a Quadra 950 with 64 megabytes of RAM, a 2-gigabyte hard drive, and an Apple Macintosh 16" Color Display (since discontinued) and compared their performance with that of the Quadra 950 running just its built-in video, at its maximum 24-bit resolution, 832 x 624 pixels (the resolution we used for the card testing as well).

We ran a series of vertical- and horizontal-scroll tests, using two 10.5-megabyte Adobe Photoshop files, a 756K Aldus PageMaker file, a 288K Microsoft Excel file, and a 131K Microsoft Word file. All four cards dramatically improved scroll times. The SuperMac Thunder II GX•1360 boosted the Quadra's speed the most, more than tripling the speed of the Quadra using just its built-in video.

QuickDraw speed is task- and application-dependent, however. In the Word scroll test, the SuperMac card made the Quadra run six times as fast as the Quadra with internal video only and 20 percent faster than the Quadra with the Apple or the Radius card. But on the Photoshop scroll tests, all four of the cards achieved the same speed boost, making the Quadra run 1.7 times as fast as it ran with internal video only. (Application-specific RGB-scroll test results are available in the Special Reports section of Library 1 in the MacUser Forum on ZiffNet/Mac. For information on how to access ZiffNet/Mac, see page 4 of this issue.)

A far more significant difference appeared when we scrolled in Photoshop's CMYK mode. Graphics pros like working in this mode, which translates the display's red, green, and blue (RGB) color channels into cyan, magenta, yellow, and black, corresponding to the four ink colors that are used in commercial printing presses — a conversion process that severely taxes the Mac system. The CMYK scroll took 30 percent longer on the Quadra with the Apple, E-Machines, or Radius cards than the Photoshop component of the RGB test, but with the Thunder II card, the CMYK test actually took *less* time than the RGB test, thanks to an onboard chip devoted to CMYK screen redraws.

Bear in mind that QuickDraw acceleration doesn't affect all video functions. This is illustrated by our PageMaker zoom test. None of the cards sped up zooms on photographic images within a PageMaker document. In



Apple Macintosh Display Card 24AC

List Price: \$1,579.

Street Price: \$1,500.

Pros: Easy to use and install.

Cons: No tech support from Apple. User must get tech support from reseller.

Warranty: 1 year.

Peak Power Consumption: 9 watts.

Company: Apple Computer, Inc., Cupertino, CA; 800-776-2333 or 408-996-1010.

fact, all but the SuperMac card slowed the process down by insignificant but measurable amounts, due to NuBus throughput limitations.

DSP or Not DSP?

In addition to boosting QuickDraw speed, each of the four cards is designed to enable you to take advantage of DSP technology to accelerate specific Photoshop commands and filters.

The SuperMac Thunder II GX•1360 has a pair of 16-bit AT&T DSP16A DSP chips built in, the E-Machines Ultura LX can accept a SuperMac Thunder II DSP daughtercard that employs a lower-speed version of the same

Video-Card Performance / quick QuickDraw

The keys to boosting speed for demanding 24-bit-color work are QuickDraw acceleration and DSP power. The following charts compare the performance of a Quadra 950 using each of four

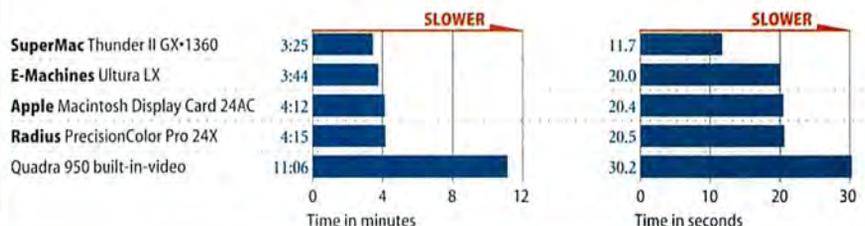


RGB Scroll (Composite)

The scores are sums of the times required to scroll from top to bottom and side to side in RGB mode in Photoshop, PageMaker, Excel, and Word files.

CMYK Scroll (Photoshop)

This chart shows the sums of the times required to vertically and horizontally scroll a 10.5-megabyte, 24-bit photographic image in Photoshop's CMYK mode.





E-Machines Ultura LX

List Price: \$1,299; with SuperMac Thunder II DSP daughtercard, \$1,898.

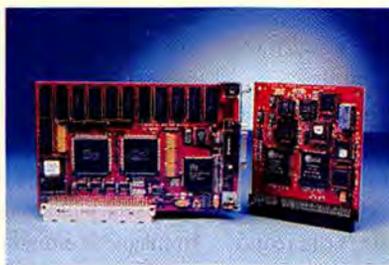
Street Price: \$1,065.

Pros: Top-performing 7-inch card for LC-class Macs.

Warranty: 3 years.

Peak Power Consumption: 7 watts.

Company: E-Machines, Sunnyvale, CA; 800-344-7274 or 408-541-6100.



Radius PrecisionColor Pro 24X

List Price: \$2,598 with Photobooster DSP card.

Street Price: \$2,015.

Pros: Accelerates RGB-to-CMYK conversion.

Cons: DSP daughtercard incompatible with Power Mac PDS design.

Warranty: 1 year.

Peak Power Consumption: 7 watts.

Company: Radius, Inc., San Jose, CA; 800-452-5524 or 408-434-1010.



SuperMac Thunder II GX-1360

List Price: \$3,299.

Street Price: \$2,900.

Pros: Photo CD open and JPEG open/close acceleration modules. Apple PhotoFlash software.

Cons: Bundled software supplied by mail upon registration.

Warranty: 5 years.

Peak Power Consumption: 18.75 watts.

Company: SuperMac Technology, Sunnyvale, CA; 800-334-3005 or 408-541-6100.

AT&T DSP chips, and the look-alike Radius PrecisionColor Pro 24X and Apple Macintosh Display Card 24AC are designed to work in tandem with Radius' Photobooster cards. The stand-alone Photobooster card, which contains a pair of 32-bit AT&T 3210 DSP chips, plugs in to any 68040 Mac's PDS slot, whether or not a video accelerator is installed. But Radius designed the Photobooster to work with its 7-inch NuBus video card: Ordinarily, a PDS card and a NuBus card take up two of your Mac's extension slots, but the Photobooster and the PrecisionColor Pro 24X can fit together in just one slot.

Each of the cards comes with software that replaces several often-used Photoshop

filters and commands with versions that reproduce their effect but run on the DSP chips. The SuperMac Thunder II GX-1360 also has software that uses the card's DSP to speed decompression of JPEG and Photo CD image files — useful for desktop publishers who use compressed stock photos that are published on CD-ROM.

When we timed how long it took the Quadras with each card to apply Photoshop's Unsharp Mask filter to a 10.5-megabyte, 24-bit image, the Quadra that had the E-Machines Ultura LX with the Thunder II daughtercard was the fastest, by a slight margin; all four of the configurations nearly doubled filtering speed.

Finally, a suite of video tests included in MacBench 1.0, ZD Benchmark Operations' program for gauging Mac system performance, confirmed the findings of our application-based tests: The SuperMac Thunder II GX-1360 provided the top QuickDraw-performance boost, with the E-Machines Ultura LX coming in a close second.

Today's high-end video accelerators offer top-of-the-line QuickDraw performance, DSP acceleration, and other features, all at lower prices than ever. The question is, are the prices low enough? With prices comparable to those of new Quadra and Power Mac systems, these cards are purchases that may be difficult to justify, particularly in light of the Power Macs' impressive built-in-video capabilities: Accelerated video will help Power Macs too, but you may not feel that the speed increase is worth the cost of one of these high-end cards.

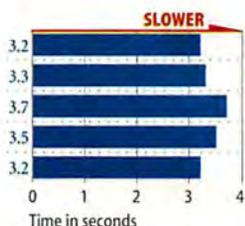
But for those who have invested heavily in a Quadra system and want to hang on to it for a while — and are prepared to spend a lot more cash — the SuperMac Thunder II GX-1360 has impressive QuickDraw performance and DSP capabilities as well as blazing speed in Photoshop's CMYK mode.

After we began testing for this feature, several additional entries to the 24-bit-accelerator arena were announced, all of which support 21-inch displays: the RasterOps Horizon 24 (\$2,799; \$3,599 with DSPro DSP daughtercard), the Radius LeMans GT (\$2,499), and the Mirror Tornado Graphics Card (\$799; \$1,299 with DSP ChargeCard daughtercard). / Paul Yi

24-bit accelerated-video cards to that of a Quadra 950 using only its internal video, running 24-bit color on a 16-inch display.

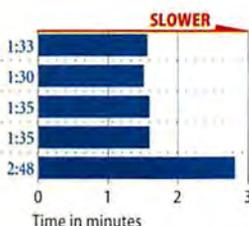
PageMaker Zoom

The scores are sums of the times required for 400-percent zooms on three 24-bit photographic images embedded in a PageMaker document.



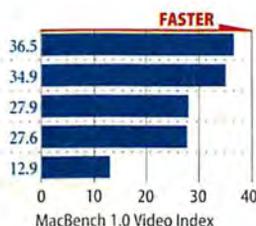
DSP Speed

Comparing the time each card took to apply Photoshop's Unsharp Mask filter illustrates the speed boost digital signal processors provide.



Video Mix

Ziff-Davis' MacBench 1.0 Video Mix test suite gauges system-level performance of video hardware by running a wide range of video tests.



COLOR MONITORS

While considering controls, look into whether an autosynchronous monitor includes software that allows you to adjust your screen and change resolutions without restarting your Mac. NEC's DPI-on-the-Fly and Radius' Radiusware software are among the leaders in this area. The SuperMac SuperMatch PressView 21 and the Ikegami CT-17A also offer extensive software controls.

You should also be sure to examine the monitor's antiglare treatment, which can have a dramatic effect on overall focus. Examine the monitor from different angles and in varying light, if possible. Relatively expensive OCLI coatings are the best antiglare treatments; mechanically etched screens and silica coatings can reduce sharpness. All the monitors we reviewed except the NEC MultiSync 5FGe had some form of antiglare treatment, but NEC offers an add-on glare filter (\$99) that dealers often bundle free with this unit.

As another consideration, be sure to check whether the monitor you pick includes the necessary Mac cables and adapters.

The Final Look

Few components of your desktop Mac system are as important to your day-to-day satisfaction — and sanity — as your monitor. A dim, blurry display will give you a headache faster than a whining customer. A tiny, cramped screen will limit your productivity. Do yourself a favor: Move up to a big, crisp monitor.

After testing, scoring, and analyzing 28 top 16- and 17-inch

monitors — and arguing over the results — we recommend the Sony Multiscan CPD-1730 as the ideal business monitor. Competition was tight: The NEC MultiSync 5FGp, Nokia Multigraph 447B, and RasterOps Sweet 16, for example, are all worthy competitors, but the Multiscan CPD-1730 won our vote for its delivery of sharp, bright images at a reasonable price.

For a few extra bucks — well, for quite a few — the Nanao FlexScan T560i is the Cadillac of midsized monitors. It provides outstanding image quality and the finest monitor-control setup we've seen plus an energy-conserving Sleep mode and very low electromagnetic emissions.

For color publishing, the 20-inch Sony GDM-2038 offers the best value, with the Sigma ErgoView 20 and the Sony GDM-2036S close behind. The Sony GDM-2038's color performance and sharpness were top-notch, and its emissions were extremely low.

If you're a desktop publisher who spends ten hours or more a day staring at your monitor, you deserve the best. Narrowly edging out the Nanao FlexScan F780iW as the best 21-inch Mac monitor you can buy is the SuperMac SuperMatch PressView 21. Along with first-rate image quality, its feature set — including a color calibration system and an antireflection hood — makes it an ideal choice. 

ZD Labs project leaders Katie Barnes and Brian Fikes are well focused and have extraordinary maximum usable brightness.

Directory / vendors of monitors tested

Altima

CD Solutions
San Ramon, CA
510-820-5400
510-820-4115 (fax)

CTX International, Inc.

Walnut, CA
800-888-2012
909-598-8094

E-Machines

Sunnyvale, CA
800-344-7274
408-541-6100

IBM

Research Triangle Park, NC
800-772-2227

Ikegami Electronics (USA), Inc.

Maywood, NJ
201-368-9171
201-569-1626 (fax)

Mag InnoVision

Santa Ana, CA
800-827-3998
714-751-2008

Mirror Technologies

Edina, MN
800-654-5294
612-832-5622
612-633-5709 (fax)

Mitsubishi Display Products

Cypress, CA
800-843-2515
714-220-2500
714-236-6187 (fax)

Nanao USA Corp.

Torrance, CA
800-800-5202
310-325-5202

NEC Technologies, Inc.

Wood Dale, IL
708-860-9500

Nokia Display Products, Inc.

Sausalito, CA
800-296-6542
415-331-0322
415-331-0424 (fax)

Orchestra MultiSystems, Inc.

Santa Ana, CA
714-708-3400
714-708-3500 (fax)

Philips Consumer Electronics

Knoxville, TN
615-521-4316
615-521-3210 (fax)

Radius, Inc.

San Jose, CA
800-452-5524
408-434-1010
800-966-7360 (fax)

RasterOps

Santa Clara, CA
800-729-2656
408-562-4200
408-562-4065 (fax)

Relisys

Milpitas, CA
800-383-2333
408-945-9000
408-945-0587 (fax)

Sampo America

Norcross, GA
404-449-6220
404-447-1109 (fax)

Sceptre Technologies, Inc.

Placentia, CA
800-788-2878
714-993-9193
714-993-2997 (fax)

Sigma Designs, Inc.

Fremont, CA
800-845-8068
510-770-0100
510-770-2640 (fax)

Sony Electronics, Inc.

San Jose, CA
800-352-7669
408-894-0555

SuperMac Technology

Sunnyvale, CA
800-334-3005
408-541-6100

Tatung

Long Beach, CA
800-827-2850
310-637-2105
310-637-8484 (fax)

ViewSonic

Walnut, CA
800-888-8583
909-869-7976
909-869-7318 (fax)

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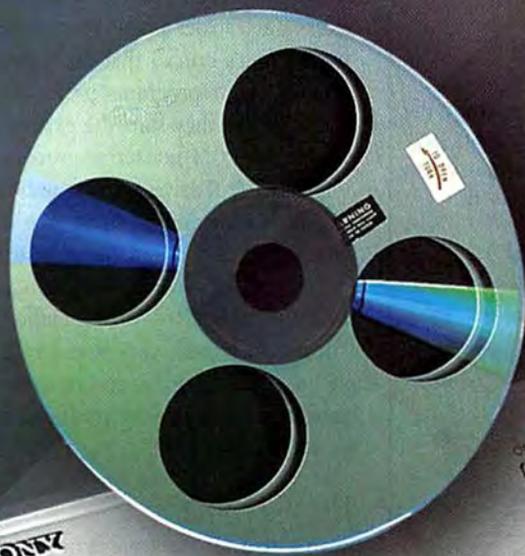
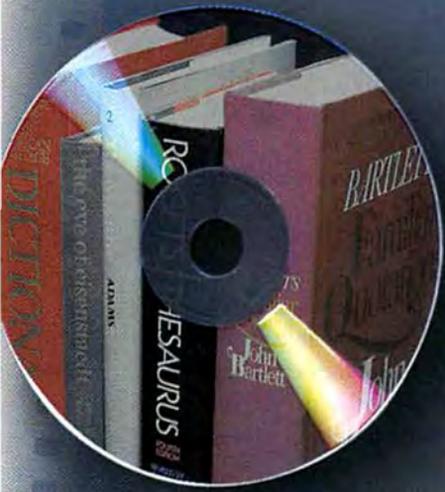
By Erik Holsinger

SOONER OR LATER, WE ALL END UP WITH A PILE OF DATA that just can't be thrown out. For many of us, it's stashed away on a stack of expensive SyQuest cartridges. For others, it's clogging up costly hard-disk real estate.

Fortunately, there's now an affordable technology that provides a way to store data: CD-R, or compact-disc-recordable. Using a combination of special software and a CD-R drive, you can make your own CD-ROMs for storing data.

You may also want to produce a multimedia masterwork that's destined to be distributed on CD-ROM. You need some way of previewing your work before committing it to mass production, where mistakes can be expensive. The answer? CD-R.

Or you may be nursing an aging audiocassette that contains a once-in-a-lifetime performance or lecture. The next trip through the cassette player may be the last one the fraying tape can survive. How do you end the fear of tape destruction forever? CD-R.



Lease - CURRENT

CD-R to the Rescue

CD-ROM is the ultimate archiving medium. CD-Rs offer incredibly cost-effective storage for those files you just don't need hanging around on your hard disk — each

disc can hold as much as 650 megabytes and costs about \$20. (It would take more than 460 floppy disks, each with a capacity of 1.4-megabytes, at a cost of \$600, or eight 88-megabyte SyQuest cartridges, at about \$700, to store the same amount of data.)

Workgroups can archive project files for company-wide access — just record the data, using a CD-R drive, and put the resulting disc into a networked CD-ROM drive. Because you can create CD-Rs as needed, this is one of the best ways to keep incorruptible copies of critical data. A CD-R's incorruptibility has one drawback, however: Because you can't erase the data, when you write to a CD-R, it's final. If you find you've made a mistake, you need to create another disc — for another \$20.

For those who need to send large amounts of data around the world, a CD-ROM is one of the best storage media around. It weighs practically nothing, is virtually indestructible, and is small enough to stick in an overnight-delivery envelope.

CD-R drives are also great for multimedia mavens and others interested in testing a CD-ROM title by *premastering* it (creating a one-shot disc before embarking on a full-scale pressing). Because CD-ROM drives access and transfer data so much more slowly than hard drives do, it's crucial that multimedia producers test how well their programs perform at CD-ROM-drive speeds before they start the expensive and time-consuming CD-ROM-mastering process.

Finally, CD-R drives provide audio enthusiasts with a way of creating audio CDs of their digital sound files. Several of the CD-R systems we tested can format discs in the *Redbook*, or audio-CD, format, so you can play back your audio CD-R on any audio-CD player.

Just as there are several uses for CD-Rs, so there are a plethora of CD-R drives and a rich variety of CD-R software. Drives and software are often sold in combination; we tested 15 systems.

The Big Setup

Setting up a CD-R system is not as easy as hooking up most Mac SCSI peripherals. The real difficulty is getting the hardware to cooperate with all the other devices on the SCSI chain and getting the CD-R software to communicate with the CD-R hardware.

The software installation for all the drives we tested was fairly simple. In most cases, it involved a simple drag-and-drop operation. The only wrinkle was the hardware copy protection (or *dongle*) required for OMI's QuickTOPIX II and incatsystems' Easy-CD Pro. We know that dongles have the advantage of preventing illegal software copying, but because your whole system is rendered unusable if you lose or damage the dongle, we'd rather vendors didn't use this method.

For each CD-R drive, you need to set the SCSI ID and provide the proper termination, as with any SCSI device. Although all the drives we tested work on the Mac's SCSI

The Bottom Line

RECORDING YOUR OWN CD-ROMs is an economical way to archive indispensable data and an inexpensive way to premaster multimedia titles. Because CD-R systems are such a significant investment, it's important to get the right software/hardware combination to fit your particular needs.

⊕ = OUTSTANDING

● = ACCEPTABLE

⊖ = POOR

PRICE/
PERFORMANCE

CUSTOMER
SERVICE

EASE OF USE

SOFTWARE
FEATURES

★★★★ **Sony CDW-900E** ● ⊕ ⊕ ⊕
with Sony's Hybrid Formatter 1.1



Service bureaus need speed and flexibility. The Sony CDW-900E with Sony's Hybrid Formatter software (\$8,995 list, \$6,795 street) offers all the power and formatting options to handle just about any archiving, multimedia-premastering, or audio needs.

★★★★ **Pinnacle RCD-202** ⊕ ● ⊕ ⊖
with Pinnacle's RCD 1.3



The best CD-R system for low-volume archiving is the Pinnacle RCD-202 with Pinnacle's RCD software (\$3,995 list, \$3,000 street). The software is limited, but the system provides a great way to fill simple archiving needs.

★★★★ **Kodak PCD Writer 200** ● ⊕ ⊕ ⊕
with Optimag's CD-It! All 2.05

★★★★ **JVC Personal RomMaker** ● ⊕ ⊖ ⊕
with JVC's Personal RomMaker 2.01

★★★★ **Kodak PCD Writer 200** ● ● ⊕ ●
with OMI's QuickTOPIX II 1.02

★★★★ **Sony CDW-900E** ● ● ⊕ ●
with OMI's QuickTOPIX II 1.02

★★★★ **JVC Personal RomMaker** ● ⊕ ● ● ⊖
with JVC's Personal Archiver 2.00

★★★★ **Philips CDD 521 CDR** ● ● ● ⊖
with CeQuadrat's MacOnCD 2.0

★★★★ **Philips CDD 521 CDR** ● ⊖ ⊕ ●
with Elektrosn's GEAR 2.0

★★★★ **Sony CDW-900E** ● ● ⊕ ●
with Elektrosn's GEAR 2.0

★★★★ **Microboards PlayWrite 1000** ● ⊕ ⊖ ●
with Dataware Technologies' CD Record 2.0

★★★★ **Philips CDD 521 CDR** ● ⊕ ● ● ⊖
with incatsystems' Easy-CD Pro 1.2

★★★★ **Ricoh RS-9200CD** ⊖ ● ⊖ ●
with Elektrosn's GEAR 2.0

★★★★ **Ricoh RS-9200CD** ⊖ ● ⊖ ●
with OMI's QuickTOPIX II 1.02

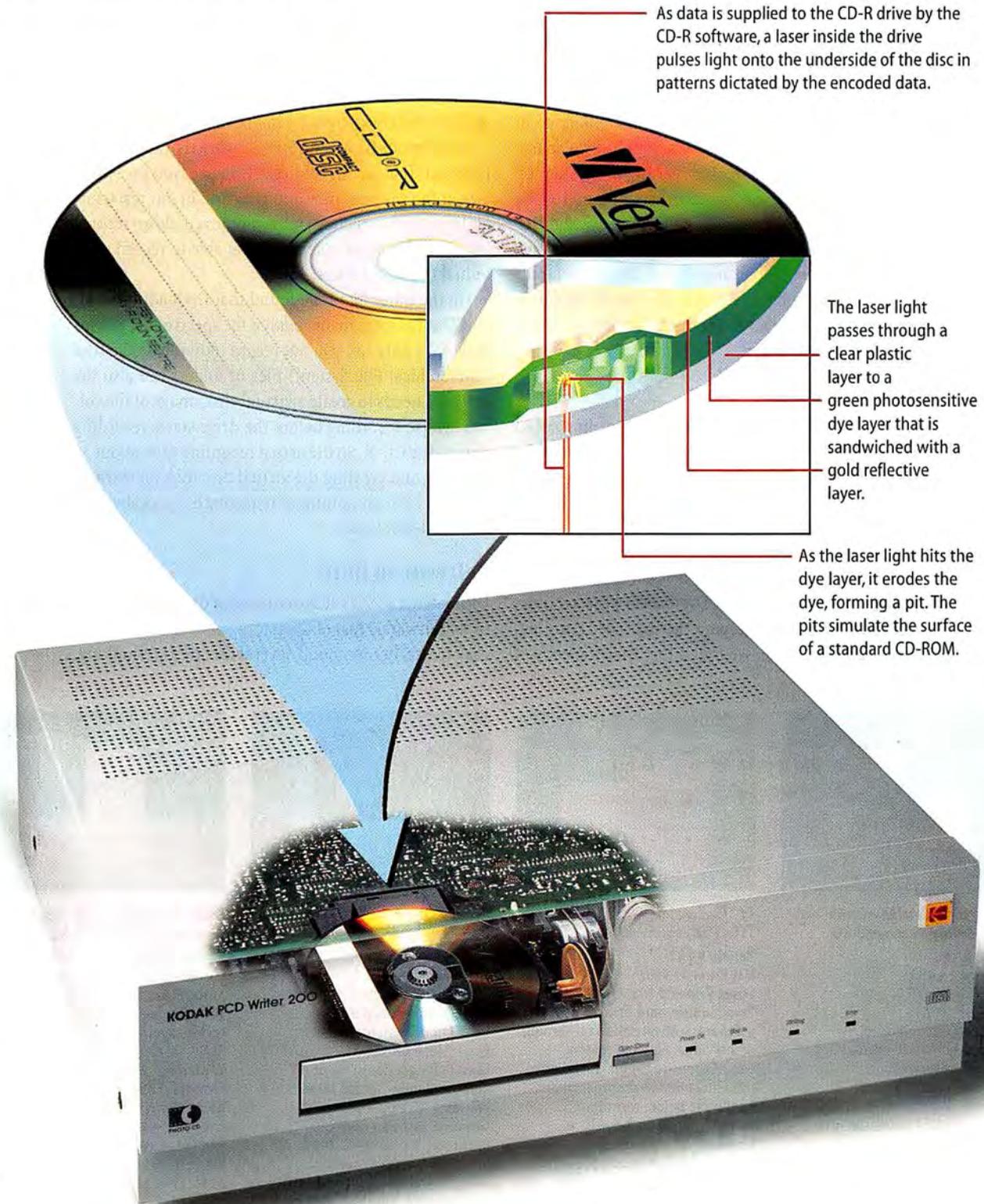
★★★★ **Sony CDW-900E** ● ⊖ ● ⊖
with Sony's Multimedia Formatter 1.0

Listing is alphabetical within groups of equal mouse ratings.

figure 1

How CD-Recordable Works

Any CD-ROM drive can read any CD-R, because the CD-R process creates infinitesimal holes in a dye layer on the disc that mimic the pits stamped into the surface of a standard CD-ROM.



chain, they each go at it a little differently. The Kodak, Philips, and Sony drives, for example, use mini-37 SCSI-2 ports, used more commonly on Sun workstations than on Mac peripherals, whereas all the others use standard 50-pin Centronics SCSI ports.

We found that the termination and SCSI-ID controls for most of the drives were still in the Stone Age: With the exception of the Pinnacle and JVC drives, all the drives had DIP-switch panels for setting termination and SCSI ID. Most Mac storage devices now have easier-to-use termination and ID-setting methods.

The Ricoh RS-9200CD was the worst offender in terms of setup difficulty. First, you have only a sparse six-page instruction manual for getting the system up and running. Second, you have to unscrew a panel on the back of the drive before you can even get at the DIP switches. Even after closely following the instructions, we still had to have help from a system integrator familiar with the Microboards PlayWrite system (which is based on a Ricoh drive) to set up the system — and it took him nearly an hour.

Recording Speed

If you're working in a service bureau, recording speed will be critical for you. To get a sense of the speed of the various CD-R systems, we used each to create a multimedia CD-ROM that contained 150 megabytes of data.

You can choose between a CD-R drive that records (or *burns*) discs at double-speed, which takes about 30 minutes, or at single-speed, which takes about an hour. Recording is only part of the CD-creation process, however: You first need to prepare the data for recording, using special software. We found that the efficiency of

the software that comes with some of the single-speed drives makes up for their slower recording speed.

Most CD-R applications require you to record an entire hard-disk volume the size of the CD-R (650 megabytes), no matter how much data you want placed on the disc. JVC's Personal RomMaker software and Pinnacle's RCD software, however, can record individual files and folders and doesn't force you to record an entire 650 megabytes. Our test files occupied only 150 megabytes, so this feature significantly cut the recording time and enabled the JVC and the Pinnacle single-speed CD-R drives to nearly keep pace with the double-speed drives.

Elektrososn's GEAR and Sony's Hybrid Formatter use a different time-saving strategy: Each lets you preset the size of the volume you want to record. In our tests, this ability to make custom-sized volumes cut down recording time almost as much as being able to record individual files and folders.

On the other hand, we found that CeQuadrat's Mac-OnCD software actually *reduced* the speed of the Philips drive. Not only can you not record individual Mac HFS (Hierarchical File System) files or folders but also the software needs to create a virtual-disk image of the volume you're recording before the drive starts recording data to the CD-R. So the actual recording took about 30 minutes, and creating the virtual disc took an extra 15 minutes — to say nothing of requiring 650 megabytes of free hard-disk space.

Software to Burn

Ultimately, each CD-R system lives or dies by the quality of its software. Most of the packages we looked at were easy to use, but we found several that need rethinking.



JVC Personal RomMaker with JVC's Personal Archiver 2.00

Rating: ★★★
List Price: \$4,495.
Street Price: \$4,200.
Pros: Inexpensive.
Cons: Single-speed drive. Data must be saved onto a hard drive before recording.
Warranty: 1 year.
Company: JVC, Irvine, CA; 714-261-1292; 714-261-9690 (fax).



JVC Personal RomMaker with JVC's Personal RomMaker 2.01

Rating: ★★★
List Price: \$9,995.
Street Price: \$9,995.
Pros: Built-in hard drive. Excellent software. Software allows recording of individual files and folders.
Cons: Expensive. Single-speed drive. Data must be saved onto included hard drive before recording.
Warranty: 1 year.
Company: JVC, Irvine, CA; 714-261-1292; 714-261-9690 (fax).



Kodak PCD Writer 200 with OMI's QuickTOPiX II 1.02

Rating: ★★★
List Price: \$7,990.
Street Price: \$6,500.
Pros: Double-speed drive. Excellent documentation. Easy-to-use software.
Cons: Software doesn't support audio and mixed-mode formats.
Warranty: 1 year.
Company: Eastman Kodak, Rochester, NY; 800-242-2424 or 716-724-4000.
 OMI (Optical Media International), Los Gatos, CA; 800-347-2664 or 408-376-3511; 408-376-3519 (fax).



Kodak PCD Writer 200 with Optimage's CD-It! All 2.05

Rating: ★★★
List Price: \$8,990.
Street Price: \$8,990.
Pros: Double-speed drive. Excellent tech support and documentation. Software easy to use and powerful.
Warranty: 1 year.
Company: Eastman Kodak, Rochester, NY; 800-242-2424 or 716-724-4000.
 Optimage, West Des Moines, IA; 800-234-5484 or 515-225-7000; 515-225-0252 (fax).

Fortunately, nearly all the CD-R programs have easy-to-use interfaces that facilitate fast archiving setups. OMI's QuickTOPIX II was the easiest package to use while still offering good control over the recording process.

The two problem packages were incatsystems' Easy-CD Pro and Sony's Multimedia Formatter. Version 1.2 of Easy-CD Pro was full of glitches, ranging from identifying a failed disc as being OK to having dialog boxes with Italian text (incatsystems' parent company is based in Italy). Also, the software isn't totally compatible with any partitioning scheme other than that of Norton Utilities. Considering that Norton Utilities offers only a proprietary, soft-partition feature, it's clear that this version of Easy-CD Pro isn't worth considering.

We found a bug in Multimedia Formatter 1.0 that Sony admits it has not fixed, although it claims that the bug affects only about 20 percent of users. If you report encountering the bug, Sony sends you a stripped-down version of its Hybrid Formatter as a fix. Considering that you have to ruin a \$20 disc before you know whether this bug will occur with your system, you'd be better off avoiding Multimedia Formatter altogether and getting the Sony drive with Hybrid Formatter instead — in addition to being bug-free, this software is more powerful than Multimedia Formatter.

Feature Sophistry

To create CD-ROM premasters, you need as much control over your software as possible. This is especially true if you're creating hybrid discs, which contain Mac HFS files as well as industry-standard ISO 9660 files. Not all CD-R software can set the right partitions for each format (see figure 2).

Trends / faster and fuller-featured

FASTER CD-R DRIVES and improved software are slashing recording times and making CD-ROM recording more flexible.

Faster CD-R drives mean shorter recording times. The recently released quad-speed Yamaha CDR 100 can record an entire CD-ROM in 15 minutes — a job that would take a full hour on a single-speed drive. Recorders based on a new Kodak mechanism (also to be sold by Kodak as the PCD Writer 600) will spin at six times the speed of a single-speed drive, cutting recording time to just 10 minutes.

Support for more CD formats will be added to most CD-R applications. Support for recording multisession Photo CD and other CD formats will be included in version 2.0 of OMI's QuickTOPIX II, version 2.0 of incatsystems' Easy-CD Pro, and version 2.1 of Dataware Technologies' CD Record by the time you read this. Version 1.4 of Pinnacle's RCD software will include a backup utility and should also be shipping by the time you read this. / Patty Ames

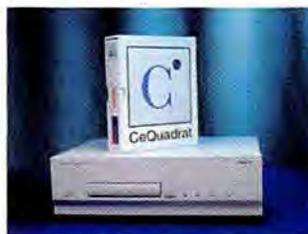
By far the most powerful — and complex — software for CD-ROM premastering is JVC's Personal RomMaker. No other program offers as much control over the data's order, format, and position before it is recorded. It's also the most difficult software package to use — it's not for novices.

Optimage's CD-It All! offers the widest variety of hybrid and mixed-mode formats. Not only can you combine data on a Mac disc with ISO 9660 or audio-CD material but you can also create a CD-ROM XA, a generic data archive for PC or UNIX systems, or a mixed-mode disc that combines audio with any computer-data format. Considering the power, price, and ease of use of the program, CD-It! All is a good choice if you need to support many CD formats.



Microboards PlayWrite 1000 with Dataware Technologies' CD Record 2.0

Rating: ★★★
List Price: \$5,990.
Street Price: \$5,000.
Pros: Inexpensive. Easy-to-use software.
Cons: Single-speed drive. Poor SCSI implementation. Difficult setup. Limited software features.
Warranty: 1 year.
Company: Microboards, Inc., Carver, MN; 612-448-9800; 612-448-9806 (fax).
 Dataware Technologies, Cambridge, MA; 800-344-5849 or 617-621-0820; 617-621-0307 (fax).



Philips CDD 521 CDR with CeQuadrat's MacOnCD 2.0

Rating: ★★★
List Price: \$7,244.
Street Price: \$6,400.
Pros: Double-speed drive. Easy-to-use software.
Cons: Poor hardware documentation. Must create a disk image before recording.
Warranty: 1 year.
Company: Philips, Colorado Springs, CO; 800-777-5674 or 719-593-7900; 719-599-8713 (fax).



Philips CDD 521 CDR with Elektrotron's GEAR 2.0

Rating: ★★★
List Price: \$5,944.
Street Price: \$5,000.
Pros: Inexpensive. Double-speed drive. Easy-to-use software.
Cons: Poor hardware documentation. Limited software features.
Warranty: 1 year.
Company: Philips, Colorado Springs, CO; 800-777-5674 or 719-593-7900; 719-599-8713 (fax).
 Elektrotron USA, Berwyn, PA; 610-695-8444; 610-695-8440 (fax).



Philips CDD 521 CDR with incatsystems' Easy-CD Pro 1.2

Rating: ★★
List Price: \$7,244.
Street Price: \$6,300.
Pros: Double-speed drive.
Cons: Poor hardware documentation. Software doesn't work with standard Apple partitioning schemes.
Warranty: 1 year.
Company: Philips, Colorado Springs, CO; 800-777-5674 or 719-593-7900; 719-599-8713 (fax).
 incatsystems, Campbell, CA; 800-774-6228 or 408-379-2400; 408-379-2409 (fax).

figure 2

Features of CD-R Software

CD-R software is the key to success. Although the various CD-R drives have significant differences, it's the software they come with that should top your list of important considerations. Pay close attention

to which recording formats each software package supports and whether or not it lets you copy specific files and folders rather than forcing you to copy an entire hard-disk volume.

	CeQuadrat MacOnCD 2.0	Dataware Technologies CD Record 2.0	Elektroson GEAR 2.0	incatsystems Easy-CD Pro 1.2	JVC Personal Archiver 2.00
CD-R drives supported	2	1, 2, 3, 4	1, 2, 3, 4, 5	2	5
Records files or folders		*	†		
Mac HFS	●	●	●	●	●
ISO 9660	●	●	●	●	●
Redbook audio	●	§		§	●
Mac HFS and ISO 9660	● ^o	§	§	§	
Mac HFS and Redbook audio	● ^o	§		§	
ISO 9660 and Redbook audio	● ^o	§			

Drives supported: 1 = Sony 2 = Philips 3 = Kodak 4 = Ricoh/Microboards 5 = JVC 6 = Pinnacle

*This option possible on ISO 9660-formatted disc only.

†Must record entire volume, but size of volume is user-selectable.

§Available soon.

^oCan be done but not documented in manual.

Make It Work

Good tech support for a CD-R system is as vital as it is with any peripheral, especially if CD-ROM creation is part of your daily business. We called each hardware and software vendor's tech support three times — not identifying ourselves as *MacUser* editors — to get a glimpse of what you might expect to encounter.

Overall, most of the companies provided support in a timely and competent manner. Some of the responses were slower than we would have liked, however, and

Ricoh failed to return *any* of our telephone calls.

Chances are you'll get your support from a local reseller. It's a good idea to make blind calls to prospective resellers before plunking down your hard-earned dough.

Careful Considerations

Because CD-R systems are such a significant investment, it's particularly important to decide on the right combination of software and hardware components,



Pinnacle RCD-202 with Pinnacle's RCD 1.3

Rating: ★★★

List Price: \$3,995.

Street Price: \$3,000.

Pros: Inexpensive. Hardware doubles as CD-ROM drive.

Software allows recording of individual files and folders.

Cons: Single-speed drive. Can't create hybrid discs.

Warranty: 1 year.

Company: Pinnacle Micro, Irvine, CA; 800-553-7070 or 714-727-3300; 714-727-1913 (fax).



Ricoh RS-9200CD with Elektroson's GEAR 2.0

Rating: ★★

List Price: \$4,690.

Street Price: \$3,400.

Pros: Inexpensive.

Easy-to-use software.

Cons: Single-speed drive. Poor SCSI implementation. Difficult to set up.

Limited software features.

Warranty: 1 year.

Company: Ricoh, San Jose, CA; 408-432-8800; 408-432-8372 (fax). Elektroson USA, Berwyn, PA; 610-695-8444; 610-695-8440 (fax).



Ricoh RS-9200CD with OMI's QuickTOPiX II 1.02

Rating: ★★

List Price: \$5,990.

Street Price: \$3,995.

Pros: Inexpensive.

Easy-to-use software.

Cons: Single-speed drive. Poor SCSI implementation. Difficult to set up.

Software doesn't support audio and mixed-mode formats.

Warranty: 1 year.

Company: Ricoh, San Jose, CA; 408-432-8800; 408-432-8372 (fax). OMI (Optical Media International), Los Gatos, CA; 800-347-2664 or 408-376-3511; 408-376-3519 (fax).



Sony CDW-900E with Elektroson's GEAR 2.0

Rating: ★★★

List Price: \$8,195.

Street Price: \$6,200.

Pros: Double-speed drive.

Good documentation.

Easy-to-use software.

Cons: Limited software features.

Warranty: 1 year.

Company: Sony Electronics, Inc., San Jose, CA; 800-352-7669 or 408-432-0190; 408-943-0740 (fax). Elektroson USA, Berwyn, PA; 610-695-8444; 610-695-8440 (fax).

JVC Personal RomMaker 2.01	OMI QuickTOPIX II 1.02	Optimage CD-It! All 2.05	Pinnacle RCD 1.3	Sony Hybrid Formatter 1.1	Sony Multimedia Formatter 1.0
5	1, 2, 3, 4, 5	1, 2, 3	6	1, 2	1
●			●	†	
●	●	●	●	●	●
●	●	●	●	●	
●	5	●	●	●	●
●	●	●	●	●	
	5	●	●	●	●
	5	●	●	●	

finding one that most closely fits your specific needs.

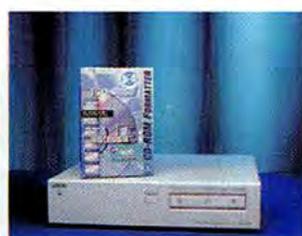
For archiving tasks, look for inexpensive CD-R systems that are easy to use. Occasional users will find that extensive software features and drive speed aren't nearly as important as ease of installation and overall system price.

If you want to regularly record CD-ROMs, look for a system that includes either a double-speed CD-R drive or a single-speed drive that comes with time-saving software that can record individual files and folders.

Finally, service bureaus need not only the higher-speed configurations but also software that can support a variety of CD formats.

Whatever your choice, realize that CD-R is still an emerging technology and that — like any pioneer — you have the opportunity to make great gains but may have to endure a few hardships along the way. ☹

Erik Holsinger, author of the *MacWEEK Guide to Multimedia*, is an independent multimedia producer and writer.



Sony CDW-900E with OMI's QuickTOPIX II 1.02

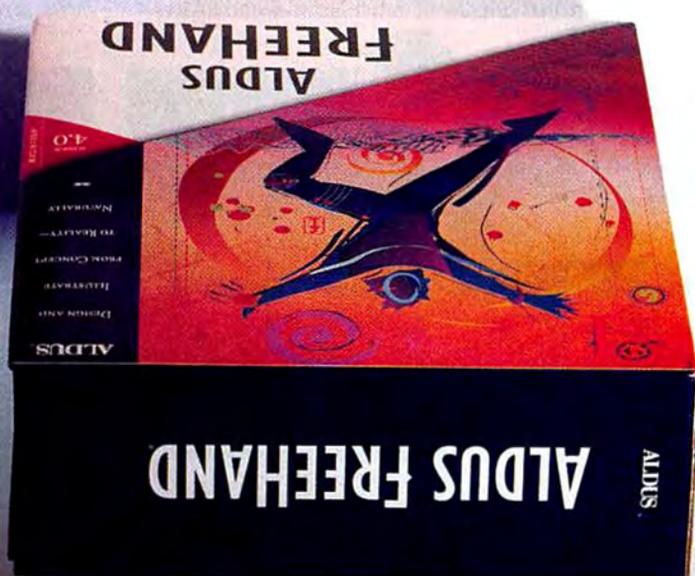
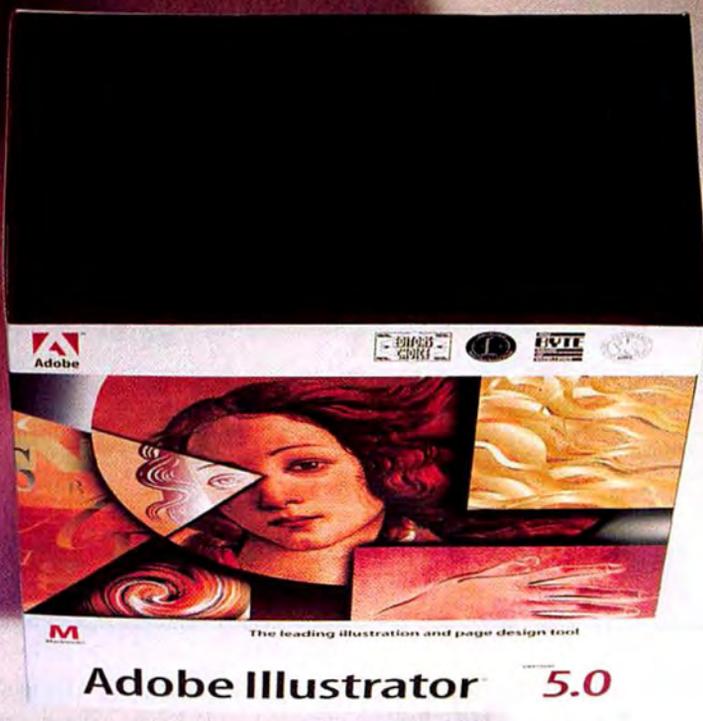
Rating: ★★★★★
List Price: \$9,495.
Street Price: \$7,495.
Pros: Double-speed drive. Good documentation. Easy-to-use software.
Cons: Software doesn't support audio and mixed-mode formats.
Warranty: 1 year.
Company: Sony Electronics, Inc., San Jose, CA; 800-352-7669 or 408-432-0190; 408-943-0740 (fax). OMI (Optical Media International), Los Gatos, CA; 800-347-2664 or 408-376-3511; 408-376-3519 (fax).

Sony CDW-900E with Sony's Hybrid Formatter 1.1

Rating: ★★★★★
List Price: \$8,995.
Street Price: \$6,795.
Pros: Double-speed drive. Good documentation. Easy-to-use software. Software fully supports hybrid and audio formats.
Warranty: 1 year.
Company: Sony Electronics, Inc., San Jose, CA; 800-352-7669 or 408-432-0190; 408-943-0740 (fax). Sony Electronic Publishing, Monterey, CA; 800-654-8802 or 408-372-2812; 408-375-7130 (fax).

Sony CDW-900E with Sony's Multimedia Formatter 1.0

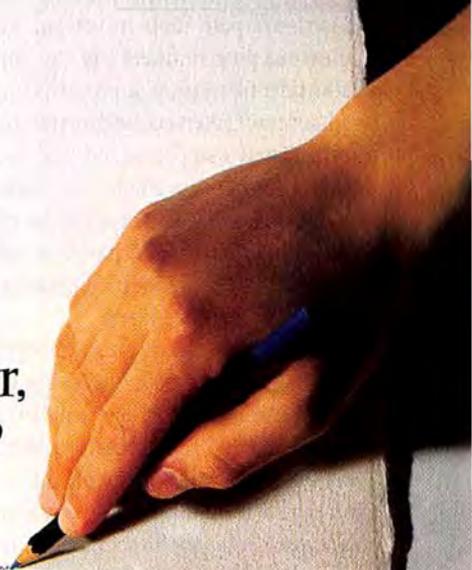
Rating: ★★★★★
List Price: \$8,095.
Street Price: \$6,495.
Pros: Double-speed drive. Good documentation.
Cons: Unresolved bug in software, with no upgrade planned.
Warranty: 1 year.
Company: Sony Electronics, Inc., San Jose, CA; 800-352-7669 or 408-432-0190; 408-943-0740 (fax). Sony Electronic Publishing, Monterey, CA; 800-654-8802 or 408-372-2812; 408-375-7130 (fax).



Drawing a *fine* Line

Two new versions of the leading illustration applications: more power, more features — or more confusion?

By David Biedny



OVER THE YEARS, many artists have formed distinct loyalties to either Adobe Illustrator or Aldus FreeHand. Just ask those artists why they prefer one program over the other, and you'll get an answer that combines religious fervor with technical detail. But here's the irony: Each program offers a full complement of illustration, type-manipulation, and page-layout features useful for creating everything from fine art to advertisements. And with the latest releases — version 5.0.1 of Illustrator and version 4.0 of FreeHand — the two have grown more alike.

Does this mean that you should simply throw a dart to pick a professional illustration program? Well, no, we wouldn't go that far. Although the latest releases of these products have eliminated some important differences, you'll still find key variations in the programs' interfaces, drawing capabilities, color handling, text controls, and technical support.

Interface

ADVANTAGE / A Draw FreeHand used to hold a wide lead over Illustrator in ease of use, but Illustrator 5.0 eliminates two of the most important interface differences between the programs: In version 5.0, Illustrator finally allows you to edit images in a preview mode and now offers floating palettes.

Adobe has replaced many of Illustrator's arcane modal dialog boxes with floating palettes that contain general information and

control aspects of painting, layering, gradient editing, and character and paragraph formatting (see figure 1). (Illustrator's main toolbox continues to be accessible in a floating palette.) When you select one or more objects, the palettes change to reflect the settings for those objects. You can either edit the objects by changing the settings in the palettes or edit the objects directly. You can't add features to or delete them from the palettes, but you can display or hide them at will, just as you can with FreeHand.

Not to be outdone, FreeHand has taken palettes a step further by presenting the important controls for a multitude of tools in a single, context-sensitive floating palette called Inspector. This palette contains icons you click on to bring up editable settings (see figure 2). You can access options for text, fill, and stroke values; column specifications; object dimensions; page configurations; and more.

The Inspector palette's buttons are nicely clustered, and the interface is easy to use. And the palette is efficient — a single, elegantly implemented area that links you to all other places in the program.

Drawing Tools

ADVANTAGE / Illustrator Each program allows you to create basic shapes, such as squares and circles, and lines with different types of ends; and each lets you design more-complex shapes, such as octagons, pentagons, and stars. Each also includes a pressure-

DRAW PROGRAMS

sensitive brush tool that produces vector-based outlines when used with a pressure-sensitive drawing tablet such as those from Wacom and CalComp. And each program can create and edit object paths.

Superficially, there's not much difference between the programs' drawing tools, but if you look closer, you'll discover that Illustrator has a wider assortment of options (including, for instance, a graphing tool for creating basic business charts). The programs also differ in how they handle paths, layers, and guides.

Path Creation and Editing

ADVANTAGE / Illustrator Adobe hasn't significantly enhanced Illustrator's path tools in version 5.0, but the company provides numerous plug-in filters you can apply to paths. For openers, the Pathfinder filters provide powerful Boolean functions, which let you add, subtract, intersect, and merge any number of objects and paths to create new shapes (see figure 5). For instance, you can use a foreground object to cut a hole in an underlying object. The Pathfinder filters also allow you to easily create transparency effects by mixing overlapping objects and paths — achieving similar transparency effects in previous versions of Illustrator required you to use complicated masking procedures.

The filter that clearly puts Illustrator in the lead when it comes to creating advanced path and shape effects is the one that lets you apply controlled distortions to paths (see figure 3). For example, you can use the Stylize and Distort filter categories to randomize the edges of shapes, thereby giving illustrations a more natural look. If you type text into Illustrator and then convert the letters into outlines, you can apply these filters to them as well.

FreeHand has always been somewhat weaker than Illustrator at handling basic path-creation chores; for example, Illustrator has

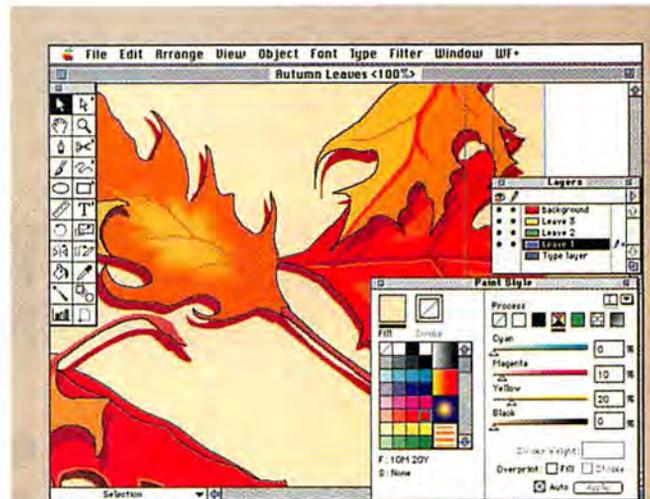


figure 1 / Clearly designed floating palettes have replaced many of the arcane dialog boxes of past Illustrator versions. For example, you can now choose colors from the Paint Style floating palette, and the Layers palette puts an intuitive interface on some very sophisticated functions.

offered better point control. But in version 4.0, FreeHand significantly narrows the gap. First, you can now change a point's type (from, say, corner to curve) via the Inspector palette — a method of editing that is much simpler than using the keyboard commands required in previous versions of the program.

Second, FreeHand includes a new Bezigon tool, which places control points at the correct angle on the curves of a scanned object. You can easily change the points' type later. If you have trouble figuring out how curve angles work, you'll truly appreciate the Bezigon tool.

Although FreeHand contains basic path- and object-combination commands such as Blend, Intersect, Punch, and Union, it doesn't offer Illustrator's level of control and myriad of creative options. Nor does FreeHand have Illustrator's multitude of special effects for modifying paths and objects. And because Illustrator supports plug-ins, the special-effects gap will probably widen.

Layer Management

ADVANTAGE / A Draw Layering capabilities were long overdue in Illustrator — with version 5.0, they're finally here. If you work with complex documents that have many overlapping objects, you'll appreciate the solid control each program gives you over layers.

With each program, you display individual layers by selecting an icon. You make the layers active by selecting another icon. Moving an object or a group of objects from one layer to another is equally straightforward: You cut and paste objects from one layer to another, or you can drag entire layers around in a palette to reorder them.

Differences between the two applications are minor. For example, Illustrator forces you to manually place guides in individual layers and FreeHand automatically creates separate layers that contain only guides. To help you edit multiple layers simultaneously, Illustrator lets you assign different selection colors to each layer: Objects selected in one layer are shown with bounding boxes and handles of one color, and objects selected in another layer are shown with a different color.

The Bottom Line

THE OLDER THEY GET, THE BETTER THEY GET. You won't go wrong with either of the top two PostScript draw programs — Adobe Illustrator 5.0.1 and Aldus FreeHand 4.0 — but take a close look at which one best suits your needs. Each of these old-timers offers a full set of professional illustration features, and each can be used to produce basic page designs. We think they'll keep getting better with age.

⊕ = OUTSTANDING

● = ACCEPTABLE

⊖ = POOR

PRICE/
PERFORMANCE

CUSTOMER
SERVICE

DRAWING
TOOLS

TEXT
HANDLING

★★★★

Adobe Illustrator 5.0.1

⊕ ● ⊕ ●



An abundance of drawing tools makes Illustrator the better choice for artists who produce intricate artwork and want to use creative special effects. This latest version of the program also includes more text-handling options than before.

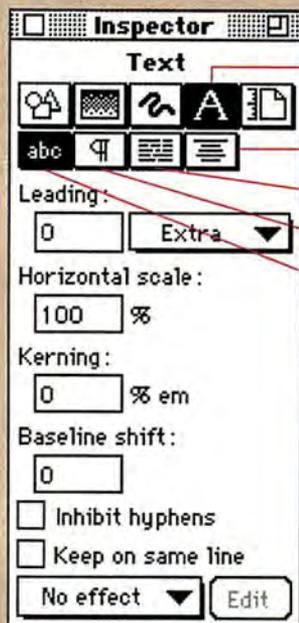
★★★★

Aldus FreeHand 4.0

⊕ ⊕ ● ⊕



Advanced type-handling and page-design features make FreeHand the better choice for designers who produce complex multipage projects such as brochures that contain linked text. Color handling is also much improved in this new version.



Text icon
Justification
Word spacing
Paragraph formatting
Character formatting

figure 2 / **Packing a lot of power in a single punch**, FreeHand's new Inspector palette consolidates many functions in one place. In this example, clicking on the text icon brings up four subicons, which you click on to access various formatting controls.

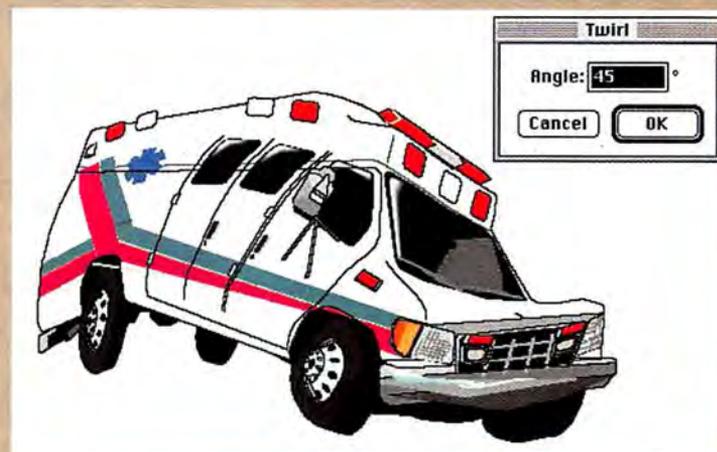


figure 3 / **For creating special effects**, Illustrator 5.0 is the leader. In this example, we warped an ambulance by applying the Twirl filter at a 45-degree angle. Twirling works best with objects that contain many paths or points.

Alignment Guides

ADVANTAGE / Illustrator As an artist, you know that some tasks are best accomplished with paper and pen — but aligning objects isn't one of those tasks. Illustrator and FreeHand each let you drag horizontal and vertical guide lines from their rulers onto an active document, and they each offer snap-to guides for easily aligning and constraining elements.

Although each offers similar guide functionality, only Illustrator lets you use any object or path as a snap-to guide. So, for example, you might create a group of circular shapes, put them in a regular pattern — or in an irregular arrangement — and convert them into guides. Objects and text would then snap to your custom guides as well as they could. FreeHand's ruler-based guides work well but lack the flexibility of Illustrator's object guides.

Color Handling

ADVANTAGE / FreeHand FreeHand's color handling, a weak part of the program in previous versions, has been dramatically improved in version 4.0 — so much so, in fact, that FreeHand now surpasses Illustrator in color-handling flexibility. For instance, although each program allows you to create custom colors and store them in libraries for reuse, FreeHand supports more color models and offers more ways to choose colors. Illustrator, however, provides better on-screen color calibration.

To pick a color for an object in Illustrator, you use a Paint Style palette, from which you set color, pattern, and fill and stroke settings for a selected object. Illustrator's main color model is CMYK, although you

can create custom colors (such as gold) or specify Pantone colors or percentages of black and white. To create colors in FreeHand, you mix colors in the Color Mixer floating palette.

FreeHand supports CMYK, HSL, and RGB color models. When you use the HSL color model, FreeHand displays a miniature version of the Apple Color Picker. You select a color and then move slider bars to adjust the color's hue, saturation, and lightness — an easy and intuitive way for CMYK novices to specify the color they want.

Applying colors to objects with FreeHand is just as easy and can even be downright fun. You simply select one or more objects, drag a swatch of any color to the objects, and drop it onto them. The power of this technique becomes apparent when you create gradients. You specify the beginning and ending color of a gradient as well as the direction of the blend by dragging the colors onto an object. For instance, to make a gradient from light green to dark green, going from the top to the bottom of an object, you drop a swatch of light green onto the top and then drop a swatch of dark green onto the bottom. FreeHand creates the gradient automatically. Unfortunately, FreeHand can create only two-color gradients.

Illustrator 5.0, on the other hand, can automatically create multicolor gradients (see figure 4). In previous versions of Illustrator, you had to use the blend tool to manually create gradients — and because each line of the blend was treated as a separate object, gradients required huge chunks of memory. With Illustrator 5.0's automatic-gradient feature, gradients are stored as mathematical descriptors, which require much less memory. Like custom colors, gradients can be stored in libraries for

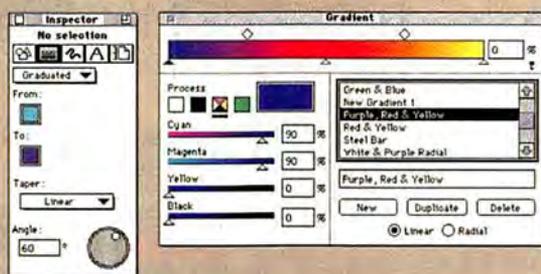


figure 4 / **When you're blending colors**, Illustrator offers far more options than FreeHand. FreeHand's controls (left) allow only two-color gradients. Illustrator's gradient editor (right) lets you create multicolor gradients, control cross-fades, and store gradients in libraries.

reuse. Be forewarned, however — we had problems getting Illustrator images that contained numerous gradients to print correctly on some models of Linotronic imagesetters.

In their latest versions, both programs let you globally update the color of objects. Both also now let you use PostScript patterns as fills and strokes. Only Illustrator, however, lets you preview custom patterns on-screen. In either program, you can apply the fill and stroke attributes of any object to any other selected objects.

Each has basic on-screen color-calibration capabilities. FreeHand displays seven color swatches on-screen. You manually adjust the color swatches via the Apple Color Picker until they look like ones printed in a reference book — so much for accuracy. Illustrator offers more-advanced color-calibration methods — CIE calibration, monitor gamma adjustments, and built-in color-device profiles.

Text Handling

ADVANTAGE FreeHand If you've never thought of FreeHand and Illustrator as page-layout programs, then maybe you should reconsider. Although neither program can replace a dedicated publishing package, each can be used to create simple documents such as advertisements or menus. With FreeHand's more advanced text-handling capabilities, you can produce even-more-sophisticated documents, such as brochures or entire design projects.

On the most basic level, Illustrator's Character palette gives you control over the font and the size, leading, baseline shift, horizontal scale, and tracking of text. Illustrator can automatically adjust spacing for selected text, using the kerning pairs that are built in to each font. FreeHand includes all the character-formatting options found in Illustrator as well as special effects such as automatic creation of in-line type and drop shadows. FreeHand has a full formatting ruler that lets you control indentation, tabs, and more.

Each program offers advanced text-formatting controls such as the ability to wrap text around shapes or have it flow within them, place text on paths, and link blocks of text. FreeHand, however, clearly has the lead when it comes to power-user features such as

The 10 Best Things About Illustrator

1. Pressure-sensitive brush tool that offers calligraphic features.
2. A graphing tool for creating standard business charts, such as pie, column, line, area, or scatter charts.
3. Pathfinder filters, which provide advanced path editing.
4. Powerful Boolean operators for combining objects.
5. A multitude of special-effects options.
6. Plug-in-filter architecture that ensures easy upgradability.
7. Excellent layering tools.
8. Ability to use objects as snap-to guides.
9. Ability to create multicolor gradients.
10. Good color-calibration tools.

automatic copyfitting. You can automatically adjust the size and other attributes of selected text to force it to fit within a specific block. Although Illustrator doesn't have a full copyfitting feature, it does offer the simple Fit Headline command, which automatically adjusts the weight of the characters in one or two lines of text to fill the horizontal dimension of a block. Headline fitting, however, is designed primarily for use with Adobe multiple-master fonts.

FreeHand has a multitude of other text-handling capabilities that far surpass those in Illustrator. For instance, FreeHand's paragraph-formatting options provide full control over margins, hanging punctuation, and justification. The program's powerful hyphenation features give you options such as preventing capitalized words from being hyphenated and limiting the number of consecutive lines that end with a hyphen.

FreeHand also includes advanced text-handling options that are crucial for page-layout work. You can create columns within a text block, for example, and you can easily link text blocks and achieve various kinds of text effects (see figure 6). In contrast, Illustrator allows you to link only text blocks that are contained within a shape. FreeHand also lets you combine pages of varying sizes in a single

	Combine
	Unite
	Intersect
	Exclude
	Back Minus Front
	Front Minus Back
<hr/>	
	Divide/Merge
	Divide Fill
	Divide Stroke
	Merge Fill
	Merge Stroke
<hr/>	
	Crop
	Crop Fill
	Crop Stroke
<hr/>	
	Mix
	Mix Hard
	Mix Soft...

	Correct direction
	Reverse direction
	Remove overlap
	Simplify
<hr/>	
	Blend
	Intersect
	Punch
	Union
<hr/>	
	Expand stroke...
	Inset path...

figure 5 / Illustrator's Pathfinder commands (left) offer many more options for combining paths than do FreeHand's commands (above). The Pathfinder's Mix commands lets you easily create transparency effects with layered objects. Creating such effects in FreeHand requires much more work.

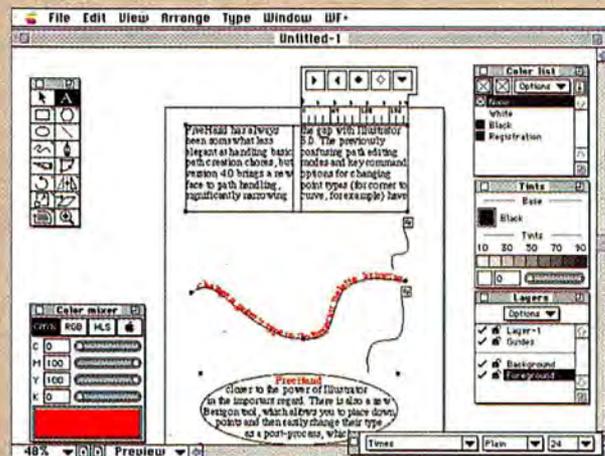


figure 6 / **Awesome** — that's the word for FreeHand's text-linking tools. In the example shown here, a two-column block of text at the top of the page is linked to a path, which is, in turn, linked to the oval at the bottom of the page. Links show up as squiggly lines.

The 10 Best Things About FreeHand

1. The Inspector palette, which consolidates complex operations.
2. The Bezigon tool, for placing control points at the proper angle on curves.
3. Various color-selection schemes.
4. Drag-and-drop color placement.
5. Powerful character and paragraph formatting.
6. Automatic-copyfitting feature.
7. Flexible text-linking capabilities.
8. Ability to handle multiple page sizes in a single document.
9. Style sheets that help automate page production.
10. Comprehensive on-line help.

document — a handy feature for grouping an entire design project (such as ads, brochures, and handouts) within one file.

To help automate page production, FreeHand includes a style-sheet feature. You can assign any combination of object and text attributes to a style and then apply that style to other objects. If you modify the style's parameters in the Style palette, FreeHand automatically updates all objects that have that style.

Power Mac Plans

ADVANTAGE A Draw The superior performance of the new Power Macintosh will surely please illustrators and designers — especially because both Illustrator and FreeHand should be available in native Power Mac versions this spring. To give you an idea of the speed increases you'll see, we compared a prerelease PowerPC version of FreeHand running on a Power Mac 6100/60 to a shipping 680x0 version of FreeHand running on a Quadra 950. Generally, we saw speed increases of 300 percent on most computation-intensive operations and screen redraws. Working with gradient fills was a pleasure; it was thrilling to watch the screen update at warp speeds.

Aldus says that the native version of FreeHand will have the same interface and feature set as FreeHand 4.0. The PowerPC version, however, will be sold separately from the 680x0 version, so if you want the PowerPC version of FreeHand, you'll either need to buy it for \$595 or upgrade from version 4.0 for \$129. (For those who have an older version of FreeHand, the upgrade is \$249.)

Adobe's plans for a PowerPC version of Illustrator are much more aggressive. An entirely new version of Illustrator, Illustrator 5.5, will include new features such as tabs, a spelling checker that allows you to create custom dictionaries, and the ability to search and replace by font. Adobe will also include Acrobat Exchange and Distiller with Illustrator 5.5, so that you can turn any type of document into an Adobe PDF file and import it into Illustrator. Except for the tab feature, all the new features will be implemented via plug-in filters.

Illustrator 5.5 will cost \$595; you get both the PowerPC version and the 680x0 version in the same box. The program includes a smart installer, which automatically installs the correct version on your Macintosh. Additionally, you can perform a custom install that places both the PowerPC code and the 680x0 code on your hard disk — a good idea if you move your hard drive from Mac to Mac. An upgrade from version 5.0 costs \$99, and an upgrade from version 3.0 costs \$149.

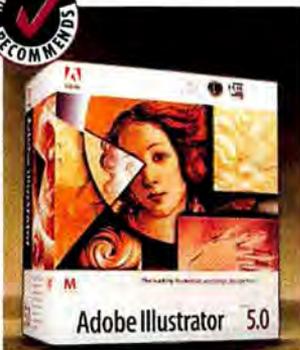
Documentation and Support

ADVANTAGE FreeHand Because these programs are so complex and because the cost of technical support keeps going up, good documentation is essential. Aldus has combined the documentation for the Mac and Windows versions of FreeHand into one package. Screen shots alternate randomly between the versions throughout the manual — an effect that is slightly disconcerting to die-hard Mac fans (as well as to Windows fans, we suppose).

Nonetheless, FreeHand's documentation is a joy to use. Rather than simply describing a command or a tool, FreeHand's manual explains exactly what problem you can solve with each command or tool. The documentation also includes a slim (but utilitarian) tutorial and the immensely practical *Commercial Printing Guide*, which covers real-world color-reproduction issues. FreeHand also has excellent on-line help that details all of the program's features.

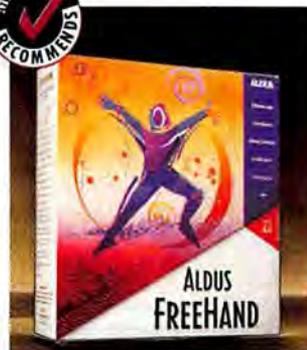
Illustrator does not include any on-line help, but the tutorial, tips-and-techniques booklets, and hefty reference manual more than amply cover all aspects of the program. Adobe also offers a CD-ROM version of Illustrator 5.0, which includes additional technical notes, QuickTime-based tutorials, stock images, and 40 PostScript fonts. Although Illustrator's documentation is not organized or designed as clearly as FreeHand's, Illustrator's comprehensive tutorials are a great help for users new to PostScript drawing programs.

We also found Adobe's new tech-support policy to be stricter (and more expensive) than Aldus'. When you purchase Illustrator, you get one tech-support credit, which entitles you to have a single problem



Adobe Illustrator 5.0.1

Rating: ★★★★★
List Price: \$595;
CD-ROM version, \$695.
Street Price: \$390;
CD-ROM version, \$460.
Pros: Powerful path-editing and special-effects tools. Multicolor-gradient designer. Flexible alignment guides.
Cons: Weak text handling. Lack of on-line help.
Levels of Undo: 200.
File-Input Formats: EPS, PICT.
Color Models: CMYK, custom/spot.
Alignment Guides: Object and ruler.
Calibration: CIE, color matching, output-device profiles.
Levels of Zoom: 6.25 to 1,600 percent.
Company: Adobe Systems, Mountain View, CA; 800-833-6687 or 415-961-4400.



Aldus FreeHand 4.0

Rating: ★★★★★
List Price: \$595.
Street Price: \$390.
Pros: Intuitive interface. Excellent text-handling options. Solid color-handling controls. Flexible page-layout features. Good on-line help system.
Cons: Lacks advanced special-effects and path-editing features. Weak gradient editing.
Levels of Undo: 100.
File-Input Formats: ASCII, EPS, FreeHand, Illustrator, PICT, RTF, TIFF.
Color Models: CMYK, custom/spot, HSL, RGB.
Alignment Guides: Ruler.
Calibration: Color matching.
Levels of Zoom: 12 to 800 percent.
Company: Aldus Corp., Seattle, WA; 206-622-5500.

DRAW PROGRAMS

solved. Additional credits cost \$25 each. Credits have to be used within three years and can be applied to any Adobe product.

Aldus offers 90 days of free tech support from the first call. After that, you can choose from several support plans. You can call a 900 number for \$2 a minute, or you can sign up for an extended support contract (prices start at \$99 a year for unlimited toll-free support and discounts on software).

Drawing Conclusions

ADVANTAGE / A Draw FreeHand continues to outpace Illustrator when it comes to advanced text handling. In addition, FreeHand's Inspector palette is a wonderful interface addition, a feature we'd like to see show up in more software. FreeHand's updated color-handling capabilities bring intelligence and grace to this often ignored aspect of draw software. FreeHand's main disadvantage in comparison to Illustrator is its dearth of special-effects options.

Illustrator, on the other hand, has a much larger selection of creative filters and effects than FreeHand, and its plug-in architecture

holds the promise of a healthy third-party market much like that of Photoshop. In addition, Illustrator has an edge when it comes to generating precise curves and editing paths. But although its text controls have been improved over those of previous versions, they're still not as powerful as those of FreeHand.

Many artists will find that either package can fulfill their needs. Each program has a strong feature set, and many of their functions overlap. If you're choosing between the two programs, however, we recommend FreeHand for demanding layout or text-handling chores and Illustrator for creating special effects.

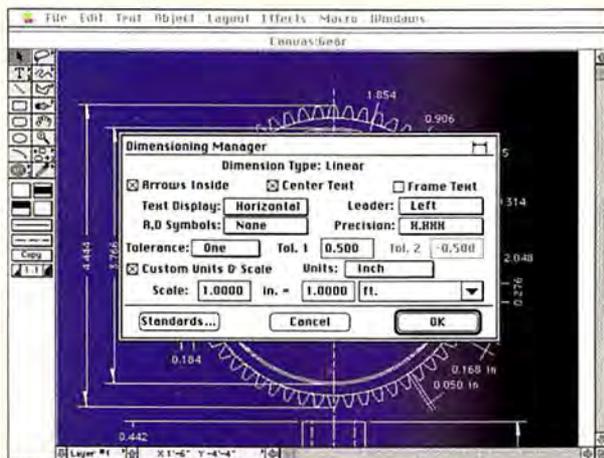
[At press time, Adobe and Aldus announced an agreement to merge. The companies' shareholders will not consider the merger for approval until July. Both Aldus and Adobe claim that if the merger is approved, the combined company will continue to sell and support both Illustrator and FreeHand. — Ed.]

In 1984, David Biedny taught people how to design pages with MacDraw.

Canvas 3.5 / the Swiss-army knife of illustration

A FULL-FEATURED PAINT/DRAW PROGRAM, Deneba Software's Canvas 3.5 tries to be all things to all people — and often succeeds. Like Illustrator and FreeHand, Canvas includes PostScript drawing capabilities. But in addition, Canvas offers bit-map-editing tools, and the program handles output to QuickDraw printers better than FreeHand or Illustrator. Straddling another line, Canvas comes in identical Mac and Windows versions; files are fully interchangeable between the two. (A native PowerPC version of Canvas 3.5 will be available this summer.) Canvas can also create decent four-color separations.

The drawing portion of Canvas contains features that are useful for drafting. For example, an autodimensioning feature lets you create numerically accurate floor plans and industrial designs. Powerful layer-management tools (similar to those in Illustrator and FreeHand) help in creating and editing complex, multilayer drawings such as technical illustrations.



For industrial designers and engineers, Canvas offers a variety of precision tools. An autodimensioning feature determines a selected object's size and creates dimension lines that have the appropriate measurements. Each of the lines' parameters is adjustable.

Convenience is a key concept in Canvas. You can search for specific fill properties and objects within a drawing. The Smart Mouse feature — unique to Canvas — helps automate many alignment and constraint tasks. For instance, if you specify that all angles be drawn in increments of 30 degrees, the Smart Mouse feature will automatically adjust angles as you draw them.

When it comes to text handling, Canvas' features rival those of Illustrator. Canvas includes full kerning and tracking features, and it can wrap text around or flow it within any shape. A built-in spelling checker rounds out Canvas' text toolbox.

What you don't get with Canvas, however, is extrafine control over illustrations. For example, although Canvas' curve- and path-editing tools work well, they don't include as many options as those in Illustrator 5.0. Nor does Canvas include all the features FreeHand includes for producing page layouts. In addition, with Canvas, you're limited to one level of undo — not only a scary proposition when you're creating complex images but also a damper on what-if experimentation.

If you're looking for a bargain, Canvas is an excellent choice. For a low street price of \$265, you get one program that lets you produce both bit-mapped and PostScript drawings, and the company offers free, unlimited technical support. For \$149, you can trade your old copy of FreeHand, Illustrator, MacDraw, or IntelliDraw for Canvas 3.5. Canvas is an especially good choice for students and for users who need to create basic CAD diagrams or technical illustrations.

Canvas 3.5

Rating: ★★★★★

List Price: \$399.

Street Price: \$265.

Pros: Offers tools for PostScript and bit-mapped drawings. Good text handling. Many precision features.

Cons: Weak page-layout features.

Does not offer fine control over curve and path editing.

Levels of Undo: 1.

File-Input Formats: Canvas, Canvas for Windows, CGM, DXF, EPF, IGES, Illustrator 1.1, Illustrator 88, MacDraw 1.0 and 2.0, MacPaint, PICT, PICT2, StartupScreen, TIFF, UltraPaint.

Color Models: CMY, CMYK, HSV, RGB.

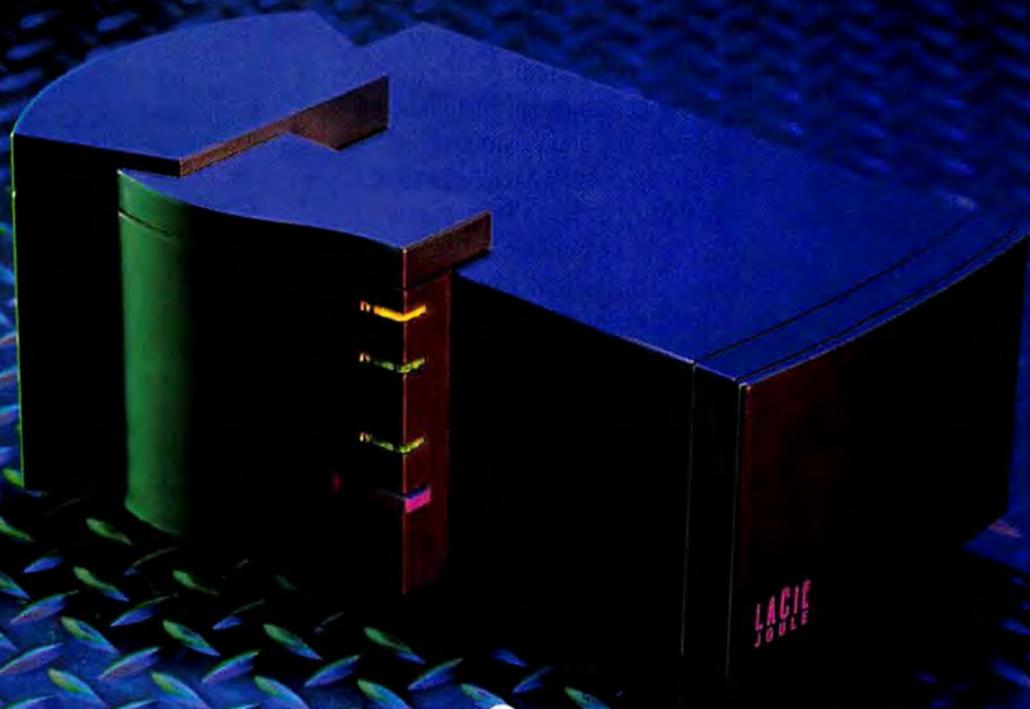
Alignment Guides: Ruler.

Calibration: Pantone color tool kit.

Levels of Zoom: 3 to 3,200 percent.

Company: Deneba Software, Miami, FL; 800-622-6827 (sales) or 305-596-5644 (support).

Introducing Joule,TM
a modular system
so innovative
it redefines
mass storage.



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only from La Cie, a Quantum Company

The Joule™ Modular Storage System

Joule System Components

Innovative technology
at surprisingly
affordable prices.



The Joule Top Cap



Joule 2.5" Hard Drive Module
with Mount



Joule 3.5" Half-Height Module
with Mount



Joule 3.5" Full-Height Module
with Mount



The Joule Base

Like building blocks, Joule tops
one great drive with another—
No tools required.

There's a reason Joule (pronounced "Jewel") doesn't look like other mass storage systems. It isn't. Joule is modular. Uniquely versatile. Unconventionally easy-to-use. And unexpectedly elegant.

Joule is a radical concept that transcends the boundaries of conventional drive engineering. It allows you to combine a variety of hard disk drive and removable media drive options into a single vertically interlocked system.

Joule's modular concept eliminates cumbersome redundancies in cables, power supplies and circuitry. Its unique tower design makes installation child's play and expanding or changing your system effortless and fast. It also allows you to move drive modules in and out of the system—at will—without affecting the system's operation.

Joule reinvents the "ins and
outs" of portable mass storage.

Everyone knows the hardest part of moving portable hard drives from one computer to another is wrestling with the cables. Joule's drive modules are cable free. They mount and dismount from the system with single-handed ease. And, because removing modules doesn't affect the system's operation, there's no easier way to move mass storage—from workstation to workstation, across the office, across town or across the country.

Joule Base with 1080MB
Hard Disk Installed, plus
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270MB Hard Disk Module



340MB
Joule Base
\$389

Joule Base with 340MB
Hard Disk Installed

The Joule system and switchable active
termination are patent pending.

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advantages are simply towering.

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Joule Mounts pass power and SCSI signals from the base through each interlocking mount (patent pending). Mounts also allow modules to be inserted or removed, leaving the SCSI chain intact.

Joule Drive Modules offer even greater selection. Hard disks from 170MB to 2050MB, plus a full range of SyQuest, optical, tape and DAT modules are available to complete your system.

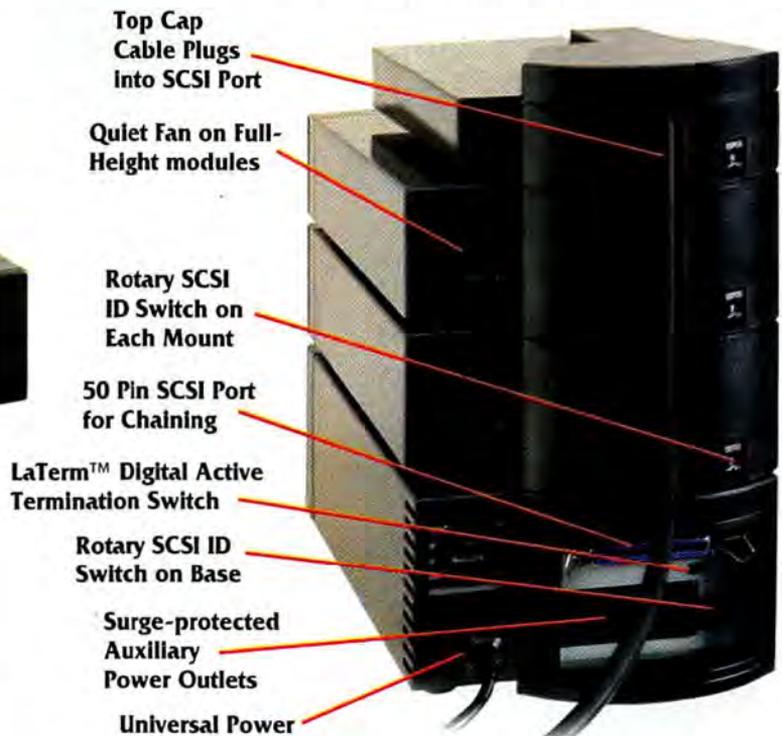
The **Joule Top Cap** contains the SCSI cable to the Mac giving the system a clean single-cable design, regardless of the number of modules.

Building on a firm foundation.

With Silverlining disk management software, Quantum quality, a great warranty and toll-free technical support, Joule offers every La Cie advantage. As a Quantum Company, La Cie is backed with a Fortune 500® commitment to quality and service.



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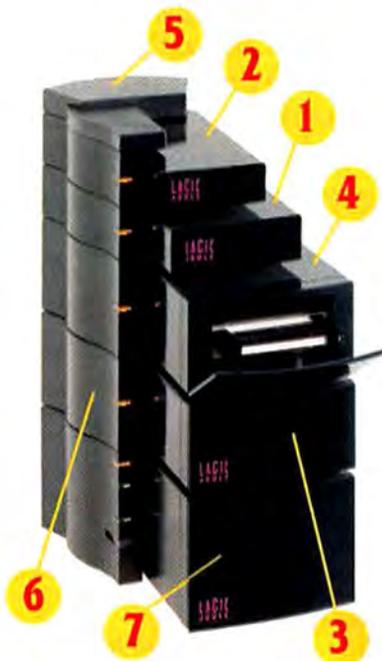
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The Joule Modular Storage System is the most versatile and convenient mass storage solution available (patent pending). Select from a full range of hard disk and removable media options in base and module units.



1 Quantum 3.5" Drives

Capacity	Base w/TopCap	Module w/Mount
170MB		\$259
270MB		\$329
340MB	\$389	\$359
540MB	\$639	\$609
1080MB	\$949	\$919
3 1800MB		\$1259

2 Quantum 2.5" Drives

Capacity	Module w/Mount
85MB	\$299
160MB	\$349
256MB	\$449

3 Seagate Drives

Capacity	Module w/Mount
1650MB	\$2039
2050MB	\$2329

4 Removable Drives

Drive	Base w/TopCap	Module w/Mount
SyQuest		
105MB	\$539	\$509
270MB	\$689	\$659
DAT		
5.0GB DAT	HOT!	\$1159
TurboDAT		\$1629
8.0GB DAT		\$1729
Tape		
155MB		\$569
600MB		\$789
Optical		
128MB		\$1179

Additional Accessories

5 Top Cap	\$49
6 Mount	\$69
7 Joule Base (no drive)	\$199

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- ▶ Double Shielded SCSI Cables
- ▶ FCC, UL, TUV, VDE & CSA Approved
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- ▶ Front Power Switch

remarkable...even the price.

La Cie Storage Solutions



Tsunami™: Sleek, transportable.

Our award-winning Tsunami drives offer superb performance and design.

Quantum 3.5" Drives

Capacity	Internal	Tsunami
170MB	\$199	\$259
270MB	\$269	\$329
340MB	\$299	\$359
540MB	\$549	\$609
700MB		\$699
1080MB	\$859	\$919
1650MB s	\$1979	\$2039
1800MB	\$1199	\$1259
2000MB s	\$1919	\$1979
2050MB s	\$2269	\$2329

S=Seagate mechanism

PocketDrive™: Palm-sized portability.



Weighing in just under 10 ounces, the only pocket portable to offer the PocketDock™ docking option.

Quantum 2.5" Drives

Capacity	Internal PowerBook*	PocketDrive
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160MB	\$249	\$349
170MB	\$259	\$359
256MB	\$349	\$449

*LaserWriter 630 installation kit available

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ZFP Removable Drives

Drive	Internal	External
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44MB	\$369	\$429
88C MB	\$479	\$539
105MB	\$449	\$509
Cartridges	44MB \$69	88MB \$99
		105MB \$79

Each drive comes with Silverlining™ and one free SyQuest cartridge.

CD-ROM

Toshiba Dual Speed \$639

Optical Drives

128MB \$1109 \$1179
128MB Cartridge \$45

Each drive comes with Silverlining™ and one free 3.5" optical cartridge.

DAT

5.0GB DAT \$1099 \$1159
TurboDAT \$1569 \$1629

Tape

155MB \$569
600MB \$729 \$789

Each drive comes with Retrospect™ and one free DAT or TEAC tape cartridge.

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Macworld, November 1993

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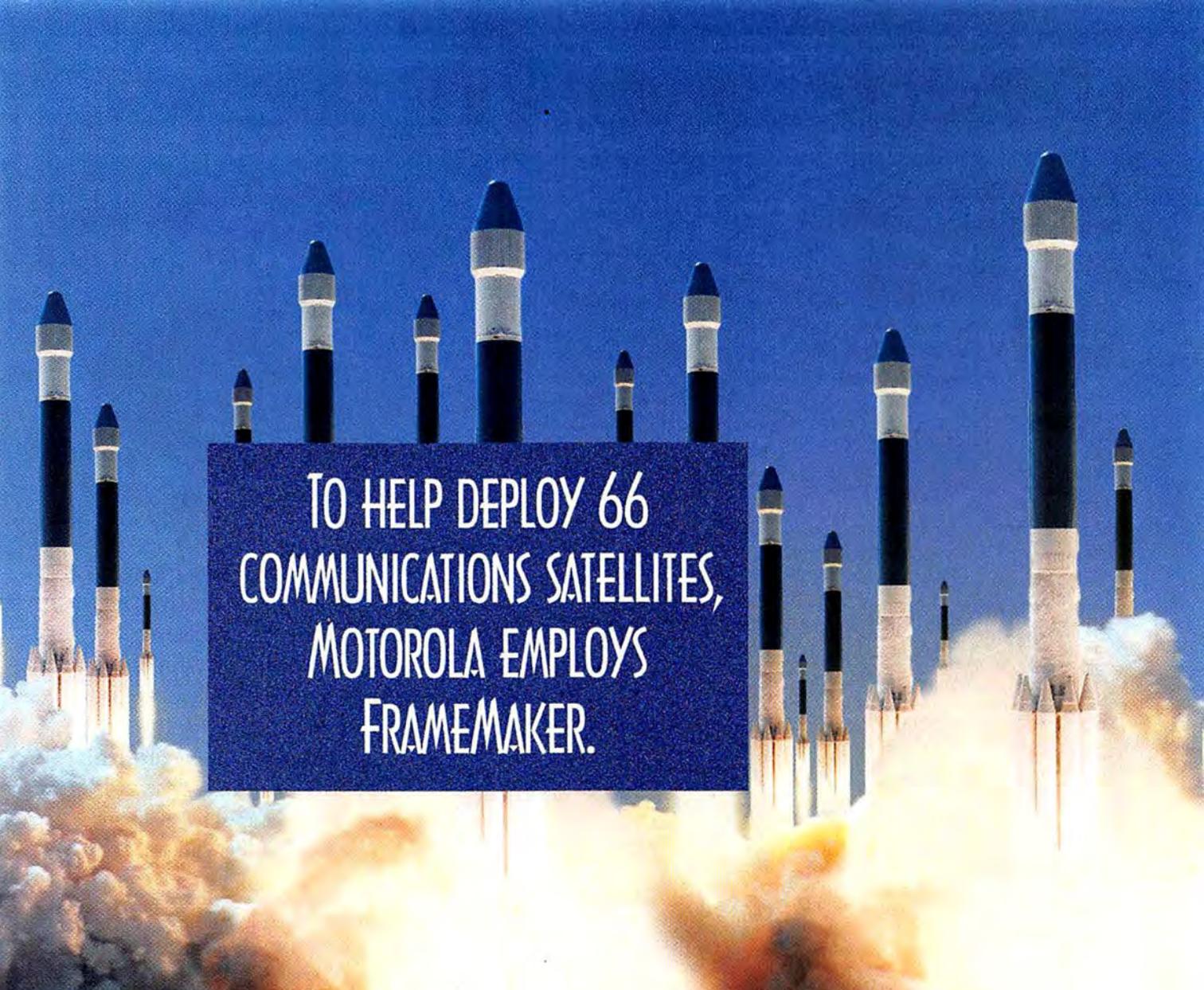
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HANDS ON Desktop Publishing

COLOR MANAGEMENT /

TRIP THE LIGHT FANTASTIC

IT'S NOT A DIGITAL CAMERA, but it does take snapshots — of color. This futuristic-looking device from Light Source measures color both on-screen and on the printed page. Serving as spectrometer, colorimeter, and densitometer rolled into one sleek unit, it gives you all the data you need to more accurately match colors throughout your publishing system.

The Colortron fits in the palm of your hand — unlike other color-measuring devices that require elaborate tabletop setup — and it connects to your Mac through an ADB or serial port. To take a sample of color data from reflective art, a computer screen, or another source, you simply rock the unit forward until its light source clicks on, almost like a camera's shutter snapping when the camera takes a picture.

The Colortron's optics record 32 bands of light in 10-nanometer

slices through a 3-millimeter aperture — in other words, the device is really precise. The Colortron runs off Ni-Cd batteries and takes 1,000 samples per battery charge.

You can incorporate the color data into your production stream in a variety of ways: The Colortron comes with its own stand-alone application as well as with a system extension that sits on top of ColorSync 2's Apple Extensible Color Picker. Final pricing wasn't set at press time, but the unit will cost less than \$1,000. 800-231-7226 or 415-925-4200. / Pamela Pfiffner



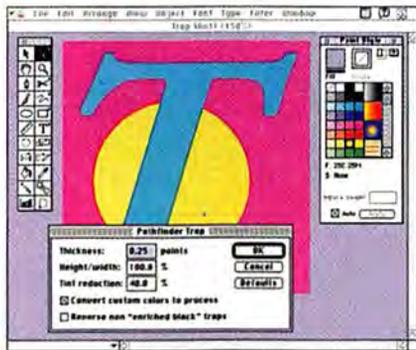
DRAW PROGRAMS /

ADOBE DRAWS THE LINE

IT'S A DRAW between Adobe Illustrator 5.0 and Aldus FreeHand 4.0, at least for the time being (see "Drawing a Fine Line," page 108 in this issue). And now that Adobe and Aldus have merged, the line between the products is even more blurred. But a new native PowerPC version of Illustrator may change that, especially in the areas of text functions and trapping.

With Illustrator 5.5, Adobe takes advantage of the plug-in technology introduced in version 5. Many enhancements included in version 5.5 are in the form of plug-ins, such as filters for importing PICT files, converting custom color to process, and setting black percentages for overprints.

Illustrator 5.5 also builds on the previous



version's Pathfinder technology. The Pathfinder Trap feature automatically traps spot- or process-color Illustrator art. You select objects to be trapped, assign a trap width, and set tint variables; Illustrator then applies the appropriate choke or spread.

Where Illustrator 5.5 really makes up lost ground is with its new text-handling features, such as a floating palette for setting

tabs. You can control the number of columns and rows, their width and height, and the space between them and then preview the formatted text block. Word-processing capabilities — such as smart quotes and dashes, case change, spell checking with user-definable dictionaries, and search-and-replace by font — are implemented as plug-in filters too.

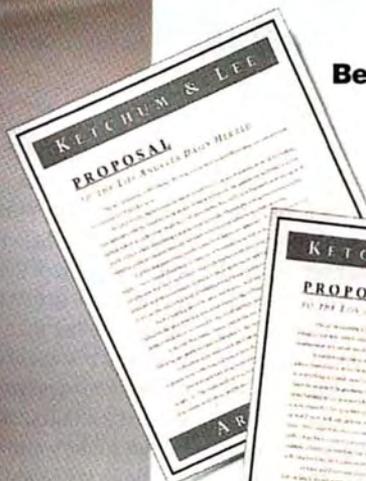
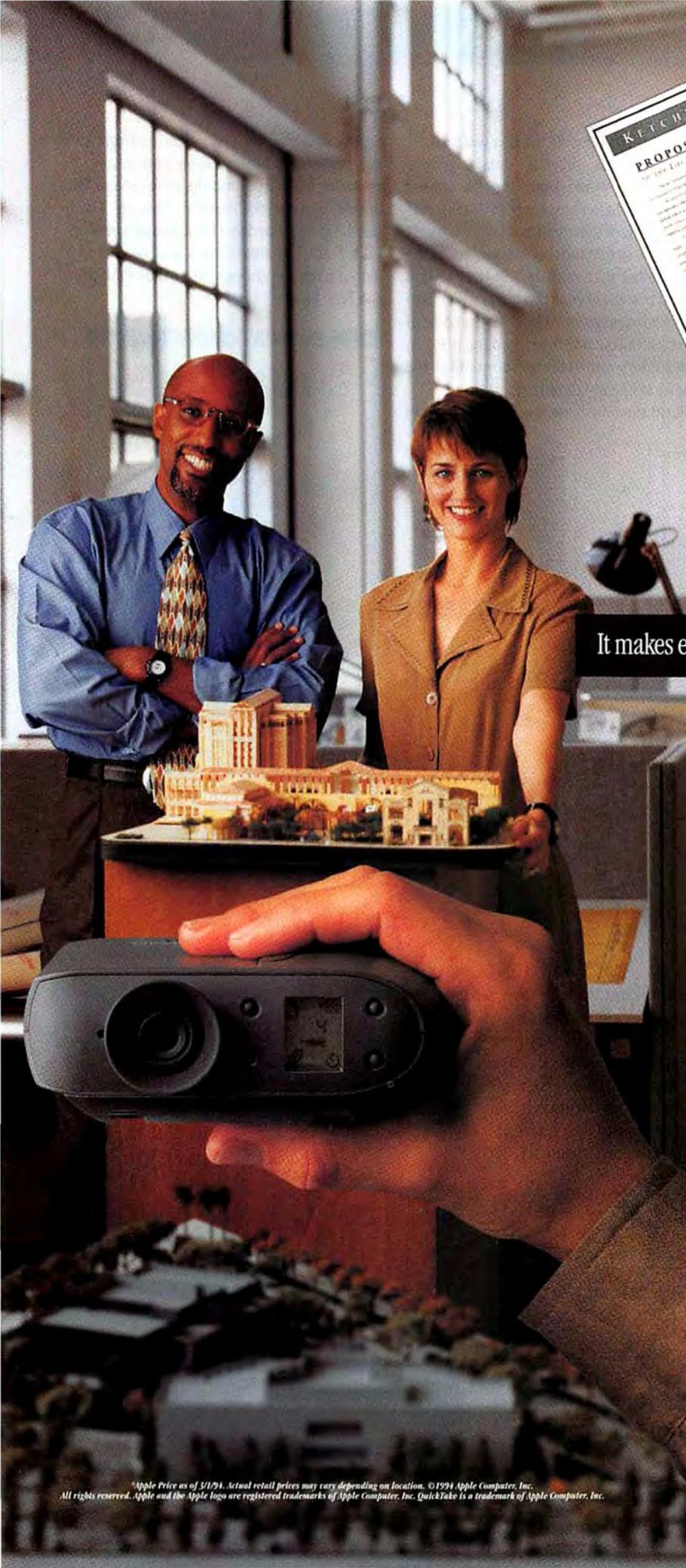
Illustrator 5.5 also includes Acrobat Exchange and Distiller software as well as a plug-in for importing files created in Adobe's PDF (Portable Document Format). Once you bring a PDF file into Illustrator, you can perform some basic editing functions on it, such as correcting misspelled words or changing colors. \$595 (includes Deluxe CD-ROM); upgrade from 5.0, \$99; upgrade from all other versions, \$149. 415-961-4400. / PP

TURNING BACK THE PAGES

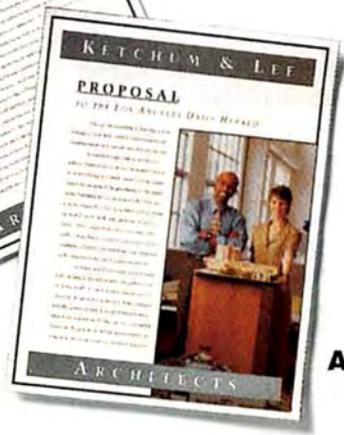
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margins, and other options. FlipBook automatically determines how many pages are required. The product ships with special perforated paper for easy assembly into books, but you can manually cut up standard paper. Is it useful? Not really. Is it fun? You bet. FlipBook is from S. H. Pierce & Co., the same company that brings you large-scale printing with PosterWorks. \$89. 617-338-2222. / PP





Before



After

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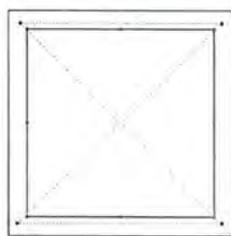
*Apple Price as of 3/1/94. Actual retail prices may vary depending on location. © 1994 Apple Computer, Inc. All rights reserved. Apple and the Apple logo are registered trademarks of Apple Computer, Inc. QuickTake is a trademark of Apple Computer, Inc.

3 Wrapping Text Inside a Triangle

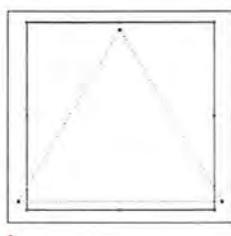
In PageMaker, draw a square and apply text wrap. To make your text flow inside the shape rather than outside, turn the text boundary inside out: Drag the bottom right and bottom left corner points to exchange positions (a), and then switch the positions of the two upper corner points so that the text will flow inside the polygon rather than outside. Edit the polygon to make a triangle. If your text box is wider than the runaround polygon in QuarkXPress, some of the text will fall outside the runaround (e). Adjust the width of the text box until all the text flows inside the runaround (f).

In Illustrator 5.0, shape text by using the pen tool to draw an arrow, clicking on the arrow with the default type-tool pointer and pasting in text, which will flow into the arrow shape. The arrow's black stroke becomes invisible. Finish the design by drawing a background arrow (g).

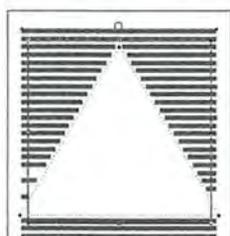
In FreeHand 4.0, select a text block and a closed path and choose Flow Inside Path from the Type menu.



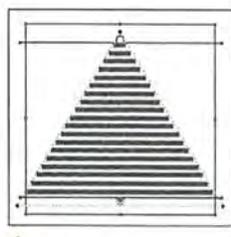
a



b



c



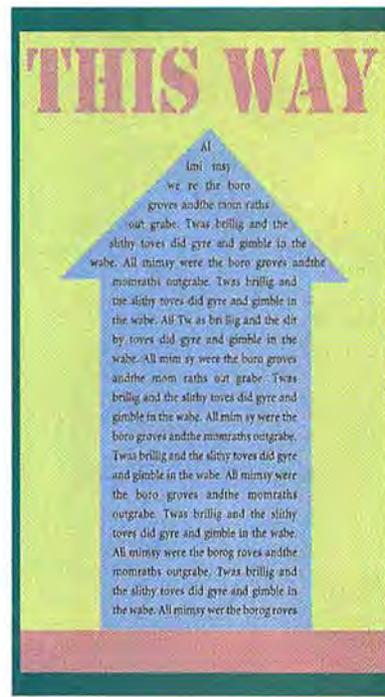
d



e



f

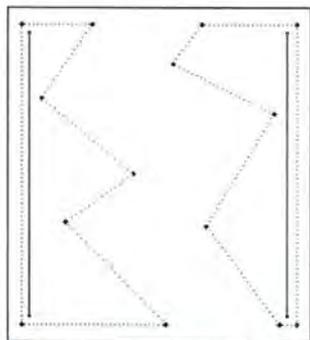


g

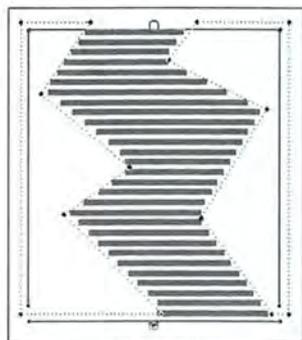
4 Molding Type with Two Text Wraps

To create a zigzagging text column in PageMaker, draw two vertical lines, apply text wraps to each, add points to their inner boundary edges, and move the points to create crooked shapes (a). In QuarkXPress, use the polygon tool to draw angular shapes and apply Runaround, in Auto Image mode, to wrap the text along the edges of the polygon. In either program, position a page-wide text block. The

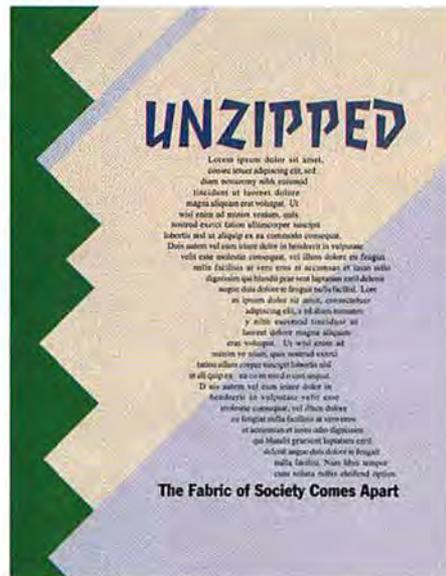
two text-wrap or runaround objects force the text into a zigzag shape (b). To make the defining shapes invisible, be sure to specify None for the two text-wrap objects' lines. Complete the page by adding a headline, a subhead, and geometric elements that reinforce the shape of the text column and the "unzipped" theme (c).



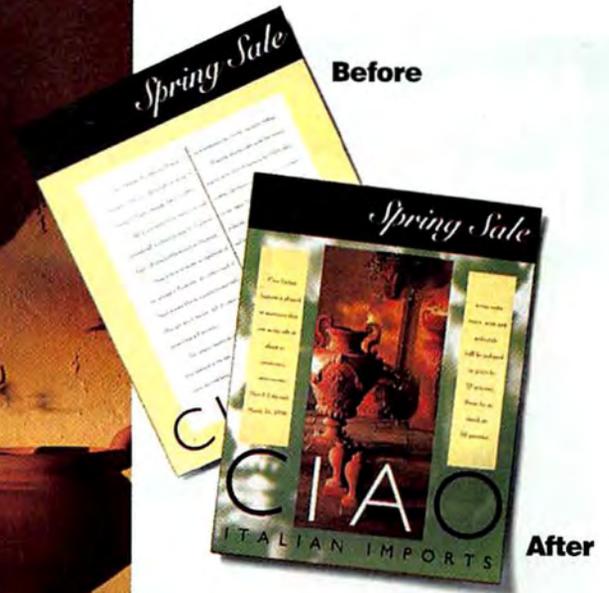
a



b



c



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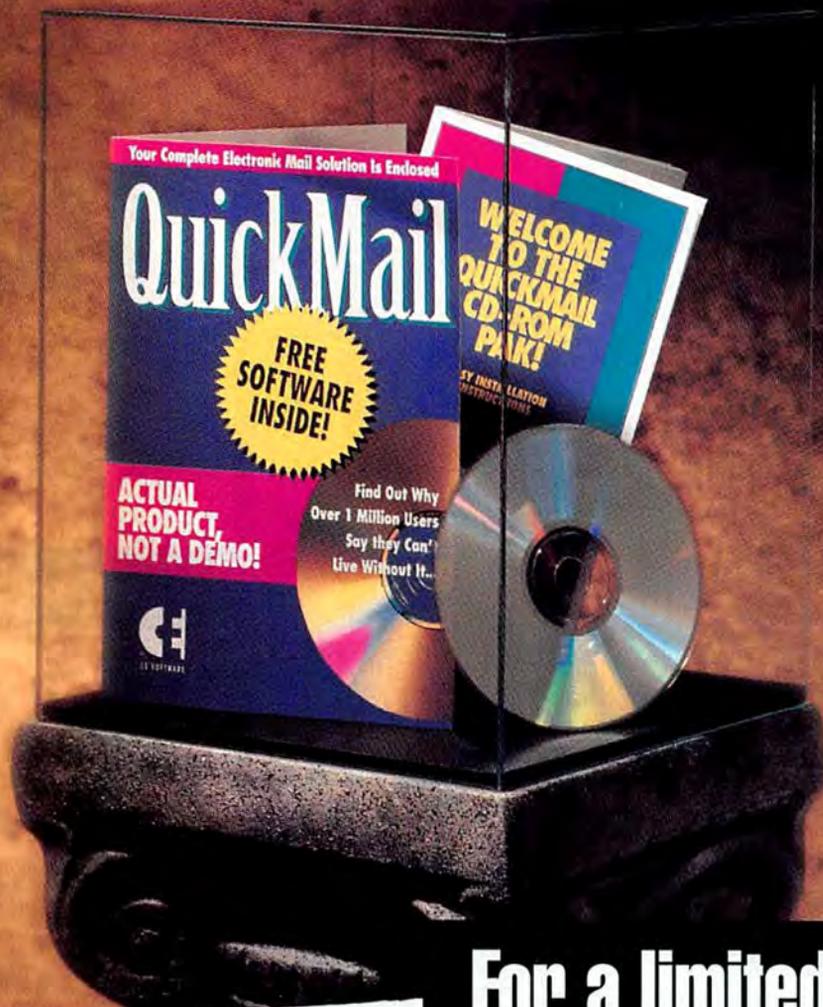
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HANDS ON Bridges

ETHERNET HUBS /

BEST OF TWO WORLDS

FLEXIBILITY AND CONVENIENCE are the main features of Asanté's NetStacker line of hubs, which combine the versatility of plug-in modules with the ease of configuration of stackable boxes. Without using any cables, you can expand a NetStacker system by snapping as many as three NetStacker hubs together. Each hub can have up to 24 ports, giving you a maximum of 72 ports (prices start at \$1,699 for the NetStacker Base, with an average cost of \$79 per additional port).

Within each NetStacker hub, you can mix and match a variety of plug-in modules, including repeaters for 10BASE-T, 10BASE-2, and

10BASE-F (fiber optic) wiring. You can swap the modules in and out of the hubs without powering down the NetStacker, which allows you to keep your network up and running while you upgrade it.

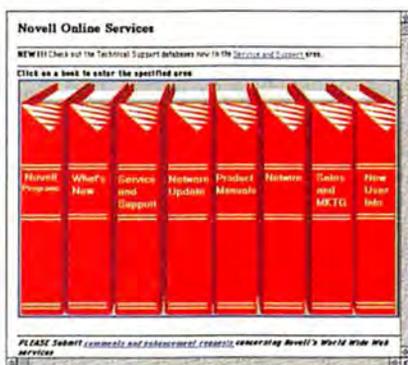
Asanté also offers a bridge module, for connecting network segments, and an SNMP module, which lets you control and manage the NetStacker from a Mac or a PC running Asanté's SNMP console software, AsantéView 2.3. 408-286-8401. / John Rizzo



INFORMATION HIGHWAY /

GRAPHICAL INTERNET

MAKE THE INTERNET more Mac-like with Mosaic, an interface to the World Wide Web (WWW) that puts a hypertext face on the navigation commands necessary to move around the Internet. Mosaic uses the metaphor of a *home page* for each WWW server. From the home page, you simply click on hypertext links that automatically connect you to Internet services throughout the world — there's no need to worry about trying to learn those cryptic Internet pathnames. Developed and distributed free by the National Center for Supercomputer



Applications, Mosaic is available for the Macintosh and for Windows and XWindows machines via anonymous ftp from a variety

of Internet sites and from ZiffNet/Mac (filename MOSAIC.SIT in Library 1 of the Download & Support Forum).

One of the WWW servers you can access with Mosaic is run by Novell to provide software updates, marketing information, and technical support to its customers. By clicking on one of the book-shaped icons on the Novell home page in Mosaic, you can burrow deeper into the company's customer-service system. You can reach Novell through Mosaic (or through any other WWW client), with a network connection to the Internet and MacTCP 2.02 or later, at <http://www.novell.com/>. / Shelly Brisbin

FILE SERVERS /

THE OPTICAL ALTERNATIVE

MULTIGIGABYTE SERVER STORAGE for less than a dollar a megabyte? It's possible with the MaxLyb line of optical jukeboxes, from Maxoptix (408-954-9711). The jukeboxes come in 6.5-gigabyte, 13-gigabyte, 26-gigabyte, and 52-gigabyte capacities and range in price from \$6,850 to \$28,560. Each jukebox uses 5.25-inch magneto-optical cartridges read by one or two fast T3 drives. The MaxLyb units can plug in to an existing AppleShare or NetWare server. Higher-capacity MaxLyb jukeboxes are planned for this summer.

Maxoptix will also introduce a new line of self-contained optical-storage servers, called Praxis, this summer. The units will plug directly in to a network and will consist of a MaxLyb jukebox, a hard drive containing server software, and 4 megabytes of RAM cache. Macs will need MacIPX or MacTCP. / JR



COMMUNICATIONS /

ADDING NEW LINKS

EXPAND YOUR COMMUNICATION software by giving it access to Apple's Communications Toolbox (CTB), even if your software doesn't have support built in. PortConnector (\$49), from Stalker Software (800-262-4722 or 415-927-1026), lets any Mac communication program use CTB connection tools (which reside in the System Folder) to establish a link over a wide variety of LAN and WAN networks, including TCP/IP, X.25, and ISDN.

PortConnector lets you use Apple Remote Access to connect to your office network through a TCP/IP network rather than having to use a dial-up phone line. You can also use the CTB's LAT tool for establishing a link over a DECnet network. And using the CTB's TCP/IP tool, PortConnector gives a network router outgoing capability, which lets users establish a direct Telnet connection through the router. PortConnector also provides software developers with an inexpensive way of adding multiple connection capabilities to any communications application. / Nancy Peterson



If there's a needle in here, AppleSearch will find it.



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System 7 Opens Up



With a version of System 7 that runs on Sun and HP machines, Apple has finally taken the first steps to move system software to other platforms. But is it too late? BY JOHN RIZZO

FOR THE PAST DECADE, the Mac has been a closed system, using technology designed and sold only by Apple and shared with no one. If you wanted to run the Mac operating system, you had no choice but to buy hardware from Apple. The Mac's ROM — the heart and soul of the Mac and crown jewel of Apple's secret treasure chest — was successfully defended from would-be reverse engineers and wannabe cloners by an army of lawyers.

All of this has changed, however, with the release of a \$549 version of System 7 that runs on Sun and Hewlett-Packard hardware. Macintosh Application Environment: Virtual Macintosh for Open Systems (MAE) provides Sun and HP RISC workstations with the Mac Finder, complete with Chooser, control panels, and aliases as well as the ability to run multiple Mac applications at the same time. MAE 1.0 runs on Sun SPARC workstations using Solaris (Sun's version of

UNIX), version 2.3 or later, and the HP Apollo Series 700 using HP/UX 9.0 or later.

With MAE, UNIX users have access to productivity applications such as word processors, schedulers, and presentation programs, which are usually expensive in native UNIX formats, if they exist at all.

But the significance of MAE goes far beyond making life easier for UNIX users. MAE demonstrates that Apple is indeed opening up and willing to share its developments. The proof of this is that MAE is only the first in a series of products that will put Mac-operating-system technology on multiple platforms. In doing so, Apple creates a bigger market for third-party Mac-software vendors and makes the Mac a more accepted part of corporate computing — both of which help ensure the Mac's continued existence.



If It Looks Like a Mac . . .

MAE gives UNIX users the full System 7.1 Finder and can run any Mac application. The virtual Mac runs inside a window in any X Window manager, such as Motif or OPEN LOOK. The size of the virtual-Mac window (in pixels) can be changed in the Monitors control panel.

In addition to looking like the System 7 Mac users are accustomed to, MAE acts like it too. The UNIX root-level directory, or volume, acts as the virtual Mac's mounted

SYSTEM 7 / Apple's open-platform strategy

MACS WILL RUN NON-APPLE OPERATING SYSTEMS within the next few years, if Apple's plans go as intended. The company intends to port System 7 to other platforms, a goal made possible by the Macintosh Application

Environment (MAE). Already, Apple has opened up System 7 to Sun and Hewlett-Packard workstations, and that's only the beginning. Here's a look into what the future might hold:

1994

MAE 1.0: System 7 runs on Sun Solaris and HP/UX. **Power Mac with SoftWindows:** Windows runs on Mac hardware. **MAE 1.x:** Sun and Hewlett-Packard machines get more System 7 features. **Apple ports System 7** to other UNIX workstations, using MAE.

1995

Macintosh Application Services (MAS) allows System 7 to run on IBM PowerPC and RS/6000 machines. **PowerOpen** provides cross-platform UNIX. **IBM AIX** runs on Mac hardware using PowerOpen. **MAE for PC UNIX:** System 7 runs on Intel Pentium hardware. **Power Macs:** Apple allows other manufacturers to build its PowerPC-based machines.

1996

Microkernel: New Mac UNIX-like core operating system runs multiple operating environments, including possible new Apple user interfaces, standard UNIX, and Taligent for Macs and PCs.

ILLUSTRATION / PEGGY SMITH



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Very Small.



Power Macintosh
8100/80



EasyNet Transceivers. Small Size, Low Cost, Guaranteed.

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24-Hour Replacement	✓

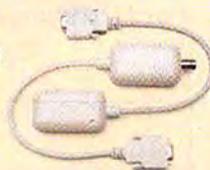
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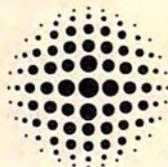
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startup disk. As with A/UX, you can see and access all UNIX directories and files on the workstation's hard disk by opening this volume. When you double-click on a UNIX file in the Finder, the file opens in a separate UNIX window, and you can copy and paste between Macintosh and UNIX applications. Mounting a Mac floppy disk is simply a matter of popping it in to the UNIX machine's floppy-disk drive.

APPLE IS INDEED willing to share its developments: MAE is the first in a series of products that will put Mac OS technology on multiple platforms.

You can print from Mac applications running on a virtual Mac just as you would from a real Mac. A special version of the LaserWriter 8 driver works with the UNIX LPR driver to route the printer job through the UNIX spooler. There is no support yet for AppleTalk, but you can access a UNIX network from the virtual Mac; an NFS volume appears as a folder in the root-level volume.

MAE is more than just an interface: It includes lower-level system features such as Apple events for support of publish-and-subscribe and other interapplication communication. There is even a standard Communications Toolbox that supports communications programs such as Synergy Software's VersaTerm, although the full range of Toolbox tools is not yet available.

MAE works by using a 68LC040 emulator and a software version of the ROM found in the Mac 840AV. Like the version of System 7 used on Power Macs, MAE on UNIX uses 680x0 code running under emulation as well as native RISC code. Some services accessed from the virtual Mac, such as I/O and imaging, are performed by the UNIX host, in which case there's no need for emulation. This strategy yields Mac-like speeds, from that of an LC III to that of a Quadra.

The Next Step

Apple plans to port MAE to other UNIX platforms, possibly by the end of this year. Next year, we're likely to see the release of Power-Open, a cross-platform UNIX operating system that will run on RISC-based hardware

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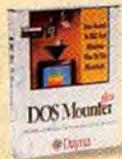
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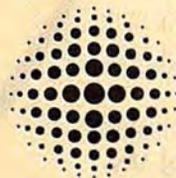
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MacUser,
December 1993



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from Apple and IBM and perhaps other platforms. Unlike A/UX, Apple's current UNIX for the Mac, PowerOpen on the Mac will run the thousands of applications written for AIX, IBM's version of UNIX for PCs.

System 7 will run under PowerOpen on the Mac and IBM platforms, with Macintosh Application Services (MAS) for PowerOpen. MAS will have the same functionality as today's MAE but will also run native PowerPC applications on the Macintosh and IBM platforms. MAS will also incorporate more System 7 features than today's MAE — including AppleTalk, PowerTalk, QuickTime, and AppleScript. IBM will offer MAS for future versions of AIX and PowerOpen that will run on its PowerPC-based hardware and the RISC System/6000 workstations.

HAD APPLE OPENED up System 7 two years ago, we'd probably be able to run it on Compaq PowerPC machines and Silicon Graphics workstations.

Apple is planning to release the Macintosh Microkernel in about two years. The Microkernel is a UNIX-like core operating system that will run multiple operating environments (called personalities) at the same time, the way we now run multiple applications. The planned personalities will include standard UNIX with X Window; future Mac system software; and Taligent, the cross-platform Apple/IBM-developed operating environment. IBM has been talking about doing the same thing with its Workplace OS, which will most likely be able to run anything the Mac Microkernel can.

Why UNIX?

This vision of cross-platform partnership revolves around UNIX and RISC because UNIX is an open system. It's simple for Apple to develop on top of an operating-system technology that has no proprietary features. System 7 on top of DOS is not in the cards, because DOS and Windows are not open systems and are becoming more proprietary as Microsoft releases each new version. System 7 could run on an Intel-based PC, using a version of MAE for PC UNIX. However, the 486 processor doesn't have the power to run 680x0 applications under emulation at

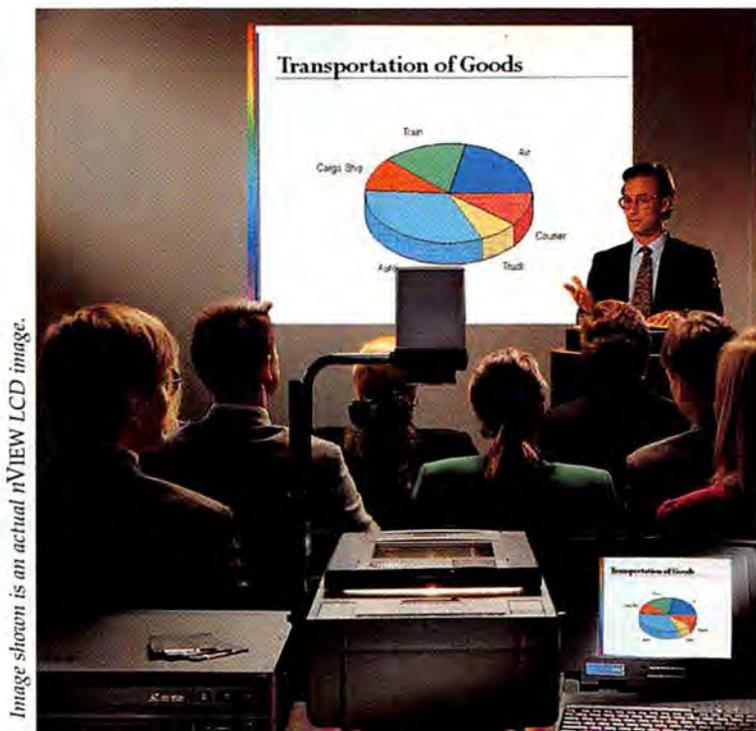
normal Mac speeds. We're more likely to see System 7 on more-powerful 486-machine successors, such as Pentium PCs.

Will anyone want to buy any of these multiplatform System 7 products? Apple is not the only vendor providing personal-computer applications to UNIX users: Insignia's SoftWindows for UNIX already brings Microsoft Windows to UNIX.

Apple's acting too late. Had it opened up System 7 two years ago — before Windows 3.1 took hold — we'd probably be able to run System 7 on Compaq PowerPC machines and Silicon Graphics workstations. ☞

MacUser technical editor John Rizzo is the author of *MacUser Guide to Connectivity and How Macs Work* (Ziff-Davis Press).

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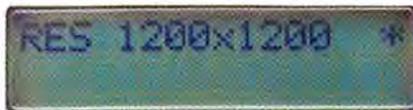
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SOLAR BATTERY / GREEN LIGHT

LIKE FOUR-WHEEL-DRIVE trucks, PowerBooks in magazine advertisements are often pictured outdoors — preferably in the



lap of someone perched high on a ledge in Yosemite or against some other scenic backdrop. If that's how you use your PowerBook — rather than on airplanes like the rest of us — then Keep It Simple Software (KISS), of Helena, Montana, has an accessory you'll want to strap to your backpack. The SunPack PB is a \$229 pair of folding solar panels that its maker says can supply enough power — given direct sunlight — to keep an all-in-one PowerBook running indefinitely. This assumes that you're practicing every other conceivable power-saving measure at the same time, however (turning down the CPU speed and using a RAM disk, for example) — and that you don't have an energy-hungry color screen. But even if you

can't toss out your AC adapter, the SunPack PB will make it possible to work longer on one battery.

As if being able to spend all afternoon out on the deck with your PowerBook weren't enough, KISS also makes two single-panel products for the Newton. The SunPack (\$199) doubles as a carrying case for the Newton and accessories; the SunPack Jr. (\$159) has a simpler design with a single outside pocket.

Solar panels might seem like a fringe technology, but they're a great deal lighter than conventional auxiliary batteries and the extra energy is free of charge — to you and to the environment. 800-327-6882 or 406-442-3559. / James Bradbury

DUO MEMORY MODULES / RAM TO GROW

FOUR MEGABYTES ISN'T ENOUGH — you need a minimum of eight megabytes of RAM, and taking your Duo to its RAM limit is the stuff power users' dreams are made of. One way to ramp up your Duo's RAM is with Viking Components' upgradable RAM modules. The \$1,365 20-megabyte RAM module plugs in to the RAM slot on any Duo to give you 24 megabytes of RAM. Duo 270c owners can then take their machine's RAM up to the 32-megabyte limit just by adding a \$670 8-megabyte daughterboard to the RAM card (both cards together cost \$1,825). With 32 megabytes of RAM, 270c users have a little more elbowroom for such pastimes as color image editing and video production.

For those who don't need more than 16 megabytes of RAM, Viking offers a 12-megabyte RAM module (which can't use the daughtercard) for \$830. And in case you're thinking of upgrading, Viking says its RAM modules will be compatible with any future Duo releases. 800-338-2361 or 714-643-7255. / Victoria von Biel

HARD DRIVES / STORAGE BOOST

IF DATA IS BURSTING from your PowerBook's hard disk and you don't know which files you should delete first, take heart: You can now buy a 2.5-inch, 500-megabyte internal drive for your portable.

Microtech International (800-626-4276 or 203-468-6223) and APS Technologies (800-235-2753 or 816-483-6100) are each offering such a large-capacity hard drive: Microtech's Roadrunner 500i costs \$749, and the APS T 520 costs \$899. Each company offers an external version of its



hard drive, at a price that's \$100 to \$150 more than the internal version.

Installing an internal drive in a PowerBook yourself isn't such a great idea: It's difficult to do and it voids your warranty. Microtech will install its drive free; APS suggests you get your Apple dealer to install the T 520. / Nancy Peterson

to the front of your PowerBook, that is. Kantek/Spectrum also makes filters for the Mac that reduce electromagnetic emissions, but the company hasn't announced any plans to make one for PowerBooks yet. / NP

SCREEN FILTER / BLURRIER IS BETTER

WORKING IN PUBLIC on your PowerBook — in airports while you're traveling, for example — makes it hard to keep on-screen information to yourself. Weighing in at 7 ounces, the Secure-View filter (\$199), from Kantek/Spectrum (800-536-3212 or 516-593-3212), helps you keep your privacy by distorting on-screen images when they're viewed from the side; text appears unreadable, and graphics are blurry. Images viewed straight on aren't affected by the distortion and may even be easier to see, because the filter reduces glare.

The Secure-View fits any PowerBook screen and is simple to install — if you don't mind having a strip of Velcro permanently stuck



Flexibility (ˌflek·sə·ˈbil·ət·ē) *n.* 1, A feature previously not found in this category. *example:* For under \$800, **TI microWriter™** printers with **Adobe® PostScript®** give you more networking and paper handling flexibility than Apple and HP, at a lot lower price.



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If you're looking for a PostScript printer with a street price well under \$800, you'll have a hard time finding one with as many features as a TI microWriter.

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CIRCLE 138 ON READER SERVICE CARD

PowerBook Tips

From lengthening your power cable to sending faxes from foreign countries, these tips from experienced PowerBook users will keep you on the move. BY JOSEPH O. HOLMES

Power-Cable Extension

Tired of being tethered to a nearby outlet when you're plugged in? Wish your PowerBook's AC adapter had a longer cord? Radio Shack's 5-foot DC extension cable (part #273-1648, \$3.99) goes between the charger and your PowerBook and gives you some extra room to move.

Andy Baird
Hightstown, NJ

[A 12-foot cable called the Powerbrick Extender is available for \$19.99 from TeleAdapt (408-370-5105). — Ed.]

Foreign Faxing

If you need to send a fax via modem from an office PBX or an overseas telephone, you may find that the PBX or foreign phone system uses a dial tone your modem doesn't recognize. The simplest fix is to look for your fax software's manual-dial option, which lets you listen for the nonstandard dial tone and dial the number yourself. Because most telecom applications don't offer a simple manual-dial option, you must modify the modem-init string, using Hayes AT commands (usually ATX1D) to ignore the dial tone. After you've done the dialing, the software takes over.

Gordon Brown
Middlesex, England

Write to PowerBook Tips

c/o MacUser
950 Tower Lane
18th Floor
Foster City, CA 94404

You can also send your tip to Joseph Holmes (72241,731) on ZiffNet/Mac, MacUser's on-line service (include a daytime phone number). We pay \$25 for every undocumented tip we print, and the Tip of the Month earns \$100; see page 4 for more details.

RAM Disks

If your PowerBook has enough RAM, you can install a minimum System Folder on a RAM disk and use the Startup Disk control panel to set your RAM disk to be the startup disk. (You'll have to install the system from scratch, because your hard disk's System Folder is almost certainly too large.) Running from a RAM disk reduces your need to access your hard disk, which can save considerable battery power.

Unfortunately, when you shut down, the contents of the RAM disk are lost and you must reinstall a System Folder the next time you create a RAM disk. (The PowerBook 100, by the way, doesn't suffer from this problem.) One workaround is to keep a compressed copy of the RAM disk's System Folder on your hard disk, ready to copy to the RAM disk as needed. Alternatively, use Apple's Assistant Toolbox extension (included as part of Apple's File Assistant package), which saves your RAM-disk contents even after you shut down.

Ted Landau
Rochester, MI

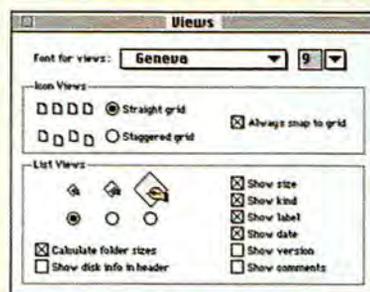
Mini Folder Icons

If you're like me and have a lot of aliases on your PowerBook's desktop, you're probably getting irritated by the amount of space they take up. You can save a lot of desktop space by using a graphics application such as SuperPaint to create mini icons for your aliases so you can stack them much closer together.

Mini icons are tricky to create, because the Finder always centers a graphic in an icon's space. To get around this, create a mini icon in the graphics application. Then, to control the icon's placement within the icon space, use the marquee tool to select a square the size of a regular icon (32 x 32 pixels), keeping the mini icon at the very bottom of the square.

I created a file of small icons called Short

TIP OF THE MONTH



Saving Battery Power

Recently, I couldn't get my hard drive to stay asleep — it woke up every 10 to 15 seconds. The culprit was the Calculate Folder Sizes option in the Views control panel. With this option turned on, my PowerBook woke up the drive to recalculate folder sizes in any open windows every 10 to 15 seconds. This happened even if the open window was hidden by others or was not part of the active application.

To save power, either close all windows on the desktop or use an icon view (Calculate Folder Sizes doesn't work in this view). Of course, you can turn off the Calculate Folder Sizes option as well.

George Slusher
Santa Maria, CA

Folders for use on my PowerBook and desktop Macs. You can download Short Folders from MacUser's on-line service, ZiffNet/Mac (filename SHORTE.SIT, in Library 4 of the Download & Support Forum). To use one of these icons, open the Get Info dialog boxes (press Command-I) for both Short Folders and the alias you want to replace, select the Short Folders icon, copy it, and paste it over the icon in the alias' Get Info box.

If you want to be able to open the alias by double-clicking on its name in the Finder as well as by double-clicking on its icon, simply lock the alias in the Get Info box.

Craig O'Donnell
Boston, MA

ca•tas•tro•phe

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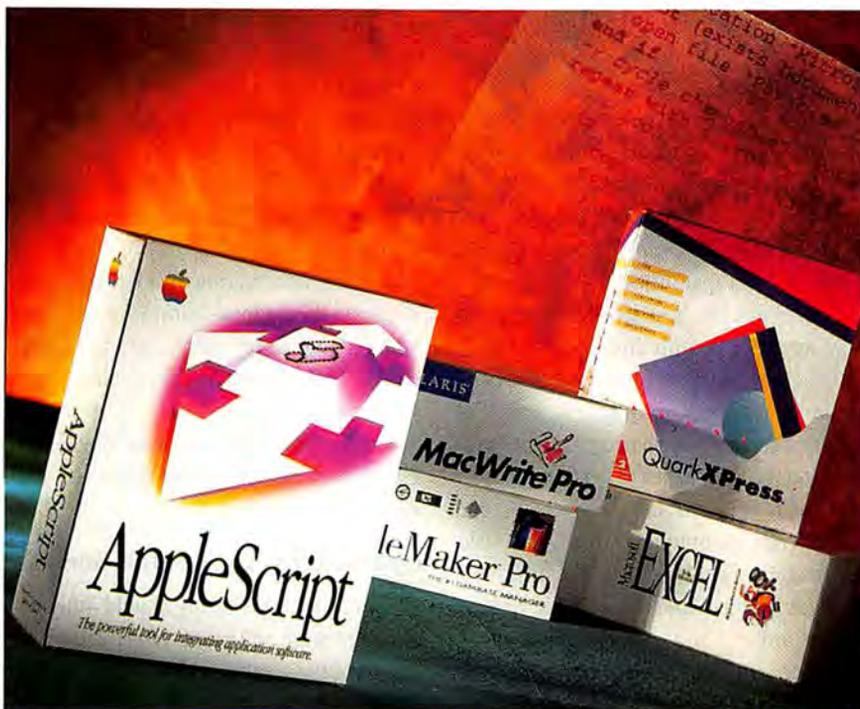
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CIRCLE 155 ON READER SERVICE CARD



HANDS ON **Power Tools**



PHOTOGRAPHY / LEON

Time for AppleScript

WITH MORE AND MORE applications supporting AppleScript, now is the time to see what it can do for you. **BY DANNY GOODMAN**

About a year ago, Apple introduced a scripting language — AppleScript — offering users the ability to customize Mac functions to a degree they never could before, with a language no more difficult to learn than HyperTalk. It was a potentially powerful tool, especially for consultants, in-house developers, and users who had to tailor applications to their specific needs. But despite its promise of making work easier, users didn't embrace the new technology, because so few applications supported AppleScript. And Apple itself handicapped AppleScript by not offering a scriptable Finder.

Now there are dozens of programs — among them QuarkXPress, Microsoft Excel,

and Claris' FileMaker Pro and MacWrite Pro — that support AppleScript, allowing you to write routines that cross application boundaries. In addition, Apple has released an extension that makes the Finder scriptable, so you can automate such tasks as emptying the Trash, restarting your Mac, and synchronizing files on two Macs.

AppleScript run-time software comes with System 7 Pro, HyperCard 2.2, some Mac models, and some books about AppleScript. I strongly recommend that you buy Apple's \$189 AppleScript Scriptor's Kit if you want to write programs that have a user interface, because it includes interface-building software. By now, the Scriptor's Kit should also include the extension that

makes the Finder scriptable. (This extension will soon become part of the Mac's system software; at press time, Apple wouldn't say which version of system software would be the first to include the extension.)

What Is AppleScript?

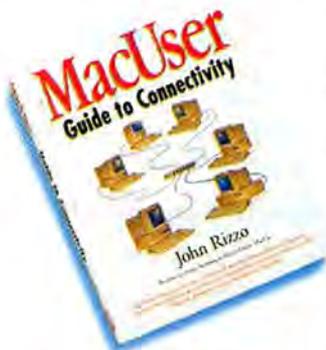
AppleScript is a language for writing scripts that control Mac functions. It's based on Apple's Open Scripting Architecture (OSA). OSA acts as a translator between you and Apple events, which are complicated sequences of code that perform such basic functions as opening documents from the Finder and printing them. AppleScript simplifies the use of Apple events — you can write a routine using simple terminology such as *open file*, and OSA converts it into Apple events for you.

For many beginning scripters, the plain-language syntax of AppleScript is also easier to use than that of UserLand's Frontier. UserLand broke new ground when it introduced Frontier, the first system-level scripting language, but Frontier's huge vocabulary and body of C-like constructs take longer to grasp than the vocabulary and constructs of AppleScript.

More Than a Macro

Using AppleScript, you have more control over automating Mac functions than you would with a macro program, such as QuicKeys. This is because AppleScript is based on the *object model*, a way of describing data by name. You can name any part of a document, such as a paragraph or a character in a word-processing document, a cell in a spreadsheet, or a line in a design. Being able to name the objects in a document lets you apply intelligence that a macro program doesn't have. For instance, with a macro program, you can construct a macro to select the same paragraph in a specific location in a document every time it runs. AppleScript, on the other hand, acts directly on the paragraph (perhaps changing the style to bold) without having to select it first. If you want, the script will act only when the paragraph contains certain text and even if the paragraph's location in the document

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CIRCLE 17 ON READER SERVICE CARD

has changed since the script last ran.

The only problem with AppleScript's implementation of the object model is that it requires you to learn a new vocabulary for each application you want to include in a script.

Combined Power

Although AppleScript provides advantages over HyperTalk (AppleScript talks to applications outside HyperCard), AppleScript does not replace HyperTalk. Also, Frontier and QuickKeys can help fill some gaps in AppleScript's capabilities.

Sometimes the best strategy is to combine AppleScript with Frontier, HyperTalk, or QuickKeys. For instance, an AppleScript script can trigger a QuickKeys script to mount a remote file-sharing volume without interrupting the user to request a password. Or you can have HyperTalk and AppleScript communicate to do such tasks as update a FileMaker Pro database with changes entered into an address field in HyperCard.

HyperCard 2.2 is also OSA-scriptable from outside itself, so you can use HyperCard as a controller and user interface for processes in other programs or as the workhorse for a script written with an external script editor.

AppleScript in Action

To help you see how an AppleScript script actually works, I've created one that blends the power of three applications — Excel;

FileMaker Pro; and a simple word processor, Apple's Scriptable Text Editor. You can download the script from ZiffNet/Mac, MacUser's on-line service (it's in the Download & Support Forum, Library 1, filename ASDUN.SEA). It shows you how to script the following steps:

- Looking in an accounts-receivable-aging Excel spreadsheet for customers whose balances are over 120 days old.
- Locating each past-due customer's mailing address in a FileMaker Pro customer database.
- Merging information from the spreadsheet and the database into a Scriptable Text Editor template to create customer letters indicating how much money is due.
- Printing the letters.

To run the script, you need AppleScript 1.1 or later as well as FileMaker Pro and Excel.

Specializing with AppleScript

Support for AppleScript should only increase as more and more software developers make their applications scriptable. The uses for AppleScript will multiply when Apple releases OpenDoc, which is expected to rely on AppleScript for communication among application tools. Such widespread support will make it possible for you to create custom routines. 

Danny Goodman is the author of *The Complete AppleScript Handbook* and *The Complete HyperCard 2.2 Handbook*.

SCRIPTABLE APPLICATIONS / how to save time

NOT ALL SCRIPTABLE APPLICATIONS are created equal. Although many applications are scriptable, some are much easier to write scripts for than others.

Here's how to quickly find out which applications work best with AppleScript:

Look at the dictionary first. It's easy to identify which applications take good advantage of AppleScript's capabilities, by looking at the size and content of the application's scripting dictionary — the larger its vocabulary, the better. To look at a scripting dictionary, open it within the Script Editor utility, which comes with AppleScript.

Look for italicized words. It's crucial for a scripting dictionary to contain object definitions, which appear in italics. The more object definitions it contains, the more parts of a document you'll be able to directly control, using AppleScript's standard scripting style.

Learn by example. Check out Microsoft Excel 4.0 and Claris' FileMaker Pro 2.0 to see examples of programs that meet our standards for good object-model support.

Be aware that some applications waste time. Skimpy dictionaries or those that completely lack object definitions, such as the one in Software Ventures' MicroPhone Pro 1.0, may mean that you have to master the application's internal macro language — yet another way to write scripts. Writing scripts for applications that don't support the object model of scripting requires more learning time than for those that follow the AppleScript standard.

IT'S GONE. AND YOU DIDN'T BACK IT UP.

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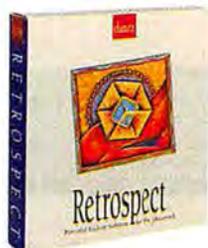
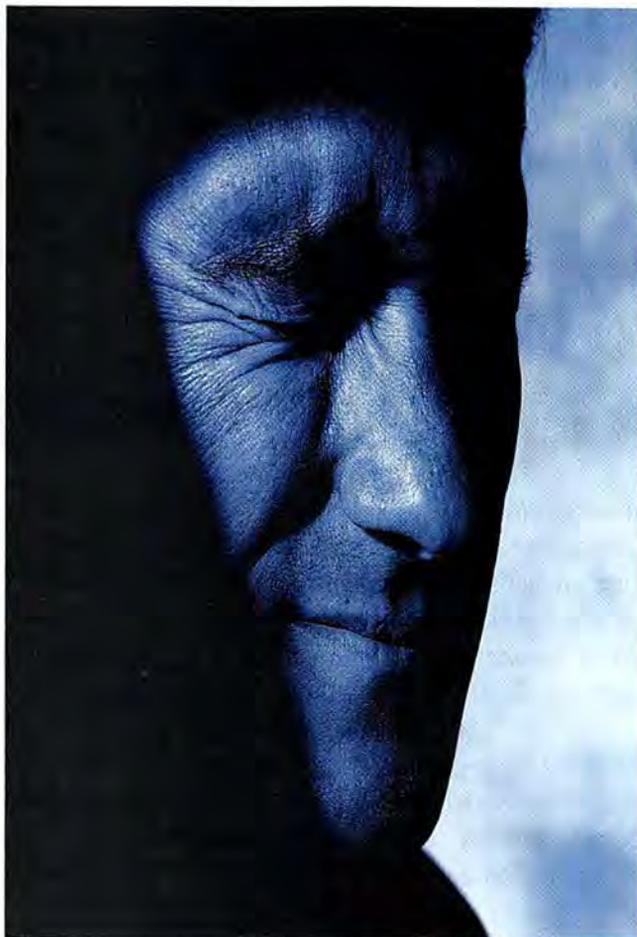
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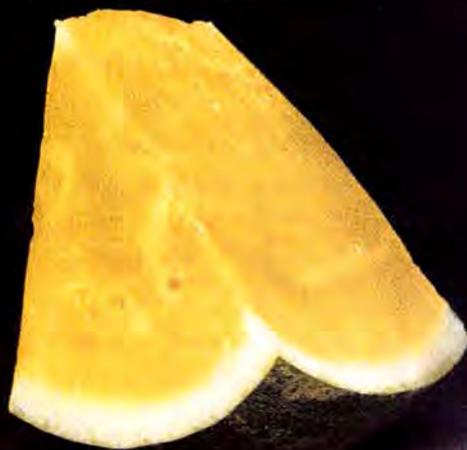
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We Scan Corrected.

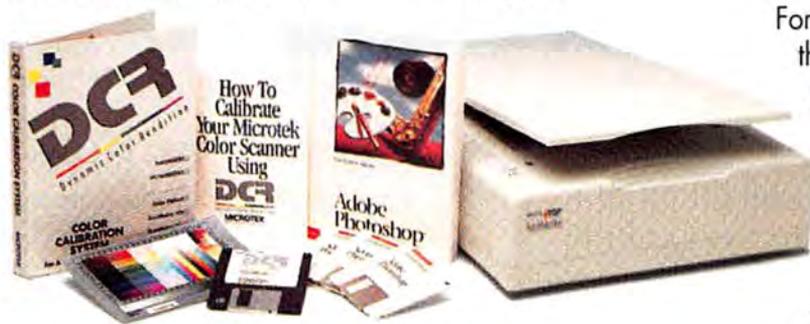


You expect a scanned image to accurately reflect the color found in your original. Getting there, however, is usually no picnic. After scanning, precious hours are often spent adjusting the image in software to capture the truest blue, a faithful fuchsia, or for example, just the right kind of red in a ripe watermelon. But DCR™ has changed all that.

Now, when you purchase the **new, low-priced ScanMaker® IISp single-pass color scanner**, you also get **DCR, Dynamic Color Rendition**, an advanced, yet easy-to-use color calibration and correction system. DCR actually calibrates the ScanMaker IISp to a photographic industry-accepted calibration target, creating a custom color profile of your

specific scanner, ensuring the most accurate color possible as you scan the image. But don't take our word for it. Here's what *PC Magazine* said in their February 8, 1994 issue: "...this mechanism (DCR) seems to have worked well, because the ScanMaker IISp's color output was clearly the best of any scanner in our survey."

So, even if you need to capture the bright yellow flesh of a Honeyheart watermelon, like the wedge on the left, the quickest way to do it is with the new ScanMaker IISp with DCR.



For more information about the ScanMaker IISp, DCR, your nearest authorized Microtek reseller, or a FREE copy of *The Scanned Image* — a scanning primer, call **1-800-654-4160** or fax (310) 297-5050.

The ScanMaker IISp accurately captures millions of brilliant colors at resolutions up to 1200 x 1200 dpi through software interpolation (300 x 600 dpi optically). In addition to the DCR color calibration/correction system, the ScanMaker IISp is bundled with Adobe Photoshop 2.5 LE for either Windows or Macintosh. Windows users also get Caere's PageKeeper Portfolio document and image management software.



Get a hands-on demonstration of the ScanMaker IISp with DCR and find out more about accurate color scanning by attending Focus Seminars' "ColorRight, Color Correction & Reproduction Workshop." For dates and locations, call Microtek at 1-800-654-4160.

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Help Folder



Converting faxed documents into editable text, and the best way to import sound from a CD. BY ANDY IHNATKO AND BOB LEVITUS

/ TIPS COMPILED BY GREGORY WASSON

Starting this month, you'll find the best of MacUser's tips in Help Folder. We'll feature tips from the experts on a range of subjects, from hard drives to system software. If you have undocumented tips to share, please send them — we pay \$25 to \$100 for any reader tip we publish.

Getting Depersonalized

BOB: Back in January, we recommended the shareware program DFERase to erase the personalization information you type when installing Microsoft Excel 4.0 (page 196).

What we didn't mention is that Microsoft hides the personalization information in its installer program on the Install 1 disk, *not* in the copy of Excel (or Word) installed on your hard disk. So, you have to run DFERase on the installer program on the floppy disk and then reinstall Excel. It's a good idea to make a backup copy of your Install 1 disk and run DFERase on the copy rather than on the original disk.

Thanks also to the readers who wrote in to remind us that the freeware program Anonymity can do the same things DFERase does. You can find it on on-line services or request it from Mac user groups. (You can find both utilities on ZiffNet/Mac, MacUser's on-line service, in Library 1 of the Download & Support Forum, filenames DFERAS.SIT and ANONYM.SIT.)

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). Send your tips to Christopher Breen (72241, 1036).

The FAX About OCR

Q. Can you recommend a good OCR program? I'll be using it mainly to convert incoming faxes from my fax modem into editable text.

Susan Yan
via ZiffNet/Mac

ANDY: I could, but in your case, I recommend new fax software. STF AutoPak (\$89), from STF Technologies (816-463-7972), has OCR built in and works with most fax modems. It's a good deal smaller, cheaper, and more convenient than a stand-alone OCR program, which is particularly important if you're a PowerBook user with a low-capacity hard drive. Global Village Communication (800-736-4821 or 415-390-8200) has GlobalFax OCR (\$49), which is combined fax/OCR software, but you have to have a Global Village modem to use it.

BOB: If you use neither STF AutoPak nor GlobalFax OCR, consider switching over from the fax-modem software you use now. I've found that GlobalFax OCR makes both faxing and OCR a pleasure. Global Village's software and excellent tech support make it worth paying extra for the Global Village modems.

From CD to Mac

Q. I've been importing sound into my Mac from my audio CDs by running a cable to the microphone jack, or sound-input port, of my Mac. Because the sound is already digital on the CD, it seems as though I'm going to a lot of trouble for nothing. Can I use software to transfer the data off a compact disc?

Leslie Morrison
Clinton, CT

ANDY: Right you are, Leslie. There's a cheap and simple way to import sounds into your Macintosh from a CD, using QuickTime 1.6.1, but it works only with Apple's PowerCD, AppleCD 300, or any other CD-ROM drive with the same mechanism and it

TIPS / Word Processing

WORDPERFECT 3.0 — COLUMN WIDTHS

Avoid the frustrating trial and error and multiple steps the WordPerfect 3.0 manual advocates for changing column widths. Instead, position the cursor over a column divider so the cursor changes into a double bar with arrows. Click on the border, and drag it in order to resize the column. If you need to be precise, use the guide in the gray status bar at the bottom of the document window, which displays the exact size of the column as you drag the border.

Eddy Fankhauser
Chicago, IL

MACWRITE PRO

You can format date, time, and page numbers rapidly in Claris' MacWrite Pro by bypassing the Preferences dialog box. Holding down the Option key while choosing Date, Time, or Page# from the Insert Variable submenu of the Edit menu causes a formatting dialog box to appear on-screen.

Technical-Support Department
Claris

works only with audio CDs, not CD-ROMs.

Just follow these steps: Insert your audio CD, and launch a QuickTime movie player, such as Apple's MoviePlayer or Leonard Rosenthal's freeware Popcorn. Choose Open to bring up the Open dialog box, navigate through the folders to find the audio CD on your desktop, select one of the tracks on the CD volume, click on the Convert button, and give the track a name and a destination in the Save dialog box. Click on the Options button before you save if you want to convert only a portion of a track, select a sampling rate, or choose between stereo and mono recording. These settings help you control the size of your sound files (see figure 1).

After some percolation, the entire track

will be converted into a QuickTime movie with no picture. The resulting sound is much better than you could hope for by going through the microphone jack.

You will need a utility, such as Scott Lindsey's freeware Movie2Snd, to convert your new sound from a QuickTime movie into a standard System 7 sound file. Once it's converted, you can use the result for such things as an alert sound, a startup sound to greet you when you turn on your Mac, or as a sound in presentations. You can find Movie2Snd on various on-line services (on ZiffNet/Mac, it's located in Library 1 of the Download & Support Forum, filename MOV2SD.SIT).

Screen Saver Saved

Q. Can you tell me how to capture a screen from a screen-saver program? Using Command-Shift-3 doesn't work, because pressing any key clears the screen-saver image before I can capture it.

Jon Ellenbogen
Penland, NC

BOB: The commercial program Capture (\$129.95), from Mainstay (805-484-9400), has a setting for delayed screen captures that does just what you ordered. Set Capture's delay to 10 seconds or any setting that gives you enough time to move the pointer to the sleep-now corner of your screen, and wait for Capture to take the shot. That's all you have to do to get a screen dump of flying toasters or Opus swimming with his fellow penguins.

Any Mac, Any Printer

Q. I have an old dot-matrix printer, a C. Itoh model 8510, that I'd like to use as a backup if my LaserWriter ever fails. What kind of cable do I need in order to connect it to my Centris 650? What printer driver will I need?

Richard Moore
Chubbuck, ID

BOB: Problems like this used to be a nightmare before GDT Softworks (800-663-6222 or 604-291-9121) introduced its PowerPrint cable-and-software packages, with prices starting at less than \$150. These kits make it possible to connect any of thousands of previously unconnectable printers, including the C. Itoh 8510, to your Mac.

ANDY: The Grappler Printer Interface Kit (\$79), from Orange Micro Systems (714-779-2772), also has what you need in order

to connect a Mac to a non-Apple printer. The kit, which includes cable and software, translates QuickDraw commands from your Mac into whatever lingo your third-party printer uses. However, GDT's driver software is so impressive that it gives PowerPrint the distinct advantage.

Questionable Drive

Q. Yesterday I got a flashing question mark when I tried to start up my Centris 650. Could there be a problem with the partitions I created with FWB Software's HDT Primer? I thought there might be a problem with the boot blocks, but Norton Utilities says the hard disk is fine. SAM 3.5 says I don't have any viruses. Any suggestions?

Juan Martinez
via the Internet

BOB: The flashing question mark means your Mac doesn't see a disk with valid boot blocks or valid system software and Finder. It should be easy to fix.

Your problem might be with the configuration of FWB Software's HDT Primer. To check the configuration, launch HDT Primer; double-click on the name of the boot volume; and in the next window, select the name of your hard drive and click on the Modify button. Make sure both the Auto-mount and the Bootable options are

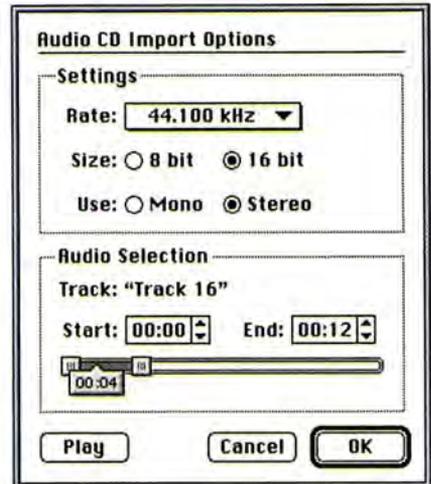


figure 1 / **Importing sounds** from an audio CD into your Mac can create huge files that hog several megabytes of space on your hard disk. To keep sound files small, Apple's MoviePlayer lets you set the sampling rate and select which portion of a track you want to import.

checked in the boot-partitions dialog box (see figure 2). If one or both are unchecked, you'll get the flashing question mark.

If checking those options doesn't resolve your problem, run Disk First Aid (it comes on the Disk Tools disk you got with your Mac) on your boot volume. Even though Norton gave your hard disk a clean bill of health, sometimes Disk First Aid can find

TIPS / ClarisWorks 2.0

FONT NAMES

If you ever encounter font names that look something like UPC bar codes in the ClarisWorks Font menu, you can quickly solve the problem by quitting ClarisWorks and trashing the Claris Fonts file, inside the System Folder. Restart ClarisWorks, and the program will rebuild the Claris Fonts file and clean up the troublesome menu. The corrupted Claris Fonts-file problem usually occurs on Macs that are running ATM or Adobe Type Reunion.

Valerie J. Rusetsky
North Massapequa, NY

CUSTOM-DESIGN COMMANDS

The ClarisWorks word processor doesn't have a command for changing a word to all caps or all lowercase, but you can create one yourself, using macros and the ClarisWorks spreadsheet module. To create an all-caps command with this technique, do this:

1. In the word-processing module, select the word or words you want to convert to uppercase letters, and begin recording a macro. Name the macro Uppercase, and press Return.

2. Press Command-C, press Command-N, click on the Spreadsheet radio button, and press Return. Press Command-V, and then press Tab.

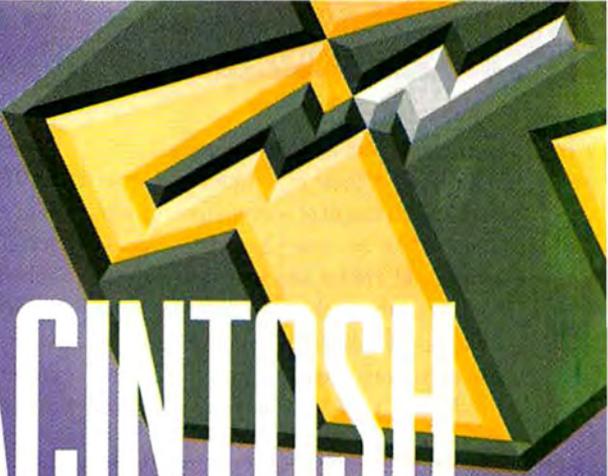
3. Type =UPPER (A1), and press the Enter key (or click on the Accept button in the entry bar). Press Command-C.

4. Press Command-W to close the spreadsheet window. Click on the No button.

5. Press Command-V, and then press Command-Shift-J to stop recording the macro.

If you want to create a lowercase macro as well, follow the steps above, but name the macro Lowercase and type =LOWER (A1) as the code font in step 3.

Michael Kostos
Idaho Falls, ID



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and repair a problem Norton missed.

If neither of these techniques works, perform a clean install of your system software (called clean because you delete your old system and Finder and install new ones): Boot from the Disk Tools disk, delete the system and Finder from your boot partition, shut down your Macintosh, insert the Install 1 disk, turn your Mac on, and install your

system software on the boot partition.

ANDY: The classic causes of a flashing question mark are a wonky SCSI setup (incorrect termination, duplicate SCSI IDs, faulty cables or connectors), a drive that's overlooked because its disk is still spinning up when the Mac is looking for devices, and an incompatibility between the driver software and your hardware.

To figure out the cause, look for the happy Mac. If it precedes the flashing question mark, you can be pretty sure your system software is damaged. If so, follow Bob's instructions for performing a clean install. If the happy Mac never appears, that means your Mac didn't see your drive and you have a hardware problem. Try checking your cable connections. If that doesn't help, hook up new cables if you have extras lying around. Also, check your SCSI devices to make sure you haven't assigned the same ID number to two of them.

If you still end up with the flashing question mark after all of our solutions, you probably have a hardware problem that deserves the attention of an Apple-authorized service provider.

Call-Waiting Blues

Q. The call-waiting feature on my home phone line becomes a frustration when I have my modem hooked up to that line and someone calls — it terminates the modem session. Can I temporarily turn call waiting off while I'm using the modem?

Jason Tyree
Turlock, CA

BOB: Yes. All you have to do is type *70 or 1170 before issuing a dial command to the modem. So, for example, if you usually dial a local BBS by typing ATDT 555-1212, instead type ATDT *70 555-1212 (or ATDT 1170 555-1212) to temporarily turn call waiting off. When you hang up, call waiting will automatically be turned back on. You have to experiment to see whether your phone system uses *70 or 1170.

ANDY: You can also contact your phone company to sign up for spiffy alternatives to call waiting such as routing calls to voice-mail or automatically calling back a caller who couldn't get through to you, as soon as you hang up. These solutions don't make any noise that might cause your modem to skid into a guardrail.

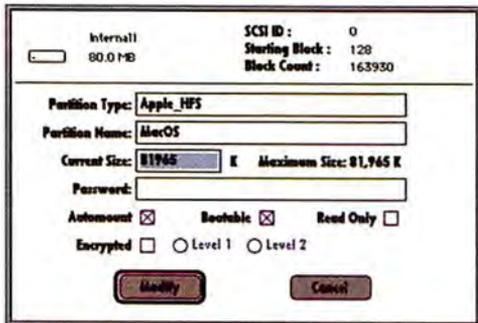


figure 2 / **Configuring hard-disk** partitions correctly can make the difference between being able to start up your Mac and not being able to. If you use HDT Primer, from FWB Software, make sure the Automount and Bootable options are checked in the Partitions dialog box.

Horse Pill

Horse Pill.sit

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CIRCLE 83 ON READER SERVICE CARD

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- Aldus PageMaker (2)
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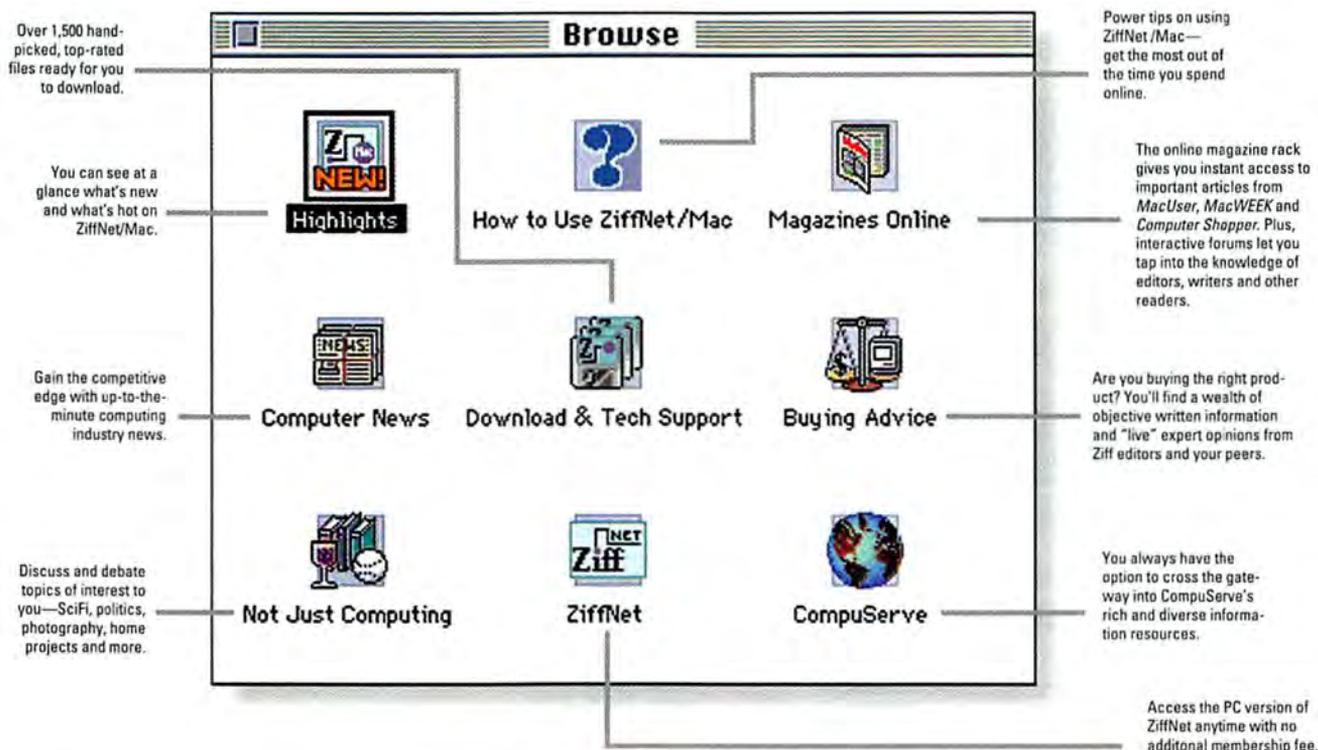
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CIRCLE 18 ON READER SERVICE CARD

The Service-Bureau Shuffle

Q. Recently I saw someone bring a large file into a service bureau to be printed, but instead of clumsily bringing it in on his hard drive, he managed to spread it across four high-density floppy disks and printed it out from the service bureau's drive. How did he do this?

Jack Jerghalian
Belleville, IL

ANDY: He probably had a run-of-the-mill backup program, such as HFS Backup, from PCPC (800-622-2888 or 813-530-0123), or Retrospect, from Dantz Development (510-253-3000), and instead of using it to back up an entire hard disk to floppy disks, he backed up a single jumbo file. But that's too quick and direct an answer, so I'm also going to suggest that he might have used an archiving utility such as StuffIt, from Aladdin Systems (408-761-6200), or Compact Pro, from Cyclos Software (415-821-1448).

Much like raisins, which the American Raisin Council declares "are not just for oatmeal cookies anymore," archiving utilities have plenty of uses. Most of them can *segment* a file or a folder — chop it up into

floppy-disk-sized portions — with or without compression.

Besides their ability to make files smaller and to free up space on your hard disk, most

archivers also offer ironclad file encryption that can (according to legend) be broken only by the fine men and women of the National Security Agency. ☞

TIPS / Spreadsheets

CLARISWORKS 2.0 — BORDERS

ClarisWorks 2.0 has an annoying bug that prevents you from printing some outside borders on forms you've created in its spreadsheet module. There's a way to squash this bug: Select the cells adjacent to the borders that won't print, and create a new border. If the border on the right side of your form refuses to print, for example, select the cells just to the right of that border. Use the Borders command, on the Format menu, to create a right border for the adjacent cells. If the missing border is at the bottom of the form, select the cells immediately below the border and use the Borders command to create a bottom border. Then make the column or row with the new borders as narrow as possible. When you print, the new outer borders won't print but the original borders will.

Jesse Castri
New Orleans, LA

EXCEL 4.0

Rounding numbers in a Microsoft Excel spreadsheet can clean up its appearance and make it much easier to read. Here's how to do it without losing the real values:

1. Select the numbers you want to round.
2. Select the Number command from the Format menu.
3. Select the #,##0 format from the scrolling list.
4. Add a comma immediately after the code in the Code box, and click on OK. The comma will round the number up to the nearest thousand.

The numbers will be more readable, because they're not so long. Even though you can't see as many numbers, you can still access them — if you click in any of the formatted cells, Excel will display the full value.

Gregory Wasson
Contributing editor, *MacUser*



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For many of you, mail-order is your primary means of purchasing Macintosh products and services. That's why MacUser has put together the following special section. Direct Line offers a convenient place to quickly find the products you need from the vendors you want to buy from. But before you shop by phone, look for the mail-order company that is best for you. Here are a few tips to help you get the most out of your buying experience.

How to Buy Mail Order Products

Research The Company

Well-established companies tend to be reliable, but if you're not sure how well established a company is, it pays to do a little research and ask a few questions.

Know What You Want

Know exactly what you want before you call. Magazines, on-line forums, and user groups are all good places to seek advice.

Check Compatibility

To avoid having to return merchandise, find out whether the product you're interested in is compatible with your system.

Pay With Credit

Whenever possible, use a credit card. Some credit-card companies do such

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Confirm Prices

Confirm the price when you place your order, including delivery charges. Some companies will waive the delivery charge.

Delivery Methods

Ask about delivery methods — find out what carriers are used, how fast they are, and how much each one costs. Record delivery information.

Return Policies

Because you're buying sight unseen, make sure the company has a return policy you're comfortable

with. Find out if you're responsible for paying shipping charges on returned goods and whether you'll be charged a restocking fee.

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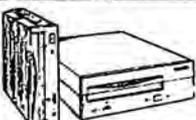
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 PSR=2823, PSW=2555, RT=581, RW=617, OI=5.7

#2 Conner CFP1060S 1013MB
 PSR=2778, PSW=2509, RT=775, WT=94, OI=5.6

#3 Seagate ST11200N 1006MB
 PSR=793, PSW=793, RT=538, WT=93 OI=4.8

#4 Micropolis MC4110 1002MB
 PSR=2561, PSW=2305, RT=332, WT=93, OI=4.7

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1080MB	EMP1080S	\$779	\$839
1800MB	PD1800S	\$979	\$1039

Capacity	Speed	RPM	Buffer	Brand	Warranty	Internal	External
105MB	19ms	4464	31K	Maxtor	1 Year	\$469 (Type III PCMCIA)	
170MB	17ms	3600	32K	Quantum	2 Years	\$179	\$239
240MB	16ms	4306	256K	Quantum	2 Years	\$249	\$309
240MB	14ms	4500	256K	Fujitsu	1 Year	\$329 (2.5" for Powerbook)	
270MB	12ms	4500	128K	Quantum	2 Years	\$238	\$298
340MB	12ms	4500	128K	Quantum	2 Years	\$275	\$335
540MB	9.5ms	5400	128K	Quantum	2 Years	\$444	\$504
1052MB	9ms	5400	256K	Seagate	5 Years	\$779	\$839
1052MB	8.5ms	5400	256K	Micropolis	5 Years	\$799	\$849
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1080MB	9.5ms	5400	256K	Fujitsu	5 Years	\$789	\$849
1690MB	8ms	7200	1024K	Seagate	5 Years	\$1459	\$1559
1750MB	10ms	5400	256K	Micropolis	5 Years	\$1169	\$1199
1800MB	10ms	4500	512K	Quantum	5 Years	\$979	\$1039
2145MB	8ms	7200	1024K	Seagate	5 Years	\$1689	\$1769
2148MB	9ms	5400	512K	Seagate	5 Years	\$1429	\$1529
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9100MB	12ms	5400	512K	Micropolis	5 Years	\$4099	\$4199

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105MB	SQ3105	14.5ms	64K	2 Years	\$309	\$369
270MB	SQ3270	13.5ms	128K	2 Years	\$519	\$579

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NEC	CDR510	195ms	450KB/sec	Single disk	\$439	\$499
Pioneer	DRM-602X	300ms	307KB/sec	6 Disc Changer	n/a	\$919
Pioneer	DRM-604X	300ms	614KB/sec	6 Disc Changer	n/a	\$1169
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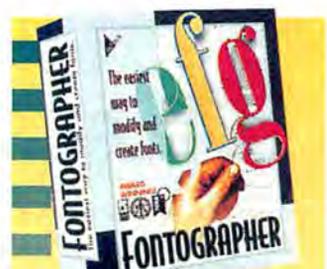
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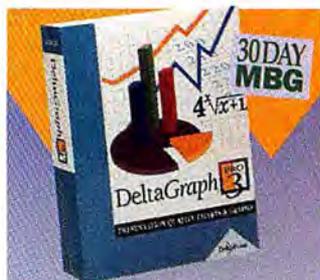
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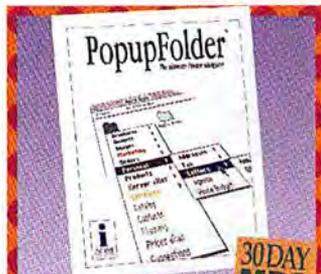
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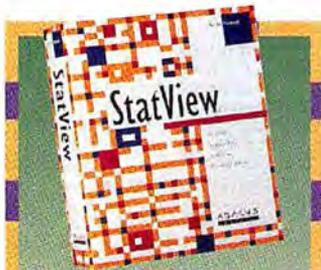
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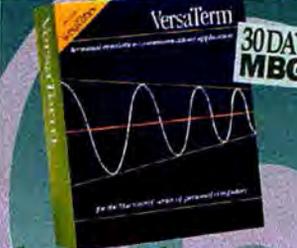


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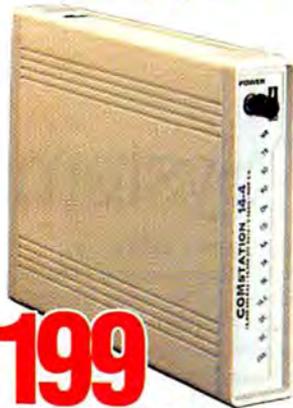
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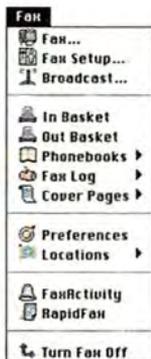


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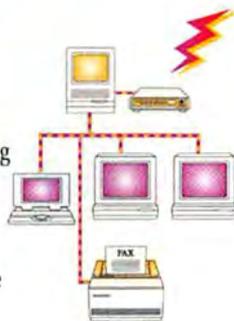
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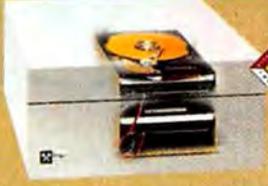


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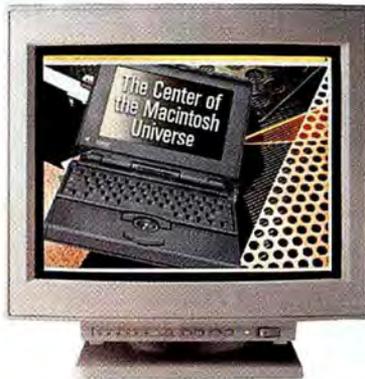
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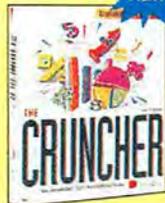


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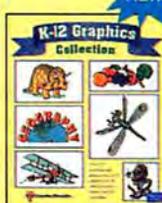
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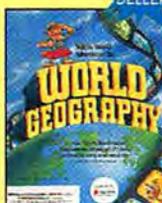
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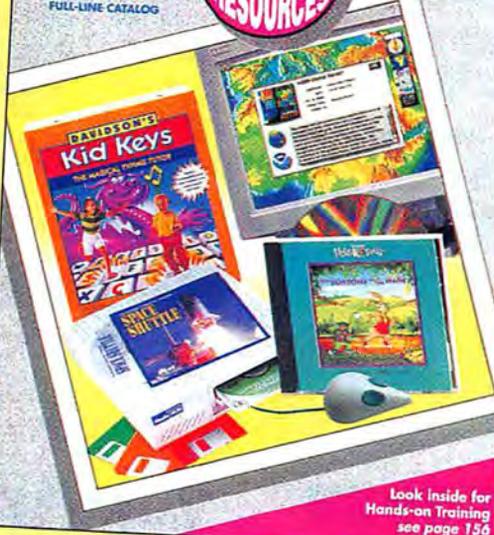
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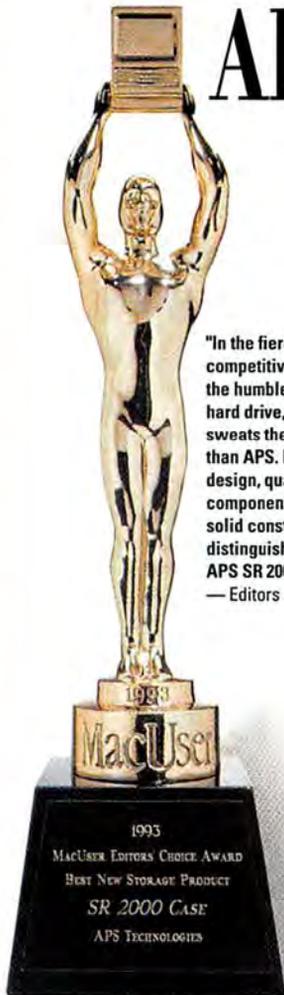
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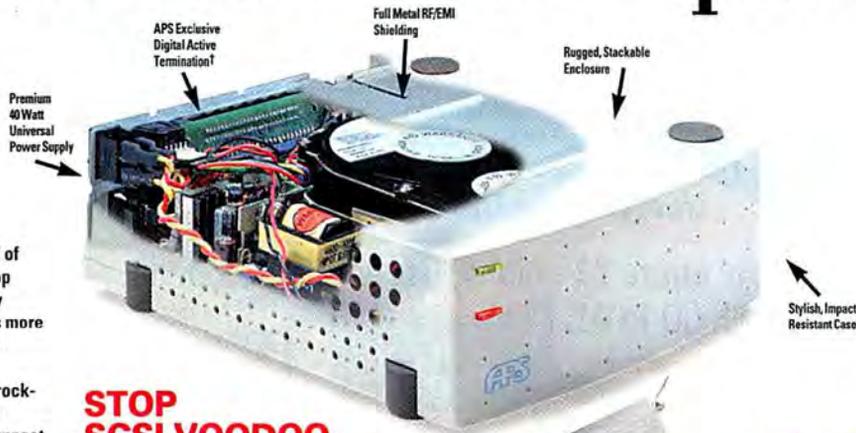
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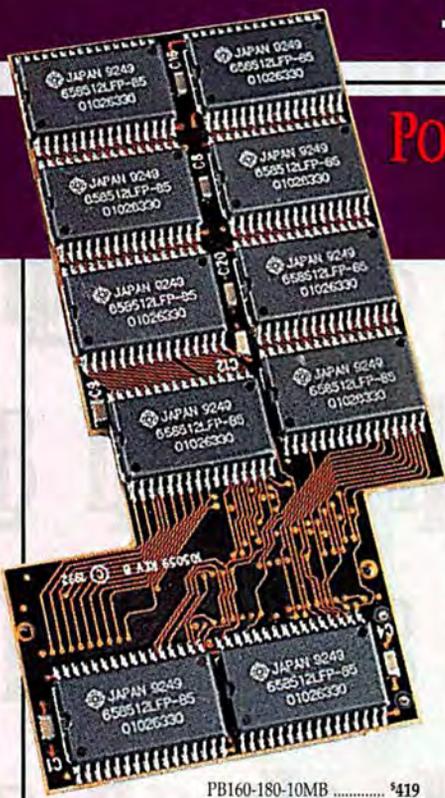
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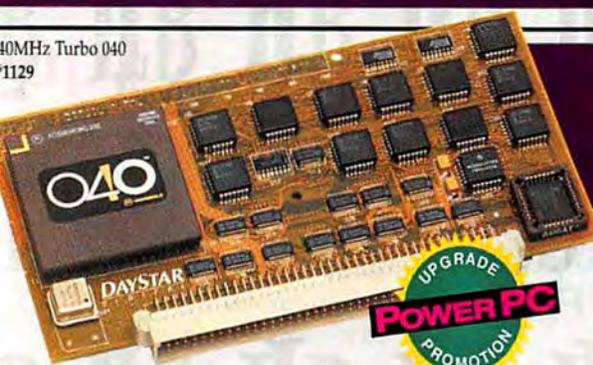


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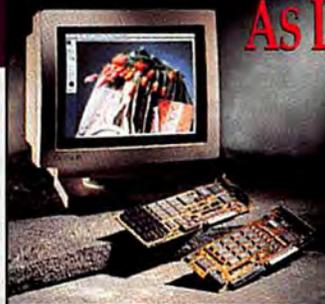
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1. For how many micro computers do you buy products?
(check one)

01) 1-4 02) 5-49 03) 50+

2. Your primary job function is: (check one)

01) Administrative/ 03) Engineering/R&D
 General Management 04) Finance/Accounting
 02) MIS/OP. Communications 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 03 04
 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 03 04
 Scanners 10 10
 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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 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480

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
 General Management 04) Finance/Accounting
 02) MIS/DP, Communications 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)

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- SOFTWARE:**
- | | | |
|---------------------------------|-----------------------------|-----------------------------|
| Accounting | <input type="checkbox"/> 01 | <input type="checkbox"/> 01 |
| Spreadsheets/Financial Planners | <input type="checkbox"/> 02 | <input type="checkbox"/> 02 |
| Project Managers/Planners | <input type="checkbox"/> 03 | <input type="checkbox"/> 03 |
| Word Processors | <input type="checkbox"/> 04 | <input type="checkbox"/> 04 |
| Database Managers | <input type="checkbox"/> 05 | <input type="checkbox"/> 05 |
| Graphics/Presentation Software | <input type="checkbox"/> 06 | <input type="checkbox"/> 06 |
| Integrated Software | <input type="checkbox"/> 07 | <input type="checkbox"/> 07 |
| Communications | <input type="checkbox"/> 08 | <input type="checkbox"/> 08 |
| Utilities | <input type="checkbox"/> 09 | <input type="checkbox"/> 09 |

HARDWARE:

- | | | |
|-------------------|-----------------------------|-----------------------------|
| Modems | <input type="checkbox"/> 10 | <input type="checkbox"/> 10 |
| Scanners | <input type="checkbox"/> 11 | <input type="checkbox"/> 11 |
| Microcomputers | <input type="checkbox"/> 12 | <input type="checkbox"/> 12 |
| Printers/Plotters | <input type="checkbox"/> 13 | <input type="checkbox"/> 13 |
| Monitors/Displays | <input type="checkbox"/> 14 | <input type="checkbox"/> 14 |
| Storage | <input type="checkbox"/> 15 | <input type="checkbox"/> 15 |
| Add-in Boards | <input type="checkbox"/> 16 | <input type="checkbox"/> 16 |
| Networking | <input type="checkbox"/> 17 | <input type="checkbox"/> 17 |

5. If so, what function do you serve in the buying process? (check all that apply)

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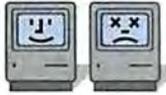
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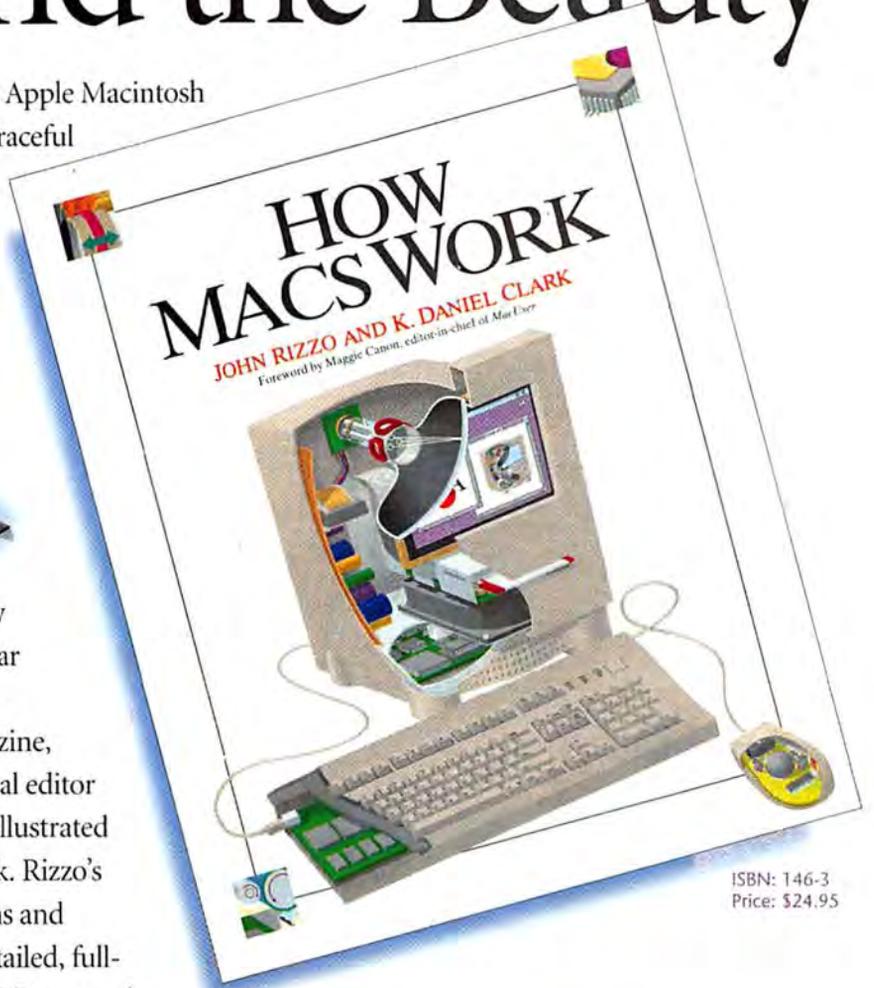
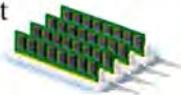


together, read *How Macs Work*, an all-new book inspired by the popular "How It Works" series that appeared in *MacUser* magazine, written by *MacUser* technical editor John Rizzo, and brilliantly illustrated



by K. Daniel Clark. Rizzo's lucid explanations and Clark's highly detailed, full-

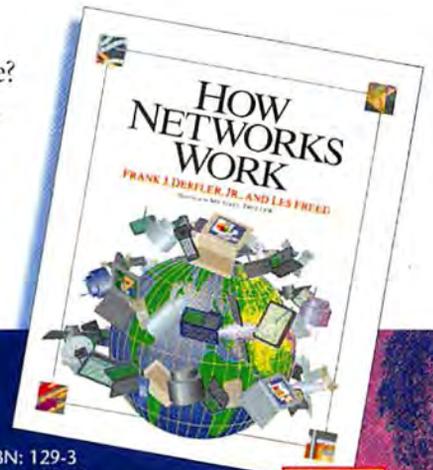
color illustrations artfully unmask and demystify the inner workings of the Macintosh. What happens to data on the way from memory to storage? How does the closely guarded Mac ROM chip give the Mac its unique look and feel? How do technologies mesh to form the Mac's built-in networking features? If you've ever wondered what makes a Mac a Mac, turn to *How Macs Work*.



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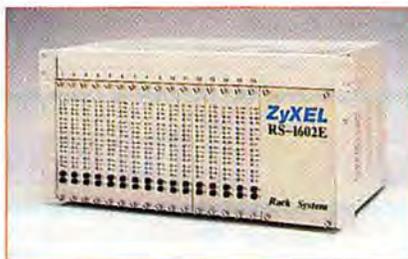
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188-193

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Accelerator Boards		209	Bar Coding		205	CAD/CAM		
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Disk Drives	189		Entertainment/Games	191		MISCELLANEOUS		
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Multi-Media	190		General		208	Data Recovery		209
Peripherals	189	204	Graphics	192	209	Desktop Publishing Services	193	210
Powerbook Products	190		Communications/Networking			Digital Output Services		210
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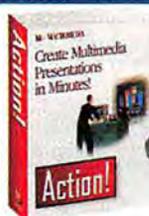
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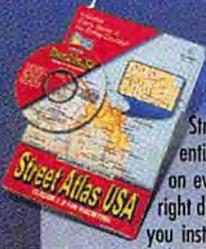


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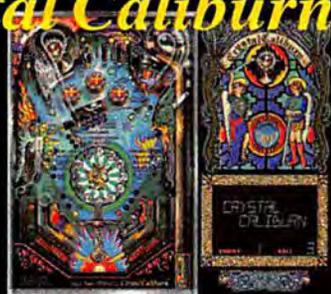
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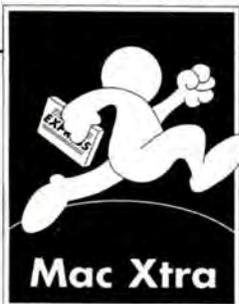
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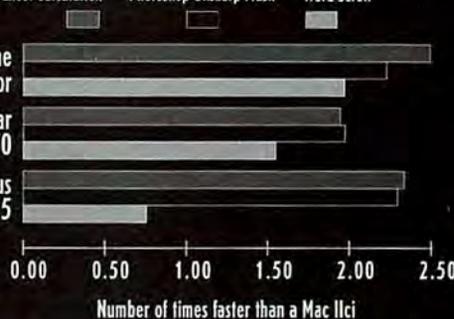


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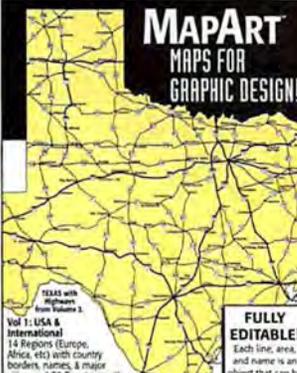
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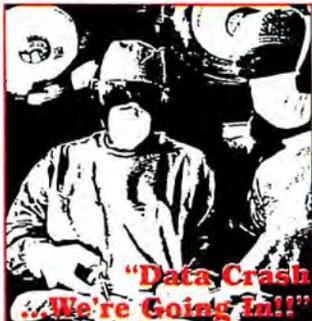
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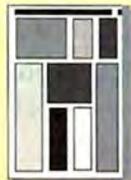
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Over the past few months, I've recommended that newcomers take a serious look at the Mac, because the prices are lower than ever. I recently visited some retail outlets to do some comparison shopping myself. As cheaply as Apple has priced its Macs, though, its approach to maintaining — much less expanding — market share still has serious flaws.

Here are some comparisons from a flier put out by Micro Center, an excellent store in Fairfax, Virginia. It is heavily into discounting and has aggressive prices. The top of this flier featured a 340-megabyte IDE hard drive for \$259. "Only 76 cents per MB!" Next to it was an IDE controller card for \$9.97.

The IDE hard-drive controller was one of the interesting byproducts of the PC price wars. Because of the incredible competition to have the very lowest prices in the PC market, new, less expensive technologies like IDE's are always cropping up. However, although cheap Ethernet circuits and onboard video-display capability can be found in Macs, the dirt-cheap IDE hard

drive can't. I'm kind of amazed that some hardware hack hasn't used an IDE controller chip to make a NuBus card that would allow Mac users to use these drives. Apple and all of its users are missing the boat.

In the same Micro Center flier, a PLI 170-megabyte hard drive for the Mac is available for \$219 — well over a buck a megabyte. And don't let them kid you about the IDE-versus-SCSI performance difference. There is none. Furthermore, if the same drive mechanism is made IDE-compatible, it usually outperforms its SCSI counterpart.

I'm not telling Apple to switch from its SCSI design, but something has to give with the hard-drive situation. There are Macs being sold today with 80-megabyte hard drives. The 80-megabyte hard drive is a joke. It was a joke two years ago. You can barely get by with 340 megabytes nowadays.

Let's do some price comparison at Micro Center. This appears to be one of its big sellers: the Multimedia Complete System, a PC clone. It sells for \$1,499 (probably less by the time you read this) and includes a 486SX machine preloaded with Windows, running at 33 megahertz and including 4 megabytes of RAM, a 340-megabyte hard drive, built-in sound, a 14-inch color monitor, and a double-speed CD-ROM drive.

Personally, I don't recommend the 486SX chip, since it has no math coprocessor; I'd prefer to see people go with the DX2/50 or DX2/66 chip. The flier has a similar Windows system with a DX2/66, 8 megabytes of RAM, a 528-megabyte hard drive, a 15-inch monitor, a CD-ROM drive, sound, and a digital signal processor, all for \$2,499. This is the machine to get.

Micro Center is an Apple dealer. Let's see what it comes up with to compete with these two machines.

The closest equivalent to the \$1,499 multimedia machine is a \$1,999 Quadra 610 with a built-in CD-ROM drive. It has 8 megabytes of RAM, a 230-megabyte hard drive, and — oops! — no monitor or keyboard. Hmm. Well, it has AppleTalk and, uh, built-in Ethernet.

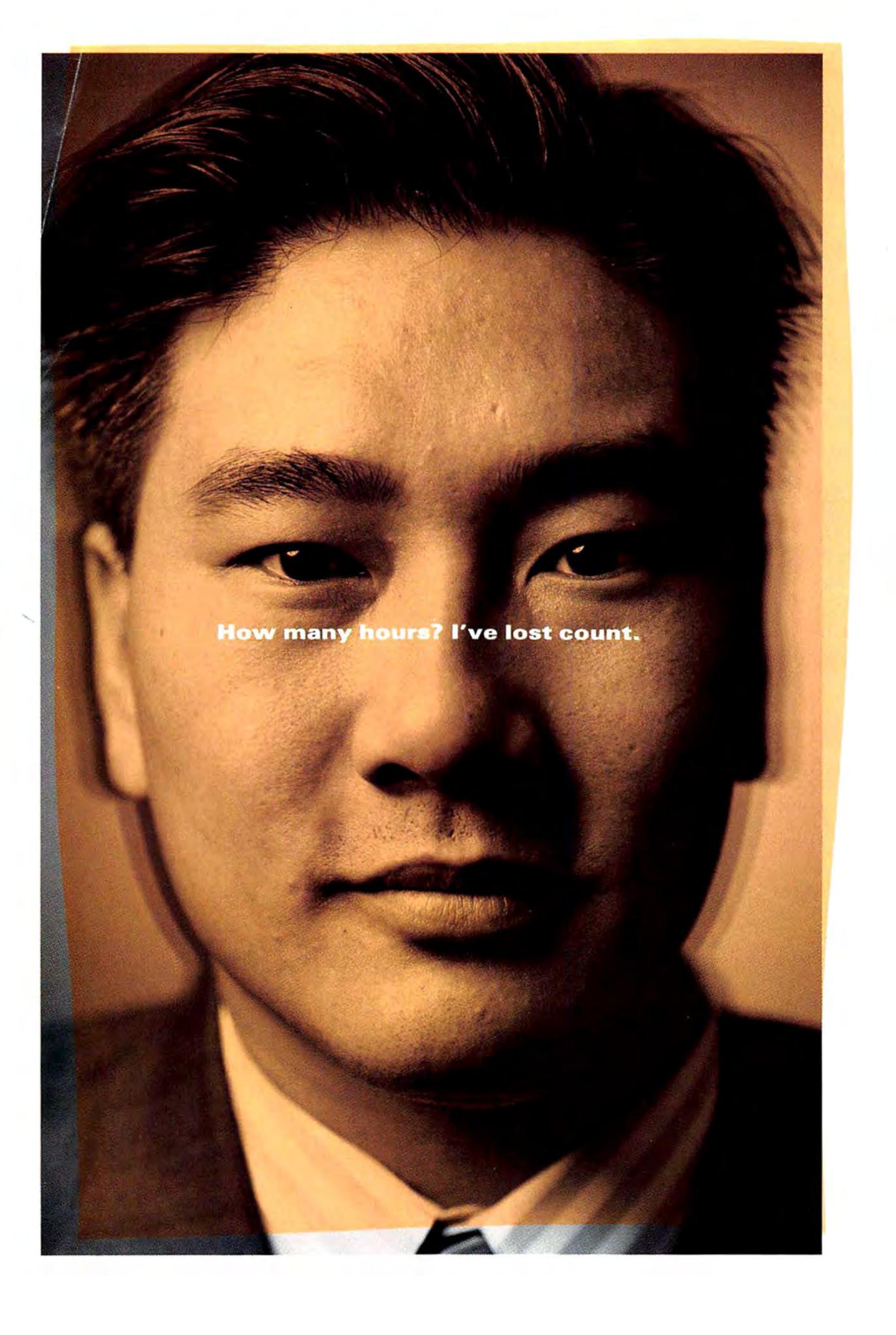
Well, what about the high-end machine? Here we have a Quadra 840AV. It's got it all. But it costs \$3,499 with a meager 230-megabyte hard drive and 8 megabytes of RAM. To get an additional 8 megs of memory and a 500-megabyte hard drive, you have to pay \$4,799 in all, and again this doesn't include



a keyboard or a monitor. This \$1,300 is a pretty steep increase for an additional 8 megabytes of memory and an additional 270 megabytes of hard-drive capacity. A buck a megabyte would be \$270 for the hard drive. The extra RAM is a whopping \$1,030 for 8 crummy megabytes. Puh-leeze!

The flier also offers a Quadra 650 with a CD-ROM drive. Check out these prices: The 650 with 8 megs of RAM and a 230-megabyte hard drive is \$2,499. The exact same machine with a 500-megabyte drive is \$3,279. This is a \$630 difference — \$630 for a mere 270 megabytes of additional hard-drive capacity. Remember the 340-megabyte hard drive selling for \$259?

Is there something wrong with this picture? It doesn't take a genius to comparison-shop. Apple management should try it sometime. ☹️



How many hours? I've lost count.



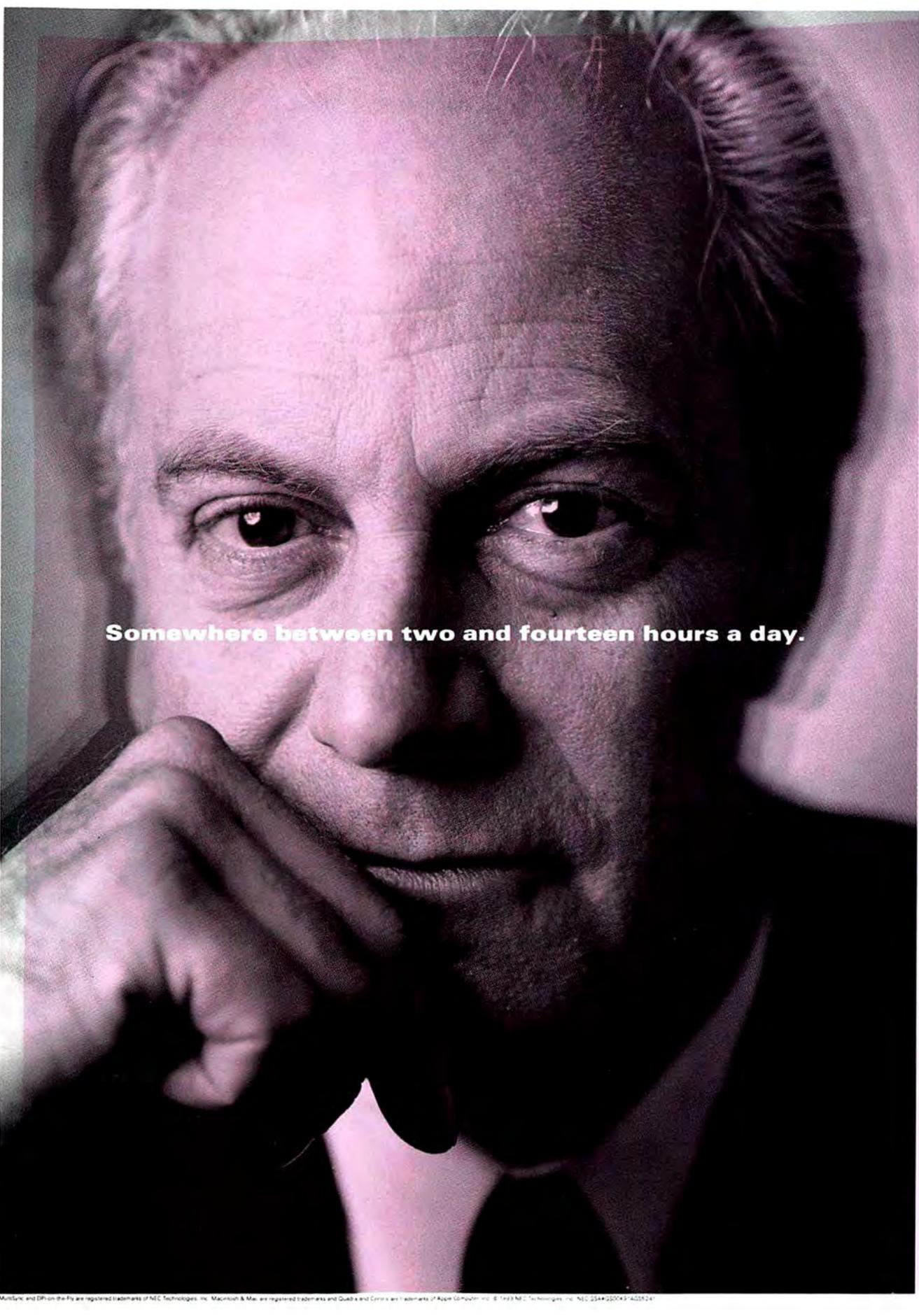
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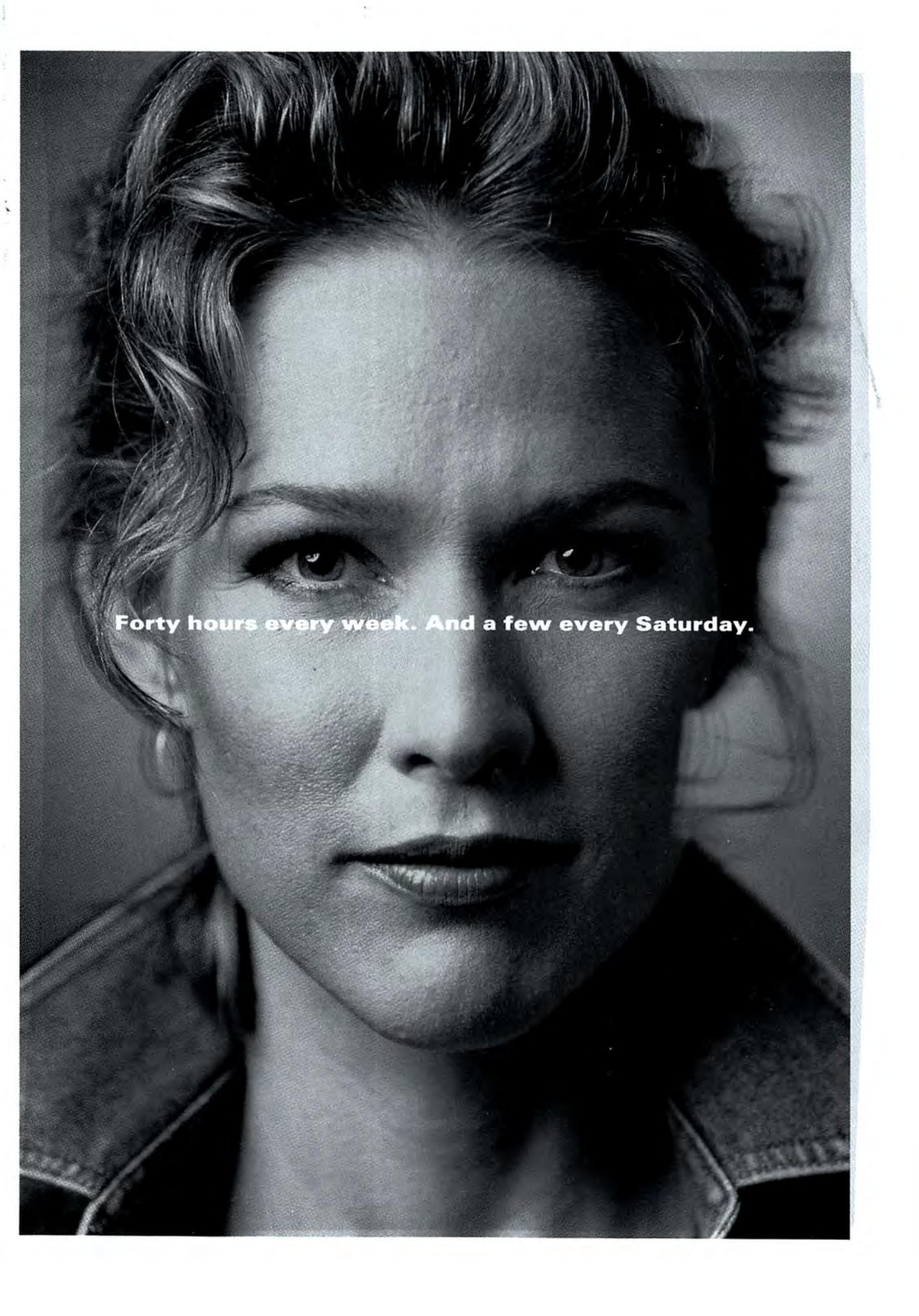
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