

APRIL 1994 / \$2.95

MacUser

COLOR PRINTING

**20 Printers
That Get
Down to
Business**

REVIEWS

FreeHand 4.0

Meeting Maker XP

LaserWriter

Select 360

Conflict Catcher



Talk about a bright new day. Everything you've dreamed of in a database is finally at your beck and call—in the form of new Microsoft® FoxPro® relational database management system 2.5 for the Macintosh.*

For the first time ever, you can develop an endless array of ultra-fast custom database applications. You have powerful tools for both developers and users, and full cross-platform capabilities. Big time.

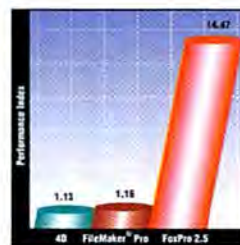
FoxPro is built with a unique technology we call Rushmore™ query optimization. Bottom line? It's the fastest way to retrieve information. No other database for the Mac® comes anywhere close to it.

What makes this database so far-reaching in its creative potential is the host of development tools it puts at your fingertips.

Use the Screen Builder to graphically create detailed screens. Or click on the enhanced Report Writer to design complex business reports. And with the Project Manager, it's easy to manage and track all the parts of your new creation.

The FoxPro database programming language has such breadth and depth, you'll never run out of ways to develop robust applications. Ever. It even supports Apple® events, XCommands, XFunctions and QuickTime™ video.

What's more, you don't have to change a thing to run FoxPro for the Mac applications in FoxPro for the Windows™ and MS-DOS® operating systems. Or vice-versa.



Query multiple tables at once using Relational Query By Example. Then see the answers in a flash. (LEFT) On average, new FoxPro 2.5 for the Macintosh is 13 times faster than FileMaker® Pro and 4th Dimension.™

This marks a new era of incredibly easy cross-platform development.

FoxPro even inspires your users. Now relational database power is well within their grasp. Especially since our helpful wizards make generating screens, reports and graphs so effortless.

The price will make your day, too. Only \$99** for a limited time.

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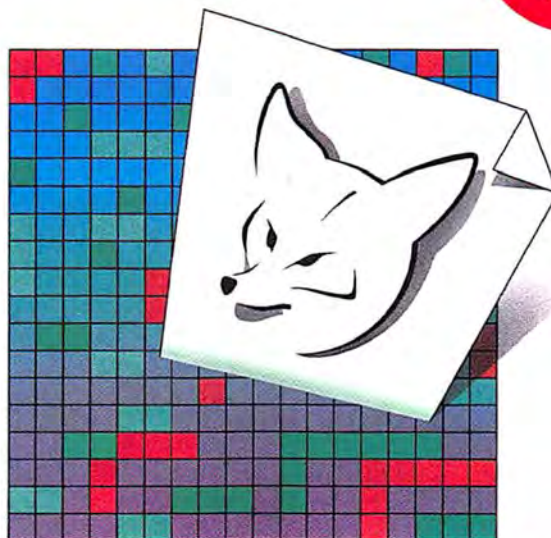
Microsoft®

*FileMaker Pro cannot perform multitable tests. The FileMaker Pro performance index is based on single table tests. The FoxPro and 4th Dimension performance indices are based on both single and multiple table tests. Query tests performed by Micro Endeavors, Inc., a third-party consulting firm (November 1993). **Plus freight and applicable sales tax when ordering direct from Microsoft. Reseller prices may vary. Offer expires June 30, 1994, and is good only in the 50 United States. © 1994 Microsoft Corporation. All rights reserved. In the 50 United States, call (800) 434-3977, Dept. KZ2. For information only: In Canada, call (800) 563-9048; outside the U.S. and Canada, call your local Microsoft subsidiary or (206) 936-8661. Microsoft, FoxPro, the Fox head design and MS-DOS are registered trademarks and Windows and Rushmore are trademarks of Microsoft Corporation. 4th Dimension is a registered trademark of ACIUS/ACI. Apple, Macintosh and Mac are registered trademarks and QuickTime is a trademark of Apple Computer, Inc. FileMaker is a registered trademark of Claris Corporation.

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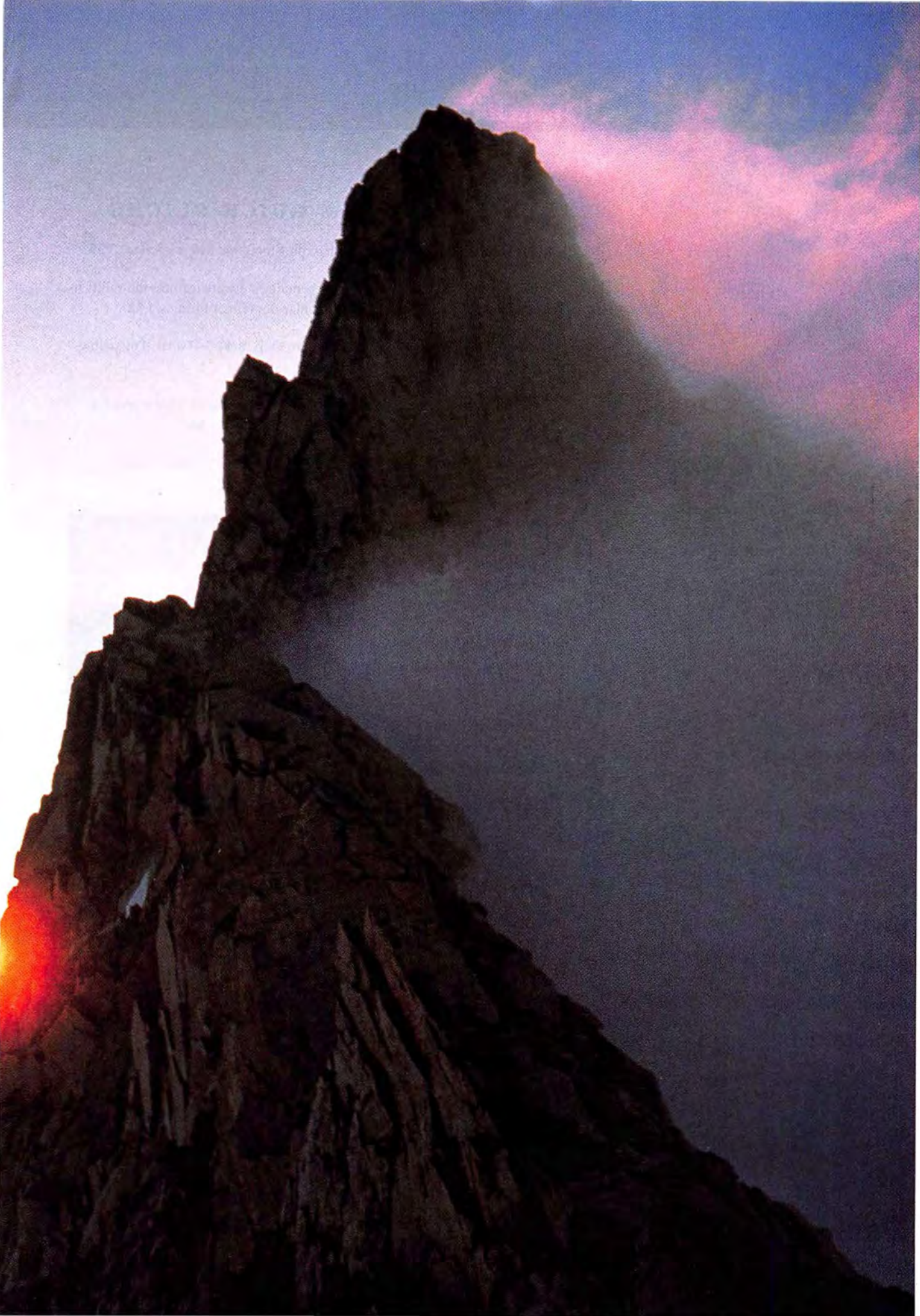


Microsoft **FOXPRO**

Relational Database Management System for the Macintosh

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ONE DAY WITH THE
INFINITE POWER TO CREATE.**





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Color Printers

It's the little things — such as fine print and detailed line art — that speak volumes about color-printer precision.

MacUser Labs It's also the big things — such as speed, output quality, and the cost of consumables — that you need to factor in when you decide whether a color printer meets your office's needs. We examine 20 printers representing five color-printing technologies to see how they measure up for business use. BY BRUCE FRASER / 76



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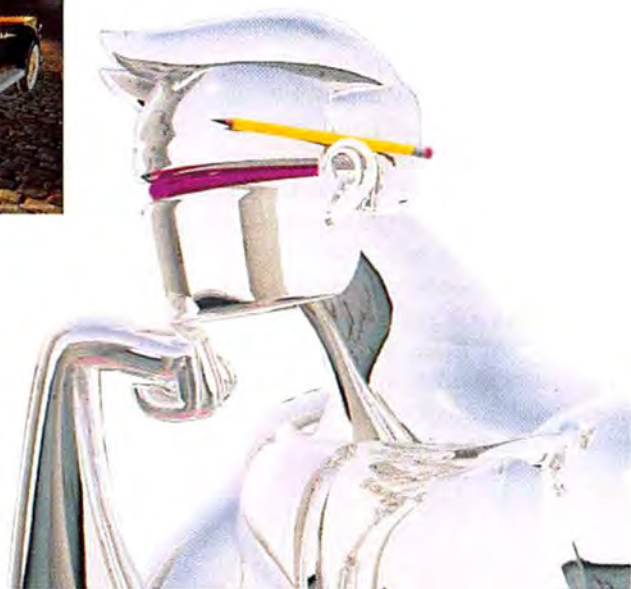
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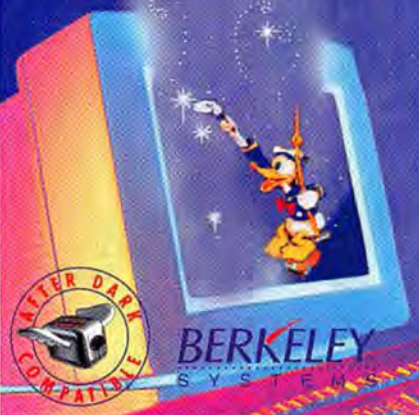
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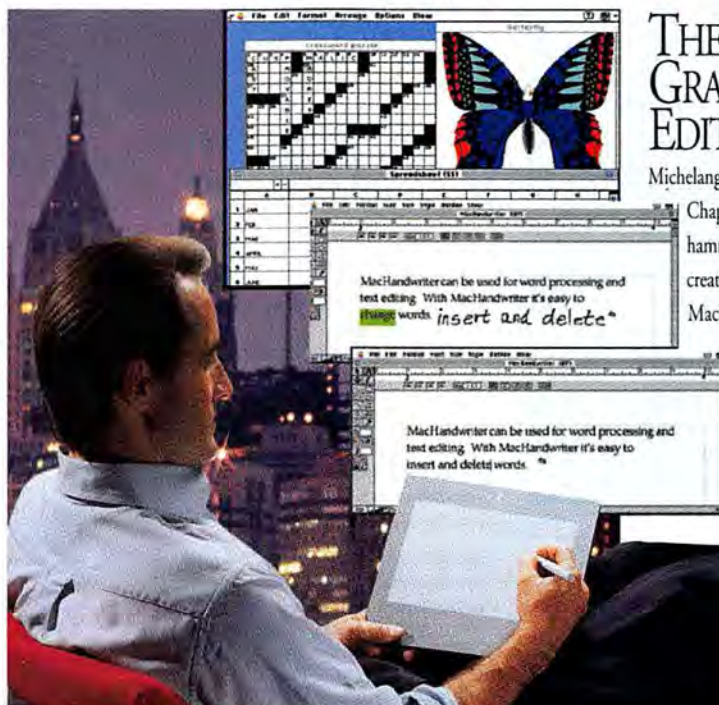
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James Coates, CHICAGO TRIBUNE

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The Apple Report On PowerPC

NUMBER 2 – RISC PERFORMANCE AND CROSS-PLATFORM COMPATIBILITY

Many of the most popular applications have been or are being optimized to take advantage of the high-performance PowerPC processor.

PowerPC chips are faster and less expensive than Pentium chips – so are the personal computers they will run.

A complete Macintosh system with PowerPC will cost well under \$2,500, but will offer better performance than higher-priced Pentium-based systems.

With SoftWindows, Macintosh with PowerPC will have the ability to run DOS and Windows applications, unmodified.

For more information about Macintosh with PowerPC, call 1-800-732-3131, ext. 150, in the U.S. We'll send you a copy of our informative, free booklet, *PowerPC Technology: The Power Behind the Next Generation of Macintosh Systems*. In Canada, call 1-800-665-2775, ext. 910.

In the first half of 1994, Apple will introduce a new family of computers that already has the entire computer industry standing on end.

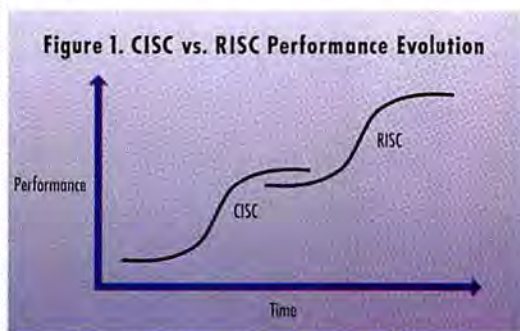
They will offer better performance than computers based on the X86 microprocessors. They will be extremely competitive on a price basis. And they will be compatible with Windows and DOS applications, by using SoftWindows software.

They will be based on the revolutionary new PowerPC™ microprocessor, created jointly by Apple, IBM and Motorola.

For the first time, desktop personal computers will take advantage of RISC chip architecture previously found only in high-performance workstations. This advance will make possible quantum improvements in the way we manage and work with information.

RISC vs. CISC.

Tremendous advances have been made in CISC architecture over the years. However, the physical limitations of the new, high-performance CISC design mean that CISC chips must be significantly bigger and more complex, and must run at hotter temperatures to perform the same tasks as comparable RISC chips. Consequently, the newer



generation of CISC chips, like the Pentium, are much more expensive to manufacture. Which means that personal computers powered by PowerPC chips can offer a significant advantage in price as well as in performance.

As you can see on the chart, RISC microprocessors offer dramatically greater potential for growth, leading us well into the next century and increasing the practicality of features like voice recognition, videoconferencing, object-oriented software and multimedia capabilities – functions that will be integral to doing business in the 21st century.



More compatible personal computers.

Apple's new generation of Macintosh® personal computers built around the PowerPC chip offer the ability to run MS-DOS and Windows applications, as well as Macintosh software. Moving from one environment to the next will be seamless and, even more importantly, it will be effortless.

PC users who move to Macintosh with PowerPC will gain access to the large number of new applications which take advantage of the incredible performance of the new PowerPC chip.

Higher-performance optimized applications.

When PowerPC microprocessor-equipped Macintosh computers begin shipping, software developers including Microsoft, WordPerfect, Adobe, Aldus and Claris will begin shipping new versions of their most popular software, specifically rewritten to take full advantage of the new processor's capabilities.

These optimized, sometimes called "native," applications will offer significantly faster performance than their MS-DOS, Windows or current Macintosh counterparts.

Unprecedented value.

Because RISC-based personal computers cost less to manufacture than equivalent systems based on CISC chips, we will be able to make this technology available for well under \$2,500 for a complete mainstream desktop system.* Competitive with a lower-performance, Pentium-based PC.** Watch for Apple Report #3, coming soon.



LETTERS

Ten More Years!

I ENJOYED YOUR ARTICLE "Why 2004 Won't Be Like 1994" (January '94, page 94), but I was disappointed with your technical extrapolations. You took today's technology and scaled it up to what you believe will be the standard for a 2004 Mac. Instead, you should have come up with some new takes on the next ten years' technological leaps.

You said that the 2004 Mac Ultra's base configuration will be "128 megabytes of RAM, a 2-gigabyte hard drive." Why not something innovative? How about a standard Ultra configuration with 100-terabyte crystal-based memory modules and an UltraDrive, a small plastic cube with single-atom polarity reversal that allows virtually unlimited storage (short of deliberate duplication, it is impossible to find enough information on Earth to fill it up). And forget about monitors altogether. A heads-up-style, high-definition, three-dimensional holographic floating-projection display that appears to hover before your eyes seems closer to the ultimate.

Dave Alexander
via ZiffNet/Mac

If technology really moved as fast as Dave thinks it does (ten years isn't all that long), we'd all be flying helocars and living to be 110. Winchester hard-drive technology and RAM have been with us for more than a decade, and there's no sign that they won't survive for at least one more. In fact, given the magnitude that the vested interests have grown to, there's even more reason to argue that fundamental

technologies will be more evolutionary than revolutionary in the next decade than in the last. / JZ

I JUST FINISHED reading your article "Why 2004 Won't Be Like 1994," and I have just one thing to say:

Excellent!
Ed Crowley
via ZiffNet/Mac

ALTHOUGH I GENERALLY applaud Michael Swaine's piece about the tenth anniversary of the Macintosh ("The Computer That Smiled," January '94, page 82), I take exception to the comparison of the original Mac to the '65 Mustang.

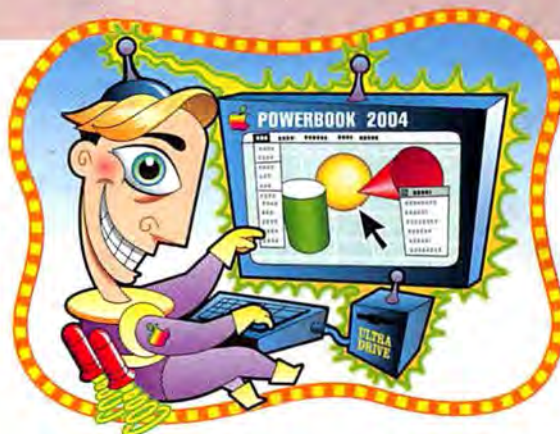
If the Mac had been a 1965 Ford Mustang, it would have been underpowered, unreliable, and cheap and, aside from styling, would have contributed nothing new to computer engineering. But it would have been tremendously popular, maintaining an image completely out of proportion with its actual worth or ability. The original Mac was more like the '79 Volkswagen Rabbit — a bit more expensive than the competition but able to do much more than you'd expect, with reliability thrown in for good measure.

David A. Zatz
Tenafly, NJ

MAGNUM SOFTWARE is one of an extremely small group of developers who've been with the Macintosh since its birth. Our McPic! clip art was one of the first programs for the Mac, and our Mouse Mover — with its 99 baby ball bearings! — won the MacUser Editors' Choice Award in 1985 for best accessory.

And in 1988 we introduced Teleflex (now TFLX), the original phoneware system for the Mac, which lets you create almost any phone application under the sun. But in your tenth-anniversary story, you state that the first phone product for the Mac arrived in 1992. Credit was erroneously given to another product.

Scott McTyre, Vice President, Development
Magnum Software, Chatsworth, CA



OPEN FOLDER

A couple of sharp-eyed readers questioned us about the PowerBook 180c that appeared on the cover of our January 1994 issue. "Compared to my 180c, it has a rather large screen, and it also has a contrast slider as well as a brightness slider," notes BMUG's Steve Costa. "Ah, what interesting magic one can play with photo-editing software!" Dana Basken chimes in. "The PowerBook 180c on the front cover looks more like a PowerBook 160 with color added." Well, it's, uh, actually a new PowerBook we cooked up for, uh, our anniversary story about the future of the Mac. Yeah, that's right. But its three-dimensional holographic floating-projection display didn't show up on film, so we had to fake it. Yeah. And don't even get us started on its single-atom polarity reversal . . .

The "Celebrating 10 Years of Macintosh" feature in January stirred George D. Bigham to send us two-and-a-half single-spaced pages reminiscing about the early days. Here are a few highlights of George's highlights: "Filevision, the graphics-database program, shipped in April (?) 1984 and jumped to the top of Merisel's best-selling-software list, the first Mac-specific product to do so. . . . Remember the case of the HyperDrive, GCC's internal drive? The read/write head couldn't home in on track 0, so the drive became unbootable. GCC's fix was to manually align the disk and use superglue to put the stop in the right location. Remember the sound of your HyperDrive fan falling out of the back right corner of your Mac's case directly into your HyperDrive mechanism? . . . And who could forget the Apple sales meeting in Hawaii where Steve Jobs and Bill Gates did a demo together, sending a file from one Mac to another over AppleTalk? At the same meeting, Woz [Steve Wozniak] led the 'Apple II Forever' chant. The whole building shook as everyone joined in." Sadly, the Apple II is officially dead.

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COMPUTER SHOPPERS are willing to cough up full price for a Mac when it's the hot new model, but after about six months, they start getting price-conscious again and have to be flogged into action. That's why Apple brings out new models frequently.

Mac XXX

MAGGIE CANON'S RIGHT: Apple hasn't gone quite far enough in ending the confusion over Mac models ("Keep It Simple, Apple," December '93, page 27). Stamping different numbers on the fronts of Performas just because they have different software is a new low. Computer shoppers are willing to cough up full price for a Mac when it's the hot new model, but after about six months, they start getting price-conscious again and have to be flogged into action. That's why Apple brings out new models frequently, even when the technical improvements are minor.

Will the PowerPC machines be presented as Macs with different model numbers? I doubt that Apple can resist giving them a name that suggests potency, in the same way that the name Quadra played off the number of the 68040 chip. Going directly to the Latin roots, Apple has some interesting *power* possibilities: Fortis, Valida...

Ross Signal
Ann Arbor, MI

I WAS PLEASED TO SEE that your article on Apple's new product lines ("And Then There Were 4," December '93, page 92) was preceded by Maggie Canon's "Keep It Simple, Apple" editorial, which identified Apple's foolhardy development and promotion strategies of the last ten years. Apple has alienated untold potential customers by introducing countless new models in an apparent attempt to appeal to every possible market niche. In the process, it has infuriated Mac owners and allowed the brilliantly conceived, elegantly designed Mac to degenerate into a collection of "me too" products with no clear delineation of power, features, or price.

But the new marketing scenario described in the article is no better than the previous situation, for crying out loud! Apple has created parallel lines of identical machines with different names and prices. The company has confused the concept of

models with the concept of options.

Eric Wenocur
Rockville, MD

Spin Doctors

BECAUSE OF THE CONTINUING advances of technology and the long lead time *MacUser* requires for feature articles, you unintentionally left out some important performance and price facts regarding our Bernoulli products in "Choosing the Right Removable" (November '93, page 106).

About the time you were testing the original MultiDisk 150 drive, Iomega added a 256K read/write cache to all MultiDisk 150 drive models, significantly increasing speed and performance. In an Iomega-conducted benchmark test, akin to the test you used for your article, we obtained speed results similar to those you published but we found that the cached MultiDisk 150 was significantly faster than the original MultiDisk 150 as well as drives based on the SyQuest 44 or 88 mechanisms. A drive using SyQuest's 105 mechanism, which has lower storage capacity and no multidisk capabilities, had speed similar to that of the cached MultiDisk 150.

Second, your article did not reflect our August price reductions. Based on the average November street price for a drive and storage media, you can purchase 150 megabytes of Bernoulli removable storage for about \$560, 300 megabytes for about \$658, or as much as 1 gigabyte for about \$1,155.

As the price reduction and benchmark tests indicate, today's Bernoulli 150 drives are a much more competitive choice.

Steve Wise, Bernoulli Product Manager
Iomega Corp., Roy, UT

Blue-Colored Glasses

I FELT AGGRIEVED when I read John Dvorak's column "Apple's Entropy Case" (January '94, page 282), about the loss of vision at Apple. Dvorak exposed a truth that all of us loyal Mac fans have been afraid to face: At Apple, the excitement of having zeal and a vision is being buried under an IBM-

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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, Beziér 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

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MAC UP
GERMANY, 1992



MACWORLD
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MACWEEK
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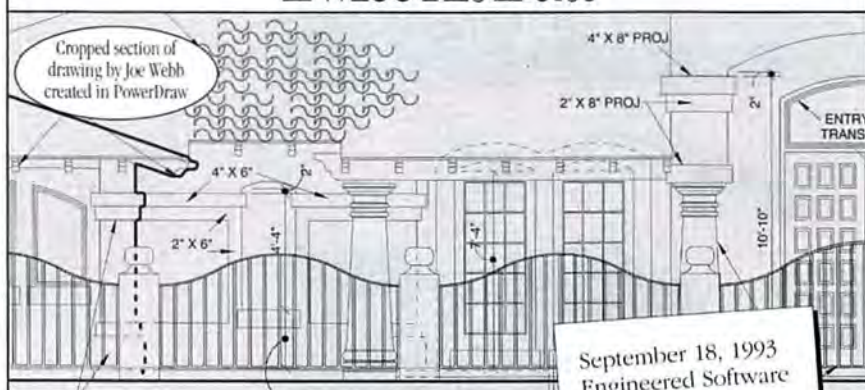


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like corporate mentality. Thankfully, the residue of that original vision is so powerful that, like with IBM, the force that propelled Apple to success may continue long after the company has ceased to be truly innovative. Hopefully, unlike with IBM, Apple's bureaucrats will not so mismanage the company that they cause it to tumble into oblivion.

Jefferis Peterson
Grove City, PA

Transplatform Intercourse

CONGRATULATIONS TO John C. Dvorak for "Platform Choose" (December '93, page 300). There was a time when even the suggestion of comparing Windows with the Mac would be proof of dementia. I have and use both platforms, and I like them both.

My comment is addressed to Mrs. Dvorak, who her husband said contrasted a real woman and a transvestite. I have made love to a real woman, and I concede that it is a remarkable experience. I have never (knowingly) made love to a transvestite, but I suppose it could be a truly sensational experience. So, Mrs. Dvorak, don't knock Windows until you've tried it.

Norm Peterson
Santa Monica, CA

Waiting for Gates

AS A SOFTWARE AUTHOR for the Mac, Windows, and DOS platforms, I am amazed at the articles and letters regarding the battle between Intel-based machines and Macs. The nearly phobic attitude toward DOS or IBM-compatible equipment of Mac users is amusing and, considering the vast numbers of Intel-based machines out there, unjustified. Let's face it: If the Mac were really all that much better a computer, no one would ever buy a PC. Apple has a superior operating system (everything is either built in or connects automatically), but PCs deliver a lot more hardware bang for the buck.

In the end, I don't care what company puts its name on a computer — a computer is there only to run software — but it is unlikely that Apple will ever have that vision. It will wait for Bill Gates to do the job, and he will likely do it well. It's time for the Mac users who view their computer as a religion more than as a working tool to realize that their computer is a secular device.

David A. Greene
Los Angeles, CA

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Lotus-Eaters

YOU RICH FOLKS IN LOTUSLAND need to get a reality check from the little people who read your slick color magazines, which always seem to have a monolithic editorial viewpoint expressed in the phrase "Shop till you drop" or perhaps "Buy, buy, buy."

In "System Software for the '90s" (December '93, page 105), the phrase that caught my eye was "running a suite of inexpensive new system extensions" followed by "if you're still using System 6, it's time to switch."

Inexpensive? Don't make me laugh.

Inexpensive is system software that costs, maybe, \$30 at a retail store, complete with manuals. *Inexpensive* is system software (which comes free with the Mac you bought) that you upgrade at your user-group meetings for the cost of the blank floppy disks you bring to the meeting. *Inexpensive* is not having to buy more motherboard memory or a larger hard drive to run bloated system software. *Inexpensive* is not having to spend hundreds of dollars upgrading applications that system-software revisions just made unrunnable. *Inexpensive* is not having to buy replacement fonts for the ones you already have, which work perfectly fine, thank you very much.

You may not "have to plop down five grand to get it," but by the time you do all the above and spring for a bigger monitor to accommodate the cluttered desktop, plus a video card to run the monitor, plus an accelerator to compensate for the drag on the system the big monitor will cause, you will easily have spent three or maybe four grand.

That describes a Quadra 840AV. System 6 on my SE/30 looks better and better every day.

George Wruck, Jr.
Dallas, TX

/ George, what you want is *cheap* or *free* software. *Inexpensive* is spending \$149 for System 7 Pro, which gives you extended functionality that would cost several times more if you purchased separate products with similar capabilities. Individual users may not want PowerTalk, but corporate users do. By the way, there's no need for you to replace your font library. The PostScript or TrueType fonts you have do work perfectly fine on any Mac. / PP

Memory Lapses

IN "SYSTEM SOFTWARE FOR THE '90s," the minimum requirements for PowerTalk are listed as 5 megabytes of RAM and a

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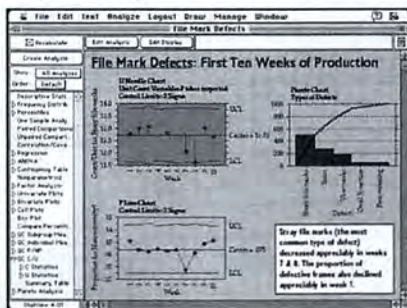
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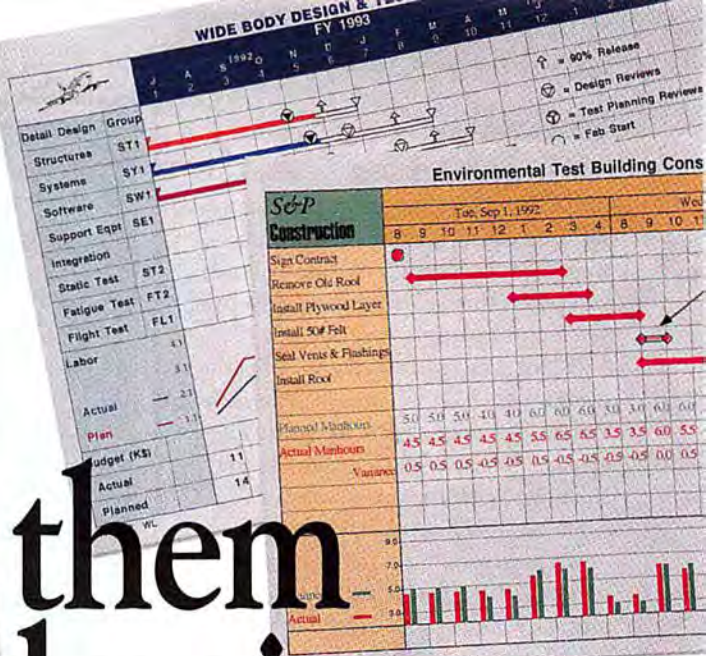
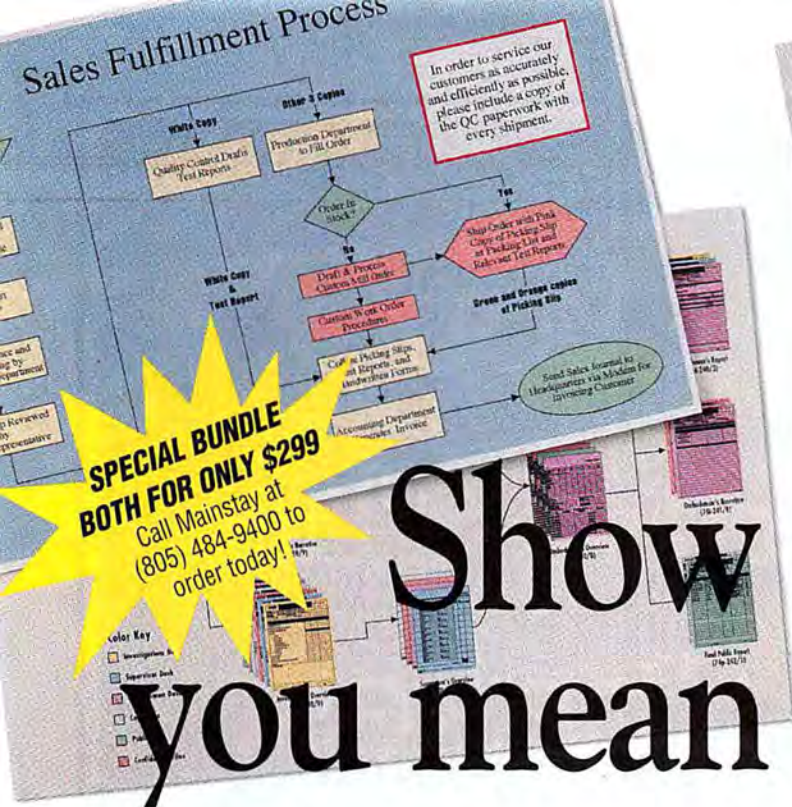
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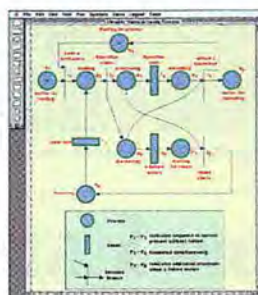
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68000 processor. I have an SE with 4 megabytes of RAM, and insofar as I am aware, that is the maximum amount of memory a 68000 processor can support.

David L. Chase
BMUG Boston, via CompuServe

/ You're right. System 7 Pro, which includes the PowerTalk extension, can run on a 68000 processor and 4 megabytes of RAM, but a faster processor and 5 megabytes are recommended. / PP

IN "THE MACUSER 100" (December '93, page 131), you state that Bliss Saver "takes up only 4 megabytes of disk real estate." In fact, the complete Bliss Saver package takes up only 700K of disk space, less than a double-sided floppy disk. The small footprint of Bliss Saver is one of its great features — it enables us to supply more than 130 animated paintings that last from 5 to 30 minutes, because they take up only 2K to 6K each.

Greg Jalbert, President
Imaja, Albany, CA

Power060

I KEEP HEARING ABOUT the 68000-series processor being dead, now that the PowerPC is here, but I've also heard that Motorola is working on a 68060. Supposedly this processor will be twice as fast as the PowerPC and available at the end of 1994. If this is true, it seems to me that we will see another upgrade path without the software-compatibility issues the PowerPC introduces. But is it true?

John Heaney
Novato, CA

/ Motorola is working on a 68060 chip, but like Intel's Pentium, it will be a CISC processor rather than a RISC chip like the PowerPC. The next step in Motorola's 68000 line, the chip is expected to be two to three times as fast as the 68040 but not faster than the PowerPC chips. Given Apple's commitment to the PowerPC, we don't expect Apple to make a 68060-based Mac. / PP

Bits per Inch

I THOUGHT I COULD RELY on your usually stunning magazine for purchasing decisions. I was therefore quite dismayed by the lack of clarity in the review of the new Quadra 610 and Quadra 650 ("And Then There Were 4," December '93, page 92). What I want to know is: Can I get 16-bit color with a 16-inch monitor? Your article was less

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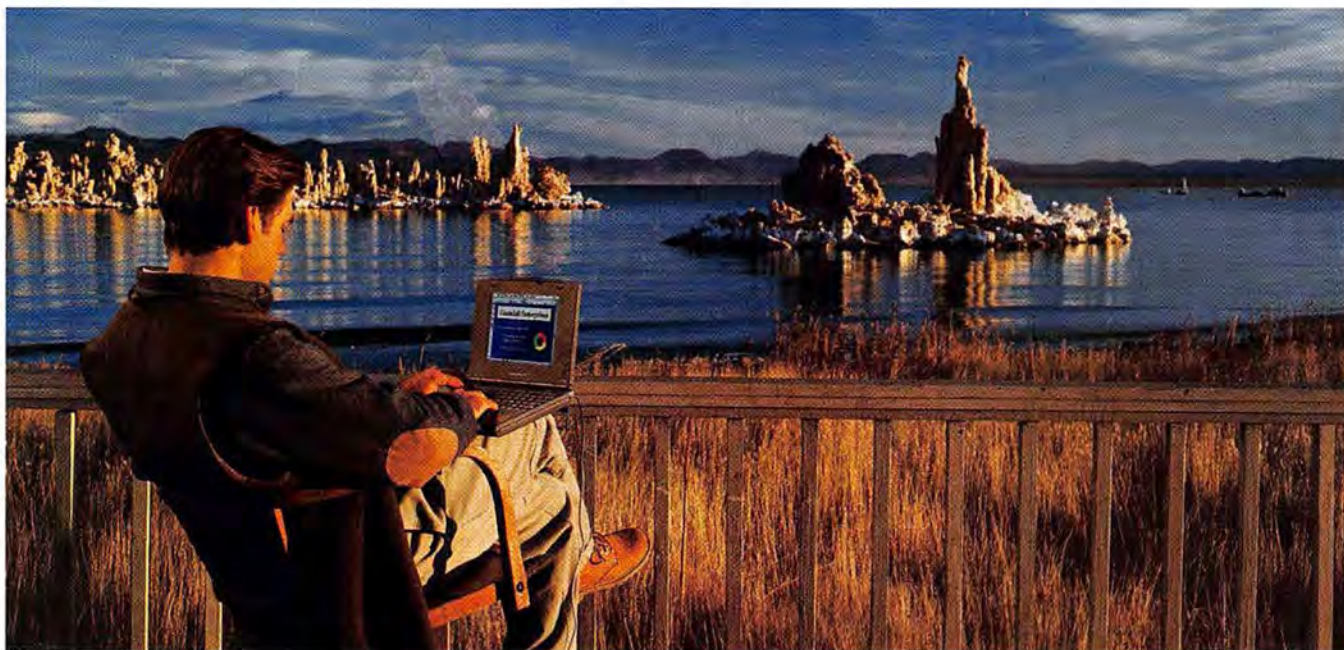


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THE WHINING IDIOTS who comment on the world of Mac computing have no place in providing contents to a magazine which is otherwise chock-full of healthful information.

than illuminating. At least you erred in being vague, whereas the answer I got from your competitor was incorrect. Armed with that "knowledge," I took a look at your review of affordable video cards ("Affordable Color Upgrade," December '93, page 113) and, lo and behold, found the correct answer to my original question, although I didn't find data comparing accelerated video with the speed of internal video.

Mark Avery
via CompuServe

/ The Quadra 610 and the Quadra 650 can support 8-bit color on a 16-inch monitor with the standard, soldered-on VRAM and can support 16-bit color after you add a 512K Macintosh VRAM Expansion Kit (for a total of 1,024K of VRAM). Accelerated video will be faster than the Quadras' internal video, but how much? Well, it depends on the card. / RM

You Mean Like This?

I AM APPALLED AT your discretion in selecting letters for publication. First, the whining idiots who comment on the world of Mac computing atop their guileless foundation have no place in providing contents to a magazine which is otherwise chock-full of healthful information. Ignorance breeds ignorance. Persons inclined to absorb useful content will leave this following of lemming behaviorists. Mac computing is not based on compromising technology for mass appeal. Apples do not taste like oranges, nor are they orange in color.

Second, someone should warn your readers that your columnists are not gods or psychics but mere idealists. To take their advice literally is to adhere to the former IBM stigma that regiments creative thinking. Where is the vanity that spurns controversy by fostering competitive rage? It is a society of perpetual bickering that stagnates on consuming this idealist behavior.

Mike Taylor
San Antonio, TX

/ Riddle me this: What does it mean that we printed your letter? / PP

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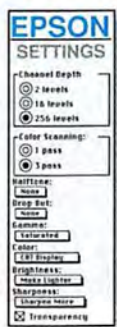
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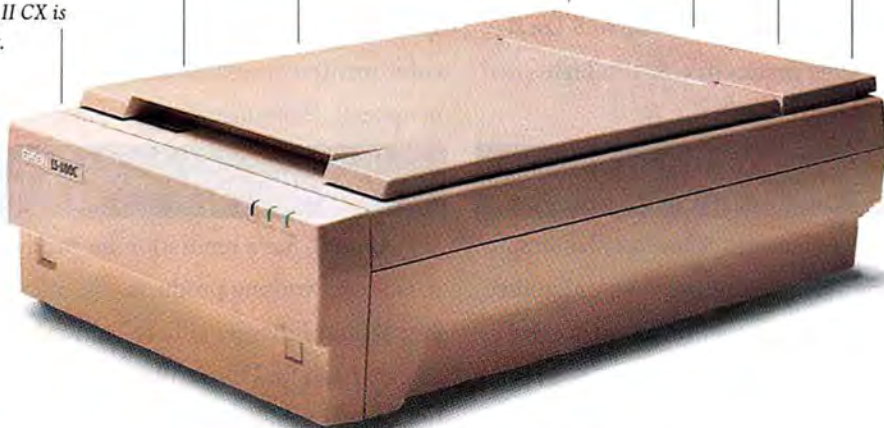


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CIRCLE 86 ON READER SERVICE CARD



The Message

POWERPC MACS WON'T SUCCEED unless Apple improves its ability to communicate. I'm not talking

about the latest Express Modem either. At a time when Mac users are excited but a little anxious about the transition to PowerPC (and Apple finds itself hammered by the general press and Wall Street analysts), the company needs to seize every opportunity to convince potential and existing customers alike that choosing a Mac is a smart move. And Apple's already behind on getting the word out.

For starters, Apple needs a compelling ad campaign that makes it clear once and for all why a Mac (especially a PowerPC Mac) is better than a machine running Windows. I happen to think Apple's advertising has improved recently, but it still misses the mark too often.

Take the AV Macs, for example. I just got one. I love it. It's fast, and its innovative technology — voice recognition and synthesis — comes standard (no add-ons required). Here's a revolutionary concept that makes working with your computer easier and more efficient — another Apple first, and a competitive advantage in a crowded market. Yet I haven't seen any Apple ads for the AV that have caught my imagination. Six months after the AV's introduction, along comes Compaq with a clever set of AV-look-alike ads that clearly demonstrate the advantage of talking to your computer (add-ons required).

Next, Apple needs to set the mainstream press straight. I continue to be amazed at news stories declaring that the advent of machines based on the PowerPC RISC chip means the end of the Mac (even some of our local Bay Area press, which you'd expect to be better informed, has taken this absurd angle). I want to yell, "It's a Macintosh, stupid!" To give Apple credit, this is not all its

fault. Today's media, even the presumably "respectable" segments, have succumbed to some degree to the tabloidization of news. "Is the Mac Dead?" makes a more sensational headline than "New Generation of Macs Coming Soon." (The funny thing is, Apple has done a superb job of briefing magazines such as *MacUser* on PowerPC. Somehow the same message isn't getting through to the mainstream press.)

Finally, Apple needs to keep its core constituency informed. A good opportunity to do that slipped by at this year's Macworld Expo in San Francisco. This was anybody's definition of a dream audience — 60,000 potential first buyers of new PowerPC machines. Instead of taking the opportunity to lay out the future of the Mac before this enthusiastic crowd, though, Apple used CEO Michael Spindler's big speech to announce its e•World on-line service. Nothing against e•World — it's an interesting offering — but Apple could have announced it *and* spent some time promoting PowerPC Macs. At the very least, Spindler could have repeated the "state of the union" speech he gave at last fall's Comdex show.

Yes, PowerPC Macs were on the show floor and in Apple's own, separate exhibit space, but their overall presence was surprisingly low key, in part maybe because the actual

boxes were always kept under wraps. Instead you saw demonstrations of the impressive speed gains for such applications as Adobe Photoshop, Painter, and FrameMaker. Yet, in spite of these gains, I overheard people in the aisles pondering whether the Mac platform was still viable.

Presumably, Apple is worried that promoting PowerPC too aggressively too soon will cannibalize sales of existing Macs, but

the reality is that the cat's already out of the bag. Consumers know that a new crop of computers based on a new chip is coming soon to a store near them. And here were thousands of people who would have liked to hear, from Apple, what to expect from Apple. The company could have used the opportunity to energize this influential crowd.

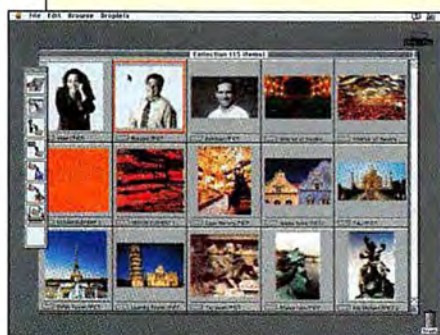
This really is the crux of the problem: Apple is still the leader in innovation,

but most people don't know it. At a time when companies are cutting back on R&D, Apple continues to invest 7 to 8 percent of its revenues in this area (as one point of reference, Compaq spends only 2 to 3 percent of its revenues on R&D). But Apple can't seem to communicate its leadership position to the rest of the world. As much as they'd hate to (Apple suffers from serious Microsoft envy), Apple's marketers should steal some pages from Bill Gates' playbook: Communicate your strategy early and often — even if you might not end up carrying it all out or succeeding at it. ☐

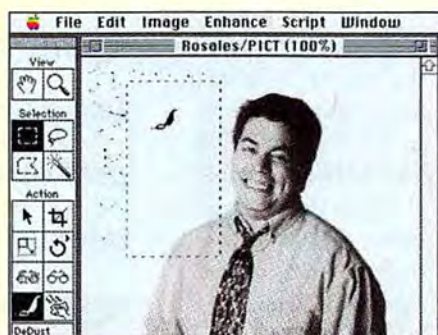
*Six months after the
AV's intro, along
comes Compaq with
a clever set of
AV-look-alike ads
that clearly
demonstrate the
advantage of talking
to your computer.*

A simple demonstration of PhotoFlash software.

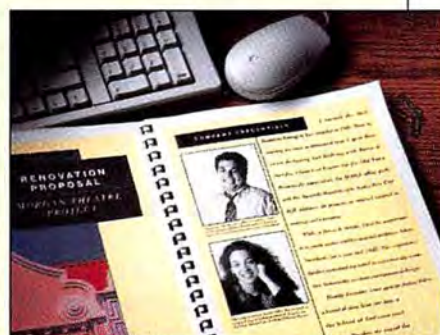
(A complicated demonstration isn't possible.)



1. Find a photo. The PhotoFlash Browser 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.



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You used to have to learn a lot — and spend a lot — before you could work with photos on your computer. Now there's PhotoFlash.™ PhotoFlash is easy to use, right out of the box. It helps you organize pictures, enhance them and drop them into your work. It's fast. It's memory efficient. And it's just \$279.* So if you want to make your work look great, get PhotoFlash. You'll get the picture right away.

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Monkey ©, Monkey Do

YOU MUST BE EITHER HAMMER or anvil." Avid followers of the classics are sure to recognize

these immediately as the words Number Two used to intimidate Patrick McGoochan in episode 14 of *The Prisoner*, "Anvil into Hammer." That particular line was written by Goethe, according to *The Official Prisoner Companion*, and if you ever bump into him, you can tell him I think it's one of his juiciest ever. It not only describes the perilous state of interhuman relationships but also dovetails quite nicely with this two-part column on copyright.

Last month, we trained our searchlights on the problems we the consumers create as Hated Oppressor Forces — people who, knowingly or not, trample on the rights of the creative element of society and bring big piles of potential problems upon ourselves as a result. This month, we move into Victim mode and discuss ways you can use copyrights to your advantage.

Marking Your Territory

Everyone has at least a passing familiarity with the concept of copyrights, of course. That little © symbol is on everything you touch, and there's also the benefit of nigh-weekly lawsuits lodged against the famous composer of "Cheese and Onions" by the unknown composer of "Knees and Bunions." Nonetheless, most people have the notion that a copyright is a complex beast requiring strenuous proof and mind-raking paperwork to recognize and properly document. Nothing could be further from the truth. Copyright can be summarized in the following four words: "This work is mine." Much like a house pet's freshening up the landscaping here and there, a copyright notice serves only to signal to others that ownership of a particular creative entity has been established.

Note the choice of words: "creative entity." Nearly any work of creative expression set in some tangible form (that's an almost verbatim reading of the copyright law) can be copyrighted. Copyrights apply not only to your 40-page short story but also to the customized icon you've designed for your hard drive, a spreadsheet you've constructed for organizing your video library, or anything else that exists in our plane of reality. Actually, "exists in our plane of reality" is really the only hard-and-fast rule regarding copyrights: You can't copyright the *idea* of a HyperCard stack that translates English text into ferret talk, but once you've actually sat down and written the stack, the copyright is yours.

Getting It

But is it worth the bother to secure a copyright for all of your work? Of course, it is. The great thing about copyrights is that they're automatic. Show up at a 7-Eleven without a T-shirt, and you're automatically barred from entry; set a creative idea into tangible form, and automatically the U.S. Copyright Office, which knows all and sees all through your cable-TV hookup, automatically grants you the copyright. You don't even have to add a copyright notice, although doing so can offer you greater security if someone later attempts to steal your work.

Proper use of a copyright notice is pretty straightforward. If you're protecting some sort of printed material, put "Copyright ©

1994 Rocky Raccoon" (assuming that's the right year and author name) on the title page at least. (On the Mac, you get the © symbol by pressing Option-G.) For a piece of software, stick the notice in the same place where you declare authorship: in the splash screen, the About box, and/or in the first few lines of the source code. (By the way, substituting (c) when the © symbol

is unavailable is a near-universal practice but has never been officially sanctioned. As such, it's probably safer in that case to omit the symbol entirely and merely write out the word *copyright*.) Because copyright notices are free, try to get into the habit of slapping one on everything you create that you think has potential value.

All right, so if copyrights are free, then how

does the Copyright Office stay in business? Ah, because there's a catch: The term of this "automatic" copyright is only three years. If you want the work to be protected for at least your own lifetime, you must register the copyright. This doesn't require lawyers or exorbitant fees; all you have to do is send the appropriate form, \$20, and a copy of the material. Call the U.S. Copyright Office hot line (202-707-3000) for free copies of forms and helpful booklets on filling them out. Once your copyright has been registered, the work is protected for your lifetime plus 50 years.

Supervictim Mode

What if someone infringes on your copyright? Well, it's up to you to police it. If you find that someone's abused your copyright, the presence of a copyright notice means

PROBLEM:

You want to protect your creative rights without using a truncheon.

SOLUTION:

One simple keystroke (and a small spool of red tape).

that the bully can't claim he had no idea he was swiping copyrighted material. And if the copyright was already registered at the time of infringement, you're entitled to statutory damages (big bucks) plus attorney's fees (bigger bucks).


But if you bungle things, you can unwittingly toss your work to the wolves. The most common mistake is to, through misunderstanding of the term, identify something as "public domain." This has a specific legal meaning, which is basically "free for use by all." If you mean "Give this away to anyone and everyone who wants a copy, but the copyright still belongs to me," then say so explicitly. As an example, my MacQuarium guide, which has infected almost every on-line entity known to man, has a full page of legal notices describing situations under which the document can and cannot be distributed. No legalese (beyond the formal copyright notice) is necessary; just state explicitly which rights you're giving away and which you're keeping for yourself.

What if you never had those rights in the first place? Now this is tricky: There are two

main circumstances (within the confines of this column, that is) under which you can create something for someone else without even knowing it. The first, familiar to many, is when you're doing "work for hire." According to the law, if you prepared a work as an employee (and not as an independent contractor) and that work was within the scope of your employment, then it was performed as work for hire and the copyright belongs to your boss. A HyperCard stack you wrote as a network supervisor/programmer to diagnose network problems would almost certainly belong to the company, whether you wrote it at home or in the office; a video game you wrote at home in those circumstances almost certainly would not. This can be a tricky distinction, however, and if the stakes are high enough, you certainly should seek professional advice.

Second, there are situations under which you've already agreed that the copyright for what you create will belong to another. The contract I've signed for this column gives *MacUser* the copyright, for example, but this relinquishing of rights can also apply to

things such as so-called contests in which you submit programming modules or artwork you've created as part of a certain commercial package and, per the terms of the contest, give up all rights to those materials. More interestingly, some on-line services include as part of their user agreements statements that any public messages you send become the property of that service. This is merely a way of simplifying some of the legal issues related to distributing messages worldwide, but it still should give you pause now and again.

Finally, I always finish these legally oriented columns with the same spiel: Although this column was researched, it wasn't written by a lawyer, and I strongly advise that if you need a lawyer, you seek one out. But if there's one thing you should take with you from this column, it's the idea that anything you create — software, words, art, whatever — has value, either to you or to someone seeking to make a buck. A copyright is a simple and effective means of preserving that value and as such should be understood and used properly. 

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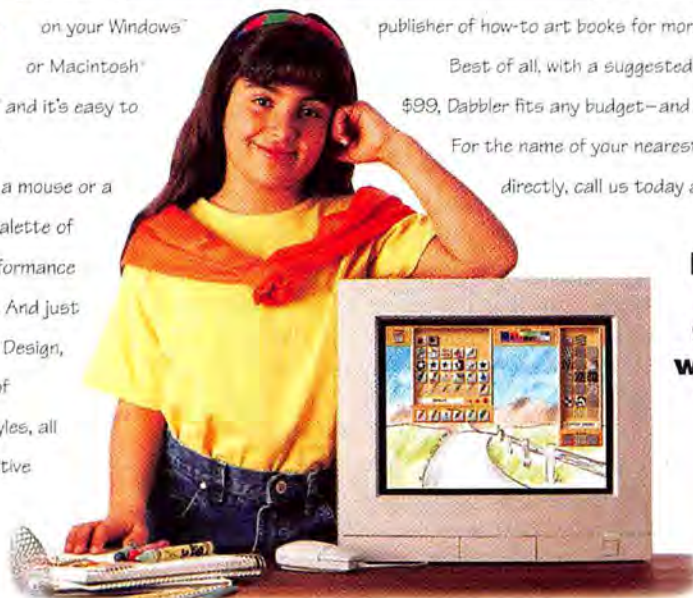
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you can do all the things you can do with competing programs, except for spending a whole lot of money. Yes, this happens to be a wordy headline, but then again, this program's so simple to use, it's

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Sean Safreed
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PowerPC: The Calculated RISC

COULD POWERPC BE ANY MORE crucial to Apple's future? While the stock price sits at about half

of its early-1993 level and debates are staged over Apple's continued existence, the company is engaged in the high-stakes gamble of moving its entire computer business over to an untried new family of microprocessors. If PowerPC turns out to be a mistake, it'll be a major one.

That being the case, it might be informative to listen in on what various commentators in the non-Apple world are saying about the PowerPC:

"...respectable right off the bat... a great part with good software... fast, versatile, and hot... cheaper and faster than Pentium... the first serious threat to Intel's CPU dominance... a strong threat... the only thing that scares [Intel CEO] Andy Grove... will be wildly successful... successful beyond analysts' predictions... way cool."

Well, that sounds encouraging.

Of course, they're talking about the chip, not Apple's use of it. Other PowerPC machines will be built by other companies, in particular IBM, a partner with Apple and Motorola in the joint venture that produced the PowerPC. Still, it's good to know that the chip isn't a turkey.

So what makes the PowerPC so way cool?

Some interpret the (predicted) success of the PowerPC as the triumph of RISC design. RISC (reduced-instruction-set computing) is a chip-design approach that emphasizes simplicity of the processor instruction set and that has to date been proved successful only in workstations. It has been spectacularly successful, though, in IBM's RS/6000 line, and the RS/6000 is the source from which the PowerPC derives, so maybe it's not quite fair to call the PowerPC "untried."

Nor is it fair to call IBM just "a partner with Apple and Motorola in the joint venture

that produced the PowerPC." IBM essentially designed and actually produces the PowerPC 601 chip, although Motorola will produce subsequent versions of it. Software written for the POWER (Performance Optimization with Enhanced RISC) architecture of IBM's RS/6000 workstations will run unmodified on the PowerPC.

Having proved this RISC technology in the workstation market, IBM will let Apple test its viability in the desktop one. But according to *BYTE* magazine's Tom Thompson, there is no question about that. The only question is, When will you move to RISC? Regarding Intel's Pentium, the cutting-edge processor for the Windows and DOS world and the pinnacle of commercial CISC (complex-instruction-set computing, the label applied by RISC proponents to any non-RISC design), Thompson says, "CISC processors might be able to hold the line for a while longer. For the short term, Intel can pump up the Pentium's clock speed, but the system's complicated instruction decoder... eventually becomes a bottleneck."

No doubt, he's right, but I suspect that this insight has not escaped Intel.

The challenge that today appears to be a clear RISC-versus-CISC face-off may become less clear as Intel adds more RISCiness to future processors (the Pentium already has some RISCl-like features) and PowerPC chips get more CISCified. The simple fact is that IBM has developed a chip that beats the pants

off Intel's best effort and opens the door to new paradigms of computing.

The PowerPC "could create a fundamental shift in how work is done [on the desktop]," Thompson says, "enabling new categories of applications such as real-time processing, interactive collaboration, 3-D imagery, and other computationally intensive activities."

Many of these categories will take advantage of the PowerPC's remarkable floating-point-calculation speed. Another of the chip's strengths is in its support of certain instructions that make fast emulators possible. This is important to the non-Apple world, because it means that PowerPC machines may be

able to run Windows at acceptable speeds. It's vastly more important to Apple, whose strategy for moving customers to PowerPC machines depends on fast emulation.

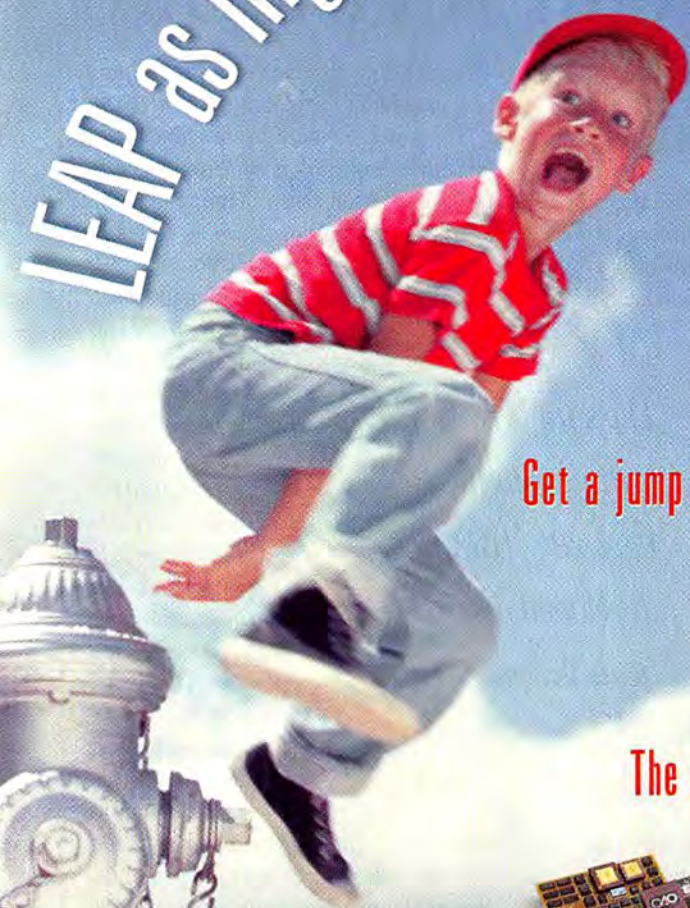
So what will come of the PowerPC/Pentium face-off? Listen to the buzz from the non-Apple swarm once more:

"Don't look for Intel to lose... Intel will remain king of the hill... Intel will still sell the most next-generation PC engines in 1994... RISC chips can't come near the 50,000 applications available for the Intel PCs... 2 million PowerPC-based systems by the end of 1994... far short of the 6 million to 7.5 million Pentiums that Intel expects to ship this year... it will take marketing blunders of Biblical proportions for Intel to fall from the top."

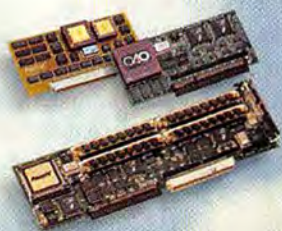
OK, I get the message. But all Apple really has to do is put a dent in Intel's armor. If it does that, its RISC will have paid off big.

The simple fact is that, with the PowerPC, IBM has developed a chip that beats the pants off Intel's best effort.

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[†]DayStar has several ways for you to upgrade your Macintosh to faster performance, including DayStar's \$199 PowerPC Upgrade Promotion. Call for details. Some restrictions may apply. *The PowerPro 601 processor upgrade will ship concurrently with Apple's delivery of its PowerPC products. DayStar is a registered trademark of DayStar Digital, Inc. Other brands and product names are trademarks or registered trademarks of their respective holders. Product specifications are subject to change without notice. ©1994 DayStar Digital, Inc.

CIRCLE 93 ON READER SERVICE CARD

NEW ON THE MENU

NEW PERIPHERALS /

SMILE, YOU'RE ON APPLE'S CAMERA

Snap digital photographs fast with the QuickTake 100.



MOVE OVER, NIKON? Well, maybe not yet, but Apple is making a foray into yet another new product area: digital photography. With the QuickTake 100 digital camera, developed in conjunction with Eastman Kodak, Apple hopes finally to convince everyday users that it's easy to add color images to their documents.

The argument for digital photography is compelling. Scanning photographs on a flatbed scanner, the most common route to getting images into documents today, is time-consuming and can be quite expensive when film-processing and printing costs are added in. With the QuickTake 100, the initial investment in the camera is your only outlay. As for speed, you're talking seconds: Take the picture, connect the camera to your Mac via a serial cable, and download the image. You're done.

With a \$750 price tag, the QuickTake 100 is geared toward the consumer market, in contrast to such professional devices as the \$6,900 Lumina, from Leaf Systems, or the \$8,000 DCS 100, from Eastman Kodak. Apple wants users to consider the

QuickTake 100 as an alternative to instant cameras, although instead of popping in a fresh roll of film, you'll need to download images to a Mac when you've reached capacity. Vacation snaps could be a problem.

The QuickTake 100 can store thirty-two 24-bit images at low resolution (320 x 240 pixels) or eight of them at high resolution (640 x 480 pixels). It connects to the Mac's serial port and, using Apple's new GeoPort, can transfer images to the Mac at 882 kilobits per second. All the software necessary to view images stored in the camera and download them to a Mac ships with the camera.

A few technical tidbits: Automatic exposure and focus are standard QuickTake 100 features. A flash unit, which you can control manually if you prefer, is built in. The lens has a focal length equivalent to that of a 50-millimeter lens. The camera is powered by three AA NiCd batteries; the batteries and a plug-in charger are included. Expect to get about 120 images from one charge. Available options include a battery-booster pack for \$49 and a travel case for \$79. 800-776-2333 or 408-996-1010. / Henry Bortman

Apple's Color StyleWriter Pro, Canon's Color Scanner Head for Home

The buzz-acronym these days is SOHO (small office, home office), and vendors are targeting small-business entrepreneurs and late-night/weekend workers more than ever. Case in point: the Apple Color StyleWriter Pro, a compact, four-color, 360-dpi QuickDraw inkjet printer that costs less than \$750, and the Canon Color Scanner IX-4015, a space-efficient 400-dpi color flatbed scanner that's less than \$1,200.

The Color StyleWriter Pro is Apple's second color printer, (the first being the ill-conceived Apple Color Printer), and it could give home-office leader Hewlett-Packard a run for its money. Apple claims its printer has better graphics and shorter print times than HP's DeskWriter 550c, for a comparable price. Unlike the HP unit, Apple's printer uses separate cartridges for its CMYK inks, so replacing a cartridge is quick and easy. Print speed is rated at 2 ppm for monochrome and .5 ppm for color. The printer



Apple Color StyleWriter Pro

offers two halftone options and 64 TrueType fonts and includes three ColorSync profiles for photographs, business graphics, and spot color. For small-business users, it ships with a serial interface and ColorShare, a technology similar to Apple's GrayShare that allows printer sharing and password protection.

As for paper options, the Color StyleWriter Pro can print on transparencies and plain paper, but premium coated paper is recommended for best-quality printing. The input tray holds 100 sheets of paper or 15 envelopes. The inks are fast-drying and the inkjet nozzles self-cleaning. 800-776-2333 or 408-996-1010.

Canon's new Color Scanner IX-4015 is geared to home-office users for whom desk space — and spare cash — is limited. Measuring a little more than 11 inches wide and less than 15 inches long, it offers resolutions of 400 x 800 dpi for color images and 400 x 1,200 dpi for monochrome ones. The 24-bit single-pass scanner uses a Xenon (instead of fluorescent) light source, which, according to Canon, produces more-stable color. Canon developed the unit in conjunction with Light Source, whose Ofoto automatic scanning software ships with the scanner. 800-848-4123 or 714-438-3000. / Pamela Pfiffner



Canon Color Scanner IX-4015

BUSINESS TOOLS /

BEYOND WORD

New versions of WriteNow and Nisus Writer stake out word-processing turf.

WHEN IT COMES TO WRITING on a Mac, Microsoft Word is far from the only game in town. New versions of two Mac word processors that command relatively small but loyal followings target Word's weaknesses while building on their own strengths.

WriteNow 4.0 may come from WordStar International (which bought the product from T/Maker), but its original development team is still working to make it the smallest, fastest, and least cluttered full-featured word processor. This version adds such power-user features as table editing, which might tempt Word users — especially at a price of \$119.95.

Given Microsoft Word's PowerBook-unfriendly reputation, WriteNow has always been a better alternative for notebook computing, and version 4.0 goes a step further by adding the Optimize for PowerBook setting, which loads all of the program's resources into memory and keeps them there.

And because many would-be WriteNow users must work with Word files, WriteNow can now read tables created in Word and read and write Word style sheets. Saving files in Word format, though, still means

using Save As to create a Word RTF file. 800-227-5609 or 415-382-8000.

Nisus Writer 4.0, formerly Nisus but rechristened for its scheduled April release, has long been recognized as a more robust yet less polished alternative to Word, with features such as unlimited undos and powerful search-and-replace options. The new version sports a redesigned interface (more

polish) and a continued emphasis on multilingual computing (more Polish and the like). Nisus Writer 4.0's implementation of Berkeley Speech Technologies' text-to-speech technology means the program can read documents aloud in English, French, German, and Spanish.

This revision also has a table editor, PowerTalk capability, and an equation

editor and allows more-precise placement of graphics within text. Nisus Writer 4.0, which includes Romance languages and Japanese, is priced at \$495. For another \$100, users can purchase a hardware key that unlocks functionality for right-to-left languages (such as Hebrew and Arabic), Cyrillic languages, Chinese, and Korean. 619-481-6154. / James Bradbury



Nisus Writer 4.0 is a powerful, polyglot word processor.



MACUSER/ZMAC UTILITY OF THE MONTH ONE-CLICK FINDER POWER

MAKING A COPY OF A FILE IN THE FINDER takes time, even if you avoid the Duplicate command, on the File menu, and use keyboard shortcuts. But now, copying, aliasing, trashing, and inspecting files can be as simple as a click on a button bar. WunderBar, this month's ZiffNet/Mac utility, places a handy tool bar in each Finder window, with buttons for common Finder commands, such as Open, New Folder, Duplicate, Make Alias, Get Info, and Print. Other button functions include moving selected files to the Trash and editing special file attributes, such as type and creator codes.

WunderBar is available exclusively on ZiffNet/Mac and from the ZiffNet Selections area on AppleLink; it was created by John and Sheila Wallace, of Fluent Software, authors of Now Compress. ZiffNet/Mac members can download WunderBar free of connect-time charges until March 25, 1994, by typing GO MACUTIL. After that, you can find the file WUNDER.SIT in Library 3 of the MacUser Forum (GO MACUSER). On AppleLink, look for WunderBar in ZiffNet Selections:MacUser Software:Utilities. / Mark Simmons

TECHNOLOGY TRENDS /

E-MAIL GETS SMART

ELECTRONIC MAIL TODAY is simply an evolution of the paper-based memo, using electrons rather than pulped trees as the information carriers. But a paper memo can't perform a task on arrival at its recipient's in box. Its electronic descendants, on the other hand, are becoming considerably more active.

General Magic, which announced its Magic Cap operating system for PDAs earlier this year, has also introduced Telescript, a communications language whose relationship to e-mail could be compared



to PostScript's relationship to the printed page. Telescript not only encompasses a standard for addressing messages but every message, known as an *agent* in Telescript parlance, is also a piece of software.

Like today's e-mail, the simplest Telescript agent carries a message to its recipient. A more advanced agent can, on arrival, use information available on the receiving system to hunt down the recipient via pager or wireless network connection if the message is urgent enough. A scheduler agent can arrive on a recipient's system with a proposed meeting date; check the recipient's calendar; and depending on whether the desired time slot is free, either schedule a meeting or inform the sender that the recipient is already busy. Unlike today's scheduling software, though, the smarts are in the message, not in the server software.

Such "self-propelled" e-mail can pose a significant security risk — after all, who wants someone else's program running on their system — but General Magic has built privacy safeguards in to Telescript. AT&T's Personalink will be the first Telescript-based on-line service when it's released this year.

Telescript isn't the only such scheme under development. safe-tcl is a project being developed as an adjunct to the Internet-based MIME e-mail standard. The idea behind safe-tcl is to allow scripts written in tcl (a general scripting language for applications, developed at the University of California at Berkeley) to be part of e-mail messages and to execute when they arrive. The "safe" part of safe-tcl means that a tcl script embedded in mail is limited in what it is allowed to do and therefore can't perform any destructive actions on a receiving system. No commercial products have yet been announced, but it's likely that Internet users will encounter safe-tcl soon. / Stephan Somogyi

POWERPC FOR ALL

Upgrade options and hardware strategies come into focus, plus licensing the Mac OS.

AS THE COUNTDOWN TO THE LAUNCH of the PowerPC Macs continues, more details emerge about what users can expect from Apple and third-party vendors in terms of hardware-upgrade options.

For existing Mac users, Apple will offer logic-board upgrades as well as a so-called processor-upgrade card — a PDS card you'll be able to stick into your current 68040 machine. The latter approach is cheaper than swapping out your entire motherboard, but you'll probably have to sacrifice a NuBus slot, because the PDS slot is often in line with a NuBus slot.

The following Mac models will be logic-board upgradable: the Quadra 800 and 840AV; the Quadra/Centris 610, 650, and 660AV; and the Mac IIvx, IIvi, and Performa 600 series. Processor-upgrade cards will be available for the Quadra 700, 800, 900, and 950 as well as for the Quadra/Centris 610 and 650. Owners of the Apple Workgroup Server 60, 80, or 95 will be able to upgrade their systems via a logic-board

upgrade. The resulting servers, including the upgraded 95, will run a version of System 7 for the PowerPC.

While software developers have been getting the lion's share of attention by demonstrating just how fast their applications run on the PowerPC, hardware vendors have been busy too. Several companies recently announced support for PowerPC Macs.

Radius plans to provide native versions of its RadiusWare and SoftPivot extensions as well as revised drivers for its video cards, especially its QuickDraw accelerators. The company also plans to release a native version of RocketShare that will allow multiple Rocket cards to function in PowerPC Macs.

SuperMac will support all of its currently shipping 24-bit-video cards on PowerPC Macs and will make ROM upgrades available for maximum performance. It is also planning to release a PowerPC-specific acceleration extension to boost the speed of its QuickDraw accelerators even more.

If you want more proof that Apple is banking on PowerPC, try this: At Apple's shareholders' meeting in January, president and CEO Michael Spindler publicly reaffirmed that Apple plans to license the Mac operating system to other hardware vendors, but only those that develop for PowerPC. Compatibility among various vendors' machines shouldn't be an issue either, thanks to the fledgling PowerPC hardware standard PReP (PowerPC Reference Platform). What this means, of course, is a bigger market share for the Mac operating system, which translates into more options and lower prices for all of us.

ENERGY STARS /

MONITORING ENERGY WASTE

MAKERS OF MACINTOSH MONITORS are sinking a lot of energy into saving energy: Power-management schemes that put watt-hungry displays into low-consumption "sleep" mode are

becoming standard features on new hardware. If you

want to do your part to reduce global energy use (and save some cash in the process)

but you're not in the market for a new monitor, Inversion Development's Monitor-Miser (\$79.95, with quantity discounts available) may be for you.

This simple hardware box, just a bit larger than a pack of cigarettes, enables your energy-hungry monitor to nap after a specified duration of inactivity.

To configure the MonitorMiser, hook up the included cables and set DIP switches on the bottom of the box to a delay of 10, 18, 26, or 42 minutes. If your Mac is idle for the specified duration, your monitor's power will be reduced. Moving the mouse or touching a key wakes it up. No software is required.

The MonitorMiser carries the U.S. Environmental Protection Agency's Energy Star designation for saving power, and Inversion Development claims that the MonitorMiser can save you as much as \$130 per monitor each year. 415-940-7805. / Jim Shatz-Akin

OCR SOFTWARE /

INSTANT, INEXPENSIVE TEXT RECOGNITION

OCR (OPTICAL CHARACTER RECOGNITION) software, which translates hard copy into editable text, often straddles the line between being a handy utility and a full-featured — and accordingly priced — application.

With TextBridge 2.0, Xerox offers users a rich OCR application at the cost of a utility.

Priced at \$99, TextBridge includes several features that speed recognition and increase accuracy. Like a spelling checker, Lexifier identifies word and numerical patterns as it goes along. When it encounters a Social Security number, for example, Lexifier knows to use the number 0 instead of the letter O. Word Verifier lets you view and correct words

during recognition. The software learns from common mistakes and detects recurring errors. TextBridge also retains text formatting, columns, and graphics. When it runs into a low-resolution or degraded document, it automatically switches to the more sensitive Fax mode.

The program supports System 7 and TWAIN. It ships with dictionaries for five foreign languages, with others sold separately, and has Export options for popular Mac and PC word processors and other applications. 800-248-6550 or 508-977-2000. / Pamela Pfiffner



BAM! POW! OOF!

PUT THE INCREDIBLE HULK, Silver Surfer, X-Men, the Fantastic Four, and more on your Mac with Marvel Screen Posters, the latest screen saver from Berkeley Systems. These are still images taken directly from the pages of your favorite Marvel comics — just the thing for eliminating pesky penguins and pink bunnies. \$32.25. 510-540-5535.

NEW CPUS /

MORE APPLES FOR THE TEACHER

Fast, cheap LC 575 and LC 550 target the education market.

APPLE'S NEWEST CPUs pack a lot of bang for the buck: The LC 575 (\$1,599) and the LC 550 (\$1,199) each have a 33-megahertz processor, a 160-megabyte hard drive, and built-in stereo sound. An all-in-one form factor that includes a 14-inch Trinitron monitor make these units classroom-ready.

With a 68040 processor and 5 megabytes of RAM, the LC 575 is the zippier of the two, clocking speeds comparable to those of the Quadra 800, according to Apple. The LC 550 sports a 68030 processor and 4 megabytes of RAM. Each of the new machines has an open LC PDS slot, but the LC 575 also has a communications slot, which can house either a 14.4-Kbps fax modem or an Ethernet card (thin coax, 10BASE-T, or AAUI) for an additional \$89.



For playing those all-important educational CD-ROMs, the LC 575 includes a built-in, dual-speed, tray-loading CD-ROM drive. This neat device has a retractable tray that lets you pop in CD-ROMs as you would with an audio-CD player, no caddy required. The CD-ROM drive is a \$269 option for the LC 550.

The 550 and 575 replace the 520 and 520CD, respectively, in the LC lineup, but sadly they're sold only to the education market (K-12 and higher), and they're more widely available outside the U.S. 800-800-2775 or 408-996-1010. / Pamela Pfiffner

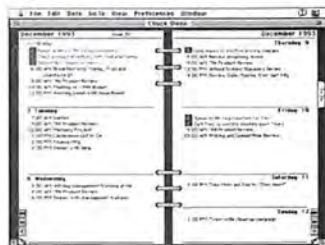
BLURB OF THE MONTH

"SOMETIMES IT'S BETTER not having the option of changing your headline into the shape of a fish." / Rudy VanderLans, cofounder of Emigre Graphics, on using Macs as design tools, in a press release for *Emigre (The Book)*, from Van Nostrand Reinhold

ORGANIZING CC:MAIL USERS

Mac users of Lotus cc:Mail need no longer feel isolated. With Lotus Organizer 1.1 for the Macintosh, cc:Mail users can integrate group messaging and scheduling on Macs

and Windows-based machines. Leveraging off cc:Mail's service directory, Organizer can search for open calendar time; invite attendees; and track "accept," "decline," or "delegate" replies. The Organizer



Scheduling Agent, which runs on a PC server, funnels all correspondence and schedules through the user's cc:Mail in box, updating schedules and calendars automatically while streamlining communication for the user. Any cc:Mail user can be invited, even if Organizer is not present, and administrative assistants can send meeting requests transparently on behalf of absent executives. Lotus Organizer uses a customizable-notebook metaphor to track appointments, to-do lists, and contact information, all of which can be linked. Priority items are color-coded, and completed tasks are grayed-out. Organizer files can be printed to a variety of page-layout formats. \$149, with license packs available for 10, 20, 50, and 100 users. 800-343-5414 or 617-253-9150. / Pamela Pfiffner

MACINTOSH PRICE INDEX

THE UNITED COMPUTER EXCHANGE index reflects national sales activity for the new and secondary Mac markets as of January 10, 1994. Prices do not include a monitor or a keyboard. New prices represent the average discount selling price of current models. The United Computer Exchange is a national clearinghouse for buyers and sellers of used microcomputer equipment. For more information, contact the United Computer Exchange at 800-755-3033 or 404-612-1205.

Mac Model	New	Used	Mac Model	New	Used	Mac Model	New	Used
Plus (1/20)	*	\$300	IIfx (8/160)	*	\$1,350	PowerBook 100 (4/20)	*	\$700
SE (2/20)	*	\$375	IIvx (4/80)	*	\$900	PowerBook 140 (4/40)	*	\$875
SE/30 (4/40)	*	\$675	Centris 610 (4/80)	*	\$950	PowerBook 145 (4/40)	*	\$975
Classic (4/40)	*	\$475	Centris 650 (8/230)	*	\$1,650	PowerBook 145B (4/40)	\$1,349	\$1,050
Classic II (4/40)	*	\$575	Quadra 605 (4/80)	\$899	\$750	PowerBook 160 (4/40)	*	\$1,375
Color Classic (4/80)	\$999	\$750	Quadra 610 (8/160)	\$1,399	\$1,100	PowerBook 165 (4/80)	\$1,699	\$1,425
LC (2/40)	*	\$375	Quadra 650 (8/230)	\$2,349	\$1,950	PowerBook 165c (4/80)	*	\$1,425
LC II (4/40)	*	\$450	Quadra 700 (4/230)	*	\$1,450	PowerBook 170 (4/80)	*	\$1,450
LC III (4/80)	\$799	\$600	Quadra 800 (8/230)	\$2,699	\$2,250	PowerBook 180 (4/80)	\$2,199	\$1,750
II (5/40)	*	\$450	Quadra 660AV (8/230)	\$2,299	\$1,750	PowerBook 180c (4/80)	\$2,549	\$2,075
IIsi (5/40)	*	\$600	Quadra 840AV (8/230)	\$3,549	\$3,100	PowerBook Duo 210 (4/80)	*	\$1,100
IIx (5/80)	*	\$725	Quadra 900 (4/230)	*	\$1,800	PowerBook Duo 230 (4/120)	\$1,529	\$1,200
IIcx (5/80)	*	\$550	Quadra 950 (8/230)	\$3,999	\$2,950	PowerBook Duo 250 (4/200)	\$2,589	\$2,075
IIci (5/80)	*	\$875	Portable (1/40)	*	\$325	PowerBook Duo 270c (4/240)	\$3,097	\$2,625

* = discontinued model

WHERE WERE YOU THE LAST TIME NORTON UPDATED THEIR SOFTWARE?

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It's been a long time since Norton Utilities really improved its software for the Mac. Too long. Now Central Point Software introduces a newer, faster, smarter Mac utility—new MacTools 3.0. How much smarter is it? It retrieves accidentally trashed files in one step. (With Norton, it takes seventeen.) It continuously checks for disk corruption in the background, so small problems don't become disasters. (Norton doesn't.) MacTools 3.0 also finds and fixes Desktop file damage. (Norton can't.) And unlike Norton, it includes complete anti-virus protection, with network support. But that's just scratching the surface. For a detailed comparison of MacTools 3.0 vs. Norton, call FAXBACK at 1-800-847-8766 and ask for document 97533. For all upgrades, just call 1-800-277-3874. And stop living in the past.

UPGRADE FROM MACTOOLS, NORTON, SAM OR VIREX ONLY \$49.95* 1-800-277-3874

*Upgrade from MacTools, Norton Utilities, SAM or Virex. Offer expires February 28, 1994. Offer good only in U.S. and Canada. Shipping and handling extra.

CENTRAL POINT
CIRCLE 69 ON READER SERVICE CARD

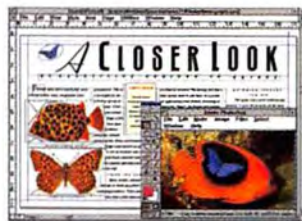


It's time to stop

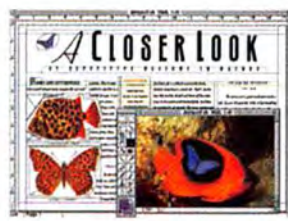


You've reached a crossroads in computer technology. A point where choosing between a PowerPC* or a Pentium™ processor-based PC could be a difficult decision.

The PC is not what it used to be. Everything you want to do on a Macintosh*, you can just as easily do on a PC. And now, all of the most popular Mac applications are available for PCs, including those by Aldus, Microsoft, Adobe, Quark and Broderbund.



This is a document created on an Intel-based PC.



This is a document created on a Macintosh.

With Windows*, they're just as easy to use. And they run at incredible speeds. To put it in



and ask directions.

perspective, Intel486™ DX2 processor-based PCs outperform the Mac Quadra* 840av, and Pentium processor-based PCs are even faster.

Best of all, you have a choice of over 100 computer vendors who now offer Pentium processor-based PCs.

These PCs give you access to some of the world's most innovative technologies. Like ProShare™ document and video conferencing. Video software using the Indeo™ format. Even future performance upgrades with the OverDrive™ processor technology.

So before you buy another Mac, stop and ask some questions. Find out where Apple is going, especially with the PowerPC. Then ask Intel about the Pentium processor. What you find out might put you on a whole new path.

To learn more about the Pentium processor and other innovative technologies, call 1-800-395-7009, Ext. 111.

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SII 
Seiko Instruments

REVIEWS & Quick Clicks

Aldus FreeHand 4.0 / A new interface plus powerful text-handling tools add up to a winning combination.

REWRITING THE RULES of illustration-software design, Aldus FreeHand 4.0 significantly enhances the productivity of graphics professionals with the most accessible tool set of any illustration program for the Macintosh. What's more, FreeHand's powerful new text-handling controls make FreeHand the program of choice for creating short graphics-intensive documents, such as newsletters, brochures, and flyers.

The Tools at Hand

Veteran FreeHand users won't discover a plethora of new tools in version 4.0, but they will find a new and faster way to work. Replacing most of the previous version's cumbersome dialog boxes with a refined system of floating palettes, FreeHand 4.0's new interface provides immediate access to all of the program's tools and functions.

Although rival Adobe Illustrator 5 takes a similar approach, we found FreeHand's palettes better organized than Illustrator's. And they require less screen real estate — you can maximize your working space with FreeHand by reducing the palettes to simple title bars. When you click on a zoom button, the palette rolls down.

FreeHand's command center is the unassuming Inspector palette, which contains icons for most of the major tool sets, including those for positioning objects, setting element attributes, handling text, and managing layouts. To call up each set of tools into

the Inspector palette, you click on the set's icon. Most users will keep this palette open, so its diminutive size is a big plus.

FreeHand's interface for managing color is greatly improved as well. The program's Color Mixer displays RGB, HLS, and Apple Color Picker controls as well as the previous version's CMYK controls. You can also convert from one color model to another on the fly. Another welcome change is the substitution of the Tint palette for the confusing Colors dialog box of the previous version.

You can apply color more easily in FreeHand 4.0 than in the previous version. For starters, you don't have to name and save colors before you can apply them, as you did before. Even better, you can apply colors by simply dragging them from a palette and dropping them onto objects.

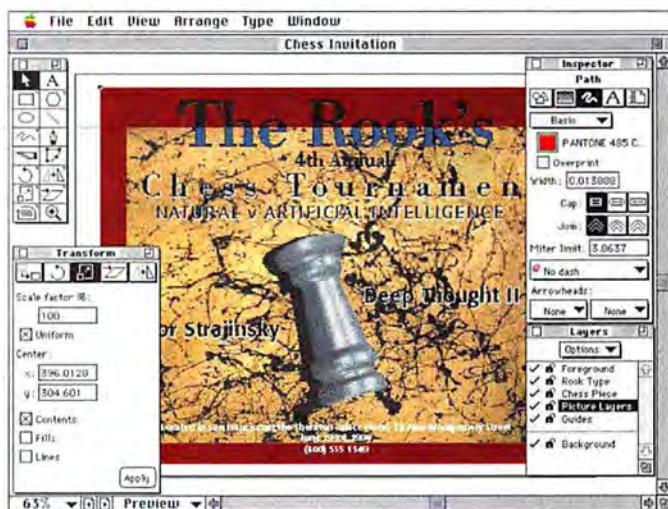
For fine-tuning transformations, such as rotate and skew, you no longer have to Option-double-click on an object to bring up a dialog box. FreeHand 4.0's new Transform palette groups all such tools, including numeric dimensioning controls, in a single palette.

Just Your Type

In addition to a streamlined interface, the second major enhancement to FreeHand is its impressive new text-handling controls. Providing the most comprehensive set of tools for manipulating text of any illustration program, FreeHand 4.0 offers so many

options that its controls begin to rival those of PageMaker and QuarkXPress.

You can now enter text directly into your design rather than into a dialog box. As you enter text, FreeHand lets you use tabs, just as you do in your word processor. The program's special wrapping tabs make it easy to create unevenly spaced tables. To create evenly spaced tables, you simply set the number of rows and columns, in the Inspector palette. Type controls provide a slew of



Floating palettes in place of dialog boxes provide Aldus FreeHand 4.0 not only with a new look but also with one of the best-designed and most accessible tool sets of any illustration program.

choices for managing the appearance of text once you've entered it.

A comprehensive set of paragraph controls is also provided, including control over the number of consecutive hyphens in a paragraph. Minimum-, maximum-, and optimum-letterspacing and -word-spacing controls for copy fitting work just like their counterparts in PageMaker. Ragged Width % and Flush Zone % controls let you fine-tune the alignment of paragraphs within columns of text.

Graphics professionals will welcome the flexibility they gain with FreeHand 4.0's advanced page-layout options. The program's new Balance option distributes text evenly among multiple columns. To fit text within a single column, you can use copy-fitting settings to alter the type size and the leading.

Reviews Rating Key

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

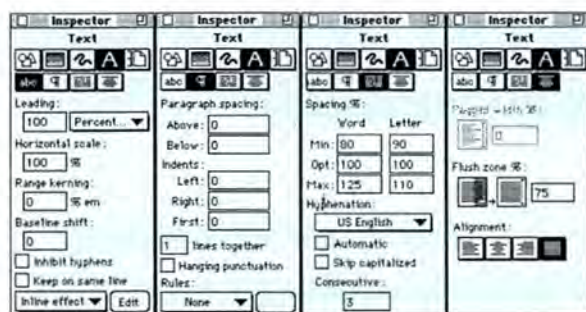
FreeHand 4.0's text controls are complemented by new multipage-layout capabilities. The program can now handle as many as 30 letter-sized pages, which you can group on a 56.5-inch pasteboard. The beauty of this feature is that it enables designers to create sets of related documents — business cards, envelopes, and letterhead that share the same logo, for example — and store them in one file.

Down the Right Path

A third major enhancement is FreeHand 4.0's path operations, which vastly simplify the process of creating complex shapes. Almost identical to those provided by Illustrator 5, FreeHand's path operations let you perform basic Boolean operations, including intersection, union, and difference (called Punch), on two or more objects.

Although its interface is better organized than Illustrator's, FreeHand doesn't offer the breadth of options provided by Illustrator's filters. For example, FreeHand does not offer any special-effects filters for twisting or tweaking lines. However, unlike Illustrator, FreeHand does provide a command for simplifying lines that contain too many anchor points, a useful feature when you're editing autotraced outlines.

Interface and text enhancements are the most important changes to FreeHand 4.0,



Superior text-handling tools are available in FreeHand 4.0's versatile new Inspector palette (left). Color handling is also much improved — you can create tints and apply colors by simply dragging and dropping colors from palettes (bottom).

palette allows you to create any shape and store it as an arrowhead.

Minor additions include Illustrator 3- and Illustrator 88-format export options that let you export FreeHand illustrations to Photoshop. New snapping preferences let you use sounds to indicate when objects snap to guides, points, or a grid.

Wish List

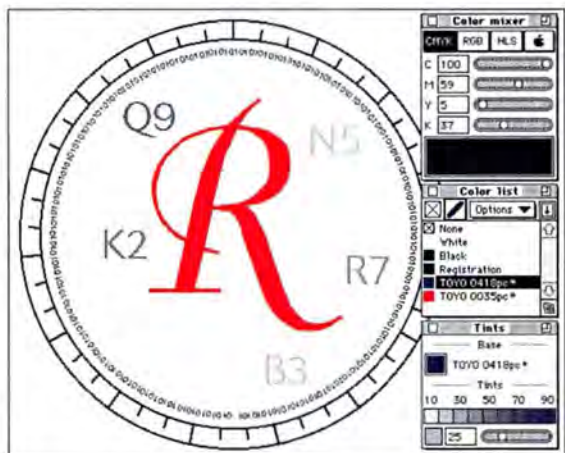
Aldus has outdone itself with this FreeHand upgrade, but we have a few items on our wish list. In version 4.0, FreeHand still limits zoom operations to 800 percent, which makes editing intricate shapes more difficult than it should be. (By contrast, Illustrator 5 supports zoom operations as high as 1,600 percent.)

And we'd really like to see FreeHand provide a feature similar to Illustrator's multicolor graduated fill. FreeHand's two-color-graduated-fill model makes complex shading operations tedious and time-consuming.

The comprehensive FreeHand documentation comprises three books: the *Getting Started* manual with tutorial, the 260-page *User Manual*, and the *Guide to Commercial Printing*. The latter explains the intricacies of working with commercial printers

and trapping. The *User Manual* is good at explaining each of the program's functions, but it would be useful to have more than one tutorial lesson. A tutorial on working with text would be especially helpful.

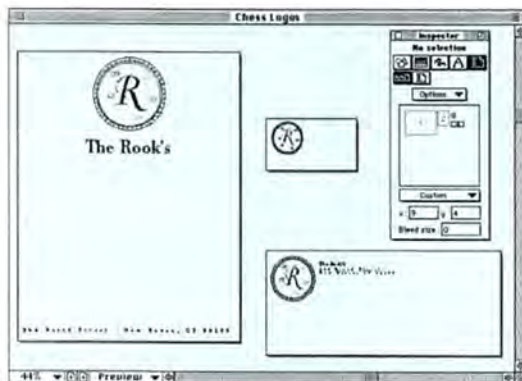
Registered users of previous versions of FreeHand can upgrade to version 4.0 for \$150.



The Bottom Line

Aldus FreeHand 4.0 ups the ante in the illustration-software race by providing graphics professionals with text-handling tools that rival those of page-layout programs. Standouts are FreeHand's copy-fitting tools and multipage-layout functions.

Equally impressive is the program's revamped interface. With its well-designed new palettes, FreeHand 4.0 is a study in simplicity and economy, enabling users to concentrate on design rather than on the manipulation of software tools. In this latest version, FreeHand not only closes the gap that separated it from rival Illustrator but also becomes the No. 1 choice for those who require precise text-handling tools for their designs. / Sean Safreed



Multipage-layout tools let designers group related FreeHand 4.0 documents on the program's new pasteboard and store them in one file.

but the program also boasts a few new tools. The polygon tool, for creating multisided polygons (with as many as 20 sides) and stars, is a newcomer to the tool palette. The new Calligraphic Pen option lets you draw with a pressure-sensitive pen and drawing pad. And a new dialog box that appears when you select line options in the Inspector

Aldus FreeHand 4.0

RATING: ★★★★★

LIST PRICE: \$595.

PROS: Superior interface. Comprehensive and precise text-handling controls.

CONS: Limited zoom operations. No support for multicolor graduated fill.

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Meeting Maker XP / ON Technology takes its group scheduler cross-platform.

NO MATTER HOW IMPRESSIVE the feature set, group-scheduling software is practical only if everyone in a workgroup is able

MacUser Labs

to use it. ON Technology's Meeting Maker XP (the XP is short for cross-platform) is not only a practical scheduler for groups that use Macs as well as PCs but it also boasts the best group-scheduling features we've seen. Meeting Maker XP lets mixed-platform workgroups plan meetings and coordinate schedules over a network, using standard network protocols. It also provides a personal calendar and to-do list and well-designed controls over scheduling.

Out in Front

Compared to competing cross-platform group schedulers, Meeting Maker XP is clearly the front-runner. Its feature set easily outdistances that of Microsoft Schedule+, and the program is much easier to set up and use than WordPerfect Office. Features that make Meeting Maker XP a standout include the ability to designate proxies (so, for example, you can give your assistant access to your calendar), support for most popular Day-Timer formats, and the ability to work off-line with schedules. The latter means that PowerBook users can take their calendars with them and schedule events when they're not connected to the Meeting Maker server. When they reconnect to the server, Meeting Maker XP sends out meeting proposals and updates the calendars on the network.

Meeting Maker XP also has one substantial advantage over the Mac-only network calendar program Now Up-to-Date: Meeting Maker XP can tell you if a proposed meeting time fits the schedules of all your prospective attendees. In addition, the program provides several useful and well-designed tools that automate this process.

To propose a meeting in Meeting Maker XP, you use the Meeting Proposal window, which lets you select your guests (required or optional) and fill in agenda details. Meeting Maker XP also lets you schedule a meeting room and reserve equipment.

You can select a time slot for your meeting manually or by using Meeting Maker XP's handy Auto-Pick feature. To make a manual selection, you click on the Schedule button and drag in the calendar window to select a time slot. To help you pick a time when all of your guests are free, Meeting Maker XP displays a composite of the schedules of all required and optional guests. Once you've selected a time for your meeting, Meeting Maker XP also displays an icon for each attendee that indicates whether or not the guest is available during the selected time. Alternatively, you can use Auto-Pick to get Meeting Maker XP to locate the earliest time slot available for all of your required guests.

Clicking on the Send Proposal button sends a meeting-notification message to each guest. You can also send cc or blind-cc messages to other workgroup members. When guests receive meeting proposals, they simply click on a Yes or a No button to

Meeting Proposal by John Rizzo

Proposal: ☒ Date: Wed 3/16/94 Time: 8:00 AM Duration: 0:45 Auto-Pick

Guests: ☒ Frequency: Wednesday, March 16, 1994 8:00 AM to 8:45 AM

Schedule: ☒ Agenda: ☐ Options: ☐ Comments: ☐

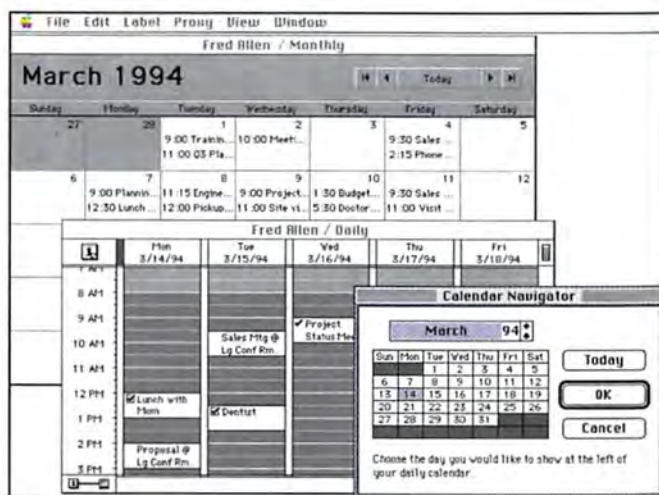
Time	Guests
8 AM	Henry Borland
9 AM	Ray Bradbury
10 AM	Amanda Fibbinacci
11 AM	Michael Hernandez
12 PM	Vicky Ohlson
	John Suto
	Karen Von Trapp

Click "Send Proposal" to send this proposal to your guests.

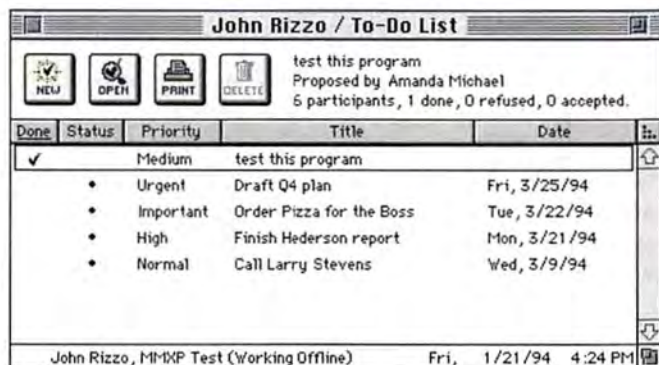
Send Proposal

Meeting Maker XP helps

workgroups schedule meetings over a network. By clicking on the helpful Auto-Pick button, you can have Meeting Maker XP find a time slot when all of your guests are available.



Meeting Maker XP displays meetings as well as personal events in three views — monthly and weekly (shown here) as well as daily.



With the to-do list manager, Meeting Maker XP lets you prioritize not only your own tasks but also those you propose to other members of your group.

indicate whether they can attend or not. They can also opt to delay their decision until later. Scheduled meetings appear in the Daily and Monthly calendar windows. Double-clicking on an event title brings up a window that displays the details of that particular meeting.

Meeting Maker XP also serves as a personal calendar program. Although other group members can't view the titles of your personal activities, they can see that you're busy during a proposed meeting time. A small check mark in a square indicates that an event on your calendar is a personal event rather than a group meeting.

Navigating Through Time

As you're scheduling events and meetings, Meeting Maker XP's navigation tools let you move quickly among the dates in the Monthly and Daily calendar windows. In the Monthly window, you can click on arrow buttons that move you forward and backward in time — one set of buttons moves you in monthly increments, another in yearly increments. A convenient Today button moves you to the current date.

The Daily calendar window displays the schedule either for a single day or for a five-day week. Its navigation tools aren't as intuitive as those in the Monthly calendar window, however. The scroll bar, for example, is almost useless, because it encompasses a 100-year span, from January 1, 1940, to December 30, 2039 (36,525 days!). A holdover from earlier Meeting Maker versions, this feature is one we'd like to see scrapped. You quickly learn that the preferred method of navigating the weekly calendar is with the Navigator icon, which works more accurately and effectively.

To help you keep track of meeting proposals you've sent and received, Meeting Maker XP provides a Messages window, which serves as an e-mail in box. The window contains folders for storing different types of messages, such as active messages (new meeting proposals; notices of changed, rescheduled, or canceled meetings; and responses to proposals), meeting refusals, to-do proposals sent by other users, and cc messages and cc to-do items. To-do items can be personal or assigned to others. You can set one of seven priority levels for to-do

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	CC Messages			
	CC To-Do Items			
Gina Campo, MMXP Server		Tue,	3/9/94	5:41 PM

Folders in Meeting Maker XP's Messages window help you keep track of messages you've sent and received. Bold type indicates unopened messages.

items and set reminders for yourself and others. You can view to-do items and create new ones in the To-Do List window, but you can't view to-do items on your calendar.

Overall, Meeting Maker XP does a pretty good job of presenting a multitude of scheduling features without totally overwhelming users. Expect a learning curve, however: The multitude of features translates into a multitude of small icons with which you must become familiar.

Sophisticated Networking

Meeting Maker XP's server software runs on either a Mac or a PC and can be installed and set up in minutes. Meeting Maker XP doesn't force AppleTalk on PCs but instead offers some fairly sophisticated networking options. These include AppleTalk, for all-Mac networks; IPX (the most popular network protocol in use today, it's the protocol used in Novell NetWare), for mixed Mac/PC networks using a PC-based Meeting Maker server; and Net BIOS, for PC-only networks. Meeting Maker PCs must be running Windows 3.1 or later.

Mac clients accessing PC servers use the ON-IPX control panel, which is based on Novell's MacIPX. Exceptions are Macs networked with LocalTalk rather than with Ethernet and Macs running System 6, neither of which can use IPX. In these cases, the Mac client software can do AppleTalk tunneling, which hides IPX network packets inside AppleTalk packets.

Wisely, ON Technology hid most of Meeting Maker XP's network underpinnings from users. Mac users need to know if the

server software is running on a Mac or a PC, however, because when they log in, they need to select either IPX (for a PC server) or AppleTalk (for a Mac server).

The Bottom Line

Meeting Maker XP corrects the major shortcomings of its predecessor, Meeting Maker, and is one of the most effective groupware applications we've seen. Unlike the initial release, Meeting Maker XP serves groups consisting of Mac and PC users and enables them to work with their schedules off-line. Moreover, Meeting Maker XP's networking scheme is simple and standard, and the program's interface is nearly identical on both platforms.

Because Meeting Maker XP brings so much scheduling functionality to the table, most users will find it necessary to spend time with the program's well-written and well-illustrated manual in order to learn the program and get the most from its features. However, their efforts will be rewarded.

/ John Rizzo

Meeting Maker XP 1.0

RATING: ★★★★★

LIST PRICE: 10-user pack, \$790;
50-user pack, \$3,750.

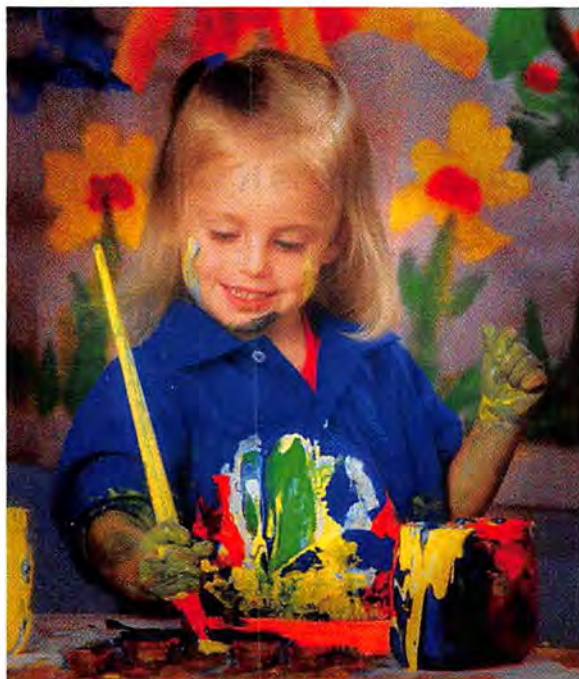
PROS: Supports Macs and PCs.
Well-designed scheduling controls.

CONS: Many small icons to learn.
Clumsy scroll bar.

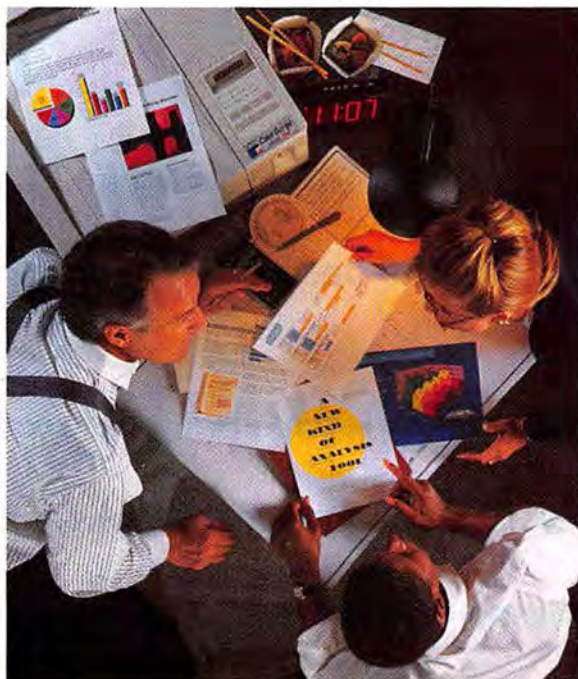
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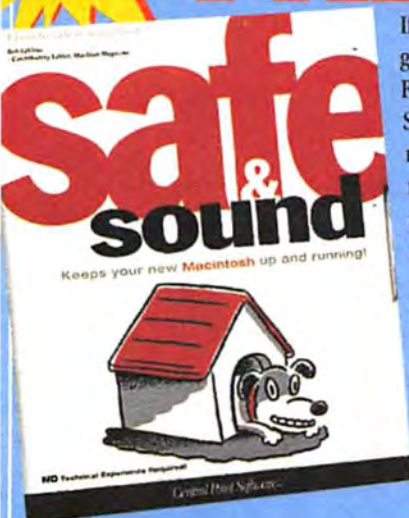
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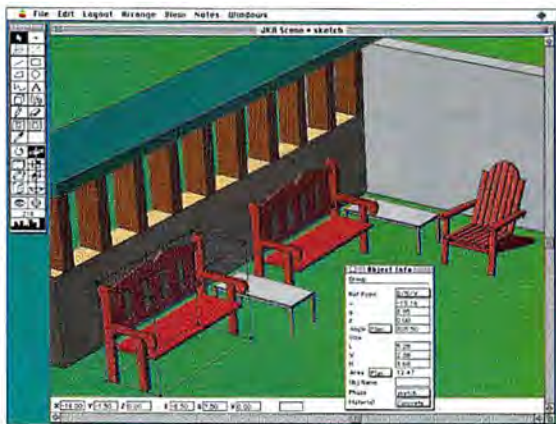
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Alias upFRONT and DesignWorkshop

/ Two competing approaches to quick architectural modeling in 3-D.

ARCHITECTS LOOKING TO create quick-and-dirty, realistically shaded 3-D models may not want to bother launching AutoCAD or some other high-end architectural-modeling program for such tasks. Fortunately, they have some lower-priced, easier-to-use alternatives: DesignWorkshop, from Artifice, and Alias upFRONT, from Alias Research — the latter greatly enhanced in version 2.0 as well as substantially reduced in price. Each program makes it easy for architects to quickly model a wide range of structures and interiors. These programs lack the photo-realistic-rendering capabilities of high-end programs such as AutoCAD and they aren't well suited to modeling fine architectural detail, but they work well in visualization for client presentations, massing studies, shadow-casting evaluations, and the like.



DesignWorkshop's familiar interface — much like Claris CAD's, but for 3-D — will make many users feel instantly at home. However, its modal orientation controls and its paucity of specialized tools for 3-D work make it less efficient than upFRONT for performing many tasks.

Working on Location

Although the two programs have many similarities, the differences are readily apparent. Each program uses grid-based working planes to help you place objects and maintain orientation. DesignWorkshop uses three mutually perpendicular planes, with a 3-D crosshair cursor for locating and moving objects. The cursor moves in a plane that you adjust up or down by pressing the

Option key while dragging. In contrast, upFRONT relies on a single working plane (representing the ground) and intelligent tools that establish and constrain geometry.

At first glance, the DesignWorkshop interface appears more accessible, but with use, the elegance of the upFRONT environment wins out. The three-axis cursor of DesignWorkshop moves somewhat jerkily and easily gets lost in complex models, but the context-sensitive tools of upFRONT make it easy to locate crucial points, edges, and surfaces.

Basically, upFRONT is smarter than DesignWorkshop about understanding what you're trying to do — and what aspect of your model you're trying to work on. DesignWorkshop requires you to specify explicitly what surface you're dealing with.

For example, if you've just placed a window on the left side of a house and want to move to the front to create a door, you'll first have to reposition the working plane. With upFRONT, you change the working orientation simply by moving the cursor onto the surface you want. As you move the upFRONT cursor over points, lines, centers, and surfaces, a small icon attached to it shows whether you're on a planar surface or on an edge. A short line segment, also attached to the pointer, is displayed perpendicular to the chosen surface, providing a clear indication of the current working plane. These features make

upFRONT one of the easiest and most natural 3-D programs in which to create and manipulate geometry.

DesignWorkshop's tool set for creating 2-D and 3-D shapes is easier to understand than upFRONT's, but upFRONT's tools are more specialized and efficient. DesignWorkshop has only two 3-D tools: a block tool and a polygonal wall tool. To create other 3-D shapes, such as cylinders and

spheres, you must first create the appropriate 2-D objects and then extrude or revolve them into 3-D objects. In contrast, upFRONT provides specific tools for creating 3-D boxes, walls, cylinders, and spheres. Although these tools aren't as familiar and simple as DesignWorkshop's, we soon got the hang of using them, and we appreciated the amount of time they saved us.

Filling in Details

Each application lets you assign colors to objects after you've created them, and you can make objects in upFRONT translucent as well. Neither program lets you assign textures to objects, though. For true photo-realistic rendering, you'll want to export the geometry of your model to other applications. DesignWorkshop's one photo-realistic export option is for exporting files to the Radiance format, which is supported by UNIX-based Radiance software from Lawrence Livermore Labs. Alias chose a more popular photo-realistic export option for upFRONT; you can export its files to the RenderMan RIB format, which is rapidly becoming the de facto standard for photo-realistic-rendering applications.

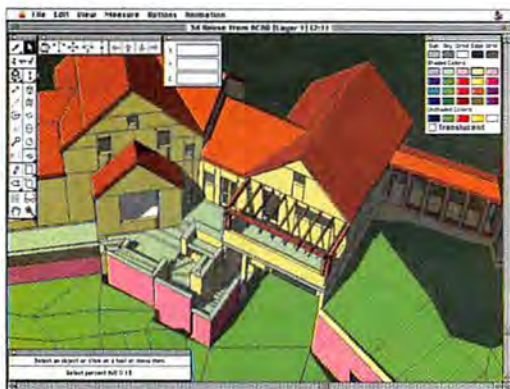
DesignWorkshop and upFRONT can each import PICT background images to create realistic backdrops. You can use this feature to present proposed designs in their intended settings. Each program lets you easily alter the viewing angles of the model to match the perspective of the background photograph.

Each vendor supplies a modest symbol collection. You can use these symbols as starting points for your own collections or create your own from scratch. Because upFRONT offers an excellent DXF translator, you'll probably be able to adapt third-party AutoCAD DXF libraries for your upFRONT models.

Making Movies

DesignWorkshop and upFRONT each let you save walk-through animations or sun/shadow studies as QuickTime movies, but the process is easier in upFRONT.

In order to create a walk-through in DesignWorkshop, you must save a series of views in the sequence you want them viewed. Because each view becomes a separate frame in the movie, you'll generally want to smooth the transitions by adding



upFRONT's flawless AutoCAD importing (this 3-D site plan was created in AutoCAD and imported faithfully) is just one of its pluses. Others are its intelligent, specialized tools and its easy-to-navigate, single-working-plane interface.

interpolated view frames; you specify how many steps you want between the saved views in each pair, and DesignWorkshop builds the intermediate views. Unfortunately, adding these views can be lengthy and tedious.

upFRONT eases the animation-building process by using *paths* — essentially walls along which a virtual camera moves to film the animation. The program includes several predefined paths, such as the turntable path (which causes the camera to move along a wall encircling the scene, looking toward the center of the circle). You can also define your own views by creating polygonal paths through your model. upFRONT's path tools make it easy to define complex walk-throughs quickly.

Unlike Virtus WalkThrough, which supports real-time walk-through animation, neither DesignWorkshop nor upFRONT can maneuver through scenes like your favorite Sega or Nintendo game can. However, WalkThrough's modeling features aren't as strong as those of the programs reviewed here — for example, it can't match perspective vanishing points to a scanned image.

Trading Data

Each application can import and export a wide variety of formats besides the photo-realistic formats mentioned previously, although we found upFRONT's data-trading capabilities more impressive.

DesignWorkshop can import Architrion models, DXF files, object-oriented PICT files, and graphics from the now defunct Claris CAD application. It exports Claris

CAD drawings, 2-D and 3-D DXF files, and PICT files.

upFRONT boasts an import list fairly similar to DesignWorkshop's — DXF files and object-oriented PICT files — but its export capabilities are without peer. It can write Adobe Illustrator, Alias PIX (used by other high-end Alias products), Architrion, EPS, object PICT, PICT bit-map, Swivel CMD, 3-D DXF, and TIFF formats and either tab- or comma-delimited ASCII text.

We tested each program's ability to import AutoCAD architectural models (3-D DXF files). DesignWorkshop can handle only the sim-

plest of 3-D DXF files without problems, but the upFRONT translations were flawless. We suspect that even Autodesk couldn't have done better.

The Bottom Line

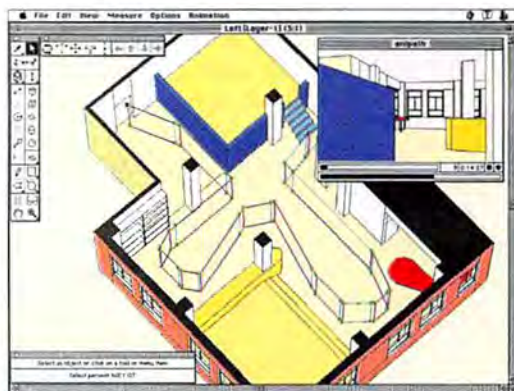
Although the programs boast similar feature lists, the differences in implementation and execution are significant.

DesignWorkshop is a capable program that looks and feels like a 3-D version of Claris CAD. If only Claris CAD were still around, DesignWorkshop could offer an interesting 2-D/3-D connection to help link modeling and drafting tasks. Overall, though, DesignWorkshop pales in comparison to upFRONT, which also costs quite a bit less.

Alias upFRONT is one of those rare Mac programs in which every aspect of operation and interface has been tweaked and

refined to the nth degree. From the design of each icon and dialog box to the pleasant, off-white display background, upFRONT exudes quality. Flaws are minor, and mentioning them borders on nit-picking (for example, the upFRONT Preferences file isn't properly stored in the Preferences folder and some graphic operations require a time-consuming re-sort process). The upFRONT tools do take time to master, but the excellent documentation and tutorials — full of clear, concise examples with useful pictures — make learning easy.

If you're an architect with a Mac, upFRONT is a must-have application. It's relatively inexpensive and can be used either by itself (to create design studies) or in conjunction with a high-end program, such as AutoCAD or Architrion, for more-detailed



Creating animated walk-throughs is easier in upFRONT than in DesignWorkshop, which requires you to save views individually as movie frames. upFRONT lets you create paths — much like walls — along which a virtual camera moves to film the animation.

modeling. If you're not an architect, you may still want to purchase upFRONT just to see how a well-designed program should look. / James K. Anders

Alias upFRONT 2.0

RATING: ★★★★★

LIST PRICE: \$299.

PROS: Intelligent, context-sensitive tools. Excellent documentation. Support for translucent materials. Flawless DXF importation. Bargain price.

CONS: Unfamiliar interface requires some learning time. No real-time animation.

COMPANY: Alias Research, Inc., Toronto, ON, Canada; 800-447-2542.

READER SERVICE: Circle #404.

DesignWorkshop 1.0.5

RATING: ★★★

LIST PRICE: \$895 (\$795 direct).

PROS: Familiar user interface. Ability to import and export Claris CAD files.

CONS: Erratic cursor movement. Inaccuracy of DXF translations. Poor documentation. No real-time animation. Expensive compared with upFRONT.

COMPANY: Artifice, Inc., Eugene, OR; 503-345-7421.

READER SERVICE: Circle #403.

NEC MultiSpin 3Xe / CD-ROM drive scores high on innovation but loses points for usability.

WITH A SPIFFY NEW DESIGN and triple-speed data-transfer rates, the NEC MultiSpin 3Xe CD-ROM drive sets itself apart from the competition. **MacUser Labs** The drive comes with extended audio capabilities and new features designed to make it easier to use. Unfortunately, NEC gets higher marks for the drive's concept than for its implementation.

Form and Function

Sleek and curvy, the 3Xe's new styling is attractive enough, but we found that the device's form hardly follows function. Forgoing standard power and access lights, the 3Xe employs an LCD panel that we found very hard to read at typical viewing

slipping around on the desk.

The 3Xe comes with a full set of audio controls, so you can play audio CDs without connecting the drive to a computer. However, to accommodate audio controls, the LCD panel, the headphone jack, and the volume-control dial on this standard-sized CD-ROM player, NEC had to make the 3Xe's control buttons small and closely spaced. We pressed the wrong button more often than not.

The 3Xe's design aside, what you're paying for with a triple-speed drive is, of course, speed. However, although triple-speed drives can achieve transfer rates as high as 450 kilobytes per second (compared to 300 kilobytes per second for a double-speed mechanism), speed is limited by the types of applications you're using.

Applications such as Adobe Photoshop that consume data in large segments can benefit from faster data-transfer rates. On the other hand, applications optimized for the current crop of lower-speed drives, including QuickTime movies and many popular interactive multimedia programs, read data in small chunks. They're more cache-dependent, and they don't benefit as much from fast data-transfer rates.

Triple Versus Double Speed

With this in mind, we ran a suite of speed tests on both the triple-speed 3Xe and the AppleCD 300, the top-rated double-speed drive in *MacUser's* most recent CD-ROM drive roundup (see "Double-Time CD-ROM Drives," October '93, page 110).

The 3Xe surpassed the Apple drive (by a mere 5 percent) in only one of our tests — opening a 12.5-megabyte Photoshop file. In all the other tests, the NEC drive was 6 to 8 percent slower than the Apple drive. This seems surprising, but it parallels the results of our previous tests — the speed of single-speed drives with excellent caching schemes often equals or surpasses that of double-speed drives.

Even more surprising than our speed results was the state of the 3Xe's driver at testing time. According to NEC, the driver was still in beta, although at press time, the 3Xe had been in mass distribution for several months. NEC informed us that the current shipping driver is the same version it provides with its double-speed models and is not optimized for triple speed.

As we've noted in past reviews, well-written drivers can vastly improve a drive's performance and poorly implemented drivers can cripple even the best mechanisms. According to NEC, the final 3Xe driver should be in the hands of dealers before this review appears. Based on our tests and previous findings, we believe that with an ideal 3Xe driver, 3Xe users may anticipate speed results nearly identical to those of a double-speed drive for small-file access. For throughput-intensive applications that read data in large blocks, a 3Xe equipped with the proper driver may well be 10 to 15 percent faster than a double-speed drive.

In addition to the full-sized MultiSpin 3Xe model reviewed here, NEC offers a more-compact and -portable version — the MultiSpin 3Xp. Each drive comes with a two-year warranty.

The Bottom Line

Although no triple-speed CD-ROM drive is ever likely to run three times as fast as a standard drive, we expected better speed results from the NEC MultiSpin 3Xe. NEC merits recognition for being first-to-market with triple-speed drive technology (as it was with double-speed technology), but it's clear there's much room for improvement in this category. The 3Xe's speed problems, coupled with the clumsy implementation of the front-panel and audio features, indicate that there may be a better option waiting in the wings. / Anita Epler

NEC MultiSpin 3Xe

RATING: ★★

LIST PRICE: \$635 (including Mac interface kit).

PROS: Stand-alone audio capabilities.

CONS: Clumsy controls. Slow.

COMPANY: NEC Technologies, Inc., Wood Dale, IL; 800-632-4636 or 708-860-9500.

READER SERVICE: Circle #405.

The NEC MultiSpin 3Xe is eye-catching, having a design like that of no other CD-ROM drive, but its innovative features are poorly implemented and it's not as fast as it should be.

distances (roughly two feet).

The power switch is also poorly designed. Instead of the standard up/down toggle switch or push button located on the front of most peripherals, the 3Xe has a switch on its side. You slide it once to turn the drive on and back again to turn it off. However, we found that sliding the switch caused the drive itself to slide, so we often had to brace the device with one hand to keep it from

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EtherWave / Add multiple nodes to a single hub port with Farallon's plug-and-play Ethernet solution.

IF YOU THOUGHT YOU NEEDED extra hub ports to add more nodes to your 10BASE-T network, think again. With **MacUser Labs** Farallon's innovative line of Eddy Award-winning EtherWave networking products — billed as “daisy-chainable 10BASE-T” — you can add multiple devices to your network, using a single hub port or wall jack. And creating small Ethernet workgroups is a snap with EtherWave — no patch panels or punch-down blocks are required.

Surf's Up

The Farallon EtherWave product line consists of Ethernet adapter cards for Macs and PCs (NuBus and LC flavors for Macs and an ISA version for PCs); external transceivers; and external serial-port adapters for printers, PowerBooks, and slotless Macs. EtherWave products are cost-competitive with standard Ethernet cards and transceivers: Farallon's adapter cards cost \$229 each, external transceivers cost \$129 each, and serial-port adapters are \$379 each for PowerBooks and \$419 each for printers.

Each card, transceiver, and adapter is equipped with two 10BASE-T ports that enable you to daisy-chain multiple devices. The daisy chains can either connect to a hub or stand alone.

Installation is simple. Plug in a card, or connect a transceiver to an AUI-type port. With the exception of the serial-port adapters, the EtherWave hardware is fully compatible with Apple's drivers. However, we recommend that you install Farallon's own drivers for optimal performance. Once you've installed the EtherWave hardware and software, you're ready to connect the device to a 10BASE-T network, using twisted-pair cable you plug in to a wall jack or hub port.

To daisy-chain several devices, you connect the adapter on one device to the adapter on another with twisted-pair cable. The EtherWave products are intelligent enough to determine the type of connection and generally require no special cabling. The devices are self-terminating.

EtherWave is one slick networking product, but it has a limitation. It supports only eight devices (including hubs) on a single chain. Obviously, the devices in the middle of a chain must use the EtherWave adapters, but you can place a non-EtherWave device at either end of the chain. Thankfully, Farallon includes a power-off pass-through mode so that the network stays up even when EtherWave-equipped computers are shut down.

Ethernet Speed

Our speed tests showed that for common network tasks, such as printing bit-mapped graphics or copying files and folders to and from a server, EtherWave speed is virtually identical to that of traditional Ethernet adapters.

You can even manage EtherWave-connected devices with conventional network-management tools. In general, we had good results using GraceLAN Network Manager and EtherPeek on our test network. Farallon also ships an SNMP client that lets you manage EtherWave-connected devices remotely, using SNMP tools.

The Bottom Line

The Farallon EtherWave line of products lets you extend the functionality of standard 10BASE-T networks with a minimum of cost and effort. Well documented and intelligently designed, the EtherWave products successfully combine the flexibility and ease of use of LocalTalk with the speed of Ethernet. / J. W. Davis

EtherWave

RATING: ★★★★★

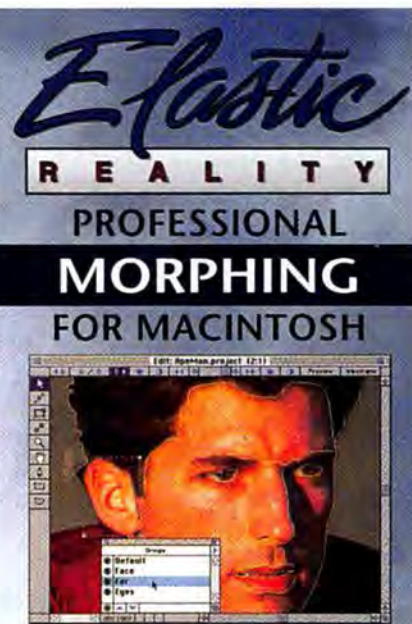
LIST PRICE: Cards, \$229; transceivers, \$129; serial-port adapters, \$379 to \$419.

PROS: Cost-effective plug-and-play Ethernet product.

CONS: Limited number of hubs on a chain.

COMPANY: Farallon Computing, Inc., Emeryville, CA; 415-596-9100.

READER SERVICE: Circle #406.



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CIRCLE 6 ON READER SERVICE CARD

Apple LaserWriter Select 360 / Apple scores high marks with its new 600-dpi personal PostScript laser printer.

THE APPLE LASERWRITER SELECT 360 is not just a good printer, it's a great printer. The 600-dpi device features PostScript Level 2, solid speed ratings, and a slew of other benefits — all at an affordable price that closely matches the street price of its closest rival, the 600-dpi Hewlett-Packard LaserJet 4MP.

Select Design

The Apple LaserWriter Select 360 is capable and stylish. We liked the printer's design almost as much as its \$1,599 price tag. However, if desktop real estate is a major concern, be aware that the Select 360 takes up a bit more space than the LaserJet 4MP. Measuring 8 inches high, 15 inches wide, and 18.3 inches deep and weighing in at 29 pounds, the Select 360 is also 9 pounds heavier than the 4MP.

Under the Select 360 hood is a 10-ppm Fuji Xerox engine with a minimum life expectancy of 300,000 pages teamed with a 16-megahertz AMD 29200 RISC processor. Out of the box, the printer comes equipped with LocalTalk, parallel, and serial ports as well as with 7 megabytes of RAM, expandable to 16 megabytes. You must supply the cable that connects the printer to your Mac.

Although the Select 360 is clearly designed as a personal printer for home or office, it does provide networking features — automatic switching between ports as well as between the printer's built-in PostScript Level 2 and PCL 5 printer languages.

Reading the FinePrint

In addition to using the Select 360's 600-dpi-resolution setting, you can opt for a 300-dpi setting, with or without Apple's FinePrint text-enhancement technology. The Select 360 doesn't offer an equivalent to the HP 4MP's EconoMode, a toner-saving option that produces very legible output.

The energy-conscious Select 360 meets the EPA Energy Star standards for low power consumption. An idle Select 360 switches to dormant mode after a user-specified time period (15 minutes; 30 minutes; or 1, 2, or 4 hours).

Setting up the Select 360 is simple. As with other Apple printers, an installer program directs the printer driver, 64 TrueType fonts, and a utility program to their correct places on your hard disk. The printer comes with a power cord and toner cartridge as well as with software that allows it to connect with PCs running Windows.

Paper handling is flexible enough to meet just about any requirement. With the printer, Apple provides a 250-sheet paper tray and a 50-sheet multipurpose tray for special stock, including labels, transparencies, and envelopes. The multipurpose tray attaches to the manual-feed slot at the front of the printer. The tray, which you can install and remove easily, holds five envelopes or



Affordable 600-dpi output and flexible paper-handling options make the \$1,599 Apple LaserWriter Select 360 a top contender in the current crop of personal laser printers.

approximately 30 sheets of label or transparency stock. Of course, you can also elect to feed envelopes and label sheets directly into the manual-feed slot.

Additional paper-handling options include a 250-sheet A4 feeder, a 500-sheet letter feeder, a 500-sheet A4 feeder, a 250-sheet U.S. legal cassette, a 250-sheet A4/letter cassette, and a 30-sheet envelope cassette. Apple recommends paper in the 16-to-28-pound range.

To gauge the Select 360's speed and

output quality, we used the same suite of MacUser Labs tests we used to evaluate the HP LaserJet 4ML and 4MP personal laser printers. The test files comprised a ten-page Microsoft Word text document, two Adobe Photoshop gray-scale documents, and type samples in sizes from 6 to 48 points. Our test platform was a Mac IIcx equipped with 8 megabytes of memory and running System 7.1.

Looking Sharp

At 600 dpi, the Select 360 produces sharp, crisp characters that look good even when viewed through a loupe. Almost as good-looking was output printed at 300 dpi with Apple's FinePrint option activated (surprisingly, the printer took longer to print the test document at the 300-dpi setting than at the 600-dpi setting). For faster but lower-quality output, you can choose the 300-dpi setting without the FinePrint option.

Our page-per-minute tests clocked the

Select 360 at 5 ppm at 600 dpi and at 6 ppm at 300 dpi (without the FinePrint option), a respectable achievement for a low-cost printer. And the Select 360 bested our 3-to-4-ppm rating of the 4MP.

The Select 360's slight speed advantage over the 4MP carried over into our gray-scale tests. A Photoshop document required only slightly more than 2 minutes to print with the Select 360, compared to 3 minutes for the 4MP.

Output was top-notch for both printers.

Another advantage the Select 360 has over the 4MP is the convenience of its controls. You control most crucial aspects of the Select 360's print operations, including switching between the 300-dpi and 600-dpi settings, from the Print dialog box. By contrast, with the 4MP, you must run a separate utility to control many of its features.

We were also pleased to discover that output from the Select 360 doesn't suffer from the paper-curl problems that often affected

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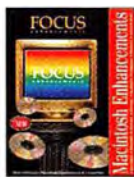
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24 pt LaserWriter Select 360



Sharp, crisp type and top-notch gray-scale images characterize the Apple LaserWriter Select 360's output.

the 4MP's output. The one slight disadvantage of the Apple printer compared to the 4MP is noise. We found the whirring of the Select 360's fan to be slightly louder than the sound of a hard-disk-drive fan and a bit bothersome when the printer was close.

Last but far from least, the Select 360 boasts a \$300 PostScript fax option so you can send and receive faxes without cluttering up your desktop with a dedicated fax machine. The fax package comprises a fax-modem card your Apple dealer installs in the printer and fax software for the Mac and IBM PC-compatibles. The printer exchanges faxes with CCITT Group III-compatible fax machines at 100 or 200 dpi. It can also exchange faxes with other PostScript fax-capable printers and print received faxes at 600 dpi.

The Bottom Line

The 600-dpi Apple LaserWriter Select 360 is a personal PostScript laser printer that stacks up well against the competition.

Although it requires more desktop real estate than the comparably priced HP LaserJet 4MP and doesn't offer a toner-saving draft mode, as does the 4MP, the Select 360 is slightly faster than the 4MP, offers more paper-handling options, and features more-convenient controls. The Select 360's \$300 PostScript fax option is an added plus. In short, for those who are looking for a feature-rich, low-cost printer capable of producing high-quality output, we can recommend the Select 360 without reservation.

/ Gregory Wasson

Apple LaserWriter Select 360

RATING: ★★★★★

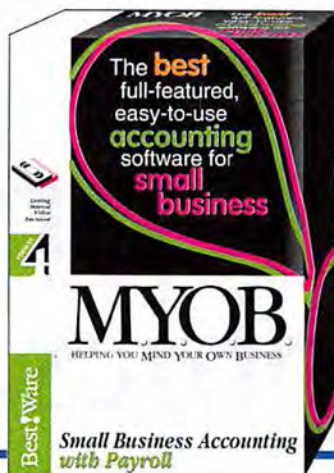
LIST PRICE: \$1,599.

PROS: Excellent output. Affordable price. Flexible paper handling.

CONS: Lack of draft mode.

COMPANY: Apple Computer, Inc., Cupertino, CA; 408-996-1010.

READER SERVICE: Circle #407.



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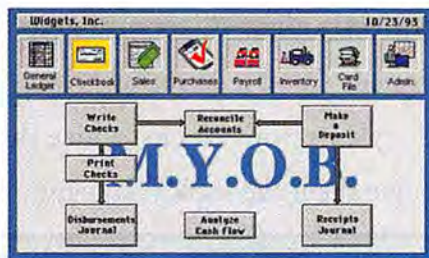
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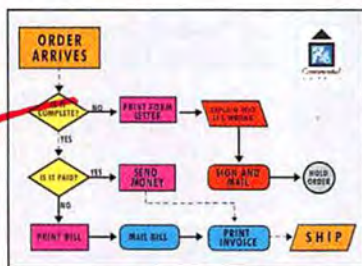
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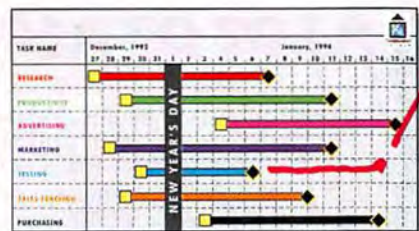
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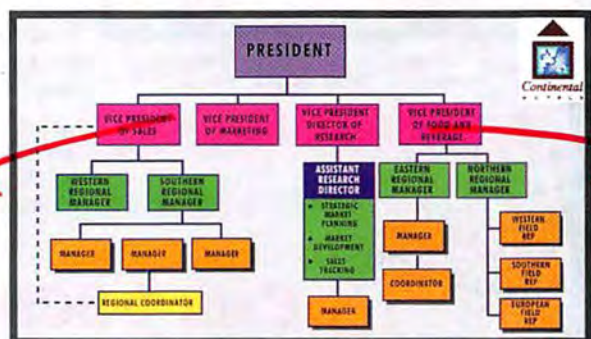
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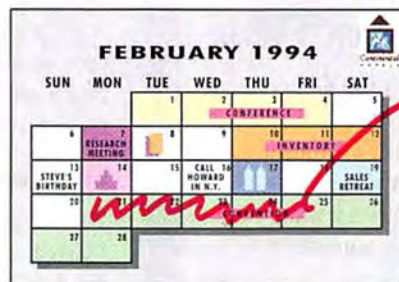
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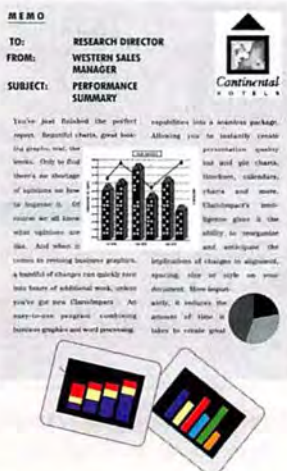
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REVIEWS Video

VideoShop 2.0 / Avid's QuickTime- movie-editing software garners a not-ready-for-prime-time rating.

SUBTRACT HYPERCARD, add improved special-effects and sound-handling capabilities, and what do you have? The latest version of VideoShop, Avid's QuickTime-movie-editing tool. VideoShop 2.0 sheds the program's awkward HyperCard-based implementation and boasts several important new features. Bugs in the new release, however, hamper the program's ability to compete with Adobe Premiere, the Mac's most powerful video-editing tool.

Interface Improvements

With version 2.0, Avid has revamped VideoShop's Finder-like interface to make the program more convenient to use. Tool strips at the top of the program's main windows provide handy access to basic editing features.

With the initial VideoShop release, the company introduced an innovative interface element called the micon — a thumbnail movie preview that makes it easy to identify QuickTime movie clips. Version 2.0 improves on this feature — you can now create different views of your clips by organizing and sorting micons according to file information (by name or size, for example).

But despite these improvements, VideoShop's editing tools still can't match those of Adobe Premiere 3.0. Premiere's ripple tool, for example, lets you adjust the duration of a clip without affecting the duration of other clips on the same track. VideoShop lacks this capability. Moreover, Premiere 3.0 lets you access almost all of its editing features by clicking on icons displayed at the bottom of the Construction window. VideoShop, on the other hand, requires you to memorize a variety of keyboard combinations to activate the full range of its editing features.

VideoShop 2.0 corrects one of the weakest aspects of the initial release: the program's sound handling. With version 1.0, you

couldn't fade audio files in and out to accompany transitions between movies. Version 2.0 fixes this problem. The new release also supports interactive scrubbing of audio and video tracks. By grabbing a playback handle and dragging, you can play tracks forward and backward, timed at the speed of your scrubbing motion. This wonderful tool for editing is one advantage VideoShop has over Premiere.

VideoShop's special-effects capabilities are also much improved in the new version, although the program's collection still can't match Premiere's. There are many more transition effects and filters — two stand-



For fast access to frequently used tools, VideoShop 2.0 windows feature handy new tool strips.

outs are a simple morphing effect and an excellent explosion transition effect you won't find in any other Mac program. The transition-effect dialog box has also been improved so you can set in and out points.

With VideoShop's newly added support for alpha channels, you can use any still image or QuickTime movie as a mask. That means you can combine movies and create a variety of sophisticated layering effects.

VideoShop's tools for combining and layering multiple movies and still images remain one of the program's chief strengths, making it an excellent aid for creating composite-video effects. The Canvas window simplifies the task of positioning and resizing movies for complex "video in a window" effects. After Effects is the only Mac

program that does a better job of layering movies than VideoShop, and it costs much more.

Motion-control effects, which enable you to animate the elements within a movie or an entire movie window itself, are also new. Although we found this feature easy to use, it is poorly implemented. Because VideoShop doesn't calculate motion effects at the subpixel level, as do Premiere, VideoFusion, and After Effects, the effects tend to be unacceptably jerky.

Another important enhancement in version 2.0 is the built-in titling tool, which supports anti-aliased text. However, although you can specify drop shadows for type, the program doesn't support soft edges or variable transparency — a big limitation.

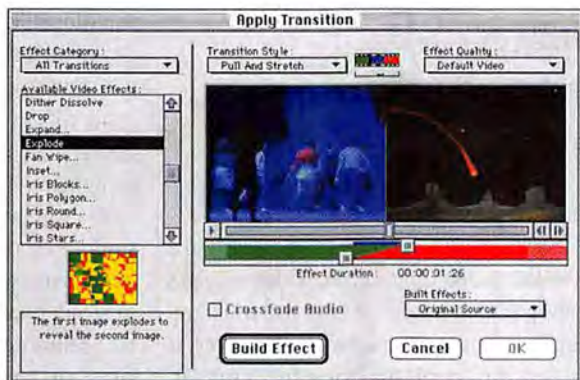
For those who are looking to create rotoscope effects, the new release allows export of QuickTime movies in filmstriplike format to paint programs such as Adobe Photoshop and Fractal Design's Painter.

Given that Avid makes high-end digital-video-editing systems, we were surprised that VideoShop still lacks support for EDLs (edit decision lists). Without the ability to create EDLs, professionals can't do off-line editing and export the results directly to the Avid Media Composer, the company's high-end system. According to Avid, VideoShop will provide this functionality in the future. But for now, this limitation will keep professional users firmly entrenched in the Premiere camp.

Erratic Behavior

VideoShop brings several useful features to the QuickTime-movie-editing table, but its strengths are undermined by version 2.0's instability. We encountered a variety of annoying bugs, and in general, the new version performed more like beta software than a final release.

Most predominant among version 2.0's troubles are screen-redraw problems. Opening and closing windows and control dialog boxes often caused the Canvas window to redraw erratically. We also encountered problems with cross-fades between



You can now set in and out points for transition effects with VideoShop 2.0.

two sound tracks. Worst of all, we experienced a variety of random crashes.

As we were evaluating VideoShop 2.0, Avid released a 2.0.1 upgrade, which partially corrected the screen-redraw and cross-fade problems, but even with the bug fix, we continued to experience unpredictable results.

Avid has significantly improved the contents of VideoShop's documentation for the 2.0 release, but the manual is still a bit disorganized and lacks some key information. For example, the documentation doesn't provide a much-needed detailed description of the program's extensive collection of special-effects filters.

The Bottom Line

VideoShop 2.0 fixes one of the major stumbling blocks of the initial release — the program's sound handling — but it's still a mixed bag. Several features, including motion effects and titling, are poorly implemented, and the program is marred by bugs. It's also surprising that VideoShop is not well integrated with Avid's high-end video-editing systems — a big disappointment for professional users. / David Biedny

VideoShop 2.0

RATING: ★★

LIST PRICE: \$499.

PROS: Excellent interface for composite-video effects. Good scrubbing tools.

CONS: Poorly implemented motion-control and titling features. Bug-ridden.

COMPANY: Avid Technology, Inc., Tewksbury, MA; 800-394-3482 or 508-640-6789.

READER SERVICE: Circle #408.

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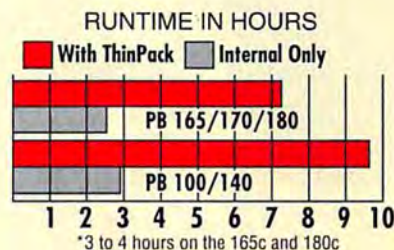


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GraceLAN Network Manager 3.0 / TechWorks' Eddy Award-winning network inventory tool.

POKING AROUND ON NETWORKS is GraceLAN Network Manager's stock-in-trade. It can't find Elvis for you (unless he's one of your users), but it *can* tell you which Macs on your network haven't been upgraded to System 7 Pro, which ones are using file sharing, and much more. Now in version 3.0, the TechWorks product boasts a redesigned interface and lots of new capabilities.

Instant Inventory

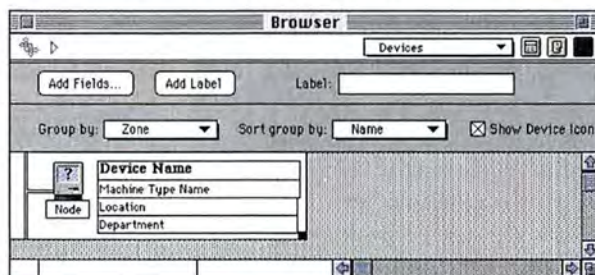
GraceLAN Network Manager 3.0 uses a greatly enhanced Responder control panel to gather a dazzling array of configuration information about Macs, printers, and even PC-compatibles. Just install the control panel on each machine you manage and scan your network with the GraceLAN application, and you'll get an instant view of

the current state of your Mac inventory.

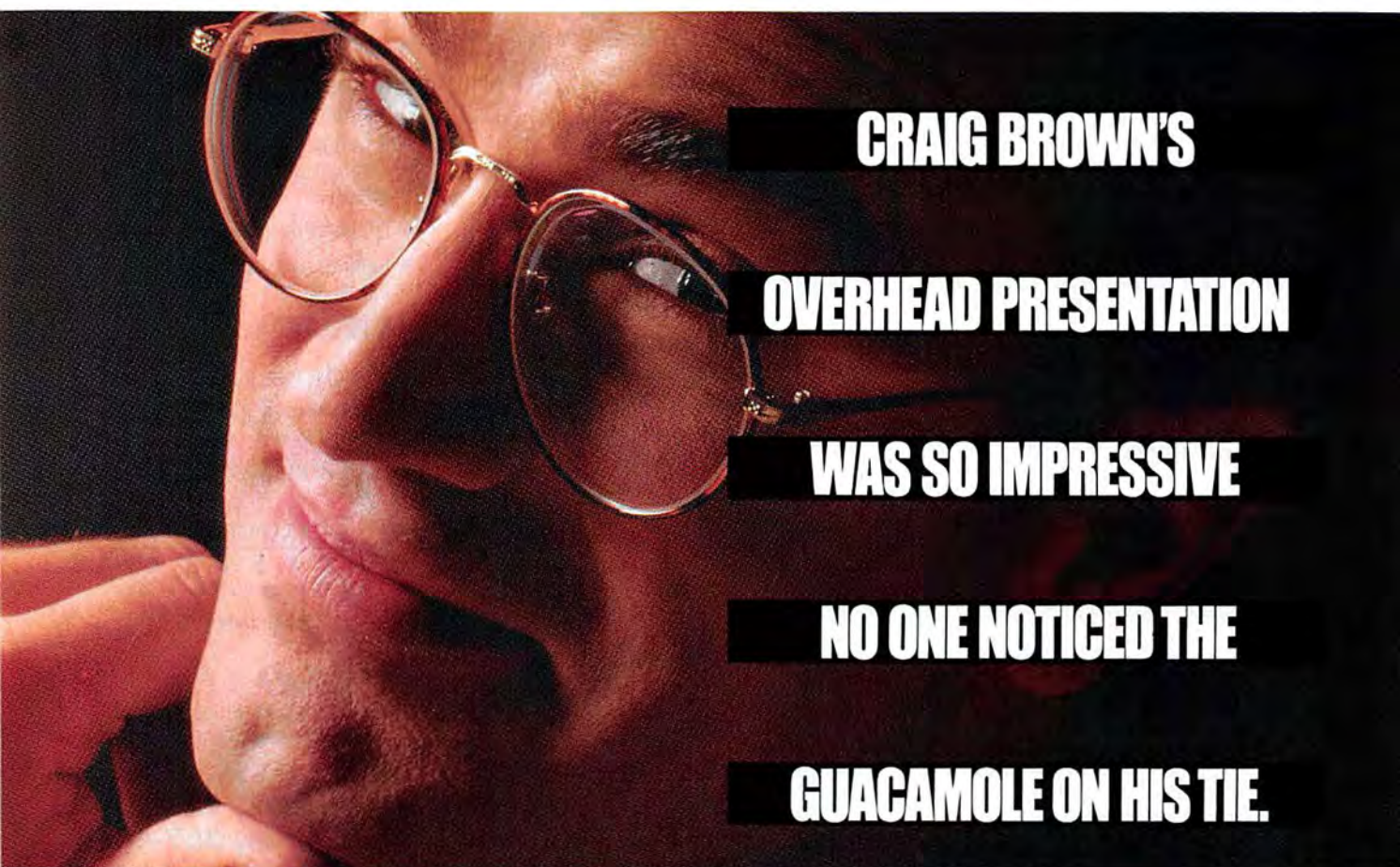
Your view of the network is provided in a window called the *Browser*, which displays configuration information in real time. You initiate scans of the networked devices at specified intervals and view the results in the Browser. Fortunately, the Browser doesn't cram all the many fields of collectible data into one display screen. Rather, it provides a selection of pregrouped data views in easy-to-read columnar and single-record forms. The default Browser view includes the following data for each scanned Mac: machine name and type, zone, and system version.

Additional views, available from a pull-down menu, enable you to see each machine's network status and chosen printer, for example, as well as provide looks at printer activity and Responder-equipped computers.

To customize your look at the network, you can create your own Network Manager documents — an option completely missing from previous versions. Using an interface reminiscent of Claris' FileMaker Pro, you can create layouts showing single-record or group views of Network Manager



The new Layout mode in GraceLAN Network Manager 3.0 lets you customize your data-viewing formats. Adding and resizing fields is easy in all views. In the topology view, you can also move fields around and use device icons.



CRAIG BROWN'S

OVERHEAD PRESENTATION

WAS SO IMPRESSIVE

NO ONE NOTICED THE

GUACAMOLE ON HIS TIE.

fields associated with any number of devices. The Layout mode lets you add, format, label, resize, and move fields to suit your viewing and reporting needs. Like the default Browser document (because the default view is itself simply a document), the documents you create can contain as many layouts as you like, in columnar, single-record, or topology view. The topology view groups records by a category (such as zone, network, or machine type); it can include machine icons and visual links between nodes.

Data Diversity

Network Manager 3.0 collects much more configuration information than did previous versions. To keep you from being overwhelmed, the information is grouped into categories, including hardware, system software, file sharing, ARA (Apple Remote Access), NuBus cards, graphics, and sound. Within each category are specific fields, such as system version, file-sharing status, and current printer. It's safe to say that almost every conceivable remotely collectible

Name	Type	System	Responder Vers	Current Printer	Last GUI Package	PCs	Laser/Writers	ARA user	AppleTalk
Rose Fleming	Macintosh IIfx	7.1.1							58.1.0
Frank Brisbacher	Macintosh IIfx	7.1.1							58.1.0
Mail Server	Macintosh IIfx	7.1							57.0.4
File Server	Macintosh IIfx	7.1	7.1	yes					58.0.2
Bob Roberts	Macintosh IIfx	7.1	7.1	yes					57.0.4
Bart Flintstone	Macintosh Quadra	7.1	7.1	yes					58.0.2
David Garrison	Macintosh PowerB...	7.1	7.1	yes					58.0.2
Ellen Treadwell	Macintosh IIfx	7.1	7.1	yes					58.0.2
Katy Martin	Macintosh IIfx	7.1	7.1	yes					57.0.4
Sue Foley	Macintosh IIfx	7.1	7.1	yes					58.0.2
Denis Newman	Macintosh IIfx	7.1	7.1	yes					58.0.2

statistic is available to Network Manager users. Fortunately, a compact dialog box makes it easy to pick and choose the fields you need.

Unlike previous versions of Network Manager, version 3.0 is designed not only as a collector of information but also as a functional database program. You can create simple formats for on-screen views or printed reports. However, if you want to show lots of data or if you need heavily formatted reports, exporting information to a more sophisticated database program may be your best bet. You can export Network

Manager data to TechWorks' Asset Manager database program or save it as text for use in another application.

Administrative Pluses

In addition to viewing inventory data, you can perform some basic administrative tasks with Network Manager. For example, the Actions menu includes an option for sending a file with an attached message telling the user what you've sent. You can't create complex installation packages in Network Manager, but you can drop a file into one of several locations on the user's disk.



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Other options on the Actions menu include commands for synchronizing clocks on a network and for shutting down Macs (to reboot the system after a software installation, for example). You can also send updated Responder control panels as TechWorks releases them.

Other packages may have more-sophisticated features for remote administration,

but remote administration isn't Network Manager's main goal. This product is designed primarily to retrieve and display configuration data. Setting the clocks of your networked colleagues is a little bonus.

Two other bonuses for managers of large internets are Network Manager's security scheme and its ARA compatibility.

Network Manager provides a two-level

security scheme for Responder data. You can set administrator passwords, meant to be used by administrators of particular portions of a network, plus supervisor passwords, which override the administrator passwords. Although the security scheme is a helpful addition to the product, we found it somewhat confusing to use. For example, you can see Responders for which you don't have passwords. But the reason you can't see their data isn't made clear.

Administrators on the go will appreciate how well Network Manager works over an ARA connection. Because you can choose to scan the network at intervals or simply perform one scan and work with the data while you're in the application, you can minimize contact with the remote network when using Network Manager at home or on the road.

Administrators will also appreciate TechWorks' fine job on the documentation. The user manual is nicely formatted, with many useful screen shots.

The pricing scheme is also well thought out. Network Manager is priced at \$795 per network administrator, and you're free to distribute the Mac and PC versions of the Responder to as many users as you like — as long as all users of the Network Manager software have their own copy. This scheme is a significant improvement over version 2's per-zone licensing arrangement.

The Bottom Line

Network Manager is an excellent and efficient tool for network administrators whose internets are so extensive that configurations can change without their knowledge. Its flexible data formatting makes it useful for inventory control, troubleshooting, software-licensing checks, and other common administrative tasks. / Shelly Brisbin

GraceLAN Network Manager 3.0

RATING: ★★★★★

LIST PRICE: \$795 per administrator (Responder freely distributable).

PROS: Greatly expanded configuration information. Flexible viewing and reporting options.

CONS: Confusing security scheme.

COMPANY: TechWorks, Austin, TX; 512-794-8533.

READER SERVICE: Circle #409.



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DiskLock PB / Keep your PowerBook's contents safe from prying eyes

STORING CONFIDENTIAL INFORMATION on a PowerBook can be riskier than storing it on your desktop Mac. The password protection provided by most PowerBook utilities, however, is pretty simple to bypass: All anyone has to do to get to your files is start up your PowerBook with a floppy disk.

DiskLock PB supplies a deeper level of protection: You can password-protect your hard disk so that others will always need a password before the disk will mount.

Unobtrusive Protection. You can set DiskLock to lock your disk under various conditions: sleep, restart, shutdown, and even after a crash. When you shut down the PowerBook or put it to sleep, a notice that the disk is being locked appears in the menu bar. The locking doesn't take long, but sometimes the delay between issuing the Shut Down or Sleep command and receiving the notice is long enough to make you think your system has frozen. When the PowerBook wakes or starts up again, it asks for a password. Three wrong passwords in a row shuts down the PowerBook,



although you can restart it immediately and try again. DiskLock PB keeps track of incorrect passwords and the time they were tried, so you'll know if someone's been trying to get to your data.

Driver Duels. DiskLock PB alters the hard-disk driver, so it doesn't work with driver-level compression products. You must remove it before driver updates to avoid data loss. There's an emergency-unlock utility to use if, say, your system's crashing and you can't get at normal unlock, but unlocking can take as long as a minute per megabyte of hard-disk space.

DiskLock PB worked flawlessly on a PowerBook 170 and should do so on other models as well — except for the 100, on which it consistently crashed in our tests (a 1.0.1 version update may fix the problem, but it wasn't available at press time). In general, though, if you need better PowerBook password security than that offered by a simple extension, DiskLock PB will fill the bill. / Sharon Zardetto Aker

DiskLock PB 1.0 ★★★★★ / LIST PRICE: \$59. COMPANY: Symantec Corp., Cupertino, CA; 800-441-7234 or 503-334-6054. READER SERVICE: Circle #410.

Conflict Catcher / The Sherlock Holmes for startup problems

IN THE OLD DAYS, diagnosing a startup conflict — generally a recurring crash, freeze, or bomb duplicable upon or after startup — was a major pain. It usually meant taking all of your extensions and control panels out of the System Folder and then putting them back one at a time, restarting after each addition. But now there's Conflict Catcher, a uniquely helpful program that automates most of this tedious process, quickly determining which control panel, extension, or combination of the two is to blame.



Systematic Testing. When you tell it to perform a conflict test, Conflict Catcher systematically disables combinations of extensions and control panels and asks you to determine whether the problem is still occurring. If it is, you go through another restart and respond to the dialog box again. After the minimum necessary number of restarts, Conflict Catcher tells you what it's identified as the problem. In several months of heavy use, Conflict Catcher correctly identified the conflicting extension or control panel every time we used it and successfully diagnosed at least one tricky three-way conflict.

Solid Startup Supervision. Conflict Catcher is also an excellent startup manager. Like other startup managers, it lets you create sets (combinations of fonts, extensions, and control panels that load when you press particular keys during startup) and links (startup files that must or shouldn't run together or that need to load in a particular order). Unlike the others, however, Conflict Catcher recognizes aliases of extensions, control panels, and fonts — a feature RAM-disk users will love. Conflict Catcher's ability to enable and disable files in your Startup Items and Fonts folders is also unique.

Conflict Catcher is the best startup manager so far. But even if you already have a startup manager, Conflict Catcher is worth considering for its convenient conflict-diagnosing capability. / Bob LeVitus

Conflict Catcher 2.0.1 ★★★★★ / LIST PRICE: \$79.95. COMPANY: Casady & Greene, Inc., Salinas, CA; 800-359-4920 or 408-484-9228. READER SERVICE: Circle #411.

Open Sesame! / Help! There's an agent inhabiting my Mac!

THE NOTION OF software agents has long beckoned seductively to software designers — the goal being to embed intelligence in software so it can anticipate users' actions and perform helpful tasks. Still, we've seen few actual personal-computer-software products that incorporate agents. Open Sesame!, from Charles River Analytics, is one of the first.

Suggestion Box. Open Sesame! monitors your actions and then offers to automate particular tasks. You can receive advice via a female voice that pipes up to say, "I have a suggestion," or through less intrusive dialog-box suggestions. You can also turn off notification.

Automating Patterns. If you use a Mac in a fairly routine manner — turning it on each morning, opening a few favorite programs, and then reading your e-mail — Open Sesame! can automate those tasks by placing aliases in your Startup Items folder and then fetching your mail for you at the same time each morning. Another helpful suggestion might be volunteering to delete an alias from the Apple Menu Items folder after you've deleted the original from the disk.

Not all of Open Sesame!'s suggestions are helpful, though. For example, the program quickly noticed that we tended to empty the Trash after placing something in it. It asked if we wanted to automate that process. Well, the answer is sometimes yes and sometimes no. We're not sure that any expert system, no matter how powerful, could usefully anticipate our preferences in this area.

In fact, we often found Open Sesame!'s suggestions dim. After the program pointed out that we hadn't rebuilt the desktop in 34 days, we were tempted to identify a new software category: nagware. However, novice users who don't know the ins and outs of System 7 may well find Open Sesame! a useful investment. / John Markoff



Open Sesame! 1.0.2 ★★★★★ / LIST PRICE: \$99. COMPANY: Charles River Analytics, Cambridge, MA; 800-913-3535 or 617-491-3474. READER SERVICE: Circle #412.



OptiMem / Inexpensive 'virtual RAM' software

LIFE WITHOUT LOTS OF RAM isn't easy. You're plagued by messages saying you don't have enough memory to launch an application, open a document, or perform other memory-eating operations. And then there are those memory-related system crashes. What's a RAM lacker on a budget to do?

Enter OptiMem, a new control panel that promises to rescue you from low-memory hassles at far less cost than that of a major RAM upgrade. If we awarded mice based solely on ingenuity, we'd give OptiMem five. Its innovative approach is simple to implement and, when it works, strikingly effective. Unfortunately, there are too many applications with which it doesn't work.

Memory Juggling. Here's what OptiMem does. First, it forces each application to open at its minimum-partition setting (as set from the application's Get Info window). Next — and here's the critical part — it dynamically allocates more memory to the application, as needed, without requiring you to quit the application. Allowing still more flexibility, these additional allocations can be discontinuous from the location of the application's initial memory partition. OptiMem can also minimize memory fragmentation (a problem that can prevent you from opening applications even when enough memory is available), by relocating additionally assigned blocks within the memory space. Finally, if the application later doesn't need the additionally assigned memory, OptiMem can take it away

and allocate it to another program. The result: OptiMem lets you have many more applications open than you otherwise could, with little or no effect on performance.

The Weak Link. Sounds good, right? Here's the catch: Applications sometimes have their own methods of optimizing memory — methods that may conflict with OptiMem's approach. In such cases, undesirable results can range from an inability to open an application (as long as OptiMem is active) to system crashes. We had such problems with CompuServe Information Manager, Nisus, Panorama, and other applications. To avoid such problems, you can turn OptiMem off selectively for each conflicting application — but this reduces the advantage of using OptiMem in the first place. Making matters more frustrating, OptiMem doesn't come with a list of applications known to cause problems.

Jump Development promises that upgrades will resolve many of these conflicts. The company also offers guidelines for developers, so they can prevent their applications from conflicting with OptiMem. If developers embrace these guidelines — and if Connectix's \$99 RAM Doubler software, just out at press time, doesn't steal its thunder — OptiMem can look forward to a successful future. In the meantime, we can recommend OptiMem only with reservations. If it's compatible with the programs you use regularly, OptiMem can be a big help — but be sure to check into that *if*. / Ted Landau

OptiMem 1.5 ★★★ / LIST PRICE: \$129. COMPANY: Jump Development Group, Pittsburgh, PA; 412-681-2692. READER SERVICE: Circle #413.

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CIRCLE 55 ON READER SERVICE CARD

Greg LeMond's Bicycle Adventure / CD-ROM cycling with a pro

IMAGINE HANGING OUT with Greg LeMond and other cycling pros — traveling around the world, hearing their stories, getting tips on technique, and so on. That's what Greg LeMond's Bicycle Adventure CD-ROM lets you do — without making you leave your Mac.

Easy Riding. Bicycle Adventure is easy to use. A globe lets you click on parts of the world to see items about cycling in those regions (each item includes a picture or a QuickTime movie plus a narrative vignette presented in a scrolling text window). A time line lets you learn about the history of cycling and envision cycling in the future. Click on a row of buttons to jump through items by category, or use the directory to navigate by title. On-line help



and Balloon Help make the first half of the game's manual pretty unnecessary, but the second half is an interesting discussion of Greg LeMond's bicycle-sizing philosophy.

Deraillers. We'd like to see Eden Interactive add more QuickTime clips to the product and make the standard QuickTime playback controls available. Some of the button sounds also seemed odd and out of place (a plucked violin string?). Still, cycling buffs will find this CD-ROM well worth more than one tour. / Louis E. Benjamin Jr.

Greg LeMond's Bicycle Adventure ★★ ★ / LIST PRICE: \$79.99. COMPANY: Eden Interactive, San Francisco, CA; 800-743-3360 or 415-241-1450. READER SERVICE: Circle #414.

Virtual Tarot / Take your Mac into the mystic

VIRTUAL TAROT IS A CD-ROM that lets you explore the world of tarot-card readings through multimedia. This beautiful program — including animations, music, and informative voice-overs — has copious on-line (and printable) notes on tarot philosophies, card significance, and reading interpretations.

Fun but Frustrating. Virtual Tarot is lots of fun, and it would probably work well for tarot aficionados as an adjunct to real-time card readings (you can buy a version that includes a deck of the superb Rider-Waite cards used on the CD-ROM). But the program has its drawbacks too. Because it was created with Macromedia Director, it's painfully slow. It's also a little unstable — the manual advises that you turn off all but crucial extensions when using Virtual Tarot, and that's good advice. We crashed repeatedly before discovering (in the Read Me notes) that the program is incompatible with ATM. What's more, we were unable to print any of the readings on either a Hewlett-Packard LaserJet 4Si or an Apple LaserWriter II.

Here's some advice the cards won't give you: Read the manual. It contains useful navigation tips as well as vital information on shortcuts that radically speed up the program. / Victoria von Biel

Virtual Tarot ★★ ★ / LIST PRICE: \$49.95; with the Rider-Waite tarot deck, \$69.95. COMPANY: Virtual Media Works, Sunnyvale, CA; 800-292-3157 or 408-739-0301. READER SERVICE: Circle #415.



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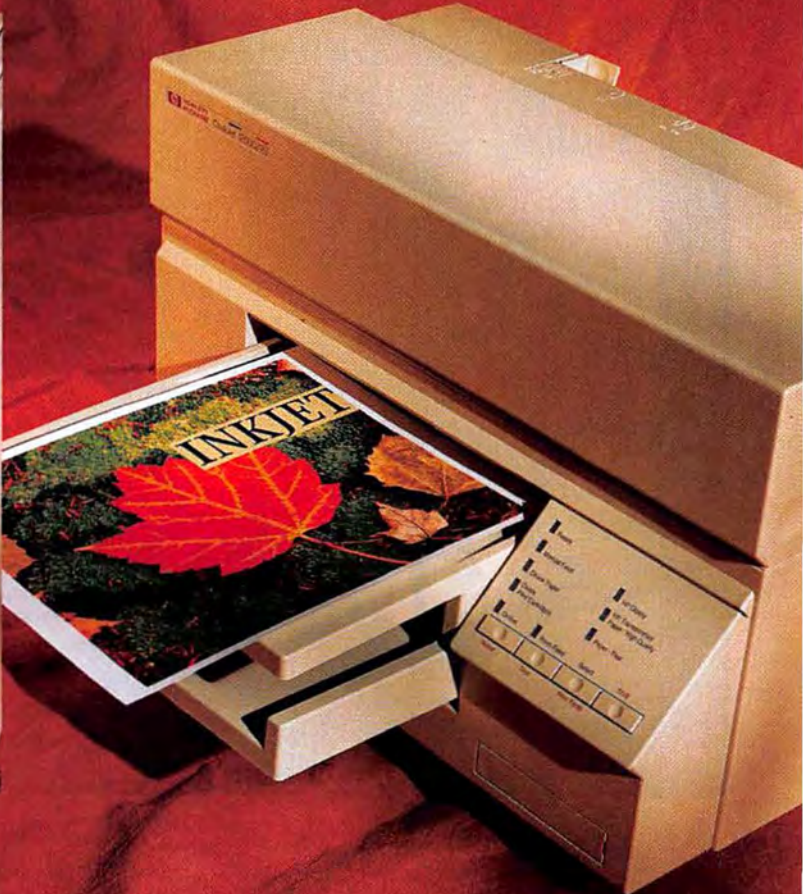
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CIRCLE 45 ON READER SERVICE CARD



Color, Inc.

If your office is ready to dedicate a printer to producing color documents, one of these 20 models, spanning five color technologies, will fit your needs.

By Bruce Fraser



IS YOUR DEPARTMENT, workgroup, or small company ready for a color printer that means business? Perhaps monthly print-shop bills are sky-high, because everyone wants to give color presentations. Or that inexpensive color inkjet printer you bought as an experiment is choked with overuse. Or maybe you just recognize that color will make your business documents more exciting and easier to understand.

Each is a good reason to give an office color printer serious consideration, but perhaps the best reason is that more office color

The Bottom Line

THE BEST FULL-TIME COLOR PRINTER for your office will work the way you want to: quickly, efficiently, and with little supervision. Out of the 20 representatives of the five color-printing technologies, we picked 3 that stand out for their value, speed, and output quality — and how well you can expect to be treated by their manufacturers.

⊕ = OUTSTANDING

● = ACCEPTABLE

⊖ = POOR

PRICE/
PERFORMANCE

CUSTOMER
SERVICE

PRINTING
SPEED

OUTPUT
QUALITY

★★★★ Tektronix Phaser 200i (TW) ⊕ ⊕ ⊕ ●

Fast, vibrant output puts the thermal-wax Phaser 200i (\$8,480 list, \$6,830 street) at the top of its class for business color. Pages crank out quickly and — thanks to the optional plain-paper ribbon — very affordably. (Its successor, the Phaser 220i, offers higher-quality 600-x-300-dpi output at a comparable price.)

★★★★ Tektronix Phaser IIsox (DS) ● ⊕ ● ⊕

Dazzling photo images and outstanding graphics output make the Phaser IIsox (\$10,690 list, \$9,765 street) the best of the batch in terms of output quality. If your color documents and presentations include photos, this dye-sub printer — and its handsome output — deserve a careful look.

★★★★ Hewlett-Packard DeskJet 1200C/PS (IJ) ● ● ● ●

Affordable quality is the stock-in-trade of Hewlett-Packard's DeskJet 1200C/PS (\$3,777 list, \$2,950 street) inkjet printer. Although no speed demon, its transparency output is dazzling and it prints well on plain paper.

★★★★ SuperMac ProofPositive

Full-Page Printer (DS)	●	⊕	●	⊕
★★★★ Tektronix Phaser 200e (TW)	●	⊕	●	●
★★★★ Fargo Primera (TW)	⊕	●	●	⊖
★★★★ Fargo Primera (with Photo-Realistic upgrade) (DS)	⊕	●	⊖	●
★★★★ General Parametrics SpectraStar GT (TW)	●	●	●	●
★★★★ Kodak ColorEase (DS)	●	⊕	●	⊕
★★★★ QMS ColorScript Laser 1000 (L)	●	⊕	⊕	⊖
★★★★ CalComp ColorMaster Plus 6603XF/PS (TW)	●	●	●	●
★★★★ CalComp ColorMaster Plus 6613XF/PS (TW)	●	●	●	●
★★★★ GCC ColorTone (DS)	●	⊕	●	●
★★★★ QMS ColorScript 210 (TW)	●	●	●	●
★★★★ RasterOps CorrectPrint 300i (DS)	●	⊕	⊖	●
★★★★ Sony UP-D7000 (DS)	●	●	●	●
★★★★ Tektronix Phaser III PXi (SI)	●	⊕	●	●
★★★★ Dataproducts Jolt PSe (SI)	⊖	⊕	⊖	⊖
★★★★ QMS ColorScript 230 (TW)	●	●	●	●
★★★★ General Parametrics SpectraStar Q50 (TW)	⊖	●	⊖	⊖

TW = thermal-wax DS = dye-sub IJ = inkjet SI = solid-ink L = laser

Listing is alphabetical within groups of equal mouse ratings.

printers exist today than ever before, and with street prices ranging from \$1,000 to \$14,000, there's probably one that's right for you.

A Spectrum of Choices

The 20 printers we evaluated differ in a variety of important ways: Most use highly accurate PostScript technology to reproduce text and graphics, but a few rely instead on the lower-resolution QuickDraw technology your Mac uses to generate screen images. Most, but not all, can connect to your network (or a single Mac) via Ethernet; this capability costs extra in many cases, but it improves output speed so significantly that we strongly recommend using it. We used it whenever possible in our testing.

The most important difference among the printers, however, is the technology each uses to place color on the page. The respective merits of these color technologies — thermal-wax-transfer, dye-sublimation, inkjet, phase-change solid-ink, and laser — will dictate in large part how well a printer will meet your needs. We therefore grouped our findings on a technology basis. We recommend that you decide which technology is best for you and then make a final choice based on the features of the individual printers in each class.

Thermal-Wax: Vivid Color

If the bulk of your color needs involve presentation graphics, look into thermal-wax technology: It delivers bold colors and has low per-page costs for pages with heavy color coverage. The best printers in this class get the job done quickly too.

We looked at nine thermal-wax printers. Overall, the Tektronix Phaser 200i was by far the fastest, due to the combination of a speedy processor, a fast engine, and its ability to use Ethernet. It outraced every other printer on every document but the QuarkXPress page, for which it was more than 15 percent slower than the QMS ColorScript 210. The General Parametrics SpectraStar Q50 failed to print two documents and was slow with those it did print.

The best thermal-wax output came from the CalComp ColorMaster Plus printers, but the field was tight. Our judges vastly preferred the output from the dye-sublimation printers, which can generate continuous-tone images, to the thermal-wax-printer output. However, the differences among output samples from the thermal-wax printers — with the exception of the Fargo Primera's output — were less significant than among those from the dye-sub printers. The Primera is something of an oddity: a thermal-wax printer with an optional dye-sub upgrade. It lacks Ethernet support and is strictly a QuickDraw printer, so on the all-PostScript Illustrator test, it

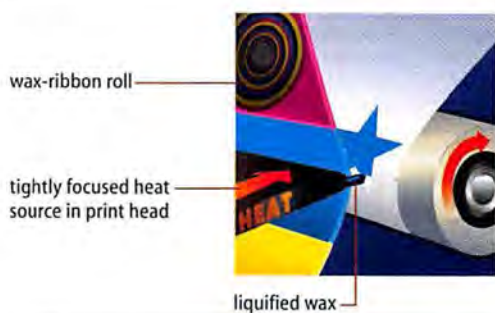
Technology Brief / thermal-wax

General graphics output quality	B
Text output quality	A
Photo output quality	C
Speed	A
Cost per page	C
Consumables management	C

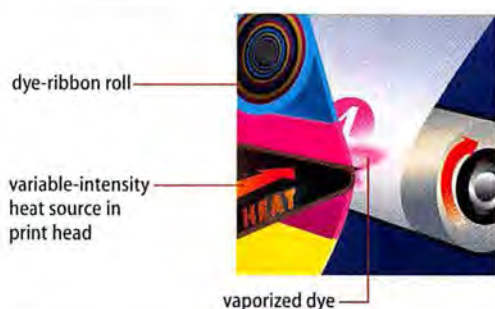
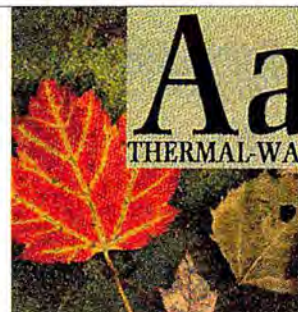
Mechanics of Color / which technology is best for you?

A printer's color technology — the mechanics it uses to place color on the page — determines, more than any other factor, what types of work it does best. Below are output samples from each of the five technologies

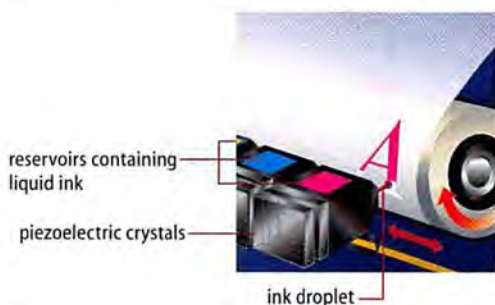
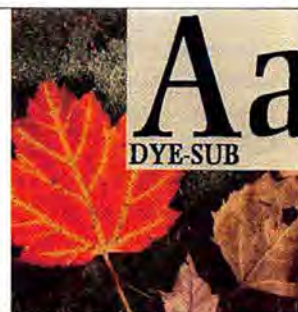
included in this article, along with brief descriptions and schematic illustrations describing how each technology works. (Note: The illustrations are not exact representations of printer mechanisms.)



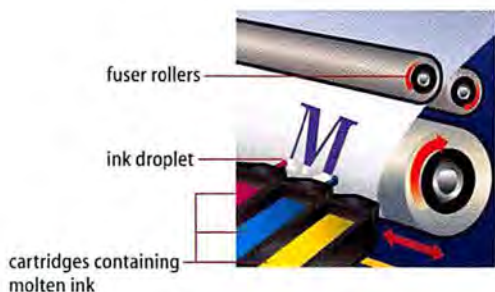
Thermal-Wax HOW IT WORKS: A ribbon coated with page-sized panels of cyan, magenta, yellow, and (sometimes) black wax passes over a tightly focused heat source, which causes the wax to melt and adhere to the paper. Color images consist of arrays of colored dots. **IDEAL USERS:** Office users who generate a lot of presentation transparencies and handouts.



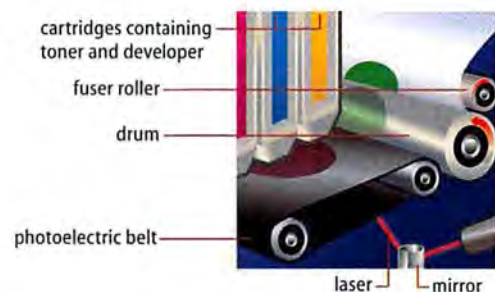
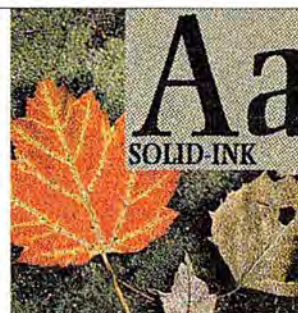
Dye-Sub HOW IT WORKS: A ribbon containing page-sized panels of cyan, magenta, yellow, and (sometimes) black dyes is moved across a tightly focused heat source that is capable of precise temperature variations. As they heat up, the dyes evaporate from the ribbon and diffuse into specially coated paper, forming areas of color whose hues differ according to the intensity of the heat. **IDEAL USERS:** Desktop publishers and graphic artists who use photographs.



Inkjet HOW IT WORKS: Piezoelectric crystals embedded in liquid-ink containers vibrate as electric current pulses through them setting up precisely timed ripples in containers of cyan, magenta, yellow, and (sometimes) black inks; each ripple causes a droplet of ink to spray from an ultrafine nozzle and form a dot of color on the page. **IDEAL USERS:** Office users on a tight budget who produce a few presentations a year and want occasional splashes of color in mostly text documents.



Solid-Ink HOW IT WORKS: Pellets or sticks of crayonlike wax — cyan, magenta, yellow, and black — are heated until they're liquid and then sprayed through tiny nozzles onto the page. The wax cools on contact, solidifying into dots of color. **IDEAL USERS:** Graphic artists, advertisers, package designers, and others needing rough proofs of output that will be produced on unusual paper stocks.



Laser HOW IT WORKS: In four separate stages, a laser beam directed at a photoelectric belt forms a region of electric charge corresponding to the cyan, magenta, yellow, and black portion of an image. Toners of each color adhere electrostatically to the belt and are transferred to an electrically charged drum. After all four colors are on the drum, the image is rolled onto paper and heat-fused. **IDEAL USERS:** Office users who want to incorporate nonphotographic color elements into text.

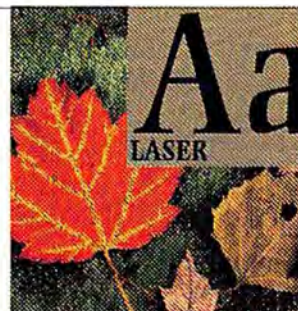


figure 1

Printing Speed / wide variation with technology

Being kept waiting irritates most of us, and printer output speed is critical for office users. Note the variations between and within

different color technologies in our test results, and then look for a printer model that won't overtax your patience.

MacUser Labs

- thermal-wax
- dye-sub
- inkjet
- solid-ink
- laser

Illustrator

The processor-intensive PostScript data in this single-page document tested the printers' speediness in reproducing complex graphics.

Photoshop

Plug-ins for Adobe Photoshop were a real asset in printing this single-page photographic image (see figure 3).

QuarkXPress

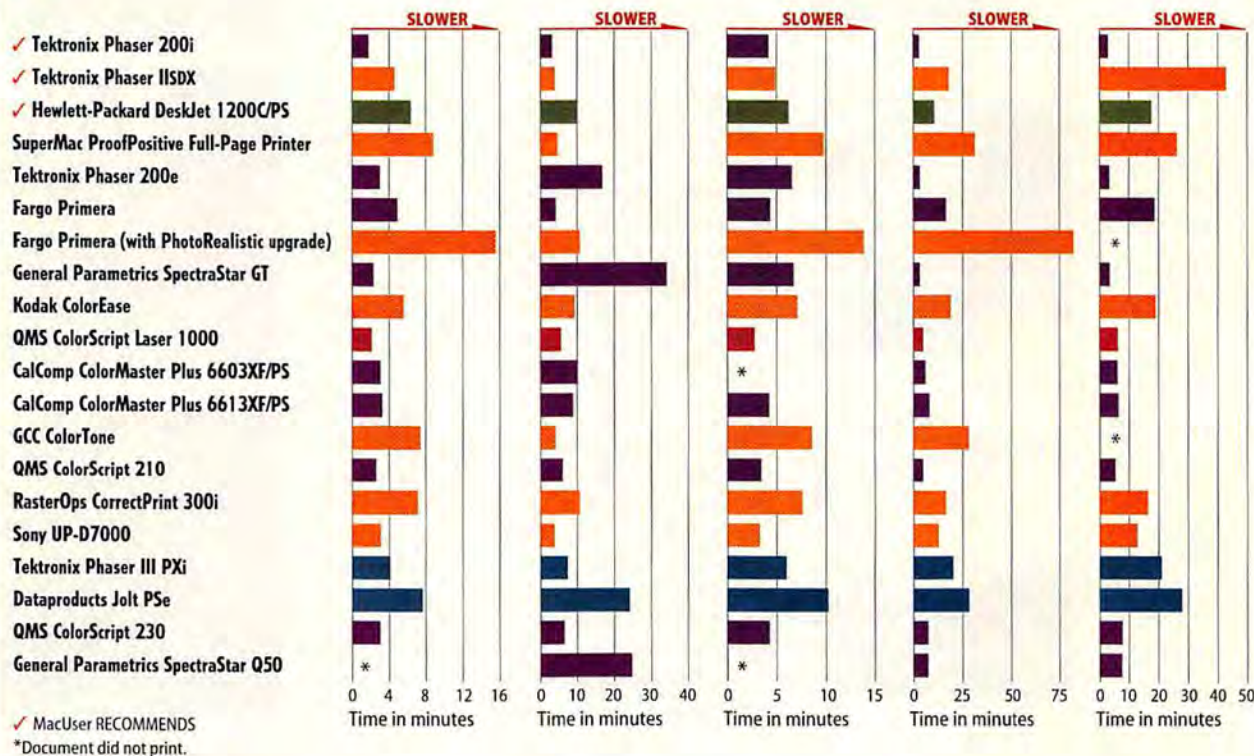
This page's mix of text, photos, and graphics gave a good idea of output speed for many typical business documents.

PowerPoint Handout

A five-page paper document with nearly complete color coverage gave an idea of batch-printing speeds.

PowerPoint Transparency

Color printers typically slow down to print transparencies; compare these results with those for the handout to see just how much.



printed the file at screen resolution — a jaggy 72 dpi. (Several tactics can reduce this problem, including using a software PostScript interpreter, such as ColorAge's Freedom of Press or TeleTypesetting's TScript, but they slow the printer's already poky speed.)

Even with non-PostScript images, the Primera's top resolution of 203 dpi was unspectacular, especially compared to the 300-dpi output of the other thermal-wax printers we tested.

The thermal-wax Primera did, however, print every document we threw at it, which was not the case with the General Parametrics SpectraStar Q50. Problems with the latter's PostScript interpreter, an early version of the Pipeline PostScript Level 2 clone, prevented it from printing the Illustrator and the QuarkXPress pages, and General Parametrics indicated that it was unlikely the problems would ever be fixed. The company's SpectraStar GT, which uses a later version of

the Pipeline interpreter, printed the pages without difficulty.

The CalComp ColorMaster Plus 6603XF/PS was unable to output our QuarkXPress test page with the 8 megabytes of RAM that ship standard with it. A little extra memory probably would have done the trick, because its close cousin, the ColorMaster Plus 6613XF/PS, which ships with 16 megabytes, had no trouble with the page.

The QMS ColorScript 210 and 230 were set apart by the worst documentation we encountered: The poorly organized manuals contained a confusing mix of information for DOS, Mac, and Windows computers.

This was not our only complaint about QMS' thermal-wax printers. We found them exceedingly difficult to set up and couldn't get the ColorScript 210 or the 230 to work after we'd installed the Ethernet interface. The ColorScript 210 was also plagued by paper-jam error messages. The Ethernet problem

figure 2

Output Quality / look for dazzle, detail

Boldness is important in business, and in business color output, but the little things — such as fine print and detailed line art — speak

volumes about printer precision. We asked our judges to look for vivid hues and sharp details as part of their assessment.

MacUser Labs

- thermal-wax
- dye-sub
- inkjet
- solid-ink
- laser

Illustrator

A single-page, complex illustration tested each printer's fidelity in reproducing PostScript graphics.

Photoshop

Our single-page photographic image included skin tone and blue sky, two elements that are hard to reproduce convincingly.

QuarkXPress

This page's demanding mix of text, headline type, two TIFF graphics, a photo, and color gradations tested all-around output quality.

PowerPoint Handout

The judges looked for even coverage on solid-color areas and crisp reverse-type "knockouts" on this five-page paper document.

PowerPoint Transparency

The judges awarded points for vivid color, free of "dropouts" or overlaps, in projections of two of the presentation's five pages.

✓ Tektronix Phaser 200i

✓ Tektronix Phaser IISDX

✓ Hewlett-Packard DeskJet 1200C/PS

SuperMac ProofPositive Full-Page Printer

Tektronix Phaser 200e

Fargo Primera

Fargo Primera (with PhotoRealistic upgrade)

General Parametrics SpectraStar GT

Kodak ColorEase

QMS ColorScript Laser 1000

CalComp ColorMaster Plus 6603XF/PS

CalComp ColorMaster Plus 6613XF/PS

GCC ColorTone

QMS ColorScript 210

RasterOps CorrectPrint 300i

Sony UP-D7000

Tektronix Phaser III PXi

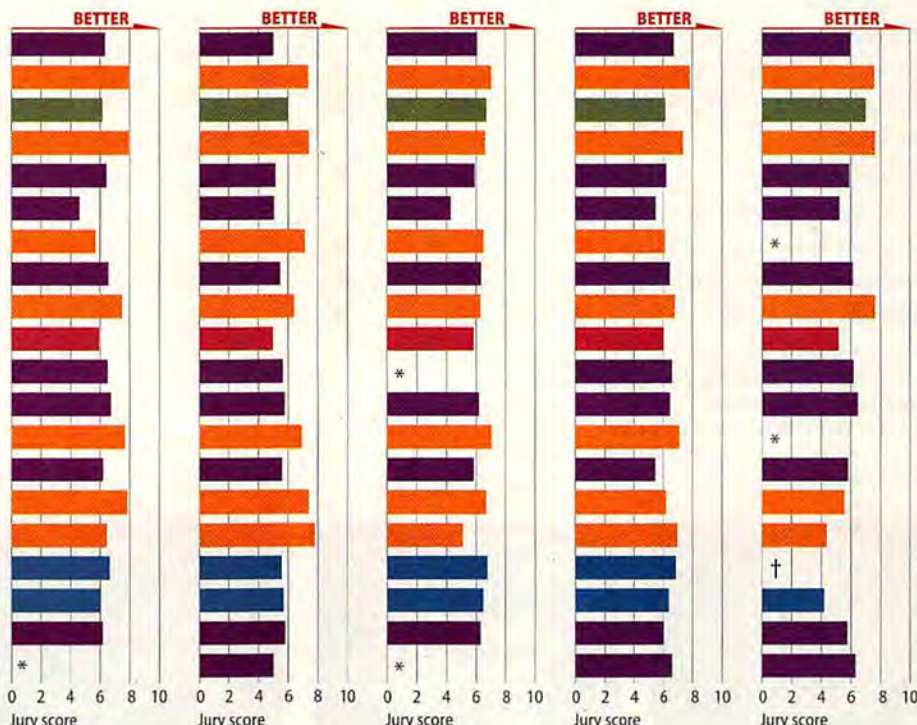
Dataproductions Jolt PSe

QMS ColorScript 230

General Parametrics SpectraStar Q50

✓ MacUser RECOMMENDS

*Document did not print. †No score, because transparency laminator was not supplied in time for judging.



turned out to be due to a connector we'd installed incorrectly, despite its key notch, which should have made installation foolproof; QMS' tech support was unable to help us by phone and had to send us a technician. The "paper jam" was actually a problem with an (overly complicated) wax ribbon, but the error messages had us looking for trouble in the wrong place.

The General Parametrics SpectraStar Q50 was unusual in two ways: It was the only printer we tested that included a film recorder, which enables you to print directly to 35mm slides. It also offered the shortest warranty, at 90 days; all the other printers offer a one-year warranty.

Dye-Sub: Photo Images

If you want no-compromise image quality and the greatest color subtlety available from any desktop printer, you want dye-sublimation technology. But you will have to pay for it,

both in terms of per-page costs, which can go as high as \$3 to \$4 per letter-sized page, and in the time you spend waiting for output.

The Sony UP-D7000 was the fastest of the seven dye-sub printers that we examined, but speed is not the most important issue for all but the Photoshop test: Because it's missing PostScript capabilities, the UP-D7000 (like the Fargo Primera) printed unsatisfactory, 72-dpi images of the Il-

lustrator, QuarkXPress, and PowerPoint pages. The UP-D7000's results for the Photoshop image, however, were stunning; if all you want to do is print photo-realistic images from Photoshop, the Sony UP-D7000 deserves consideration.

Technology Brief / dye-sub

General graphics output quality	A
Text output quality	C
Photo output quality	A
Speed	D
Cost per page	D
Consumables management	C

figure 3

Features of Color Business Printers / beyond speed and output quality

A wide variety of traits dictate whether a color printer will meet your office's output needs. Although PostScript support costs extra, it can

mean superior graphics output. Also, keep in mind that an Ethernet connection is a real advantage, particularly when you're printing large

	CalComp ColorMaster Plus 6603XF/PS (TW)	CalComp ColorMaster Plus 6613XF/PS (TW)	Dataproducts Jolt PSe (SI)	Fargo Primera (TW/DS)	GCC ColorTone (DS)	General Parametrics SpectraStar GT (TW)	General Parametrics SpectraStar Q50 (TW)	✓ Hewlett-Packard DeskJet 1200CPS (IJ)
PostScript-capable	●	●	●		●	●	●	●
Prints well on plain paper			●					●
Photoshop plug-in					●			
Automatic emulation switching	●					●		●
Multiple ports simultaneously active	●	●	●		●	●	●	
LocalTalk port	●	●	●		●	●	●	*
EtherTalk port	●				●			*
Parallel port	●	●	●	●	●	●	●	●
SCSI port for connection to Mac								
SCSI port for hard-drive font storage	●		●		●		†	
Paper capacity of 100 sheets or more	●	●	●			●	●	●
Warranty of 1 year or more	●	●	●	●	●	●		●

✓ MacUser RECOMMENDS
 *Can be configured with either an EtherTalk or a LocalTalk port.
 †Includes an 85-megabyte hard drive.
 ‡Includes a built-in 120-megabyte hard drive.
 TW = thermal-wax DS = dye-sub IJ = inkjet SI = solid-ink L = laser



CalComp ColorMaster Plus 6603XF/PS

RATING: ★★★
LIST PRICE: \$6,490.
STREET PRICE: \$5,730.
PROS: Good documentation. Easy setup.
CONS: Could not print QuarkXPress page.
TECHNOLOGY: Thermal-wax.
ENGINE SPEED (COLOR): 1 ppm.
MAX. PAPER SIZE: 8.5 x 11 in.
SUPPORTED RES.: 300 dpi.
RAM (STD./MAX.): 8 MB/64 MB.
RAM (TEST CONFIG.): 8 MB.
RAM-UPGRADE COST: 8 MB, \$695; 16 MB, \$995; 32 MB, \$1,995.
POSTSCRIPT (VENDOR): Level 2 (Phoenix).
NO. OF RESIDENT FONTS: 39.
DIMENSIONS (L x W x H): 23 x 17.6 x 16 in.
WEIGHT: 55 lb.
COMPANY: CalComp, Anaheim, CA; 800-225-2667 or 714-821-2000.



CalComp ColorMaster Plus 6613XF/PS

RATING: ★★★
LIST PRICE: \$8,995.
STREET PRICE: \$8,350.
PROS: 11-x-17-inch output capacity.
CONS: Poorly organized manuals.
TECHNOLOGY: Thermal-wax.
ENGINE SPEED (COLOR): 1 ppm.
MAX. PAPER SIZE: 11 x 17 in.
SUPPORTED RES.: 300 dpi.
RAM (STD./MAX.): 16 MB/64 MB.
RAM (TEST CONFIG.): 16 MB.
RAM-UPGRADE COST: 8 MB, \$695; 16 MB, \$995; 32 MB, \$1,995.
POSTSCRIPT (VENDOR): Level 2 (Phoenix).
NO. OF RESIDENT FONTS: 39.
DIMENSIONS (L x W x H): 23 x 21 x 19.2 in.
WEIGHT: 62 lb.
COMPANY: CalComp, Anaheim, CA; 800-225-2667 or 714-821-2000.



Dataproducts Jolt PSe

RATING: ★★½
LIST PRICE: \$5,540.
STREET PRICE: \$5,140.
PROS: Outstanding documentation. Excellent tech support.
CONS: Extremely slow.
TECHNOLOGY: Solid-ink.
ENGINE SPEED (COLOR): .7 ppm.
MAX. PAPER SIZE: 8.5 x 11 in.
SUPPORTED RES.: 300 dpi.
RAM (STD./MAX.): 6 MB/10 MB.
RAM (TEST CONFIG.): 10 MB.
RAM-UPGRADE COST: 4 MB, \$545.
POSTSCRIPT (VENDOR): Level 2 (Adobe).
NO. OF RESIDENT FONTS: 39.
DIMENSIONS (L x W x H): 22.5 x 19.5 x 10 in.
WEIGHT: 45 lb.
COMPANY: Dataproducts, Woodland Hills, CA; 800-283-1932 or 818-887-8000.



Fargo Primera

RATING: ★★½
LIST PRICE: \$995.
STREET PRICE: \$930.
PROS: Lowest price of any unit tested.
CONS: Mediocre-to-poor output quality. Lack of PostScript makes text and line art jaggy.
TECHNOLOGY: Thermal-wax.
ENGINE SPEED (COLOR): .4 ppm.
MAX. PAPER SIZE: 8.5 x 11 in.
SUPPORTED RES.: 203 dpi.
RAM (STD./MAX.): 32K/32K.
RAM (TEST CONFIG.): 32K.
RAM-UPGRADE COST: NA.
POSTSCRIPT (VENDOR): None.
NO. OF RESIDENT FONTS: 1.
DIMENSIONS (L x W x H): 13.75 x 10 x 5.8 in.
WEIGHT: 16 lb.
COMPANY: Fargo Electronics, Eden Prairie, MN; 800-258-2974 or 612-941-9470.

color files. If your printer will be installed on a network with non-Macintosh computers, look for appropriate interfaces and emulation-

switching capabilities. And remember that printers with plain-paper output can save you a bundle.

Kodak ColorEase (DS)	QMS ColorScript 210 (TW)	QMS ColorScript 230 (TW)	QMS ColorScript Laser 1000 (L)	RasterOps CorrectPrint 300i (DS)	Sony UP-D7000 (DS)	SuperMac Pro/Positive Full-Page Printer (DS)	Tektronix Phaser 200e (TW)	✓ Tektronix Phaser 200i (TW)	✓ Tektronix Phaser 1150X (DS)	Tektronix Phaser III PXi (SI)
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Fargo Primera (with PhotoRealistic upgrade)

RATING: ★★★
LIST PRICE: \$1,245.
STREET PRICE: \$1,175.
PROS: Lowest-cost dye-sub printer.
CONS: Slowest printer tested overall. Lack of PostScript makes text and line art jaggy. Cannot print transparencies.
TECHNOLOGY: Dye-sub.
ENGINE SPEED (COLOR): .4 ppm.
MAX. PAPER SIZE: 8.5 x 11 in.
SUPPORTED RES.: 203 dpi.
RAM (STD./MAX.): 32K/32K.
RAM (TEST CONFIG.): 32K.
RAM-UPGRADE COST: NA.
POSTSCRIPT (VENDOR): None.
NO. OF RESIDENT FONTS: 1.
DIMENSIONS (L x W x H): 13.75 x 10 x 5.8 in.
WEIGHT: 16 lb.
COMPANY: Fargo Electronics, Eden Prairie, MN; 800-258-2974 or 612-941-9470.



GCC ColorTone

RATING: ★★★
LIST PRICE: \$7,999.
STREET PRICE: \$7,780.
PROS: Excellent manual. Easy setup.
CONS: Did not print transparencies.
TECHNOLOGY: Dye-sub.
ENGINE SPEED (COLOR): .32 ppm.
MAX. PAPER SIZE: 8.5 x 11 in.
SUPPORTED RES.: 300 dpi.
RAM (STD./MAX.): 16 MB/64 MB.
RAM (TEST CONFIG.): 16 MB.
RAM-UPGRADE COST: 32 MB, \$1,999.
POSTSCRIPT (VENDOR): Level 1 (Phoenix).
NO. OF RESIDENT FONTS: 35.
DIMENSIONS (L x W x H): 17.5 x 17.2 x 13.4 in.
WEIGHT: 66 lb.
COMPANY: GCC Technologies, Bedford, MA; 800-422-7777 or 617-275-5800.



General Parametrics SpectraStar GT

RATING: ★★★
LIST PRICE: \$5,160.*
STREET PRICE: \$4,615.
PROS: Optional plain-paper ribbon exacts no speed penalty.
CONS: Transparencies scratch easily.
TECHNOLOGY: Thermal-wax.
ENGINE SPEED (COLOR): 2 ppm.
MAX. PAPER SIZE: 8.5 x 11 in.
SUPPORTED RES.: 300 dpi.
RAM (STD./MAX.): 6 MB/32 MB.
RAM (TEST CONFIG.): 8 MB.
RAM-UPGRADE COST: 6 MB, \$665.
POSTSCRIPT (VENDOR): Level 2 (Pipeline).
NO. OF RESIDENT FONTS: 52.
DIMENSIONS (L x W x H): 17.5 x 13.5 x 11 in.
WEIGHT: 44 lb.
COMPANY: General Parametrics, Berkeley, CA; 800-223-0999 or 510-524-3950.



General Parametrics SpectraStar Q50

RATING: ★★
LIST PRICE: \$13,798.
STREET PRICE: \$13,400.
PROS: Film recorder enables 35mm-slide output.
CONS: Buggy PostScript clone.
TECHNOLOGY: Thermal-wax.
ENGINE SPEED (COLOR): 1 ppm.
MAX. PAPER SIZE: 8.5 x 11 in.
SUPPORTED RES.: 300 dpi.
RAM (STD./MAX.): 10 MB/10 MB.
RAM (TEST CONFIG.): 10 MB.
RAM-UPGRADE COST: NA.
POSTSCRIPT (VENDOR): Level 2 (Pipeline).
NO. OF RESIDENT FONTS: 52.
DIMENSIONS (L x W x H): 17.3 x 17.3 x 13 in.
WEIGHT: 72 lb.
COMPANY: General Parametrics, Berkeley, CA; 800-223-0999 or 510-524-3950.

*Price reflects upgrade to 12 MB of RAM; upgrade to 8 MB is no longer available.



Putting Imagination



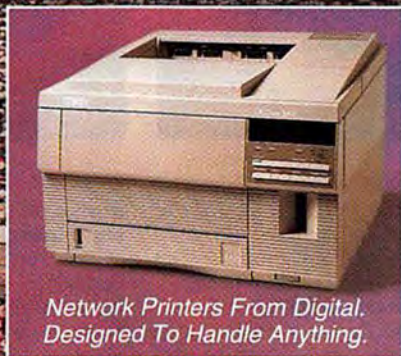
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- Optional Ethernet card
- Optional internal hard disk

To Work

digital™

Except when printing transparencies, the Tektronix Phaser IISDX was by far the fastest PostScript dye-sub printer, thanks to a powerful processor, an Ethernet connection, and a direct-export plug-in that lets Photoshop communicate directly with the printer. Plug-ins offered a significant speed advantage on our Photoshop-image test: The Phaser IISDX and the other dye-sub printers that have plug-ins — the GCC ColorTone, the Sony UP-D7000, and the SuperMac ProofPositive Full-Page Printer — were roughly twice as fast on the Photoshop test as the Fargo Primera, the Kodak ColorEase, and the RasterOps CorrectPrint 300i, which lack Photoshop plug-ins.

The Fargo Primera with the PhotoRealistic upgrade was the slowest dye-sub printer in our tests and could not produce the PowerPoint transparency, because it is unable to handle transparency media in dye-sub mode.

The Tektronix Phaser IISDX won acclaim for the best-looking dye-sub output. The printer has a special printing mode for transparencies: To boost image quality, it slows to half-speed, which gives the dye more time to diffuse into the media and results in more-intense color.

The SuperMac ProofPositive Full-Page Printer strongly challenged the Phaser IISDX for excellent output. The SuperMac printer is noteworthy, because its Adobe PostScript

Level 2 interpreter comes in software rather than hardwired in a processor chip, which means a Mac must be dedicated to serve as its "brain." SuperMac recommends that you use a fast Quadra loaded with as much memory as you can afford — ideally far more than the Quadra 700 with 20 megabytes of RAM we used for all of our tests. Although the Mac driving the printer *can* print in the background while performing other tasks, SuperMac recommends against using it to do so; print speed slows significantly under these circumstances, and speed of the foreground application suffers too.

The ProofPositive Full-Page Printer's software interpreter is inherently slower than a hardware version would be, but unlike printers with hardware interpreters, the SuperMac printer is not limited to a single speed. Faster Macs of the future, including the ultraspeedy PowerPC machines, scheduled to have arrived this spring, will make it faster. What's more, software upgrades from SuperMac will eliminate the need to buy a new printer to benefit from future enhancements to PostScript.

Inkjet: Plain Practical

The lone inkjet printer we tested, the Hewlett-Packard DeskJet 1200C/PS, was in the middle of the pack in terms of output speed, but its output quality — for plain paper as well as for



Hewlett-Packard DeskJet 1200C/PS

RATING: ★★★
LIST PRICE: \$3,777.
STREET PRICE: \$2,950.
PROS: Extremely vibrant transparencies. Outstanding on plain paper.
CONS: Poorly organized documentation. Mediocre speed.
TECHNOLOGY: Inkjet.
ENGINE SPEED (COLOR): .5 ppm.
MAX. PAPER SIZE: 8.5 x 11 in.
SUPPORTED RES.: 300 dpi (color), 600 x 300 dpi (text).
RAM (STD./MAX.): 4 MB/20 MB.
RAM (TEST CONFIG.): 12 MB.
RAM-UPGRADE COST: 1 MB, \$119; 2 MB, \$209; 4 MB, \$309; 8 MB, \$579.
POSTSCRIPT (VENDOR): Level 2 (Adobe).
NO. OF RESIDENT FONTS: 45 scalable; 35 Adobe Type 1.
DIMENSIONS (L x W x H): 16.9 x 19.1 x 11.1 in.
WEIGHT: 29 lb.
COMPANY: Hewlett-Packard Co., Palo Alto, CA; 800-752-0900 or 619-487-4100.



Kodak ColorEase

RATING: ★★★
LIST PRICE: \$8,494.
STREET PRICE: \$7,010.
PROS: Single-sheet feed option.
CONS: Awkward ribbon installation.
TECHNOLOGY: Dye-sub.
ENGINE SPEED (COLOR): .29 ppm.
MAX. PAPER SIZE: 8.5 x 11 in.
SUPPORTED RES.: 300 dpi.
RAM (STD./MAX.): 16 MB/16 MB.
RAM (TEST CONFIG.): 16 MB.
RAM-UPGRADE COST: NA.
POSTSCRIPT (VENDOR): Level 2 (Adobe).
NO. OF RESIDENT FONTS: 35.
DIMENSIONS (L x W x H): 21 x 16.75 x 12 in.
WEIGHT: 55 lb.
COMPANY: Eastman Kodak Co., Rochester, NY; 800-344-0006 or 716-253-0740.



QMS ColorScript 210

RATING: ★★★
LIST PRICE: \$6,293.
STREET PRICE: \$5,560.
PROS: Free Ethernet installation.
CONS: Difficult to set up and use. Poor documentation.
TECHNOLOGY: Thermal-wax.
ENGINE SPEED (COLOR): 1 ppm.
MAX. PAPER SIZE: 8.5 x 11 in.
SUPPORTED RES.: 300 dpi.
RAM (STD./MAX.): 8 MB/32 MB.
RAM (TEST CONFIG.): 16 MB.
RAM-UPGRADE COST: 4 MB, \$299; 8 MB, \$599.
POSTSCRIPT (VENDOR): Level 2 (QMS).
NO. OF RESIDENT FONTS: 65.
DIMENSIONS (L x W x H): 25.6 x 16.1 x 9.6 in.
WEIGHT: 48 lb.
COMPANY: QMS, Mobile, AL; 800-523-2696 or 205-633-4300.



QMS ColorScript 230

RATING: ★★
LIST PRICE: \$8,649.
STREET PRICE: \$7,595.
PROS: Free Ethernet installation.
CONS: Difficult to set up and use. Poor documentation.
TECHNOLOGY: Thermal-wax.
ENGINE SPEED (COLOR): 1 ppm.
MAX. PAPER SIZE: 8.5 x 11 in.
SUPPORTED RES.: 300 dpi.
RAM (STD./MAX.): 13 MB/32 MB.
RAM (TEST CONFIG.): 13 MB.
RAM-UPGRADE COST: 4 MB, \$299; 8 MB, \$599.
POSTSCRIPT (VENDOR): Level 2 (QMS).
NO. OF RESIDENT FONTS: 65.
DIMENSIONS (L x W x H): 26.6 x 20.5 x 13.2 in.
WEIGHT: 102 lb.
COMPANY: QMS, Mobile, AL; 800-523-2696 or 205-633-4300.

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Enhanced Gray Scale	✱			
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† Optional

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CIRCLE 126 ON READER SERVICE CARD



transparencies — was remarkably good. Our panel of judges rated the HP DeskJet 1200C/PS higher than all of the thermal-wax printers overall and found its transparency output comparable to that of some of the dye-sub printers.

Our chief complaint about the DeskJet 1200C/PS concerned its documentation: It came with five manuals that focused almost entirely on use with a PC. Revised documentation should be shipping by the time you read this — we hope it's better.

Solid-Ink: Prints on Anything

Phase-change solid-ink printers are characterized by the strong, vibrant color they produce and the ability to print on virtually any medium. (We've actually seen one print on a tortilla.)

Solid ink is highly opaque, so it works very well for colored paper stock — none of the background colors affect the printed results. But for the same reason, solid ink is less than ideal for transparency output. When you use the Dataproducts

Technology Brief / inkjet

General graphics output quality	C
Text output quality	B
Photo output quality	D
Speed	D
Cost per page	B
Consumables management	B

Jolt PSe to produce transparencies, you must run them through a fuser (which is available as a \$299 option) to make it possible for light to pass through the ink. Similarly, the Tektronix Phaser III PXi requires the use of a laminator, which costs an extra \$1,000.

Of the two solid-ink printers we looked at, the Phaser III PXi was the faster in all of our speed tests, yielding results comparable to those of the faster dye-sub printers but significantly slower than those of the thermal-wax printers. The III PXi beat the Jolt PSe by about 80 percent overall, due largely to its having an Ethernet interface, which the Jolt PSe lacks. It also provided superior image quality for all the paper documents except the Photoshop image, for which the Jolt PSe came out marginally ahead.

(Tektronix has announced a second solid-ink model, the Phaser 300i [\$9,995 list], which promises to be faster than the III PXi and to have more-advanced graphics and networking abilities; its arrival this spring is set to coincide with a mark-down in the Phaser III PXi's list price to \$7,995.)

Technology Brief / solid-ink

General graphics output quality	B
Text output quality	B
Photo output quality	C
Speed	D
Cost per page	B
Consumables management	B



QMS ColorScript Laser 1000

RATING: ★★★
LIST PRICE: \$13,497.*
STREET PRICE: \$11,580.
PROS: Second-fastest printer tested overall. Bright, vibrant colors.
CONS: Immature technology. Poor photo output. Many consumables.
TECHNOLOGY: Laser.
ENGINE SPEED (COLOR): 2 ppm.
MAX. PAPER SIZE: 8.5 x 11 in.
SUPPORTED RES.: 300 dpi.
RAM (STD./MAX.): 12 MB/32 MB.
RAM (TEST CONFIG.): 14 MB.
RAM-UPGRADE COST: 4 MB, \$299; 8 MB, \$599.
POSTSCRIPT (VENDOR): Level 2 (QMS).
NO. OF RESIDENT FONTS: 65.
DIMENSIONS (L x W x H): 22.2 x 20.5 x 14.6 in.
WEIGHT: 106 lb.
COMPANY: QMS, Mobile, AL; 800-523-2696 or 205-633-4300.



RasterOps CorrectPrint 300i

RATING: ★★★
LIST PRICE: \$9,249.
STREET PRICE: \$8,195.
PROS: Easy plug-and-play setup. CONS: Lack of PostScript makes text and line art jaggy.
TECHNOLOGY: Dye-sub.
ENGINE SPEED (COLOR): .25 ppm.
MAX. PAPER SIZE: 8.5 x 11 in.
SUPPORTED RES.: 300 dpi.
RAM (STD./MAX.): 36 MB/48 MB.
RAM (TEST CONFIG.): 36 MB.
RAM-UPGRADE COST: 12 MB, \$1,389.
POSTSCRIPT (VENDOR): Level 1 (RasterOps).
NO. OF RESIDENT FONTS: 35.
DIMENSIONS (L x W x H): 17.3 x 17.2 x 12.6 in.
WEIGHT: 66 lb.
COMPANY: RasterOps, Santa Clara, CA; 800-729-2656 or 408-562-4200.



Sony UP-D7000

RATING: ★★★
LIST PRICE: \$9,445.
STREET PRICE: \$7,765.
PROS: Fastest dye-sub printer tested.
CONS: Lack of PostScript makes text and line art jaggy.
TECHNOLOGY: Dye-sub.
ENGINE SPEED (COLOR): .5 ppm.
MAX. PAPER SIZE: 8.5 x 11 in.
SUPPORTED RES.: 500 dpi.
RAM (STD./MAX.): 0 MB/0 MB.
RAM (TEST CONFIG.): 0 MB.
RAM-UPGRADE COST: NA.
POSTSCRIPT (VENDOR): None.
NO. OF RESIDENT FONTS: None.
DIMENSIONS (L x W x H): 19.4 x 16.75 x 7 in.
WEIGHT: 44 lb.
COMPANY: Sony Electronics, Inc., Montvale, NJ; 800-472-7669 or 201-930-7796.



SuperMac ProofPositive Full-Page Printer

RATING: ★★★★
LIST PRICE: \$8,995.
STREET PRICE: \$8,865.
PROS: PostScript can be easily upgraded, extending the printer's useful life. Excellent photo output.
CONS: Software-based PostScript requires dedicated Mac with lots of memory to serve as "brain."
TECHNOLOGY: Dye-sub.
ENGINE SPEED (COLOR): .5 ppm.
MAX. PAPER SIZE: 8.5 x 11 in.
SUPPORTED RES.: 300 dpi.
RAM (STD./MAX.): 0 MB/0 MB.
RAM (TEST CONFIG.): 0 MB.
RAM-UPGRADE COST: NA.
POSTSCRIPT (VENDOR): Level 2 (Adobe, in software).
NO. OF RESIDENT FONTS: None.
DIMENSIONS (L x W x H): 17.5 x 16.1 x 12.2 in.
WEIGHT: 59 lb.
COMPANY: SuperMac, Sunnyvale, CA; 408-541-6100.

*Price reflects upgrade to 16 MB of RAM; upgrade to 14 MB is no longer available.



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Laser: Fast, Cost-Effective

The QMS ColorScript Laser 1000 brings the advantages of laser technology — high speed and plain-paper capability — and extremely low per-page costs to the desktop realm for the first time. At less than \$14,000, its list price is at least half that of the other color laser printers that are available today.

The ColorScript Laser 1000 was the second-fastest printer we tested and had the lowest cost per page, but its output quality was a disappointment, with dull colors and obvious banding in graduated backgrounds for the Power-Point handout and transparencies. Nevertheless, for producing multiple copies of color documents, the ColorScript Laser 1000 is probably the most capable high-volume printer we looked at.

Technology Brief / laser

General graphics output quality	B
Text output quality	B
Photo output quality	C
Speed	A
Cost per page	A
Consumables management	C

Color Conclusions

If your office generates lots of presentation graphics and your printer often keeps coworkers waiting, your obvious candidate is the speedy Tektronix Phaser 200i thermal-wax printer.

The combination of a powerful processor, a speedy engine, and an Ethernet interface make it far and away the fastest of these printers. (The next-generation Phaser 220i, which will be available by the time you read this, promises even greater speed plus better output, thanks to 600-x-300-dpi resolution, for a price comparable to the Phaser 200i's. We've seen output from a Phaser 220i, and the printer's results are impressive.)

For those whose paramount concern is the image quality they can get from a printer, the dye-sub Tektronix Phaser IISDX and SuperMac ProofPositive Full-Page Printer are close contenders for top honors. The Phaser IISDX's speed earns it our recommendation.

For those whose major consideration is cost, the Hewlett-Packard DeskJet 1200C/PS inkjet printer is worth a look. It doesn't break any speed records, but it proved to be a solid, reliable performer that delivered exceptional transparency output.

Contributing editor Bruce Fraser's fascination with color can be attributed to years spent under the gray skies of Edinburgh, Scotland, and in San Francisco's fog belt. Jeff Davis, senior project leader at ZD Labs, oversaw the testing for this article.



Tektronix Phaser 200e

RATING: ★★★★★
LIST PRICE: \$4,090.
STREET PRICE: \$3,755.
PROS: Provides ColorCoat ribbon produces good results on plain paper (although it reduces output speed). List price dropped \$1,000 on Jan. 1.
CONS: Optional plain-paper ribbon slows print time.
TECHNOLOGY: Thermal-wax.
ENGINE SPEED (COLOR): 2 ppm.
MAX. PAPER SIZE: 8.5 x 11 in.
SUPPORTED RES.: 300 dpi.
RAM (STD./MAX.): 4 MB/8 MB.
RAM (TEST CONFIG.): 8 MB.
RAM-UPGRADE COST: 4 MB, \$395.
POSTSCRIPT (VENDOR): Level 2 (Adobe).
NO. OF RESIDENT FONTS: 39 max., 17 standard.
DIMENSIONS (L x W x H): 17.5 x 13.5 x 11 in.
WEIGHT: 40 lb.
COMPANY: Tektronix, Wilsonville, OR; 800-835-6100 or 503-682-7377.

Tektronix Phaser 200i

RATING: ★★★★★
LIST PRICE: \$8,480.
STREET PRICE: \$6,830.
PROS: Fastest printer tested overall. Optional ColorCoat ribbon provides good results on plain paper (although it reduces output speed).
CONS: Optional plain-paper ribbon slows print time.
TECHNOLOGY: Thermal-wax.
ENGINE SPEED (COLOR): 2 ppm.
MAX. PAPER SIZE: 8.5 x 11 in.
SUPPORTED RES.: 300 dpi.
RAM (STD./MAX.): 6 MB/14 MB.
RAM (TEST CONFIG.): 14 MB.
RAM-UPGRADE COST: 4 MB, \$395.
POSTSCRIPT (VENDOR): Level 2 (Adobe).
NO. OF RESIDENT FONTS: 39.
DIMENSIONS (L x W x H): 14.5 x 18.8 x 13.4 in.
WEIGHT: 40 lb.
COMPANY: Tektronix, Wilsonville, OR; 800-835-6100 or 503-682-7377.

Tektronix Phaser IIsox

RATING: ★★★★★
LIST PRICE: \$10,690.
STREET PRICE: \$9,765.
PROS: Best output quality of all the printers tested. Extremely vibrant transparencies.
CONS: Extremely slow in transparency mode.
TECHNOLOGY: Dye-sub.
ENGINE SPEED (COLOR): 3 ppm.
MAX. PAPER SIZE: 8.5 x 11 in.
SUPPORTED RES.: 300 dpi.
RAM (STD./MAX.): 16 MB/64 MB.
RAM (TEST CONFIG.): 16 MB.
RAM-UPGRADE COST: 4 MB, \$395.
POSTSCRIPT (VENDOR): Level 2 (Adobe).
NO. OF RESIDENT FONTS: 39.
DIMENSIONS (L x W x H): 17.4 x 17.2 x 14.7 in.
WEIGHT: 73 lb.
COMPANY: Tektronix, Wilsonville, OR; 800-835-6100 or 503-682-7377.

Tektronix Phaser III PXi

RATING: ★★★★★
LIST PRICE: \$11,085.
STREET PRICE: \$10,040.
PROS: Vibrant color. Ability to print on tabloid-sized (11 x 17 in.) pages.
CONS: Slow.
TECHNOLOGY: Solid-ink.
ENGINE SPEED (COLOR): 2 ppm.
MAX. PAPER SIZE: 11 x 17 in.
SUPPORTED RES.: 300 dpi.
RAM (STD./MAX.): 10 MB/22 MB.
RAM (TEST CONFIG.): 14 MB.
RAM-UPGRADE COST: 4 MB, \$395.
POSTSCRIPT (VENDOR): Level 2 (Adobe).
NO. OF RESIDENT FONTS: 39.
DIMENSIONS (L x W x H): 27 x 25 x 13.5 in.
WEIGHT: 90 lb.
COMPANY: Tektronix, Wilsonville, OR; 800-835-6100 or 503-682-7377.

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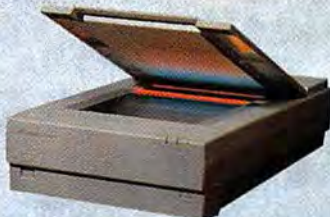
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Entering the World of 3-D

CALLING ALL ARTISTS! Better products and less-expensive hardware mean that now's the time to invest in 3-D software.

IF YOU ARE CAPTIVATED by the high quality of 3-D images such as the ones in this article but have been using a 2-D-illustration program such as Aldus FreeHand until now, then you're a likely candidate for using a 3-D program. As recently as a couple of years ago, 3-D programs were used only by an exclusive elite — those who could afford fast Macs and who had the patience to master arcane interfaces. Only Macromedia's entry-level modeler, Swivel 3D Professional (a charming program that runs fine even on LC-class Macs), made 3-D accessible to the masses. But as hardware prices plummet and vendors revamp their products' interfaces, artists can move beyond the capabilities of Swivel 3D

and animation features, whereas specialty programs offer a subset of these features. Integrated programs are easier to use and less expensive than specialty programs, but specialty programs have stronger features in a specific area. Most professional 3-D designers own more than one program — a modeling program as well as separate rendering and animation programs, for instance. Each of the programs reviewed here — the top packages available today — includes modeling capabilities.

Producing 3-D Images

Before plunging into the heart of the matter — which product's best for you — you need to understand what's involved in 3-D production. Bear with us. Reading the following

By David Biedny

definitions now will keep you from getting confused later.

Modeling: *the process of creating 3-D objects.*

Modeling tools make it easy to create basic shapes, or *primitives*, such as cubes and spheres as well as *lathed* and *extruded* shapes (see the "Visual Glossary" sidebar). Advanced modeling programs offer special features such as *lofting*, *sweeping*, and *vertex-level editing*. When you're working in 3-D space, you can rotate models to display them from any angle. In fact, most 3-D programs give you four views of your object — top, bottom, left side, and right side. Generally, you can make changes to the object while in any view and see the changes reflected instantly in all views.

Rendering: *adding attributes to the surfaces of objects.*

Once you've created the objects in your image, you can assign

surface attributes (textures) to them, set up and adjust lighting, and take a snapshot of the resulting scene with a virtual camera.

You can render an image at several quality levels, from flat (which all the programs support) to ray tracing. The higher the quality level, the longer the image takes to render — anywhere from several minutes to several days. (PowerPC Macs will cut rendering times dramatically.) Many professionals use a low-quality-rendering mode to preview a scene and then use a high-quality mode to produce final images.

Animation: *making your images move.*

Here's where 3-D technology really begins to pay off. To display a scene from another vantage point, you simply move your virtual camera to a different location. Unlike with flat, 2-D illustrations, you don't need to re-create the scene to show a new view. Thus, if you move the camera around a scene in small increments and take a snapshot at each camera position, you automatically create an animation that shows a revolving scene. Likewise, you can take snapshots of changes to individual objects in a scene (such as changes in size, orientation, or color) in order to animate the objects.

Any 3-D program (or combination of programs) gives you access to these basic modeling, rendering, and animation features. As you become more experienced in working with 3-D images, you'll discover where you need more power and where you don't. You'll also start to learn a new way of working — creating objects in 3-D space requires, literally, a new way of looking at images.

The Programs Up Close

To become accustomed to working in 3-D space, some users may want to start with an entry-level package. These programs are the easiest to learn — you'll be less likely to give up in frustration along the way. We discuss the programs reviewed here in order of increasing street price (which, not coincidentally, corresponds to complexity) to help you figure out where to draw the line.

Ray Dream Designer (\$250). Previously, Ray Dream Designer, from Ray Dream, consisted of two modules — LightForge, for creating objects, and SceneBuilder, for adding lights and textures to objects in a scene. In version 3.0, these modules have been combined to create a single modeling and rendering application. Ray Dream has also significantly enhanced the program; Designer contains potent features that will appeal to beginning as well as advanced users.

Designer includes a selection of powerful lofting and lathing functions. There's a cross-section skinning tool that has an additional sweep control, which allows you to create, say, a fork that's bowed instead of flat. As you're building an object, Designer renders a smooth, shaded preview of it — a nice feature that will appeal strongly to those who have a hard time

The Bottom Line

OUR "MACUSER RECOMMENDS" CHOICES are the products we see as overall crowd-pleasers, but that doesn't mean one of them is best for your particular job. In fact, many 3-D designers have several of these products in their tool kits so they can pick and choose among them.

⊕ = OUTSTANDING

● = ACCEPTABLE

⊖ = POOR

PRICE/
PERFORMANCE

CUSTOMER
SERVICE

INTERFACE

FEATURES

★★★★ Ray Dream Designer 3.0 ⊕ ● ⊕ ●
A combined modeling and rendering program, Ray Dream Designer (\$349 list, \$250 street) is a top choice for still-image artists. The program offers powerful modeling tools and superb texture-placement controls.

★★★★ StudioPro 1.0 ⊕ ● ⊕ ⊕
An excellent midrange integrated program, StudioPro (\$1,495 list, \$900 street) offers a full feature set at a reasonable price. The program's best feature is its powerful free-form modeler, 3D Sculptor.

★★★★ form•Z 2.3 ⊕ ● ● ⊕
The uncompromised modeling prowess of form•Z (\$1,495 list, \$1,350 street) makes it a perfect choice for professional designers. The learning curve is steep, however, and you'll probably want a high-end rendering program such as ElectricImage to go along with it.

★★★★ Infini-D 2.5 ⊕ ● ⊕ ●
For producing basic animations, Infini-D (\$695 list, \$520 street) is an excellent choice. This inexpensive all-in-one program has an intuitive interface and some sophisticated animation features.

★★★★ MacroModel 1.5	●	⊖	●	⊕
★★★★ Presenter Professional 1.5	●	●	●	⊕
★★★★ StrataVision 3d 2.6	●	●	⊖	⊕
★★★★ Sculpt 3D 3.1 and 4D 3.1	●	●	⊖	⊕
★★★★ Alias Sketch! 1.5	⊖	●	⊖	●

Listing is alphabetical within groups of equal mouse ratings.



figure 1 / **The artists who created this image** didn't want to invest a fortune in 3-D-modeling and -rendering programs, so they bought Ray Dream Designer, an inexpensive program that offers both capabilities. The program's basic modeling tools make lathing and creating geometric shapes a breeze, but it takes persistence to create natural shapes such as these flowers, says artist Terry Van Huis-Moore.



figure 2 / **Achieving the dramatic misty effect** in this island world was as easy as flipping a switch, says artist Robyn Miller. StrataVision 3d, the lower-end version of Strata's StudioPro, gives you a dialog box for specifying fog effects: You set the depth at which the fog begins and at which it becomes opaque, and the program figures out how dense it should be.

visualizing what the results of their actions will be.

Designer's texture controls have been overhauled and are now among the most capable of any 3-D program, enabling you to build highly complex textures. For example, you can specify a checkerboard texture and then have the program mask any two textures into the check pattern, creating, say, a checkerboard pattern of orange-polka-dotted and paisley squares. Designer also includes high-quality procedural (computer-generated) textures such as wood and marble.

Texture placement in Designer is a snap. You can drag a texture's bounding box around any 3-D shape and watch as the bounding box deforms in real time. Because the texture conforms to the object's shape, placement is always precise.

One of Designer 3.0's most unusual features is its ability to paint directly onto a surface, with the paint strokes conforming to the contours of the shape. The brushes aren't of the highest quality, but Ray Dream and Fractal (the developer of Painter, a 32-bit paint program) have announced that Painter will be able to paint directly onto a rendered 3-D image imported from Designer. You can select atmospheric density, or fog, in Painter, for example, and using your chosen brush, paint onto a rendered image imported from Designer. The fog will cover objects located a significant distance from the camera and leave objects closer to the viewer more transparent.

StrataVision 3d (\$500). StrataVision 3d 2.6, from Strata, is a competent modeling, rendering, and animation program. The package offers more modeling prowess than does its nearest competitor, Infini-D, but its interface is not as intuitive nor are its animation features as good. You can, however, upgrade from StrataVision 3d to StudioPro — Strata's high-end integrated package — for about \$600. (According to Strata, a new version of StrataVision 3d will be available by the time you read this. The new version will include many of StudioPro's

features — vertex-level editing, painting features, and additional animation capabilities.)

StrataVision includes a full arsenal of modeling tools, from those for creating basic shapes to a good lofting tool, for creating complex, skinned shapes. StrataVision can quickly extrude TrueType and PostScript fonts into 3-D logos (although the beveled edges aren't quite as good as those produced by Infini-D). If the built-in tools aren't enough, you can add more by using StrataVision's plug-in architecture. Strata includes some plug-in primitives such as a torus (doughnut), a pyramid, a rounded-edge cylinder, and a teapot in the StrataVision package.

StrataVision's rendering quality is excellent, but the program is slow. In fact, its big brother, StudioPro, almost twice as fast, is nevertheless considered only middle-of-the-road in terms of speed. Still, the degree of control you have over the rendering options and the quality of the final image are excellent. The program gives you an array of lighting options, including good soft-shadow effects. It also offers a healthy range of built-in textures — static texture maps as well as procedural textures such as stone, wood, and metal — all of which are fully editable.

Infini-D (\$520). The greatest strengths of Infini-D 2.5, Specular International's integrated modeling, rendering, and animation program, are its intuitive interface and solid animation features. The program's modeler is not as strong as the ones in competing products — for instance, it lacks the comprehensive sweeping tools available in Ray Dream Designer. Still, Infini-D is an excellent choice for artists who want a reasonably priced program and for those who want to avoid a steep learning curve.

The program contains a variety of basic shapes and some intriguing tools (such as a terrain tool, for making realistic, as

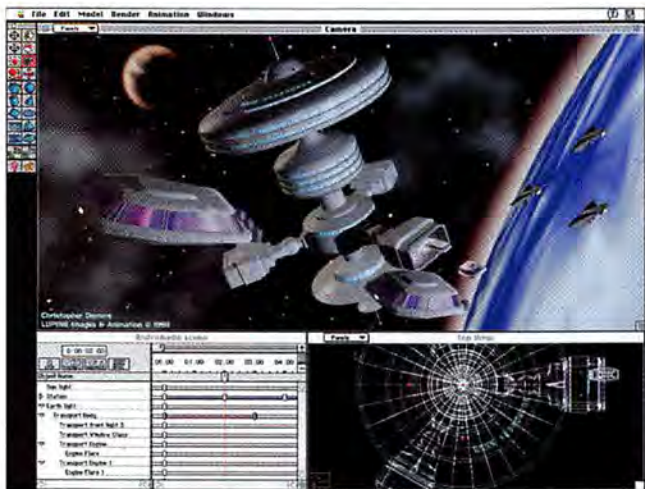


figure 3 / **Artist Christopher Demers used Infini-D** to create and animate this image. Demers launched the space pods (in the foreground) in an upward arc away from the station. Using version 2.5's autobanking feature, he was able to give the vehicles a realistic trajectory without having to do a lot of calculation.



figure 4 / **To create this Packard's high-resolution curves**, Donald Grahame imported a 2-D image into MacroModel. The program allowed him to make true rounded surfaces, rather than curves composed of thousands of polygons. MacroModel includes the Nudge command, for tweaking curves' control points.

well as downright alien, landscapes). Infini-D also supports System 7's publish-and-subscribe. You can import 2-D shapes created in programs such as Adobe Illustrator into Infini-D and extrude them. If you change the outline in Illustrator and update the edition, Infini-D will automatically update the extruded shape, even if you've placed that shape in a complicated animation.

Infini-D has excellent texture-generating and -layering options. The program comes with a variety of procedural textures (such as marble, wood, and water ripples). The Surface Composer lets you place numerous textures on the surface of an object, with exact precision. You can, for instance, create a bottle with one texture that defines the bumpiness of the glass, another texture that defines which parts of the bottle are shiny and which are dull, and a third that shows up as a label. The preview feature lets you see the textures mapped onto the object before you render the entire scene.

Infini-D has long been a favorite of lower-end animators. You can animate a wire-frame rendition of a scene so that you can determine what changes you want to make before rendering it. Other special features include autobanking (for producing smooth flybys) and velocity smoothing (to make objects move naturally). Infini-D is also one of the only programs that can morph two objects that have different numbers of polygons or vertices.

Alias Sketch! (\$550). If you want to model smooth, curved, organic shapes (shapes that have asymmetrical variations, such as those occurring in nature), you should consider Alias Sketch! 1.5, a powerful spline-based modeler from Alias. The first version of Alias Sketch! suffered from a surplus of quirks and abnormalities. With version 1.5, Alias has addressed many of those problems — for instance, the program's redraw speed, although still not top-notch, is greatly improved.

Sketch! allows you to create complex paths by specifying a reference path and then applying a variety of sweeping and extrusion commands to it. The program includes a full complement of tools for editing an object's vertices as well as its mesh (or skin). These tools let you reshape an object by dragging a portion of it in any direction. The program also includes a good set of snap-to commands that help you align objects precisely.

Sketch!'s rendering quality and speed will suit most users. The program includes a variety of controls for lighting, texturing, and rendering (including anti-aliasing and great soft shadows). Version 1.5 of Sketch makes it easy to place textures onto objects. Perspective matching, a feature unique to this program, allows you to use a scanned background image as a reference point when setting the perspective drop-off of 3-D models, so you can create a 3-D object that is perfectly integrated with a scanned background.



figure 5 / **To create this fish-eats-fish filmstrip**, Rob Magiera used Alias Sketch! to design the aquatic scene and then reshaped and rerendered the image to get several different stills. He used Photoshop to combine the stills for the movie effect and then imported them back into Sketch!, where he applied them as a texture map.

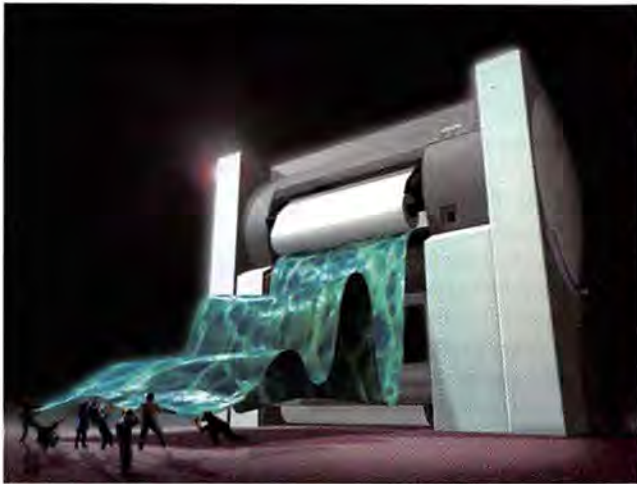


figure 6 / It took Design Edge artists less than five minutes, using Presenter Professional, to form the paper billowing from this printer. The artists drew a curvy line, used the Extrude command, and then grabbed control points along the line until they got these pleasing waves of paper.

Although Sketch! offers a decent set of advanced 3-D tools, the program's interface and performance leave much to be desired. Even on a fast Mac, Sketch! is less than interactive, and we ran into some pesky bugs when performing advanced vertex-level editing. Alias claims it will rewrite Sketch! to take advantage of Apple's PowerPC Macs — and that new version may be just what the doctor ordered.

StudioPro (\$900). StudioPro 1.0, a modeling, rendering, and animation program from Strata, offers a full feature set for a reasonable price. StudioPro's rendering speed is almost twice StrataVision 3d's, bringing the program up to par with others in the same price range. But it's StudioPro's 3D Sculptor — a powerful yet easy-to-use free-form modeler — that makes this midrange program stand out.

3D Sculptor offers full vertex-level editing. You can edit the vertices of imported primitives — including lathed, extruded, and skinned objects — and you can add new vertex points to these objects. In addition, 3D Sculptor has spline-based deformation controls, so you can change the angle of surface curves that end at a specific vertex. 3D Sculptor's only drawback is its lack of a constraining grid in the free-form editing window, which makes creating symmetrical deformations a bit harder than it would otherwise be.

The animation tools of StudioPro will



figure 7 / To ensure that the windshield and the black panel (on which the number 37 is emblazoned) of this motorcycle fit together perfectly, artist Joseph Ashear used Sculpt 3D to create them as one unit. Ashear used a Boolean function, which works much like a cookie cutter, to separate the windshield from the panel so he could apply different textures to the two parts.

appeal to professional animators. You can display motion paths for objects and edit the paths directly — a handy feature for fine-tuning animations that use multiple objects with various motion characteristics. You can also animate objects by setting the program to bounce them automatically off a floor.

You can apply a variety of physical effects to objects to create slick special effects. You can, for instance, break a model into polygonal shards and then apply a gravitational effect that causes the shards to fall or fly in all directions. You can even specify how fast the shards fall or how much force gravity exerts. Strata offers a \$69 add-on module, MultiMorph, that provides morphing and particle morphing (the ability to shatter an object and reassemble the shards into a new object while at the same time morphing the objects' textures).



figure 8 / Organic shapes, such as the hair on this chrome man, are notoriously difficult to achieve with 3-D programs. Using form•Z, George Chang set up a ribbed model of variously sized cross sections of hair. Chang placed the cross sections along the swooped line of the man's hair and then used form•Z's lofting feature to fill the spaces between ribs.

MacroModel (\$1,000). MacroModel 1.5, from Macromedia, is a very capable modeler that lets you create complex shapes with numerical precision. The program does not include animation capabilities, though, and its rendering quality is good only for previewing images. But the program has a huge range of options for creating models, and spending some time learning to use the program (which has a distinct working style and a steep learning curve) pays off. MacroModel is available for PCs as well as for Macs, and documents are interchangeable across platforms.

Trends / more-powerful 3-D

EVER SINCE 3-D SOFTWARE MADE THE LEAP from its workstation-only domain to the desktop, vendors have searched for ways to make the products more powerful. Expect the way-cool-feature war to continue heating up, especially with the release of the first batch of PowerPC Macs.

Modeling tools will make creating surfaces and complex geometries a lot easier. VIDI plans to release ModelerPRO, a program that will have powerful Boolean operators. Graphisoft (South San Francisco, California) will release Zoom, a high-end modeler that competes with form•Z and also offers true Boolean operations. Pixel Putty (a plug-in for Pixar's ShowPlace, from the Valis Group, of Tiburon, California) and version 3.0 of StrataVision 3d will offer free-form surface modeling. CyberMesh, an innovative Photoshop plug-in from Knoll Software, of San Rafael, California, will turn gray-scale images into complex 3-D forms.

PowerPC Macs will speed up rendering. All the 3-D-software vendors are rewriting their programs to take advantage of the PowerPC chip. You'll see overall speed gains of three to five times for these programs. The extra power boost will also allow vendors to add special features such as particle effects, depth of field, and motion blur to their programs. Look for particle effects in Typestry 2.0, from Pixar (San Rafael, California), and in ElectricImage 2.0.

Expect more-realistic animation features. VIDI's forthcoming OZ, for example, will automatically calculate an object's gravity, mass, and acceleration to create a physically accurate animation. ElectricImage 2.0 will precisely synchronize sound with events in an animation and let you twist and bend objects.

Expect near-real-time walk-throughs, thanks to faster Macs and more-efficient algorithms. Radiosity algorithms that render an entire space at once will finally appear for the Mac. (Radiosity is a photo-realistic method of rendering diffuse reflective surfaces such as painted walls.) Look for radiosity-based rendering technology from Virtus (Cary, North Carolina) and Strata.

Multiprocessing and network rendering should become even more accessible. YARC Systems (Newbury Park, California) and DayStar Digital (Flowery Branch, Georgia) will offer fairly inexpensive (\$2,000 to \$3,000) coprocessing cards based on the PowerPC chip. Most likely you'll want to install one of these NuBus cards in your PowerPC Mac. / Sean Safreed

MacroModel includes strong 2-D-design tools for creating paths that you can then turn into 3-D objects. The program also provides a full complement of extrusion, lathing, sweeping, and skinning tools, which you can use in combination to create organic shapes.

MacroModel allows you to edit models at various levels of complexity. At one level, you can stretch and squash an entire object; at a deeper level, you can edit individual vertices. Twist, bend, and taper controls let you distort entire shapes or portions of models and can be used to create complex animations such as a dancing figure that twists from side to side while bent at the waist. A powerful set of grid and snap-to options makes it relatively easy to navigate and control every aspect of MacroModel's 3-D world.

The program includes the same object-linking tools offered by its kid brother, Swivel 3D Professional (\$299 street). These tools let you use ball joints, slot joints, and other mechanically correct links to connect parts of a model. The links are hierarchically constrained — how one link moves affects how the others move — and you can edit any portion of a linked hierarchy. Used in conjunction with an animation program, MacroModel's linking capabilities are great for creating fluid animations of elaborate objects.

When you're working with moderately complex objects, however, MacroModel's screen redraw slows to a crawl. This should change, because Macromedia has plans to rewrite

MacroModel to take advantage of the PowerPC chip's faster processing speed.

Macromedia also offers a rendering and animation program — Macromedia Three-D — but the product is somewhat behind the times. If you need a professional-level rendering and animation package to work alongside MacroModel, check out ElectricImage (\$7,495 street), from Electric Image, of Pasadena, California. At its price, ElectricImage isn't an impulse buy, but the program provides high-end rendering and animation features not available in any other program.

form•Z (\$1,350). You can use form•Z 2.3, from auto•des•sys, to tackle monstrously complicated modeling tasks, such as creating a detailed image of a jet fighter. But form•Z's interface, with its CAD-like feel, can be intimidating. Spending some time with the program's tutorials and extensive documentation will bring you up to speed, however, and you can simplify your palettes by turning off the tools you aren't using.

form•Z, like Sketch! and MacroModel, gives you a single view of a scene (although you can display four views when you're editing an image). You create 3-D objects by drawing 2-D shapes onto a plane that lies along the active axis and then applying any of a mind-boggling array of 3-D-forming options (including a plethora of extrusion, sweeping, skinning/lofting, and lathing tools) to them. The resulting mesh is completely adjustable, and you are able to edit it with an almost



Alias Sketch! 1.5

RATING: ★★

LIST PRICE: \$995.

STREET PRICE: \$550.

UPGRADE PRICE: From version 1.02, \$25.

PROS: Powerful asymmetrical-modeling tools. Good rendering quality.

CONS: Difficult to master. Slow.

IMPORT FORMATS: Adobe Illustrator, Aldus FreeHand, Alias Pix, Alias upFront, DXF, EPS, IGES, PICT, TIFF.

EXPORT FORMATS: DXF, EPS raster, IGES, PICT, RIB, TIFF.

COPY PROTECTION: Serial-number scheme.

TECH SUPPORT: On-line forums.

COMPANY: Alias Research, Toronto, ON, Canada; 800-447-2542 or 512-345-6554; 512-345-9509 (fax).



form•Z 2.3

RATING: ★★★★★

LIST PRICE: \$1,495.

STREET PRICE: \$1,350.

UPGRADE PRICE: From version 2.0, \$125; from other versions, \$295.

PROS: High-end modeling capabilities. Wide array of 3-D-forming options.

CONS: Steep learning curve.

IMPORT FORMATS: Adobe Illustrator, DXF, FACT, IGES, PICT, STL, 3DGF.

EXPORT FORMATS: Adobe Illustrator, DXF, EPS, FACT, IGES, PICT, RIB, STL, 3DGF, TIFF.

COPY PROTECTION: ADB key.

TECH SUPPORT: Four months free, then \$185 per year. On-line forums.

COMPANY: auto•des•sys, Columbus, OH; 614-488-8838; 614-488-0848 (fax).



Infini-D 2.5

RATING: ★★★★★

LIST PRICE: \$695.

STREET PRICE: \$520.

UPGRADE PRICE: From version 2.0, \$129.

PROS: Intuitive interface. Excellent texture handling.

CONS: Weak modeling capabilities.

IMPORT FORMATS: DXF, EPS, PICS, PICT, Swivel 3D Pro.

EXPORT FORMATS: DXF, PICS, PICT, TIFF.

COPY PROTECTION: Serial-number scheme.

TECH SUPPORT: On-line forums.

COMPANY: Specular International, Amherst, MA; 800-433-7732 or 413-253-3100; 413-253-0540 (fax).



MacroModel 1.5

RATING: ★★★★★

LIST PRICE: \$1,495.

STREET PRICE: \$1,000.

UPGRADE PRICE: \$149.

PROS: Powerful modeling capabilities. Numerical precision.

CONS: Slow. Poor rendering quality.

IMPORT FORMATS: DXF, EPS, PICT.

EXPORT FORMATS: DXF, PICT, RIB, Swivel 3D Pro.

COPY PROTECTION: Network scheme.

TECH SUPPORT: 90 days free, then \$349 per year, with toll-free number.

COMPANY: Macromedia, San Francisco, CA; 415-252-2000; 415-626-0554 (fax).



Presenter Professional 1.5

RATING: ★★★★★

LIST PRICE: \$2,995.

STREET PRICE: \$2,700.

UPGRADE PRICE: \$199.

PROS: Well suited to creating technical images. Excellent numerical accuracy.

CONS: Steep learning curve. Weak animation tools.

IMPORT FORMATS: DXF, ElectricImage, EPS, IGES, PICT, Super3D, VersaCAD.

EXPORT FORMATS: DXF, ElectricImage, EPS, PICT, RIB, VersaCAD, Wavefront.

COPY PROTECTION: ADB key.

TECH SUPPORT: On-line forums.

COMPANY: VIDI, Monrovia, CA; 818-358-3936; 818-358-4766 (fax).

overwhelming number of vertex-level controls.

You can apply a variety of bevel effects to all edges or to selected edges of an object; you can also apply them to text to create 3-D logos. form•Z gives you a great deal of control over the mesh characteristics of objects (including separate x, y, and z increments). You can choose any point or group of points on a mesh and drag them to reshape the mesh. The program provides profile settings for controlling the way a mesh is distorted: A rounded profile produces a bulbous "dimple" when the mesh is reshaped, whereas a straight profile results in sharp spikes protruding from the mesh surface.

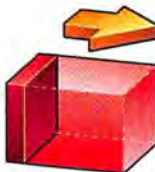
form•Z is one of the only programs to offer 3-D Boolean operations, with which any shape can modify any other shape. You can build complex geometries by applying union, subtraction, and intersection Boolean operations to a series of simple shapes. You can also use a shape to break apart another shape (for instance, using a wedge shape to split a circle).

form•Z's renderer is bare-bones. You can use the fast, shaded mode to display a basic representation of a model as you work, but the other rendering algorithms are so sluggish you'll want to avoid them completely. form•Z offers superb modeling prowess, but you'll need to look elsewhere for rendering and animation.

Presenter Professional (\$2,700). Because it includes some powerful CAD features, Presenter Professional 1.5, from VIDI,

A Visual Glossary

Boolean operations: When you modify a shape with another shape, you're performing a Boolean operation. Shown here is a subtraction operation.



extrusion: To extrude an object, you extend it outward into 3-D space.



lathing: You create a lathed object, such as this cup, by spinning an outline around a central axis.



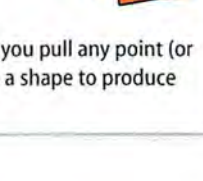
skinning/lofting: To make a skinned, or lofted, object such as a boat hull, you model a series of ribs and stretch a skin over them.



sweeping: Sweeping lets you extrude a basic shape along any path to create a sophisticated tubular form.



vertex-level editing: Vertex-level editing lets you pull any point (or set of points) away from a shape to produce complex geometries.



**Ray Dream Designer 3.0**

RATING: ★★★★★
LIST PRICE: \$349.
STREET PRICE: \$250.
UPGRADE PRICE: \$99.
PROS: Good modeling and rendering tools. Low price.
CONS: No animation capabilities.
IMPORT FORMATS: addDepth, Adobe Illustrator, Aldus FreeHand, DXF, EPS, JPEG, MacPaint, Photoshop, PICS, PICT, TIFF.
EXPORT FORMATS: DXF, EPS, JPEG, Photoshop, PICS, PICT, TIFF.
COPY PROTECTION: None.
TECH SUPPORT: On-line forums.
COMPANY: Ray Dream, Mountain View, CA; 800-846-0111 or 415-960-0768; 415-960-1198 (fax).

**Sculpt 3D 3.1 and 4D 3.1**

RATING: ★★★★★
LIST PRICE: Sculpt 3D, \$2,995; Sculpt 4D, \$3,995.
STREET PRICE: Sculpt 3D, \$2,995; Sculpt 4D, \$3,995.
UPGRADE PRICE: Depending on version, from \$0 to \$495. To upgrade from one Sculpt program to another, you pay the difference in price.
PROS: Excellent vertex-level editing tools. Exquisite rendering quality.
CONS: Steep learning curve. Poor interface.
IMPORT FORMATS: DXF, EPS, EVI, FACT, IGES, SA4D, STL, 3DGF.
EXPORT FORMATS: DXF, EVI, FACT, IGES, SA4D, STL, 3DGF.
COPY PROTECTION: ADB key.
TECH SUPPORT: Free for first year. On-line forums.
COMPANY: Byte by Byte, Austin, TX; 512-795-0150; 512-795-0021 (fax).

**StrataVision 3d 2.6**

RATING: ★★★★★
LIST PRICE: \$695.
STREET PRICE: \$500.
UPGRADE PRICE: From version 2.5, \$39; from version 2.0, \$89; from version 1.x, \$199.
PROS: Good selection of modeling tools. Excellent rendering quality.
CONS: Weak animation features. Slow.
IMPORT FORMATS: Adobe Illustrator, DXF, EPS, IGES, MiniCAD+, PICS, PICT, Super3D, Swivel 3D Pro.
EXPORT FORMATS: DXF, EPS, PICS, PICT, TIFF.
COPY PROTECTION: Serial-number scheme.
TECH SUPPORT: On-line forums.
COMPANY: Strata, St. George, UT; 800-869-6855 or 801-628-5218; 801-628-9756 (fax).

**StudioPro 1.0**

RATING: ★★★★★
LIST PRICE: \$1,495.
STREET PRICE: \$900.
UPGRADE PRICE: From StrataVision 3d, \$599.
PROS: Powerful modeling capabilities. Excellent animation special effects.
CONS: Does not support network rendering.
IMPORT FORMATS: Adobe Illustrator, DXF, EPS, IGES, MiniCAD+, PICS, PICT, Super3D, Swivel 3D Pro.
EXPORT FORMATS: DXF, EPS, PICS, PICT, TIFF.
COPY PROTECTION: Serial-number scheme.
TECH SUPPORT: On-line forums.
COMPANY: Strata, St. George, UT; 800-869-6855 or 801-628-5218; 801-628-9756 (fax).

has a loyal following of technical users — people such as industrial engineers who need numerical precision when creating, say, models of items for manufacture. The program also sports a professional-quality modeler and renderer. Presenter Professional's animation portion isn't suitable for production-level work, but the program provides solid options for animating the camera in order to create fly-through movies. (VIDI claims that the next version of Presenter Professional will contain many new animation tools.)

Presenter Professional's modeling tools give you a great deal of control when you're creating complicated models. Advanced modeling features include a free-form modeler, great vertex-level editing options, spline-based modeling controls, and good mesh controls. Presenter Professional's CAD-like features include the ability to calculate the mass and weight of objects and the ability to control parameters with absolute numerical accuracy. (If you want an even more traditional CAD package, you should look at DesignCAD [\$160 street], a 2-D-drafting program from DesignCAD [Pryor, Oklahoma] that offers some 3-D features such as vertex-level editing and extrusion and sweeping tools. Unlike Presenter Professional, however, DesignCAD does not offer spline-based editing or solid-modeling capabilities.)

For rendering purposes, Presenter Professional provides an excellent interface to MacRenderMan, Pixar's high-end rendering language. You can access all the attributes and

parameters in MacRenderMan's shaders from within Presenter Professional to produce high-quality rendered images. MacRenderMan's interface is difficult, however.

Sculpt 3D (\$2,995) and Sculpt 4D (\$3,995). If you can imagine it, chances are Sculpt can model it. Sculpt 3D 3.1 and Sculpt 4D 3.1, from Byte by Byte, are extremely capable (and complex) modeling and rendering programs. (The only difference between the two programs is that only Sculpt 4D includes animation tools). Geared toward users with demanding modeling tasks, Sculpt provides an unprecedented degree of control, but at a price: The program has one of the steepest learning curves of any of these packages, and its interface is much less intuitive than a typical Mac program's (Byte by Byte claims that the interface will be revamped in the next release of the product).

Sculpt includes a free-form modeler as well as some of the best vertex-level editing tools of any of the modelers. Exquisite sweeping and cross-sectional-modeling tools allow you to create even the most perplexing shapes — for example, animals and humans. The program offers powerful hierarchical-linking capabilities, which let you make models consisting of hundreds of linked parts. You can easily isolate any portion of a model in order to edit it.

Sculpt provides exquisite rendering quality and texture handling. The built-in procedural stone and mottled-surface

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textures are among the best of any of the programs reviewed here. The degree of control Sculpt gives you over rendering is almost overkill — you can, for example, give each polygon on a surface its own texture.


Although Sculpt 4D includes animation features, they aren't particularly good. Sculpt 3D, which does not include animation tools, may be a better choice for the cost-conscious. And for those who are really on a budget and don't need extremely high-quality rendering, Byte by Byte sells Sculptor (\$1,995 street), a version of Sculpt 3D without the excellent ray-tracing capabilities.

What to Do Next

There's no longer anything to keep you from using 3-D software to create bold images. The products have come down in price, and several of them are reasonably easy-to-use packages with competent feature sets. Moreover, all these companies are rewriting their programs to take advantage of the

speed gains that are inherent in Apple's PowerPC Macintoshes.

If you're looking for an inexpensive integrated package, veer toward Infini-D and Ray Dream Designer. You'll prefer Infini-D for animation and Ray Dream Designer for print work. For a midrange integrated package, check out StudioPro. Its advanced modeling and animation capabilities, combined with its reasonable price, make the program an excellent value.

Users who need industrial-strength modeling tools should consider form•Z and MacroModel. Both programs could use a better interface and faster speed, yet either is a good tool for creating intricate and complex models. We give form•Z the edge, however, due to some of its more advanced capabilities, such as its support for Boolean operations. With either program, however, you'll need a separate high-end rendering and animation program. 

David Biedny learned how to free-view stereograms when he was ten years old.

Features of 3-D Software / a variety of capabilities

All the programs we reviewed include modeling tools, but not all include the rendering and animation features you may need for a

particular job. Most 3-D professionals end up owning two or more programs in order to get a variety of features.

	Alias Sketch! 1.5	✓ form•Z 2.3	✓ Infini-D 2.5	MacroModel 1.5	Presenter Professional 1.5	✓ Ray Dream Designer 3.0	Sculpt 3D 3.1 and 4D 3.1	StrataVision 3d 2.6	✓ StudioPro 1.0
Modeling features									
Vertex-level editing	●	●		●	●		●		●
Spline-based editing	●	●		●	●	●	●	*	●
Font extrusion and beveling		●	●	●	●	●	●	●	●
Skinning/lofting	●	●		●	●	●	●	●	●
Sweeping and extruding along a path	●	●		●	●	●	●	●	●
Boolean operations		●					●	*	*
EPS-file import for extrusions	●		●	●	●	●	●	●	●
Rendering features									
Gourard rendering	●	●	●	●		●		●	●
Phong rendering	●	●	●		●	●	●	●	●
Ray tracing	●		●		●	●	●	●	●
Ambient lights	●	●	●		●	●	●	●	●
Distant lights	●	●		●	●	●	●	●	●
Point lights and spotlights	●		●	●	●	●	●	●	●
Animation features									
Editable motion paths			●	●			†		●
Morphing			●				†		● ⁵
Keyframe control			●	●			†	●	●

✓ MacUser RECOMMENDS

*2-D only.

†Sculpt 4D has these animation features, but Sculpt 3D doesn't.

⁵Requires Strata's MultiMorph (\$69).



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Vol. 3, Issue No. 7

Orchard News



Apple Trees Bear Fruit For 50 Years

is done by spraying chemicals that damage about half of the trees blossoms. A chemical that is already registered by the Environmental Protection Agency for use on other crops

Apple trees will bear fruit after approximately four years and will continue to do so for about fifty years. Apples are now grown twelve months out of the year in temperate latitudes of all continents. Until the early 1900's apples were not in season during the summer months. A breakthrough in the 1940's at Cornell University Agricultural College with controlled atmosphere storage extended the growing season year-round.

Left alone an apple tree will yield a large crop one year and few fruit the next. The apple tree voluntarily sheds some apples, but to truly counteract this effect orchardists thin their trees each spring. This thinning



can likely be a safe and effective spray. Several of the tested products have been found to effectively damage apple flowers so that they cannot be pollinated. This can be done



without harming bees, which are responsible for the pollination.

Continued pg. 6

Focus On Color

Color is the key to picking fruit at its peak. Bright reds, yellows, greens, or oranges tell you that harvest time has arrived.

\$60

Film & Separation cost — The Microtek 45t scanner*

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Continued pg. 6

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\$1,105

Film & Separation cost — outside pre-press house**

Apples vs. Apples

Until now, your high-quality color scans for publication and four-color printing were usually done on expensive drum scanners. Owning and maintaining this type of equipment was not an affordable option.

But now there's the ScanMaker® 45t Multi-format Film Scanner from Microtek, so you can branch out and do your own high-quality scanning and save money in the process.

The ScanMaker 45t produces high-quality scans and separations from 35mm, 2 1/4 or 4 x 5 transparencies. The 45t features 36-bit color with interpolated resolution as high as 10,000 x 10,000 pixels and 2,000 dpi. Microtek's Dynamic Color Rendition technology produces from original 36-bit image data an optimized 24-bit file for use with today's 24-bit imaging software. The result—precise digital color. Also included with the 45t is Kodak's EKTACHROME Film Production Guide Q-60A for use with Microtek's Custom



Calibration Utility that builds a calibration profile for your specific scanner. Now add 12-bit grayscale scaling from 1% to 100% and a maximum 5" x 5" scanning area and you have a scanner that rivals even the most expensive scanning equipment.

But there's more than cost-savings. Consider the time saved in producing high-quality scans at your own desktop. You now have complete control and can even manipulate the image with Adobe Photoshop 2.5 (included with your purchase of the ScanMaker 45t) without incurring expensive system time at your separators.

Priced thousands less than its nearest competitors, the ScanMaker 45t will soon pay for itself — who knows, maybe on your first multiple-image project.

For more information, or the name of your nearest authorized Microtek dealer, call **1-800-654-4160**.

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*Images were scanned with Microtek's ScanModule for Adobe Photoshop. Separations were done in Cachet by EFI.

Film cost of \$60 based on 4 pieces of lino film from service bureau, no match print included.

HANDS ON Desktop Publishing

PHOTOSHOP FILTERS /

PLUG IN TO MORE POWER WITH NEW PHOTOSHOP ADD-ONS

OUT OF THE BOX, Adobe Photoshop offers a lot of power, and its modular architecture lets you tap in to additional functionality via third-party plug-in filters. Developing Photoshop filters is a booming subindustry these days; here are a few new plug-ins that have caught our eye:

CyberMesh. Developed by John Knoll, one of Photoshop's inventors, CyberMesh lets you create 3-D images from any 2-D gray-scale images in Photoshop and save them as DXF files. This export plug-in sports an intuitive, Photoshop-like interface. Controls for creating meshes from simple geometric shapes are neatly displayed, with sliding controls that automatically update your

model in a preview window. In addition to icons that let you zoom into a model, rotate it, and view it in wire-frame or shaded modes, CyberMesh gives you everything you need to create landscapes, asteroids, and more. Objects can then be rendered in any 3-D package that accepts DXF files. \$49. Knoll Software; 415-453-2471.

FotoMagic Series 1. Ring of Fire, a Japanese startup, has erupted into the U.S. market with FotoMagic Series 1, a package of eight filters exclusively for working with an image's colors. Other plug-ins alter individual pixel positions to produce unusual effects, but these filters extend Photoshop's native color-correction tools by letting you manipulate just the image colors. Highlights of FotoMagic Series 1 include ColorRanger, which divides an image into color ranges, so you can create pop-art effects; ColorFilters, which work like negative and positive color filters on a camera, for selectively changing the lightness of a color or range of colors; and ColorShifter, which

changes an image's tint or cast. Two more sets of FotoMagic filters are in the works for 1994. \$199. 800-990-0990 or 408-992-0400.

Pattern WORKSHOP. MicroFrontier has taken a kernel from its image editor, Color It!, and turned it into a Photoshop filter that lets you create and edit patterns and organize them for later use. You can choose from



160 patterns — from textiles to patriotic symbols — or use Pattern WORKSHOP's built-in pattern editor to make your own. You can pick pattern dimensions and then grab patterns right out of Photoshop files. And if the patterns you make still aren't enough, you can buy a volume containing 160 more patterns. \$49.95; additional pattern library, \$24.95. 515-270-8109. / Sean Safreed and Jason Snell



TECHNOLOGY TREND /

IMAGICIAN'S IMAGING MAGIC

THE RACE FOR FASTER IMAGE PROCESSING continues with the Imagician, a hardware/software combination that lets you manipulate color images in close to real time, faster than any DSP accelerators allow you to. Developed by MacEurope Information Systems, the Imagician consists of a NuBus card, which contains 16 megabytes of RAM for image caching, and Imagician Workshop, object-oriented software optimized to work with the card. Running in just 500K, Workshop lets you layer multiple windows and work on them independently. Because of its speed and batch-processing capabilities, its inventors see the Imagician as a companion to Photoshop; it doesn't currently offer the sophisticated painting tools of comparable products, however. \$3,495. Available through Working Software; 408-423-5696. / Pamela Pfiffner

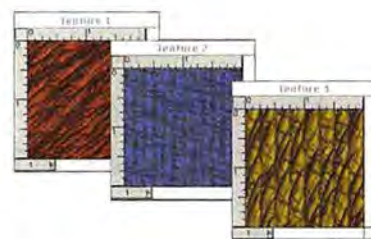
SPECULAR'S TEXTURE EXPERT

If you like the look of backgrounds and textures available on CD-ROM but want more flexibility, then check out Specular International's TextureScope, a program for creating seamless, high-resolution textures from artwork created with Adobe Illustrator or Aldus FreeHand.

For adding complexity to a given texture, TextureScope offers an interesting array of controls. Each texture can be imbued with properties of gloss, bumpiness, transparency, softness, and color and has multiple layers that can be rearranged at any time. Lighting controls with

settings for angle, direction, and intensity enhance the impact of each layer (with as many as four lights per layer).

For animating textures over time, TextureScope morphs between texture settings automatically and saves the resulting animations. You can also save individual textures as PICT or TIFF files that have alpha channels. \$179. 413-253-3100. / Sean Safreed



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For Your Information.

CIRCLE 120 ON READER SERVICE CARD

Curves in the Road

There are a zillion ways to go from straight lines to curves in draw applications. But can you do that in Adobe Photoshop? Yep. BY KAI KRAUSE

A question I'm asked about many Photoshop techniques is, "...but is this relevant to my serious business use?" The answer is, Who knows? What seems like entirely irrelevant fun one day may become a well-paid job the next. I have oodles of mail to prove it: Accountants by day who play with Adobe Photoshop and Fractal Design's Painter by night and read every tip I write here or post on-line suddenly leave that real job for their hobby — making a mint in the process. (And they discover that sleep is a highly overrated concept.)

This month's tip is one of those tidbits that may detour you from your real job and put you on the road to Photoshop freedom. It's a simple idea that can provide interesting results by distorting images into curvilinear shapes. You'll wave the flag for this one later.

Grid Lock

Let's start by making something very, very angular, such as a square grid. Create a new window, and with Photoshop's gradient tool, drag out a gradient of about 1 inch at whatever angle you like. With the marquee tool, steal a 100-x-100-pixel square, and then select Define Pattern from the Edit menu (see figure 1). You've now stored the gradient as a pattern fill for later use.

Make a new, larger window, and set its background to black. Select all (Command-A), and then go to Fill ... (on the Edit menu). You'll see the options for Contents

(Photoshop 2.0.1 has Fill ... With). Check Pattern. After clicking on OK, you'll have a grid of gradients. (If you've never tried this before, you can see that there's a whole world of fun in tiling.)

Now comes the fun part: In the larger window, use the marquee tool to draw a pretty large area. Go to Effects, on the Image menu, and then choose Skew. Handles appear on the four corners of your marquee area. Your cursor turns into a cancel icon (a circle with a diagonal line through it), but when you move it to the upper left handle, it turns into the standard arrow again (see figure 2). Now click once; wait; and then click and drag to the right, all the way to the upper right handle. Then click and click-drag the right one to the left, so you effectively swap the upper two handles.

What you should see now is the grid warped like an hourglass with straight lines (see figure 3).

Here's the key: If you merely click and drag, the Skew function will operate as usual, dragging two corner points in sync to form a parallelogram. But the next click on that handle moves only that handle. That's why you need to add one extra click as part of this operation. Also, after skewing, your cursor toggles to either the cancel icon, if you're outside the selected area, or to a



hammer icon, if you're inside the selected area. The latter means that you accept the new image. To continue with this trick, hammer down the changes you've made.

Dangerous Curves

What we've done so far may already be surprisingly easy and fun for those of you who've never tried the Skew function. But check out what happens when you do a second pass with it.

Select Skew again, and you'll have a new rectangular marquee selection, complete with marching ants (I recommend that you turn them off, with Command-H). Now pick the upper left handle, single-click, and then click-drag downward on the left side to the middle of the screen. Follow that same procedure with the lower left handle: Click and click-drag up to the middle. The result is a sweeping-curve butterfly like the shape

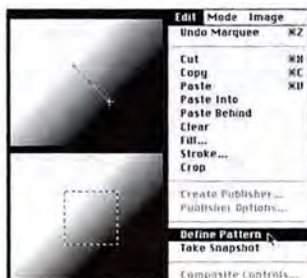


figure 1 / Make a gradient to use as a pattern.

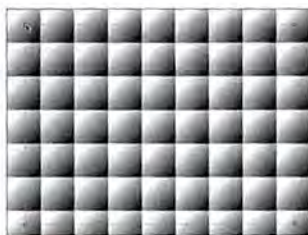


figure 2 / Create a grid of gradients, and select a corner to skew.

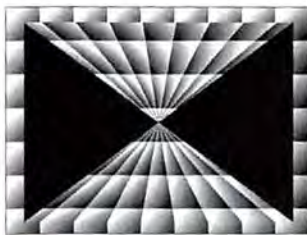


figure 3 / Swap the top two handles.



figure 4 / Move the two left handles to make a butterfly.

ca•tas•tro•phe

\kə-'tas-trə-phē\ *n* **1**: hard drive crash or other disaster resulting in loss of data files



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CIRCLE 155 ON READER SERVICE CARD



shown in figure 4. Pretty neat, eh?

The theory is rather simple: The area that occupied the rectangle in figure 3 is now being squeezed into the triangular region of figure 4, which causes the components to merge and to be interpolated, resulting in curvature across all portions. And once you've grasped that concept behind the images, you can very reliably predict what will happen and even plan ahead to add curvature to any side of a shape. Of course, you can use Photoshop's Twirl filter and others to add curves to a picture. But *everyone* does that — you've seen each wave and twirl a thousand times. The effect we're creating here yields rather beautiful nonlinear shapes, like something you might create with Bézier tools, while at the same time morphing the image area. Do try it!

More Curves Ahead

As you can see in the progression from figure 5 to figure 6, repeating the rectangle-to-triangle conversion on the bottom of the image and then finally swapping the handles on the right side results in increasingly complex curvatures. The flying dragonfish in figure 6 consists entirely of curves on the edge and the inside. You can imagine what might happen if you used a picture instead of a grid. This effect would not be easy to do with just about any other technique, actually.

A few caveats for better results: As you may have noticed, all this scaling does introduce artifacts and aliasing (those stair-step edges). Because the object area gets smaller with each modification, start with a very large initial shape and/or increase the image size as you go.

By the way, under Effects, you'll also find Distort, which in Photoshop 2.5, is normally for relocating only a single corner point, not all corners, as with Skew. However, it acts in the same 3-D plane as the Perspective effect and operates quite differently from a single-point skew. In Photoshop 2.0, however, Distort does work on more than one corner at a time, so try it!

As figures 7, 8, and 9 show, the variations

are endless. The flowers image was created out of about five transformations on a few simple circles and then colorized, copied, and flipped. The Times Roman letter M was curved and skewed seven times or so. Think of doing whole flying alphabets, sails and



figure 5 / Converge the bottom two handles.



figure 6 / Swap the two right handles for a flying dragonfish.

flags in the wind, butterfly wings, ornamental frames, logo shapes. Play with the technique, and share your results with us.

Kai Krause is busily hacking away on a PowerPC Mac and an Indigo II. He and his family are happy to have narrowly escaped last fall's fires in the Malibu mountains.



figure 7 / Make a bird fly.

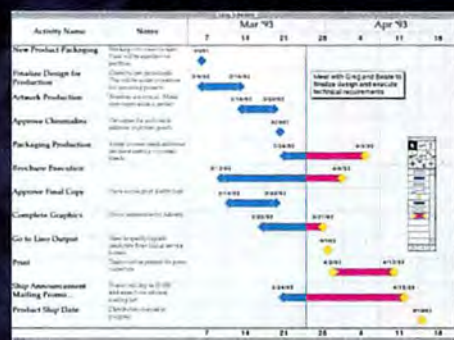


figure 8 / Grow a flower patch.



figure 9 / Warp the letter M.

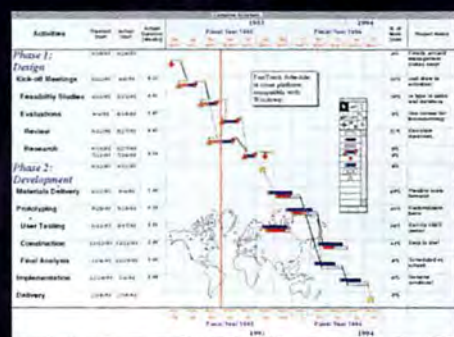
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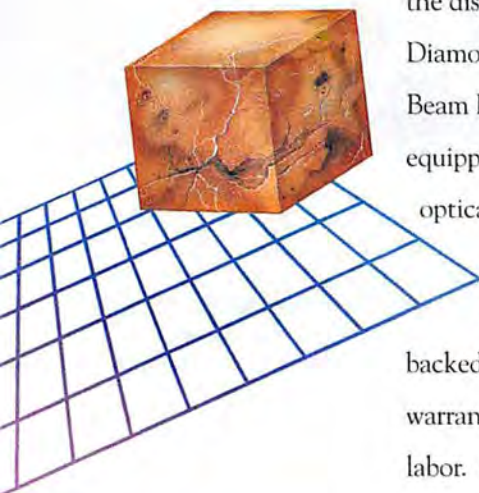


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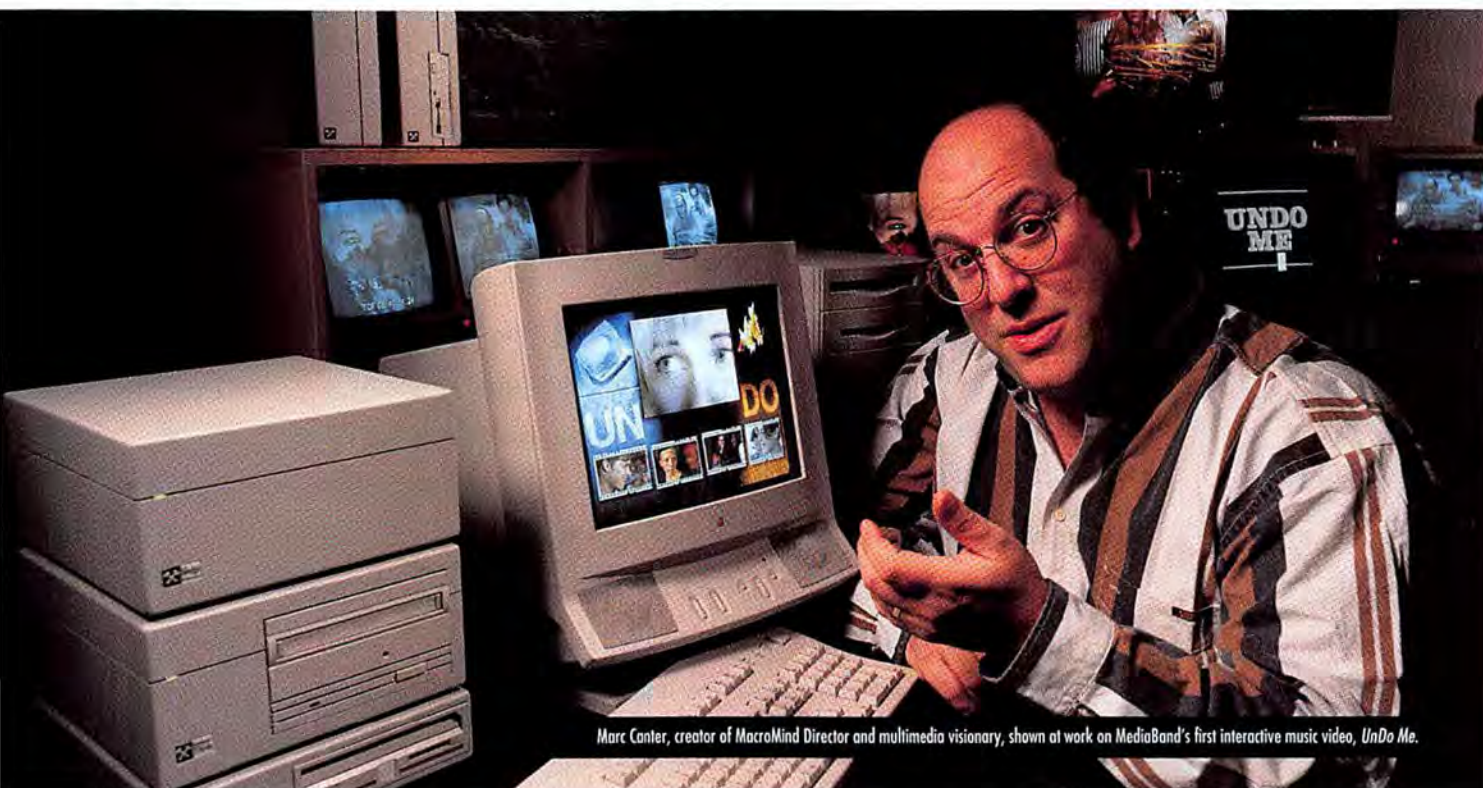
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CIRCLE 166 ON READER SERVICE CARD

How Do You Build The World's Fastest Digital Video Empire?



Marc Canter, creator of Macromind Director and multimedia visionary, shown at work on MediaBand's first interactive music video, *UnDo Me*.

Apply The Hammer.SM

11MB/sec and 13MB/sec on the Quadra[®] 840AV. Are the industry's fastest sustained transfer rates the only reason multimedia visionary, Marc Canter, chose the new SledgeHammer[™] II and SledgeHammer Wide arrays from FWB? No. Capacities of up to 5.6 gigabytes were important. And his other SledgeHammers got top marks from him, as they had from MacWEEK, MacUser and Macworld. But for his new MediaBand digital music video projects, the measure he applied first was RAID speed. That's why he applied the Hammer.[®]

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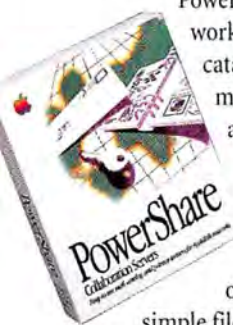
COLLABORATION /

APPLE'S POWERSHARE SERVERS

APPLETALK NETWORKS LEAP FORWARD with the addition of Apple's PowerShare Collaboration Servers (\$999, unlimited users), the server-software portion of the Apple Open Collaboration Environment (AOCE). The package, containing PowerShare Catalog Server and PowerShare Mail Server, gives AppleTalk networks some of the functionality of big PC networks and lets users take advantage of the unique features of System 7 Pro.

PowerShare Catalog Server stores lists of users and network servers, which can be accessed via the PowerTalk catalog in System 7 Pro. Catalog Server provides automatic authentication of users and applications as well as data encryption.

PowerShare Mail Server stores messages sent from mail-enabled applications and can recognize when senders and recipients are connected to or disconnected from the network. To connect to other Mac, PC, and UNIX mail systems, you add simple files called Service Access Modules (SAMs).



Changes in a network are no problem — networks that have PowerShare Collaboration Servers can be scaled from ten users to thou-

sands of users by the addition of more PowerShare servers — the servers talk to each other to replicate and synchronize catalog and mail databases. Large catalogs can be split up and distributed among servers, but users see only one server. PowerShare Collaboration Servers requires at least a 68020 Mac with 8 megabytes of RAM and can also run on the Apple Workgroup Server 60 and 80.

Third-party support of AOCE is growing. Microsoft has announced that Word, Excel, Works, and PowerPoint will be AOCE-compatible. Other newly compatible applications include ClarisWorks 2.1, Hayes' Smartcom II 4.0, Farallon's Timbuktu Pro, and No Hands' Common Ground. 408-996-1010. / John Rizzo



TELECOMMUNICATIONS / MODERN SOFTWARE

THE THEME IS MORE AND FASTER sessions with new versions of telecommunications software from Hayes Microcomputer Products (404-840-9200) and WRQ (206-726-7361). Hayes' general-purpose Smartcom II 4.0 is capable of 28,800-bps data transmission, using the new V.34 international modem standard, which is supported by Hayes, Motorola, AT&T, U.S. Robotics, and other telecom companies. V.34, which

Hayes believes will become the dominant high-speed standard this year, is not compatible with the competing high-speed V.32terbo or V.Fast standards.

Smartcom II 4.0 adds floating keypad windows, user-configurable icons, VT220 emulation, support for AppleScript and PowerTalk, and other new features. PowerTalk automatically downloads e-mail messages to System 7 Pro's In Tray and automatically dials a number and sends a message when you drop it into the Out Tray.

Reflection 4.0, from WRQ, gives you an

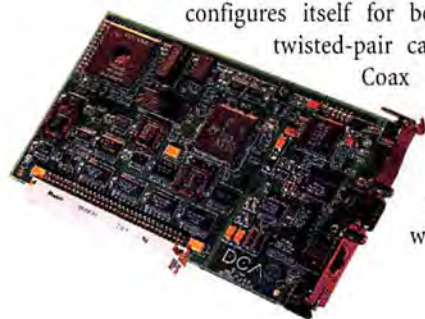
unlimited number of simultaneous VT320 or VT340 connections to UNIX and VAX hosts. File transfer is faster than with earlier versions of Reflections with a new proprietary protocol, and support of Mac Communications Toolbox's File Transfer Manager allows flexible selection of file-transfer protocols. Reflection includes a Telnet tool for FTP over TCP/IP networks and for NetWare for LAT over DECnet wide-area networks. Reflection 2 Plus 4.0 (VT320 emulation) costs \$269, and Reflection 4 Plus 4.0 (VT340 graphics emulation) is \$369. / John Rizzo

LANS /

TOKEN RING FOR ALL MACS

THE FIRST TOKEN-RING AND COAXIAL CARDS for the smaller 7-inch NuBus slots of the Centris and Quadra 610 and 660AV Macs are available from DCA (800-348-3221 or 404-442-4364). The MacIRMAtrac NuBus Token Ring Adapter (\$895) automatically configures itself for both shielded and unshielded twisted-pair cabling. The MacIRMA NuBus

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WIRELESS WORLD /

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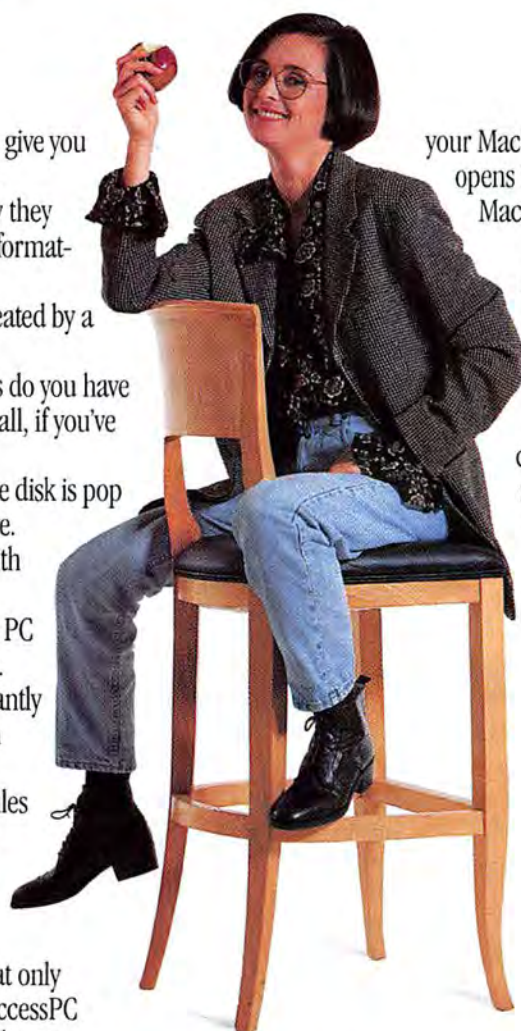
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Insignia

What's OpenDoc?



Apple and Microsoft want to drastically change the way you work with files and applications — and each is offering a dramatically different technology to let you do it. **BY JOHN RIZZO**

IDREAD SOFTWARE UPGRADES. A typical x.0 upgrade has 159 new features, 3 of which I may actually use but each of which requires several hours of study so that I can do the same things I used to do with the old version. I'm not blaming developers — to stay competitive, they must add more and more features to their applications, making them more and more complex and more and more difficult to use. This, in turn, hurts developers: The time and effort required to create and maintain software have ballooned, squeezing smaller software companies out of the picture.

The every-feature-for-every-user mindset is a problem with Macintosh as well as PC software and is worse if you work on both platforms. For instance, moving a word-processing file between a Mac and a PC is a snap — unless the document contains a nontext item, such as a picture. And the reality is that today's documents often contain lots of nontext items, including such elements as movies and sound. To create these

complex documents, we often have to use several feature-heavy applications.

To refocus the experience of users away from individual applications and back toward the document, Microsoft and Apple are each proposing the adoption of *compound-document* technology. A compound document is one that lets you use *editable* graphics, text, spreadsheets, and video, as well as mail and database front ends, all on one page. Microsoft's proprietary technology is called OLE (pronounced "o-lay"). Apple is pushing OpenDoc, which is being developed by a consortium of companies. Both of the technologies are cross-platform, which allows Macintosh and PC users to share compound documents.

I looked at a beta version of OLE 2.0 for the Mac (it's now available) and got as close as I could to OpenDoc, which was not yet in beta at press time (it will be available later this summer). I'm hesitant to generalize about an industry that uses the word *revolution* almost as often as it uses *floppy disk*, but either compound-document technology

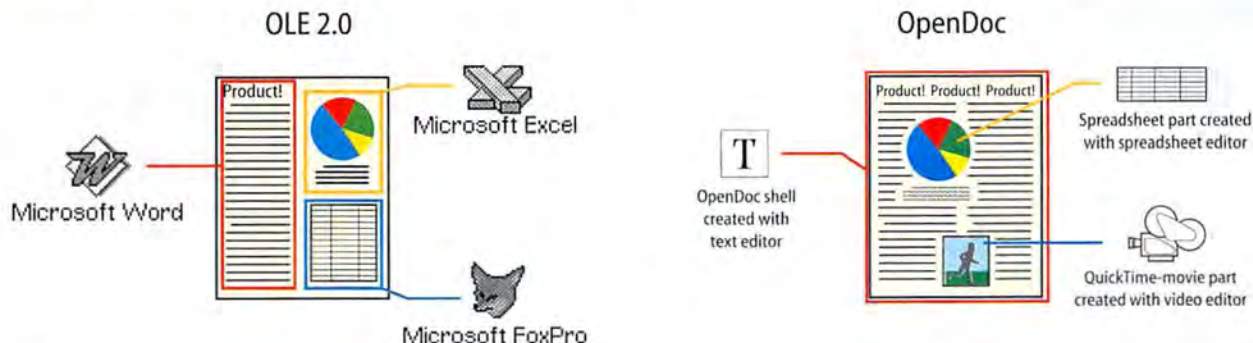
may change the way you work more than anything since the introduction of the mouse.

Apples and Oranges

OLE 2.0 and OpenDoc use different approaches for creating compound documents (see the "Compound Interest" sidebar). With OLE, you use several applications to create a document, whereas with OpenDoc, you use a *root content container* (a graphics editor, for example) that contains small, user-selected modules of code.

OLE stands for *object linking and embedding*; an *object* is a piece of code, such as a spreadsheet program, that is used from within another type of application. OLE's *object linking* behaves similarly to System 7's publish-and-subscribe, letting you use an object in multiple documents. When a linked object is modified, it is updated in all the documents in which it appears. An *embedded* object travels with a document — for instance, a Word document that has an embedded Excel-spreadsheet object can

COMPOUND INTEREST / OLE 2.0 Versus OpenDoc



COMPOUND-DOCUMENT TECHNOLOGIES OLE 2.0 (developed by Microsoft) and OpenDoc (supported by a consortium of developers, including Apple) each let you create and edit complex documents from within one application. OLE applications can share and edit files, as long as similar OLE-equipped programs are available. In contrast, all OpenDoc files share

a common file format that can be edited by any OpenDoc editor.

This new way of working may be a little disorienting at first, as users become accustomed to applications that share tool bars and menus. Eventually, customized applications offering only those features that individual users need will become the norm.



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CIRCLE 33 ON READER SERVICE CARD

be put on a floppy and opened on another computer.

OpenDoc uses *parts* instead of objects. Rather than requiring big applications such as Excel to supply a spreadsheet function, OpenDoc uses parts, which you create with small software modules called *part handlers* and which you can use in a variety of documents. With OpenDoc, you can take your favorite text editor and use it whenever you need to work with text. With OLE, on the other hand, you use the Excel text editor for a spreadsheet object, the Word text editor for

OPENDOC APPEARS to be a better cross-platform player than OLE 2.0. For one, OpenDoc can be used over a network; OLE can't.

a Word object, and the FoxPro text editor for a database object. This approach is similar to the way you do things today, where you need to learn five ways to edit text, because you use five Mac programs to put a document together.

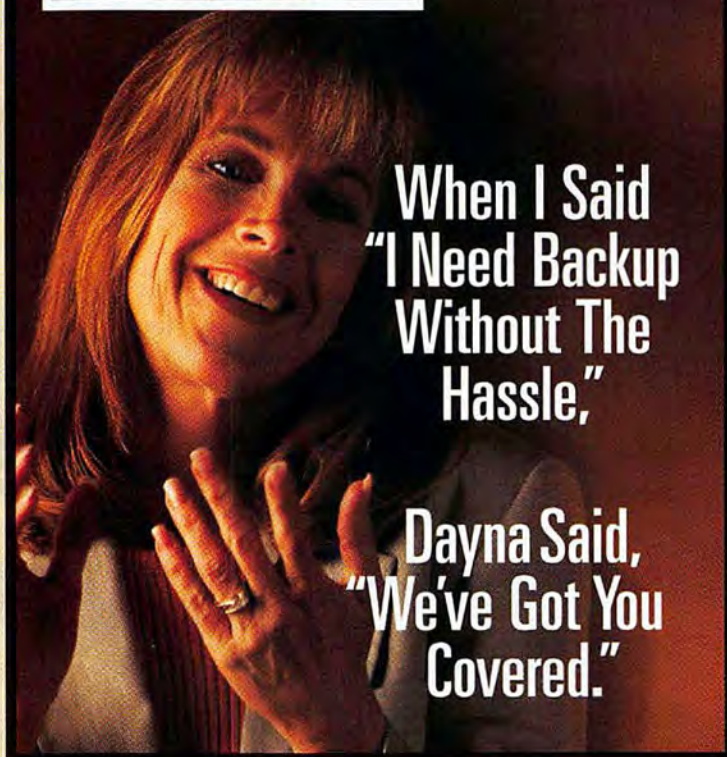
OLE uses an application, such as Word, for the *root* document, into which objects are embedded. With OpenDoc, any part can be the root document, which means you can build your own feature set by choosing a group of part handlers, leaving behind the big applications' unused features. Apple foresees a new third-party-software industry springing up to supply these functional part handlers as well as to create bundles of features for specific types of users, such as desktop publishers or accountants.

Facing the Interface

Either OLE 2.0 or OpenDoc will change the way you work and will probably require some training before you can effectively use programs based on them. One confusing aspect of both technologies is that menus change when you work with different objects — for example, when you're editing a spreadsheet, the spreadsheet menu bar is displayed; change to editing a graphic, however, and the graphic tools appear. OpenDoc is slightly less confusing, because it allows you to customize the document interface, letting several parts share tool ribbons and menu bars, for example. Users as well as developers can create their own compound-

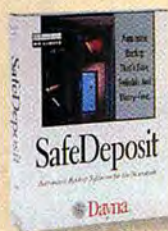
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MacUser, ★★★★★
December 1993

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CIRCLE 52 ON READER SERVICE CARD

document interfaces for specific tasks.

To link documents, OpenDoc uses System 7's publish-and-subscribe, which is not nearly as easy to use as OLE's object linking. However, OpenDoc seems easier to use in other ways — for example, you must double-click on OLE objects before you can select them or do any editing. In contrast, OpenDoc parts are selected automatically as you move the cursor over them. OpenDoc parts can overlap on a page and can be any shape, including circular or irregular. OLE objects are nonoverlapping rectangles. OpenDoc parts can also be embedded *within* other parts — you can, for example, place a button inside a graph for calling up records from a database.

Judging from the specs, OpenDoc appears to be a better cross-platform player than OLE 2.0. For one, OpenDoc can be used over a network; OLE cannot. OpenDoc supports more operating systems, including Windows, OS/2, and UNIX. OLE supports only the Mac, Windows, and Windows NT. OpenDoc also supports other compound-document technologies, including one expected from Taligent next year and OLE (OLE objects placed in OpenDoc documents bring with them OLE's interface and shape restrictions).


OpenDoc is being developed by a San Francisco-based consortium that includes some of Microsoft's fiercest competitors: Apple, IBM, Novell, Oracle, Sun, WordPerfect, and Xerox. These companies have formed Component Integration Laboratories, which will work with vendors to implement OpenDoc as an open standard. This is in contrast to OLE, whose sole owner and developer is Microsoft.

So Who's the Winner?

Those who bought a Betamax VCR know the value of picking a winning technology. Like Betamax, OpenDoc appears to be the more innovative technology, but Microsoft has years of experience with OLE 1.0 on the PC. At this point, the future of compound-document technology is in the hands of the developers who must adopt it. Some Mac developers complain that OLE 2.0 is difficult to implement on the Mac whereas Mac applications that support AppleScript and Apple events are easy to port to OpenDoc. And PC developers don't like the fact that their biggest competitor is holding the keys

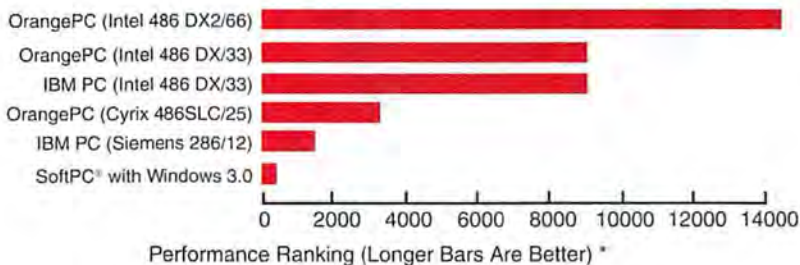
to the family car, although Microsoft has announced that it will make OLE 2.0 compatible with its popular Visual Basic development environment. Sure, OpenDoc is a risk, but Apple is trying to change the software-development model and create new software-marketing opportunities.

The competition will be fierce, but the winner is likely to be the user. Instead of a

winner-takes-all situation, we're likely to have multiple compound-document technologies to choose from, just as we have multiple operating systems and hardware platforms to choose from. 

MacUser technical editor John Rizzo is the author of *MacUser Guide to Connectivity* and *How Macs Work* (Ziff-Davis Press).

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MacUser June 93

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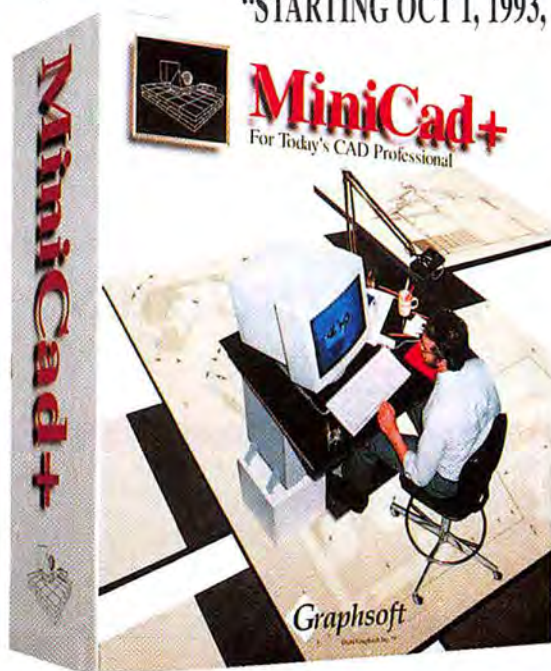
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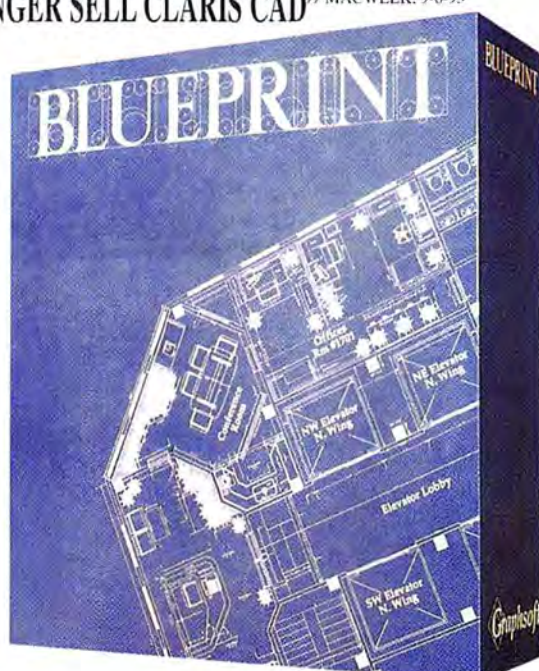
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- ☐ fillets
- ☐ editable fills
- ☐ beizers
- ☐ wall-join
- ☐ chamfers
- ☐ tolerancing
- ☐ 9 saved views
- ☐ hatching

3D CAD:

none

Integrated Database/Spreadsheet:

none

Programmability:

none

2D CAD:

- ☐ smart walls
- ☐ Smart Cursor for locating snaps
- ☐ advanced auto-dimensioning
- ☐ editable line styles
- ☐ pan by scroll bars or hand
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HANDS ON

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WIRELESS LANS /

NEWTON NETWORKS

WITH A WIRELESS LAN, Newton users can connect to an office's Ethernet or token-ring network or talk to other Newton users while walking around the office. If those scenarios sound attractive, you'll have a new option available this summer, when Dayna plans to start shipping wireless-LAN adapters based on Xircom's Netwave technology. A version on a PCMCIA card is aimed at Newton users, and an external version will work with PowerBooks (each adapter will cost \$499). You will also need one or more Access Point

boxes in order to connect with other users or to Ethernet or token-ring networks.

The Netwave adapters will communicate at 1 megabit per second — four times the bandwidth of LocalTalk but only one-tenth that of Ethernet — which will make data transmission on Netwave-based networks faster than on Digital Ocean's LocalTalk-only Grouper wireless networks. Netwave's wireless-LAN protocols are not proprietary, so other vendors can build them in to their wireless products. The technology is defined by a new open-network standard (IEEE 802.11), which uses frequency hopping, spread-spectrum radio waves and which Dayna is adopting for use with AppleTalk. 801-269-7200. / John Rizzo



LET THE GAMES BEGIN /

MESSAGEPAD SLOTS

NEWTON MESSAGEPAD FANS like to compare the first Newton to the first Mac — an underpowered, software-bereft machine with a compelling underlying technology. Here's another coincidence: One of the first available non-Apple applications for both machines is a slot-machine simulation.

Of course, the Newton version far surpasses what Mac users had ten years ago. It's part of Casady & Greene's Silicon Casino, written by John Calhoun, whose game-authoring credentials include Glider and Pararena for the Mac. Along with the slot machines, you get baccarat, craps, poker, and blackjack — all at the tap of a pen.

Most people will probably find Silicon Casino more fun than, say, Columbo's Mystery Capers (the debut game from Apple's publishing group), but garnering all these gambling resources requires memory — and not the kind you use for counting cards either. Unless you have a RAM card for your Newton's PCMCIA slot (\$130 for 1 megabyte), you won't have the 600K of free memory necessary to download Silicon Casino, which comes on a floppy disk. You also need a Newton Connection Kit to do the downloading. Still, at \$59.95, Silicon Casino is about \$20 less than Columbo's Mystery Capers (which comes on its own PCMCIA card), so you can apply the money you save toward that megabyte of memory. 800-359-4920 or 408-484-9228. / James Bradbury

THE LEAD-ACID TEST /

BIGGER, BETTER DUO BATTERIES

FOR MONTHS, DUO OWNERS have gazed lustfully at the jumbo-sized and long-lived lead-acid batteries that give all-in-one PowerBook users as much as eight hours of life on a single battery. Finally, Duo owners can get their own lead-acid batteries: Technögg (800-305-7936 or 513-321-1777) will soon ship the \$299.95 PowerPlate 4x, a zero-footprint battery that attaches to the bottom of a Duo and lasts three times as long as a Type II NiMH (nickel metal hydride) battery. VST (508-287-4600) has announced the ThinPack Duo (around \$275), which lasts three times as long as a Type I battery. / Victoria von Biel



BATTERY BOOSTER /

SAVING RAM DISKS

A RAM DISK EXTENDS the precious battery life of your PowerBook by letting you save files and programs to RAM rather than to the hard disk — with the added benefit that accessing RAM is much faster than accessing the hard disk. The big drawback is that you must continually rebuild the RAM disk, because you lose the information it contains whenever you shut down or, worse, when a system crash wipes out the contents of your

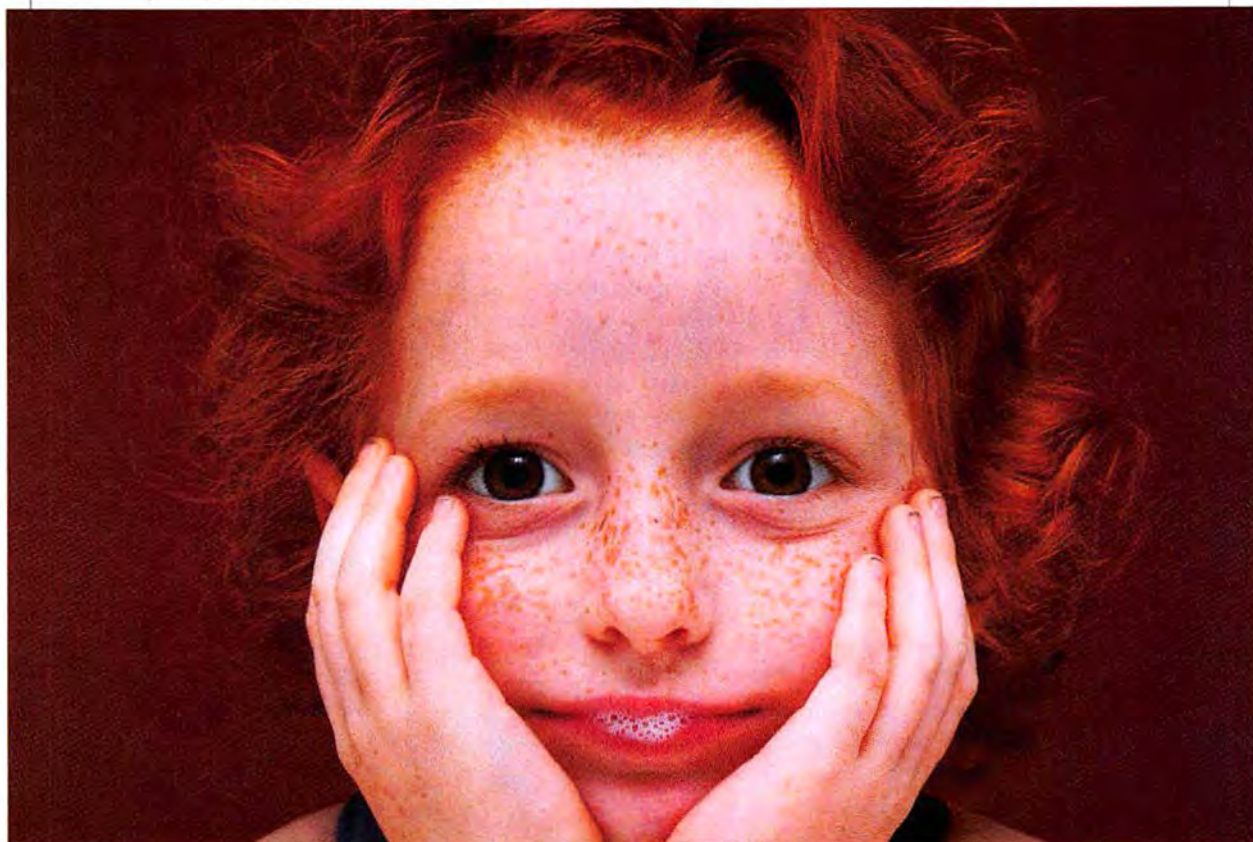
RAM disk before you've backed up to your hard disk.

One solution to this problem is to use RAMDiskSaver (\$69.95), from Atticus Software (203-348-6100), a control panel that periodically copies the contents of the RAM disk to a folder on your hard disk and restores the RAM disk's contents when you restart. RAMDiskSaver can also eliminate having two versions of the same document by replacing the older file on the hard disk with the updated file from your RAM disk. / Nancy Peterson





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Do-It-Yourself Keyboards



Is life without a numeric keypad getting you down? Are you going through function-key withdrawal? You don't have to pack a keyboard in your PowerBook case to get all those extra keys back. BY SHARON ZARDETTO AKER

SOME PEOPLE LOOK on the Apple Extended Keyboard with disdain, citing its seemingly overwhelming size as a problem (these are probably the same people who bemoaned the fact that the Mac Plus ushered in a keyboard that included cursor keys and a numeric keypad). But many of us miss all those extra desktop-keyboard keys when we're working on a PowerBook. Personally, I miss the row of function keys and the Page Up/Page Down cluster of navigation keys. And if you do a lot of number punching before you can do your number crunching, you must really miss the numeric keypad.

There are several solutions to the missing-keys problem. You can take the hardware approach (and the extra weight that goes along with it), or you can try using software to fill in the keyboard gaps. Here are the pros and cons of each approach.

Add an External Keypad

Short of carrying around a full keyboard to attach through the PowerBook's ADB port, the only way to add the keys an extended keyboard has to your PowerBook is to buy an external numeric keypad. Several models are designed with the PowerBook in mind: All are low-power, lightweight; and, of course, color-coordinated. All the models provide

the number keys, but some numeric keypads also offer software-controlled modes that give you function keys and even Page Up/Page Down substitutes. If you don't mind carrying an extra item in your traveling kit, an external keypad is often an excellent solution for the keyboard-deprived. You'll find keypad offerings from Kensington Microware (800-535-4242 or 415-572-2700), Plusware (800-268-7587 or 905-477-0015), and Sophisticated Circuits (800-827-4669 or 206-485-7979).

Record a Macro

You can also duplicate the missing keys with a macro program such as Tempo II+ (Affinity Microsystems) and QuicKeys (CE Software).

The block of keys around the K key (U, I, O, J, L, N, M, and comma) typically substitute for the keypad — at least for right-handers. With an extended keyboard plugged in to your PowerBook, simply record pressing a regular number key and then assign it to Control-U, Control-I, and so on. Because it's hard to remember which key each number is assigned to, labeling the keys really helps (borrow someone's Brother P-Touch labeler). Another nice touch: You



can use the Easy Access software that came with your system software to hold down the Control key while you're inputting numbers. You don't even have to open the Easy Access control panel — just press the Shift key five times to activate Easy Access' "sticky keys" option, and press the Control key twice to "glue" it down. Then you can punch in your numbers by using only one finger; when you've finished inputting numbers, simply press the Control key twice to unstick it from its down position.

You can write macros to stand in for the other missing keys too. If you've recorded macros on your desk machine and assigned them to function keys, you can just record them again to Control-1, Control-2, and so on. Of course, that doesn't help when an application has features tied to the *real* function keys. You can record a right-arrow press

POWERBOOK SECRETS / upgrading a Duo's keyboard

THE DUO 250 AND 270 have great new features, including active-matrix screens, longer-lasting Type II batteries, and better keyboard action. If you have a Duo 210 or 230, you may be happy with your passive-matrix screen and you can use the Type II battery, but what if you have keyboard envy?

Interestingly enough, the keyboard on the new Duos is the same as the Rev B keyboard on the Duo 210 and 230. (This keyboard was phased in early in the original Duos' production runs. It's identified by a B at the end of the keyboard's — *not* the Duo's — serial number.) What changed in the new Duos is the case stiffener. The good news is that the new stiffener fits

nicely in the 210 and 230 and significantly enhances the keyboard action.

The bad news is that the part (#922-0091) costs \$76. Installation isn't cheap either, because the Duo needs to be entirely disassembled; your technician will charge accordingly.



To arrange for Apple to do the upgrade for you, call 800-767-2775 (in the U.S. only). The labor charge is \$90; this *isn't* a warranty fix.

For those who want to do the installation themselves, instructions are included in our book *The PowerBook Companion*, second edition (Reading, Massachusetts: Addison-Wesley, 1993). / Sharon Zardetto Aker and Rich Wolfson

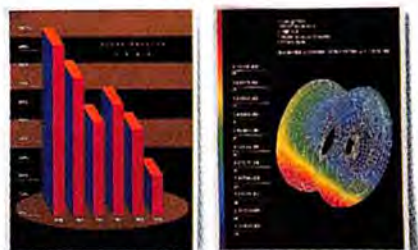


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can do. Of course, the Phaser 300 may not come with its own built-in sharpener, but hey, with color like this, you can forget about things getting dull. in two minutes flat. On top of all this, the

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followed by a Delete to fake a Forward Delete key, and you can play games with window controls to mimic the Home, End, Page Up, and Page Down keys. But don't forget that using a Control-1 macro is not exactly the same as pressing F1, because you can't add a modifier to the macro. Say you're used to pressing F5 in Word to get a new document and Shift-F5 to get a new window. You'll now find that your Control-5 macro will open a new document but Shift-Control-5 won't open a new window unless you specifically record it as a separate macro to substitute for the Shift-F5 key press.

With all that said, don't forget to check the manual that came with your PowerBook-utility package. Most utilities offer some substitutes for the Home/End group and even some function keys.

Try a Little ResEdit

You don't want to pack an external keypad, and you don't have a macro program? There are still some options available, in the form of do-it-yourself software. Of course, you'll have to face Apple's dreaded resource editor, ResEdit (available free from user groups and on-line services) — actually, its perils are greatly exaggerated, and editing keyboard-character sets is one of the simplest things you can do with it. The instructions here are necessarily brief, but even if you're unfamiliar with ResEdit, you should be able to make yourself a numeric keypad for the PowerBook. The standard ResEdit cautions and disclaimers apply: Work on copies, not originals, until you're absolutely sure you've done the editing correctly. (By the way, for those who would rather not bother with ResEdit, some PowerBook numeric-keyboard layouts are available on-line and through user groups. On ZiffNet/Mac, look for PBKEYS.CPT in Library 3 of the Download & Support Forum.)

Start by double-clicking on your System file to open it. Look for a keyboard-layout file, and duplicate it by Option-dragging it to the desktop; rename the file Keypad. (If the icon is locked and can't be renamed, use the Finder's Duplicate command.) Launch ResEdit, and open the Keypad file. A window containing four icons opens; double-click on the one named KCHR. Double-click on the one line of information you see, to open the main editing window.

The only items you need to work with in

this window are the sample keyboard at the bottom and the 16-x-16-character grid at the top left. Drag the numeral 1 from the grid down to the keyboard, placing it on top of the N key. Drag the 2 onto the M, the 3 onto the comma key, and so on, until you've built the numeric keypad around the K key on the keyboard. Next, drag the + sign from the grid onto the \ key, so it doesn't share a key with the = sign and require use of the Shift key for access. That's it. Close the three windows you opened; as you close the last one, you'll be asked if you want to save the changes. Click on Yes, and quit ResEdit.

Drag the modified keyboard-layout file back into your System file. Open the Keyboard control panel, and you'll see the Keypad file listed as a keyboard option. Select it in the list, and you'll be able to type numbers from the letter keys. (Once again, I recommend you label the keys.)

To make switching layouts a cinch, you'll have to make one more little ResEdit excursion. The following procedure puts a keyboard menu onto your menu bar so you can switch from one layout to another easily. Start by duplicating your System file — use the Duplicate command so it stays right there in the System Folder. Open the duplicate in ResEdit. In the window that opens, look for an icon named itlc. (You can type its name to select it.) Double-click on the icon, and then double-click on the single line of information in the window that opens. In the next window, you'll see two radio buttons next to the line Always Show. The 0 is selected; click on the 1 instead. Close the windows, saving the changes when asked, and quit ResEdit.

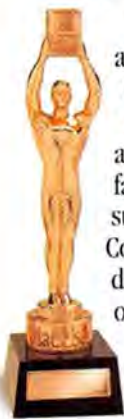
Drag the original System file out of the System Folder. Give the modified file the name System, and restart your PowerBook. If all's well, the modified System file will now be in charge and you'll see a new menu icon at the right of your screen, sitting between the Help and Application menus. Assuming you're working with a U.S. layout to start with, the icon is an American flag. Look at the menu; your keyboard layouts are listed there, and switching between them is as simple as choosing one from the menu.

Sharon Zardetto Aker reached the pinnacle of success when her book *The Macintosh Companion* was an answer on the TV game show *Jeopardy*.

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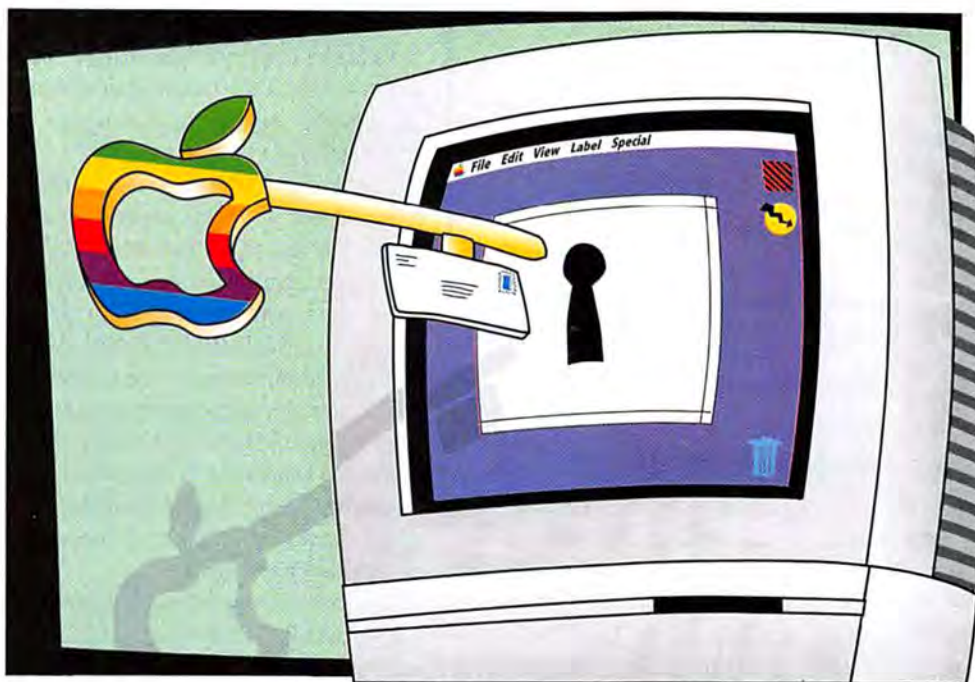
MODEL NUMBER	FORMATTED CAPACITY	TRANSFER RATE
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2100*	2.1 GB	10 MB/Sec max
3020*	3.0 GB	10 MB/Sec max

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HANDS ON Power Tools



Unlocking PowerTalk

E-mail built right in to system software sounds great — until you try using it. Here's a guide to using System 7 Pro's PowerTalk. **BY ADAM ENGST**

Apple knows how to bring networking religion to the masses, first with the inclusion of LocalTalk in every Mac and then with System 7's easy-to-use file sharing. And now Apple has introduced PowerTalk, which ships only with the \$149 System 7 Pro.

PowerTalk is a collection of system extensions and applications that enables networked Macs to easily exchange files and electronic mail (see the "System 7 Pro Desktop" sidebar). It also simplifies the viewing of network devices, such as file servers — forget about using the Chooser. And just as System 7 file sharing works fine without an AppleShare server, so PowerTalk doesn't

require that you use the new PowerShare collaboration servers, which add encrypted communications and a master directory and allow mail delivery when your recipient's Mac isn't running.

In theory, PowerTalk is a wonderful addition to system software; in practice, it's less than intuitive to use and install. Here are some tips for easier PowerTalking.

First Steps

After you've installed System 7 Pro, there are a few things you should watch out for:

Your Mac's Name. Before you do anything else, check the Macintosh Name field in the Sharing Setup control panel. PowerTalk

labels the messages you send with information obtained from the Macintosh Name field (*not* the Owner Name one), so give your Mac a name that indicates who you are. Just remember that changing your Mac's name will break other people's existing network aliases to you, so let other users know if you do change your Mac's name.

The Mailbox. The only way to change the name on your mailbox is to delete the PowerTalk Setup Preferences file from the Preferences folder in the System Folder, restart your Mac, and set up PowerTalk again.

The Key Chain. The PowerTalk Key Chain remembers your passwords to servers and on-line services after you've entered them once. To protect these passwords, you define a single Key Chain Access Code, which automatically accesses any of the services listed. As with most such schemes, there's no way to discover in the Key Chain the current password for any server if you need to change it — a problem if you're working on a large network and have accumulated many passwords.

Don't depend on the Key Chain for real security. If you trash the PowerTalk Setup Preferences file and restart, you can set up PowerTalk again. Although an intruder won't have immediate access to the entire Key Chain list of passwords or to your mailbox, your security won't be ironclad.

Personal Catalogs. Your Mac sets a default personal catalog, but you can set a *preferred* personal catalog if you want. You do this by selecting Personal Catalog from the Apple menu, choosing Get Info from the File menu, and then clicking on the Set Preferred button. Until you do this, clicking on the Recipients button in a mail-enabled application won't do anything.

Information Cards. When you're creating an information card, you should go ahead and ignore the Business Card, Personal Info, and

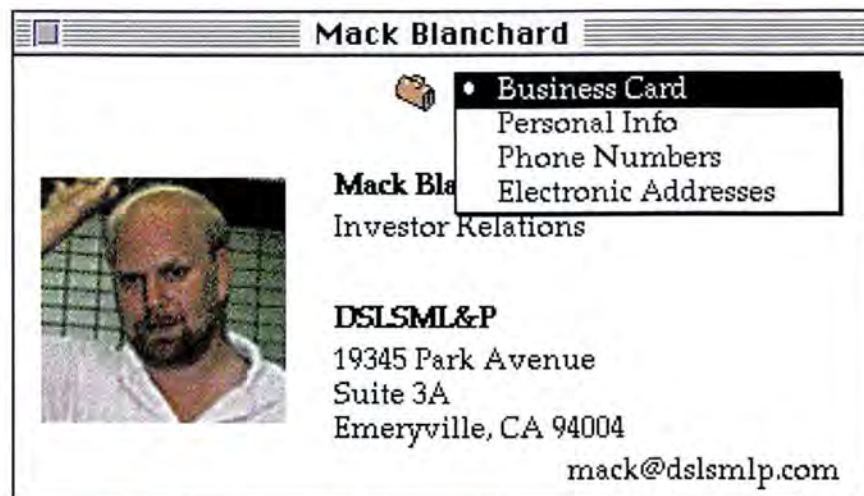


figure 1 / **PowerTalk lets you create information cards**, electronic business cards that you can distribute to the people you communicate with. Although you can add pictures, postal addresses, and phone numbers, these are frills — the most important information is your electronic addresses.

Phone Numbers fields if you like (see figure 1), but for the card to be at all useful, you *must* attach one or more electronic addresses to it.

To do this, open the Catalogs icon on your desktop, open the AppleTalk icon, and find your computer's Direct AppleTalk mail address. Drag that address icon to your newly created information card.

If you are creating information cards for other users, you can also type in addresses manually (but this is an error-prone process) or drag them onto an information card — for example, from a piece of mail that someone has sent you or from a personal catalog. If you have access to a PowerShare server, you can find users (or file servers) with the Find in Catalog option, which PowerTalk installs on your Apple menu. Because this method displays only aliases to found items, you cannot drag these address aliases onto user information cards (although you can drag address and user aliases onto group information cards). Instead, you must use Get Info on the alias, click on the Find Original button, and then drag the original onto your user information card.

Group information cards (created with the New Group option, on the Catalogs menu) are useful for sending a file or a message simultaneously to an entire group of people.

For easy access from within a mail-enabled application, store all information cards in your preferred personal catalog.

Using AppleMail

PowerTalk provides two basic ways to send mail. The first is to drag a file onto an address or information card, at which point the file is sent to that person directly. To test this, open Catalogs and then AppleTalk and drag your information card onto a Direct

AppleTalk mail address. If you placed your information card in a personal catalog originally, sending it won't work; to send an information card, you must first drag it to the desktop and then replace it in your personal catalog when you're done.

The second method of sending mail is to use a Mailer in a PowerTalk-enabled application to send a file from within that program (some applications may require an additional step to attach a Mailer). Of the two methods of sending mail, the first is foolproof but you can't easily add comments. The second method works well but only if your recipient has the same program.

When you send a message (also called a letter) from a Mailer (look for a Send menu item or a custom button — the Mailer does not provide a Send button by default), you may, in some applications, have the option of sending in multiple formats. This means that you can send a WordPerfect file in Snapshot or AppleMail format to someone who doesn't have WordPerfect.

Your mailbox stores all incoming and outgoing PowerTalk messages and files (they actually live in a folder called IPM Bin in the

THE SYSTEM 7 PRO DESKTOP

SYSTEM 7 PRO INTRODUCES several new elements, including icons for the PowerTalk Key Chain, catalogs, information cards, and your mailbox. It also includes two new stand-alone applications: AppleMail, which lets you send electronic mail, and DigiSign Utility, which allows you to attach digital signatures to documents. Here's a quick look at what System 7 Pro adds to your desktop:

Personal Catalogs. When you install PowerTalk, an empty personal catalog is placed in the Apple Menu Items folder. You can create multiple personal catalogs to hold information cards for users and groups, icons for file servers and mail addresses, and aliases to other personal catalogs. You can add items to a personal catalog simply by dragging them in.

Catalogs. PowerTalk provides not just personal catalogs but also a single, networkwide Catalogs icon, which lives on (and cannot be moved from) your desktop. The Catalogs window displays file servers and other PowerTalk Macs on your network, which show up as Direct AppleTalk mail addresses. PowerShare servers also appear here, along with their master directories.

Information Cards. Think of user information cards as electronic business cards on steroids. They each have a pop-up menu with four choices — Business Card, Personal Info, Phone Numbers, and Electronic Addresses — each of which displays its own entry screen.



BECAUSE APPLEMAIL DISPLAYS items only in the Snapshot and AppleMail formats, its utility as a mail reader is limited. It has basic features — such as Reply, Forward, Open Next Letter, and Delete — but often implements them poorly.

PowerTalk Data folder in the System Folder). The mailbox provides an In Tray and an Out Tray and does not let you create additional mailboxes. You can copy messages to a normal folder, but you lose the sender and date-sent information.

Because AppleMail displays items only in the Snapshot and AppleMail formats, its utility as a mail reader is limited. It has basic features, such as Reply and Forward, but often implements them poorly. For example, after selecting Reply from the Mail menu, you must say whether you want the message to go just to the sender or to all recipients of the letter, whether or not it was sent only to you. AppleMail has a shortcut for Delete and another for Open Next Letter, but the latter works *only* on unread mail.

If you open a message created by an unknown application, AppleMail displays its

Mailer and the icon of the original file, which you can double-click on to open the message (a pointless operation, because you don't have the creating application), or you can drag the icon onto your hard disk and open it with an application that reads foreign file types.

PowerTalk has a way to go before it becomes really useful, especially as many of its features can be duplicated with creative use of aliases and e-mail packages such as CE Software's QuickMail. With the aid of a full set of gateways that let it unite numerous diverse e-mail services, PowerTalk will someday be a more valuable player.

Adam Engst is the editor of the on-line magazine TidBITS and author of *Internet Starter Kit for Macintosh*, published by Hayden Books.

To create an information card, either duplicate the untitled information card that PowerTalk installs in the PowerTalk Folder on your hard disk or, with a personal-catalog window active, choose New User or New Group from the Catalogs menu.



AppleMail. AppleMail is little more than a souped-up TeachText with a Mailer permanently affixed. It supports more than 32K of text; uses fonts, sizes, and styles; and can record sounds and accept pasted-in graphics and movies. To create a new message, or letter, select New or Letterheads (messages with existing text or graphic objects in them) from the File menu in AppleMail.

DigiSign Utility. Just as real signatures are used to verify the validity of a check or a credit-card slip, so are digital signatures used in PowerTalk to verify that the file or message being sent has arrived unmodified from the signer. Once you have used the DigiSign Utility to obtain a Signer, you can use it to sign messages by clicking on the Sign Letter check box when you send a letter in a mail-enabled application. You can also sign files by dropping them on the DigiSign Utility before mailing them. Signed files are automatically locked to prevent tampering; unlock them in the Get Info box to modify them.

Recipients of a signed file or message must authenticate it by clicking on the verification button. For messages sent via a Mailer, opening the Mailer displays this button. It's more difficult with files, however, as the verification button appears in the Get Info box and then only *after* the recipients have removed the file from their mailboxes.




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-  **Extensions** enables you to easily master system extensions, control panels, Chooser documents and items in the Startup Items folder.
-  **Keys** can create keyboard shortcuts which will select menu items, click buttons, type text, and open documents, folders, and applications.
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-  **Notes** lets you create digital sticky notes that support text, graphics, sound, and QuickTime formats, and attach them to any folder.
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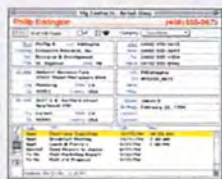


The QuickContact and Reminder menus instantly access your most important contacts and your day's events.

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Tip Sheet

Save time by using Microsoft Word's glossary, solve the mystery of missing fonts, and keep the cats — cat burglars, that is — away from the mouse. BY PHILIP RUSSELL

HYPERCARD'S SEARCH FUNCTION may be more versatile than you think. You can refine a search by typing two keywords into the find criteria, and HyperCard will find any card containing both words, even if the two words don't appear in succession on the card.

CALL UP MICROSOFT WORD GLOSSARY items with just a couple of keystrokes by using a trick to name the items. For instance, if you


want to turn a letterhead into a glossary item, assign the letterhead a glossary-entry name starting with unique characters, such as LA Letterhead or LB Letterhead. That way, all you need to do when you want to use the letterhead is press Command-Delete, type the first two letters of the glossary name, and press the Return key. The letterhead will appear provided that no other glossary items have names starting with those two letters.

ADJUST MARGINS for an entire MacWrite Pro document by holding down the Option key while dragging page guides.

YOU CAN PERFORM SORTS on tabbed material in Word 4.0 and later, but you can sort only the left-hand column. Highlight the lines you want to sort, and select Sort from the Tools menu. If you don't want to sort the left-hand column, one fix is to export the text to a database or spreadsheet program that has more-sophisticated sorting, such as Microsoft Excel.

DON'T SAVE THE SAME FONTS in the System file and in active suitcases, because you won't be able to access all of them. For instance, if you have Times 10 and 12 in an active suitcase and Times 10, 12, 14, 18, and 24 in the System file (or in the Fonts folder under System 7.1), your Mac will find Times 10 and 12 but will ignore 14, 18, and 24. Put all the type sizes you want in one place, and eliminate duplications.

PROTECTING YOUR MOUSE from theft in a public place, such as a computer lab, can cost you only pennies if you already have a security cable protecting the Mac itself. Run a loop of the mouse cable through a small washer. Now run the computer's security cable through the loop. (Thanks, *MACS Newsletter*, Spokane, WA, MUG.)

DON'T STORE DOCUMENTS in vinyl binders if the pages were produced by a method that uses toner, such as laser printing or photocopying. After a few months or years, the toner will stick to the vinyl. 

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You can also send your tip to Gregory Wasson (72511,36) on ZiffNet/Mac, MacUser's on-line service. We pay \$25 for every undocumented tip we print, and the Tip of the Month earns \$100; see page 4 for more details.

READER TIPS / compiled by Gregory Wasson

System 7 Cache Switch

Using a Quadra running System 7, you can turn caching on and off without restarting your Mac. Open the Cache Switch control panel, and press the Option key while you click on one of the buttons. The change will take place immediately.

Diego Akerman
via ZiffNet/Mac

[Some people have reported that this trick can corrupt mounted floppy disks, but we couldn't duplicate the problem. — Ed.]

Newton Handwriting Recognition

You can improve the Newton MessagePad's handwriting-recognition accuracy by writing lowercase letters. For instance, when I write the word *I'll* on the MessagePad, the Newton interprets it as *III*, *six*, or *sill* — anything but *I'll*. If I write it all in lowercase letters, the Newton identifies *i'll* as *I'll*. You can write any word in lowercase and the Newton will identify and capitalize it for you, as long as the word is entered correctly in the word list.

Deidre Cannon
Columbus, OH

QuarkXPress and Word

QuarkXPress 3.0 and Microsoft Word 5.0 have time-saving keyboard command equivalents for switching to certain fonts. If you press Command-Shift-Q in either program, the next character you type will be in the Symbol font (you may have to deactivate QuickMail's hot keys or other Command-key shortcuts for this to work). Word and QuarkXPress immediately revert to the previous font with the next key you press. Similarly, QuarkXPress also allows you to type one character in Zapf Dingbats if you press Command-Shift-Z.

Susan Sanders
Canton, OH

MacWrite Pro Tables

Tables in MacWrite Pro have a limit of 100 cells apiece. One way to make a larger table is to insert a table within a table.

To do this, select all the cells in the bottom row of your table and then choose Merge Cells from the Table menu. To increase the row height of the bottom cell to make room for the table you want to insert, choose Row Height from the Table menu and type in the point

size you want. Click on the bottom cell so that the insertion point is blinking, and select Insert Table from the Frame menu to add the new table inside the original one.

George Johnson
Seattle, WA

QuickTime 1.5

You can use Apple's MoviePlayer to add text to a QuickTime movie if you have QuickTime 1.5 or later.

Copy some text to the Clipboard. Open a QuickTime movie within MoviePlayer. Go to the first frame of the portion of the movie where you want the text to begin, and select a portion of the movie by dragging the play bar while pressing the Shift key. To place the text, press Option-Control-Shift while selecting Paste from the Edit menu. The next time you play the movie, the text will appear along the bottom of the selected frames.

Jim Frazier
Pacific Palisades, CA

Microsoft Works 3.0

Converting files from Microsoft Works 2.0 to Works 3.0 is time-consuming unless you use this trick. Hold down the Shift key, and click on the Works 2.0 files you want to convert, so that they're all highlighted. Then drag them onto the Works 3.0 application icon. All the files will be automatically converted.

Alex Rampell
Palm Beach, FL

TIP OF THE MONTH

Publish-and-Subscribe

Take the pain out of updating multiple résumés by using publish-and-subscribe. Even if your résumés emphasize different skills, you can usually update common résumé items — such as address, education, and most recent job — at the same time.

Create a folder with a name such as Common Résumé Sections. Publish all the common items from your most general résumé by highlighting the lines you want to publish (one at a time) and then choosing Create Publisher from the Edit menu. Store the selection in the Common Résumé Sections folder.

Do this for every section of the résumé you want to have appear in your other résumés. Open each of the other résumés, and subscribe to the published items by using Subscribe To, on the Edit menu.

Now, whenever you update your most general résumé and save your changes, all of your résumés will be updated.

Pete Wilding
Hanover, NH

ClarisWorks Correction

Our February '94 tip for converting a row of numbers in ClarisWorks into telephone-number format (page 194) contained an error in the code. Presented here is the way the code should have read:

```
"("&MID('Number Entry',1,3)&")"&MID('Number Entry',4,3)
&"-"&MID('Number Entry',7,4)
```

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CIRCLE 125 ON READER SERVICE CARD

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TAPE TWO - Three Fold Document, Save & Save As, Preferences, Column Guides, Multiple Paste, Color Palette, Copy/Paste, Rotate Graphic, Control Palette, Story Editor, Spell Check, Find/Change, Style Palette, Reverse Text, Paragraph Specs, Inline Graphic, Library Paste, Edit Styles, Round Corners, Rotate Text, Printing, Color Printing

TAPE THREE - Mapping Fonts, Help, New Document, Change Settings, Bleed Fill, Control Palette, Page Numbers, Multiple Master Pages, Power Multiple Paste, Place Text, Column Guides, Tile Setting, Define Styles, Paragraph Specs

TAPE FOUR - Cascade/Tile, Library Palette, Tab Ruler, Paragraph Specs, Control Palette, Aldus Additions, Placing Graphics, Cross-Over Graphics, Text Wrap, Widows & Orphans, Text Width & Track, Group, Links, Reestablish Link, Search Library, Color Palette, Index, Multiple Paste, Table of Contents, Image Control, Sort Pages, Make Booklet

TAPE FIVE - Aldus Additions, Pub Info, Acquire Image, Continued Line, Overset Text, Balance Columns, Bullets & Numbering, Styles, Color Library, Create Keyline, Bookmark, Drop Cap, Headers & Footers, Sort Pages, Update PPD, Color Palette, Tile Windows, File Transfer, Greeking Text, Untitled Document, Composing, Run Script, Edit Story, Export Text

TAPE SIX - Newsletter Solutions: Newsletters, Layouts, Page Set Up, Guides, Control Palette, Graphics, Rotate Text, Group, Text Wrap, Text/Graphic, Preferences, Fonts, Edit Styles, Paragraph, Crossovers, Rotate Graphics, Save As Template

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Help Folder



A way to keep your hard disk virus-free, advice on how to choose the right software for connecting remote Macs, and how to get inside Mac games. BY ANDY IHNATKO AND BOB LEVITUS

ARA Versus Timbuktu

Q. Getting the modem I need is easy, but I'm having trouble choosing between Apple Remote Access (ARA) and Timbuktu/Remote. **ANDY:** The problem with any remote-access software is that once you've installed it, you can no longer use the excuse "Sorry, I don't have that file on my PowerBook to make the revisions you need, but I can send it to you as soon as I get home." Instead, you'll be sentenced to your hotel room for the rest of your vacation.

Despite that drawback, the \$249 Apple Remote Access Personal Server for Macintosh, from Apple (800-776-2333 or 408-996-1010), and the \$195 Timbuktu/Remote, from Farallon Computing (510-814-5000), have useful but distinct purposes. ARA gives you an AppleTalk connection across a phone line between two Macs. Timbuktu, on the other hand, puts the entire desktop of your office Mac into a window on your remote Mac (see figure 1). Timbuktu lets you run any piece of software on your office Mac remotely, and it is faster at tasks such as printing documents to office printers and running office e-mail programs and your office Mac's other software.

However, if you need an AppleTalk connection so you can perform such tasks as document sharing with other computers on your office network, ARA is the way to go.

BOB: Although I've found that on 80 to 90

percent of my road trips, I don't use ARA, the few times I have it's truly been a lifesaver. Timbuktu can run on top of ARA, giving you the advantage of using both programs if you can afford to buy both.

Infect Me Not

Q. If I stick a floppy disk that's infected with a virus into my Mac's floppy-disk drive to be fixed by antivirus software on my hard disk, will my hard disk become infected?

Elizabeth Ricks
Bronx, NY

BOB: Probably not. But before you put the infected floppy disk into the drive, you should take precautions by setting virus-detection software to scan floppy disks when they're inserted.

There's a slight chance your floppy disk can infect your hard disk if it has a yet-to-be-discovered or -cured virus. Every year, a few new viruses appear. Fortunately, within days of the discovery of a new virus, the makers of all the major antivirus programs — such as Disinfectant, Symantec's SAM, Datawatch's Virex, Central Point Software's Anti-Virus for Macintosh, and Inline Software's Rival — update their software with a cure. They make them available online, by phone, on-disk, by postcard, and/or by fax. As long as your antivirus software is up-to-date, there's very little chance of infecting your hard disk.

You might want to try using the expert mode — most antivirus programs have one. It may enable programs to detect even an unknown virus by watching your system for any suspicious behavior, such as a program that tries to alter your System file. However, I've experienced nothing but false alarms while using that mode and work with it turned off.

ANDY: When choosing an antivirus program,



Figure 1 / Farallon's Timbuktu/Remote lets you remotely view and use everything on your office Mac from your Mac at home. You can fix problems on the Mac you're accessing, you can exchange files between Macs, or two people can work on the same document at the same time.

THE BASICS

Q. When Bob LeVitus said, "Never plug in or unplug anything while your Mac is powered up" (Help Folder, November '93, page 209), was he referring even to the sound-in and sound-out jacks and the video-in and video-out jacks of the AV Macs and the phone-line jack on a PowerBook's internal modem?

Samuel Dickson
San Francisco, CA

ANDY: It's OK to plug and unplug all the things you mention. All those items, except for the telephone line, transmit a signal rather than data. As a rule of thumb, it's OK to unplug anything that transmits a signal. It's also OK to unplug the telephone line with frenzied abandon, which breaks my rule of thumb. But hey, rules of thumb were made to be broken.

You shouldn't unplug anything that transmits data, such as cables for your printer and SCSI devices. It's also a bad idea to unplug any ADB devices, such as your keyboard or mouse.

It's possible to zap any component with static electricity, but this can happen whether the hardware's powered up or not. I know a guy who did a thousand bucks' worth of damage merely by touching his mouse on a dry, cold morning, but I suspect this was merely bad karma making its way back around.

Write to Help Folder

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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), Andy (72511, 204), or one of the other MacUser experts.

there's absolutely no need to go any further than the absolutely free Disinfectant, which you can get from just about any on-line service. (You can find it on ZiffNet/Mac, MacUser's on-line service, in Library 8 of the Download & Support Forum, under the filename DISINF.SIT.) Besides being free, it's the one antivirus utility the entire Mac community feels a communal responsibility to support and enhance.

TV Time?

Q. How can I make my TV set function as a supplemental monitor for my Mac?


Frank Gladen
Chico, CA

BOB: You can do it, but you won't be happy. Your television and your Mac use incompatible standards, NTSC (National Television Standards Committee) and RGB (red, green, blue), respectively. Some monitor companies, such as Lapis, Radius, and RasterOps, make RGB-to-NTSC converters, which let you display computer images on your TV, but the results are spectacularly unspectacular. You'll see flickering and shimmering and thin lines that vibrate like those on

an op-art poster. If you do decide to use a TV as a monitor — to show a PowerPoint presentation to a roomful of people, for instance — use big type.

ANDY: It isn't worth the time and money to hook a TV up to your Mac. Heck, you could finance a Memorial Day weekend on Cape Cod for the kind of dough it'd take to make your Mac NTSC-compatible. And to give you an idea of the kind of image quality you'll get for your trouble, most people in the video biz refer to NTSC as Never Twice the Same Color.

Where to Go for Games

We've mentioned the wonderful magazine-on-a-disk *Inside Mac Games* several times in the past few months, and we have received lots of requests for the snail-mail address of the magazine. *Inside Mac Games* is at 3862 Grace Lane, Glenview, IL 60025; 708-486-0636. A one-year subscription for high-density disks costs \$28 (\$38 for an international subscription); a special condensed preview edition should be available on your favorite on-line service. 

WINNER TAKES T-SHIRT

The winner of the *MacUser* T-shirt contest in last December's Help Folder (page 206) is Mike Baker, of Altoona, Pennsylvania, for the most creative answer. In reply to our question about image 17 of the Photo CD sampler that comes with the AppleCD 300 drive (Who is this guy, and what is he doing?), he said, "It is none other than the new CEO of Apple, Michael Spindler, holding the trackball of a top-secret, ranch-house-sized PowerBook code-named MegaBook Maximus. The MegaBook is aimed at the health-club crowd. Users jump from key to key, burning calories as they go. The giant trackball helps develop balance and foot dexterity as they roll and scroll through their documents. MegaBook is now in beta-test at Gold's Gyms throughout the country."



MacUser

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This June, MacUser tests 5 CD-ROM recording systems. Now you can archive information or eliminate the middleman by debugging, testing and making your own master of a Mac, PC or audio CD. MacUser gives buyers the knowledge to make sound and insightful investments.

THE SHORTEST DISTANCE TO APPLETALK ROUTERS

MacUser and ZD Labs examine 11 routers under \$4000. In this report, small- to moderate-sized Mac-managed networks under 200 nodes are tested for speed, technical support, the connection and division of ports, and more. Each router's set-up and management software is also evaluated. MacUser is the fastest route to smart buying.

DRAWING PROGRAMS DRAW CLOSER

Two of the best-known drawing programs are evaluated for their strengths and weaknesses, updated features and inherent advantages. Usability and interface issues are also addressed. And of course, the editors make product recommendations and award mouse ratings. In every issue, MacUser helps buyers draw the best conclusions.

JUNE AD CLOSE:
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Do You Make These Six Common Mistakes On Your Taxes?



Six common mistakes can cause you big headaches on your taxes. An oversight here, an omission there. From unnecessary tax payments to full blown IRS audits -- you can end up paying too much ... or worse.

But now, using MacInTax and your personal computer, you can avoid these simple but costly mistakes:

1 The Arithmetic Error

Today, even the simplest forms contain complex calculations. And with all the late-night scrambling, an innocent mistake could cost you plenty.

2 The Transcription Error

With all those numbers being juggled from schedule to schedule, it's no wonder the figures are so often transcribed incorrectly or entered on the wrong line.

3 The Omitted Form

Even "ordinary" returns require anywhere from six to a dozen forms to complete. It's easy to miss one ... or end up rushing all over town to find the one you need.

4 The Misinterpreted Instruction

At best, IRS instructions can be tough to understand. At worst they can be mind-boggling. What you need are clear directions in plain English.

5 The Overlooked Deduction

You'd have to be a professional tax preparer to know all the deductions you're entitled to. If you miss just one, it could cost you hundreds of dollars.

6 The Exceeded Guideline

The fastest way to trigger an IRS audit is to exceed the "normal" range on one of your deductions. You need to know what the IRS looks for on a line-by-line basis.

When you do your taxes with MacInTax, mistakes like these are virtually impossible. And filing your taxes couldn't be easier.



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Direct Line

MAIL ORDER SECTION



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

things as double your warranty or give you a refund if you find a lower price elsewhere. If you have a problem, your credit-card company will deal with the mail-order company.

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.

Check Packing Slips

Before you use your new merchandise, make sure it's exactly what you ordered — the correct model or version number, for example. It's easier to return goods before they've been unpacked.

Repair/Replacement Services

If you're buying hardware, find out how the company handles repairs or replacements.

Technical Support

Technical support varies from company to company. Make sure you know what help is available.

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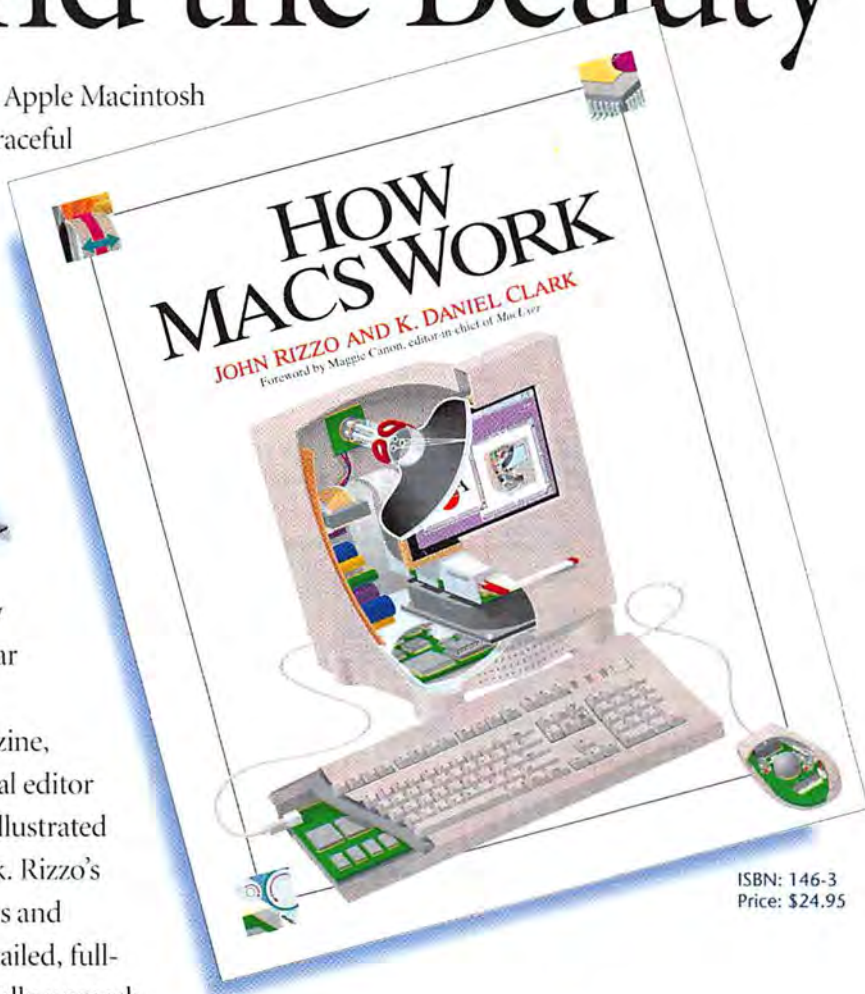
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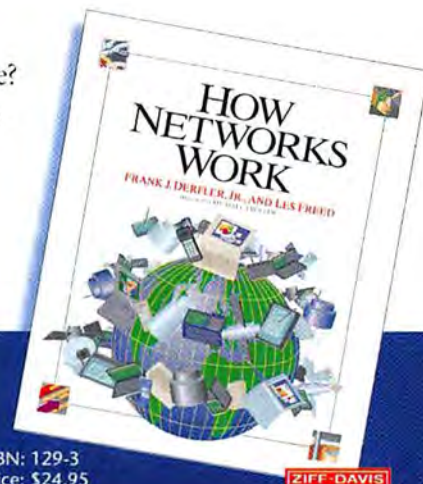
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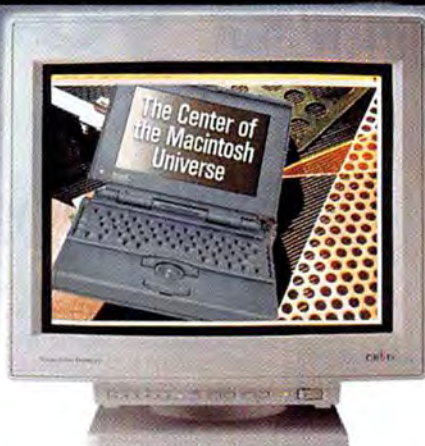
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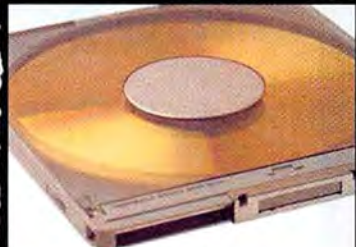
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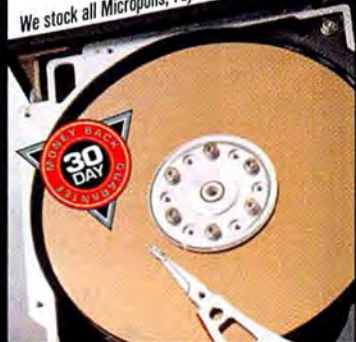
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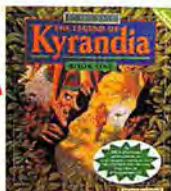


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Minimum requirements: Mac LC, System 6.0.7, 12" 256-color monitor, 4MB free hard disk space, CD-ROM drive.

Virgin Games

7413 The Legend of Kyrandia



\$48.

Xplora 1 Peter Gabriel's Secret World

Peter Gabriel's immense talent has finally dissolved the boundary between performer and audience, and you are there. Travel with Peter on an interactive musical journey with an itinerary that's entirely in your control. Go backstage at a concert; play along in an impromptu jam session; take control of the mixing board to create your own versions of "Digging in the Dirt;" explore Peter's life and his newest album performance, US; and learn more about the rhythms and instruments of world music. This incredible CD-ROM package includes a special collectors edition book, 140 minutes of video and audio, 100 full color photographic images, and a book's worth of text.

Minimum requirements: Any color Mac, 4MB RAM, System 7, 2MB hard drive space, a CD-ROM drive.

MacPlay

7456 Xplora 1



\$35.

Alone In The Dark

Your exploration of the house, and the terror within, begins with a piano in the attic. As you fight room after room of horrors, the evil of the late Jeremy Hartwood's mansion begins to twist your mind with panic. The torturous howls, the brooding darkness. Hartwood's suicide seems less perplexing as you unravel his fear-filled descent into madness. Alone In The Dark is so involving, it will actually quicken your pulse, coaxing you late into the night. You freely and actively explore the house, interacting with the demons you face. Amazing 3D rooms with up to 9 camera angles, true suspense, and fights to the death charge the intensity.

MacPlay

7537 Alone In The Dark



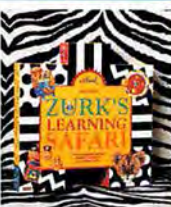
\$39.

Zurk's Learning Safari

The joy of discovery is the pleasure of learning! Children 3 to 7 will love playing games of hide-and-seek, solving puzzles, and exploring magic boxes with "cool" Zurk and Maya the baby lion. This interactive whole-mind learning program turns children's natural curiosity into valuable math, science, and reading skills.

Minimum requirements: Mac with 4MB RAM, System 6.0.7, 256-color monitor, and 7MB free hard disk space.

Knowledge Adventure/Soleil
7599 Zurk's Learning Safari



\$38.

Kids Studio

This exciting, all-in-one multimedia program gives kids all the tools they need to create and star in their own full-screen presentations, QuickTime movies, or printed stories. It's easy to use, yet incorporates features like sound recording, a paint window with 256 colors, support for Photo CDs, and a Treasure Chest library of high-quality images.

Minimum requirements: Mac LC, 4MB RAM, System 7.0, 256-color 12" monitor, 7MB available hard disk space.

Maxis

7436 Kids Studio



\$27.

The Lost Treasures of Infocom

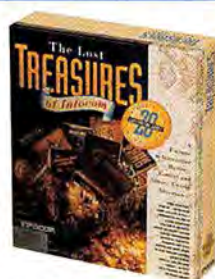
Here's an adventure gamer's dream collection, chock-full of Infocom's best-ever mystery, fantasy, and science fiction games! Volume I includes the Zork series, Planetfall, Deadline and more - 20 great titles in all. Volume II adds 11 more including Sherlock, Border Zone, and Wishbringer. These interactive challenges put your problem-solving skills to the test. You'll be captured for hours - days - weeks - by spine-tingling suspense, belly-rocking comedy, and brain-teasing puzzles galore. Each Volume contains hundreds of dollars worth of incredible games. Add both collections to your personal library of software treasures!

Minimum requirements: Mac 512K, System 6.0.

Activision

7597 The Lost Treasures of Infocom I

7598 The Lost Treasures of Infocom II\$17



\$54.

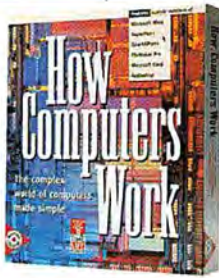
How Computers Work

Have fun while you learn in this interactive look at the past, present, and future of the desktop miracle. How Computers Work features narrated slide shows on input, output, memory, programming, and applications. QuickTime animation takes you inside every device from the mouse to the memory cells of a CPU. It also includes tutorials for the most popular programs on the market today including Word, Excel, Quark XPress, FileMaker Pro, Audioshop, and SuperPaint. And your children can easily learn the basic of programming using the included Logo programming tutorial, designed expressly for children.

Minimum requirements: Mac LC, System 6.0.7, 4MB RAM, 13" color monitor, CD-ROM drive.

Time Warner Interactive Group

5987 How Computers Work



Mac's Place carries Time Warner's entire line of CD-ROMS.

\$29.

HOT PRICE!

Crystal Caliburn

Any Pinball Wizard will "flip" for Crystal Caliburn! This is pinball excitement like you've never seen on a computer. Your quest for knighthood is full of surprises and great scoring opportunities. Accolade all twelve knights and then go for the Holy Grail. This is "Everything Lit" for you pinball fanatics! A contest feature allows you to submit an authorized score to compete with anyone in the world! And it includes all the advanced features of the best pinball machines including nudge, tilt, battle sounds, voices, 3-D ramps, 3 multiball, autobattle, flashing bumpers, contest feature, and more. Crystal Caliburn was developed by the same people behind Tristan and Eight Ball Deluxe.

Minimum requirements: Any color Mac w/13" or larger monitor, 4MB RAM, System 6.0.7.

StarPlay Productions Inc.

7080 Crystal Caliburn



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PhotoFlash

Apple PhotoFlash software is a page-layout companion that enables you to quickly and easily acquire photos, enhance them, and place them in your documents. An integrated browser simplifies image selection, and automatic photo-enhancement tools allow you to remove dust and scratches, balance image exposure, and make every image picture-perfect. Automatically place photos in popular page-layout programs like QuarkXPress and Aldus PageMaker with built-in AppleScript support and several ready-made scripts. PhotoFlash offers integrated image-compression capabilities and low memory requirements. That means even modest computer configurations can now handle storing, enhancing, and placing photos.

Minimum requirements: Any Mac with a 68020 processor, 8MB RAM, System 7.0.

Apple Computer
7431 PhotoFlash



\$648.

Lightning Effects ME

This is the fastest Adobe Photoshop filter and effects acceleration card available. You can resize and rotate images with lightning speed!

The Dual AT&T DSPs run the Adobe Systems AV DSP Power Plug-In code, giving your Mac the same power as the AV Macs, at twice the speed. Accelerate filters and effects, including Gaussian Blur, Sharpen Edges, Despeckle, Emboss, Fragment, High Pass, Unsharp Mask, CMYK/RGB mode change, Blur More, and much more! Lightning Effects ME also works with Video Fusion and Fractal Painter X2.

Minimum requirements: PDS slot in Quadra 700, 900, 950 and 800.

Spectral Innovations
7459 Lightning Effects ME



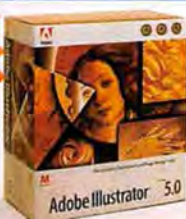
\$359.

Adobe Illustrator 5.0 & Streamline 3.0

What a combination! Adobe Illustrator 5.0 gives you the powerful tools used by graphic artists around the world to create award-winning ads, illustrations, packaging, and logos. The program's intuitive interface, precise control, and superior text handling will help you elevate your own ideas to the status of fine art. And now, Streamline 3.0 gives you unlimited access to an infinite selection of printed images by converting scanned photos and illustrations into PostScript line drawings. Convert logos, photos, or your own pencil-sketches into line drawings. Then use Illustrator to edit and refine as your inspiration demands. The power of professional graphic design is yours with Illustrator and Streamline.

Minimum requirements: Illustrator 5.0 - Mac with a 68020 or greater processor, 3.1MB RAM, System 6.0.7. Streamline 3.0 - Mac with a 68020 or greater processor, System 6.0.7, 2MB available RAM, hard drive.

Adobe
7521 Adobe Illustrator 5.0 & Streamline 3.0 (pictured)



\$134.

Smart Label Printer Plus

The Smart Label Printer Plus saves you considerable time over printing envelopes or labels on your regular printer. Print personalized labels or mailing lists from your applications, right at your desk. The integrated software works as a desk accessory with WYSIWYG screens and background printing. It includes everything you need - software, power supply, printer cable, and a roll of labels.

Minimum requirements: Mac Plus, 1MB RAM.
Seiko Instruments
5676 Smart Label Printer Plus



\$72.

FolderBolt

A natural extension of the Mac Desktop you use every day, FolderBolt is the lock-down answer to your data security questions. Completely locked, read-only, and one-way drop box folders protect your valuable information three ways. And you can custom configure any operation you choose. Works on all types of hard drives, including removables.

Minimum requirements: System 6.0.4.
Kent Marsh
3978 FolderBolt



\$279.

Claris MacDraw Pro with Action! Mouse

Words, pictures, and the means to manipulate them - that's what you get with these great new bundles from Pointex. The sleek, two-button, 400 dpi optomechanical Action! Mouse is the perfect replacement for your clunky, old, one-button varmint. And choose a great deal on one of the two classic programs that launched the Mac revolution. Newly updated for power and ease of use, MacDraw Pro 1.5 elevates your graphic creations to a new level of sophistication with QuickTime, TrueType, 4-color separations, and advanced graphic tools. And MacWrite Pro propels your verbal communications to greater effectiveness with tables, graphics, sound, and complete DTP capabilities.

Minimum requirements: Mac SE, hard disk drive, 1MB RAM, System 6.0.5.

Pointex
7616 MacDraw Pro 1.5 with Action! Mouse
7617 MacWrite Pro with Action! Mouse



\$175.

Claris MacWrite Pro with Action! Mouse



\$98.*

System 7 Pro

Three powerful new extensions in System 7 Pro give you the tools to work at your best.

PowerTalk makes communicating and sharing information as easy as point and click. Share text, picture, or video documents. Communicate by fax, modem, or over a network. Your contacts will be as close as your PowerTalk catalog. Then use AppleScript to convert complex command sequences into simple one-button actions - across multiple applications! It's the easy and simple route to productivity. Finally, you'll be using the new QuickTime 1.6 for sophisticated video and sound communications. Watch your presentations and documents come alive!

Minimum requirements: 4MB RAM (5MB recommended), hard drive, Apple SuperDrive floppy drive.

Apple
6797 System 7 Pro
6798 System 7 Pro Multi Pack 10 User\$948*

*Special price offer expires 4/15/94.



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SupraFAXModem V.32bis MacPac

"The SupraFAXModem V.32bis is an excellent value," raves Tom Negrino of Macworld. It features 14,400 bps data and fax communications with up to 57,600 bps throughput using V.42bis data compression. The modem automatically negotiates the fastest connection, and sending a fax is as easy as printing. You can even delay transmission until times when long-distance rates are lower. The Silent Answer feature detects if an incoming call is fax or voice, and handles it appropriately. The MacPac includes cables, FaxMania, and WorldLink, FREE. FaxMania is a collection of fun cover sheets, and WorldLink lets you connect to the Internet.

Supra Corporation

4017 SupraFAXModem V.32bis MacPac

6651 SupraFAXModem 144 LC\$164.

5575 SupraFAXModem 144 PB\$219.



Bonus!



\$39.

MacInTax

Tax preparation without the headaches! MacInTax makes preparing your taxes easier, faster, and more accurate than ever before. Only MacInTax has EasyStep, which leads you through your tax return from start to finish, guiding you every step of the way. MacInTax contains everything you need to do your taxes quickly and accurately - over 90 forms, schedules, and worksheets; complete IRS instructions; tax help in plain English; and itemizations. You can even print an IRS-approved form on most printers. Or, get MacInTax and Quicken together and stay on top of your finances year-round.

Minimum requirements: Mac Plus, 1MB RAM, floppy drive, System 6.0.5, and a hard disk. Supports color and monochrome monitors.

Chipsoft

7226 MacInTax Final (pictured)

7227 MacInTax/Quicken Bundle\$54.



\$41.



ReadySetGrow!

ATTENTION PARENTS! This fun, interactive guide combines animation, illustrations, sound effects, and text to cover parenthood from prebirth to age 5. Explore Family Profile to help "predict" your child's looks or determine potential risks. Medical Records with electronic growth charts, "Biological Clock," Pregnancy Timetable, and much more make this the most comprehensive parents' program available.

Minimum requirements: Any Mac with 1MB RAM, System 6.0.5, hard drive.

Atlantis

6991 ReadySetGrow!

\$49.



FLOWERscape

Plan a perfect flower garden. Just tell the program where you live, and it recommends suitable plants for your garden. Then point, click, and drag beautiful photos into your computer garden. You can actually view your garden's growth in color, as it would appear in any month of the year. FLOWERscape is easy to use, so it's great for the whole family.

Minimum requirements: Any 256-color Mac with a high-density floppy drive, 1.5MB RAM, System 6.0.4, 8.5MB hard disk space.

Voudette

6701 FLOWERscape for Mac

\$229.

Ambassador

Correspond effortlessly in Spanish, French, or Japanese - without any knowledge of the language! The Ambassador Bilingual Document System makes it easy to correspond globally using customizable templates covering a variety of business and personal topics - everything from banking and PR to travel and personal notes. Produce customized letters by choosing from 200 preformatted letters and forms and 480 template sentences and paragraphs. Ambassador can also be used by Spanish, French, or Japanese speakers to compose correspondence in English. Each version can display menus, messages, and help information in either language.

Minimum requirements: English/French and English/Spanish Versions - System 6.0.5. English/Japanese version - System 7.1 and Apple Japanese Language Kit, or KanjiTalk 6.0.5.

Language Engineering

6973 Ambassador English/Japanese (pictured)

6974 Ambassador English/French\$229.

6975 Ambassador English/Spanish\$229.



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- Mac's Place is open from 7 a.m. to 12 midnight M-F Mountain Time, and 6 a.m. to 9 p.m. on Sat., and 7 a.m. to 7 p.m. on Sun.
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- Many products carry a money back guarantee (MBG).
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- We reserve the right to revoke money back guarantee privileges.

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- We ship throughout the free world.
- International orders will be charged full shipping rate plus insurance.

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HyperCard 2.2

Creating custom applications is easier now than ever before! And with HyperCard's new color support, good looking applications are a button-click away. Ready-made templates, buttons, and scripts help you assemble creative point-and-click applications in record time. To satisfy your standards for professional-looking creative design, import PICT images and apply color to make your stack come alive with graphic energy. Then, when you're done, use the new Standalone Builder to save it as an independent application that runs without HyperCard. Plus, through the magic of AppleScript, your applications will be able to launch, control, and exchange data with dozens of other off-the-shelf, scriptable applications.

Minimum requirements: Mac Plus, 2 MB RAM (4 MB - System 7), System 6.0.5, a high density floppy drive, and a hard disk.

Apple

7592 HyperCard 2.2





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 9600 bps data; 9600 bps send/receive fax
PowerPort/Gold™ \$275
 14,400 bps data; 14,400 bps send/receive fax
PowerPort/Mercury™ \$325
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 2400 bps data, 9600/4800 bps send/receive fax
TelePort/Gold™ \$275
 14,400 bps data; 14,400 bps send/receive fax
TelePort/Mercury™ \$325
 19,200 bps data; 14,400 bps send/receive fax



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AsantéPrint \$325
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Model	Capacity	Internal	SR2000
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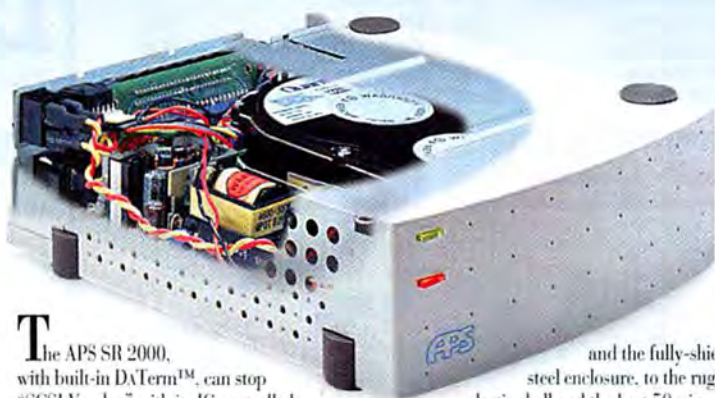
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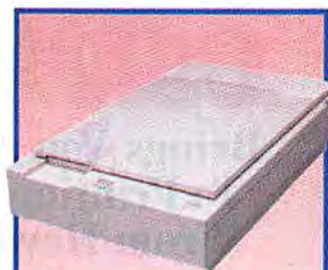
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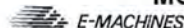


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1. For how many micro computers do you buy products?
(check one)

☐ 01) 1-4 ☐ 02) 5-49 ☐ 03) 50+

2. Your primary job function is: (check one)

☐ 01) Administrative/General Management ☐ 03) Engineering/R&D
☐ 02) MIS/DP, Communications ☐ 04) Finance/Accounting
☐ 05) Marketing/Sales Systems, Programming ☐ 06) Computer Dealer/VAR

3. For which of the following products are you involved in selecting brands/models to be bought by your company or organization? (check all that apply)

4. Which of the following products have you bought in the last 6 months? (check all that apply)

SOFTWARE:
☐ 01 Accounting
☐ 02 Spreadsheets/Financial Planners
☐ 03 Project Managers/Planners
☐ 04 Word Processors
☐ 05 Database Managers
☐ 06 Graphics/Presentation Software
☐ 07 Integrated Software
☐ 08 Communications
☐ 09 Utilities

03 04
☐ 01 ☐ 01
☐ 02 ☐ 02
☐ 03 ☐ 03
☐ 04 ☐ 04
☐ 05 ☐ 05
☐ 06 ☐ 06
☐ 07 ☐ 07
☐ 08 ☐ 08
☐ 09 ☐ 09

HARDWARE:

☐ 01 Modems
☐ 02 Scanners
☐ 03 Microcomputers
☐ 04 Printers/Plotters
☐ 05 Monitors/Displays
☐ 06 Storage
☐ 07 Add-in Boards
☐ 08 Networking

03 04
☐ 10 ☐ 10
☐ 11 ☐ 11
☐ 12 ☐ 12
☐ 13 ☐ 13
☐ 14 ☐ 14
☐ 15 ☐ 15
☐ 16 ☐ 16
☐ 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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General Management ☐ 04) Finance/Accounting
☐ 02) MIS/DP, Communications ☐ 05) Marketing/Sales
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4. Which of the following products have you bought in the
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SOFTWARE:
Accounting ☐ 01 ☐ 01
Spreadsheets/Financial Planners ☐ 02 ☐ 02
Project Managers/Planners ☐ 03 ☐ 03
Word Processors ☐ 04 ☐ 04
Database Managers ☐ 05 ☐ 05
Graphics/Presentation Software ☐ 06 ☐ 06
Integrated Software ☐ 07 ☐ 07
Communications ☐ 08 ☐ 08
Utilities ☐ 09 ☐ 09

HARDWARE:
Modems ☐ 10 ☐ 10
Scanners ☐ 11 ☐ 11
Microcomputers ☐ 12 ☐ 12
Printers/Plotters ☐ 13 ☐ 13
Monitors/Displays ☐ 14 ☐ 14
Storage ☐ 15 ☐ 15
Add-in Boards ☐ 16 ☐ 16
Networking ☐ 17 ☐ 17

5. If so, what function do you serve in the buying process?
(check all that apply)

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☐ 02) \$1 - 5 million ☐ 06) \$10,000 - \$49,999
☐ 03) \$500,000 - \$999,999 ☐ 07) under \$10,000
☐ 04) \$100,000 - \$499,999

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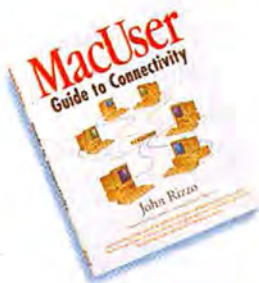
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1.2GIG	M2694	3.5" Half Height	8.5ms	995mb	\$899	\$959
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3.5" HALF HEIGHT						
1.2GIG	ST11200N		10.5ms	1000mb	\$869	\$929
1.9GIG	ST11900N		9ms	1600mb	\$1199	\$1259
2.4GIG	ST12400N		9ms	2000mb	\$1599	\$1659
1.9GIG	ST11950N	Barracuda 1	8ms	1650mb	\$1549	\$1609
2.4GIG	ST12550N	Barracuda 2	8ms	2050mb	\$1829	\$1889
5.25" FULL HEIGHT						
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3.4GIG	ST43400N	Elite-3	11ms	2750mb	\$2159	\$2259

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- Includes Retrospect v.2.0 Backup Software and ONE 90m Tape Cassette

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DAT TAPE BACKUP SYSTEMS

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-Macworld Editors' Choice December 1993



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MacUser Magazine
January 1993

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208-209**PRODUCT CATEGORIES**

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Bar Coding		188		Religion			209
CD-ROM			208	Sales Marketing			
Communications				Scientific			
Computer Systems		188		Security			
Data Acquisition				Shareware			
Disk Drives	183			Statistics			
Diskettes				Utilities		204	
General		199	208	Adult Software		206	
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Memory Upgrades		196		MISCELLANEOUS			
Networking		199		Accessories		205	
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Powerbook Products	184			Business Opportunities			
Power Supplies				Consulting/Programming			281
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Scanners		200		Data Recovery Services		205	
Security				Desktop Publishing Services	187	205	209
Tape Drives				Diskette Copy Services		205	
Used Equipment				Furniture			
				Insurance			209
SOFTWARE				Novelties			
Accounting			208	On-Line Services	187		
Back Up Systems				Repair Services		205	209
Bar Coding		200		Slide Imaging Services		205	
Business	185		208	Supplies		206	
Business Time Management				Training			209
CAD/CAM		201					
CD-ROM	185	201		ACCOUNT REPRESENTATIVES			
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Financial				Southwest —AZ, CA (213, 310, 619, 714, 805, 818), CO, HI, NM, NV, UT			
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Genealogy							
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Government							
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Public Domain							
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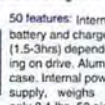
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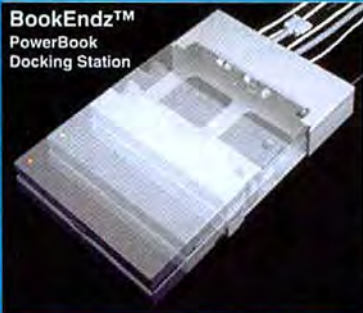
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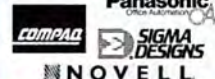
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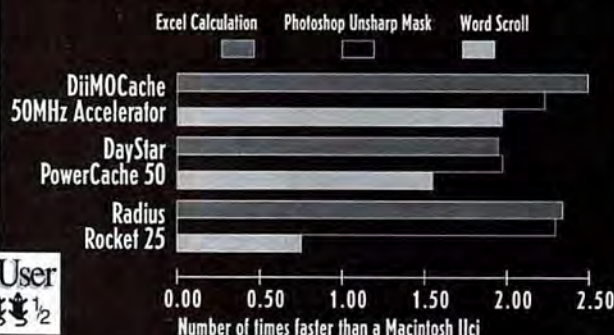
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Last Rites

NOW I KNOW WHY John Sculley was forced out of Apple. At least, I think I know.

I reckon that when he got the job, he made some sort of vow never to discontinue the Apple II line of computers. Once Sculley was gone, Apple would be free to dump the II. Thank God it did.

What I find pathetic about the Apple II's demise is the nostalgic obituaries and other reminiscences that mourn the II as if it were a generous and beloved relative who had just passed away. What a crock. The Apple II was marked for death the day the Mac was introduced in 1984. But with each stay of execution, it became more of a hindrance to Apple's progress.

In the Mac's early days, official Apple strategy was that the Mac would be sold as a business computer and the Apple II would be sold as a home/education/game machine. This was a disservice to both machines. For one thing, it turned the Apple II into a zombie computer that would not die. People who should have been switching to Macs (especially after they went color) were discouraged by the high prices and lack of suitable home/education/game software. And the Mac itself, which should have been the ultimate home/education/game machine from the start, was forced to stumble along in the business market trying to build a reputation with "serious business applica-

tions" like Habadex and Lotus Jazz. It's amazing that the Mac lasted long enough for desktop publishing to come along. Just be glad desktop publishing didn't appear on the Apple II first — if it had,

Apple would have officially discouraged it on the Mac.

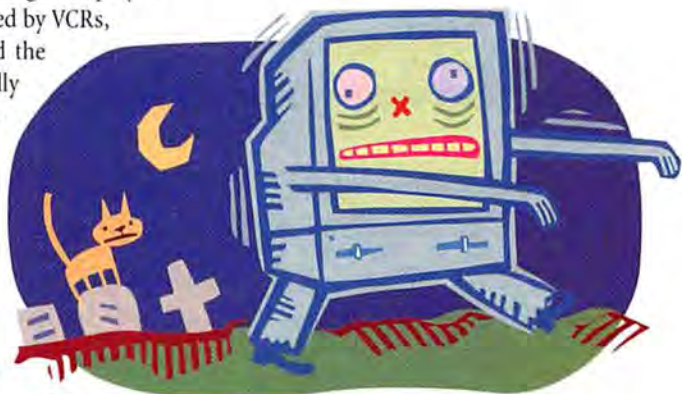
Apple's policy had the most disastrous effect in the educational arena, where the Apple II had free rein. According to all reports, the last order for the machine came from some school. What dopes! No wonder our educational system is failing. It's a sorry situation that the Apple II has become like the Bell & Howell film projector — ubiquitous and out-of-date. Although the projectors were finally supplanted by VCRs, few schools have dumped the Apple II. Now they'll finally be forced to modernize to something realistic — something with a future. Although Apple's trying hard to get those schools to migrate to its LC Macs, it now finds itself in the unenviable position of having to reconquer an entire market in which it was once the undisputed leader.

II Little, II Late

The irony is that the Apple II was a dead-end loser of a machine within a year of its release in 1977. The manufacturer of its processor — the 6502 — was bought by Commodore in 1978. Commodore never updated the chip to stay competitive with Motorola or Intel offerings. Instead, it chose to milk it by using it in cheap machines such as the VIC-20 and the Commodore 64. All of a sudden, no upgrade path was apparent for Apple's flagship machine. (As an aside, years later, Western Digital developed a makeshift 16-bit version of the 6502 for the Apple IIGS —

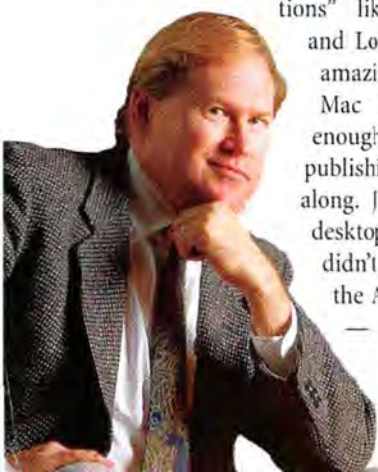
too late!) It's a miracle the Apple II remained on the market as long as it did.

Except for its popularity as a game machine (it had color) and education machine (lots of software), the Apple II was a joke, a novelty. Why Apple didn't reinvent it as a Nintendo killer — and tout its use of floppy disks instead of expensive cartridges — still baffles me. As a business computer, the II was always laughable. It was an ALL-UPPERCASE computer. (The competition in 1977 and 1978 had uppercase and lowercase.) Its Reset button was a key on the keyboard! Gads. The disk-drive system was a joke. It sounded like a meat grinder. And if the power supply didn't blow up in the thing, it was a miracle.



Only because a college student developed a spreadsheet program — VisiCalc — for it did the Apple II become a "business computer." Once spreadsheet programs appeared on more-serious computers, such as CP/M machines, businesspeople bailed from the Apple II as fast as they could. When the world went to 16 bits in 1981, Apple had to scramble. Although work on the Lisa and the Mac soon began in earnest, the Apple II led to the hopeless Apple III and, eventually, to the too-little-too-late Apple IIGS.

So why did people come out of the woodwork to praise this machine and lament that Apple had given it no wake or symbolic burial? While others lamented the passing of this old dog, I cheered. ☞





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