IT'S HERE! The Best Color Notebook

PowerBook Duo 270c
- 32,768 colors
- Less than 5 pounds
- New Type II batteries

PLUS First Looks at Apple's New Macs

Quadra 605
Quadra 650
Duo 250
Performa 550
Performa 486
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Cover Story

And Then There Were 4
By Russell Ito
With its latest round of new Macs, Apple attempts to end the confusion about its products by defining four distinct lines — Performas, LCs, Quadras, and PowerBooks. Here's how it all fits together.

Duos Done Right
By Russell Ito
Featuring sharp active-matrix screens and longer battery life, Apple's new PowerBook Duo 250 and 270c are the brightest PowerBooks to date.

Features

System Software for the '90s
By Henry Bortman, John Rizzo, and Stephan Somogyi
Three long-anticipated System 7 extensions — PowerTalk, AppleScript, and QuickDraw GX — radically extend the functionality of your Mac at a price you can afford.

Affordable Color Upgrade
By Paul Yi
You can save money without sacrificing quality when you mix and match color monitors and video cards. Here's the lowdown on 13 under-$1,000 color-video cards for NuBus Macs.

The MacUser 100
By Michele Hassan, Roman Victor Loyola, Amanda Michael, and Jason Snell
It's the fourth annual MacUser 100: MacUser's yearly selection of exactly 100 bargain-priced goodies ranging from the silly to the sublime, with special attention given to products perfect for PowerBook users, college students, kids, hobbyists, and game fanatics.
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Ever wondered what makes Macs work? 183
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4 December 1993 MacUser
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BY Magazine 09/93

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Feature Comparison: ALLright vs. NOW Utilities

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About MacUser

People Power

It takes a lot of people to put out a magazine of this size and complexity, and many of them work behind the scenes, unseen and unheralded. Among the least heralded are often the interns. Herewith, some heralding:

Louis Fonseca Jr., who began his junior year in high school last September, was the youngest of 1993's Macintems. Louis helped lab administrator Tony Stoltz with the massive bookkeeping and company tracking required to maintain MacUser's evaluation-unit inventory.

"Each week," Louis says, "hundreds of products would come in, and each week, hundreds of products had to be repackaged and returned." For the first three weeks of his internship, all he did was call "every company in the world" to request the current shipping address.

Later, he assisted lab technician and game expert Roman Victor Loyola in game evaluation.

"My friends couldn't believe it. 'You get paid to play games,' they'd say." You can see some of Louis' gametesting input in "The MacUser 100" this month (see page 131).

Nina Jackson began college this fall, infected with PowerBook lust from her MacUser experience. "I really, really want a laptop," she tells anyone who will listen. Nina worked as a researcher for various lab reports, collecting data on hundreds of companies. Her efforts enriched our video-card report "Affordable Color Upgrade," on page 113.

Journalism-school graduate student Jason Snell is no newcomer to writing. "I've always enjoyed editing and writing," Jason says. At the University of California, San Diego, he was editor-in-chief of the student paper. Although his real job was deciding content, it also fell to him to make sure the network was up. He says he didn't mind, because the job combined two interests: journalism and technology.

Jason got a chance to combine those interests again at MacUser, writing and editing several pieces, including a major contribution to "The MacUser 100" and a sidebar featuring his own publishing venture, an on-line fiction magazine called InterText, for "Digital Free Press" (see page 157).

Thanks to all our behind-the-scenes staffers. And interns, y'all come back now, hear?

— Nancy Groth
YOU HAVEN'T HAD THIS MUCH FUN PASSING A NOTE SINCE THE THIRD GRADE.

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cc:Mail. It makes passing a note as much fun as it used to be.
Can HP give you affordable color PostScript?
Get the HP DeskWriter 550C printer and PostScript software for under $1,000.

Take a good look because you've probably never seen PostScript color printing before. But here it is: right before your eyes.

The HP DeskWriter 550C printer now offers Mac users two remarkable new ways to print using true Adobe PostScript Level 2 software. If you already have an HP DeskWriter 550C printer, you can add PostScript software for less than $250. Or you can buy the HP DeskWriter 550C and PostScript software for under $1,000.

PostScript software for the HP DeskWriter 550C gives you 35 standard PostScript fonts, support for Adobe Type 1 and TrueType fonts, support for Adobe Type 1 and TrueType fonts, and PostScript language file portability and background printing. And it all works with your software, and comes with a three-year warranty.

Take a closer look at this truly affordable way to print. For a closer look at a truly affordable way to print.
Show them you mean business.

MacFlow 3.7
Flowchart Design and Development

Lay it all out for them—the process, the procedures, the relationships. Business works best when everything is clear, and there is no better way to make things clear than a detailed flowchart.

The best way to create flowcharts is MacFlow—the highest-rated flowcharting program. Neither drawing programs nor pencil and paper can create flowcharts as easily as MacFlow. And no program is simpler to learn or use.

Graphically organize complex processes, projects, and structures—minute after opening the package.

Simply drag pre-drawn symbols onto a page and connect with curved or straight lines. Place text in symbols and on lines, as well as in freestanding notes. Change the chart as desired; lines stretch and stay attached to symbols. Even create stand-alone flowcharts that can be freely distributed to any Macintosh user (and any Windows user with WinFlow Viewer). MacFlow is also System 7-savvy, letting you publish your charts and subscribe to text. Translate to and from text in ASCII and RTF formats as well as outlines created in Acta 7 and MORE.

MacFlow actually enhances your thought process because the interface is so simple and intuitive, nothing stands between your ideas and a presentation-quality flowchart. In fact, your will find just creating flowcharts keeps your thoughts organized and helps you get a handle on any task.

Show them you're serious—get MacFlow today.

MacSchedule 3.0
Project Planning and Tracking

Lay it all out for them—the plan, the people, the cost. Give them a path to follow and a way to track progress. Successful projects need a roadmap, and nothing can beat a simple yet comprehensive project schedule.

The best way to create quick, presentation-quality project schedules is MacSchedule. The Gantt-chart interface lets you create schedules, with integrated financial data, minutes after you open the application— unlike complex project management software. And MacSchedule is as easy to learn as it is to use.

MacSchedule automatically creates and manages a project calendar. Just enter task names, then indicate timing with a click and drag of the mouse. Status tracking is also easy—just click on a task bar to show progress.

MacSchedule helps track a project from initial estimates to current status by automatically developing calendarized cost estimates and reporting cost and schedule variances in an Earned Value summary. MacSchedule is also System 7-savvy, letting you publish your schedules and data as well as subscribe to data from other programs. Place schedules in documents for proposals and reports or print schedules as slides, overheads, or wallcharts.

With MacSchedule's graphic feedback, you can tell at a glance where your project is and where it's headed. It's the perfect tool for any manager.

Show them your plans for success—get MacSchedule today.

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Mainstay
LETTERS

Keith Mortimer, of Ogden, Utah, wants to know “What do you guys do with all the hardware and software you use for your tests? I figure everything is either given to you for dramatically reduced prices or even for free.” Coincidentally, he wonders whether we might be able to offer him a good deal on some used equipment. Sorry, Keith, but we return all evaluation units. Just for you, though, we might be persuaded to part with a nifty little network bridge from a startup in Brooklyn . . .

Write to Letters to the Editor, c/o MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404, or post your letter on the MacUser Forum of ZiffNet/Mac, our on-line service. All letters become the property of MacUser, and we reserve the right to edit any letters we print. Please include a return address and a daytime phone number.

Fixing Apple

Maggie Canon’s “Getting Back on Track” (September ’93, page 21) is right on the money, with one exception. Her point that the Mac OS should have been ported to the Intel architecture five years ago is valid; however, I think she is missing an obvious implication. If and when System 7 makes its debut on a -686, it will have to run Windows applications or no one will buy it!

Unless Apple can entice manufacturers to bundle Macintosh applications with new machines, the Mac OS will never sell without a Windows capability. Look at the trouble IBM is having with OS/2. Even though it’s a superior operating system to MS/DOS and can run Windows applications, it isn’t exactly setting the world aflame in sales.

I think that Apple’s development money would be better spent in preparing for the PowerPC Mac introduction. It ought to be a killer machine. Apple’s got the chance to take more than a “spiritual” lead with it.

Mark Humn via CompuServe

I disagree with one of Maggie Canon’s suggestions for helping Apple catch up. Cloning the Mac is not a good idea. One reason why Mac hardware and software are always compatible and on the cutting edge of technology is that Apple doesn’t have to force anyone but itself to accept new standards. Does Apple really want to deal with recalcitrant clone companies that—because they won’t risk money on new technologies—end up ruining the name Macintosh?

The Macintosh should remain a sacred cow and not be sacrificed.

Dennis T. Cheung
New Hyde Park, NY

Duo Die

I would like to express my thanks to Henry Bortman for his article on the PowerBook Duo (“I Don’t Want a Duo,” August ’93, page 189). I’m a Duo 230 owner who has experienced all the problems that Bortman describes. I haven’t complained very loudly about my Duo problems, because I didn’t want to admit that I got a dud for a computer. If Mr. Bortman had not publicly announced these flaws, I’d still be in denial.

To me, the PowerBook Duo seems to have been rushed to market with too many bugs. Maybe my fellow technophiles will also step forward and admit they paid too much for a computer that does too little.

Victor Hong
Fort Worth, TX

Unlike Henry Bortman, I hate sliced bread. And I found that I disagreed with almost everything else he wrote in his amazingly wrongheaded screed against the PowerBook Duo.

Bortman is correct: The active-matrix screen of the PowerBook 180 is better than the Duo’s passive-matrix screen. But what’s better than the 180’s screen? The 16-inch

Open Folder

This month readers put the heat on companies that charge for upgrades. Michael Olin, of Hermitage, Tennessee, tells us he “recently received an offer from Quark to upgrade to version 3.2 of QuarkXPress for $195.” He continues, “I can’t believe the cost of this nonmajor upgrade. I’ve been using QuarkXPress for six years, and I enjoy it, but I’m going to wait for a major upgrade and put the $195 into my 401K.”

At least Michael was notified of the upgrade. W. Scott Peterson, of Waterbury, Connecticut, shared his recent discovery about Apple service. “When I did not receive my annual notification from AppleCare to renew my service contract, I checked with my dealer. I found out that it’s now ‘the customer’s responsibility’ to remember to update. I received no notification whatsoever about this change, and I feel Apple has let me down.”

Apple gets another swift kick from Chris Gillespie, of River Edge, New Jersey: “Jeers to Apple and Claris for marketing the Performa computers with ClarisWorks for Performa. All it is ClarisWorks 1.03.” Chris elaborates further, “A salesperson told me that this was a ‘special’ version for the Performa. Hogwash. Special here is just a euphemism for old.” The story continues: “Now they want S69 for an upgrade to 2.0!”

Adam Phillip Churvis, of Norcross, Georgia, sees things in quite a different light. He writes, “Users should quit complaining about software-upgrade prices and paid software support. It seems to me that every time a developer risks the farm by sinking thousands or even millions of dollars into upgrading its products and then asks for a few dollars to offset the cost of giving its customers what they have been whining for, the customers scream bloody murder.”

Tired of shabby treatment? Write to Open Folder, c/o MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404. The usual caveats about letters apply.
Apple Macintosh Color Display on top of the Duo Dock in my office. Henry, it’s not Apple’s fault you’re too cheap or vain to buy bifocals.

It’s not Apple’s fault you have fat fingers either. I have average manual dexterity, and I have no complaints about the Duo’s trackball. If the trackball is really too small a target for you, get Connectix PowerBook Utilities and bypass the trackball and make menu selections by using keystrokes. Of course, you still have to be able to hit the right keys.

Standard PowerBooks look clunky next to my Duo. I love the Duo’s design and the way it feels in my hand when I carry it. I take my Duo down to the local coffeehouse, get a double espresso, sit at a table, and then open up the Duo and watch heads swivel. I’ll admit it: It makes me feel cool. And how do you put a price on cool?

David Glanzman
Los Angeles, CA

As stated in the third paragraph, the term chops is Kai’s shorthand for channel operations, the Photoshop functions he uses in his algorithmic paintings. And, yes, had you followed along at your computer (as I did), you would have seen that you do get results similar to the ones shown in the magazine. I say “similar” because Kai’s Photoshop philosophy is that experimentation should be fostered. Try it on 24-point text or a circular object. Try clicking on OK, and see what happens (if you don’t click on it, of course, nothing will). — PP

In “Paint by Numbers,” Kai Krause’s directions were flawless, and I was able to follow them to attain impressive results. He mentioned in the article, “Also, consider that you can capture all these steps in a macro and then play them back on any clean black shape. In fact, you can even re-create the sequence at any resolution.”

I looked through my Photoshop manual (I have version 2.0.1), and I can’t find any reference about how to accomplish this. Maybe my expertise is simply lacking, but it would be useful if Kai could explain the process of converting his “Paint by Numbers” technique into a macro.

Phillip M. Falsetti
via ZiffNet/Mac

Photoshop doesn’t have macros itself, but you can use commercial programs such as CE Software’s QuickKeys to transform many complex operations into single keystrokes. — PP

Merdinger Misery

I want to commend MacUser for the compelling column by Andy Ihnatko (“The PowerBook from Hell,” September ’93, page 27). As a Mac user for...
WOULD YOU BELIEVE THIS WAS DONE WITH MACDRAW® PRO?

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 Bezier pen tool. And Canvas 3.5 has really outdone itself with new improvements including object blends, binding of text to shapes and curves, Bezier 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 Canvas. For the ride of your life. So go ahead and hop on.

NEITHER WOULD WE.

CANVAS 3.5
THE HIGH PERFORMANCE DRAWING ENVIRONMENT FROM SOFTWARE

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CIRCLE 165 ON READER SERVICE CARD.
many years, I have had my share of frustrations with Apple Computer. Ilene Merdinger’s story hit a nerve with many Mac users, myself included.

I’m glad MacUser took the chance and bit the hand that feeds it. I’m sure it was difficult to single out key individuals at Apple, but that’s the kind of action needed to solve problems. Apple spends hundreds of dollars per Macintosh for marketing. How much did it cost Apple when we read the Merdinger-nightmare story?

Mathew Lindstedt
San Jose, CA

Somebody should teach Apple about customer service and public relations. First the Illix debacle and now the shoddy treatment of Ilene Merdinger. The first thing you learn in public-relations training is that word of mouth is the most effective and reliable form of advertising. Do you think that anyone who hears about Ilene’s ordeal will be buying a new Mac anytime soon? Copping an attitude is not a smart corporate-communications strategy. Apple can’t afford to lose any more customers.

Kurt Rahn
El Cerrito, CA

An Honest Politician

In the article “Real NetWare for Macs” (August ‘93, page 177), John Rizzo states, “Question: What do Santa Claus, honest politicians, and cross-platform networks have in common? Answer: None of them exists.” As an honest politician, I must disagree.

Politicians are easy targets. Those in Washington get a lot of press and never seem to know what they are doing. If California is anything like Georgia, then most of your state politicians seem a little scruffy. But for every state or national politician, there are dozens of city and county politicians. Most are like me, part-time nonprofessional politicians who are trying to run cities and counties as well as they can while spending the least amount of money. If Mr. Rizzo would attend his local city council meeting or county-commission meeting, I’m certain he would find some honest and hardworking politicians.

Ronny Richardson
Councilman
Chamblee, GA

I stand corrected: “Yes, Georgia, there is an honest politician.” — JR

Flexibility Penalty

Having read your article “Choosing the Right Laser Printer” (September ‘93, page 124), I am perplexed at your testing methodology. Not surprisingly, the Xante Accel-a-Writer 8100, when set at its highest resolution of 960 x 960 dpi, scored poorly in timing tests when compared with 600- and 300-dpi printers. The reason is simple: When set at 960 x 960 dpi, the Accel-a-Writer 8100 must process four times as much data as when it’s printing at 600 dpi and ten times as much as at 300 dpi. This extra processing takes time, which slows printing.

The Accel-a-Writer 8100 can serve multiple roles — if you want the highest-quality output for high-end graphics applications, set it to 960 x 960 dpi; for greater speed, switch to a lower resolution. In fact, your article states, “the Xante Accel-a-Writer . . . printed the document more than twice as fast at 300 dpi as at its default 960 dpi . . . .”

You documented in a sidebar that all printers were tested at their highest resolution, but it may have been more meaningful to your readers if you had tested the printers at similar resolutions. It seems that because it offers the added flexibility of higher resolution, the Accel-a-Writer 8100 was penalized.

Martin E. Kennedy
Vice President, Marketing
Xante Corp.
Mobile, AL

Your point is well taken. As the printer capable of the highest resolution among those we tested, the Accel-a-Writer 8100 was understandably the slowest when printing at that resolution — and, as we explained in the story, noticeably faster when set to lower, more common resolutions. When set at 960 x 960 dpi, the Accel-a-Writer 8100 earned among the highest marks in image quality — excellent output for users who are willing to wait. — RM

Never Say Never

I turned to the back of the September issue to read Dvorak’s column, “Breaking Windows” (page 368). I was prepared to see him gloating over Apple’s recent troubles. Instead, I found a glimmer of hope. He acknowledged that Microsoft doesn’t want to compete with Apple; it actually wants to destroy Apple. Having someone state this in print makes me feel better. Monopoly creates an environment with no diversity, and
Imagine if you could turn your computer into a librarian, an artist, a teacher, a research assistant, a historian, a marketing expert and an entertainer.
You already know that a personal computer is an extraordinarily powerful tool for working with documents, spreadsheets and vast quantities of information. What you may not realize is that these capabilities represent only a fraction of the things a computer can do. It can also give you the power to work with sound, video, photographs, animation and other kinds of digital informations. You can easily add music, graphics, and video to presentations. Create interactive learning programs. Or consolidate important information on one disc and have it copied—an inexpensive way to store and distribute information.
information as easily as you work with words and numbers. You probably don't even need to buy a new computer. All you need to do is add a CD-ROM drive to the computer you already have. It's easy to do. It's inexpensive. And it can add an entirely new dimension to the way you work, learn and even have fun. So read on, and find out just how much more your computer can do.
The most exciting software available today is only on CD-ROM discs. That's because CDs can hold an incredible amount of audio-visual information, making possible software that would be too impractical or too expensive with floppy disks, or even with a hard drive. Right now there are thousands of titles for Macintosh® and PCs running Windows. They cover virtually every conceivable...
he choices.

Experience the sights and sounds of the world. From Air to Ocean follows one woman's amazing trek across the Australian outback.

Entertainment becomes far more involving with audiovisual games. In Who Killed Sam Buxton? you're the detective.

Topics and interest, from business directories to cooking lessons, from nature programs to a street-by-street atlas of the United States. Only a fraction of the available CDs are shown here. New releases come out every week, and there are hundreds of titles in development. So if you don't have a CD-ROM drive in your computer, you're not just missing the fun. You're missing the future.
For Macintosh owners.
The AppleCD Multimedia Kit gets you off to a great start. It includes:
The AppleCD 300 disc drive, just plug it in, and you're ready to go.
AppleDesign® Powered Speakers. For true CD-quality sound.
A free CD package: Compton's Encyclopedia on CD, the Multimedia Starter CD and up to three other CDs - you choose from over 20 best-selling Macintosh titles listed in our special brochure.
Trail software. Our free Software Repatch CD lets you try out 70 different programs. You can purchase any of them over the phone - a code unlocks the program for immediate use.

For PowerBook owners.
The single-speed, multi-session Apple PowerCD player is the ultimate in portability. The PowerCD easily connects to Apple PowerBook computers, any other Macintosh or even a PC.

For Windows owners.
With the CD Multimedia Kit for PCs, you can get going right away. And it exceeds Multimedia PC Level 2 specifications. It includes:
The AppleCD 300. Our internal disc drive fits neatly inside a PC. You also get a sound card, software and cables - everything you'll need for full multimedia capabilities.
AppleDesign® Powered Speakers. For crisp, CD-quality sound.
A free CD package: Compton's Encyclopedia on CD, the Multimedia Starter CD and up to three more CDs, which you can select from over 20 of the top titles for Windows listed in our special brochure.

The deals.
If you have a Macintosh, or a PC running Windows software, you can take advantage of great deals on premium multimedia bundles. Each of these bundles is valued at over $1500, yet the AppleCD Multimedia Kit for Macintosh is only $659 and the CD Multimedia Kit for PCs is just $709. To get your kit, or the portable PowerCD, call today.
To get your AppleCD 300, call 800-732-5151, ext. 100.

Recently, the AppleCD 300 disc drive was named Macworld's Editor's Choice for Overall Value. Why? This double-speed drive is significantly faster than many other CD-ROM drives available today, yet it's still quite affordably priced. At $429, the AppleCD 300 is a great deal. And to get it, all you have to do is call the phone number above.

*Prices are Manufacturer's Suggested Retail Price and subject to change. Retailer prices may vary.*
If there's a computer in your future, make sure there's a future in your computer.

**Integrated Apple CD-ROM.** From this point on, a computer without a CD-ROM drive won't allow you to take advantage of the best computing has to offer. So if you're thinking about a new computer, consider one of the many Macintosh models with the AppleCD 300i already built in. That's the easiest way to start exploring the vast array of CD titles available for Macintosh, and the many more to come. Call 800-732-5151, ext. 100, to locate an authorized Apple reseller, and stop in for a demonstration. With a CD-ROM drive inside it, you'll find that a new Macintosh delivers the most impactful kind of power. The power to be your best.
the result is corruption and decay.

This was the first time I’ve read in detail about the new PowerPC chip and the computers that will use it. Dvorak’s postulations about the potential future of Apple were almost positive. I was surprised and uplifted and closed the magazine with a feeling that maybe things weren’t so bad. I find myself in a position I didn’t think I’d be in: writing Mr. Dvorak to thank him for making my day.

James T. Pendergrast
New York, NY

What’s in a Name?

In response to Jon Zilber’s question in “To Tell the Truth” (August ’93, page 25), I feel that MacUser has to cover the brave new world Apple is heading into. The Newton and PowerPC are going to be integral parts of the future of Apple and the Macintosh. We’re on the edge of a new era in personal computing where personal digital assistants will figure heavily. The Newton is the first of many new technologies to come. I would like to be kept abreast of the developments in the PowerPC area too.

As for renaming MacUser, keep it the way it is. I don’t think you can change the name fast enough to keep up with the changes we are going to see in the coming years.

Lee Martin
Houston, TX

Hard Knocks

I was very upset after reading “Working Away” (August ’93, page 102), by Owen W. Linzmayer. The author singled out our software, QuickLink II, but because the article was a review of hardware, it was surprising that any editorial comment about software was made and that it was so outrageously negative.

The author’s remarks dealt only with the look of QuickLink II. Granted, user interface is an important feature of a software product, but to the many fax modem manufacturers, functionality is of paramount importance. The author also failed to mention that QuickLink II is the only truly integrated fax and data communication application available. Another key feature not mentioned is that QuickLink II is the only software that can distinguish between an incoming fax and a data call.

We realize that there is room for improvement in QuickLink II, but it is upsetting for us to be smashed in the face by your publication while you made the decision to ignore the majority of features that set QuickLink II apart from the competition.

William W. Smith, Jr.
President
Smith Micro Software, Inc.
Aliso Viejo, CA

My comments regarding QuickLink II were based on extensive testing and comparison with other programs. I found the documentation poor and the user interface confusing, but (contrary to your interpretation) the bulk of my criticism dealt specifically with functionality issues such as error handling, the inability to choose cover pages at print time, and the lack of call-progression notification. True, QuickLink II has some unique features, but these seem insignificant in light of the many shortcomings our report uncovered. Until Smith Micro Software addresses these issues, I stand by my original recommendation that users avoid QuickLink II. — OWL

In Control

There is an error in your review of In Control 2.0 (August ’93, page 62). You state that “you can’t have a linked document and In Control open at the same time.” This simply is not true. You can have both open simultaneously. Our customers use this feature to launch a document directly from the to-do item, and they can switch back and forth between In Control and the linked item as they need.

Alan Albert
Vice President, Marketing
Attain
Somerville, MA

Corrections

Our review of ClickChange in the September ’93 issue (Quick Clicks, page 105) incorrectly listed the company’s toll-free number. Dubl-Click Software’s number is 800-626-9525.

In our review of Snooper 2.0 in the September ’93 issue (Reviews, page 97), we listed the wrong price and test information for MacEKG. MacEKG costs $150 and runs more than 250 tests.

The phone number listed for Radius (Reviews, October ’93, page 51) should have been 408-434-1010. The number in the article is a company fax number.

Do You Have a Lot On Your Mind?
Get IN CONTROL.

You have a weighty list of things you need to do. Some of them may even be in your calendar. But that little voice keeps nervously asking you—what about the rest of the things you need to get done?

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MacUser

MacWEEK

CIRCLE 60 ON READER SERVICE CARD.
Presenting the world’s smallest and lightest SCSI-to-Ethernet adapter. Asante® is adding a whole new dimension to high-speed Ethernet® networking for the Macintosh®. Introducing the Mini EN/SC™, the smallest and lightest SCSI-to-Ethernet adapter you can get your hands on.

Specially designed for the PowerBook® line, Asante’s new Mini EN/SC is so small and light – a mere 6 ounces – that it’s a snap to carry. It’s also the perfect space-saving solution for desktop Macs® without available slots for networking. For added flexibility, the Mini EN/SC comes with SCSI-to-Ethernet connecting cables for both PowerBooks and desktop Macs.

Thin and 10BaseT Ethernet at your fingertips. The plug-and-play simplicity of the new Mini EN/SC makes it the easiest SCSI-to-Ethernet adapter to install, hands down. It’s a powerful solution that puts Thin and/or 10BaseT connectivity at your fingertips.

Asante also offers a 3-in-1 SCSI-to-Ethernet adapter, the EN/SC.

The Mini EN/SC is thoroughly tested before shipping and comes backed by the same 5-year warranty and technical support as our other award-winning adapters.

To find out how you can get your hands on the smallest and lightest SCSI-to-Ethernet adapter in the world, call Asante today at 800.662.9686, extension 52.
Apple loves to reorg. It reorgs divisions, it reorgs buildings, it reorgs executives — always for some important business reason. Now Apple's reorged the Mac product line — in the name of making it easier to choose a Mac. I'd be curious to hear what you think.

Just for fun, go to your local computer store and check out all the flavors of Macintosh from Apple. Then go to a mass merchandiser such as Sears and see if you can tell the difference between the Macs you find there and the ones at the computer store. What do you think your chances are of finding someone who actually knows the specs of all the various models? For that matter, do you know anybody who can even remember the names of all the machines Apple makes?

Sure, there's a positive side to the plethora of Mac models: Apple's got some kind of Mac that fits the needs of just about anyone — from entry-level users who don't want to know what RAM is (much less have to worry about how much of it they need) to business users who are looking for high-performance machines with built-in Ethernet. But as Apple has expanded its product line and reduced the cycle time between new versions of products, it has unintentionally created confusion by churning out similar products under different brand names.

Obviously, a lot has changed since the Mac debuted almost ten years ago.

One Size Fits All

When I bought my first Mac, I had no trouble deciding which features I wanted — there weren't any. You couldn't add memory or cards or a hard-disk drive. Unless you had a special wrench, you couldn't even open the box. And the Mac came with the best available software already installed. Although some computerists were skeptical, I was an instant convert. Having spent years using CP/M and DOS machines, the Mac was a dream come true — easy to set up and use. True plug 'n' play.

Nearly ten years later, the Mac is still the easiest computer to set up and use. Buying one, however, is another story.

As you'll see in our cover stories in this issue, Apple has attempted to address this problem. The Mac product line now consists of Quadras, Performas, LCs, and PowerBooks. Period. Apple has dropped the name Centris, the LC line will be for the education market only, and the Classics are being phased out in the U.S. Apple is targeting the Quadras and the PowerBooks at business users and the Performas at home market.

Along with the name changes comes increased performance. The main difference among these branches of the product line is where they're sold: the business machines at resellers and the Performas at mass merchandisers.

Although I applaud Apple's effort to make choosing a Mac easier, I don't think the company's quite there yet. For one thing, I wish it would name products so you could figure out their basic configuration and instantly know the relative horsepower and storage capacity.

Then buyers could get down to the finer details, such as what software it comes with or whether it has an FPU or built-in Ethernet. I also think that regardless of which stores carry the products, people will still want to compare them to figure out the differences among them. And that's where MacUser comes in.

A New Mark for Macs

Readers trying to make sense of the new product line will be glad to see that we're introducing a suite of custom-developed benchmark tests called MacBench 1.0 (see "And Then There Were 4," page 92). MacBench tests measure the performance of the four main subsystems of the Mac: the processor, disk drive, video, and floating-point unit. The results indicate the overall speed ratings of these components for typical tasks. You'll be able to use the results of MacBench tests in conjunction with our traditional application-based test results, which measure how fast a specific real-world task runs. That way, you'll have both low-level and application tests to help you make your decisions.

MacUser's main editorial mission is to test products and provide comparative information that helps you make buying decisions. Believe it or not, we spend more than 30,000 person-hours each year testing products for our stories, which means we must constantly develop newer and better ways to get the answers only testing can deliver.

MacBench, which was developed by the Ziff-Davis Benchmark Operation, in North Carolina, is only the newest element of our strategy for delivering data you can trust. We still have our own labs as well as the state-of-the-art ZD Labs across the street chock-full of interesting equipment for torture-testing products. So no matter how many Macs Apple brings to the table, we'll be able to tell you which one's the fastest or best suited to your needs and budget.

Just remember to write down the name of the model you want before you head to the store.
How did the new HP ScanJet IIcx
By being the only Mac scanner that handles text as well as it handles graphics. $1,179

Finally, there's a scanner that takes text as seriously as it does graphics. Hewlett-Packard introduces the HP ScanJet IIcx. The color scanner that brings scanning performance to a whole new level. And leaves the competition picking up the pieces.

The HP ScanJet IIcx offers the best text scanning in its class. Featuring HP AccuPage technology, which enhances third-party software, this new scanner deftly handles a wide range of documents. It accurately recognizes text in small point sizes and unusual fonts. Even text on colored backgrounds and in tables—documents that would send other Mac scanners scrambling. An optional document feeder makes it even more efficient.

With 1600-dpi enhanced resolution (400-dpi optical), the HP ScanJet IIcx scans graphics with unmatched clarity and accuracy. 24-bit color provides a palette of 16.7 million colors and 256 levels of gray. And to make sure that those colors stay true, this scanner supports the Apple ColorSync color matching system. Easy-to-use HP DeskScan software and Adobe's Photoshop LE image editing software come in the box. An optional transparency adapter scans photos, slides and transparencies. To save time, there's one-pass color scanning. And to simplify things, there's a TWAIN interface, which means you don't have to leave the application you're working in to scan.

These sophisticated features have not come at the expense of simple design. The HP ScanJet IIcx was made for the Mac from the ground up, giving you easy installation and trouble-free operation. All backed by HP's legendary quality and reliability. In the unlikely event that your HP ScanJet IIcx should require service, your one year warranty entitles you to a replacement scanner within 24 hours.

To learn more about the HP ScanJet IIcx scanner, call 1-800-SCANJET (1-800-722-6538), Ext. 7801.

Once you see what the HP ScanJet IIcx can do, everything else will look a little less polished.
It doesn't take very long to get spoiled, does it?

One day you sit down at your Mac, and those 80 megabytes of disk space you never dreamed you'd fill up aren't nearly enough.

And backing up your data by dragging folders to floppies has become, well, a drag.

Especially when you find yourself counting the minutes while the Finder copies all those files.

And remember the time you discovered the telltale signs—fan humming, monitor on, folders open—of somebody snooping around on your Mac? Kinda left you wishing for some serious data security, didn't it?

Better pick up a MacPak.

Because there's no better way to enhance your Performa, Classic, PowerBook or Quadra.

And no better way to save money, either.

Like the five hundred dollars or so it costs to buy a bigger hard disk.

Buy MacPak instead, and you can let AutoDoubler* double your disk capacity by automatically compressing your files.

And that's just the start.

You can quickly back up your data with Fastback Express, the no-nonsense version of the world's bestseller.

And copy files up to five times faster than the Finder with CopyDoubler Lite. (It deletes files even faster.)

To keep other people's noses out of your data, simply install DiskLock* PB, pick a password and relax.

What could be easier?

How about launching your MacPak utilities—or any Fifth Generation utility for that matter—with our Launch Pad?

All it takes is one click.

Then there's managing your files with DiskTools.* Organizing your life with our calendar. And crunching numbers with our calculators.

By now, you probably wish this ad was half as long, the phone was within reach, and you could dial 800-666-2904 to give MacPak a try, at no risk, for one whole year.

Guess what? You can.
Don’t Leave It to Goolus

With just a few simple techniques, you can pry great service and support out of any hardware or software company.

Any trip to the dentist offers the opportunity for at least one unbridled dose of pleasure. Sure, there's the chance to be strapped into a chair and submit to someone wearing a mask and rubber gloves who then inflicts pain, but that's a matter best left between you and your therapist.

No, the pleasure I had in mind was sitting in a vintage Naugahyde chair and poring over a big ol' stack of Highlights for Children magazines. The find-the-items-in-the-picture page never lets you down; the monthly rebus is always good for a solid hour of intense left-brain/right-brain concentration. I always find; and then there's the crème de la crème: Goolus and Gallant. You know, those one-page morality plays that demonstrate polite behavior through the example of two young boys. (“Gallant makes a point of always passing serving dishes to his left and using the proper fork; Goolus blows his nose on the tablecloth.”) Leaving aside the moral question of giving kids names that guarantee that they'll have dodgeballs thrown right at their heads during gym class, it's a tremendously effective concept.

My hat's off. And my PowerBook is open, as I’m paying homage to (stealing) the concept for this month’s column on How to Deal with a Company. Cultivating a good relationship with a software publisher or hardware manufacturer doesn’t involve sucking up and offering to wash the president’s car. It merely involves making it easy for a company to regard you as a valuable customer rather than a soul-sapping crank. By laying some important groundwork early on when life is all skittles and beer, the rails will be nicely greased when you’re mired in a great joojoojloob situation. So when you break the shrink-wrap off that latest acquisition, keep some of these dos and don’ts in mind.

Do develop company contacts early on. This may sound like a naïve, Little House on the Prairie sort of thing to do, but if you’re planning to rely on a product in your day-to-day business, write the company a letter asking for all relevant fax and phone numbers. By knowing the name of the product manager and the general numbers for tech support, you’ll save yourself a lot of time and trouble if things start to go kerflooey. You’ll also get a good feel early on for what kind of support you can expect: companies that value customer support answer promptly and completely. And once you have all that info . . .

Do keep in contact. No kidding, this is the best advice you can get on the subject. Keeping in contact with the publisher singles you out as an Active User — someone who can give the publisher something more than the purchase price of the product — and can have spectacular results.

Explain your specific use of the product if it’s the least bit distinctive. For instance, if your company has 100 registered copies and you’re the person who has to keep all the users happy: if you’re using it to manage dozens of lab procedures at a hospital; heck, if you’re researching ways of understanding
ferret conversation, let the company know. If you represent a whole boatload of users, then the company can keep that boatload of users happy and informed by keeping you happy and informed; it also wants to sell another boatload of upgrades and additional software, so this sort of letter grabs a product manager's attention. These people also tend to wag their tails when they pick up the scent of university, medical, and other specific markets. Beaucoup bucks are therein, so they like the opportunity to make their products more attractive to certain key markets. Also mention any semiotic hardware you may be using; not everyone owns a pressure-sensitive graphics tablet, after all, and the publisher of a graphics program is likely to be keen to gather your input.

Don't be afraid to do some of the company's work for it. Most software companies are surprisingly receptive to ideas for new features or changes in the way their current product works. This is especially true of smaller, cozier publishers; they rely on their ability to put new features and concepts on the market faster than the monoliths above them and react warmly to well-thought-out suggestions. So if you get steamed every time a program throws a dialog box in your face when it should really let you set things up from a menu, drop a line; the adage "for every letter a customer sends, there are a hundred that aren't sent" is widely believed among publishers. Those of you who manage many users should be aware of your powers too. When a publisher hears from a single user asking that a spreadsheet program be able to make calculations for video editing, the suggestion is noted; when someone representing 400 users makes a suggestion, an improvement is slated for the next major release.

The Payoff
What does all the above gain for you? It separates you from the pack, for starters. I've talked to software companies on the subject, and it's clear that users are separated into The Faceless Mass and The Activists and that The Activists — the ones who have been in contact and, incidentally, have something to offer the company — get better service. Calls are answered promptly; feedback is taken more seriously; and when it comes time to make up a list of users who'll receive prerelease copies of the latest and greatest version, well, they don't exactly draw registration cards out of a big rotating drum. Less practical but nonetheless nice is the chance to receive T-shirts; coffee mugs; and during the Boston and San Francisco Expos, invites to decent parties.

The Letter
Allow me to indulge myself and end this on a personal note. On an 800K disk in my office sits a two-page document...
Proxima® brings the power of your computer to the meeting room.

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CIRCLE 158 ON READER SERVICE CARD.
INTRODUCING FRAMEMAKER 4

We wrote & published, edited & organized & designed, formatted & indexed, cross-referenced & distributed the book on writing and publishing.

Writing is a breeze with our high-speed WYSIWYG word processor, which includes a spell checker and thesaurus.

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CIRCLE 65 ON READER SERVICE CARD.
referred to by friends, reverently, as The Letter. The Letter is a devilishly cunning document I crafted back when I was an impoverished college student who nonetheless had a yen for hardware and software; if I changed no more than three sentences to suit the occasion, mailing The Letter to a company invariably resulted in that company’s sending me free stuff. No lies, no begging, merely some well-chosen text that, when mailed to the correct parties, resulted in my receiving in excess of $1,200 in free hardware; thousands more in free software.

The Letter is the source of unspeakable power. Let its existence inspire you.

and countless T-shirts, mugs, and jump-suits. It even came within a single phone call of snagging me a free $7,000 NeXT computer.

Now that I’ve turned pro, The Letter has been retired, but let its existence inspire you. Don’t assume that just because you can’t afford something, you can’t have it. If you’re a student, if you’re volunteering your time on a project for a nonprofit institution, or if you’re involved in something that a company might conclude ought to be encouraged, write an honest letter and ask for a donation. You will probably be surprised at how kind-hearted companies can be when given the opportunity. Software is generally easier to snag, but a key piece of hardware can often be borrowed for the duration of a project. If all else fails, the company might just allow you to purchase a product at a special “promotional” price. Again, it only costs you a stamp to find out.

And before any of you write in, no. The Letter is not available for distribution; it is the source of unspeakable power. But do feel free to write in, nonetheless, with questions, comments, or The Goods or just to conjecture about the next Star Wars trilogy. Hard copy comes to me at MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404. Slam that e-mail to me at andyi@world.std.com (Internet), 72511,204 (CompuServe), andy (AppleLink), or andyi (America Online).


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CIRCLE 108 ON READER SERVICE CARD.
The Ten-Year Track

A colleague of mine said of a recent development at Apple that "it sounds like 1984 all over again." I disagree. History does stutters, but some apparent repetitions are only apparent. Here's why 1994 won't be like 1984:

As 1984 approached, Apple's new president characterized the company's target customer as "probably under 40 — 35 and younger, down into the teens. People who are willing to make the investment in time and money and really get excited about it... people who really want to be on the frontier, on the leading edge, of what's going on..."

Going into 1994, that description sounds as if it would do nicely for the sort of technophile who might want to purchase a Newton MessagePad.

But the similarity is misleading. The customer Apple most wanted to attract in 1984 fit a different description. Apple desperately sought to nab the Fortune 500 buyer, the typical IBM customer, the kind it characterized as an expressionless gray drone in that memorable Super Bowl Mac commercial. And it was the new computer, the Macintosh, that would land the fish, through an innovative plan called the Macintosh Office.

In the '90s, the innovative plan to hook the Fortune 500 buyers was called the Enterprise Systems Division.

See? Different.

The New Machine

As 1984 dawned, Apple released the Macintosh, its long-awaited new machine based on a hot microprocessor from Motorola. Software for the new machine was scarce at first, but someone had come up with an emulator that let the Mac run software written for Apple's bread-and-butter computer, the Apple II. Sadly, the emulator is remembered today only by computer-history buffs.

In 1994, Apple will release its PowerPC Mac line, the long-awaited new machines based on a hot microprocessor from Motorola. Native-mode software is expected to be scarce at first, but the machines will include an emulation mode capable of running software written for Apple's current bread-and-butter computer, the Mac. The emulation mode will be...

But again, these similarities are misleading. The initial PowerPC machines will be called PowerPC Macs. The original Mac wasn't called the Macintosh Apple II, was it?

Different.

Despite that Super Bowl commercial, in which IBM was cast as the evil Big Brother from George Orwell's 1984, Apple's perception of IBM was as more friend than foe. When IBM entered the personal-computer fray, Apple welcomed Big Blue with a full-page ad in The Wall Street Journal, hailing IBM as a legitimizor of the industry.

In 1994, IBM will again be more friend than foe, but it will be because Apple and IBM are partners in a whole portfolio of enterprises. Same attitude, sure, but a different reason.

As 1984 wore on, Mac sales fell short of the somewhat exuberant projections of the company's visionary CEO. The stock went into a nosedive, and amid fears of a buyout, Apple went into radical-reorg mode. The visionary CEO, Steve Jobs, was suddenly supplanted by president John Sculley, a "real manager" in the eyes of the board.

Maybe you think this sounds like a report of current events, in which slowing sales, deep-diving stock prices, and buyout rumors presaged the latest radical reorg and the replacement of the visionary CEO by the president, regarded as the "real manager" during the preceding year. This time, of course, John Sculley played the visionary CEO.

But any student of Apple history knows that this is not a startling parallel; it's just business as usual in The Company Where Reorganization Is Job One. Besides, the 1984 debacle actually took place in 1985, and the 1994 one took place in 1993. No parallel at all.

Ultimately, Apple realized one unexpected and undesirable legacy of the policies of 1984: the Apple II backlash. It wasn't just the difficulty of selling computers that the company's every action and pronouncement said were dead meat. In fact, Apple II customers seemed remarkably thick-skinned and went on buying the things by the bushel. But the employees who were building the company's only profit-producing computer were miffed at not getting the attention, the perks, and the money the Mac-division people were getting. In response to this awkward situation, Apple execs came up with the slogan, "Apple II forever!"

The year 1994 will be entirely different. I predict the slogan will be, "It's still a Mac! Really!"
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*CIRCLE 93 ON READER SERVICE CARD.
Building better boxes: **CD-ROM drives and color monitors** are at the heart of NEC Technologies’ business, but CD-ROM drives and color monitors are just commodities. So NEC has come up with new models in both areas that incorporate several significant enhancements.

NEC was the first company to introduce double-speed CD-ROM drives, but with multimedia CD-ROMs, even double-speed drives aren’t fast enough. As a result, NEC is replacing its current CD-ROM drives with two *triple*-speed models: the **MultiSpin 3Xe** ($600) and the **MultiSpin 3Xp** ($455), both of which boast data-transfer rates of 450 Kbps, access times of less than 200 milliseconds, and a switchable SCSI 2/SCSI 1 interface. The 3Xe and 3Xp are the same drive, but the former is external and the latter portable.

To give the 3X line some personality, NEC has redesigned the cases, making them sleeker and providing some additional functionality. The 3Xe has a new dust door that simplifies the loading and ejecting of a disc single-handedly. The audio controls on the 3X line are all up front, including an LCD panel that makes selecting tracks on an audio CD easy.

Although most current CD-ROMs can’t take advantage of the 3X line’s triple-speed capability, NEC has signed agreements with several multimedia developers, including Time-Warner and Macromedia, who have agreed to support the new standard.

On the monitor side, NEC has three new offerings: one on the low end and two on the high end. The **MultiSync 3V** ($550) is a high-quality, low-cost, 15-inch monitor that boasts **EPA EnergyStar-compliance**. It supports a top resolution of 1,024 x 768 pixels and has a refresh rate of 60 hertz — the equivalent of a 19-inch, two-page monitor.

On the high end are the 17-inch **MultiSync 5FGp** ($1,455) and the 21-inch **6FGp** ($2,535), which offer a top resolution of 1,280 x 1,024 pixels at 74 hertz. Both of these monitors are also **EnergyStar-compliant** and offer a new OptiClear surface that reduces glare and increases contrast. The 6FGp replaces the earlier 6FG, and the 5FG remains in the line.

**Up to Date . . .**


By Russell Ito
Hewlett-Packard’s LaserJet 4MP combines the print quality of a LaserJet 4M (600 dpi) with the size and ease of use of a LaserJet 4ML. You can even print on paper as small as a 3-x-5-inch index card.

**HP’s Packed Printer**

When Hewlett-Packard introduced the LaserJet 4ML printer in June, it was the most feature-packed printer we’d seen in its class. But that was June. Now, HP has topped that machine with the LaserJet 4MP, HP’s first 4-ppm, 600-dpi printer.

Only slightly larger than the 4ML, the 4MP is a hybrid, combining elements of the LaserJet 4M and the 4ML. Like the 4M, the 4MP is a 600-dpi (with resolution enhancement) PostScript Level 2 printer, but its speed matches the 4ML’s: 4 ppm. It includes LocalTalk and parallel ports, with automatic emulation switching. Like the 4ML, the 4MP uses an instant-on fuser that doesn’t require a warm-up cycle, but unlike the 4ML, it does have an on/off switch.

The 4MP comes with 6 megabytes of RAM, and it uses a 20-megahertz Intel 80960 RISC processor. Like the 4ML, the 4MP offers HP’s exclusive EconoMode printing, which can cut toner usage in half.

The 4MP has outstanding paper-handling functions. It comes standard with a 250-sheet tray (versus the 100-sheet tray in the 4ML), and it can support a wide variety of custom paper sizes and weights. The 4MP prints on paper as small as 3 x 5 inches and as heavy as 42 pounds!

Apple’s first application in a long time, PhotoFlash, is different, however. Aimed at non-publishing professionals, PhotoFlash is a page-layout add-on that lets users prepare and manipulate images quickly, without requiring a steep learning curve or loads of memory.

Jointly developed with Storm Technology, a JPEG pioneer, PhotoFlash uses Storm’s image-compression expertise to solve the memory problem. PhotoFlash’s virtual-memory scheme is so fast and efficient that you hardly notice the virtual memory kicking in. To make finding and importing images easier, PhotoFlash includes an integrated image browser and supports Photo CD.

To close the layout loop, PhotoFlash comes with scripts that automatically place your images into your QuarkXPress or Aldus PageMaker files; you can even drag images directly from the browser into your layout. For more sophisticated users, PhotoFlash supports AppleScript and Photoshop plug-ins.

Apple Computer, 20525 Mariani Avenue, Cupertino, CA 95014; 408-996-1010. $275 to $300 (exact price not available at press time).

**Easy Ethernet**

The power of Ethernet with the ease of LocalTalk has been something of the Holy Grail of networking. Setting up or expanding Ethernet networks is complex, requiring hubs and often extensive rewiring. But Farallon Computing’s new EtherWave products are the first daisy-chainable Ethernet solution, giving you Ethernet speed with LocalTalk-like ease of setup.
Farallon Computing's EtherWave family of products brings LocalTalk-like plug-and-play simplicity to Ethernet.

The cards, transceivers, and adapters in the EtherWave line meet all the speed and network standards of 10BASE-T Ethernet but let you make your network connections over unshielded twisted-pair wiring without a hub. Each of the EtherWave products includes a pair of RJ-45 ports, letting you connect two devices to a network from a single Ethernet drop.

EtherWave's daisy-chaining function lets you connect as many as eight devices without a hub, but the devices can also be used with a hub to extend the hub's capabilities. The EtherWave products are self-terminating and provide an easy way for PowerBook users to connect to — as well as disconnect from — Ethernet networks.

Farallon Computing, Inc., 2470 Mariner Square Loop, Alameda, CA 94501; 510-814-5100, $150 to $400, depending on device.

HP Toner Redux

Remanufactured laser-printer toner cartridges and high-quality are two phrases that aren't often found in the same sentence, but Hewlett-Packard is betting it can beat the rap on remanufacturing.

HP is now the first major manufacturer to enter into the remanufactured-toner-cartridge business, with the HP Optiva 95R.

To ensure a high-quality product, the company has developed an entirely new toner formulation and drum for its Optiva cartridges, and the company will accept only HP, Apple, or Canon cartridges for its program. The Optiva process includes recertification of all parts, replacement of all worn parts, and then filling and assembling with the new Optiva toner and drum. The Optiva cartridges carry an expected 4,000-page life cycle and a 90-day warranty.

Users can get Optiva cartridges by purchasing a toner-exchange packet at their dealers and returning to HP an empty HP 92295A toner cartridge (the cartridge that fits Canon SX engines, including those of the LaserWriter HSC, IINT, IINTX, IIIF, and IIg), using the labels in the exchange packet. The cost will be about 24 percent less than that of buying a new cartridge, with a turnaround time of 4 to 12 days.

Hewlett-Packard Co., Direct Marketing Organization, P.O. Box 58059, MS511-L-SJ, Santa Clara, CA 95051, 800-752-0900 or 408-725-8900, S95.

Adobe

The first real test of the PowerPC Mac's viability will be whether anyone writes software for it.

Introduce a new computer platform, and the first thing people want to know is, "Will it have software?" Apple's already shown that PowerPC Macs can run current Mac applications by using the built-in emulator, but that won't unleash the power of the new chip. If you want to get the most out of your PowerPC Mac, you'll need "native" applications designed to run on the PowerPC Mac. Several developers have already announced their intent to ship native applications when Apple ships the new PowerPC Macs or soon thereafter. The list is impressive.

Adobe Systems, ACI, Aldus, Claris, Denbea Software, Frame Technology, Insignia Solutions, Microsoft, Quark, Spectral International, and WordPerfect have all announced that they plan to support PowerPC, but so far they haven't said what specific applications they plan to ship first. However, given that this group of developers covers nearly all the top-selling Mac applications, it's safe to assume that the most popular applications will be going native as soon as possible.

By the way, another early adopter of PowerPC technology is Ford Motor, which plans to use PowerPC chips for its next generation of engine computers. Scientific-Atlanta has also announced that it will use PowerPC chips in its next-generation television-top boxes (which will act as front ends for "smart TV"). To top it off, IBM recently announced an entire new family of PowerPC Chips: the PowerPC 400 series, which will add high-speed smarts to everything from microwave ovens to laser printers.

Although we don't think you'll be able to run a native version of Photoshop in your Taurus, these announcements indicate that the PowerPC family has a bright future.

— Stephan Somogyi
The best thing next to the Macintosh.

When we say Citizen works where you work, we mean it. On your desktop or on the road, the Notebook Printer II™ is the perfect companion to your Macintosh. With built-in, 5-page sheet feeder or optional 30-page sheet feeder and NiCad battery, you'll get laser-quality text and graphics wherever your work takes you. You'll also get two pages per minute output and Special-Image Color. All for a surprisingly low price.

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PageMaker 5.0

Aldus fashions welcome new tools for its flagship page-layout program.

In the world of page-layout software, Aldus PageMaker is the undisputed champion for preparing general business documents. With its well-designed features for indexing and creating tables of contents, as well as its separate story editor, PageMaker also makes short work of long documents. With the latest release, 5.0, the program not only strengthens its position with general business users but it also sets its sights on rival QuarkXPress’ professional publishing clientele. New built-in color-separation facilities, support for multiple open documents, and tools for free rotation of text and graphics significantly boost PageMaker’s power. Faster printing, improved cross-platform compatibility, expanded color capabilities, and a slew of new Additions round out the list of PageMaker 5.0 enhancements.

Getting Around

PageMaker 5.0’s free rotation of text and graphics is a welcome, albeit long overdue, feature. With the program’s new rotating tool, you can set a rotation point and then manually rotate items through 360 degrees in 0.01-degree increments. An outline of the object and a rotation lever help guide your progress. We encountered one minor problem with this feature — rotated opaque PICT files sometimes appeared transparent on-screen and printed correctly only on PostScript printers.

Another new feature, available on PageMaker’s Control palette, lets you create vertical and horizontal reflection effects by flipping objects, text blocks, and bit-mapped images. You can also skew objects horizontally by +85 or −85 degrees. To specify precise values for rotating, skewing, and cropping objects, you can enter values directly into the Control palette.

In the previous release of PageMaker, the Control palette served as a handy tool for moving and resizing objects. With version 5.0, however, the palette has been greatly enhanced and can control a much wider range of operations. In fact, you can drive much of the application from this single palette. Packed with more features than QuarkXPress’ analogous Measurements palette, PageMaker’s palette is a real workhorse. The palette displays different options, depending on the type of object or tool you’ve selected.

Control-palette enhancements in version 5.0 enable you to format text and paragraphs, including setting right, left, and first-line indents; edit paragraph styles; and track and kern text. A type-ahead feature (you select the Juniper font by typing J, for example) makes selection of font and paragraph styles quick and easy. To adjust measurements quickly as you’re resizing and moving items, you can add, subtract, multiply, and divide within the Control palette’s numeric fields.

Enhanced nudge buttons also reside on the Control palette. Previously, you could use the buttons to move objects in screen-pixel increments, which varied with the page view. Now you can set your own nudge units for moving and resizing objects. Using the keyboard and the Control palette together, you can also move objects in power-nudge units — a power-nudge is ten times a nudge. You can’t define nudge units for most text-formatting options, but the program does such a good job of defining them for you that this is not really a shortcoming.

On the Right Track

PageMaker’s kerning and tracking controls have been improved with version 5.0. In addition to the Control palette’s easy-to-use buttons and type-in fields, PageMaker 5.0 includes two new typographic Additions: the Expert Kerning and Edit Tracks Additions. The Expert Kerning Addition, which you can use to fine-tune the spacing between letters when you’re working with text at large point sizes, appears on the new Utilities menu. The Edit Tracks Addition provides precise control over the program’s five built-in tracking settings (very loose, loose, normal, tight, and very tight), which control the spacing between words and letters. You can adjust the tracking for font sizes from 4 to 650 points. This Addition is also supposed to automatically create a document comprising samples of edited track values, but we weren’t able to get this feature to work.

There are 18 new Additions in all, bringing the total to 22 for version 5.0.
A welcome and long overdue feature, new in PageMaker 5.0, is the ability to have more than one publication open at a time.

The PS Group It and PS Ungroup It Additions address a particularly vexing problem that has long plagued users of previous versions of PageMaker — the inability to group objects. We found the solution provided by the two Additions a bit unwieldy, however. True, you can now group objects and move them as a single item. But to group objects, PageMaker first saves your publication and then creates an EPS file of the grouped objects — a time-consuming process. Other noteworthy Additions include the Print Selection (an enhanced version of 4.2's Make Booklet), Display Story Info, and Find Overst Text Additions.

Among the several printing improvements in PageMaker 5.0 is the Printer Styles Addition, which defines and saves a document's printer settings. In addition, printing is speedier, thanks to a rewritten printing architecture. You can also now print nonconsecutive pages and ranges of pages by issuing a single Print command.

With version 5.0, PageMaker finally lets you have more than one publication open at a time (the number is limited only by the amount of RAM you have) — a tremendous improvement and boon to productivity. PageMaker also now supports drag-and-drop operations, as does QuarkXPress, for streamlining the process of moving elements within publications or among them.

Creating color separations for PageMaker documents hasn’t been a big problem since the introduction of Aldus PrePrint. However, you had to run your PageMaker document through the PrePrint standalone application in order to color-separate pages. If you made changes to documents, you had to repeat the operation. PageMaker 5.0 eliminates this inconvenience by including color-separation facilities within the application. Color-separation support applies to PageMaker text and graphics, EPS files, CMYK TIFF files, and DCS images. You still need to use PrePrint to separate RGB TIFFs, however, and PageMaker lacks the basic color-correction features PrePrint supplies.

One of the most useful new color features enables the program to automatically transfer the colors of imported EPS images to the PageMaker Colors palette. Once they've been added to the palette, you can edit the colors. This delivers a one-two punch in convenience: Not only can you quickly match the colors of rules and text created with PageMaker to the colors in your imported graphic, but you can also see ahead of time what plates will be produced with a spot-color separation.

New color libraries — Trumatch, Focoltone, and Dainippon — add to version 5.0's color feature set. These improvements aside, PageMaker 5.0 lacks the sophisticated color-management features provided by the latest release of QuarkXPress. Professional publishers looking to achieve consistent color-image output from a wide variety of printing presses and desktop color printers will find what they need in QuarkXPress 3.2's incorporation of Eficolor. As we went to press, Aldus reported that color-management features for PageMaker are still several months away.

Cross-platform compatibility, well supported in previous versions of PageMaker, is even better now. Version 5.0 supports the new PANOSE font-mapping system for automatic or manual font substitution across Mac and Windows PC platforms. When you open a publication created on the other platform, if PageMaker can't find a needed font, PANOSE notifies you, suggests a substitute, and lets you specify another font.

PageMaker also supplies a rich assortment of import and export filters. The 39 text- and graphics-import filters include support for the Kodak Photo CD format and TWAIN as well as a variety of word processing and spreadsheet formats. Seven standard export filters are included.

PageMaker 5.0 requires System 6.0.7 or later, but you gain access to more features with System 7. Aldus recommends at least a Mac SE/30 or II-series machine with 5 to 8 megabytes of RAM. This, of course, leaves behind PageMaker loyalists who work on a Mac Plus, SE, or Classic. You also need to set aside at least 13 megabytes of hard-disk space.

The Bottom Line

Although its desire to lure professional publishers into the fold is readily apparent with PageMaker 5.0, Aldus clearly hasn’t forgotten its core of general business users. Offering numerous new conveniences and features for precision and control, the versatile PageMaker solidifies its position as the page-layout program of choice for creating business documents. Despite its powerful arsenal of features, however, PageMaker 5.0 continues to lag behind QuarkXPress in several key high-end publishing areas, most notably color-management, multiple master pages, and true object grouping.

— Shelley Cryan
Illustrator 5.0

Adobe wins hands down with its long-awaited upgrade to Illustrator.

With the latest sweeping upgrade, Adobe's veteran illustration program does more than play catch-up with the competition. Illustrator 5.0 has so many enhancements—including powerful plug-in filters, floating palettes, the ability to edit in Preview mode, and support for multiple drawing layers—that it races far ahead of its rival, Aldus FreeHand.

More Palette-able

Illustrator 5.0's most visible improvement is a flexible new interface. Powerful floating palettes provide quick and convenient access to settings for paint styles, gradient fills, drawing layers, and type. Not only can you use the Character palette to select font and type size but you can also use it to alter kerning, horizontal scaling, and so on. Overall, by having replaced the previous version's modal dialog boxes with floating palettes, Adobe enables you to spend less time selecting options and more time on your design. And for those who make mistakes, the program now supports 200 levels of undo and redo.

Illustrator’s newly added support for multiple drawing layers makes it easy to group and arrange objects. You can control how your documents are printed, displayed, and edited by using the Layers palette, which lets you hide and lock layers. Symbols to the right of the layer names in the palette indicate the layer you are currently working on as well as the layer assignments for each object selected in a drawing.

To make it easy to distinguish one layer from another, you can assign a color to each layer. Illustrator comes with nine built-in colors, but you can also choose custom colors from the Apple Color Picker. This feature is a real boon for technical illustrators who frequently work with complex drawings.

The new paint features include a pressure-sensitive freehand brush tool. Illustrator matches rival FreeHand's pressure-sensitive pen feature by feature and ups the ante by providing calligraphic capabilities. Drawing with a Wacom tablet simulates the effects of using a fine calligraphy pen—you can even choose the angle of the nib. We were particularly impressed with the quick response of Illustrator's pressure-sensitive tool.

Blending In

Illustrator also provides better control than FreeHand over the process of creating gradient fills. Fills can consist of a blend of two colors or of multiple intermediate blends among several colors. Illustrator offers the same linear- and radial-blend options as FreeHand, but it provides more flexibility by letting you set the beginning point and endpoint of a blend. The Gradient palette offers easy control over the bias of blend colors (how quickly a blend changes from one color to another).

You can apply gradient fills across multiple objects, including type characters. Moreover, it's now a two-step process to blend colors across a type selection—the previous version required you to use multiple commands and tools. The blend tool is still available, but you need it only for creating blends that affect both shapes and colors.

For creating special effects, the new Illustrator comes with a varied collection of plug-in filters. The filters not only let you create distortions, calligraphic effects, and the like but they also enable you to create a wide variety of special shapes.

Powerful Boolean operations let you combine, exclude, and intersect existing objects to create new shapes—for example, with the Pathfinder Combine filter, you can create a cylinder outline by combining two ovals and a square. Boolean operations take only seconds to execute and eliminate the tedious process of cutting and joining objects. Pathfinder filters can also divide and crop any set of objects based on the intersection of a line or a square, which makes it simple to add a fancy fill effect or fit an object to a precise area.

The Colors filters enable you to manipulate color in powerful ways—for example, you can intensify the colors of selected objects by increasing the percentages of CMYK values. You can also invert the color values of an image as well as adjust the CMYK values for a set
of objects. Achieving just the right color has never been easier.

The Select filters provide powerful selection capabilities based on colors, paint styles, and stroke and fill weights. They enable you to select several ungrouped objects based on the properties of your current selection and then edit all the objects simultaneously. You can even use this feature to select stray single points in an illustration.

Custom Views
At last, Illustrator lets you edit in Preview mode — a long overdue feature. In addition, support for multiple custom views makes working with complex drawings easier. You can create as many as 25 custom views of a single document. When you create a view, you can save the current zoom level, layer options, and mode (Preview or Artwork). You can also display several views of the same document in separate windows and move quickly from one view to another.

Illustrator 5.0 provides many more zoom levels (150%, 600%, and 1,600%, for example) than the previous version did, so it's easy to achieve just the right ratio of detail and perspective. When you save custom views, the program adds their names to the View menu. Keyboard shortcuts are provided for the first ten views in the menu list.

To help you get up to speed with Illustrator 5.0's many new features, Adobe has revamped its manuals to include more-detailed descriptions of how the program works. In addition, an excellent five-part tutorial covers most of Illustrator's functions. Expert users will find it useful to check out the updated Beyond the Basics booklet, which focuses on the many new tools and commands in version 5.0.

We also highly recommend the deluxe CD-ROM version of Illustrator 5.0. At $695, it's a bit more expensive than the floppy-disk version ($595), but the QuickTime tutorials created by Adobe's technical staff offer a slew of tips and techniques designed to sharpen your drawing skills. The CD-ROM package also supplies 40 more typefaces (in addition to the 40 that come with the floppy-disk version); the complete Adobe Collector's Edition Patterns; and demonstration versions of other Adobe applications, including Premiere. Users of the previous version of Illustrator can upgrade to the CD-ROM version for $249.

Wish List
We were impressed with both the quantity and the quality of the enhancements in version 5.0, but several features are still on our wish list. For single-page layouts, we miss a ruler for setting type. Although Illustrator provides full control over type specifications, it would be nice to be able to set a series of tabs for a paragraph.

Another omission is a type envelope feature similar to the one in Broderbund's TypeStyler. Type envelopes let you create special type effects by stretching selections, using Bezier curves. This powerful feature is also available in Deneba's Canvas 3.5 as well as in most Windows illustration packages.

Last, Illustrator 5.0 still lacks the ability to import TIFF files, a feature that rival FreeHand does provide. The majority of illustrators and designers would be well served by the addition of this necessary capability.

Those who have been putting off buying extra memory will need it for this upgrade — Adobe recommends a 4,700K partition! If your Mac is equipped with less than 8 megabytes of RAM, you'll still be able to use the program but large drawings may not open.

The Bottom Line
With the release of version 5.0, Adobe Illustrator becomes the ultimate illustration tool for graphics professionals. The program's revamped interface makes Illustrator 5.0 more convenient to operate than the previous version — most notable are the program's elegant new floating palettes. In addition, new plug-in filters and paint tools enable designers to create unusual special effects. If you're already an Illustrator user, upgrading to version 5.0 is the obvious thing to do. And if you're new to Mac-based design tools, you can't go wrong with Illustrator 5.0.

— Sean Safreed

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New in Illustrator 5.0 are plug-in filters that let you create a variety of special shapes and effects.
Ah, it's been a masterful charade—an Academy Award performance. That confident smile and firm handshake covering up the fact that chaos rules your life and you're just one more lost memo, forgotten name and misplaced schedule away from total disaster.

Well, now you can actually be that buttoned-up, on-top-of-it dynamo you've been pretending to be. Introducing Now Contact™, undoubtedly the most complete contact manager available. When used together with the award-winning Now Up-to-Date™, it's the ultimate personal organizer.

Now Contact is built around the philosophy that it's no use getting organized if you can't find stuff faster. It gives you instant access to all your names, numbers and addresses, retrieving information quicker than any competitive product, actually as fast as your screen can draw. Complete with a built-in word processor, Now Contact makes printing form letters, labels, faxes, envelopes and address books painless. If time, as they say, is money, you'll be a bit richer every time you write a letter.

Now Up-to-Date, the best-selling calendar software, makes scheduling events, setting reminders, managing to-do lists, and printing calendars amazingly simple. Display your calendar by month, week or day—you choose the view that's right for you. Plus, if you are on a network, you can also keep your associates informed of your schedule.

Together, Now Contact and Now Up-to-Date put a complete record of all appointments and correspondence with your contacts at your fingertips. You can even create new appointments without pausing to open your calendar. Similarly, you can include contact information in your calendar without opening your contact file.

So, how productive would you be if you were as organized as you've been pretending to be? Get Now Up-to-Date and Now Contact and find out. Or give us a call for more information at 1-800-275-1669.

Put it on your to-do list right away. That is, of course, if you can even find it.
Adobe Acrobat and Common Ground

Digital publishing is here, but with a few catches.

Distributing digital documents has long been a dicey proposition: Often, those on the receiving end didn’t have the application and fonts used to create the document or lacked the required operating system. Fortunately, help is at hand, in the form of Adobe Acrobat and No Hands’ Common Ground.

Acrobat is a high-end, high-priced digital-publishing product ($1,395 for a complete ten-person starter kit) that targets corporations and workgroups. The price of Common Ground ($189.95) makes the product more accessible to individual users. The aim of each is the same: to let you create from within any application special documents others can view, regardless of the computing platform (Macs, Windows PCs, and eventually UNIX workstations and PDAs). The special documents retain the original document’s formatting and fonts, even when users lack the creator’s application.

Creating these documents with either Acrobat or Common Ground is as easy as printing. A printer driver converts jobs to a special file format; anyone whose machine has a special viewer installed can read the resulting file.

Adobe Acrobat

Acrobat is a set of products consisting of Acrobat Exchange, Acrobat Distiller, and Acrobat Reader. Each product offers a different set of features for creating and viewing documents in Adobe’s PDF (Portable Document Format).

The core of the product set is Acrobat Exchange ($195), which consists of a Chooser extension called PDFWriter and an application. The extension lets you print to PDF files from within any application; the Exchange application lets you add powerful document-navigation tools. PDFWriter supports various built-in compression options (JPEG, LZW, and the like) for compacting documents as it saves them to PDF format. A control panel enables you to perform one-shot PDFWriter printing and then returns you to your usual printer.

A PDF file is essentially a text file that contains PDF code describing the original document’s formatting and contents. Like PostScript files, PDF files are device- and resolution-independent.

Once you’ve created a PDF file, you can use Acrobat Exchange to add sophisticated navigation aids, such as hypertext links, to your document. For example, you can select specific document headings and add them to a table of contents as bookmarks. Readers can then jump to any part of the PDF document by selecting the name in the table of contents. Exchange also lets you create thumbnails of your pages to help readers find their way through the document.

Unfortunately, if you decide to modify your original document, you’ll need to reenter Exchange’s links and bookmarks manually. Some companies, such as Xerox (maker of Ventura Publisher), plan to let users insert PDF tags for links and bookmarks in documents as they compose them. For now, however, expect major hassles when you modify documents that contain links or bookmarks.

You can read PDF files by using either Exchange or the $50 Adobe Reader. Exchange and Reader each provide a
basic set of navigation commands (Next Page, Previous Page, Find, and so on) as well as zoom views (12 to 800 percent) and an annotation feature for adding notes to pages. You can also select text and copy it. The Find command lets you search for only one word at a time, but Adobe is reportedly working on an enhanced search feature.

In the past, if you sent a file to users who didn’t have the original document’s fonts installed on their machines, the document they viewed was often not a pretty sight. To address this problem, Acrobat uses Adobe’s ATM font substitution and multiple-master fonts to mimic the metrics of any Type 1 font, so line breaks remain the same (all Acrobat products come with ATM and the necessary support files). This technique generally works well for regular Roman fonts, but it can’t represent non-Roman characters or pi fonts, such as Dingbats.

To circumvent this problem, you can use the steeply priced Acrobat Distiller ($695) to create PDF files out of PostScript files (which System 7 users can generate in most Mac applications by selecting the PostScript File option in the Print dialog box). Distiller embeds Type 1 fonts in the PDF file so readers can see exactly how the fonts look—even pi fonts and non-Roman characters. Distiller can also print EPS graphics at the resolution of any printer (Exchange can display or print EPS graphics in PDF files only at a 72-dpi screen resolution). But Distiller is a memory hog—you need at least 6 megabytes of RAM for the application (Adobe recommends 12 megabytes). It also requires at least a Mac II (Exchange can run on a Mac Plus, running System 6.0.5 or later, and 10 megabytes of hard-disk space (Exchange needs 3.5 megabytes).

Distiller’s hefty memory requirements and high price may be a barrier to many users. In fact, Adobe’s pricing scheme for Acrobat makes it clear that the company is targeting the corporate market. Most users will be in companies wanting to cut printing and distribution costs for manuals and other documents.

**Common Ground**

On the surface, Common Ground works much like Acrobat Exchange. It consists of a Chooser extension, the Common Ground application, and AutoMaker—a drag-and-drop utility that lets you generate documents in Common Ground’s DigitalPaper format without going through the Chooser.

Unlike Acrobat, however, Common Ground saves pages in a proprietary graphics format rather than describing them in a page-description language such as PDF. Instead of using font substitution, Common Ground creates an image of the fonts in a document. That means even non-Roman and pi fonts appear normal in DigitalPaper documents, whether or not the reader’s Mac has ATM, multiple-master fonts, or the original fonts installed. However, the fonts aren’t resolution-independent—300 dpi is the maximum resolution.

Common Ground’s major advantages over Acrobat are cost, convenience, and the provision of security options. Unlike Adobe, No Hands lets you embed a free miniviewer in any DigitalPaper file (adding about 64K to the file size), so you can send the file to anyone with a Mac (No Hands plans to ship a Windows version, but it was not available at press time). Recipients can launch the file, read it, and print it. Common Ground also offers some password and DES (Data Encryption Standard) security options. Last, Common Ground’s system requirements are refreshingly modest: System 6.0.5 or later, 700K of free RAM, and about 700K of hard-disk space.

Common Ground, however, lacks sophisticated navigation features, such as those in Acrobat Exchange. You can’t add hypertext links, thumbnail previews, or text annotations to documents, although you can annotate with sound. The Common Ground application provides basic tools for searching, zooming, selecting, and copying text, but the reader supports only printing, viewing, and very basic navigation (you can maneuver to the next, previous, first, and last page).

Common Ground also lacks compression capabilities, which Acrobat has. And because DigitalPaper must store information for multiple resolutions (72, 100, 200, and optionally 300 dpi), DigitalPaper documents can be much larger than their PDF counterparts.

**Testing Ground**

We tested Acrobat and Common Ground by using a variety of documents, including memorandum, complex page-layout files, and FrameMaker manuals.
In addition to evaluating document quality, we compared file-creation speed and file size. To test Acrobat's cross-platform capabilities, we created and exchanged PDF files, using a 486/50 PC clone and a Quadra 700 equipped with 20 megabytes of memory.

In general, both products produced adequate representations of the original documents, although there were a few glitches. Common Ground made a much better job of consistently preserving the appearance of fonts. Acrobat’s font-substitution approach always successfully preserved the character widths of TrueType fonts, so line breaks remained the same, but it sometimes failed to faithfully mimic font heights, even for Adobe’s own fonts. Acrobat sometimes displayed color text in black. And it couldn’t maintain the character widths of TrueType fonts in Windows PDF files we ported to a Mac that lacked TrueType.

Acrobat Exchange and Common Ground each had problems with EPS graphics, which looked fine on-screen but printed as low-resolution bit maps. Using Acrobat Distiller is the only workaround for this problem. The PCX graphics contained in PDF files brought from the Mac to the PC also suffered in on-screen and printout quality. One graphics-heavy PageMaker 4.2 file printed out fine on a PostScript printer, but Exchange refused to process it. Common Ground, on the other hand, handled the file without problems.

Acrobat Exchange bested both Distiller and Common Ground in speed tests (it took just less than 2 minutes to create a file from a graphics-intensive 20-page FrameMaker document, compared with about 3 minutes for Distiller and 2.5 minutes for Common Ground) — but all three products created their files much more quickly than a PostScript laser printer took to print the same document (12.5 minutes). In terms of screen-display times, Acrobat Exchange suffers when compared with Common Ground. A page from a PDF file can take several seconds to draw on-screen, making browsing frustrating.

Common Ground DigitalPaper files were always much larger than PDF files, due to the product’s lack of an internal compression engine. However, we were able to shrink the DigitalPaper files to approximately the same size as the PDF files by using Aladdin Systems’ StuffIt.

The Bottom Line
The promise of digital document distribution is enticing, but neither Acrobat nor Common Ground delivers the perfect combination of affordability, resolution-independent fonts and graphics, and sophisticated navigation features.

Still, despite Acrobat’s prohibitive pricing and memory requirements, slow screen redraw, and hassles in maintaining hypertext links, the Adobe product offers the most potential power for distributing sophisticated electronic documents. With navigation tools such as hypertext links and thumbnail previews, PDF documents have clear advantages over their paper counterparts.

With the $695 Distiller, Acrobat also offers resolution-independent reproduction of fonts and EPS graphics, although you need to work from PostScript files to fully access these capabilities. Overall, for corporate users who want to create easy-to-navigate electronic documents, the Acrobat family of products is clearly the better choice.

For individual users who don’t need the complexity and advanced features of the Acrobat products — or their expense — Common Ground is a better choice. It doesn’t have sophisticated document-navigation controls, nor does it provide output at resolutions higher than 300 dpi, but it does come with a free miniviewer. And although Common Ground doesn’t provide automatic file compression, you can use third-party compression utilities to shrink files to a reasonable size.

Additionally, with its password and encryption options and exact imaging of source fonts, Common Ground may be a good choice for graphics designers and other service-bureau patrons.

— Gregory Wasson

Table 1: Deciding on a Digital-Publishing Product

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<th>Pros</th>
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<td>Adobe Acrobat</td>
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<tr>
<td>(Acrobat Distiller, Acrobat Exchange, Acrobat Reader)</td>
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<tr>
<td>• Sophisticated navigational features (hypertext, thumbnails).</td>
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<tr>
<td>• Resolution-independent file format.</td>
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<td>• Automatic file compression.</td>
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<td>• Text annotation.</td>
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<td>• Proven cross-platform capabilities.</td>
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<th>Cons</th>
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<tbody>
<tr>
<td>• Expensive; no free viewer.</td>
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<tr>
<td>• Font substitution doesn’t faithfully mimic some fonts.</td>
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<td>• Memory hog.</td>
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<td>• Slow screen redraw.</td>
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<td>• No security options.</td>
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<td>• No sound options.</td>
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<th>Ideal Users</th>
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<tr>
<td>• Corporate users requiring easy navigation in complex documents such as product manuals.</td>
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<table>
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<tr>
<th>Pros</th>
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<tr>
<td>Common Ground</td>
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<tr>
<td>• Free viewer for embedding in documents.</td>
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<tr>
<td>• Modest memory requirements.</td>
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<td>• Exact font images.</td>
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<td>• Security options (passwords, encryption).</td>
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<td>• Sound-annotation option.</td>
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<th>Cons</th>
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<tr>
<td>• No sophisticated navigational features.</td>
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<td>• Not resolution-independent (300 dpi maximum).</td>
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<td>• No automatic file compression.</td>
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<td>• No text annotation.</td>
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<tr>
<td>• No cross-platform capabilities (at press time).</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Ideal Users</th>
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<tbody>
<tr>
<td>• Individual users with documents that don’t require hypertext navigation.</td>
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<tr>
<td>• Users requiring secure document distribution.</td>
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EMBARC for the PowerBook

Motorola's wireless information service keeps PowerBook users well informed.

riding the first wave of wireless communication technology, Motorola's EMBARC for the PowerBook aims to keep mobile users as informed on the road as they are in the office. The EMBARC kit comprises a pager and messaging software that lets you set up wireless communication between your PowerBook and the Motorola EMBARC wireless network. The network currently offers communications-distribution services such as e-mail delivery, specialized news briefs, and database updates to mobile computer users in more than 200 metropolitan areas in the U.S. and Canada.

Where the PowerBooks Roam

EMBARC stands for Electronic Mail Broadcast to A Roaming Computer. The kit's hardware component is a small Advanced NewsStream Information Receiver that connects to either of your PowerBook's serial ports. The receiver continuously monitors specific radio frequencies, flashes an LED when you receive a message, and either downloads the data to your PowerBook or stores it in its 32K memory buffer. Once you've configured the software, retrieving messages is as simple as plugging the receiver in to the PowerBook and turning on the computer.

The EMBARC software, which consists of a control panel and an application, is a bit rough around the edges. You use the control panel to regulate communication between the NewsStream receiver and your PowerBook. One inconvenience is that if you're already using both of your PowerBook's serial ports—one for a modem and one for your PowerBook to the PowerBook and turning on the computer.

You use the EMBARC application to read, compose, answer, send, and delete mail. Notably absent is a facility for automating common tasks, such as logging on to the central switch, sending messages, downloading new messages, and logging off. In addition, deciphering the EMBARC software's X.400 addressing scheme and figuring out how to send messages from your current e-mail program through an EMBARC gateway aren't trivial tasks.

For almost instantaneous message delivery, you may want to consider using your modem to dial directly in to the EMBARC switch, rather than going through your e-mail system. Calling the switch enables you to send as well as receive messages. And only users who dial directly can take advantage of EMBARC's Priority (15 minute) or Express (one hour) guaranteed delivery times. The Express messages we sent when connected directly to the EMBARC switch were received only minutes after we'd sent them, whereas messages that went through gateways took several hours. For a lower rate, you can send messages Standby, which provides delivery by 5 a.m. the next day.

EMBARC supports individual itineraries for all users, a feature unique to Motorola's system. Users traveling outside their home-base areas tell the EMBARC network where they'll be and when, and the central switch broadcasts their messages to the appropriate areas.

EMBARC's most compelling feature is its ability to broadcast information—including a wide selection of specialized news services—to mobile users. To showcase this capability, Motorola provides news and weather briefs from USA Today free to all EMBARC subscribers. Organizations looking for a way to communicate to a widespread mobile workforce can also use EMBARC to deliver rapidly changing data quickly and inexpensively. Recipients each pay a flat rate of $18 per month, which entitles them to 30 minutes of no-additional-charge switch connect time, 100K of message storage at the switch, free delivery of messages, and delivery of the USA Today news and weather services. Only the sender pays for message transmission. Charges are based on the size of the message, the delivery priority, and the number of regions to which the service needs to be broadcast.

The Bottom Line

With EMBARC for the PowerBook, Motorola takes an important step toward fulfilling the promise of wireless information delivery. Companies looking for a way to quickly and inexpensively distribute proprietary information to their growing mobile workforce will welcome EMBARC's capabilities. And PowerBook owners who need to be in the know will benefit from the ability to receive news and data on the road without having to dial in.

— Mark Bieler
Quicken 4 for Macintosh

New investment-management features make Quicken 4 the last word in personal-finance software.

Boasting more than 100 new enhancements, the latest version of Quicken is far more than just another upgrade. Quicken 4 for Macintosh leapfrogs the DOS and Windows versions of the program, providing several features not available in those versions. Moreover, with the addition of investment tracking, access to electronic credit-card statements, enhanced charting, and loan amortization, Quicken 4 significantly strengthens its lead as the front-running personal-finance program.

Easier Than Paper

Although Quicken 4 has several software rivals, including MEGA's Managing Your Money and Aatrix Software's Checkwriter Pro, its real challenger is paper-based personal accounting. Quicken's success at luring people away from their check stubs and ledger books is due to two basic design assumptions.

First, you don't have to be an accountant to use the program effectively. You write checks, pay bills, track credit cards, and record cash transfers on-screen just as you do on paper. But under the hood, Quicken runs a thorough double-entry accounting system with powerful reporting capabilities. In short, you attend to your affairs as usual, and Quicken provides the accounting expertise.

Second, Quicken's check printing, electronic-payment capabilities, and new IntelliCharge electronic credit services win hands down at providing a faster and more efficient means of managing your finances than the pencil-and-paper method.

Version 4's new features reinforce Quicken's twin goals of familiarity and efficiency. The time-saving QuickFill feature accelerates data entry by referring to previous transactions and filling in fields automatically. For example, once you've typed a few characters into a field, QuickFill searches previous entries and completes the current entry if it finds a match. If the match is incorrect, you can continue to type additional characters and QuickFill will narrow its search.

Even better, you can create automatic transactions for groups of expenses that occur regularly, such as cash transfers, income deposits, and mortgage and utility payments. At the time intervals you choose, Quicken 4 adds the transactions to your register and, if you wish, automatically issues the checks or electronic payments.

With the new Transfer Money command, you can move cash from one account to another without the hassle of double-entry accounting. You simply enter a transaction description, the date of the transfer, and the dollar amount. Pop-down menus permit you to select the source and destination accounts. Quicken 4 records the credit and the debit in the appropriate accounts.

Version 4's loan-amortization features make loan tracking easy too. Quicken 4 calculates payment schedules — including interest and principal paid — and updates loan balances for fixed- and variable-rate loans, prepayments, negative amortization, and balloon payments.

The previous version of Quicken already addressed the inconvenience of check writing by providing modem access to the CheckFree electronic-check-payment service. For a monthly service charge of about $10 for 20 transactions, Quicken automatically establishes a modem link with the CheckFree Processing Center and issues electronic payments to the vendors of your choice.

Charge It

Quicken 4's IntelliCharge service brings a similar level of automation to your Visa account. If you hold a Quicken Visa Gold card and you subscribe to the IntelliCharge service, you can receive monthly electronic credit-card statements and import them directly into Quicken. IntelliCharge statements are mailed on-disk for a monthly fee of $4.50, or you can download them, using Quicken and a modem, for $3 per month. The first six months' statement delivery is free, and there's no annual charge for the Quicken Visa card. A Quicken Visa request certificate is provided with the package.

If you manage an investment portfolio, Quicken can assist you in this capacity as well. Quicken 4's extensive...
Introducing Astound.
It’s kinda like. Well, sorta like.
Actually, it’s nothing like Persuasion.

At first glance, it appears that Astound works just like Aldus Persuasion.

After all, it lets you create all your smart-looking slides, overheads, and notes using the tools and interfaces you’re already familiar with.

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No wonder MacWeek recently downgraded Persuasion to a three-star rating, while ranking us first

in the category. And why the editors at Publish Magazine said, “Its outstanding power, versatility, and simplicity make it an excellent buy.”

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new features for stock-portfolio and mutual-fund management support virtually every type of investment, including stocks, bonds, real-estate investment trusts, IRA and Keogh accounts, cash-management accounts, money-market funds, CDs, treasury bills, 401K plans, and real estate.

Consistent with Quicken’s ease of use, Intuit has built the program’s investment support around a group of Quick-Forms, which prompt you for the necessary information as you enter investment transactions, such as buying and selling stocks and reinvesting dividends. Experienced traders may want to enter investment information directly into an account register.

**Investment Analysis**

Quicken 4 provides a slew of new 2-D and 3-D charts for tracking and analyzing investment performance and financial transactions. For example, Quicken 4 can graph stock prices based on value updates you key in or import directly from an electronic stock-quote service.

The program’s convenient Quick-Browse feature displays the exact value of a chart element when you double-click on it. Similarly, double-clicking on an element in a Quicken chart or report enables the QuickZoom feature, which lets you examine the transaction details represented by the selected element.

Five new financial-planning calculators — for loans, retirement, savings and investment goals, mortgage refinancing, and college savings — provide even more analytical power. Like the Quick-Forms, these planners prompt you for information and then display the course of action you need to take to achieve your financial goals. You can perform what-if calculations to evaluate different options.

If you need to exercise some spending controls, the new QuickBudget feature lets you examine your existing transaction data and generate a sample budget based on your financial history. Once you’ve seen what you’ve spent over the past year, it’s easier to set realistic goals for the upcoming year.

Additional enhancements include improved links to tax-preparation programs, a report that lists transactions according to IRS tax-form line items, numerous interface refinements, and the ability to resize and reformat reports.

Quicken 4 comes with a thorough (400+ page), well-written manual, but the program is so easy to use that many users will find themselves up and running before they’ve even cracked the documentation.

In addition, the slim 64-page Business Users’ Guide advises you on how to use Quicken 4 to manage the finances of a small business. Unless you’re running a one-person shop or have fewer than five employees, however, Quicken is probably not the best choice for small-business accounting.

Quicken 4 supports System 7’s Balloon Help, publish (but not subscribe), and TrueType fonts. Intuit’s Qcards provide context-sensitive on-line help.

Surprisingly, Quicken 4 delivers all of its new features for the same $69.95 retail price of the previous version (Quicken 3 owners can upgrade to the new release for $29.95 plus shipping). At that price, Quicken 4 is as cost-effective as it is powerful.

The minimum configuration for Quicken 4 is any Macintosh with System 6, 2 megabytes of RAM, and a hard drive.

**The Bottom Line**

For those still managing their checkbooks with pencil and paper, Quicken 4 for Macintosh makes a compelling case for switching to computer-based personal finance. The program’s well-designed interface, comprehensive feature set, and excellent documentation and on-line help make the switch nearly painless, even for novices.

Veteran Quicken users will discover that Intuit has significantly broadened the program’s scope with version 4. No longer must users resort to using a second software program to do their investment planning and tracking — Quicken 4 has portfolio- and mutual-fund-management features built in. Who could ask for more?

— Bob Lindstrom
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Gay Bourassa
Math Teacher
Hazardville Memorial Elementary School
Enfield, CT

"As an educator and a network manager for the district, I have to make the right choices for the schools and the kids on a limited budget. As vice president of the Hartford Users Group, I reviewed many other companies and decided to buy only what I need for my LocalTalk, Ethernet and telecommunication solutions exclusively from FOCUS. What really makes FOCUS stand out for me is their total commitment to my satisfaction. Their service is unbeatable. When I had questions, they were just an easy phone call away. They’ve earned my trust and now I wouldn’t consider buying from anyone else."

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Wasting too much quality time at your AppleShare servers? Now you can manage multiple servers from any Mac on your AppleTalk network, or even remotely over the phone lines. And you can do it with more control than ever before.

**Keep Downtime To An Absolute Minimum**

GraceLAN Server Manager is the only AppleShare server management software that lets you reconfigure users and groups remotely without shutting down AppleShare. Status alarms keep you posted on disk space shortages, server crashes, backup problems and more.

**Work With Absolute Confidence**

Server Manager is the newest addition to the GraceLAN Professional Series, the most complete suite of network management software for AppleTalk networks. It fully supports AppleShare 3.0 and later, including AppleShare 4.0 and AppleShare Pro for Apple's new Workgroup Servers. And like every GraceLAN product, it features an elegant, intuitive interface that makes it remarkably easy to use.

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Get your hands on GraceLAN Server Manager today. And see how absolute control can thrill absolutely. Call 1-800-568-6712 for your free demonstration disk.

**CIRCLE 129 ON READER SERVICE CARD.**
AppleShare Pro and Apple Workgroup Server 95

Unfriendly software tools compromise dedicated server's speed gains.

Apple’s first foray into the dedicated-server arena doesn’t merit any standing ovations for usability, but it’s sure to speed up your Mac network. The company’s new dedicated server comprises AppleShare Pro 1.0 software running on the Apple Workgroup Server (AWS) 95—a Quadra 950 equipped with a preinstalled PDS (processor-direct slot) SCSI card, a high-capacity hard drive, and at least 16 megabytes of RAM.

The AppleShare Pro software is a hybrid of A/UX 3.0.1 (Apple’s version of UNIX) and new server software. The A/UX component brings several advantages to AppleShare, including preemptive multitasking, a fast file system, improved file-system caching, and support for the AWS’ enhanced SCSI system. The server software provides additional caches for Mac-specific information about icons, folders, and files.

When you boot the server, A/UX takes over, reserving half of the installed RAM for itself. The other half goes to AppleShare and the Finder, which both reside on top of A/UX. According to Apple, this top layer is designed to insulate network administrators from UNIX, except when they’re required to do maintenance and disaster recovery.

On the hardware side, the AWS 95’s PDS card gives Apple’s new server a faster SCSI port than the Quadra 950’s. With the card’s DMA (direct-memory access) capability, the AWS 95 can read data from and write it to SCSI devices without using the Mac’s 68040 CPU, freeing the 68040 to perform file-server tasks. The PDS card also comes with a 128K second-level RAM cache (upgradable to 512K). A fully loaded AWS 95 costs $11,639.

We tested Apple’s dedicated file server on networks consisting of 1 to 50 clients. Installing the A/UX and AppleShare Pro software from the supplied CD-ROM is easy: In addition to installing the operating system, the well-designed installer lets you format and partition hard disks. The Easy Install option takes care of all the basics, but this option excludes installation of many UNIX tools as well as the on-line A/UX documentation. The omission of the tools and documentation may come back to haunt you if you run into trouble later.

Creating and modifying users and groups is the same as with the previous version of AppleShare (AppleShare 3). In fact, the only visible differences are the Pro version’s added options for adjusting icon-, file-, and folder-cache sizes. AppleShare Pro’s method of defining

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**AppleShare Pro and AWS 95 Performance**

**Open Adobe Photoshop File**

- AWS 95/AppleShare Pro
- Quadra 950/AppleShare 3.0.2

**Finder Copy, Client to Server**

- AWS 95/AppleShare Pro
- Quadra 950/AppleShare 3.0.2
- AWS 95/patched AppleShare Pro

AppleShare Pro teamed with the AWS 95 offers significant speed advantages over AppleShare 3.0.2. We tested Apple's dedicated server on networks consisting of 1, 10, 20, 30, 40, and 50 clients. The AWS 95 was faster—considerably so on larger networks—than an AppleShare 3-equipped Quadra 950 at opening a 20-megabyte Adobe Photoshop file (left). Photoshop itself resided on the client Macs. Although AppleShare Pro is fast, however, it’s not perfect. Apple offers a software fix that vastly improves performance with Finder copy operations from client Macs to the server (right).
REVIEWS

"sharepoints" — folders that appear as server volumes to users — is also identical to AppleShare 3's. Compared to AppleShare 3 running on a Quadra 950, the AWS 95/AppleShare Pro combo is speedy. We tested several configurations of the AWS 95 and AppleShare Pro and compared the results with those of a similarly configured Quadra 950 running AppleShare 3.0.2. Tests consisted of Finder copy operations to and from the server as client Macs generated background network traffic.

On the 50-client network, copying a file from the server (reading) to a Mac IIci client was more than eight times as fast with the AWS 95 and AppleShare Pro, although copying a file to the server (writing) with the AWS 95 showed only about a 50-percent speed gain over the Quadra running AppleShare 3.0.2. Turning off the AppleShare Pro caches boosted the write speed significantly, though, which pinpointed the caches as the problem.

A software patch from Apple brought the dedicated server's write speed back on track, however: Further test with the patch showed a fivefold improvement over AppleShare 3. (You can get the fix, called AWS 95 Tune-Up, free through Apple's technical-support service [800-767-2775] and from dealers.)

One benefit of harnessing UNIX file services for AppleShare Pro is that they're much faster than those of the Mac operating system. But AppleShare Pro usability clearly suffers from its UNIX underpinnings. If you plan to use the AWS 95 server strictly as configured by Apple, your contact with the arcane world of UNIX should be minimal. But if you need to add a hard drive (a likely occurrence if you're maintaining a high-performance file server) or perform disk maintenance, you'll find yourself wrestling with the UNIX command-line structure. If you used the Easy Install option when you first configured the server, the absence of on-line UNIX documentation will further hinder your progress.

Because AppleShare Pro uses the UNIX file system, Mac hard-disk diagnostic tools such as Fifth Generation's Public Utilities, Central Point's MacTools, and Symantec's Norton Utilities for Macintosh don't work with the AWS 95. In their place, A/UX supplies a standard UNIX tool called fsck (file-system checker), but no Mac interface for this tool is included. Even worse, A/UX requires that you type a command to prepare the server for fsck — this is a process that would be better handled by the installer. Had Apple provided even a rudimentary interface for the only file-system-recovery tool available for the AWS 95, the server would be a far friendlier machine. In addition, UNIX is much more fragile than the Macintosh operating system. Because so much data is cached by A/UX, a power failure or a simple, accidental punch of the reset button can cause a disk's data to be irrecoverably lost.

To help you circumvent data-loss problems, Apple ships Dantz Development's Retrospect Remote 2.0 for A/UX with the AWS 95. Retrospect takes full advantage of the AWS 95's fast SCSI port for optimal backup speed. Four of the five standard AWS 95 configurations come with a built-in DAT drive for backup.

One final caveat: You must install (or reinstall) A/UX and AppleShare Pro from a CD-ROM; you cannot install from floppy disks. Ironically, however, not one of Apple's five AWS configurations includes a CD-ROM drive. Only the $11,639 configuration of the AWS 95 comes with the AppleShare Pro software; for other configurations and for the $2,499 Quadra 900/950 upgrade package, you must purchase the $2,499 software separately.

The Bottom Line

The AppleShare Pro/Apple Workgroup Server 95 package offers significant speed advantages over its predecessor. However, because the server forces network administrators to deal with a complex and unwieldy UNIX-based file-recovery tool, the product is much less straightforward to use than a standard AppleShare server.

Moreover, at $11,639 for the top-of-the-line AWS 95 dedicated server, the product is pricey. Nevertheless, for those who are willing to cope with the additional hassles involved in setup and maintenance in order to gain a boost in speed, using Apple's dedicated-server software is an improvement over using previous software and it's much easier to set up and maintain than the Novell NetWare alternatives.

- Stephan Somogyi

Julie Baier and Jeff Davis of ZD Labs managed the testing for this review.
Announcing the first personal computers that will send faxes, read you your mail, take phone messages and work with your video camera, VCR and TV.
anything you tell them to.

“Computer, open my word processor.”
Now work the most intuitive way. With Apple PlainTalk AV computers (here, the Macintosh Quadra 840Av) can recognize spoken commands—you just speak naturally. We’ve also included QuickKeys OSI Component software, so you can create your own verbal commands, like “Computer, open my word processor.”

“Computer, start video.”
Just plug a video camera, VCR or laserdisc player into the back of either AV computer. The FusionRecorder software included lets you easily capture video and single-frame snapshots, or record 16-bit stereo sound. You can paste your videos directly into presentations, documents or any software that supports QuickTime.

“Computer, display Macintosh on TV.”
You can play video right on your AV computer monitor for easy presentations to coworkers, clients or a class. You can also plug either machine into a TV if you need a larger display. Or plug into a VCR, and record your work on videocassette for distribution.

“Computer, play CD.”
Add the AppleCD 3000 disc drive to either machine, and you can access huge libraries of clip art, sound effects, video clips and more. Or just play your own music CDs while you work.

The Macintosh Centris 660Av and Macintosh Quadra 840Av

You’ve probably read that telephones, computers, television and other technologies will converge soon. This is where they meet. Introducing the Macintosh Centris’ 660Av and Macintosh Quadra’ 840Av personal computers. These two computers offer a suite of communication capabilities called Apple AV Technologies: a telecommunications center, easy video input/output connections, voice recognition and text-to-speech abilities.

For the first time, use a Macintosh to pick up phone messages with a point and click, record video by plugging in a video source, and open a file by saying, “Computer, open.” Many of these new functions are sped along by a digital signal processor (this chip flies through data at the rate of 55 MHz in the Macintosh Centris and an even faster 66 MHz in the Macintosh Quadra).

With a 25 MHz 68040 processor and up to 68MB of RAM, the Macintosh Centris has the horsepower required to breeze through huge spreadsheets and documents. And there’s room to add a 500MB internal hard disk, a CD-ROM or SyQuest drive and a NuBus expansion card.

The new Macintosh Quadra will make publishing, graphic design and other communications professionals salivate. Its 40 MHz 68040 processor and up to 128MB of RAM make it the most powerful Macintosh ever. And it has room for a gigabyte of hard disk storage, four internal storage devices and three NuBus expansion cards.

Best of all, you can get a Macintosh with Apple AV Technologies starting at $2489. Once again, Apple puts the most amazing kind of power within your reach. The power to be your best.”

Apple AV Technologies. Telecommunications, video, speech—all the ways you communicate.

Apple AV Technologies

Telecommunications, video, speech—all the ways you communicate.
In fact, they’ll do just about

“Computer, call Michelle Dunn.”
With Apple GeoPort, you can turn your AV computer (in this case, the Macintosh Centris 660AV) into a telephone and an answering machine. The hands-free phone line lets you do work on-screen while you talk. And both computers have BBS software, so all you need is a video camera to hold a video-conference across a local area network.

“Computer, fax letter to Steve Wingate.”
Forget the fax machine. The optional Apple GeoPort Telecon Adaptor includes fax and modem software—everything you need to send and receive faxes from your desk or use on-line services. And both computers let you try out Experilax, an application that converts your faxes into text.

“Computer, read me today’s mail.”
These computers will actually speak to you, reading aloud your e-mail, documents or spreadsheet numbers. Our new Apple AudioVision Display, with its sensitive microphone and built-in speakers, is the perfect all-in-one monitor for speech capabilities, multimedia presentations and more.

“Manufacturer’s Suggested Retail Price as of 9/15/93. Reseller prices may vary. ©1993 Apple Computer, Inc. All rights reserved. Apple, the Apple logo, Macintosh and “The power to be your best” are registered trademarks of Apple Computer, Inc. All other products and services are trademarks of their respective owners.”
Not a company to rest on its laurels, Knowledge Revolution has gone one step further in the area of motion simulation with the introduction of Working Model, a follow-up to the company’s award-winning Interactive Physics simulation program. Whereas Interactive Physics targets college-level physics teachers and students, Working Model’s accuracy, sophistication, and support for importing and exporting CAD files make it a worthy tool for engineering motion analysis.

The $995 Working Model sets itself apart from the less expensive Interactive Physics by bringing a host of advanced features to the table. The Smart Editor maintains the association of linked objects as you run a simulation, and Working Model supports 20-digit accuracy, compared with Interactive Physics’ 8-digit accuracy. Support for interapplication communication through Apple events enables Working Model to work with data in spreadsheet and database programs. And finally, Working Model can exchange files with CAD programs and can export animation files to 3-D-rendering programs.

You use Working Model’s toolbar and menus to create objects and give them physical properties such as mass, friction, and elasticity. Environmental variables such as gravity (including universal gravitation), air drag, resistance, acceleration, and magnetic properties are all under your control. You can create simple objects by using Working Model’s tools, or you can...
When It Comes To Memory, We'd Like To Say We Have An Edge Over The Other Guys. But The Fact Is, We Have Several.

There's one sharp distinction which makes TechWorks the leader in memory products: outrageous customer support that's a cut above. Unlike countless memory resellers, we manufacture our own memory modules. Right here in Austin, Texas. Each one backed by a lifetime warranty plus a 30-day, no-questions-asked money-back guarantee. And if you ever have a problem with any TechWorks memory, we'll ship a replacement to you overnight.

Call us today for a complete price list. And see why our competition is on edge. But our customers aren't.

We have all memory for all Macs.
Introducing EtherWave: Daisy-chainable 10BASE-T.

We didn’t just change the shape of Ethernet. We changed the ground rules.

Now, for the first time ever, you can “daisy-chain” computers and printers to a 10BASE-T network. Saving you time and money.

EtherWave is a complete family of cards, adapters and transceivers. All 100 percent compatible with 10BASE-T. True plug-and-play. In essence, the Ethernet equivalent of PhoneNET—a Farallon innovation that’s connected more than 4.5 million computers.

Save money expanding existing networks.

You need to add a node. And fast. But there’s not a port available. That’s why EtherWave products contain two self-terminating RJ-45 ports. So you can “daisy-chain” Macs, PCs, PowerBooks and printers from a single hub port or wall jack. Saving you the hassle—and tremendous expense—of pulling more cable.

Build a small hubless network easily.

EtherWave also lets you quickly create small, ad hoc Ethernet networks without a hub. It’s great for temporary workgroups. These networks can contain up to eight nodes, and can be connected to larger networks.

Add PowerBooks, printers and slotless Macs.

Now it’s finally simple, reliable and affordable to add these types of devices—even the new Newton MessagePads—to Ethernet. Just plug the EtherWave adapter into the device’s LocalTalk port, and connect it to another Mac, PC, or to a hub. For Macs and PowerBooks, an optional high-speed serial driver boosts adapter performance to better than SCSI speeds without the trouble.
Farallon users
ape of Ethernet.

Based on industry standards. Of course.
All EtherWave transceivers, cards and adapters are built with everything our customers asked for—100 percent 10BASE-T compatibility first and foremost. Plus self-terminating ports, so you can add nodes without disrupting the network. A robust set of diagnostic LEDs. And power-off pass through, so shutting off a node doesn’t shut off the network.

EtherWave products won’t impact network reliability or repeater hop counts. And they all include a lifetime warranty.

The EtherWave family of products.
We offer a full line of EtherWave cards. Everything from Macintosh LC and NuBus cards to cards for PCs. All include SNMP compatibility, industry-standard drivers, and diagnostic software.

We also have EtherWave transceivers for PCs, Macs, workstations and printers with Ethernet installed. Plus EtherWave adapters for connecting PowerBooks, printers, and Macs without a slot. They feature a molded, flexible 1-meter cable so they can sit on the desktop, floor, or mount on a wall or computer.

In a nutshell, if you need it, we’ve got the solution.

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import objects in DXF format. Unfortunately, Working Model doesn't let you import PICT files for use as object outlines. Once you've created an object and given it physical characteristics, you apply forces to it by drawing vectors. The vectors represent velocity, acceleration, and energy. On-screen digital meters let you monitor the strength of the forces. Once everything is in place, the simulation runs in real time as Working Model calculates the accurate motion of each object.

Working Model enables you to create surprisingly complex machines by linking many simple shapes. The program supports a variety of grouping and linking options including hinges, tracks, joints, ropes, rods, and various types of springs.

**Smart Editor**

The program's Smart Editor prevents a complex mechanism from breaking apart as its various components move during an animation. For example, you can create a profile of a human figure composed of a body and joint-linked legs and arms. When you select and drag one of the figure's feet, Smart Editor preserves the relationships among the parts, allowing the program to create a realistic simulation of the resulting leg motion. By combining different types of constrained links, you can create a surprisingly wide range of sophisticated mechanical systems with little effort.

Working Model's simulations allow a high degree of interactivity. You can create buttons that trigger menu commands and other functions. Used imaginatively, this feature provides powerful animation capabilities. For example, you can create a button that switches views of a simulation or that pans the view in a specified direction.

You can manipulate sliders that change the parameters of an experiment as the simulation is running, which gives you real-time control over any aspect of a simulation. In addition to using digital meters, you can opt to use dynamic charts.
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and various software programs, you need SAM 3.5 anti-virus software.

You see, SAM will constantly monitor for 14 suspicious viral activities. Which is more than any other anti-virus program on the market. And it's the only program that will scan compressed files in System 6.0 and 7.0.

So basically, if your Mac has a virus, SAM will detect it, get rid of it and repair the file. And if your Mac is virus-free, SAM will help to make sure it stays that way. Because it monitors your Mac transparently, working behind the scenes, and only interrupting when a virus is found.

What's more, SAM is simple to install on a Macintosh networking system, as well as a single-user Mac. All you need to do is load the program disk, double-click on the Installer Icon and let SAM handle the rest.

For the most anti-viral protection, pick up SAM 3.5 at your local retailer. It's the most popular anti-virus program in the world, and will keep you from ever having to deal with this ugly crime. Or these ugly criminals.
that measure simulation parameters.
You can save your simulations as PICS files, QuickTime movies, or as Macromedia Three-D files complete with animation paths and extruded shapes. Once a simulation has been imported into Macromedia Three-D, you can replace Working Model’s simple extruded shapes with more-complex models.

As an Apple-events-savvy application, Working Model lets you link simulations to external data-processing programs, such as Microsoft Excel. That means you can set up a process whereby data generated by a running simulation is automatically transferred to a spreadsheet. You can then manipulate the data and return it to Working Model.

Alternatively, you can directly access all the underlying math that drives a Working Model simulation and manipulate it to create more-complex scenarios. For example, you can create a realistic simulation of a rocket launch — as the rocket rises and gradually exhausts its fuel supply, it can get progressively lighter and faster. Or, using Working Model’s built-in random-number generator, you can simulate the effects of unpredictable winds in a sailing experiment.

To help get you started, Working Model includes various preprogrammed simulations. The documentation comprises a tutorial and a clearly written reference manual. The tutorial takes you step by step through the setup of several simulations, including the running of a piston engine and an earthquake.

The tutorial may be a bit overwhelming for those with limited knowledge of physics, but with a little practice, even novices will be able to build basic mechanisms. Unfortunately, the program’s documentation of interapplication processing and custom math programming is weak and lacks sufficient examples.

Given the limitations of a personal computer compared with the power of a workstation or mainframe, Working Model’s real-world simulations are impressive. The degree of accuracy they provide has limitations, however. For example, if you create a ball, give it the property of rubber (one of the program’s built-in object properties), and simulate the effect of throwing it against a wall, the ball will bounce off the wall but the actual shape of the ball won’t deform the way it does in the real world. This isn’t surprising — Working Model is already pushing the computational envelope of the Mac, and implementing this capability wouldn’t be practical, given current Mac technology.

The Bottom Line
With its unique ability to simulate complex motion, Working Model will likely garner a loyal following among engineers and physics-savvy animators. Users can create realistic mechanical systems and animations as well as add interactive properties to simulations. At $995, Working Model is a high-priced tool, but its power and flexibility make it well worth the cost for professional designers and animators.
—David Biedny

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Safe Deposit

Dayna’s Safe Deposit offers substantial peace of mind in return for very little effort. It makes it easy to configure backups, and once you’ve done so, Safe Deposit carries them out automatically and in the background.

Safe Deposit consists of a system extension and an application that takes a simple “what, where, when” approach to backup. You use the application to specify what you want backed up (specific files, folders, or volumes — local or remote — based on their names or System 7 labels), where you want it backed up to, and when (at specific times, when files are modified, at system shutdown, or whenever you mount a specifically named backup medium). You can vary the backup criteria from item to item — for example, backing up important folders continuously and other folders only once a day. The Safe Deposit extension performs the backups as specified, whether or not you have the application running.

You can back up to anything you can mount on your desktop: removable media, hard disks, or remote volumes. (You can’t back up to tapes unless you use a product that mounts them on your desktop, such as Optima’s DeskTape.) If you have AppleTalk Remote Access, you can set Safe Deposit to automatically back up your files to a remote server whenever you connect to that server. And, because Safe Deposit backs up files in Finder-readable format, it’s easy to restore backed-up files. You can simply copy them, using the Finder, or have Safe Deposit restore them for you.

Safe Deposit does have some limitations, though. The dialog box it uses to notify you of what it’s copying is modal, so you can’t do anything else until the box goes away. Even if you turn notification off, background copying can be intrusive; your foreground application may lag noticeably, and backups are never much faster than Finder copying.

Also, Safe Deposit maintains backups of only your current files and folders; although this limitation keeps things simple, it means you can’t use the program to clean old files off your hard disk and archive them for posterity.

A more artificial limitation prevents you from launching the standard personal version of Safe Deposit on a Mac that’s acting as an AppleShare server. To gain this capability as well as the ability to back up files based on their users and groups, you need to buy Safe Deposit Server, which is otherwise the same as the personal version but costs more than twice as much. Although it would be handy to have Safe Deposit Server running on your AppleShare server and automatically backing up data as it’s saved to the server, we’re not sure this convenience is worth the much higher price — especially because you can use the personal version to back up a remotely mounted server from your desktop (a capability not mentioned in the manual).

Safe Deposit isn’t the fastest way to back up your data, but it gives you a wide array of options in an easy-to-use package. If you’re looking for bargain-priced automatic backup, the personal version is a wise choice.

Dayna Communications, Sorenson Research Park, 849 W. Levoy Drive, Salt Lake City, UT 84123; 801-269-7200. Safe Deposit, version 1.0, $189. Safe Deposit Server, version 1.0, $449.
— Eric Taub

Snow Report Writer

Sure, your number-crunching program lends you a lot with your data, but does it let you print reports that look exactly the way you want ‘em to? If not, check out Snow Report Writer. It’s a standalone program that reaches into existing accounting, database, and spreadsheet files; retrieves the information you need; performs sorting and calculations on the data; and presents it in your own custom layout.

Report Writer reads a variety of file formats directly, including 4th Dimension, FileMaker Pro, Excel, Lotus, dBASE, Btrieve, SQL, most versions of COBOL, and most text-based formats. Special versions of Report Writer also read data directly from MacP&L (formerly Accountant, Inc.) and Great Plains Accounting files. A report can include data from a primary file and from any related file in which the primary file looks up information. You can view reports on-screen, print them, or save them to disk in a variety of file formats compatible with popular spreadsheet and database programs.

Creating custom layouts for your reports is a breeze. The Design window provides vertical and horizontal rulers to help you position the elements in a report. Vertically, the layout is divided into five resizable sections corresponding to the five parts of a report: the report header (which prints at the top of page 1 only), the header (which prints at the top of each page), the detail section (the main body of the report), the subtotal section (Report Writer handles as many as nine levels of subtotals), and the footer (which prints at the bottom of each page).

Specifying the data you want included in your report isn’t always easy, though. The menu item for selecting files and fields leads you to DOS-like disk directories — names separated by colons and backslashes — and field names that are sometimes surrounded by confusing gibberish characters (actually separator or instructional characters native to the type of file being read). We’d like to see the program filter these characters out.

Report Writer’s copy-protection scheme can also be annoying. The program works only in a limited-use tutorial mode until you enter a registration code — which isn’t included in the package. You can obtain the code either by calling Snow’s voice line (during standard business hours only) or by faxing your registration form to Snow and waiting for a reply. Some registration codes are specific to particular Mac models, preventing you from running the same copy of the program on both your desktop Mac and your PowerBook, for example.

If you’ve been unable to get reports in exactly the format you want, Report Writer may offer the breakthrough you need. But its interface to source data files isn’t user-friendly, so make sure you understand the underlying structure of your data before you start.

Snow Software, 2360 Congress Avenue, Clearwater, FL 34623; 813-784-8899. Version 4.01. $695; Great Plains Accounting and MacP&L versions, $795.
— Darryl Lewis
Musicshop

Opcode’s Musicshop is a well-crafted entry-level program for recording, editing, playing, and printing MIDI data entered via synthesizers and a MIDI interface. If you’re a music hobbyist or educator, its features and flexibility should meet your needs well — without breaking your bank account. And the program fully supports the new General MIDI standard for consistency of sound among synthesizers.

Unlike the massive, rocket-science-level manuals included with more-powerful sequencers, Musicshop’s manuals are encouraging and fun to read. For example, the tutorial’s explanation of just what MIDI is and is not is better than any other we’ve seen.

Musicshop’s interface is refreshingly intuitive and attractive. Opcode makes extensive use of color, pop-up menus, interactive cursors, and on-screen hot spots. Just moving the cursor over the time signature or key signature changes the cursor to the appropriate tool for editing the signature in question, and context-sensitive help is available at a keystroke.

Adjusting the relative volumes of tracks within a sequence is just as well thought out. The Mixer looks exactly like a recording-studio mixing console and works in the same way. To adjust loudness, users need only click and drag faders up or down. Stereo panning, mute, and solo functions, also common on mixing consoles, are present.

Musicshop prints music easily but should not be confused with a professional notation program. It provides rudimentary control over the elements on a page — margin settings for titles and staves, number of staves per page, and number of measures per line — but that’s all. You can’t add instrument names or measure numbers to the staves, for example. Still, for quick, easy-to-read printing, Musicshop does fine.

Unfortunately, the program has a darker side too. It crashes occasionally for no apparent reason. Also, some of its functions, such as locking in mixer settings, creating tempo changes, and applying permanent instrument names, are not as intuitive as other aspects of Musicshop. And the system requirements can be misleading: The box claims the program runs on a Mac Plus or later, but we recommend at least a Classic II if you want to avoid ultraslow response times.

If you need a sequencing program that lets you sync to SMPTE time code, transpose music modally, or adjust quantizing strength, you will probably want one of the more expensive programs such as Opcode’s Vision or Mark of the Unicorn’s Performer. If, however, you have no idea what anything in the previous sentence means, you’ll feel right at home with Musicshop.


— Ken Gruberman

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Ever wished you could write a letter in English and have it print in Japanese, or vice versa? Either scenario can come true with the Japanese version of Ambassador, a bilingual document program (soon to be available in European-language versions as well) that translates commonly needed business phrases involving movements of people, money, information, and merchandise.

The program includes 190 model letters and forms, 467 canned sentences (such as "Damage occurred in transit . . ."), and translations of 1,250 business words and place names (plus the option to add 250 more words in kanji).

Creating letters is a fairly simple process. You can start with a model letter and add particular words and canned sentences as needed, or you can compose an original letter by stringing canned sentences together. To find the sentence or letter you need, you select a category (such as Communications) and a subcategory (such as Follow-up) from pull-down and scrolling lists and then choose from a list of final choices (for example, "Please respond in English"). Once the text has appeared in your document, you choose details by using pull-down or pop-up menus, check boxes, and fill-ins.

Fill-ins rely on your entering words contained in Ambassador’s noun dictionary, either by guesswork or by using the Find command—but the manual doesn’t clue you in about the latter method. Another drawback is the time it takes to download kanji characters to the printer; expect a ten-minute wait—or longer on a heavily trafficked network.

Although the manual truthfully tells you Ambassador can run on a Mac that has 2 megabytes of RAM, it doesn’t tell you the requirements are stiffer if you want to print Japanese characters (as you no doubt will). For printing Japanese, Ambassador requires either KanjiTalk or WorldScript (available in Apple’s Macintosh Japanese Language Kit), each of which costs about $250 and needs at least 5 megabytes of RAM plus 20 megabytes or more of free hard-disk space for installing two fonts.

Businesses that often need to communicate simple logistical information across the English/Japanese language barrier may find using Ambassador a cost-effective strategy. An upgrade announced at press time, offering a selection of personal-letter templates, will add to Ambassador’s value. Even with the selection of hundreds of canned choices, however, you’ll sometimes find that what you want to say is not there. If your communication is at all complicated, you may be better off reaching for the phone and an expert interpreter on AT&T’s Language Line (at standard long-distance rates plus $3.50 per minute extra).


—Marilyn Bancel
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Microtek's 3-pass process, as represented here, must scan your image three times, then assemble and align all three scans into one. (Images shown are not final output.)

What's more, the ActionScanning System comes with everything you need to be a scanning expert right out of the box, including Adobe Photoshop 2.5 LE, one of the most versatile image editing programs around.

For our free booklet on scanning or to learn more about the easy-to-use ActionScanning System or our other scanners for Macintosh and PCs, call the Epson Connection at 1-800-BUY-EPSON (800-289-3776). This is one scanner you should jump at the chance to own.

EPSON
Apple streamlines its offerings into four clear categories and adds five new models. Is it finally easier to pick the right Mac? Maybe not . . .

“Less,” Mies van der Rohe declared, “is more.” For the last few years, however, Apple has steadfastly ignored the Bauhaus master’s dictum. Apple’s “More is more” philosophy has produced more products than ever, creating more than a little confusion for buyers.

But times change, and Apple has decided that it could use a little more Bauhaus around the house — the new Apple credo is “Fewer is more.” Specifically, fewer different products and fewer product lines — but not necessarily fewer total products.

Apple’s new goal is to simplify its offerings, targeting specific lines at specific markets. The result is four distinct product lines — Performas, LCs, Quadras, and PowerBooks — that are to be sold through different sales “channels” in model configurations to suit the customer needs of that particular channel. To pull this off, Apple now offers identical machines in different lines — only the names have been changed to protect the bottom line.

The Performas will be offered to home users through Wal-Marts, mass-merchant retail stores such as Sears, office-product superstores, Price Clubs, and consumer-electronics stores. Buying a Performa remains the easiest way to get started with the Mac. You get everything you need — monitor, keyboard, modem, software — packed in a single box.
The New Mac Lineups

The LCs are now targeted at the education market. You may find them at your local school but not at your local Apple dealer. The Quadras continue to be Apple’s business models, the line you’ll find at your local Apple dealer. The Quadra line now subsumes the earlier Centris models, which are being “speed-bumped” to faster versions. The PowerBooks — including the PowerBook Duo systems — remain Apple’s mobile-computing line, targeted at business users on the go. Along with the Centris name, the compact Mac is also facing retirement as Apple begins to phase out the Classic line. The Classic II will soon disappear, and the Color Classic will be available only “in certain geographies and markets where demand continues,” according to Apple. Translation: You can expect these descendants of the original 128K Mac soon to be sold mostly outside the U.S.

Because any one channel will carry only one — or at most two — of the surviving lines, Apple has duplicated some machines to ensure that a broad range of capabilities is available in each line. For example, there’s a 25-megahertz 68LC040 Mac in the Performa (the Performa 475 and 476), LC (the LC 475), and Quadra (the Quadra 605) lines. Remember, this is the exact same Mac — the only differences are in the bundled software, if any; where you buy that particular model; and in some cases, simple cosmetic differences in the plastics.

Performa 460 and 466/467: A Faster LC III

The Performa 460, 466, and 467 are the same machine, an LC III with a faster 68030 processor (33 megahertz versus 25 megahertz). They each ship with 4 megabytes of RAM, expandable to 36 megabytes, and 512K of VRAM (video RAM) for 8-bit color on a 14-inch monitor. The VRAM is expandable to 768K, enough to give you 16-bit color (32,000 colors) on a 14-inch monitor. Like the LC III, they each use the standard LC PDS (processor-direct slot) for expansion.

The only differences among the three machines are the capacities of their internal hard drives, where they’ll be sold, and the software that’s included with them. The Performa 460 ships with an 80-megabyte drive, whereas the 466 and 467 each ship with a 160-megabyte drive. The 466 and 467 are differentiated only by their bundled software and will be sold at Wal-Marts and Price Clubs, whereas the 460 will be sold at office-product superstores, consumer-electronics dealers, and mass-merchant retailers.

To test the Performa 460, 466, and 467, we ran our standard suite of application tests on a prerelease Performa 466. When running most applications, a Performa 466 was significantly faster than a similarly equipped LC III, reflecting the 460 series’ faster processor. The only tests in which the 466 wasn’t appreciably faster than the LC III were in the Word scroll and the FileMaker Pro sort.

Performa 550: A Big, Fast One-Piece Mac

The Performa 550, like the 460-series Performas, is a speed-bumped version of an earlier Mac. Most users probably haven’t seen the original (the LC 520), which was sold only to education customers. You can’t beat the Performa 550 for convenience: a one-piece Mac with a 14-inch color display and a high-quality Trinitron tube. Because everything is in one enclosure, all you have to...
do is plug in the keyboard, the mouse, and the power cord. The Performa 550 uses the same CPU as and a motherboard similar to that in the 460-series Performas. Its maximum 768K of VRAM is enough for 16-bit color on its display; it has 5 megabytes of RAM standard (36 megabytes maximum) and an internal CD-ROM drive (Apple’s standard, the dual-speed 300i).

Comparing our prerelease Performa 550 with an LC III, we found that the smallest improvement was in the Word-scroll test, and the largest boost was in the Excel-recalculation test, for which the Performa 550 took about 40 percent less time than the LC III.

### Quadra 605, LC 475, Performa 475 and 476: A 68040 LC III

The Quadra 605, the LC 475, and the Performa 475 and 476 are the lowest-priced 68040-based Macs so far — and they’re all basically the same Mac. The base
The New Mac Lineups

The processor however, is now a 25-megahertz 68040-based Quadra 610 was also announced. (expandable to 64 megabytes) and 512K of VRAM (enough for 8-bit color on a 14-inch monitor). The VRAM can be expanded to 1 megabyte (enough for 16-bit color on a 14-inch monitor).

Of all the LC-form-factor machines, the Quadra 605, LC 475, Performa 475 and 476 foursome was the fastest in our tests. We tested a prerelease Quadra 605 and watched it hustle through our test suite, taking anywhere from half to about a third the time of an LC III. Because it is — or more properly, they are — 68040-based (versus the 68030-based LC III), we expected this improvement. Excel and Illustrator were the greatest beneficiaries of the 68040's power — common tasks took less than a third the time they took with the LC III. Even in the Word-scroll test (the test that took the longest), the Quadra 605 took less than half as long as the LC III.

Quadra 610: A Faster Centris 610

The Quadra 610 should look familiar, and so should its name: It used to be called the Centris 610. It’s the same low-profile box with room for an internal CD-ROM drive. The processor, however, is now a 25-megahertz 68040 — the same chip that powers the Quadra (née Centris) 660AV — and not the math-crippled 20-megahertz 68LC040 in the Centris 610. [At press time, a 68LC040-based Quadra 610 was also announced. — Ed.]

The Quadra 610 ships with 8 megabytes of RAM (expandable to 64 megabytes) and 512K of VRAM

Free ZMac Database

If you're confused about how your Mac fits into Apple's new lineup, you're not alone. But ZiffNet/Mac — MacUser's on-line resource — can help. This month's free file is MacCatalog, which contains every technical detail you'd ever want about every Mac ever made, in FileMaker Pro format. The Mac Catalog is available free of connect-time charges until November 25, 1993, by typing GO MACCATALOG. After that, you can find the file DBMACS.SEA in Library 9 of the Download & Support Forum (GO DOWNTech).

Although they aren't free, these other DOWNTech files will help you sort out the new CPU changes:
- Mac Shuffle. This PICT chart shows what's old and what's new with the fall 1993 line (SHUFFLE.SIT, Library 9).
- Which Mac Should I Buy? This expert system helps you choose the right machine for your needs (WCHMAC.SEA, Library 9).

Call 800-666-0330 or 317-856-4144 for information about joining ZiffNet/Mac.

— Ben Templin

The Ultimate Test

You can test a Mac's speed in two ways: by seeing how fast the Mac can run typical tasks in typical applications or by using a specially designed application, a benchmark test, to find the speed of its individual components — such as its processor, hard drive, or video hardware.

Each approach has its advantages and disadvantages. Application-based testing gives you an excellent idea of how long a specific task will take — but what if you never use that particular piece of software? Benchmark testing thoroughly examines a broad range of subsystem parameters — but how do you relate a benchmark score to the real world of day-to-day use?

We have the answer: Do both. For years, MacUser Labs has performed extensive application-based testing; this month we introduce MacBench 1.0, Ziff-Davis' new benchmark test suite that measures the performance of the main subsystems of a Mac. Its four key tests produce overall speed ratings for a Mac's processor, disk, video, and floating-point subsystems. Not only will we be using MacBench in future reports but we're also making it available — free — to anyone who wants a copy.

The key to MacBench is that it's based on application profiling — the process of determining and logging an application's behavior. MacBench's key tests perform actions based on those that we at the Ziff-Davis Benchmark Operation (ZDBOp), developer of MacBench, observed while profiling the behavior of such best-selling applications as Word, Excel, and FileMaker Pro during typical usage.

MacBench normalizes the results of each of its four key tests relative to those of an out-of-the-box Mac LC III with 4 megabytes of RAM, an 80-megabyte hard drive, an Apple 14-inch monitor, 512K of VRAM, a standard System 7.1 installation, and no floating-point-math coprocessor.

MacBench is designed so that the score of this reference LC III (which lives in ZDBOp's North Carolina research center) is 100.0 on each of the four tests.

Higher scores mean higher speed. For example, a Mac with a MacBench Disk Index of 20.0 can deliver about twice the drive speed of the base LC III for typical tasks.

MacBench's Disk Mix test, its key disk-subsystem test, is a sequence of disk input/output operations modeled on those that applications perform. Its result, the MacBench Disk Index, indicates the speed of a Mac's hard-disk subsystem. The Disk Mix test is useful for such tasks as picking a fast disk drive when you're considering an upgrade.

The Video Mix test measures the speed of a Mac's video subsystem. It times a series of different types of QuickDraw actions and then combines those times into a single MacBench Video Index. The Video Mix test is useful for such tasks as comparing the speed gain from using accelerated-videocard software.

Similarly, MacBench's Processor test and Floating Point test exercise a Mac's main processor (and RAM) and FPU (floating-point unit), respectively. For a Mac without an FPU, the Floating Point test relies on Apple's floating-point-emulation software. Each test is a good gauge of the basic processing power of a Mac or a CPU accelerator.

MacBench's FPU Indexes are not included here because so few current applications take advantage of floating-point-math coprocessors. We expect more FPU-intensive software to appear after the advent of PowerPC Macs in spring 1994.
In addition to generating these four summary scores, MacBench also provides tests that produce lower-level indicators of drive and video speed. The drive tests provide kilobytes-per-second ratings for disk subsystems reading and writing blocks of different sizes. The video tests produce scores of how many video operations of different types a Mac can perform per second.

If you'd like a free copy of MacBench, you can download it from ZiffNet/Mac. MacBench is available in the MacUser Forum on ZiffNet/Mac (GO MACUSER). Just download the file MACBEN.SEA from Library 3 (MacUser Utilities). If you don't have a modem, you can request MacBench by sending a postcard to Ziff-Davis Benchmark Operation; One Copley Parkway, Suite 510, Morrisville, NC 27560; Attn: Distribution Coordinator. Or fax your request to 919-380-2879. Please include with all requests your name, address, and phone number and allow four to six weeks for delivery. If you'd like faster delivery, enclose your Federal Express account number and Federal Express shipping instructions.

If you use MacBench to test your own Mac, remember that extensions, control-panel settings, and video-hardware configurations may affect performance. Also, not all hard drives are created equal — there may even be variations among seemingly identical drives from the same manufacturer.

— Bill Catchings and Mark L. Van Name, Co-directors, Ziff-Davis Benchmark Operation

MacBench 1.0: A Closer Look at the Mac Family

Each member of the four Mac lineups was tested in a popular RAM/hard drive configuration. The Performas and the LCs were tested in 8-bit (256-color) video, the Quadras in 16-bit (thousands of colors), and the PowerBooks at their highest resolution and bit depth.

<table>
<thead>
<tr>
<th>Processor</th>
<th>Disk</th>
<th>Video</th>
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</thead>
<tbody>
<tr>
<td><strong>Home</strong></td>
<td><strong>Home</strong></td>
<td><strong>Home</strong></td>
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<tr>
<td>Performa 410 (4/80)</td>
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<td>4.7</td>
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<td>4.0</td>
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<td>Performa 466/467 (4/160)</td>
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<td>10.0</td>
</tr>
<tr>
<td>Performa 475 (4/160)</td>
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<td>10.0</td>
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<tr>
<td>Performa 476 (4/230)</td>
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<td>Performa 550 (5/160)</td>
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<td>10.0</td>
</tr>
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<td><strong>Education</strong></td>
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<td>4.0</td>
<td>4.0</td>
</tr>
<tr>
<td>LC 475 (4/160)</td>
<td>4.0</td>
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<td>LC 520 (5/80)</td>
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<td>Quadra 660 (8/230)</td>
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<td>Quadra 800 (8/500)</td>
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<td><strong>Mobile</strong></td>
<td><strong>Mobile</strong></td>
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<td>PowerBook 145B (4/80)</td>
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<td>9.6</td>
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<td>PowerBook 165 (4/80)</td>
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<td>PowerBook 180 (4/80)</td>
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<tr>
<td>PowerBook 180c (4/80)</td>
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<td>PowerBook Duo 230 (12/120)</td>
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<td>7.4</td>
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<tr>
<td>PowerBook Duo 250 (12/260)</td>
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<tr>
<td>PowerBook Duo 270c (12/240)</td>
<td>13.8</td>
<td>7.4</td>
</tr>
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</table>

*Not available in time for testing
The New Mac Lineups

Table 1: Features of the Performa Series

<table>
<thead>
<tr>
<th></th>
<th>Performa 410</th>
<th>Performa 460</th>
<th>Performa 466/467</th>
<th>Performa 475</th>
<th>Performa 476</th>
<th>Performa 550</th>
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<td>$1,800</td>
<td>$1,800</td>
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<td>68030, 33 MHz</td>
<td>68LC040, 25 MHz</td>
<td>68LC040, 25 MHz</td>
<td>68030, 33 MHz</td>
<td>68030, 33 MHz</td>
</tr>
<tr>
<td>FPU</td>
<td>none</td>
<td>none</td>
<td>none</td>
<td>none</td>
<td>none</td>
<td>none</td>
</tr>
<tr>
<td>RAM (min., max.)</td>
<td>4 MB, 10 MB</td>
<td>4 MB, 36 MB</td>
<td>4 MB, 36 MB</td>
<td>4 MB, 36 MB</td>
<td>4 MB, 36 MB</td>
<td>5 MB, 36 MB</td>
</tr>
<tr>
<td>VRAM (min., max.)</td>
<td>512K, 768K</td>
<td>512K, 1 MB</td>
<td>512K, 1 MB</td>
<td>512K, 1 MB</td>
<td>768K, 768K</td>
<td></td>
</tr>
<tr>
<td>Maximum colors on 14&quot; display</td>
<td>256, thousands</td>
<td>256, thousands</td>
<td>256, thousands</td>
<td>256, thousands</td>
<td>256, thousands</td>
<td></td>
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<tr>
<td>Maximum colors on 21&quot; display</td>
<td>16</td>
<td>256</td>
<td>256</td>
<td>256</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Network interface</td>
<td>LocalTalk</td>
<td>LocalTalk</td>
<td>LocalTalk</td>
<td>LocalTalk</td>
<td>LocalTalk</td>
<td>LocalTalk</td>
</tr>
</tbody>
</table>

* Price includes CPU, monitor, data/fax modem, keyboard, mouse, and application software.

Apple’s Latest LaserWriters: Versatile and Powerful

While attempting to simplify its desktop-Mac offerings, Apple continues to broaden its printer line. Its two latest additions, the LaserWriter Select 360 and the LaserWriter Pro 810, are targeted, respectively, at small- to medium-sized workgroups of five to ten users and large workgroups of ten or more.

The LaserWriter Select 360 is a PostScript Level 2, 600-dpi, 10-ppm printer intended for small- to medium-sized workgroups. It replaces both the LaserWriter NTR and the LaserWriter Pro 600, straddling the Select and Pro lines. It is powered by a 16-megahertz Am29200 RISC processor and comes with 7 megabytes of RAM standard (expandable to 16 megabytes).

In addition to PostScript Level 2, the Select 360 offers Hewlett-Packard’s PCL 5, popular among PC users, and automatic port and emulation switching in ROM. LocalTalk, parallel, and serial ports are standard on the Select 360, but Ethernet connectivity isn’t an option. A 250-sheet and 500-sheet tray is standard, with 250- and 500-sheet trays available as options.

The Select 360’s most significant new option is a PostScript Fax Card. With the fax card installed, you can send and receive PostScript faxes, just as if you were printing normally, with PostScript-quality, plain-paper output for your faxes — and the Select 360 can print faxes at 600 dpi, far superior to the 200-dpi output of stand-alone fax machines. The fax option also provides the ability to batch-send faxes to groups of recipients — whether they have PostScript or non-PostScript fax devices — with just a single Print command.

We tested a prerelease LaserWriter Select 360 for pure engine speed and for overall print quality and compared its results with those of the popular — and similarly priced — Hewlett-Packard LaserJet 4M. The engine-speed test involved printing a 50-page Word text document. Here, the Select 360’s faster engine gave the Select 360 a slight edge, letting it beat the 4M by a little more than 10 percent. To evaluate speed and overall print quality, we printed a 5-page, complex document from PageMaker. Again, the Select 360’s faster engine gave the Select 360 about a 10-percent advantage, but the 4M had the edge in print quality: The prerelease Select 360 we tested printed text and graphics that were noticeably darker and heavier than those produced by the 4M. The 4M’s 800-dpi resolution enhancement also made a noticeable difference for reproducing text and thin lines.

If the LaserWriter Pro 810 looks familiar, it’s because Data-Products and Varityper are shipping the same model: a PostScript Level 2, 20-ppm unit that offers resolutions of 300, 400, 600, and 800 dpi (the engine is a 400-dpi Fuji Xerox model that has been enhanced to provide higher resolution). The processor is a Weitek 8200 RISC chip, and the printer ships with 8 megabytes of RAM standard (expandable to 32 megabytes).

If the LaserWriter Pro 810 looks familiar, it’s because Data-Products and Varityper are shipping the same model: a PostScript Level 2, 20-ppm unit that offers resolutions of 300, 400, 600, and 800 dpi (the engine is a 400-dpi Fuji Xerox model that has been enhanced to provide higher resolution). The processor is a Weitek 8200 RISC chip, and the printer ships with 8 megabytes of RAM standard (expandable to 32 megabytes).

LocalTalk, serial, and Ethernet ports are standard, and to perform any required emulation switching (the Pro 810 also supports PCL 4+), the Pro 810 uses DataProducts’ Virtual Printer Technology (VPT), which lets various configurations of the same printer appear as different printers on the network. IPX, TCP/IP, EtherTalk, and Digital LAT are supported concurrently. To keep up with paper demands, the Pro 810 ships with three 250-sheet trays that can hold anything from letter- to tabloid-sized paper. Unfortunately, the LaserWriter Pro 810 was not ready for testing in time for this report.

— Russell Ito

With its PostScript fax option installed, the LaserWriter Select 360 provides PostScript-quality faxes at 300 or 600 dpi — far better than a stand-alone fax machine.

Fax machine to fax machine (200-dpi output)
Select 360 PostScript fax to fax machine (200-dpi output)
Select 360 PostScript fax to Select 360 PostScript fax (600-dpi output)
Table 2: Features of the LC Series

<table>
<thead>
<tr>
<th></th>
<th>LC II</th>
<th>LC III</th>
<th>LC 475</th>
<th>LC 520</th>
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<td>$1,300</td>
<td>$1,300 - $1,600</td>
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<td>68030, 25 MHz</td>
<td>68LC040, 25 MHz</td>
<td>68030, 25 MHz</td>
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<tr>
<td>FPU</td>
<td>none</td>
<td>none</td>
<td>none</td>
<td>optional 68882</td>
</tr>
<tr>
<td>RAM (min., max.)</td>
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<td>4 MB, 36 MB</td>
<td>5 MB, 36 MB</td>
</tr>
<tr>
<td>VRAM (min., max.)</td>
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<td>512K, 768K</td>
<td>512K, 1 MB</td>
<td>768K, 768K</td>
</tr>
<tr>
<td>Maximum colors on 14&quot; display</td>
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<td>thousands</td>
<td>thousands</td>
<td>256</td>
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<tr>
<td>Maximum colors on 21&quot; display</td>
<td>16</td>
<td>256</td>
<td>256</td>
<td>256</td>
</tr>
<tr>
<td>Network interface</td>
<td>LocalTalk</td>
<td>LocalTalk</td>
<td>LocalTalk</td>
<td>LocalTalk</td>
</tr>
</tbody>
</table>

*Price includes CPU, monitor, keyboard, and mouse. (expandable to 1 megabyte). With 1 megabyte of VRAM, you can obtain 16-bit color on a 14-inch monitor. Ethernet is standard on the motherboard, and the Centris PDS is retained to provide for high-performance add-in cards.

Our prerelease Quadra 610 proved how much difference a full 68040 (the Centris 610’s 68LC040 has no FPU functions) and a faster clock speed can make. Compared with a similarly equipped Centris 610, the Quadra 610 was anywhere from 15 to 50 percent faster for common tasks. Excel saw the biggest improvement. Adobe Illustrator, which has always liked the 68040, also benefited.

Quadra 650: A Faster Centris 650

The Quadra 650, like the Quadra 610, is a relabeled and accelerated version of a Centris model. It uses a faster 68040 than its predecessor (33 megahertz versus 25 megahertz) and still offers all the features of the Centris 650: room for an internal CD-ROM drive, three NuBus slots, a PDS, and Ethernet on the motherboard. It ships with 8 megabytes of RAM standard (expandable to 132 megabytes) and has the same VRAM capacity as the Quadra 610.

Because the change to the Quadra 650 from the Centris 650 was only a matter of using a faster processor, the speed improvements we saw were not as dramatic as with some of the other machines. Our prerelease Quadra 650’s speed proved to be pretty much in line with its faster clock speed, coming in at as much as 25 percent faster than a Centris 650. Illustrator was the biggest winner, at around 25 percent faster, with Word, Excel, and MacDraw Pro all coming in around 15 percent faster.

Is It Simple Yet?

Whether Apple’s new strategy will work or not isn’t clear. Even after days of working with these new Macs, we found it difficult to remember which were duplicated where in the whole scheme of things. If Apple is successful, you, of course, won’t have to go through what we went through, because you’ll see only one line (or maybe two) when you go to your favorite Apple dealer. Good luck.

Russell Ito is a MacUser senior editor who, unlike Patty Duke and Apple, finds the concept of identical cousins a bit daunting.

Table 3: Features of the Quadra Series

<table>
<thead>
<tr>
<th></th>
<th>Quadra 605</th>
<th>Quadra 610</th>
<th>Quadra 650</th>
<th>Quadra 650AV</th>
<th>Quadra 800</th>
<th>Quadra 840AV</th>
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<tr>
<td>Estimated street price depending on configuration</td>
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<td>$1,400 - $2,100</td>
<td>$2,300 - $3,400</td>
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<td>$3,100 - $4,500</td>
<td>$3,400 - $5,300</td>
<td>$3,800 - $5,500</td>
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<td>68LC040, 25 MHz</td>
<td>68040, 33 MHz</td>
<td>68LC040, 25 MHz</td>
<td>68040, 40 MHz</td>
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<td>in 68040</td>
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<td>256</td>
<td>thousands</td>
<td>thousands</td>
<td>thousands</td>
<td>thousands</td>
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<tr>
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<td>LocalTalk</td>
<td>LocalTalk</td>
<td>LocalTalk</td>
<td>LocalTalk</td>
<td>LocalTalk</td>
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</tbody>
</table>

*Price is for CPU only; monitor, keyboard, and mouse not included.

1A 68LC040-based configuration is also available.
The PowerBook Duos’ docking concept has charmed a lot of users, but the screens of these lightest of mobile Macs haven’t won as many fans. Although the displays on the Duo 210 and 230 are gray scale, they lack the eye-popping crispness you can get only from an active-matrix display, and many Duo users remain slightly envious of their PowerBook 180-toting brethren.

To help settle this sibling rivalry, Apple has introduced a pair of new Duos: the gray-scale Duo 250 (which replaces the Duo 210) and the color Duo 270c, each of which packs an active-matrix display. Apple will also provide owners of earlier Duos an opportunity to move up to the new, superior displays.

The PowerBook Duo 250 and 270c:

Duos Done Right

The newest PowerBook Duos sport bright, active-matrix displays and more than 32,000 colors — for the first time ever on a laptop computer.

BY RUSSELL ITO

In addition to active-matrix displays, the new Duos have several other elements in common. Each uses a 33-megahertz 68030 processor (with the dropping of the 25-megahertz 210, the entire Duo line uses the same type of CPU).

The new Duos use an improved battery technology that Apple claims will give the Duo 250 anywhere from two and a half to six hours of battery life and the Duo 270c anywhere from two to four hours. (We weren’t able to test Apple’s battery-life claims before press time, but stay tuned.) The new Type II NiMH (nickel metal hydride) batteries also work with the existing Duo 210 and 230, with the addition of a battery-management-software upgrade, so owners of the older Duos can cash in on the longer battery life as well.
PowerBook Duo 250 and 270c

Figure 1: Overall Speed

Figure 2: Everyday Tasks

The new Duos also offer owners of older Duos another advantage: upgrades. For the first time since the introduction of the PowerBook line, Apple is offering its customers a way to upgrade to the newest PowerBooks. The upgrade kits replace the passive-matrix screens in the Duo 210 and 230 with active-matrix screens and add the new battery-management technology. Duo 210 users also benefit from the addition of a faster 68030 processor. The upgrades aren’t cheap ($1,299 for the Duo 250 upgrade, $1,999 for the Duo 270c upgrade), but at least they’re an option.

Duo 250: Active-Matrix Duo 230

With the elimination of the Duo 210, the Duo 250 becomes the middle-of-the-line Duo. Except for its active-matrix display and new battery technology, the Duo 250 is identical in form and function to the Duo 230. Like the 230, it weighs in at 4.2 pounds and has a 9-inch diagonal screen capable of displaying 16 shades of gray. The maximum RAM capacity remains 24 megabytes.

Given that the Duo 250 uses the same processor as the earlier Duo 230, we expected our prerelease model to perform at roughly the same speed, and we weren’t disappointed. Our Duo 250 completed our test suite in a virtual dead heat with the Duo 230.

Duo 270c: Active-Matrix, 16-Bit Color

The Duo 270c is the new top of the line: It’s the first color Duo model — and the first sub-notebook-sized computer from any manufacturer to offer active-matrix, 16-bit color on its internal display. Its basic characteristics are the same as the Duo 250’s, with a few enhancements. The 270c is the only Duo model to include an FPU, and at 32 megabytes, its RAM capacity is a third higher than that of the other (24-megabyte) models. Its color screen makes the Duo 270c slightly heavier than the other models (4.8 pounds versus 4.2), and it’s a tenth of an inch thicker. That tiny change in thickness, however, means the Duo 270c won’t fit into the current Duo Dock. Fortunately, all that’s required to fix that problem is a new lid for the Duo Dock, which Apple will sell for around $70. Because all the Duos will work in a Duo

Table 1: The PowerBook Duo Series — More Alike Than Different

<table>
<thead>
<tr>
<th>PowerBook Duo Series</th>
<th>PowerBook Duo 230</th>
<th>PowerBook Duo 250</th>
<th>PowerBook Duo 270c</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated list price (RAM/hard drive)</td>
<td>$1,450 (4/80)</td>
<td>$2,500 (4/200)</td>
<td>$3,000 (4/240)</td>
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<td>68030, 33 MHz</td>
<td>68030, 33 MHz</td>
</tr>
<tr>
<td>FPU</td>
<td>none</td>
<td>none</td>
<td>68882</td>
</tr>
<tr>
<td>RAM (min., max.)</td>
<td>4 MB, 24 MB</td>
<td>4 MB, 24 MB</td>
<td>4 MB, 32 MB</td>
</tr>
<tr>
<td>Display type</td>
<td>passive-matrix gray scale</td>
<td>active-matrix color</td>
<td>active-matrix color</td>
</tr>
<tr>
<td>Maximum gray levels/colors on built-in display</td>
<td>16</td>
<td>16</td>
<td>256 at 640 x 480 pixels</td>
</tr>
<tr>
<td>Video-out</td>
<td>with optional dock</td>
<td>with optional dock</td>
<td>with optional dock</td>
</tr>
<tr>
<td>Maximum colors on external 14&quot; display</td>
<td>256*</td>
<td>256*</td>
<td>256*</td>
</tr>
</tbody>
</table>

*Third-party docks that provide 32,768 colors on a 14" display are available.
Dock if it has the new lid, all of Apple’s future Docks will ship with one.

Although the Duo 270c uses the same type of 8.4-inch-diagonal, 93-dpi active-matrix screen as the one in the PowerBook 180c, Apple has enhanced the display through software. The Duo 270c is the first multiple-resolution PowerBook of any kind. With the Duo 270c, you have the choice of using either 8-bit color (256 colors) at 640 x 480 pixels (standard 14-inch-display dimensions) or 16-bit color (32,768 colors) at 640 x 400 pixels (standard PowerBook screen dimensions).

We tested our prerelease Duo 270c at pixel depths of 8 and 16 bits: In the CPU tests, the bit depth and pixel dimensions had no significant effect on the speed of real-world tasks. The Duo 270c completed the Microsoft Excel, Claris MacDraw Pro, and Adobe Illustrator tests in basically the same time as our Duo 230, which was running in 4-bit gray scale. Where the 270c’s color abilities hurt it was in the same test that has hurt all the color PowerBooks: the Microsoft Word scroll. At 8-bit color, the 270c took somewhat longer than the 230 to scroll our Word document; at 16 bits, it took nearly twice as long.

**Get Active**

With their bright, sharp active-matrix screens and promised longer battery life, the Duo 250 and 270c may finally bring the PowerBook Duo the widespread acceptance Apple has been pursuing. For users who want the sharpest, lightest PowerBook they can get, the new Duos are the way to go.

Russell Ito is a MacUser senior editor who still uses a PowerBook 140.

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### Table 2: The PowerBook Series — a Broad Range of Choices

<table>
<thead>
<tr>
<th></th>
<th>PowerBook 145B</th>
<th>PowerBook 165</th>
<th>PowerBook 165c</th>
<th>PowerBook 180</th>
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<td>none</td>
<td>none</td>
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</tr>
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<td>68030, 25 MHz</td>
<td>68030, 25 MHz</td>
<td>68030, 33 MHz</td>
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<td>68030, 33 MHz</td>
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<tr>
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<td>none</td>
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<tr>
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<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Maximum colors on external 14” display</td>
<td>NA</td>
<td>256</td>
<td>256</td>
<td>256</td>
<td>256</td>
</tr>
</tbody>
</table>
Like most color printers, this one works best if you use the right paper.

Color printing on plain paper is, no doubt about it, a remarkable achievement. But we know there are times when you wish you weren't limited to an 8½” x 11” white piece of paper. You know, those times when you need a Phaser™ III color printer. From vellum to card stock, newsprint to acetate, the Phaser III prints on almost any stock you'll ever need. In any size you wish, from 4” x 6” to 12” x 18” full bleeds. That way, you can do your comps on the paper you're ultimately going to use. After all, what you print on is just as important as what you print.

To make sure you always look good on any paper, the Phaser III features Adobe PostScript™ Level 2 (the latest version), 300 dpi, PANTONE®* certification, and a 24MHz RISC processor to keep your work humming. It also connects nicely to PCs, Macs or workstations. Or all three at once. Above all, it gives you 16.7 million of the brightest, most saturated colors ever printed on the desktop. No wonder it's won more industry awards for excellence than any other printer.

With the Phaser III, you'll always have the right paper. You'll have the right printer, too.

Call 800/835-6100, Dept. 30-A for a free output sample. If you can't wait and want more information, we'll gladly fax it to you. Just call 503/682-7450 and ask for document 1230.

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The hottest new Mac of the year is almost ready. It offers more-powerful features but is simpler to use than any other. You won’t have to plop down five grand to get it, and it won’t be obsolete in six months. No, it’s not the Quadra 840av, the PowerPC Mac, or the Newton. It’s the Mac you have now—running a suite of inexpensive new system extensions that will revitalize it.

Your rejuvenated Mac will be running PowerTalk and AppleScript—which were just released as part of System 7 Pro, Apple’s new, advanced system-software package ($149)—and QuickDraw GX. Apple will continue to sell the current version of system software, System 7.1, at a reduced price of $79. With the new software, you will be able to print at the drop of an icon, send e-mail without leaving your paint program, and pass data among applications without lifting a finger from your mouse.

QuickDraw GX, PowerTalk, and AppleScript are system extensions; they extend the functionality of the operating system. This software trio won’t make your Mac faster, but it will speed up the way you work with your Mac. These extensions will change how your Mac looks and acts and will be a more radical and powerful upgrade than buying a new box.

On the next few pages, we preview what some of the new features will look like. We look first at QuickDraw GX, which by itself adds more features to the Mac than System 7 did. QuickDraw GX has something just about everyone can use. Powerful new graphics routines let any application produce sophisticated color and transformational effects. Smart fonts automatically adjust the typographical parameters of a character, depending on where it falls in a word or a line. Color-management software goes a long way toward making colors produced by scanners, printers, and monitors look the same.

PowerTalk is the user implementation of AOCE (Apple Open Collaboration Environment). Apple also sells the PowerShare Collaboration Servers package ($999), which provides directory, messaging, and security services for workgroups. AOCE takes the current maze of communications—be it LAN or WAN, modem or fax (you name it)—and organizes it neatly on the desktop. E-mail becomes as integral to the Mac as cut-and-paste, and network security becomes fortified yet transparent to users.

AppleScript ties it all together, letting you automate complex or routine tasks. For example, using AppleScript in conjunction with PowerTalk, PowerShare, and off-the-shelf third-party software, you can create customized work-flow systems that pass data among applications on one or more Macs.

These new system extensions offer more than new features, however. Each embodies an enabling technology that software companies can build on for years to come. Although QuickDraw GX, PowerTalk, and AppleScript add great improvements to the Finder, you’ll need to use applications that take advantage of them to get the greatest benefits.

The new technologies are built on top of System 7; if you’re still using System 6, it’s time to switch. Take a look at the Mac to come, on the following pages.
System Extensions

QUICKDRAW GX

Apple’s new imaging architecture, QuickDraw GX, will bring a wealth of new graphic and typographic capabilities to those Mac applications that take advantage of it. Among the highlights of GX, expected to be released by year’s end and to users in early 1994, will be rotation, skewing, and transparency of any graphic object, including text; new font capabilities, such as automatic ligatures and swash characters; and an extensive color-management architecture for matching input from scanners to output from desktop printers (see “Getting Color in Sync,” March ’93, page 165). Many applications offer some of these features already, but GX will make them commonplace. Major new enhancements will also be available in the area of printing, among them a streamlined printing interface: Users will be able to print files by dragging and dropping them onto desktop printer icons, which the GX Chooser will create. — Henry Bortman

QuickDraw GX REQUIREMENTS
System: 7.1 or later.
RAM: 1 megabyte in addition to current system needs.
Disk space: 1.5 megabytes; 2.5 megabytes if you install GX fonts.
Minimum processor: 68020.

QuickDraw GX has these components:
• QuickDraw GX extension.
• Adobe Type Manager GX.
• ColorSync (a color-management extension).
• PrinterShare GX (which replaces PrintMonitor).
• GX-savvy fonts such as Hoefler and Tekton GX.

It has new versions of the following:
• The Chooser.
• The Finder.
• The Network extension.
• Drivers for Apple printers.

The following utilities are also included:
• Compatibility Checker, for detecting old printer drivers and providing numbers to call for new ones.
• PaperType Editor, for defining custom page sizes.
• PostScript Type 1 Font Repackager, for converting Type 1 fonts to GX-readable format.
• LaserWriter Utility, which can handle the repackaged Type 1 fonts.
• TeachText GX, which doubles as a viewer for queued print documents.

Different Page Sizes
You can set up different page dimensions for each page in a GX document. In the sample document shown here, for example, the first page is business-card-sized, the second page letter-sized. Clicking on the icons at the top left of each page brings up the By Page Setup dialog box (not shown), which is also accessible from the File menu.

Print One
When QuickDraw GX is running, pressing Command-P invokes the Print One Copy command, which prints a single copy of your document, using whatever settings are already established in the Print dialog box.

Smart Fonts
GX fonts, TrueType as well as Type 1 (PostScript), support extended character sets, such as the swash capital, ligatures, and lowercase (old-style) numbers shown in this example, along with automatically formatted fractions. GX’s Line Layout Manager automatically substitutes the ff/glyph (or symbol) when it encounters the ff-combination in the word efficient. Note that it’s possible to select the individual characters in the glyph. Before GX, each ligature was treated as a single combination character that required special key combinations or special fonts called Expert Sets and fractions had to be created manually.

New Type Controls
A type-control palette is a standard part of the GX interface. It lets you set tracking, choose among different variations such as the width and weight of multiple-style fonts, and turn on and off features such as initial-swash caps and automatic fractions. Application developers may choose to implement the GX standard or continue to use their own type controls. (The palette shown here is an early prototype; the final version was not complete at press time.)

First, efficient, cost-effective (only 1/3 the price), and flexible.

Selected Text Contains:
• Hoefler
• Hallo

AA Variation:
• Demi Bold

Feature:
• Tracking

Tight Normal Loose

File Edit View Arrange
New Open... Close
Save Save As...
Print One Copy... Print One Copy
By Page Setup...

Quit

Different Page Sizes

Print One

Smart Fonts

New Type Controls
Customized Printing A new printer-extensions list, accessible from the Print dialog box, lets you customize your print jobs — for instance, you can have the word Confidential screened in the background of any document. GX will ship with several standard printer extensions; application and utility vendors will also provide printer extensions.

Select Any Printer The GX Print dialog box lets you select, at print time, any printer for which you have a desktop printer icon, even if the printer is on a network.

New Chooser Selecting a printer in the GX Chooser creates a desktop icon for that printer. You can select the default printer by clicking on it on the desktop (here the printer Yr LaserWriter, surrounded by a heavy line, is selected as the default), and you can print a file by dragging its Finder icon to a desktop-printer icon. Also, when GX is active, any printer, even one attached directly to a Mac's serial port (such as My ImageWriter, shown here), can be shared on a network.

Print Spooling Each desktop printer under GX maintains its own print queue. Spooled print jobs can be dragged from one printer's queue to another (to redirect a print job) or from a print queue to the Finder's Trash (to delete the print job). Double-clicking on a print-job icon in a print queue displays a preview of the printed document in a TeachText GX window.

Graphic Effects GX offers several graphics effects and transformations previously available only in high-end programs. Applications that take advantage of GX can make any graphic object, including text characters, transparent. GX also enables full rotation of any graphic object, including text, and supports limited 3-D perspective.

Application developers are queuing up to take advantage of QuickDraw GX. Expect to see many vendors rushing to support the new Print dialog box, which will be relatively easy to add to existing applications. And look for new GX fonts from the likes of Adobe, Bitstream, The Font Bureau, and others.

For more-extensive use of GX capabilities, keep your eye on the following vendors. Deneba will have a GX-based version of Canvas in short order. Pixel Resources, maker of PixelPaint, will offer a new application (unnamed at press time) that will use GX technology to simplify working with graphics and color. It will integrate bit-mapped and object graphics so thoroughly that users won't have to think about which is which, as they often do now. Corel, maker of the most popular drawing program for Windows, will release CorelDRAW for the Macintosh. CorelDRAW/Mac will include the same drawing, charting, and animation features as the 4.0 version of its Windows cousin but with full GX capabilities. Cross-platform compatibility will be another plus.

But with GX, several parts of the system as you know it will change. Your old printer drivers — including Apple's new PostScript Level 2 LaserWriter 6.0 driver — won't work. Thankfully, a new driver will ship with GX, as will a new version of ATM, because your old versions of that won't work either. And any Type 1 fonts that you want to use with GX will have to be run through the GX font-repackaging utility to convert them to a GX-readable form.

Application developers will have to revise their programs to take advantage of new features such as more-flexible printing options, setup by page, and extended-character-set GX fonts. Other features, such as rotated text and graphics, are already available in high-end illustration and page-layout applications, but they will migrate to other applications as well.

Will GX kill Postscript? There are already rumors that Apple plans to release GX-based printers in 1994. Although Postscript is probably secure as the high-end graphics language of choice, GX may give it a run for its money at the low end, just as TrueType has done with Postscript Type 1. Ironically, what will probably dictate the extent to which GX becomes a Postscript replacement will be the speed with which Windows developers adopt GX, which Apple will make available cross-platform.

— Henry Bartman

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— Henry Bartman
**POWER TALK**

AOCE (Apple Open Collaboration Environment) is a suite of software technologies that standardizes all the communications you do, whether over a network or telephone line or via floppy disk. Apple's first retail implementations of AOCE technology are PowerTalk client software and the PowerShare Collaboration Servers package. The PowerTalk software on your Macintosh connects AOCE-savvy applications to mail, directory, and security services, either on a direct Mac-to-Mac basis or via PowerShare servers. This new server software — PowerShare Catalog and Authentication Server and PowerShare Mail and Messaging Server — provides user authentication, store-and-forward messaging, data encryption, and directory services to users' Macs as well as to remote log-on services.

Apple's new System 7 Pro includes a slew of extensions; the Personal Directory; and AppleMail, an application that's best described as a mail-enabled TeachText. System 7 Pro presents you with a new Finder (7.1.1), which has a compound mailbox containing all incoming messages and has a Catalogs icon that lets you access shared lists of people and resources on your various network and communication services. — John Rizzo
Collaborative Catalogs When you double-click on the Catalogs icon, you find catalogs representing your network environment. For example, the AppleTalk catalog mimics some features of the Chooser, such as displaying zones and AppleShare-compatible file servers. It also lists PowerTalk users' machines. The Telephone catalog, which holds names and numbers of your contacts, can be used with a program that dials voice numbers for you. Other catalogs might include directories of e-mail users or an X.500 directory for big LANs or WANs. The Novell catalog might contain users and services on a Novell NetWare network. The DEC DDS catalog might do the same for DECnet. You can also create personal catalogs on the desktop, listing people and services with whom you communicate regularly.

Open Multiple Servers PowerTalk lets you log on to multiple servers from within a single log-on dialog box and password, although each server has its own password. These servers can be almost anything: a file server, a QuickMail server, even a CompuServe account. PowerTalk Key Chain, one of three new icons PowerTalk adds to the desktop, contains the list of servers you automatically connect to from the Sign-On dialog box. When you log on to the PowerShare server, the authentication service verifies your identity and privileges by using a security technique called public-key encryption.

Catalogs Browser A catalogs browser, which appears on your desktop as the Catalogs icon, lets you view catalogs. They contain shared lists of user names and electronic addresses of people and resources with whom you can communicate, whether peer-to-peer or via servers. You can address mail messages by dragging users' names from a catalog into any mailer — the e-mail header that appears on the top of a document.

Among early ACCE adopters is WordPerfect 3.0, which, when it ships at the end of the year, will have an ACCE mailer enabling users with PowerTalk to send, open, forward, and reply to e-mail messages via ACCE from within WordPerfect. Shane Informed Manager 1.4, available now, is also ACCE-mail-enabled and lets users create forms that have a digital-signature field — managers using the software can authorize forms without having to print them on paper first. Cypress Research has released an ACCE-savvy version of Phone Pro, which lets you create a Mac-based voice-mail system that delivers messages into the PowerTalk compound mailbox on the desktop. Just double-click on the file to listen to your voice-mail.

CE Software is planning QuickMail for ACCE, a QuickMail front end for ACCE mail. Connecting to classic QuickMail users requires StarNine Technologies' ACCE gateway, Mail"Link for PowerShare/QM. StarNine's Mail"Link SMTP for PowerShare links ACCE-mail users with UNIX mail systems and the Internet. Personal versions of these server-based gateways will also be available, allowing managers to convert individual users to PowerTalk one at a time. Mail"Link Directory Services for PowerShare, another StarNine product, will give users direct access to the user lists on servers running QuickMail, Microsoft Mail, UNIX mail, and MHS (PC) e-mail. All are expected to ship by the end of the year.

ACCE changes more than the way you send messages, however. With PowerTalk installed, the AppleTalk catalog in the Catalogs window offers much of the functionality of the Chooser, providing easier methods of logging on to file servers (QuickDraw GX will simplify all printer communications in a similar manner). The only unique function the Chooser will still perform will be to turn AppleTalk on and off — a function that will probably be duplicated elsewhere in system software in the future.

E-mail programs will not become obsolete, but they will be able to become ACCE-savvy in one of two ways: E-mail packages can serve as a front end to ACCE, supplying an interface while using ACCE's connection mechanisms; e-mail packages can also act as the back end, providing a transport mechanism that replaces the ACCE messaging mechanism but still plugging in to all the ACCE front ends.

— John Rizzo
APPLESCRIPT

AppleScript is Apple's answer to batch files on the Mac, automating multistep tasks, and much more. AppleScript sits on top of Apple events, Apple's interapplication-communication system software. With AppleScript you can tell multiple AppleScriptable applications to perform actions and to share data. It's unlikely that average users will want to write their own scripts, but anyone who has the AppleScript software installed can take advantage of other scripters' work. Using AppleScript will be an excellent way to create custom systems that integrate multiple separate applications.

The underlying functions of AppleScript are hidden from users, which is as it should be. However, AppleScript is the foundation for several new technologies coming from Apple. PlainTalk, Apple's new speech-recognition system, is a perfect example. PlainTalk recognizes commands and controls applications the same way AppleScript does; any application that can be scripted with AppleScript can be controlled with PlainTalk.

In order to run AppleScript, you need the AppleScript extension. AppleScript is available to developers from Apple for inclusion into shipping products — most users will receive a run-time version of AppleScript with a specific software package. The AppleScript extension and Script Editor will also be included in System 7 Pro. — Stephan Somogyi

**AppleScript REQUIREMENTS**

System: 7.0 or later.
RAM: 4 megabytes.
Disk space: 1 megabyte.
Minimum processor: 68000.

**Droplets**

Another way to use AppleScript is to create a small stand-alone application — called a droplet — that runs a script on a specific set of files. These files are usually dragged and dropped onto the droplet; for example, DropStuff contains an AppleScript script that causes StuffIt Deluxe to compress files that are dropped onto it.
Several applications already use AppleScript to streamline operations, and more scriptable applications are on the horizon. Here's a quick rundown on the top ones available.

The Microsoft Excel 4.0 you've had on your hard disk all these months is scriptable. You can use AppleScript to enter and retrieve data from cells, make charts, and perform calculations. Combine this with the ability to get data to and from other apps via AppleScript, and you can use Excel as a calculation engine. Claris FileMaker Pro 2.0 also lets you move data in and out of databases and perform other standard database-related functions via AppleScript.

QuarkXPress 3.2 is an excellent application for AppleScript, and the product ships with an AppleScript demo to help get you started. In addition to streamlining production tasks, you can extract data from applications such as Excel and FileMaker Pro and automatically create documents based on this gathered data.

Aladdin Systems' StuffIt Deluxe 3.0 has a broad suite of options that let you integrate data compression and decompression into your workflow. If you want to regularly archive certain files, using StuffIt via AppleScript to automate the process is definitely a convenient way to go.

On the image-compression front, Storm Technology's PicturePress 2.5 is also an eminently scriptable application. With the help of the included Frontier run-time module and scripts (whose functionality can be duplicated in AppleScript), you can set up watched folders in which to put the image files you wish to compress. A script running in the background checks these folders regularly and calls PicturePress if anyone places a file in such a folder — the resulting compressed file is then placed in an "out" folder.

— Stephan Somogyi
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Affordable COLOR UPGRADE

The current pack of color-video cards can expand your Mac's color horizons — for a price that won't put you in the red.  

BY PAUL YI

UPGRADE ENVY. It nags Mac users every time Apple introduces a new Mac model. These days, it seems to take just a few months for your new, improved Mac to wind up on the discontinued list. What’s a Mac user to do? You might feel you’ve just got to buy a new Mac — after all, the new ones run faster and you get more colors on larger screens.
Speed aside, if it's more colors you want, put away that Apple catalog, because your trusty NuBus Mac is not obsolete yet. Instead, spend as much as you can on a high-quality color monitor and then invest less than $1,000 in a video card. Of course, you have to make sure you get the right card, because video cards vary greatly in the speed they provide and in the types of monitors they support.

Several of the newest Macs — the Quadras and the Centris family — support 16-inch monitors with 16-bit color (thousands of colors) or 24-bit color (millions of colors), depending on the Mac model and the amount of VRAM (video random-access memory) installed. We looked at 13 color-video cards — each costing less than $1,000 — that can upgrade NuBus Macs (the Mac II, Centris, and Quadra families) to at least 16-bit-color capability. (See the "PDS, I Love You" sidebar for options for SE/30s and LCs.)

Some of these NuBus cards provide for 24-bit color on monitors as large as 20 inches.

Of course, you can spend several thousand dollars for a video card alone. High-end cards such as those in the SuperMac Thunder series retail for $2,599 and up. Part of the reason they cost so much is that they contain the latest, fastest acceleration technology and support 24-bit color on large monitors. We tested the SuperMac Thunder/24 and found it provided twice the speed of the best-performing low-cost cards. Even-more-expensive multimedia cards can also digitize video from your TV or VCR to allow you to work with video images on your Mac.

But if you do not work with high-end graphics software that requires blazing speed, save your money. For business presentations that have colorful graphs and newsletters that have semicomplicated graphics, the cards we looked at for this review give you good performance for the price. Ten come with video acceleration, which speeds up screen drawing and scrolling significantly.

Two — the E-Machines ColorLink...

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**PDS, I Love You**

In our lab tests, we focused on color-video cards for NuBus Macs (the Mac II, Centris, and Quadra families). Although not as many cards are available for owners of LCs and SE/30s, a few do provide 24-bit color for these PDS (processor-direct slot) Macs.

For those who are smarting over their LC or LC II being outdated by the LC III, Extreme Systems shipped three cards this summer to ease the pain. The Impact RGB Series cards are combination CPU-accelerator and video cards. Not only do they make your machine faster than an LC III but also the high-end card gives you millions of colors (24 bits) on a 16-inch monitor or 256 colors (8 bits) on a 21-inch monitor, for $899. The least expensive card in the series supports 24-bit color on 13- and 14-inch monitors and 8-bit color on 16-inch ones, for $699. Extreme Systems, 1050 Industry Drive, Tukwila, WA 98188; 800-995-2334 or 206-575-2334.

An even-lower-cost way to add color to an LC is with the $249 ColorBlaster LC, a VRAM SIMM from DGR Technologies. It gives you 16-bit color on a 14-inch monitor and leaves the PDS free for an accelerator or an Ethernet card. It also lets you enlarge a QuickTime frame to almost full-screen size. DGR Technologies, 1219 W. 6th Street, Austin, TX 78703; 800-235-9748 or 512-476-9855.

Another VRAM SIMM, the Video 4000R ($299), from Applied Engineering, also lets the LC, the LC II, and Performa 400s display 16-bit color on 14-inch monitors. Applied Engineering's VideoX expansion card for LCs gives you 16-bit color on monitors as large as 19 inches. It plugs into the company's TransWarp 4300 CPU accelerator, which means you have to buy that too, if you don't already own one. You can pay a bit more to get Ethernet support on the flip side of the VideoX, giving you everything you can possibly fit into an LC's PDS slot. Pricing was not fixed at press time. Applied Engineering, 3210 Beltline Road, Dallas, TX 75234; 800-554-6227 or 214-241-6060.

Lapis has one of the few cards that add color to an SE/30. The three ProColorServer cards we tested came in PDS versions for the SE/30, IIsi, LC, LC II, LC III, and LC 520. Prices: $499 to $699. Lapis Technologies, Inc., 1100 Marina Village Parkway, Suite 100, Alameda, CA 94501; 800-435-2747 or 510-748-1600.

— Nancy Peterson

**At a Glance**

- **Radius PrecisionColor 24/XP**
- **SuperMac Spectrum/24 Series IV**
- **E-Machines ColorLink 9x/7**
- **E-Machines ColorLink 9x/2**
- **E-Machines Futura MIX**
- **E-Machines Futura SX**
- **Lapis ProColorServer B+16**
- **Lapis ProColorServer 24**
- **Lapis ProColorServer 24x**
- **RasterOps PaintBoard Li**
- **RasterOps 24Mx**
- **Sigma ColorMax Turbo**
- **SuperMac Spectrum/24 POG**
- **MacUser Bottom Line Pick**

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**Using a ProColorServer video card from Lapis is one of the only ways to use a color monitor with the SE/30.**

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SX/T and ColorLink SX/2 — offer Ethernet support, providing a single card that supports your monitor and connects you to your office network while filling only one NuBus slot.

**To Buy or Not to Buy**

When you upgrade to a larger monitor or one that displays more colors, before you sink money into buying a video card, make sure you really need one. The 13 cards reviewed here are for NuBus Macs, but not all NuBus Macs are the same. Your Mac may already support the monitor you’ve chosen, or you may just need to add VRAM SIMMs. If you put 1,024K of VRAM (at a street price of about $100) into one of the Centris computers, you can get 16-bit instead of 8-bit color on a 16-inch monitor. The drawback is that you don’t get video acceleration.

Be sure to look carefully at your Mac’s video capabilities before going ahead with an upgrade. An upgrade chart that outlines every Mac’s video capabilities is available on CompuServe and AppleLink. If you’re a member of ZiffNet/Mac (hosted on CompuServe), download it from Library 7 of the Download & Support Forum; the filename is SVMACS.SEA (QuickTime version) or DBMACS.SEA (FileMaker Pro version). On AppleLink, go to ZiffNet Selections:MacUser Software: Reference.

If you really need speed, buying a video card might not be the wisest choice. It might be best to save up for a CPU accelerator or even a newer and faster Mac. Accelerating QuickDraw operations, which is what an accelerated-video card does, speeds up screen-related tasks only. To accelerate your Macintosh’s computational operations, such as spreadsheet recalculation — or even the application of Photoshop filters — you need a CPU accelerator. Read “Supercharging Your Mac: 100 Accelerated Systems” (April ’93, page 118) for further information about CPU acceleration.

**Monitor Your Decision**

If you do decide to purchase a video card, you need to make two decisions before you buy: What size monitor do you want to use, and how many colors do you need? One of the most confusing things about video cards is identifying which ones work with which monitors. That’s why we recommend you choose your monitor first and that you invest in a good one. Although a video card controls the time it takes to draw and scroll an image on-screen and the number of colors available, the monitor is responsible for the quality of the display — how crisp, clear, and stable the image is.

Make sure the card you buy supports your monitor’s resolution and scan rate. A monitor’s resolution tells you how many pixels can fit on-screen and how many lines of text, or how much of a page, will be visible. For a 16-inch Mac monitor, the resolution is 832 pixels horizontally by 624 pixels vertically, producing a WYSIWYG image: What you see

---

**Figure 1: Overall Speed**

![Overall Speed Chart](image)

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Figure 2: Accelerating Your Buying Decision

Figure 2: When upgrading your computer to display more colors, the first problem you’re likely to run into is a sluggish Mac. To avoid that problem, consider spending a little extra for an accelerated-video card. The SuperMac Spectrum/24 Series IV produced the fastest results in all of our tests. It’s more expensive than most of the other cards, but you get fast 24-bit color on monitors as large as 20 inches. The Radius PrecisionColor 24Xp is the best value if you have a 16-inch monitor; among the cards that come close in the speed they provide, none can compete with its price.

Word Scroll
All the accelerated-video cards provided similar times for scrolling through a ten-page Microsoft Word 5.0 document. The Lapis ProColorServer 8·16 took less time than the other two Lapis cards because it was running in 16-bit mode and had less information to process.

Photoshop Scroll
Using each card, we timed how long it took to scroll through a 2.2-megabyte, 24-bit graphic image, 14.2 inches wide by 10.7 inches high, in Photoshop.

16-bit on 14” monitor

- SuperMac Spectrum/24 Series IV
- Sigma ColorMax Turbo
- Radius PrecisionColor 24Xp
- RasterOps PaintBoard Li
- RasterOps 24Mx
- E-Machines Futura MX
- E-Machines ColorLink SX/T
- E-Machines ColorLink SX/2
- E-Machines Futura SX
- Lapis ProColorServer 24x
- Lapis ProColorServer 24
- SuperMac Spectrum/8·24 PDQ
- Lapis ProColorServer 8·16

- MacUser Bottom Line pick

16-bit on 14” monitor

- SuperMac Spectrum/24 Series IV
- Sigma ColorMax Turbo
- Radius PrecisionColor 24Xp
- RasterOps PaintBoard Li
- RasterOps 24Mx
- E-Machines Futura MX
- E-Machines ColorLink SX/T
- E-Machines ColorLink SX/2
- E-Machines Futura SX
- Lapis ProColorServer 24x
- Lapis ProColorServer 24

- SuperMac Spectrum/8·24 PDQ
- Lapis ProColorServer 8·16

- MacUser Bottom Line pick

Once you’ve chosen a monitor, one more consideration before you choose your new video card is how many colors you need. (See the “A Little Bit’s Better” sidebar for tips on using different bit depths.) If you want 24-bit color on a 16-inch monitor and you don’t foresee moving to a larger one, consider the Radius PrecisionColor 24Xp, the RasterOps 24Mx, or the E-Machines Futura SX. If you want 24-bit color on a 19-inch monitor, you’ll have to choose among the more expensive cards we tested: the E-Machines Futura MX; the RasterOps PaintBoard Li; the Sigma...
ColorMax Turbo; or the SuperMac Spectrum/24 Series IV, which also supports 24-bit color on 20-inch monitors.

We don’t recommend the Lapis ProColorServer 8.16 and the SuperMac Spectrum/8.16 PDQ if you have a 16-inch or larger monitor. Although the Lapis card is the least expensive one we tested, for a street price of only about $100 more, you can get 24-bit support with the E-Machines Futura SX or the Radius Precision Color 24Xp. The SuperMac Spectrum/8.24 PDQ is not a good card for a 16-inch or larger monitor if you also want realistic color. But if you choose a monitor as small as 14 inches, this card performs well, because it supports accelerated 24-bit mode at that size.

Fast Decision
Once you’ve narrowed down your video-card choices, based on monitor and bit-depth support, the next consideration is speed. Using 24-bit color often means playing the waiting game. An accelerated card can

A Little Bit’s Better
There’s a price to pay for 16.6 million colors — time. Every time you scroll, zoom in or out, or click on a new window, the Mac and the video card have to update the screen and process every pixel. In 24-bit mode, they have to process more information than in 8- and 16-bit modes. The trick to saving time is working smarter.

Work in the lowest bit depth possible. If you’re doing word processing or working with spreadsheets that don’t require color, switch to 1-bit mode (black-and-white). Use no higher than 4-bit mode (16 colors) if you need to see colored text.

• If you’re working with 24-bit images, you can save time by performing some of your non-color-critical operations in 16-bit mode. But if you switch to 8-bit mode or less, things will actually slow down, because the Mac has to spend a lot of time dithering the colors.

• You can switch bit depths quickly if you have System 7: Make an alias of the Monitors control panel, and put it on your desktop or into the Apple Menu Items folder in your System Folder. That way, you’ll have quick access to the control panel that lets you switch among bit depths with one click.

• Some shareware utilities make switching bit depths as easy as clicking on a button. Utilities such as ColorAlias, ColorSwitch, DepthGauge, Fast Switchers, Screen Flipper, and Switch-a-Roo are available from on-line services. To get them from ZiffNet/Mac, MacUser’s on-line service, type GO ZMC:DOWNTECH and look in Libraries 1 and 3.

• For QuickTime movies, use 16-bit color. With moving images, you really can’t see the difference between 16- and 24-bit color. In 16-bit mode, movies run faster and smoother than they do in 24-bit mode.

— Nancy Peterson

Photoshop Scroll

The best bit depth to work with depends on which card you buy. Generally, working in 16-bit mode is significantly faster than working in 24-bit mode. The SuperMac Spectrum/24 Series IV doesn’t support 16-bit mode, but that doesn’t matter, because its 24-bit mode is so fast.
make the difference between winning the game and throwing in the towel.

Every time you scroll through text or add a new element to a drawing, the Mac has to process QuickDraw commands (a set of instructions that tells the monitor how to draw text and graphics) to rebuild the screen image pixel by pixel. The Mac then dumps the new screen-image data across the NuBus to the video card. An accelerated-video card speeds things up by intercepting the QuickDraw commands from applications and processing them faster than your Mac's CPU can. QuickDraw commands are more compact than screen-image data, so it takes less time for an entire command to get to the video card.

We ran real-world speed tests with the 13 video cards to see how they compared and to see the difference between accelerated- and unaccelerated-video cards. (See the "How We Tested Color-Video Cards" sidebar for a description of our tests.) All but the three from Lapis are accelerated-video cards. The SuperMac Spectrum/8•24 PDQ accelerates video in 8- and 24-bit mode but not in 16-bit mode, the greatest bit depth it supports on a 16-inch monitor.

When we compiled the results (see Figure 1), the overall conclusion was clear: Purchase an accelerated-video card. Scrolling from the beginning to the end of a ten-page Microsoft Word document (see Figure 2) took 2 minutes longer with the Lapis ProColorServer 24 and ProColorServer 24x unaccelerated-video cards than it did with the SuperMac Spectrum/24 Series IV accelerated-video card, which finished in 1 minute, 5 seconds. When you're scrolling through a document, 3 minutes is a long time to wait.

With the accelerated-video cards, the longest and the shortest times — using the E-Machines ColorLink SX/2 and the SuperMac Spectrum/24 Series IV, respectively — were separated by just 17 seconds, a tolerable wait. All things being equal, you would, of course, pick the card

**Rating Tech Support**

Because 9 of the 13 cards we tested were so close in terms of the speed and the image quality you get with them, you have to look at other factors, such as price and vendor reliability, to choose one. Prices are listed in Table 1. That's easy. Judging reliability is tougher. To help you cut, we evaluated each company's tech support in terms of expertise and willingness to assist customers.

We made at least three anonymous phone calls, asking three questions of each vendor. If the tech-support representatives answered incorrectly the first time, we called back later to see if they could get it right the second time.

E-Machines' tech support excelled, whereas Sigma Designs' support staff provided service that was only fair.

The questions we asked and the answers we expected were as follows:

Q. I'm running a 16-inch monitor with your card and an Apple 13-inch monitor from the video port of my lici. Is there a way to make programs appear on the larger monitor without dragging them there?

A. Open the Monitors control panel (or the vendor's own control panel, if it replaces Apple's), and drag the menu bar from the small to the large monitor icon.

Q. I switched from an Apple 13-inch monitor to a NEC 5FG and am still using your video card. How can I get a higher resolution than 640 x 480 pixels?

A. Buy an adapter from NEC, or hold down certain keys while booting the Mac. (Because hardware and software solutions are possible, we accepted any answer that corrected the problem. — Ed.)

Q. I installed your card and hooked up a 16-inch Apple monitor to my Mac lici, but nothing whatsoever appears on-screen.

A. On the Mac lici, the built-in video port doesn't support a 16-inch monitor's resolution. Unplug the monitor cable from the video port, and plug it into the card instead. Restart if your picture is still missing.

**Key**

- Excellent
- Good
- Fair
- Poor

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<thead>
<tr>
<th>Company</th>
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<td>Lapis Technologies</td>
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<td>Radius</td>
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<td>RasterOps</td>
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<td>Sigma Designs</td>
<td>Fair</td>
</tr>
<tr>
<td>SuperMac</td>
<td>Poor</td>
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</table>

E-Machines' tech support was impressive. The representatives answered all of our questions correctly and quickly on the first try and patiently waited to make sure we fixed each problem before they hung up.

Overall, Lapis' tech support was fast and accurate. The reps stumbled over the question about changing resolutions but got it right the second time.

The reps answered all the questions correctly, although one question needed two phone calls before they got it right. One time we were put on hold for seven minutes.

Although RasterOps' tech-support reps knew the answers to our questions, their responses were short and they put us on hold between instructions.

Sigma Designs gave us a mixed bag of responses. Overall, the staff was friendly and accurate, but one representative went through several suggestions before finding the correct answer and another couldn't give the correct answer at all. The most disturbing problem was how quick they were to suggest sending the board to our dealer for repair/ replacement.

As long as we were willing to wait, the reps delivered the right answer. We had to wait for callbacks; one representative went through a time-consuming sequence of possible solutions before arriving at the right one.
The Bottom Line

When we went looking for inexpensive video cards for upgrading Macs to work with monitors that have more colors and larger screens, we didn’t expect to find such a strong collection of products. Almost all the cards we tested offer good performance and features for their low price. The main differences among the cards lie in their monitor support and the drawing speeds they provide. Two cards stand out as exceptional buys.

For those who want maximum bit depth and don’t foresee going beyond a 16-inch monitor, the Radius PrecisionColor 24Xp ($659 list, $485 street) is an excellent buy. It’s one of the least expensive cards we tested, and it accelerates video. It also supports 24-bit color on monitors as large as 16 inches, including the Radius Color Pivot.

The SuperMac Spectrum/24 Series IV ($949 list, $780 street) was the 24-bit card that provided the greatest speed with a 16-inch monitor. It’s one of the more costly cards, but it’s the only one that supported 24-bit color on monitors as large as 20 inches. This card offers enough flexibility and screen-drawing power to satisfy your display needs, but it doesn’t support 16-bit color — a potential handicap for QuickTime users.

The Radius PrecisionColor 24Xp (top) and the SuperMac Spectrum/24 Series IV are the best values among color-video cards costing less than $1,000.

A Perfect Match

In the past, we’ve recommended buying a complete display system — a monitor and a card — from a single, Mac-specific manufacturer. Today, though, it pays to mix and match. You can save money without sacrificing quality, but make sure the monitor and the card work together. Remember: A video card must support a monitor’s resolution and its scan rates. Speaking of support, you should consider how the companies that sell these cards handle their customers’ problems. Look at the “Rating Tech Support” sidebar to find out about our experiences in getting help from these vendors.

Choose your monitor first, and then find the least expensive accelerated-video card that supports it. The best way to avoid a bad match is to plug the card and monitor in and take a look before you leave the store. If you’re ordering by mail, be sure to get a money-back guarantee that allows you enough time to make sure you’ve found the perfect match.

Paul Yi, a former MacUser associate editor, is a consultant and technical writer. Project leader Brian Fikes and senior project leader Katherine Barnes managed 2D Labs’ testing for this report.

Table 1 Criteria

| List price | The vendor’s suggested retail price. |
| Street price | The average price from U.S. dealers and mail-order houses in July 1993. |
| Bit-depth, monitor support | The maximum color bit depth for each monitor size. The listed bit depth works on smaller monitor sizes as well as the size listed. |
| Macs supported | All the Macs that are compatible with the card. |
| Power consumption | The maximum power the card requires, in watts. |
| QuickDraw acceleration | Does the card offer on-board QuickDraw acceleration? Specific bit depths are listed if acceleration doesn’t apply to all. |
| Brightness and contrast | Software that lets you change brightness and contrast from the Mac desktop rather than with monitor controls. |
| Extended/virtual desktop | A software or hardware feature that makes the desktop larger than your screen area. |
| Monitor sensing | A software feature that detects if the monitor is turned off or disconnected. |
| Pan | A software or hardware feature that allows you to scroll around on a screen that’s larger than your physical screen. |
| Screen saver | Software that prevents screen burn-in after the keyboard and mouse have been idle for a specified time. |
| Resolution switching on the fly | A feature that lets you change monitor resolutions without restarting your computer. Your monitor must support more than one of the resolutions the card supports. |
| Zoom | A hardware feature that lets you magnify the screen by two, four, or eight times. |

continues >>
### Table 1: Features of Color-Video Cards

<table>
<thead>
<tr>
<th></th>
<th>E·Machines ColorLink SX/T</th>
<th>E·Machines ColorLink SX/2</th>
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<td>$380</td>
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**Pros**
- Supports Ethernet.
- Excellent tech support.
- 5-year warranty.

**Cons**
- Expensive for what you get.

**Compatibility**
- **Bit-depth, monitor support**
  - 8-bit, 19-inch;
  - 16-bit, 16-inch;
  - 24-bit, 16-inch
  - 8-bit, 19-inch;
  - 16-bit, 16-inch;
  - 24-bit, 19-inch
  - 8-bit, 19-inch;
  - 16-bit, 16-inch;
  - 24-bit, 16-inch
  - 8-bit, 21-inch;
  - 16-bit, 16-inch;
  - no 24-bit support

**Design/Construction**
- **Power consumption**
  - 6 watts
  - 6 watts
  - 5 watts
  - 3.75 watts
  - 6 watts

**Software and Hardware Features**
- **brightness and contrast**, **extended/virtual desktop, pan, screen saver, resolution**, **switching on the fly**, **zoom**

**FCC Certification**
- **Class A**

**Warranty**
- **Repair site**
  - dealer

**Money-back guarantee**
- **depends on dealer (usually 30 days)**
- **depends on dealer (usually 30 days)**
- **depends on dealer (usually 30 days)**
- **depends on dealer (usually 30 days)**
- **depends on dealer (usually 30 days)**
- **30 days**

**Company**
- E·Machines
  - 215 Moffett Park Dr.
  - Sunnyvale, CA 94089
  - 800-344-7274
  - 408-541-6100
  - 408-541-7680 (fax)
- E·Machines
  - 215 Moffett Park Dr.
  - Sunnyvale, CA 94089
  - 800-344-7274
  - 408-541-6100
  - 408-541-7680 (fax)
- E·Machines
  - 215 Moffett Park Dr.
  - Sunnyvale, CA 94089
  - 800-344-7274
  - 408-541-6100
  - 408-541-7680 (fax)
- E·Machines
  - 215 Moffett Park Dr.
  - Sunnyvale, CA 94089
  - 800-344-7274
  - 408-541-6100
  - 408-541-7680 (fax)
- Lapis Technologies, Inc.
  - 1100 Marina Village Parkway, Ste. 100
  - Alameda, CA 94501
  - 510-748-1600
  - 510-748-1645 (fax)
WE’RE REDEFINING WHAT YOU SHOULD EXPECT FROM OFFICE PRINTERS.
## Table 1: Features of Color-Video Cards, continued

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<td>Slow. Unaccelerated video at all bit depths.</td>
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<td>Expensive. Limited to 16-inch or smaller monitor.</td>
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*Under Radius’ 24-Hour Worry Free Warranty Program, you get a new card by 10:30 a.m. the day after you request it. Applies for one year at no cost.

MacUser Bottom Line pick
**Flexibility** *(flek-sé-'bil-ət-ē)* n. 1, A feature previously not found in this category. example: For under $800, **TI microWriter**™ printers with **Adobe® PostScript®** give you more networking and paper handling **flexibility** than Apple and HP, at a lot lower price.

If you're looking for a PostScript printer with a street price well under $800, you'll have a hard time finding one with as many features as a TI microWriter.

Just look at the chart and compare it to our leading competitors, Apple and HP. Then, when you're ready for a full-featured printer that's truly flexible, at a price that's truly affordable, take a look at a TI microWriter. For more information or a dealer near you, call 1-800-527-3500.

---

### THE UNDER $800 PRINTER, REDEFINED.

<table>
<thead>
<tr>
<th></th>
<th>TI microWriter PS23</th>
<th>Apple LaserWriter Select 310</th>
<th>HP 4ML</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Print Speed</strong></td>
<td>5 ppm</td>
<td>5 ppm</td>
<td>4 ppm</td>
</tr>
<tr>
<td><strong>AppleTalk® Connection</strong></td>
<td>Standard</td>
<td>Not Avail.</td>
<td>Standard</td>
</tr>
<tr>
<td><strong>Paper Trays</strong></td>
<td>(std.) 250 sheet</td>
<td>250 sheet</td>
<td>100 sheet</td>
</tr>
<tr>
<td></td>
<td>(opt.) 250 sheet</td>
<td>250 sheet</td>
<td>Not Avail.</td>
</tr>
<tr>
<td><strong>Auto Emulation Switching</strong></td>
<td>Standard</td>
<td>Not Avail.</td>
<td>Standard</td>
</tr>
<tr>
<td><strong>List Price</strong></td>
<td>$799</td>
<td>$1079</td>
<td>$1279</td>
</tr>
</tbody>
</table>

*Specifications in chart are based on information as of 8/93. microWriter and “Extending Your Reach With Innovation” are trademarks of Texas Instruments. Adobe, PostScript and the PostScript logo are registered trademarks of Adobe Systems, Inc. AppleTalk is a registered trademark of Apple Computer, Inc. © 1993 TI.*

**CIRCLE 75 ON READER SERVICE CARD.**
If you’re looking for a true 600 dpi printer with a street price under $1400, you’ll have a tough time beating the new TI microLaser Pro 600.

You see, when we set out to design the ideal office printer, we began by asking thousands of users what they wanted most. And then, instead of making those “key care-abouts” optional, we made them standard.

Take print quality. We began with true 600 dpi resolution. And then enhanced it with 6MB of memory for improved graphics. Compatibility? We’re Mac®/DOS and Windows compatible right out of the box. With all the right languages and interfaces. And with the intelligence to switch these automatically, depending on the environment. Low maintenance? Our new toner cartridge typically gives you 15,000 pages between changes.

Paper handling? Two 250-sheet trays come standard. And finally, value. Take a look at the chart below, compare features and price, and your choice should be simple.

So if you’re considering a new printer, we invite you to try the new TI microLaser Pro 600. For more information or a dealer near you, call 1-800-527-3500.

<table>
<thead>
<tr>
<th></th>
<th>TI microLaser Pro 600</th>
<th>Apple LW Pro 600</th>
<th>HP LaserJet 4M</th>
</tr>
</thead>
<tbody>
<tr>
<td>True 600 dpi</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Speed/Processor</td>
<td>8 ppm / RISC</td>
<td>8 ppm / 68030</td>
<td>8 ppm / RISC</td>
</tr>
<tr>
<td>Emulations</td>
<td>PCL5/</td>
<td>PCL4/</td>
<td>PCL5E/</td>
</tr>
<tr>
<td></td>
<td>Adobe PostScript 2</td>
<td>Adobe PostScript 2</td>
<td>Adobe PostScript 2</td>
</tr>
<tr>
<td>Compatibility</td>
<td>Mac/DOS</td>
<td>Mac/DOS</td>
<td>Mac/DOS</td>
</tr>
<tr>
<td>Toner Cartridge</td>
<td>15K pages*</td>
<td>6K pages</td>
<td>6K pages</td>
</tr>
<tr>
<td>Paper Trays</td>
<td>250 sheet / 250 sheet</td>
<td>250 sheet / 100 sheet</td>
<td>250 sheet / 100 sheet</td>
</tr>
<tr>
<td>Auto Language Switching</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Auto Interface Switching</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>List Price</td>
<td>$1599*</td>
<td>$2099</td>
<td>$2399</td>
</tr>
</tbody>
</table>

Ask About Our $60 Introductory Rebate!
## Table 1: Features of Color-Video Cards, continued

<table>
<thead>
<tr>
<th></th>
<th>Sigma ColorMax Turbo</th>
<th>SuperMac Spectrum/8-24 PDO</th>
<th>SuperMac Spectrum/24 Series IV</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>List price</strong></td>
<td>$999</td>
<td>$599</td>
<td>$949</td>
</tr>
<tr>
<td><strong>Street price</strong></td>
<td>$840</td>
<td>$530</td>
<td>$780</td>
</tr>
<tr>
<td><strong>Pros</strong></td>
<td>24-bit color on 19-inch monitor.</td>
<td>5-year warranty.</td>
<td>Fastest 24-bit card. Least expensive 24-bit card for 20-inch monitors. 5-year warranty.</td>
</tr>
<tr>
<td><strong>Cons</strong></td>
<td>Expensive, Inferior tech support.</td>
<td>Slow for 16-inch and larger monitors.</td>
<td>No 16-bit color.</td>
</tr>
<tr>
<td><strong>Compatibility</strong></td>
<td>Bit-depth, monitor</td>
<td>8-bit, 19-inch; 16-bit, 19-inch; 24-bit, 19-inch</td>
<td>8-bit, 21-inch; 16-bit, 19-inch; 24-bit, 14-inch</td>
</tr>
<tr>
<td><strong>Design/Construction</strong></td>
<td>Power consumption</td>
<td>9 watts</td>
<td>10 watts</td>
</tr>
<tr>
<td><strong>QuickDraw acceleration</strong></td>
<td>yes</td>
<td>yes (8-/24-bit)</td>
<td>yes</td>
</tr>
<tr>
<td><strong>Software and hardware features</strong></td>
<td>monitor sensing, screen saver, resolution switching on the fly</td>
<td>extended/virtual, desktop, pan, resolution switching on the fly, zoom</td>
<td>extended/virtual, desktop, pan, resolution switching on the fly, zoom</td>
</tr>
<tr>
<td><strong>FCC certification</strong></td>
<td>Class B</td>
<td>Class A</td>
<td>Class A</td>
</tr>
<tr>
<td><strong>Warranty</strong></td>
<td>Repair site</td>
<td>dealer (authorized facility)</td>
<td>dealer</td>
</tr>
<tr>
<td><strong>Standard warranty</strong></td>
<td>1 year</td>
<td>5 years</td>
<td>5 years</td>
</tr>
<tr>
<td><strong>Money-back guarantee</strong></td>
<td>depends on dealer</td>
<td>depends on dealer (usually 30 days)</td>
<td>depends on dealer (usually 30 days)</td>
</tr>
<tr>
<td><strong>Company</strong></td>
<td>Sigma Designs 47900 Bayside Pkwy. 94538 Fremont, CA 800-645-8089 510-777-0100 510-777-2640 (fax)</td>
<td>SuperMac Technology 215 Moffett Park Dr. Sunnyvale, CA 94089 800-334-3005 408-541-6100 408-541-7680 (fax)</td>
<td>SuperMac Technology 215 Moffett Park Dr. Sunnyvale, CA 94089 800-334-3005 408-541-6100 408-541-7680 (fax)</td>
</tr>
</tbody>
</table>

**MacUser Bottom Line pick**
In the past year, we've introduced a whole new line of office printers. And as you've seen in the previous pages, they're some of the most advanced models on the market today. But now, we're also going to change the way you buy a printer.

When you buy one of these new TI printers, if you need any help at all, simply call us toll-free at 1-800-TI-TEXAS, and we'll work with you. Then, within 30 days from date of purchase, if you're still not completely happy, call TI and we'll take it back. It's as easy as that. That's how confident we are in each

THE WAY YOU BUY A PRINTER, REDEFINED.

and every printer we make. And even after the 30 days, you can continue to call the 800 number for any help you may need.

For more information about the TI microMarc®, the TI microWriter® or the new TI microLaser® Pro 600 printers, and for the name of a dealer near you, call 1-800-527-3500. And see for yourself how TI is redefining what you should expect from an office printer.

EXTENDING YOUR REACH WITH INNOVATION®

* Offer applies to all new TI microMarc, microWriter and microLaser Pro 600 printers, if returned in good condition. microMarc, microWriter, microLaser and "Extending Your Reach With Innovation" are trademarks of Texas Instruments. ©1993 TI.
If the competition wants to match Canon's level of color copier experience, they'd better start pushing. Since 1987, when Canon introduced the world's first Color Laser Copier, our copiers have made a whopping one billion, two hundred million color copies.

But quantity alone hasn’t made Canon the unsurpassed leader in color copiers for six consecutive years. Just as important is Canon's unsurpassed quality.

Today, Canon makes the most technically sophisticated color copiers available. With features like an incredibly brilliant 400 DPI (dots per inch) resolution. And 256 color gradations that can produce a mind-boggling 16.7 million colors.

For an idea of how much color copier experience we have push this 1.2 billion times.
Canon color copiers can even be connected to your computer. So powerful, eye-catching color graphics can be added to any business presentation or other important documents.

And because different work environments have different needs, Canon offers a choice of color copier solutions. Whether your requirements are small, medium, large, or even extra large, we have a copier designed to fit your business. So if you want the quality that only a company with over a billion copies of color experience can offer, start pushing: 1-800-OK-CANON. We'll rush you a free Color Solutions guide with even more reasons to choose Canon.

See us at Comdex LVCC Booth #L1844
New Quicken 4 will radically improve your financial organization in minutes.

There are over 4 million people managing their finances ... tracking their investments ... even running their small businesses with Quicken. So we knew an upgrade would have to be good. Really good. That's why you'll find over 100 important improvements in Quicken 4. Now it's even easier to use ... saves you more time ... and does much more. And it's still one of the best bargains for your Mac.

As easy as your checkbook

Quicken 4 is easier
If you can use a checkbook, Quicken 4 is a no-brainer — you can use Quicken 4 without ever opening a manual. And because Quicken 4 categorizes all your spending — and income — you'll see at a glance where your money goes.

QuickFill

QuickFill saves you more time
Now you can take care of your bills in a fraction of the time it takes by hand. With QuickFill™ you'll never have to type the same transaction (like your monthly loan payments) twice. Quicken even enters regular payments and deposits for you — so you get up-to-date, organized records of recurring transactions effortlessly.

Quicken 4 does more
Quicken 4 makes even complex financial situations simple. It now tracks investments with ease. Calculates loan amortization with variable interest rates. Performs "what-if?" calculations for powerful financial planning. It even provides your Quicken Visa® card statement electronically. So you always have a complete financial picture at your fingertips.

Quicken 4 shows you more
Quicken 4 also gives you new insight into your finances. Vivid 3-D graphs make it easy to monitor your spending patterns more accurately. And

QuickZoom™ shows you the numbers behind the numbers — from a spending category to an individual transaction — with just a double-click of your mouse.

Quicken 4 means business
Quicken 4 doesn't stop with personal finances. Our new Business User's Guide will show you how Quicken 4 can handle things like tracking projects by job or client. Accounts payable and receivable. And, of course, expense tracking and allocation.

Quicken 4 saves you more
Perhaps best of all, Quicken 4 remains a bargain. And it comes with a 60-day money-back guarantee. Plus, if you're a previous owner of Quicken, you're eligible for a $10 rebate when you purchase Quicken 4 from your favorite retailer.

So try new Quicken 4 — and see a radical improvement in your finances.

Upgrade for only $29.95
Plus $5 shipping & handling. US$8 in Canada. Or buy from your favorite retailer and get a $10 rebate.

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Or find Quicken 4 for even less at retailers everywhere.

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24 hours a day, 7 days a week, U.S. and Canada

Ad Code: MUBFO
THE MACUSER

100

Need something special for your Mac-loving friends? Here are 100 bargain-priced gift ideas. BY MICHELE HASSON,
ROMAN VICTOR LOYOLA, AMANDA MICHAEL, AND JASON SNELL

Most of the year, we at MacUser concern ourselves with serious Mac issues: What's the best flat-file-database program? Which hard drive has the best price and performance? When's Apple going to ship that new piece of system software — and what will it mean for Mac users? But once a year, we have a less serious mission: find the 100 best Mac gifts that cost less than $250 apiece, give or take $100 or so. It's been a tough job — putting screen savers through their paces, painstakingly testing games, seeking out the finest Mac accessories — but now that we're finished, we're glad to report that no matter how many Mac users you have on your gift list this year, you're bound to find something that will please them and their Macs. To make shopping easier, we've made suggestions, from the silly to the sublime, for some typical Mac users: home businesspeople, PowerBook users, college students, kids, hobbyists, and game fanatics. So with no further ado: the fourth annual MacUser 100.

Michele Hasson and Amanda Michael are MacUser assistant editors, Roman Victor Loyola is a MacUser Labs technician, and Jason Snell is a MacUser intern.
The Home Office

More and more Mac users are running businesses out of their homes — you may even be doing it yourself. Here's a selection of products designed to help you whistle while you work.

1. Anti-Static Cleaning Towelettes
   Work-at-home Macs are magnets for everything from cat hair to fingerprints. Clean up with Anti-Static Cleaning Towelettes, premoistened towelettes that clean your screen, remove dust-attracting static, and are guaranteed not to scratch or streak displays. Allsop; $6.95.

2. Defying Gravity: The Inside Story of the Making of Newton
   If you're following the development of palmtop organizers, you'll want to read Defying Gravity: The Inside Story of the Making of Newton. This pictorial history was put together by NBC news correspondent Markos Kounalakis and Newsweek photojournalist Doug Menuez and follows the Newton team's progress as it developed and manufactured the Newton. Beyond Words Publishing; $29.95.

3. Drive Tech Floppy Diagnostic
   Drive Tech Floppy Diagnostic includes a drive-cleaning kit and diagnostic software that tests your floppy drive's health. The drive-cleaning kit is a must for anyone who works in a dusty environment. MicroMat Computer Systems; $59.95. 

4. DTP Reference Kit
   Neophyte desktop designers can't ask for more than the DTP Reference Kit, a bag containing five rulers, a screen-percentage table, keyboard command shortcuts for Aldus PageMaker and QuarkXPress, a guide to Zap! Dingbats, and printers' and proofreaders' marks. The Communications Shop; $29.95.

5. Lockette
   The Lockette is for the security-conscious. It lets you lock your computer to your desk, your car, or even your leg. It also enables you to lock your floppy drive. Z-Lock Manufacturing; $19.95.

6. Mario Teaches Typing
   Mario Teaches Typing is still a member of the two-fingered-typing school. It's time to learn touch typing. Unfortunately, this requires lots of dull practice — dull, that is, unless you use Mario Teaches Typing. The drills are still there, but at least you're distracted by animated Mario Brothers' characters, Nintendo-style graphics, and silly sounds and music. Good for adults and kids. MacPlay; $49.95. 

7. MouseArena
   The MouseArena is the icing on the cake of your Mac office. This mousepad/wrist rest is the most sophisticated one we could find, even if it does look like a prop from "The Jetsons." Forminco; $29.95. 

8. MouseMitt
   Using a wrist rest is not always practical if you use a PowerBook, a trackball, or a graphics tablet. One solution is to use the MouseMitt, a wrist rest you wear. Like a colorful Ace bandage with a padded section that fits under your wrist, the MouseMitt looks a little strange, but it really does work (just remember to take it off when you socialize). MouseMitt International; $9.95 to $19.95.

9. PaperTemplates
   If you don't have an artistic bone in your body but have to design things on your Mac, PaperTemplates, from PaperDirect, is the answer. With it, you can create brochures, mailers, business cards, and other business forms from within Microsoft Word, PageMaker, or QuarkXPress. Designed to be used with PaperDirect's wide selection of papers, PaperTemplates contains more than 130 designs. PaperDirect; $39.95. 

10. PowerCD
    Apple's PowerCD player costs more than our $250 limit, but it's a good gift for anyone who has a small business. Use it to run standard CD-ROMs on a Mac or single-session or multisession Photo CD discs on a television, or hook it up to speakers and listen to standard audio CDs. Apple Computer; $599.

11. PublicityBuilder
    If you need to let the public know what you've got, PublicityBuilder, from Jian, lets you create a PR strategy on your Mac. It contains templates that let you write pitch letters, contracts, and press releases and plan objectives. The manual explains how to develop a PR message and deal with the media. Jian Tools for Sales; $129. 

12. Screenies
    For visual stimulation, try framing your monitor with a Screenie, a cardboard frame that comes in one of 100 variations, from a Baroque-style gilt picture...
frame to a politically correct rain-forest scene — there are even Screenies for kids. For the home office, try the corkboard or whiteboard models, onto which you can pin or scribble notes. In sizes to fit 9-inch or 13- to 15-inch monitors. Screenies; $9.95 and $11.95.

**SIMM Remover**
The SIMM Remover makes performing memory upgrades a little simpler by letting you easily lift out old SIMMs. It comes with easy-to-follow directions, but you have to provide your own grounding strap. Stratos; $4.99.

**Tabs and Indents**
You need to know a few tricks in order to turn out polished and professional-looking documents with your Mac. *Tabs and Indents*, by Robin Williams (author of the best-selling *The Mac Is Not a Typewriter*), gives you a grounding in how to format word-processing documents. The enclosed disk contains skill exercises and a couple of useful freeware programs. Peachpit Press; $12.

**Take Five**
Sitting in front of a computer all day can take its toll on your health — physical and mental. You can decompress a little with *Take Five*, a CD-ROM full of exercises, music, and psychic vacations designed to unkink your mind and body. The Voyager Company; $49.95.

**3M Privacy Filter**
Anyone whose family room doubles as an office will love the 3M Privacy Filter, a polarizing filter that fits over the front of your display and makes it impossible to see what's on the screen unless you're directly in front of it. Several models are available, some of which also cut out glare and radiation. 3M Optical Systems; $189.95 to $329.95.

**Toner Tuner**
Laser-printer owners who want to save money on toner cartridges will love *Toner Tuner*, a utility that lets you control just how much ink your printer puts down on paper. If you're printing just draft versions of documents, printing them with less toner makes the cartridge you have last a lot longer — it's kinder to the environment too. Working Software; $24.95.

**Total Health at the Computer: How to Be Pain Free**
Did you know that you should blink every three to five seconds when you're staring at a computer display? You would if you'd read *Total Health at the Computer: How to Be Pain Free*, by Martin Sussman and Dr. Ernest Loewenstein, with Howard Sann. It's a practical guide to setting up your work space and using your computer in a way that minimizes health problems such as carpal-tunnel syndrome, repetitive-stress injuries, and eyestrain. Station Hill Press; $13.95.

**Zounds**
Change your auditory environment with Zounds, a control panel/sound package that lets you set groups of sounds (farm noises, a tropical setting) to play through your Mac's speaker at random intervals. Just beware: Some people love this program, but others find it annoying. Digital Eclipse Software; $39.95.

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*MacUser* December 1993 133
The MacUser 100

The Traveling Mac

PowerBooks are both a status symbol and an indispensable aid for businesspeople on the go. Here are some suggestions to make your PowerBook even more powerful.

20 Digital Restaurant Guide
Need to know the closest place to eat in San Francisco? The best Thai food? Then check out Digital Restaurant Guide, a HyperCard stack containing information on just about every restaurant in the City by the Bay — nearly 3,000 entries. Digital Lantern plans to add other cities to the lineup soon. Digital Lantern; $99.95; seasonal updates, $18.95 each. 

21 Expanded Books
22 I Love travel guides
Voyager's line of Expanded Books keep getting better and better. New books on-disc include Randy Shilts' Conduct Unbecoming and Scott Turow's Pleading Guilty — perfect for reading on-line on your PowerBook. Macmillan New Media has jumped on the bandwagon, releasing its own Expanded Books: the I Love series of travel guides for Boston, New York, and Washington as well as other titles such as an on-disc version of Peter Gammons' book Coming Apart at the Seams. The Voyager Company and Macmillan New Media; $19.95 to $29.95. Voyager's Expanded Books Macmillan's I Love series

23 Nada Chair Back-Up
The Nada Chair Back-Up is an innovative ergonomic back support. It acts as a sling from your knees to your back, using reverse pressure from the knees to apply traction to the lower back. OK, so it looks a little funny, but it packs up smaller than a Duo and is surprisingly comfortable. Ergonomics; $39.95.

24 On The Road
On The Road lets you queue all of your print jobs while you're traveling, just as you would if you were actually attached to a printer. Then, when your PowerBook is reconnected to a network, On The Road seeks out the printer of your choice and prints the lot. It also defers your faxes until you've attached your fax modem to a phone line. Palomar Software; $99.99.

25 PBTools
26 CPU 2.0
Every PowerBook user should have a set of PowerBook utilities to do such things as extend battery life and make cursors more easily visible on the LCD screen. One favorite is Inline Software's PBTools, which stores information about your PowerBook's power consumption over time. Another option is Connectix's CPU 2.0, the granddaddy of PowerBook utilities. PBTools: Inline Software; $99.55 CPU 2.0: Connectix; $99

27 PowerBall
Getting sick of the granite-gray look of your PowerBook? Replace the trackball with a colorful PowerBall. The balls, colored orange, yellow, green, or pink, come in sizes to fit all PowerBooks, including the 100s and the Duos. APS Technologies; $9.95; set of four, $19.95.

28 The PowerBook Companion
29 PowerBook: The Digital Nomad's Guide
Using a PowerBook creates a whole set of concerns that don't arise when you're using a desktop Mac, so it's a good idea for first-time PowerBook owners — whether they're jaded Mac experts or not — to read up on their new machines.

PowerPrint

The PowerPrint software/cable combination lets PowerBook users print their files to just about any PC-compatible printer, including dot-matrix printers. GDT Softworks; $149.

SCSI Doc!

Use the SCSI Doc! connector to attach your PowerBook to any regular Mac SCSI device or to attach your PowerBook to a desktop Mac as if it were a SCSI device itself. APS Technologies; $49.

Teledapt Phone Kit

Just because your PowerBook can travel with you around the world doesn't mean your modem will be able to speak the language when you get to a foreign land. But the adapters in the Teledapt Phone Kit can convert any country's phone jack into a standard American plug. You can buy individual plugs, packages for regions (the photo above shows a European Community pack), or a catch-all package that covers pretty much every phone jack in the world. Teledapt; individual connector, $22.50; region pack, $149.99; world pack, $899.99.

ThinPack

The 1.5-pound ThinPack battery is small enough not to be a burden but powerful enough to slake your PowerBook's thirst for energy for five to seven hours when you use it in combination with a PowerBook's internal battery. It's perfect for people who are tired of swapping batteries in the middle of a long flight. VST Power Systems; $179.95.

Wallpaper The Zebra Edition

Wallpaper Light & Dark

For users of black-and-white PowerBooks — and other Macs without color or gray-scale displays — comes Wallpaper The Zebra Edition, a new version of the popular desktop-pattern utility. Now you don't need to keep staring at that plain old gray grid on your desktop. And if you have a color PowerBook (or desktop machine), Wallpaper Light & Dark gives you even more patterns and lets you run After Dark modules. Thought I Could; $59.99. The Zebra Edition $49.99; Light & Dark $59.99.

WraP Notecover

WraP Saddlebag

If you want a case that fits your PowerBook like a glove, check out the WraP Notecover. It's made of neoprene — the same material wet suits are made of. Zippers on the back allow full access to the back panel, and an extra pocket gives you enough room to keep papers and spare disks. If you need even more carrying room, just sling the WraP Saddlebag over the Notecover. WraP Design; Notecover, $69; Saddlebag, $95.
The Mac Goes to College

Macs are among the most popular computers on campus. Here are a few suggestions for making the Mac fit into any dorm room.

Achieving Your Career
Anyone looking for a new job or career, including college students preparing for life after graduation, will find loads of information and encouragement in Achieving Your Career. The software includes a list of big companies as well as helpful hints for job seeking. There's even a phone number you can call to get free advice from a real person. Up Software; $69. 

Baseball Mousepad
True baseball fans can show their allegiance to the home team with a Baseball Mousepad featuring the official logo of their favorite major-league team. MouseWares; $13.99.

Bloopers
College wouldn't be college without a few pranks, right? With Bloopers, you can booby-trap any Mac in many ways. Make really disgusting sounds emanate from the speakers. Make your roommate's word processor type messages by itself. Or make the victim's cursor drift off the screen, even though the mouse isn't moving. Binary Software; $25. 

The Deluxe American Heritage Dictionary
No self-respecting college student can write term papers without the firepower to look up definitions and synonyms. Here's a Mac-friendly version of the venerable American Heritage Dictionary. WordWise; $399.
of The Deluxe American Heritage Dictionary. In addition to defining 310,000 words (and finding them even if you don’t have the spelling quite right), the dictionary has an option, called Word-Hunter, that lets you work in reverse if you know the definition but not the word. WordStar; $129. 

4 Expert Astronomer
Astronomy students can go stargazing even on the sunniest day of the year with Expert Astronomer, a program that can show you the night sky at any position on the earth at just about any time — past, present, or future. Want to know more about a particular star, planet, or nebula? Just click on the object, and its vital statistics appear. Expert Software; $49.95. 

4 G-VOX Pickup & Belt Pack
The G-VOX Pickup & Belt Pack turns your Mac into a guitar instructor and gives you instant feedback on your performance. The hardware is easy to set up and works with any acoustic or electric guitar. Instruction software (sold separately) provides digital samples of exercises created by pro guitar tutors, who demonstrate technique via animated fretboard diagrams, staffs, and tablature. Additional optional software lets you use G-VOX with MIDI sequencers. Lyrrus; $399; additional instructional software, $16.95 to $149. 

4 The Mac Internet Tour Guide
Most college students have access to the global Internet computer network. But whereas the majority of college Internet users are stuck typing commands into UNIX systems in order to access the network, The Mac Internet Tour Guide shows how Mac users can use Mac programs to connect with the Internet. Once you’re connected, you can download the latest shareware and talk to far-off friends. Ventana Press; $27.95. 

4 NiteCap
Dropping a NiteCap over the top of your Mac shields it from even the dustiest dorm room. And because NiteCaps have cool patterns, like these fish (see photo), they liven up the room while they’re protecting your Mac. NiteCaps; $18 to $22, depending on size. 

4 Now Fun!
Bored with your Mac’s black-and-white menu bar, monotonous backgrounds, and dull cursors? Try installing Now Fun!, a collection of diversions designed to give you complete control over your Mac desktop (and avoid studying). The utilities in Now Fun! enable you to place pictures on your backdrop, animate your cursors, make sounds erupt from your Mac, and even colorize your menu bar. If you’ve ever wanted to hear your Mac snore loudly before it shuts down, this is your chance. Now Software; $69. 

47 SimLife
When it’s time to take a break from studying for the biology final, why not try creating your own life-forms? With SimLife, you can create plants and animals and set them loose on a planet of your making. Watch them evolve, take over the planet, and go extinct. The worst part of the whole experience is that when you’re done playing God, you’ve got to go back to the real world — the one where your biology professor has the power over life, death, and grades. Maxis; $49.95. 

49 SoftWear
People who want to show they’ve been with their Macs through thick and thin can do so by wearing hats and shirts from the SoftWear collection. What could be better than a bomb icon on your head? Simple — a bomb icon and the phrase “Sorry, a system error occurred” on your boxers. These clothes will make you the talk of the campus. Iconz; hat, $10; boxes, $15; T-shirt, $18; sweatshirt, $35; mug, $10. 

49 Who Built America?
Every student of American history will probably be enthralled with Who Built America?, a multimedia CD-ROM featuring the complete text of a two-volume history book, hundreds of pictures, 45 minutes of QuickTime video, and loads of recorded voices and music. (There’s even a copy of the world’s first crossword puzzle!) The subject? America from 1876 to 1914, the period that saw the growth of the United States from a rural backwater into the beginnings of a world superpower. The Voyager Company; $99.95. 

49 Word Torture
Learning a foreign language — especially building your vocabulary in that language — can be tough. Painful as it sounds, using Word Torture is a relatively easy way to learn words in whatever foreign language you’re studying. And if you miss a word, Word Torture doesn’t let you off easy — it repeats it again later, to see if you’ve learned your lesson. Hyperplot; $49.95. 

49 A Zillion Kajillion Rhymes
If you are a frustrated garage-band songwriter or a tender-hearted poet, check out A Zillion Kajillion Rhymes. Now if you really need to figure out what rhymes with banana for your groundbreaking “Ode to Fruit,” you can list all your options in no time: bandanna, hosianna, and vox humana, to name just a few. Eccentric Software; $49.95. 

The Deluxe American Heritage Dictionary

Expert Astronomer

SimLife

Who Built America?
Mac Kids’ Stuff

Here’s a selection of entertaining and educational programs for kids. You might even be able to convince your little darlings that there’s more to life than Nintendo.

52 Bailey’s Book House
Preschoolers can explore reading with Bailey the cat in Bailey’s Book House. Clicking on an object in Bailey’s room takes children on a journey of reading, spelling, and other literacy skills. This colorful, musical program also provides options for parents to guide their children’s learning. Edmark; $49.95.

53 Computer Crayon
Small hands need a small mouse—or maybe a crayon that acts like a mouse. The Computer Crayon does just that, plus it’s available in primary colors or as a dinosaur-green Jurassic Mouse. Appoint; $49.

54 Disney Screen Saver
After Dark, the venerable Mac screen saver from Berkeley Systems, now offers the Disney Screen Saver, a set of modules for kids—and for adults who have fond memories of Disney classics. They’re all there—Mickey, Goofy, the Little Mermaid, even Beauty and the Beast. Berkeley Systems; $49.95.

55 EasyBook
Who says desktop publishing is just for adults? EasyBook lets kids write and illustrate their own books. Besides creating their own drawings, they can “stamp” graphics that come with the program. After the pages print, fold them in half, and you’ve got your young author’s first book. Chickadee Software; $59.95.

56 Kid Cuts
Kids aged 4 through 12 can make everything from paper dolls to rainy-day projects with Kid Cuts (it even includes safety scissors!). Kid Cuts lets you make hats, masks, puppets, and more by clicking on various tools. Print the projects, cut them out, and then decorate them. Broderbund Software; $29.95.

57 The Miracle Piano
Teaching System
Remember when you were young and your mother made you practice the piano...
Today's kids have The Miracle Piano Teaching System. This interactive teaching system uses a Mac, a piano keyboard, and software to teach piano fundamentals. Click on a room in the Conservatory, and choose the lesson you want to practice. The Software Toolworks; $499.95.  

**My Own Stories**

A great tool for creating storybooks — from design to content — is My Own Stories, from MECC. Youngsters aged 8 through 14 can write, illustrate, and publish stories by filling pages with objects, text, color, sound, people, places, and pets. A Spell button helps them proofread, and the Preferences dialog box lets them choose fonts and printing formats. MECC; $49.95.  

**New Math Blaster Plus!**


**Sitting on the Farm**

Sitting on the Farm is an interactive musical storybook on CD-ROM for kids aged 7 through 10. Players can choose to read, write, listen, or sing along in English or French. Buttons in each option let them find out about new words, listen to the song in voice or instrument-only versions, write stories, and more. Sanctuary Woods; $59.95.  

**Stickybear's Early Learning Activities**

Stickybear’s Early Learning Activities provides six activities to help preschoolers learn basic skills such as recognizing letters, shapes, opposites, groups, and colors and counting. Parents choose a Structured or Free Play format: Structured asks them to identify objects; Free Play tells kids the answers. Available in either English or Spanish text and voice. Optimum Resource; $39.95.  

**The Velveteen Rabbit and Other Children's Classics**

The Velveteen Rabbit and Other Children’s Classics is an interactive storybook for children aged 5 and up — complete with sound, music, and illustrations. A question option makes it a great reading-comprehension tool. Queue; $49.95.  

**Wallobee Jack: The Bingi Burra Stone**

If your kids are tired of reading and writing and doing math problems, give them a treat with Wallobee Jack: The Bingi Burra Stone, an interactive cartoon on CD-ROM for kids aged 5 and up. Featuring sound, color, and fantastic animation, it’s like watching a Saturday-morning cartoon, only better, because kids get to play along. Tune 1000; $29.95.  

**Where in the USA is Carmen Sandiego?**

The holiday season just wouldn’t seem right without another addition to the Carmen Sandiego series. This year it’s Where in the USA is Carmen Sandiego? (Deluxe Edition), aimed at kids aged 12 and above. Like the others in the series, Where in the USA has young detectives seeking Carmen and her band of evil cohorts, this time across the U.S. This version features music, beautiful four-color scenes of famous American sites, maps, and a new Chief. Broderbund Software; $49.95.  

**Yearn 2 Learn Peanuts**

With the help of the Peanuts gang in...
Leisure-Time Mac

Here's a roundup of products for new users and Mac home hobbyists.

**At Ease**
Apple's customizable interface At Ease makes the Mac even easier to use than it already is. If you share your computer with others, think about getting this software. It'll save a lot of worry about important files or applications being deleted by other people. You select the applications and files you want accessible, and they appear on the At Ease desktop. Apple Computer; version 2.0, $79.  

**BlackJack Trainer**
Heading to Vegas? BlackJack Trainer will prepare you for the casino (or your weekly card game). You'll get the most out of this program if you already know the game; you can then use Trainer to drill you on strategies, including count values, surrender, splitting, and doubling. ConJelCo; $75.  

**Bliss Saver**
Bliss Saver is a design-it-yourself screensaver that decorates your monitor with animated paintings. The color synthesizer lets you add colors, shapes, and textures with a keystroke. Even with all the paintings loaded, this program takes up only 4 megabytes of disk real estate. Imaja; $49.95.  

**CD Caddy**
Keeping CD-ROMs in a caddy is the best way to eliminate scratches and dust, which can slow your drive's read mechanism. So for the CD-ROM freak who has everything, consider picking up a CD Caddy 5-pack. CD Technology; $24.95.  

**CD-ROM Organizer**
Anyone who has begun collecting CD-ROMs will appreciate the CD-ROM Organizer, which neatly stores 25 CD-ROMs. Organizers can be stacked as your collection grows. Alsoft; $15.95.  

**Daily Tripper**
If you're a Deadhead, this is the program for you. Daily Tripper is a FileMaker Pro-based personal scheduler and organizer that's loaded with features, including hundreds of photos and QuickTime movies starring the Grateful Dead. It's slow and takes up a lot of disk space, but Deadheads won't care. BrainDance Development; $69.  

**LifeSaver**
Preparing your household for medical emergencies is easier with LifeSaver, a CD-ROM containing a complete first-aid course. LifeSaver teaches you how to deal with everything from bee stings to poisoning, with a good dose of CPR on the side. Sony Electronic Publishing; $99.  

**Loon Magic**
Apparently, there are many lovers of that shy waterbird, the loon. Loon Magic is a perfect gift for anyone struck with this admittedly odd affection. This CD-ROM (which includes a special version for kids) contains facts (did you know the loon has red eyes so it can see fish better underwater?), stories, films, pictures, songs, and recorded loon cries. It's spectacular, if a little arcane. Wayzata Technology; $59.  

**Mangia**
In the past, there haven't been as many good recipe programs for the Mac as for the PC, but Mangia may change that. You can use Mangia to file your own recipes and then search for dishes by ingredient, nationality, or course. Mangia also helps you manage your pantry and shopping by automatically creating shopping lists you can print and take to the store. One drawback is that you can't import or scan in recipes. Upstill Software; $49.93.  

**MovieSelect**
If you've ever wandered through a video store unsure of what to take home, you need MovieSelect, a CD-ROM containing information on hundreds of movies. Search by actor, director, or theme, or let MovieSelect do the work for you: Just pick three of your favorite movies, and the program will generate a list of compatible suggestions. Paramount Interactive; $59.95.  

**The New Family Bible**
The New Family Bible is a fascinating historical reference on CD-ROM for anyone interested in reading the best-selling book of all time. The New Family Bible features the Old Testament, and forty stories including the Creation, Noah and the Flood, and Daniel in the Lions' Den — are also told in slide-show format. An audio overview gives you the historical context. Time Warner Interactive Group; $49.99.  

**Parents, Kids and Computers**
If you'd like to be more involved in your
kids' computer use, pick up a copy of *Parents, Kids and Computers*. This book contains information on selecting the right equipment for your youngsters (it covers PCs as well as Macs) and instructions on how to make the best use of the myriad of kids' educational and entertainment products. Random House Electronic Publishing; $20.

### Performa Made Easy
Know someone new to the Mac? In the *Performa Made Easy* tape series, friendly voices walk new users through the process of learning how to use a Mac at their own pace — without the cost of hiring a local whiz kid to spend hours tutoring them. Personal Training Systems; $59.95.

### Seize the Day
If you're going to be organized, you might as well make the process pleasant. *Seize the Day* is a personal scheduler and organizer that opens each day with an inspirational quote. To dress it up, you can choose Living Scenes artwork or add a plug-in module. Shadowcatcher, a collection of Edward Curtis photographs of Native Americans, is the only plug-in module now available, but more should be coming soon. Seize the Day; $59.95.

### The Smiley Dictionary
Spice up your on-line correspondence with *The Smiley Dictionary*. You can add expressions and personality to plain text with simple keystroke combinations, such as ‘-‘ (wink), ‘:‘ (pout), and ‘:‘ (whistle). This book contains hundreds of examples, from basic smiley faces to more-complex smiley characters. Peachpit Press; $6.95.

### Sony SRS PC series
To take full advantage of your Mac's sound capabilities, you need external speakers. The *Sony SRS PC series* of personal-computer speakers are some of the best we've seen, and they're less expensive than most. If you have a CD-ROM drive, external speakers are a must. Sony Computer Peripherals; $79.95 to $199.95.

### TelePort
Much of what's exciting in the computer world is happening on-line, so it's time to get connected. If you don't already have a modem, you should check out Global Village's *TelePort* series (the least expensive is the TelePort/Bronze II). Add an on-line service such as CompuServe or America Online, and you have access to mass quantities of information on topics such as cooking, gardening, investing, and computing. Kids can research school projects on-line and play interactive games with people across the world. Global Village Communication; $109. CompuServe; $8.95 per month for basic service; additional charges for extra services. America Online; $9.95 per month plus connect charges.

### UnderWare
*UnderWare* is a control panel that animates After Dark modules (and its own modules) on your desktop so you can watch flying toasters while you're working in your favorite application. UnderWare also offers its own After Dark-compatible screen saver, although it doesn't run special After Dark modules such as the Star Trek or Disney screen savers. Bit Jugglers; $59.95.
The Mac Arcade

Got a game lover on your list? Here are the best games we could find in the current crop. Most of them are arcade-style games, but we’ve added a few puzzles and simulations to keep things interesting.

Axis: The GameCheater
Getting demolished by Slicers on Spectre Supreme? Need more Diggers on Lemmings? Axis: The GameCheater sifts through a game’s memory allocations and fits the game with a patch. Getting ammo or adding extra Diggers is as easy as pressing a key combination. Axis works with most games, and Baseline plans to release modules to keep up with new ones. Baseline Publishing; $59.95.

Cogito
Cogito is the infamous Apple Puzzle DA on steroids. In it, you return a jumbled geometric figure to its original configuration. Things get complex as the levels get higher — controls get switched, and...
the configuration gets difficult. New Age music adds a soothing touch. Inline Software; $49.95.

Crystal Crazy

Crystal Crazy is guaranteed to be addictive. The premise behind it is the same as that of its predecessor, Crystal Quest: pick up the crystals while avoiding strange creatures and obstacles. But now there are puzzles to put together, pictures to uncover and erase, clocks and statues to smash, and pool balls to put away. Casady & Greene; $49.95.

Eight Ball Deluxe

Finally, a video pinball game that feels like a traditional pinball machine. Eight Ball Deluxe has the arcade sounds, realistic ball motion, and flipper finesses of the real thing — and the ability to tilt the machine. The only thing that's missing is the smoky arcade room. Amtex Software; $49.95.

Heaven and Earth

If action-packed arcade-style games aren't your cup of tea, try Heaven and Earth. It comprises three parts: the Card Game, the Illusions Puzzle, and the Pendulum Toy. This game takes a while to master, which is part of its charm. Buena Vista Software; $59.95.

Iron Helix

Iron Helix is an adventure game on CD-ROM in which Earth is caught in a cold war with aliens. Your mission is to avoid a universal war by stopping a spaceship that's gone awry armed with a deadly weapon. Without any weapons yourself, you must destroy the ship while avoiding the armed guardian probes. Spectrum HoloByte; $99.95.

The Journeyman Project

In the world of The Journeyman Project, time travel and world peace have been achieved. But history has been disturbed, threatening the global tranquility. You are sent back in time to correct what's gone wrong. This game can be glacially slow at times, but the graphics are awesome. Presto Studios; $99.95.

Lunicus

In Lunicus, earthlings find an alien device that displays footage of the Jurassic period. The device also doubles as a way for the aliens to monitor life on Earth. Onboard the Lunicus, you must prevent the aliens from attacking the motherland. If you don't like shoot-'em-ups, this CD-ROM adventure probably isn't for you, but it is one of the fastest games we've seen. CyderFlix; $99.95.

MouseStick II

GamePad

If you're used to the feel of a Nintendo or Sega game pad or like handling a joystick, the MouseStick II or the GamePad is what you need. The MouseStick is best suited for flight or driving simulations; the GamePad is good for arcade-style games. These devices hook into the ADB port and have custom settings for various games (they're not compatible with all games). Advanced Gravis Computer Technology: MouseStick II, $99.95; GamePad, $49.95.

Myst

In Myst, a CD-ROM game by the developer of Manhole, you find yourself on a secluded and mysterious island. You must use the library of Myst and its journals for guidance as you explore the island. This exquisite game has full animation with excellent graphics and is accompanied by an ominously atmospheric soundtrack. Brøderbund Software; $59.95.

Pathways into Darkness

In Pathways into Darkness, an alien god, buried under the earth eons ago, is ready to wake and rule the universe. You must bury it farther into the earth, but you're hampered by creatures from the god's dreams that have come to life and roam the caverns through which you must weave to fulfill your mission. Although each level is different, we found this game a little repetitious at times. Bungie Software; $69.99.

Spectre Supreme

Just like movies, computer games have sequels, and Spectre Supreme — one of the few games you can play with friends over a network — is one of the newest. Arm your tank with an awesome arsenal to destroy new as well old enemies as you struggle to survive and capture flags in an electronic arena. In network mode, six players can participate in several variations of tag, capture the flag, and tic-tac-toe. We liked this game better than Spectre — there's a real feeling of progression. Velocity Development; $69.95.

Star Trek 25th Anniversary

If you've always wanted to run the USS Enterprise, now's your chance. With Star Trek 25th Anniversary, you become Captain James T. Kirk, exploring new worlds in the company of Spock, Scotty, and the rest of the crew. Although we played with a prerelease version, the game (now available) was slated to come complete with voice-recognition commands for use on AV Macs, so you'll be able to say "Fire!" with the same melodramatics as Shatner himself. This program is optimized for 13-inch monitors, so the graphics are low-resolution and are slow on larger displays. MacPlay; $59.95.
Directory

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617-944-3700

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Bellingham, WA 98226
604-431-5020

Allseg
P.O. Box 23
Bellingham, WA 98227
800-426-4033
206-734-9090

America Online
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Vienna, VA 22182
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703-448-9700

Amtex Software
P.O. Box 572
Belleville, ON K8N 5B2
Canada
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Apple Computer, Inc.
20525 Mariani Avenue
Cupertino, CA 95014
800-776-2333
408-996-1010

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4473 Willow Road
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Pleasanton, CA 94566
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510-463-3003

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785 Castro Street
Suite C
Mountain View, CA 94041
415-968-3808

BrainDance Development
70-U Woodland
San Rafael, CA 94901
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Broderbund Software
500 Redwood Blvd.
P.O. Box 6121
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415-342-4400

Buena Vista Software
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Bungle Software
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716-473-1650

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716-724-4000

Eccentric Software
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206-556-8400

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Southampton, PA 18966
215-357-5124

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415-390-8200

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**Quantum 2.5” Drives**

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PocketDrives, less than 10 oz. 21MB mechanism made by Toshiba.

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**SyQuest Drives**

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It’s hard to beat the safety record of optical drives. La Cie’s Optical Drive uses cartridges the same size as 3.5” floppies, but store almost 160 times more. They deliver speed and reliability at a price that’s hard to beat. And that’s not all; each drive includes award-winning Silverlining ($149 free value, Bobker’s Dozen) and one free cartridge ($45 value).

**128MB Optical Drives**

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**Silverscanner II**

Silverscanner II makes scanning as quick, painless and productive as possible. With features like dynamic color preview (16 sec.), magnify in preview, proof in preview, savable scan setting, up to 400% scaling in 1% steps and up to 1600 dpi in 1 dpi steps—all in one pass. It’s easy for the beginner and powerful for the advanced user. And it’s Macworld’s Editor’s Choice.

**Silverscanner II**

All Silverscanners come with our powerful Silverscanner software and Read-It O.C.R. Pro.

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**Quantum, Direct From Quantum**

Mon.-Fri. 5 a.m.-7 p.m. & Sat. 8 a.m.-noon PST

International 503-520-9000 Fax 503-520-9100 (24 hrs.) UK 0800-89-3025 Australia 014-800-123-007 VISA & MasterCard accepted with no surcharge. COD not accepted. Printed In U.S.A.
With La Cie’s PocketDrive, you can enjoy the convenience of our exclusive T-connector or PocketDock, the desktop accessories that make connecting and disconnecting your PocketDrive a breeze. La Cie’s PocketDrive comes with our unique T-connector which allows you to snap it to almost any Mac. Our optional PocketDock gives you quick, instant desktop connectivity. Our “T” and “dock” have built-in active on/off SCSI termination, SCSI ID and a pass through SCSI connector, so you can leave them in your SCSI chain, even when your PocketDrive is on the go. At just under 1.0 ounces, and storage up to 213MB, you can cruise anywhere with your files in the palm of your hand.

40MB PocketDrive
$269

“Lightweight, portable, well-designed, these external drives are a great option.”
Macworld, February 1993

Smooth sailing with PocketDrive.

Quantum 2.5” Drives

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<th>Size</th>
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PocketDrives, less than 10 oz. 213MB mechanism made by Toshiba.

Easy to port: OURS
- Can be used with any Macintosh.
- Built-in switchable active termination.
- Easy to move drive without disturbing SCSI chain.
- Smallest drive chassis.
- U.S. and world-wide universal AC adapters available.
- Award-winning industrial design.
- Silverlining hard disk management software with auto drive spin-down.
- Macworld “Editor’s Choice” and World Class Awards.

Hard to port: THEIRS
- Internal termination does not meet SCSI specifications.
- Moving drives requires reconfiguration of the SCSI chain, some models must be last in SCSI chain.
- AC adapters not readily available.
- Generic design.
- Does not have Silverlining features and benefits.
- No awards.

800-999-
Deep blue see.

Silverscanner II is many lightwaves ahead—with gorgeous color, gray scale and line art right out of the box. Independent color controls (RGB) on the gamma/contrast/brightness help you get rich, clean scans with excellent detail and tonal range in highlights and shadows. And with new advanced features like a densitometer, white and black limit, color histogram and auto image adjustment, Silverscanner II is unsurpassed. Navigation is easy, and precise for demanding mariners.

Silverscanner II

$1599

"...[Silverscanner] can deliver color performance that surpasses anything else in the less-than-$2,000 price range, including the popular ScanJet IIC from Hewlett-Packard Co."  
MacWeek, May 1993

"...Fast and a pleasure to use. ...Produced high-quality printed images with good resolution, and its documentation was tops."  
Macworld, November 1993
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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.

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 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 9.5 (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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Film cost of $60 based on 4 pieces of 4x5 film from service bureau. No match print included.

CIRCLE 159 ON READER SERVICE CARD.
The undead: Just when you thought it was good and buried, PixelPaint Pro3 is given new life by its original developer, Pixel Resources, after years with SuperMac Technology. Re-written from the ground up, PixelPaint Pro3 may give products such as Fractal Design’s Painter a run for their money and at a larcenous price of $379. Pixel-Layers lets you keep multiple floating selections active simultaneously. You can manipulate and mask layers independently and then save them with a file until you paste them permanently. The program includes an arsenal of special lighting and glass effects; a library of paper and surface textures; and a mess of pressure-sensitive brushes, including an Impressionist brush (just once, I’d like to see a Suprematist brush). Oh, yeah: The program supports Photoshop plug-ins and pressure-sensitive tablets, and it does color correction too. 404-449-4947.

Under pressure: Getting the most out of your image-editing and paint software these days requires a pressure-sensitive graphics tablet. In the past, many artists balked at the thick tablets and heavy stylus. Thankfully, that’s changed with the new generation of tablets, such as CalComp’s DrawingSlate and Wacom’s UD-1212. If you want a tablet of extremes, check out CalComp’s Drawing-Slate family. Available in three sizes, from 6 x 9 inches to 12 x 18 inches, the tablets, which look like a rigid mouse pad, are ultrathin (¼ inch) and superlight (less than a pound for the 6-x-9-inch model) at a slim price (starting at $395). The 16-gram two-button pen detects tilt and 256 increments of pressure. 602-948-6540. What’s neat about the Wacom UD-1212 is that it allows you to use a stylus and a four-button mouse (or puck) simultaneously, giving you great flexibility and control. Its physical specifications are impressive too. Although the 12-inch-square tablet is 1.3 inches thick, the batteryless UltraPen tips the scales at a mere 8 grams. 800-922-6613 or 206-7500-8882. $695.

Type drawer: With almost 100 years under its belt, Monotype has one of the most extensive and beautiful font collections in the world, including Gill Sans, Perpetua, and Ellington. Now you can get them all — 600 fonts — on an unlocked CD-ROM for $1,999. Sets of 84 and 205 fonts are available on floppy disks for $499 and $999, respectively. 800-666-6897 or 312-855-1440.

Get it: Aldus Fetch was pretty good, but now it’s even better. Version 1.2 can handle as many as 100,000 images per catalog and provides direct support for 38 file types, including Targa and GIF files, through the included Apple EasyOpen filters. With its ability to show thumbnails of text-document files, Fetch moves beyond the niche of image-database programs. It can retrieve and preview anything, including Word, PageMaker, and QuarkXPress documents. This update is far more robust than its numerical extension suggests. Best of all, the update’s free; list price, $295. 206-628-2320.

By Pamela Pfiffner
PrecisionColor Pro from Radius is the fastest 24-bit color graphics card available. Not in one category, not in just a few functions, but in overall performance.

So instead of sitting, waiting for your Mac to catch up to your mind, you can scream ahead with all the speed and elegance your Mac can deliver.

PrecisionColor Pro is up to 26% faster overall than the self-proclaimed “fastest” graphics card—Thunder II. Up to 67% faster overall than Thunder/24. And as much as 3000% faster than your unaccelerated Mac.

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This new card is the only high-performance graphics card that fits in all Macintosh NuBus systems. And it’s fully compatible with a wide range of monitors, including our new IntelliColor/20 display.

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Just $2,499. Fully backed by our Worry-Free Warranty, with overnight replacement. So now you can really scream through your color publishing work, because with PrecisionColor Pro your creativity doesn’t have to wait.

And to really accelerate Photoshop; there’s our new PhotoBooster with the most advanced twin DSPs, to help you run your production functions up to 10 times faster than a Quadra 950, for only $999.

For complete details and the name of your nearest Radius reseller, call 1-800-227-2795 Ext 101B. Or call us now at 1-800-966-7360 to receive faxed information.

Get the PrecisionColor Pro and PhotoBooster combo. And start screaming with your Mac.

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CIRCLE 68 ON READER SERVICE CARD.
Got an idea for a hot new 'zine but your budget can't handle the burden of printing and distribution? Or maybe your ecological ethics balk at chewing up trees. Or perhaps you're just intrigued with the idea of publishing in the bitstream. Whatever the reason, many publishers are looking for ways to distribute their pages without paper.

Paperless publishing is in vogue these days, thanks to recently released products such as Adobe Acrobat, No Hands Software's Common Ground, and Farallon Computing's Replica. These products promise a paperless paradise in which a universal cross-platform document format makes distributing documents on-line a snap. This may pique your interest, but what if the price for this new technology is more than you're willing to pay? The Adobe vision of a paperless future, in particular, isn't inexpensive. What are your alternatives, if you want to launch that hot new 'zine into the nets of cyberspace without taking out a second mortgage on your house?

Leave it to those entrepreneurs who inhabit the on-line universe to come up with simple yet powerful alternatives that can be had for a song. Several shareware programs are available that make distributing on-line publications — from simple Read Me files to full-fledged electronic magazines — a practical proposition. Which product you adopt depends on whether you want graphics in your publication (choose among Print2Pict, DOCMaker, and Belgian PostCards) or whether text-only will do and on whether a document must be viewed across computer platforms (choose Easy View) or just on the Mac. Yet another alternative includes saving your layouts as PostScript files (see the "PostScript Alternative" sidebar). Even if you don't plan to use an on-line service as your publishing medium, these programs may be the answer to your document-distribution dilemma.

One warning: The Achilles' heel of document distribution is automatic font substitution — a problem the commercial products have all addressed, albeit each with a different solution. These shareware programs don't provide any similar capabilities, although Belgian PostCards takes a stab at it. If font fidelity is important to you, use a commercial product or stick with paper.

Each of these programs is available through on-line services. On ZiffNet/Mac, look for them in the Download & Support Forum (GO ZMC: DOWNTECH).

Print2Pict

Of the programs examined here, Print2Pict ($10), by Baudouin Raoult, comes closest to commercial products such as Acrobat and Common Ground. Like those products, Print2Pict is a Chooser printer driver. Essentially, it acts as a virtual printer that captures your pages' text and graphics as PICT previews to a self-launching document (see Figure 1). Print2Pict saves print jobs to other formats, including...
Since 1984, the original Mac mail-order source. Over 3500 products. Companies with Money Back Guarantees are highlighted with *.

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- Applied Engineering ... 30 day MBG
- AutoAdapt, 69. 8800 Battery Charger 65.
- Battery Technology, Inc. ... 30 day MBG
- 140-180 Battery .. 59. 10392 Charger .. 65.
- Connectix ... 30 day MBG
- 10765 Virtual 3.02.. 55.
- CPU/Virtual Bundle ... 69.
- Dove Computer ... 30 day MBG
- 5383 DoveFaxPB ... 99.
- Global Village ... 30 MBG
- PowerPort/Silver... 319. 7710Gold.. 369.
- I/O Design Cases ... 30 day MBG
- PowerBook SL 52. 8113PowerBook EX 59.
- Kensington ... 30 day MBG
- 11552 NoteBook Traveler Compact ... 49.
- 1092 Deluxe..... 75. 9585 Executive...... 115.
- 5976 NoteBook Keypad ... 79.
- Prometheus ... 30 day MBG
- 11965 Ultima Home Office-Powerbook ... 289.
- Sophisticated Circuits ... 30 day MBG
- Symantec ... 60 day MBG
- Norton Essentials for PowerBook 1.1... 87.
- Targus ... 60 day MBG
- 11207 Leather PB Case 95. 1305 Universal 69.
- 7369 Notepad 35. 6037 Premier Leather Case 169.
- Thunderware ... 30 day MBG
- 3841 Lightning Scan Portable ... 399.

NEW!

Frame Technology

- FrameMaker 4.0 ... 599.
- IdeaFisher Systems, Inc. ... 289.
- IdeaFisher 2.0 ... 95.
- Inspiration Software ... 30 day MBG
- 11269 Inspiration 4.0..... 185.
- Intuit ... 30 day MBG
- 11845 Quicken 4.0... 39.95
- Lotus Development ... 60 day MBG
- MECA
- 2796 Managing Your Money 5.0... 32.
- Microsoft ... 30 day MBG
- 2884 Works 3.0.. 155. 3669 Excel 4.0... 295.
- 4902 Word 5.1.. 2079 PowerPoint 3.0 ... 295.
- 5255 Project 3.0 ... 445. 5542 MS Office 3.0 ... 475.
- Niles & Associates ... 30 day MBG
- 4602 EndNote 1.6... 85. 8010 Plus 1.3... 142.
- Noto Press ... 30 day MBG
- 2981 WinMaker 4.0 ... 1204 Living Trust 43.
- Now Software ... 30 day MBG
- 1793 Norton Antivirus ... 2366 (10 pack) 519.
- Palo Alto Software ... 60 day MBG
- 6975 Business or 4963 Marketing Toolkit ea. 75.
- Pailet Development ... 30 day MBG
- 1785 DayMaker 2.03 ... 79.
- Peachtree ... 60 day MBG
- 9588 Insight Accounting 299. 9584 PAM 2.0 115.

U.S. Robotics
- 11841 WorldPort 14.4 Fax ... $359.
- Utiliton, Inc.
- 3013 PowerSwap (Switch batt. w/ shutdown) ... 25.
- Zoom Telephonics ... 30 day MBG
- 10737 FaxModem PBK ... 77.

DAILY BUSINESS

Abacus Concepts
- 7105 StateView 4.0 439. 5840 SuperANOVA 369.
- ACIUS
- 5618 4th Dimension 3.04 ... 1075.
- Advanced Software ... 30 day MBG
- 8051 InTouch 2.0... 9049 DocuComp II ... 99.
- Aldus ... 30 day MBG
- TouchBase or DataBook Pro ea. 49.
- 8614 TouchBase Pro/DataBook Pro w/Quicken 4.0.
- Arial Corporation ... 60 day MBG
- 6965 IN CONTROL 65. 11545 with Dynodex 99.
- Atticus
- 12978 Atticus Vista ... 45.
- Avery ... 60 day MBG
- 7446 LabelPro 1.0.1 ... 48.
- BaseLine Publishing ... 30 day MBG
- 8881 Thunder 7 1.5.3 ... 55.
- CheckMark Software ... 60 day MBG
- 5683 MultiLedge 3.0. 5862 Payroll 5.1 169.
- Claris ... 30 day MBG
- 5630 ClarisWorks/Quicken Bundle ... 199.
- 3836 FileMaker Pro 265. 11202 MacWrite Pro 169.
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Special Bundle with Quicken 4.0 thru 12/31/93
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- ProVUE ... 60 day MBG
- 4582 Panorama II 239. 11540 PowerTeam 95.

- Reality Technologies ... 30 day MBG
- 12331 WealthBuilder w/Free ZMXX MM 69.
- 7696 Calendar Creator or 7693 Address Book + 40.
- State Of The Art Accounting
- 3041 Mac P&L 4.0 ... 175.
- 9584 PAM 2.0 ... 115.
- 7636 ACTI 160. 10317 ACTI Comp. Upgrd. 79.
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- WordPerfect
- 4258 WordPerfect 3.0 299. 4711 Upgrade 55.
- 11720 WP Works/Quicken/QuickDEX II special 99.
- WordStar ... 30 day MBG
- 7684 WriteNow with Correct Grammar 3.0 ... 42.

GRAPHICS & DESIGN

- Abracadata, Ltd. ... 30 day MBG
- 12083 Design Your Own Railroad ... 39.
- Architecture, Interiors or Landscape 48.
- Adobe Systems (full line available)
- 8193 Adobe Audition ... 189.
- 12724 Acrobat Starter Kit (1 User) ... 689.
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- 10167 Adobe Dimensions 93. 5001 Streamline 119.
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- 11843 Illustrator 5.0 368. 6644 Photoshop 548.

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<td>Apple Macintosh Power Book Duo</td>
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QuickTime (with the help of a third-party shareware extension), but its self-launching file format, called postcard, will be of the most interest to people who want to distribute files on-line.

Print2Pict postcards protect on-line publishers from having to worry about the format in which to send files. You simply create your publication in your favorite word-processing, page-layout, spreadsheet, or database program and then choose Print from the File menu. The postcard, with all of its formatting and graphics intact, becomes instantly accessible to anyone with a Mac, whether or not they have the program in which it was created. An added benefit is that Print2Pict postcards tend to compress to far smaller sizes than would have been possible with the original page-layout documents. For example, a 2-megabyte PageMaker document that compressed to 1 megabyte shrank to 400K when we converted the original to Print2Pict postcard format and then compressed it. And in the world of on-line distribution, smaller is definitely better (for more handy tips, see the “Pointers for On-Line Publishing” sidebar).

Recipients can view postcards on-screen or print them on any printer. The postcard format lets them easily navigate to various parts of the document by using the Index menu, which lists the sections of the postcard like the chapters of a book. Option-clicking on any page adds it to the Index menu. Users can create hierarchical menus from the main Index-menu items and can jump from page to page by using the Page menu or go to a specific page number by using a pop-up dialog box.

Print2Pict is an exquisite program in most respects. On the negative side, however, Print2Pict postcards are not cross-platform. Like all but one of the programs mentioned here, Print2Pict is Mac-only. And as expected, you must use fonts you’re sure recipients also have installed or postcards will display and print incorrectly.


**DOCMaker**

Mark Wall’s DOCMaker ($25) takes a different approach to the problem of distributing documents. Unlike Acrobat and Print2Pict, which are printer drivers, DOCMaker is itself an application. A bit like TeachText on steroids, it lets you compose and format a document that has as many as 30 chapters (32K each). You can place as many as 20 graphics in each chapter and can also import text files created in other programs and format them in DOCMaker. The program supports styled text (including control over type color), and you can save text formatting as styles, just as with many word processors. In addition, DOCMaker lets you create footers and page breaks.

Once you’ve created a document, you have several options. You can save it as a self-launching application so that any Mac user can open the document and view or print it without any special software. This type of DOCMaker file works just like a Print2Pict postcard. When you save in this format, you have the option of creating a table of contents, a footer, a customized About box, or Print or Find commands. You can also add a command that lets recipients export the file’s contents as text.

DOCMaker is an excellent piece of software and was recognized as such with an honorable mention in MacUser’s 1992 Shareware Awards (see “The MacUser Shareware Awards,” September ’92, page 152). It’s not uncommon to find lowly Read Me files or even snazzy electronic periodicals — such as the outstanding Inside Mac Games (see Figure 2) —
distributed as DOCMaker self-launching documents. If the choice is between TeachText and DOCMaker, the latter
wins hands down. Its primary disadvantages are familiar ones: It's Mac-only, and you're restricted to using such com-
mon (read boring) fonts as Helvetica and Times if you want them to display correctly on other people's Macs.
Mark Wall, Green Mountain Software,

The PostScript Alternative

On-line publishers turn to the text-only format for a good reason: Plain ol' ASCII is just about the only thing all
computers understand. But if you want to impress people by showing them a graphics-laden publication created with
your favorite page-layout program, you need to find another way.

One language that lots of printers have in common is Adobe's PostScript page-description language (PDL). If the
people you need to reach have a PostScript printer, you can send them a file they can download and print. Creating
a PostScript file is as easy as printing one. When you print to a PostScript printer, you actually translate your docu-
ment into PostScript code and send the code to the printer, which interprets it and prints pages. When you print to a
PostScript file (the option to print to a file appears in the Print dialog box if you're using LaserWriter 7 or later and
in many application drivers as well), the text that would usually go to the printer goes to a text file on your disk inste-
ad. Then send it away for others to print. (Mac users can use Apple's LaserWriter Utility or Adobe's SendPS to send these PostScript files to their printers.) People who don't have PostScript printers can use Custom Applications' Freedom of
Press, which translates the PostScript for display and printing.

This process does have drawbacks. The big one is file size: Because your PostScript file must contain printer commands as well as text, it's a lot bigger than a plain-text file. Graphics increase the file size even more. Creating a PostScript file doesn't protect you from font problems either. If the people at the other end don't have the fonts you used when creating your file, all they'll see is Courier or some other unattractive font their printer has substituted. You can include font informa-
tion with your PostScript file, but doing so expands the file size even more, because you're sending entire fonts along for the ride. Use only the four fonts that just about every PostScript printer knows: Times, Helvetica, Courier, and Symbol.

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**ASCII, and Ye Shall Receive**

Print2Pict, DOCMaker, and Belgian PostCards each let you distribute text and graphics but restrict you to sharing your files with Mac users. If you want files that can be easily read on PCs as well as on Macs, you need to look to text-only alternatives—and that means abandoning graphics. Don't look to Apple's TeachText to solve your cross-platform document-distribution problems, by the way: The text files it creates don't include the line feeds and line breaks that are essential if you want to save files in the text-only format the DOS and Windows side of things can digest. The OS/2 System Editor opens and displays TeachText files nicely, but TeachText files without line feeds usually appear in DOS or Windows applications with their paragraphs jumbled up.

Several excellent text editors are available that enable you to add line feeds to your documents, including the commercial program Vantage, from Baseline Publishing, and the shareware program BBEdit Lite (free), available on ZiffNet/Mac as BBLITE.SEA, in Library 1 (Applications).

**Setext and Easy View**

The problem with text-only files, of course, is that they're boring. Readers must scroll around the entire document to find sections of interest. And there's no way to jump back to a particular section later. But a variant of text-only, called...
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Pointers for On-Line Publishing

- Fonts don't travel well. Settle on fonts your readers are likely to have, or design with font substitution in mind.
- For text-only files, limit yourself to the lower 128 ASCII characters. On the Mac, that means forgoing any characters you get by using the Option or Command key, such as em dashes and smart quotes.
- Smaller is better. Large, complex files are costly to your subscribers, who pay by the minute to download them. Use compression, and keep large graphics to a minimum.
- For smaller files, stick to black-and-white graphics. Optionally, distribute both a color and a black-and-white version. That way, your readers can decide if the color is worth the extra download time.
- When compressing files, use a popular compression format. If you distribute to both DOS and Mac users, either post two compressed versions (one in ZIP format for DOS-heads and one in Stuffit or Compact Pro format for Mac users) or use a format that DOS as well as Mac people can use, such as Tommy Brown's ZipIt for the Mac.

― Pamela Pfliner

Setext (structure-enhanced text), can turn regular text-only files into something more sophisticated.

Setext files are ordinary text-only files users can open with any text editor or word processor, but they include unobtrusive formatting tags (which you manually add to the text) that become important if the files are opened in a setext viewer instead. In a regular word processor, a setext file looks like any other text file. The tags usually appear as simple underlines. But if you open the file with M. Akif Eyler's Easy View setext viewer (free), the tags force Easy View to present the file in a structured format (see Figure 4). Chapters and sections are listed in panes at the top of the Easy View window, and you can easily navigate the document by clicking on a chapter or section name. It's a lot easier than scrolling blindly through a file.

At present, there are no setext viewers available for DOS and Windows users, but by the time you read this, non-Mac setext viewers should be in circulation, making setext an excellent text-only cross-platform distribution method.

M. Akif Eyler, Bilkent University, 06533 Ankara, Turkey. Available on ZiffNet/Mac as EASYVW.SEA, in Library 1 (Applications).

Contributing editor Gregory Wasson is the author of MacUser Guide to Shareware. He's also the chief sysop of the ZiffNet/Mac Download & Support Forum and can be contacted at 72511,36 through either ZiffNet/Mac or CompuServe.

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Figure 4: When viewed in a word processor, a setext file contains simple underlines that serve as special formatting tags (a). Now look at the same file viewed in the setext viewer Easy View (b). The tags enable the viewer to show the text-only file as a structured document with chapters and sections.
The Gaussian Glow

You’ve heard about Gaussian blur a zillion times, but did you know about Gaussian glow? Here’s how to use Photoshop’s channel operations to add a new glow to your images.

By Kai Krause

In the October issue, we examined some complex combinations of what I call channel operations, or chops for short (see “More Algorithmic Painting” October ’93, page 127). This month I’ll outline a simple, yet powerful, procedure that yields unusual halo and glow effects in color images.

This procedure is another example of what I call algorithmic painting—that is, creating images not by using drawing tools but by controlling processes. This technique should also point you in new directions for using applications such as Photoshop, Painter, and PixelPaint Professional. And I hope it will encourage you to explore the virgin snow of advanced imaging.

In principle, algorithmic painting works with any image of any size, in color or gray scale. For this example, I’m using a 400-dpi RGB PICT image of an eye taken from a Photo CD image (see Figure 1).

Making It Glow

Creating this Photoshop effect requires three components—a mask and two source images—so the first step is to create two copies of the original image, by using Duplicate (under Calculate, on the Image menu).

The first copy will serve as the source of the desired soft-halo and -glow areas. To get that effect, apply the Gaussian Blur filter (under Blur, on the Filter menu). Think of this image purely in terms of its glowing nature, which means it can—indeed, it should—be blurred to smithereens, something you may have rarely done before. In this example, I applied a Gaussian blur of 27, with extreme results (see Figure 2).

Let’s move next to the second copy of our original image: We need to turn this one into a gray-scale image. Convert it from RGB to gray scale by selecting Grayscale from the Mode menu (when Photoshop asks if you want to discard color information, click on OK). Your whole screen will appear in gray scale, but don’t worry about that.

With me so far? Good, because here comes the central idea of the technique: You isolate regions of this gray-scale image until these areas become either black or white. This simplified version of the image will be used as a mask in the Composite channel operation, which combines the original image in some areas with the blurred image in other parts. The result can be beautiful subtle halos, glows, auras, and such, all of which can be meticulously controlled.

Creating the Mask

Creating the mask hinges on modifying the gray-scale copy by manipulating it with the Levels control.

In this example, I used the Levels control (under Adjust, on the Image menu) and moved the three Input Levels triangles close together and to the left (see Figure 3).
Figure 3). What we want to achieve here is an image whose full range of grays are compressed into a nearly black-and-white coarse mask, which we’ll use in the next step.

I wanted to isolate a part of the image that was recognizable but grossly posterized. As you see in Figure 4, the inside iris, eyelid, and eyebrow are now nearly solid black and the rest of the image solid white.

You can achieve a similar effect by using Threshold or Curves or doing other manipulations, but it’s not as important for you to follow the exact steps here as it is to understand the reasoning behind them. You may well find new regions to explore by not following my example too closely.

Applying the Mask

So far, this is akin to chef Wolfgang Puck chopping up all the ingredients and putting them into little bowls. Now for the magic of throwing them all together: Open Composite (under Calculate, on the Image menu).

As you see in Figure 5, the Composite dialog box shows two source images and a mask. The logic is simple: Where the mask is white, you get the image that’s in Source 1; where it’s black, you get the image in Source 2. That’s it.

Let’s set it up: The gray-scale mask image from Figure 4 is in the middle pop-up menu called Mask. The two sources — Figures 1 and 2 — are the blurred image (Source 1) and the normal image we started with (Source 2). Be sure that the channel pop-up menus for the source images show RGB (or CMYK, if you’re working in that mode), not just the red or black channel, for instance.

When you click on OK, you get the result, shown in Figure 6. Where the mask is black, in the eye details, you get the clean, sharp original; where the mask is white, which is everywhere else, you now see the smooth, blurred areas. I did not make the mask totally hard-edged black-and-white but left shades of gray, so the two source images mix together softly.

The result is cool, soft, subtle, and exceedingly hard to achieve with any other technique — forget about manually applying blur tools or brushes.

Beyond the Glow

Let’s step back a little. There are many ways to go from here, so let’s try some variations on this theme. For one, simply swapping the images in Source 1 and 2 creates a different look (see Figure 7). This time the white areas of the mask carry the original, and the eye details in the black areas are soft and cuddly.

In fact, you can think even more abstractly. The two images being brought together via the Composite chop can be anything at all! One source can be inverted, and the other can be diffused; one can be pointillized, and the other can have Find Edges applied to it. Who’s to say what’s right and wrong, and who knows how it will look? If you think you know, just try it. You may end up with some killer surprises staring right back at you.

Here’s another tribute to the power of chops. If you use a simple Difference chop (under Calculate, on the Image menu) on the two glowing images you just created and then add a little color correction (aw, just play around — try clicking on the Auto button, under Levels, for instance), you may get something that looks like . . . gulp . . . this (see Figure 8).

When you use this technique someday — and you will — and it’s the next award-winning poster, send me a note on America Online, where we have talked about these things for a couple years.

One last tip: The Mac has an off switch. Once a week, use it.

Kai Krause has been using Photoshop since before it was in beta. He conducts a Photoshop forum on America Online (keywords KPT Support) and is vice president of research and development of HSC Software, which publishes Kai’s Power Tools, plug-in modules for Photoshop.
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One-slot wonders: So, you gambled that you wouldn’t need a multiple-slot Mac — and it looks like you’ve lost. You want an accelerator card and Ethernet connectivity, plus maybe an external monitor, but your Classic, SE, or LC just doesn’t have enough slots. Or does it? Applied Engineering is now offering Ethernet cards that are actually daughterboards for its TransWarp line of accelerator cards, so you can get Ethernet onboard without sacrificing an extra slot. According to AE, these $129 Ethernet cards are compatible with Apple’s Ethernet drivers. And if you want both Ethernet and external video on the same daughterboard, AE can sell you that too — it’s called the VideoX — for $499. 800-554-6227 or 214-241-0055.

SLIPpage: ARA isn’t the only game in town for remote network access from your Mac. If you predominantly use TCP/IP service, check out one of the three SLIP products (a triple-SLIP threat?) that work with MacTCP to give you an Internet connection over standard phone lines from your Macintosh. VersaTerm SLIP comes with the VersaTerm products, from Synergy Software (215-779-0522), of which VersaTilities 1.1 is the least expensive, at $145; it includes MacTCP, SLIP software, and numerous other useful TCP/IP tools for the Mac. InterCon (703-709-9890) offers its SLIP product, InterSLIP, free to owners of all InterCon products; InterSLIP is available over the Internet via ftp at the address ftp.intercon.com. MacSLIP 2.0, from Hyde Park Software, costs more than InterCon’s product, but anyone can buy it. It’s $49.95 per copy ($22.95 to upgrade from version 1.0); volume discounts are also available. Sales are handled through TriSoft, at 800-531-5170 or 512-472-0744.

By Stephan Somogyi
MicroNet’s Raven-800. Disk Array Power For The Quadra 800/840av.

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Circle 114 on reader service card.
If you spend too much time browsing around your server for important files, let Apple’s new utility AppleSearch find your data for you — it can even automatically search on-line services.

By David Beaver

The Information Age is here, and we’re all drowning in data. Even a small business can find itself creating hundreds of new documents every week, and the electronic on-line services, such as CompuServe and America Online, can pump a huge amount of data into our computers. The result? Many of us have file servers full of documents, but we can’t find the information we need.

Sure, you can find files manually by plowing through folder after folder, but for maximum efficiency, you should try using a full-text-indexing program, such as Apple’s new AppleSearch or ON Technologies’ On Location. Full-text indexing creates a list of the locations of almost all the words in every document, much like the index at the back of a book. When you ask for a word, the application looks through the index it’s created and tells you the locations of the word you asked for.

Unlike single-user programs such as On Location, AppleSearch brings full-text-indexing technology to multiple users on a Macintosh network for the first time. AppleSearch can show you, in seconds, a list of all the documents on a server that contain any string of words you specify. But that’s not all — you can even use it in conjunction with on-line news services, such as those available on CompuServe and America Online, to automatically create your own electronic newspaper filled with articles preselected according to your criteria (see Figure 1).

Installing AppleSearch

AppleSearch uses a client/server architecture, devoting one central Mac (the server) to the task of storing and searching for data. Users can access the server with AppleSearch’s client software, which is installed on their Macs.

The AppleSearch server software works with the AppleShare file-server software and can be installed on any Mac that’s running AppleShare 3.0 or 4.0 or the new AppleShare Pro, which is designed for the high-end Apple Workgroup Server 95. You can also use AppleSearch with a network-shared folder via System 7’s built-in file sharing. Unfortunately, you can’t use AppleSearch on a NetWare for Macintosh volume connected to a PC NetWare server.

If your network includes an AppleShare file server, installing AppleSearch is simply a matter of running a standard Apple Installer. During setup, the administrator can decide which folders on the server will be indexed and who on the network will have access to them.

After you’ve installed the software, AppleSearch must build an index of the documents in the folders you’ve selected. Be prepared: You’ll need lots of disk space, so you may have to buy a bigger hard-disk drive to accommodate indexes. AppleSearch indexes use about as much disk space as the original source documents, because they include almost every word in most documents (“stop words,” such as and the, are filtered out, and verbs are reduced to their root forms). In addition,
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Figure 1: Imagine turning on your Mac each morning and being presented with a summary of articles collected from on-line news sources. We asked AppleSearch to show us articles that appear daily about database programs. Here’s the report for August 23, 1993.

building the indexes the first time requires temporary disk storage of about 15 megabytes for every 10 megabytes of source data. The temporary storage space is freed after the index has been built. Indexing can also be done — slowly — if less space is available. It’s a good plan to use a separate hard drive to hold the indexes.

Once the initial index has been created, AppleSearch automatically indexes any additional documents placed in its folders, on a schedule the administrator sets. Because AppleSearch includes the Claris XTND and DataViz MacLinkPlus file translators, it can extract the text from most popular word-processing files as well as page-layout files such as those created by PageMaker and FrameMaker; it can also extract non-formula text from Excel. You can add additional translators to index other types of files.

One of AppleSearch’s most useful features is that it can index data on CD-ROMs too, letting you find data on a CD-ROM quickly. If you create your own CD-ROMs for distribution, consider including an AppleSearch index on the
Using AppleSearch

Once the server is running, using the AppleSearch client application to search for documents is simple: Just type a few words and click on the Search Now button, and after a few seconds, AppleSearch returns a list of all the documents on your server that contain those words (see Figure 2). The list is sorted in order of relevance; the system attempts to ascertain which documents meet your request most closely, based on complex formulas that account for the number of times the words appear, how close they are together, and other rules.

For complex searches, AppleSearch uses Boolean operators. For example, you can search for President W/2 Clinton to get all the documents in which the word President appears within two words of the word Clinton (some examples are President Clinton, President Bill Clinton, and President William Jefferson Clinton). You must memorize the syntax of the eight available commands, including NOT (which means "exclude documents that have this word") and wildcard operators (? for any one character and * for any sequence of characters). You'll probably find yourself starting with a simple request, but if it is too general and returns too many documents, you can combine operators into very complex statements to get a shorter list of documents.

Once you have a list of documents, you have three choices: You can view the text on your screen, you can save the text to your hard disk, or you can copy the original source document to your disk.

It's at this point that AppleSearch's limitations start to show. For example, it can't open the original document, so if you want any of the original formatting, you must open the document manually. And you can't delete or copy a file directly from the list AppleSearch gives you. Instead, you have to open the file-server volume from your Mac's Finder and select the documents manually.

Automatic On-Line Searches

One of AppleSearch's most exciting features is that it can act as a powerful filter on an incoming stream of data from an electronic news service or other source. For example, you can set up AppleSearch to retrieve Dow Jones articles on mergers of midsize European fruit companies. To do this, you save Reporter files that contain search criteria on the server. AppleSearch runs searches at regularly scheduled intervals to find any new documents that have been added since the search was last run and that meet your search specifications.

AppleSearch alone can't gather online data: You need communications software such as Software Venture's MicroPhone Pro, which can be programmed to connect to the source and download files into the folders used by AppleSearch. But AppleSearch can automatically index these new documents, and your Reporters can have the documents you want available to you the next morning in a newspaper-like document (see Figure 1).

This might be useful for investors who want to see all the news stories on certain companies or for doctors who want to keep up with any new pharmaceutical announcements on the business wire, for example.

AppleSearch costs $1,799 for a server and five clients, and $499 buys you ten additional clients. APDA's developer's kit ($299) lets you build AppleSearch into your own software; for information, call the Apple Network Information Line at 408-882-3385.

Full-text-indexing technology has been used for a long time on high-end workstations, and it's about time Mac network users had such a capability. AppleSearch still doesn't have some of the features available on workstation systems, such as versioning, which resolves the confusion created by having multiple versions of a document on a server. AppleSearch would also be much more useful if it were integrated with the Finder, so you could open or delete original documents from within AppleSearch. Even so, AppleSearch does provide an inexpensive and easy method for quickly finding the information you need, letting you avoid the onerous task of getting to know every file on a server.

David Beaver is president of The Automation Group, a San Francisco database-management consulting firm.
You asked them to give you the file on a disk.
But the floppy they handed you was formatted for an IBM PC.
Worse yet, the file was created by a program you don’t have.
So what kind of gyrations do you have to go through now? None at all, if you’ve installed AccessPC.
All you need to do with the disk is pop it into your Mac’s floppy drive.
And all you need to do with the file is double-click.
You see, AccessPC makes PC disks look just like Mac ones.
And it makes PC files instantly accessible to your Macintosh applications.
It even lets you write PC files back to disk from your Mac programs.
How, you ask, does AccessPC do this?
Unlike other packages that only provide disk compatibility, AccessPC also includes dozens of translators.
So when you try to open a file your Macintosh doesn’t recognize, AccessPC opens it anyway—and asks you which Mac format to convert it to.
And when you go to write a Mac file to a PC disk, AccessPC lets you choose which PC format you want.
Speaking of choices, AccessPC works with all kinds of PC media—from floppies and flopticals, to Bernoullis, SyQuests and mageto-opticals. It lets you format and partition them, too.
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And discover the words that best describe AccessPC.
No sweat.
MAC TO PC

Low-Budget LANs

If you need only a small Mac-to-PC network, you don’t have to invest in an expensive network operating system.

By John Rizzo

In the ‘60s, it was the space program. In the ‘70s, it was 8-track tape, quadraphonic sound, and Betamax VCRs. In the ‘80s, it was high-tech weapons outfitted with video cameras. Now that we’re in the ‘90s, Big Networking is the technology that’s getting all the attention. Big Networking — information highways, global networks, and data empires — is now on TV, in the newspapers, and on the lips of celebrities. Big Networking may be hip, but for many of us who actually use computers, the big news is still in Little Networking.

Rather than an information highway, many people just need an information pathway — a simple, inexpensive way to move files between Macs and PCs without using a dedicated file-serving machine. Little Networking is easier than ever, which means you don’t have to hire a consultant to set up a system for you. Little Networking is also inexpensive enough that you can try out more than one product.

The Solution for You

The number of little-network options has been growing, and rather than duplicating services, each new product seems to be aimed at a slightly different audience. I’ve described some of these products in the past (COPS’ COPSTalk, in April ’93, page 215, and Farallon’s Timbuktu, in March ’93, page 197).

Now I’ve had a chance to look at four new products that connect Macs and PCs. Three of the products — the Coactive Connector ($149), from Coactive Computing (415-802-1080); Personal MacLAN Connect (single-user, $199; 10-pack, $995), from Mirimar (805-966-2432); and LANtastic for Macintosh ($599), from Artisoft (602-293-4000) — let Macs and PCs share files and printers, but they do so in quite different ways. The fourth new product — the EtherWave ($150 to $400), from Farallon (510-814-5000) — is a series of Ethernet connections for Macs and PCs that is truly a breakthrough.

But before I describe my experiences with these new products, let me tell you what to look for in network products:

- **Pick the right pieces.** Know what you’re buying. Not all products come complete with everything you need.

  - The first piece you need is some kind of hardware to transmit the network signals. Little networks rarely stray from anything more exotic than LocalTalk or Ethernet.

  - Next is the network-protocol software that enables the computers to recognize each other. This software is usually invisible to users except as a series of files loaded in the PCs on the network. (The Mac already has AppleTalk built in.) All the products I’ve mentioned, including Timbuktu and COPSTalk, use the Mac’s native AppleTalk network protocol for the Macs, and most use it for the PCs as well.

In addition to all this is user-interface software that gives Windows users a way to open Mac folders or share Windows directories with Macs. It is in this area that the products differ the most, both in capabilities and in look and feel.
Mac to PC

- **Do you need speed?** How fast do you want your network to be? LocalTalk tends to be cheaper for Macs, because all Macs have built-in LocalTalk hardware and software, but many newer Mac models also have built-in Ethernet, which is four to five times as fast as LocalTalk. For PCs, LocalTalk and Ethernet cost about the same.

LocalTalk is fine for groups of less than a dozen or so Macs and PCs, provided you're not passing around multi-megabyte files — in that case, don't even consider LocalTalk. Most of the networking products work with either Ethernet or LocalTalk (the Coactive Connector is a LocalTalk-only product).

- **Where's the data stored?** Decide where you want to store shared data. on the PCs or on the Macs. All these products let Mac and PC users share files, but they differ in who is the sharer and who is the sharer. For instance, COPSTalk and Timbuktu each let PC users access Mac hard disks in the form of AFP network volumes, such as folders shared via System 7's file sharing. PC users can't publish parts of their hard disks on the network.

LANtastic and Personal MacLAN Connect are just the opposite — the Mac users can access shared directories on PCs, but the PC users can't access System 7 shared folders. This is not intrinsically better or worse than the COPSTalk/Timbuktu method — in either case, Mac and PC users are accessing the same areas. It just means that the shared data is stored on the PCs instead of the Macs.

The Coactive Connector is the only one of the bunch that lets Mac and PC users share files on each others' disks. (Timbuktu has two-way remote control — a great feature, but it's a little bit more complex than simple file sharing.)

You also need to make a decision about printing. The Coactive Connector, COPSTalk, and Timbuktu let PC users print to Mac printers, but Mac users can't see printers attached to PCs. Personal MacLAN Connect is the reverse, letting Mac users print to PC PostScript printers. LANtastic for Macintosh gives you two-way printing.

- **Do you have more Macs than PCs?** The number of Mac and PC users you are planning to connect is important, because some products work better in certain situations. Do you have a predominantly Mac shop with a few PCs, or is it the other way around?

- **How small is your network?** Some products enable you to expand your network as your organization grows, whereas others are optimized to work best with small workgroups. Don't buy a product that can expand to handle a thousand users if you'll never have more than a dozen — you'll spend more money and time trying to get it running than you would with a simpler, less expensive product. And don't be afraid to discard a product when you outgrow it — you'll save time and money in the long run.

Using Personal MacLAN Connect on Windows is actually less complicated than setting up System 7 file sharing on the Mac.

### Hands-On Network

The best way to choose a networking system is to get your hands on the product and try each one out on a few machines. This is exactly what I did with the Coactive Connector, Personal MacLAN Connect, LANtastic for Macintosh, and the EtherWave.

To create a network consisting of a handful of Macs and PCs or to plug a few PCs into an existing Mac network, nothing was easier than using the Coactive Connector. The connector itself is an intelligent parallel-to-LocalTalk converter that lets you add a PC to a LocalTalk network without having to open up the PC. The accompanying Windows software is intelligently written. If the PCs are connected to larger AppleTalk networks that have routers, PC users can select AppleTalk zones to find printers and shared network volumes.

For those whose network will soon grow from a small one to a large one, the Coactive Connector is not a good product, mainly because it uses LocalTalk instead of Ethernet. Although Coactive claims the product works with cross-platform network applications, such as accounting and database programs, I found a network application it didn't work with — WordPerfect Office, cross-platform e-mail server software that requires a PC that supports some sort of file sharing. But creating a server is not what the Coactive Connector is about. For PC users who...
have PowerBooks, the Coactive Connector is a far superior alternative to a serial cable for transferring files.

For creating bigger networks in which shared files are stored on PCs, I like Personal MacLAN Connect. Although you have to provide your own network hardware (I used Ethernet cards in the PCs), it's a snap to set up. In fact, using this Windows program is actually less complicated than setting up System 7 file sharing on the Mac; it also proved faster for transferring files. You can share any directory on a PC disk or even an entire PC disk itself. A separate printserver program lets Mac users access PC PostScript printers — or even non-PostScript printers, provided the Macs use software such as GTD's PowerPrint or Orange Micro's Grappler.

LANtastic for Macintosh mainly offers a way to connect a group of Macs to an already established LANtastic PC network. LANtastic is the most popular PC network product that doesn't require a dedicated file server. It is simpler to set up and administer than a high-end network operating system such as Novell NetWare, but it is limited to networks smaller than the 1,000-node NetWare ones.

LANtastic for Macintosh requires a PC to act as a gateway between the Macs running AppleTalk and the PCs running the NETBIOS protocol. The gateway software is sold by itself ($599) or with a LocalTalk card ($799); it also works with Ethernet. Setting up a LANtastic gateway requires some adventures in DOSland. Fortunately, you can administer the gateway — to make changes to user accounts and network volumes on PCs — from a Mac.

Catching the Wave

The Farallon EtherWave doesn't come with file-sharing software, but it's worthy of note, because it's the easiest Ethernet hardware to set up. The EtherWave is the first twisted-pair, 10BASE-T-compatible Ethernet system that allows daisy chaining, as LocalTalk does. An ordinary twisted-pair Ethernet system requires a hub concentrator to connect each computer, and only one computer can be connected to each hub port. The EtherWave allows as many as eight nodes per chain and can also be plugged into standard 10BASE-T hubs. The EtherWave is sold as add-in cards or external connectors for Macs and PCs.

A single connector can connect any three computers, be they Macs, PCs, or a mixture. To complete your multiproduct system, you can run COPSTalk, Personal MacLAN Connect, or Timbuktu. Plug-and-play, inexpensive, and cross-platform — now that's what I call an information highway. 🎸

Technical editor John Rizzo is author of How Macs Work and MacUser Guide to Connectivity, both from Ziff-Davis Press.

DiskExpress II

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Circle 58 on reader service card.
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It all started last June here at Earth Lovers Landscaping, when I discovered money doesn't grow on trees. So I went digging for ways to save money and make the Earth a better, more profitable place. Which is how I found QuickKeys. With QuickKeys I have replaced repetitive tasks I perform all day—every day—with a single keystroke or a mouse click. QuickKeys allows me to plant lots of time-saving and money-saving shortcuts directly into my business. Earth Lovers' employees can launch applications with one keystroke, saving 5-10 seconds every time, or 2.5 weeks a year.

QuickKeys can instantly change control panel settings. Each time Earth Lover's landscape designers change the number of screen colors displayed, they save 25-30 seconds. This one shortcut adds up to a savings of three days a year.

Test Drive QuickKeys for FREE

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Super battery power: If you don’t mind lugging around a few extra pounds with your PowerBook, you can now work as much as five times as long on a single charge as you can with a standard internal battery. The latest entrants in the super-battery stakes are the Technoggin PowerPlates, three battery products, two of which fit under your PowerBook and work in conjunction with your PowerBook’s internal battery. According to Technoggin, the PowerPlate 5x ($299.95) lets you work four to five times as long on a single charge as you can with the internal battery and the PowerPlate 3x ($239.95) lets you work three times as long (each attaches to the underside of your PowerBook with fastener pads). The PowerPlate Mini 3 ($169.95) is a stand-alone model that also lets you work as much as three times as long. 800-305-7936 or 513-321-1777.

Command lines: With version 3.0 of CE Software’s QuicKeys 2 ($169), the macro-creation tool that lets you automate hundreds of mundane tasks, you can tell your AV Mac what to do by using voice commands to trigger macros. For those who don’t have the latest Macs, version 3.0 has other new features too, including a revamped interface, AppleScript support, and more-powerful Sequence macros. 515-221-1801.

Help! Buying a software package is easy, but often using it isn’t. If you use Claris products, take note that the company has introduced a three-tiered tech-support program called the Support Portfolio, which caters not just to large companies with thousands of employees but also to single-person home businesses. Ranging in price from $129 to $3,999 per year, the program offers priority tech-support phone and fax lines, technical documentation, troubleshooting manuals, and access to tech-support databases. 408-727-8227.

Power books: Finally, a book worthy of reproduction on CD-ROM! All 20 volumes of the Oxford English Dictionary, second edition, are now available from Oxford University Press on one CD-ROM. At $895, the price may seem a little steep, but it’s only a third the price of the bound edition and takes up less shelf space. 212-679-7300. When multimedia and desktop video made it onto the cover of Time magazine earlier this year, we knew a revolution was finally happening. If you’re thinking of jumping on the multimedia bandwagon, check out the MacWEEK Guide to Desktop Video ($34.95), by former MacWEEK editor Erik Holsinger. This book from Ziff-Davis Press consists of primers in video and Mac basics and includes a CD-ROM containing tutorials, software demos, clip art, QuickTime movies, and more. 800-688-0448 or 510-601-2099. Want to find out what makes your Macintosh tick? Ziff-Davis Press’ How Macs Work ($24.95), by MacUser technical editor John Rizzo and technical artist K. Daniel Clark, is an illustrated guide to the Mac. Covering everything from the CPU and memory to AppleTalk networks to desktop publishing, How Macs Work can also be used in the classroom.

By Victoria von Biel
Introducing the PocketHammer 525FMF Fast SCSI-2 Drive

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104MB/sec Fast SCSI-2 burst transfer rate
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Introducing the extraordinarily powerful, portable, and highly affordable PocketHammer 525FMF™. It’s one of the fastest drives Macworld magazine ever tested, so fast it earned Macworld’s Editor's Choice award for the mid-capacity drive with the best overall quality. Like its big brother, the hammer 1000FMF, it works with any Macintosh, Quadra, or Centris (an internal version works with most models). And because it’s a Hammer® you’ll enjoy the quality and performance you’ve come to expect from FWB®—Hammer Premium Service™, a two year warranty, and our advanced Hard Disk ToolKit™ SCSI utility software for unparalleled control, security, and versatility.

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Circle 71 on reader service card.
Mac Fitness Tests

Diagnostic software can give you a better feel for your Mac, but it won’t make you a certified technician.

By Craig Danuloff

It’s a recurring dream: My Mac crashes or begins to cough and sputter, so I insert the Guru on a Disk floppy and restart. The program examines my hardware and software and reports that one of two conditions could be causing the problem. First, the boot blocks on my hard disk are corrupted. Second, the SIMM in the first slot on bank A of the logic board is loose. To correct these problems, Guru suggests I reinstall my system software and reseat the SIMM. Guru also informs me that a new version of my word-processing program has been released (and lists the vendor’s phone number) and that my Mac’s performance has suffered since I added a CD-ROM drive but that a higher-quality SCSI cable would improve performance significantly. Pretty slick!

Unfortunately, Guru on a Disk doesn’t exist, although several Guru-esque products have recently become available. Programs such as Maxa’s Snooper, MicroMat’s MacEKG, Apple’s MacCheck and Disk First Aid, and Polybus’ Peace of Mind address your hardware-diagnostic needs, and the likes of Technosys’ Help!, Maxa’s Alert, and Apple’s Compatibility Checker tackle your software troubles.

Hardware Diagnostics

Despite their common purpose, hardware-diagnostic tools vary significantly in their features. Each product analyzes various components of your Mac and its peripherals (see Figure 1), but here the similarities end. Some of them perform sophisticated testing and deliver detailed reports; others perform low-level diagnostics and give little feedback.

There are at least three reasons why you should proceed with caution when using such programs:

⚠️ Many of the problems that are plaguing your hardware will also affect the diagnostic software. A dead ADB chip, connector, keyboard, or mouse makes it impossible to use any diagnostic program. Likewise, SCSI and floppy-drive problems can hinder program performance, and bad RAM or processor chips can prevent you from restarting your Mac or running any software at all.

⚠️ With few exceptions, computer components or peripherals do not fail gradually — they fail instantly. So even though you can run a diagnostic program periodically to detect potential problems, a diagnostic check performed the second before a failure occurs will report that all is well and will not predict imminent failure.

⚠️ Hardware-diagnostic tools point out problems but don’t offer solutions. Even if a diagnostic tool accurately pinpoints a problem component, what good is knowing which component has failed if you don’t know how to repair it? So unless you’re willing to pick up a soldering iron and fiddle with capacitors, you still face a trip to a service technician.
But hardware-diagnostic programs do have their place. If you use them correctly — in conjunction with books, advice, and your own experience — these products can save you time and energy. If you aren’t already an adept Mac troubleshooter, these packages are likely to do little more than instill a false sense of security. You would be better off concentrating on the basics of Mac maintenance and troubleshooting — such as limiting the use of extensions; ensuring that your Mac’s SCSI chain is properly cabled and terminated; rebuilding your Desktop file; reinstalling your system software; and picking the brains of your Mac-savvy friends at work, on-line, or at user-group meetings.

**Software Troubleshooters**

Software problems are easier to solve without diagnostic software than are hardware problems, because you can always restart your Mac with all the extensions turned off (hold down the Shift key as you restart). At this point, it should be possible to track down conflicts among extensions, applications, and your system software. You can also use a software-diagnostic program such as Compatibility Checker (available on-line in ZiffNet/Mac’s Download & Support Forum; filename CCHECK.SIT) or Help!, which tells you if your software is outdated too.

To test for software incompatibilities, current diagnostic tools rely on their own databases of known problems and software information. These programs examine your system software, extensions, and applications; search their databases for problems that match your system’s condition; and generate a report (see Figure 2).

Maintaining a complete and accurate database of software incompatibilities and version numbers is difficult, however. And — as users of Apple’s Compatibility Checker found out after upgrading to System 7 — an incomplete Apple’s Free Diagnostic Utilities

Searching for a good diagnostic utility? Look no further than Apple’s Software Utility Update, available on-line in Library 14 of ZiffNet/Mac’s Download & Support Forum (SOUTUP.SIT). This update contains several utilities, including Disk First Aid 7.2 and MacCheck, a diagnostic tool developed by Apple and one of its best-kept secrets. Here’s how to use these utilities effectively:

- **MacCheck’s profiles.** Launching MacCheck is slow. Unlike most Mac applications, MacCheck makes you wait about five minutes while it polls the characteristics of your system, including the logic board, the peripherals, and the

![Test Results 1](image-url)
Diagnostic programs usually can't repair any of the hardware ills they find, but they can tell you how your Mac is performing and clue you in to possible areas of concern.

Figure 1: MacCheck's report tells you whether your Mac has a coprocessor, which ROM version it's running, which extensions are enabled and which are disabled, and which of your applications are not 32-bit clean. MacCheck also looks for multiple copies of your System Folder and tells you their locations.

MacCheck's tests. Once you've studied the report, you can click on the Test button and MacCheck will scan your Mac for potential problems. MacCheck examines most logic-board components (except for RAM) and your directory files and looks for corrupted System and Finder files. Unfortunately, it doesn't let you select a specific test, so you must sit through a complete system diagnosis. When the testing phase is complete, MacCheck lists any problems or potential problems it has found.

MacCheck's help. Like most Mac utilities, MacCheck cannot perform repairs, but it does suggest possible solutions, which are listed on the Help menu. The Help menu covers topics ranging from a glossary of basic computer terms to a listing of sad-Mac and system-error codes. For specific problem-solving advice, select Error Explanations.

Disk First Aid. You can repair many Mac problems MacCheck encounters by using its companion utility, Disk First Aid. After launching Disk First Aid, select the disk you want to repair and click on the Repair button. Disk First Aid does the rest. Unfortunately, Disk First Aid cannot repair the current startup disk or the disk from which it was launched, so you must restart your Mac with a different startup disk before launching Disk First Aid.

Once the Disk First Aid repair phase is complete, run MacCheck to see whether the problem has indeed been corrected. If not, MacCheck's Help feature can suggest an alternative course of action.

Unlike more-sophisticated utilities such as Help! and Alert, MacCheck cannot identify specific software conflicts. Nor does MacCheck perform extensive hardware testing, as do programs such as Snooper and MacEKG. But for the price, it's a good place to start.

— Ted Landsau
problem database in a diagnostic utility can result in incomplete and unreliable reports.

Of the current crop of software-diagnostic utilities, Help! contains the most complete problem database. Still, Help! was unable to verify the correct versions of more than 50 percent of the extensions and applications on my hard disk. Not surprisingly, shareware utilities are the most neglected, but Help! listed many commercial applications from major developers and even some extensions from Apple as unknown. Help!’s competitors, Alert and Compatibility Checker 2.0, did even worse. Before you buy a diagnostic program, find out how often the problem database is updated and how.

Clearly, none of the currently available products is the Guru package of my dreams. But that doesn’t mean they don’t deserve a place in your troubleshooting toolbox. These packages do perform tests and provide valuable feedback — but it is critical to keep in mind that the tests are not comprehensive and that the results are not totally accurate. You would be better served using these packages to complement your own solid troubleshooting skills and understanding of Macintosh hardware and software.

Craig Danuloff is the Seattle-based author of The Macintosh Shareware Buyer’s Guide.

Figure 2: You can find out if you have software conflicts or outdated versions of your favorite programs by using a software-diagnostic utility such as Teknosys’ Help! Before buying, find out how often the product’s database is updated.
Now You Can Select and Actually Use Any PC File on Your Mac.

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CIRCLE 120 ON READER SERVICE CARD.
Mac Audio Tools

If you own a Mac with a built-in microphone or microphone-input port (a Performa, Classic II, Color Classic, LC, IIci, IIvx, Centris, Quadra, docked PowerBook Duo, or any PowerBook except the PowerBook 100), you have all the tools you need to get digital audio into your computer. Simply open HyperCard 2.1's Audio palette, or use the Sound control panel, and start recording.

A shareware alternative that provides you with more editing capabilities is Sample Editor, available from user groups and on-line services such as CompuServe and America Online. ZiffNet/Mac members can download this and all of the shareware packages mentioned in this article from the MacUser Forum, under Download & Support, Library 1. The filename for Sample Editor is SAMPED.SEA. AudioShop, from Opcode (415-856-3333), and SoundEdit Pro, from Macromedia (415-252-2000), are two commercial packages that provide more-advanced sound-editing features.

If your Mac doesn't have a built-in microphone or microphone-input port, you can use a serial input device such as the Macromedia MacRecorder, which includes SoundEdit Pro software.

Once you've gotten sounds onto your hard disk, you can transform them into alert sounds. These are sounds that play when you perform functions such as deleting e-mail messages or clicking outside a modal dialog box (a message window on your screen that you must respond to before performing any other function on your Mac). To convert sounds, try shareware products such as David Lambert's SnmConverter Pro (filename SNDPRO.SIT) or Ricardo Etore's Sound Mover (filename SOUNDM.SEA).

If you want near-CD-quality sound, be prepared to make a large cash investment. You'll need a digital-audio card that gives you 16-bit sound, such as the AudioMedia II ($1,295), from Digidesign (415-688-0600), and a high-capacity hard drive to handle the gigantic sound files that digital-audio cards generate. You don't need a 16-bit card if you own one of the new AV Macs; they come with 16-bit-sound capability built in.

If you want to include music in your presentations but can't afford a digital-audio card, try using a General MIDI (GM) module, an external box that makes playing sophisticated sound on your Mac simple. Modules start at $399 each and save you from buying a high-capacity hard drive — the MIDI files a module uses are much smaller than those generated by digital-audio cards, so you don't need a high-capacity hard drive.

You don't even have to be able to play a note of music to use GM modules. Instead of inputting sound with a keyboard, you can play and adjust already-existing sequences (songs or sequences of sounds). You can find commercial sequences for GM modules at most music stores, or you can buy them from vendors such as Opcode and Trycho Tunes (714-696-3577). Expect to pay $7 to $10 per individual sequence, $20 or more for collections. Look for advertisements in such magazines as Keyboard and Electronic Musician.

GM standardizes sound location in a way that makes sequences play alike no matter which GM module you use: The piano will always be a piano, not a tuba or a flute, for example. There's still some variation in sound, however, because each manufacturer of GM modules interprets sounds differently. Whereas a piano sound is fairly similar from module to module, some sounds have names such as "Synth Pad 2 (warm)" that leave the character of the sound entirely up to the manufacturer.

GM modules connect to your Macintosh through one of the serial ports, either the printer or the modem one. To avoid sacrificing one of those ports, buy a module with a serial through-port, to which you can connect other serial devices.

For GM modules that do not have a serial through-port, you can get a serial switch box for $20 from most electronics stores. Another option is to purchase a switchable MIDI interface (starting at $120), an external box with a serial through-port that plugs
SHOPPING LIST

in to the modem or printer port on the Mac. A button on the box enables you to switch between music and modem or music and printer. Because it has extra MIDI ports, you can also use the box to connect more than one MIDI device.

- You can pick up small speakers for personal use from several vendors, including Altec Lansing, Apple, Bose, Koss, and Sony. But if you’re planning to give a large presentation that requires multiple sound sources, such as MIDI, digital audio, and audio CDs, you’ll need a small audio mixer and some powered speakers that can handle a hefty load, such as Pattern 100s, from Atlantic Technology (617-762-6300). You’ll also need a boxful of adapters from your local electronics store to convert between mini-plug, RCA, and ¼-inch jacks.

- Although you should consider the quality of bundled software when you purchase your GM package, the module’s sound is more important. You can always purchase better software, but you can never make that acoustic guitar sound less cheesy.

- For more information about sound for the Mac, check out Opcode’s Book of MIDI HyperCard stack or Craig Anderton’s MIDI for Musicians (New York: Amesco Publications, 1986). Christopher Yavelow’s Macworld Music and Sound Bible (San Mateo, Calif.: IDG Books, 1992) is the most comprehensive book on Mac audio you’re likely to find. For product comparisons, consider David M. Rubin’s The Audible Macintosh (Alameda, Calif.: Sybex, 1992). Search the shelves of computer stores and bookstores for these and other books.

If you want near-CD-quality sound, you’ll need a digital-audio card for 16-bit sound and a high-capacity hard drive for the gigantic sound files that digital-audio cards generate.
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So call us today to find out how you can upgrade to top speed, with the best value.
Anybody can replace an internal hard drive in a modular Mac (Macs without a built-in monitor, such as the Mac II). All you need is about 15 minutes, a Phillips-head screwdriver, and a few pointers. Although this tutorial focuses on modular Macs, many of these principles apply to compact Macs (such as the Classic) as well.

Even though replacing your internal hard drive is simple, opening the case of a Classic, a PowerBook, or a PowerBook Duo means voiding the warranty, so have a dealer install the drive if the Mac’s still under warranty. If you own a PowerBook (even if it’s out of warranty), you should probably leave this job to a dealer anyway, because opening the PowerBook case and disconnecting its cables can be a tricky business.

If your new drive is a different size from the one you’re replacing, check with the supplier to see if you need a new chassis bracket (the U-shaped case that holds the drive). It may be included in the price of the drive.

Before you install the replacement drive, make sure you back up your current drive’s hard disk. You need to store the data somewhere, be it on a floppy disk, cartridge, external disk, or some other medium, until you transfer it onto the new one.

Start by opening the Mac and grounding yourself by touching the metal power-supply case (or wearing a grounding strap); you can then unplug your Mac from the wall socket. Set the SCSI ID of the replacement drive to 0, so that your Mac boots from that drive’s hard disk. Remove the SCSI- and power-cable plugs from the back of the hard drive in your Mac; gently release the locking tabs (or remove the screws); and

By Tom Petaccia
37 million Americans suffer from arthritis. That makes it the number one crippling disease in this country. It attacks in over one hundred different forms. Some forms disable. Some disfigure. All of them hurt.

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Before you install the internal drive, set its **SCSI ID** to 0 so the Mac will boot from that drive's disk. To set the SCSI ID, locate the drive-select pins (consult diagrams that come with your drive to find them). The first three are usually labeled A0, A1, and A2. If the A0, A1, and A2 pins don't have jumpers (metal or plastic wraps), then the drive is already set to 0. If they do have jumpers, just slip them off.

Remove the old drive, still in its metal chassis. Unplug the indicator-light cable if it's plugged in to the front of the drive, and then unscrew the old drive from the chassis. You are now ready to insert the new drive and screw it into the chassis.

At this point, you might want to replace the existing SCSI and power cables attached to the logic board. Apple typically uses aluminum-wire SCSI ribbon cables, which don't conduct as well as copper. If you're lucky, new cables will be included with the drive, but if that's not the case, you can get new copper cables from an electronics or computer store for $10 to $15.

The next step is to plug in the indicator-light cable (if applicable) and insert the drive and chassis and screw them back in place, making sure the locking tabs lock (if applicable). Plug the SCSI and power cables in to the hard drive, and put the top of the Mac back on. Once you've transferred your stored data to the new hard disk, you're ready to get back to work.

So what do you do with your old internal drive? One possibility is to rehouse it in an external casing, such as is available from APS Technologies (800-235-3707 or 816-483-6100) and Casa Blanca Works (415-461-2227). For $85 to $199, you get what amounts to an extra hard drive, which you can use as a backup or as a spare.
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By Philip Russell

Reader tips compiled by Gregory Wasson

■ Here’s how to design better presentation slides or transparencies:
  - Keep the color scheme consistent throughout.
  - Put the good news high in the copy so the audience will notice it first.
  - Display your competitors’ names in black and yours in color.
  - Minimize the number of type styles; have headings in one style, main-body text in another.
  - Use 3-D charts with care and only where appropriate, because they may confuse the audience. (Thanks, Jean Mickelson, MadMacNews, Madison, Wisconsin, MUG.)
  - Don’t mail a floppy disk in a plain envelope. If its shutter gets bent, you can hurt your drive when you insert the disk.
  - Bubble-pack envelopes are the answer. If you buy them in bulk (500 or so), envelopes for 3-5-inch disks cost less than 12 cents each. Can’t use 500? Line up a few buddies, and split an order. Envelopes are available from mail-order office-supply houses.

■ If you still use double spaces between sentences, you can globally change double spaces to single spaces, which are what typsetters use. Use the same method to replace double hyphens with proper em dashes (Option-Shift-hyphens).
■ Maybe you’ve noticed that some programs import certain kinds of TIFF files but not others. That’s because each vendor felt it necessary to develop its own version of TIFF. PageMaker recognizes more TIFF versions than any other program, because Aldus was a driving force behind the development of TIFF.
■ How do you open documents that refuse to open?
Use CE Software’s DiskTop, the shareware utility FileTypor, or any other utility that lets you change Type and Creator codes. If you suspect the document is a text file, change its Type and Creator codes to MacWrite or Word. Other utilities, such as Now Utilities, also let you convert stubborn files. Just to be safe, make a copy of the document before changing its codes.

You can also try using PageMaker’s Place command to import a stubborn file. Then export it to a program you know will work, or at least copy pieces of the file to the Clipboard and then to the Scrapbook for safekeeping.

■ Do you want to make slides of your Mac’s screen? Here’s one way:
Place a camera on a tripod, use a cable shutter release for steadiness, and shoot at 1⁄30 second or longer exposure. Use Ektachrome 160 or Kodachrome film and a long lens (200 mm suggested), place a black cloth like a tent over the camera and monitor, and set the exposure two stops either side of your best-guess exposure. Make sure the monitor’s screen and the camera are absolutely level with each other.

■ Do you get “Out of memory” messages in MultiFinder under System 6, even when you have lots of available RAM? Try loading your applications in order, from the smallest to the largest. Then if you need memory to run another large program, quitting the latest (and largest) program will leave enough space for the new application to run.

■ Zooming in or out of an image in HyperCard looks best when you use the Zoom Close and Zoom Out visual effects. Use Zoom Close to see detail and Zoom Out to see the big picture.

DTP Redraws

Slow screen redraws in DTP programs? Go to the Edit menu, select Preferences, and set the greening to a higher level. You can also increase PageMaker’s redraw speed by setting Detailed Graphics in the Preferences dialog box to Normal or Gray Out.
Reader Tips

System 7 Desktop

To keep icons on the desktop even when windows are open, make a Desktop Things folder on your hard disk for all the icons you normally leave on your desktop. To save space, you can set the view to Small Icon, Date, or whatever suits you.

When you switch to the Finder, all of your desktop icons will be brought to the front, and as long as a corner of your Desktop Things folder window is visible, it can even be brought to the top of a stack of windows.

Before you shut down, press Option and select Close All, on the File menu, to close the windows you have left open. Placing an alias of your Desktop Things folder inside your Startup Items folder opens your Desktop Things folder on startup.

Richard Smith Chicago, IL

QuarkXPress 3.1

Pressing Command-Shift-Q sets the next character you type in Symbol font, and pressing Command-Shift-Z sets it in Zapf Dingbats. After you’ve typed the character, QuarkXPress will automatically revert to the original typeface.

If you want to jump quickly to the font field of the Measurements palette, press Command-Option-Shift-M.

Doug Stanfield
Belleville, PA

Word 5

The Tip Sheet of June ’93 (page 203) has the suggestion that changing italic text to plain text makes editing in Word easier. You can do this globally, changing italic to plain bold text, by following these steps:

Select Replace (Command-H), on the Edit menu. Make sure the Find What box is empty. Choose Character from the Format box located under the Find What box, click on the Italic check box, and click on OK. The word Its will appear below the Find What box.

Repeat the same steps for the Replace With box, only this time click on the Italic box again to remove the check mark and select Bold in the list. The words Bold; Not Its will appear below the Replace With box.

Select Find Next in the dialog box, and Word will find any text in italics. Select Replace, and the same text will appear in bold.

William J. Reynolds
Sioux Falls, SD

[Don’t use this tip if your document already contains bold text. — Ed.]

Floppies

When you erase all the files from a floppy disk, sometimes all the free space is not redeclared (that is, you end up with less than 785K on a double-density disk). To get 785K on a double-density disk or 1,415K on a high-density disk without reformattting it, follow these steps:

1. Delete all the files from the disk by dragging them to the Trash and then choosing Empty Trash from the Special menu. Then create a new folder on the disk.

2. Drag the disk to the Trash. (Do not use the Eject Disk command.)

3. Insert the disk, and hold down the Option and Command keys until a dialog box pops up asking you if you want to rebuild the desktop. Click on OK.

4. Erase the folder by dragging it to the Trash, and notice the extra few K squeezed onto the floppy disk.

David Alten
Houston, TX

Drawing Notes

When you draw something — whether in MacDraw, Canvas, Illustrator, or another drawing program — you usually have to export the drawing to a different format such as PICT or EPS before you can open it in a page-layout program or word processor.

If you are working on a drawing, make abundant notes and keep them in a text box positioned on the page next to the graphic. This text box might include such information as what the drawing is for, what chapter it goes into, the version number, and whether or not it is finished. When you’re ready to export the graphic to PICT or EPS, simply delete the text box first.

Be sure to use the Save As command to save the file under a different name.

Bruce Pierson
Bozeman, MT

Directory Assistance II

Norton Utilities’ Directory Assistance II has a built-in icon editor available under System 7. Here’s how to use it:

From any application, select Open or Save. (If Directory Assistance II is installed, the special Open/Save dialog box will appear.) In the Open/Save dialog box, select the application, file, folder, or disk of the icon you want to edit. Next, select Get Info from the Tools menu in the dialog box, and select icon from the scroll box. The item’s icon will appear with a standard set of paint tools you can use to modify the icon.

After you have edited and saved the icon, restart your Mac to see the edited icon.

Patrick Houlihan
Greenwood, MS

Tip of the Month: System 7 File Sharing

Looking for an easy, low-cost way to network two Macs? You don’t have to spend $50 on AppleTalk connectors and cable. All you need is System 7 file sharing and a $15 ImageWriter II-to-Mac Plus/SE printer cable, available from any Mac-product retailer.

Turn off both Macs, and connect the printer cable to the printer port on each Mac. Both Macs should be plugged in to the same power strip to avoid the ground mismatches that are prevented by real networking cables. Power up both Macs, and turn on AppleTalk and file sharing. Your Macs are now networked.

The only drawback is that you can have only two Macs on the network, but for a temporary situation, this method works just fine.

Keith Veleba
Sandusky, OH
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.

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"I DON'T NEED (tick) YOUR DATA (tick) PROTECTION SOFTWARE (tick).
I'VE HAD MY MAC (tick) FOR YEARS AND (tick) IT HASN'T CRASHED (tick) YET."

Not to alarm you or anything. But if a lot of wishful thinking is all that's standing between you and a Mac meltdown, you may want to check out a more proven method of protection.

We suggest the Norton Utilities for Macintosh v2.0. It both prevents data loss and gives you the most effective data recovery features available. In other words, it's like giving your computer its own personal bomb squad.

For starters, let's talk prevention. The Norton Disk Doctor hunts down potential problems and lets you squash them before they become actual nightmares. Plus, Speed Disk defragments files and boosts performance of your hard disk, making data loss less likely in the first place. So far, so good.

Now, the recovery part. Our FileSaver feature keeps a record of vital disk information, which helps you rescue files if you happen to lose or delete them. On top of that, you get automatic backup. It's total security like this which has helped Norton Utilities become the best-selling data protection and recovery software in the world.

To learn more, dial FAST FAX 1-800-554-4403 and select option 1, document 411. (For information on easy network installation, choose option 1, document 481.) Better yet, pick up Norton Utilities at your local dealer for about $149.
Questions, anyone? Here's where to get answers from the experts. Bob LeVitus and Andy Ihnatko are the authors of the best-selling Dr. Macintosh's Guide to the On-Line Universe. Andy Ihnatko is also a longtime activist with BCS/Mac. They're ready to answer your questions about everything Macintosh.

Write to Help Folder, c/o MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404.

Don't want to wait for an answer? Post your question on ZiffNet/Mac, MacUser's on-line service, and get a reply from Bob (760-042076), Andy (725-11204), or one of the other MacUser experts. See the masthead in this issue for instructions on how to sign up.

By Bob LeVitus and Andy Ihnatko

**Damien Monitor**

**Q. Why does my Apple 13-inch color monitor spontaneously switch itself off after only three or four hours every time I use it?**

**Alison Morgan**

**Darren, WI**

**Andy:** Two possibilities suggest themselves, Alison. Either (a) you are the lucky beneficiary of a guardian angel, who is warning that you're about to suffer a work-related strain injury, shuts down your monitor to give your hands and wrists a needed rest, or (b) it's broken.

Fortunately, it's not simply broken; it's defective (no cash outlay necessary). Many Apple high-resolution color monitors built a couple of years ago shipped with a defective power capacitor that over time, sends the screen into power shutdown at awkward moments. The short-term solution is unplugging the unit for a few seconds and then powering it back up. The long-term solution is sending your monitor back to the mother ship for a free repair.

Not all monitors have this problem. If yours has a serial number within the ranges 5378111 to 5624450, 7000001 to 7101012, or 9000001 to 9029500, you've won this little lottery. Schlep your monitor to your friendly local authorized repair provider before March 1994, when the 13" RGB High Voltage Capacitor Repair Extension Program (translation: Apple's promise to fix it for free) ends.

Incidentally, it's generally good form to pop in on your local repair center every few months to see its book of valid repair extensions.

**Bob:** I know I say this frequently, but denizens of the on-line universe — ZiffNet/Mac, America Online, the Internet — find out such tidbits without the messy inconvenience of visiting their local repair center.

**Screen Exorcism**

**Q.** I have a color startup screen of a beautiful . . . well, let's just say I have a beautiful color startup screen. At least, I used to. One day, my startup screen began acting strange. It appeared in black-and-white, remained on-screen for only a second, and then disappeared.

I tried everything I could think of replacing the startup screen, rebuilding the desktop, running Disk First Aid and Norton Utilities, zapping the PRAM — but nothing helped.

After a while, my startup screen came back, only to disappear again. Do I have a ghost in my machine?

**Andy Winters**

**McLean, VA**

**Bob:** This problem baffled me for months, until I accidentally discovered how to fix it. Open the Monitors control panel, select a bit depth (say, 256 colors), and then select a different bit depth.

---

**But Were Afraid to Ask**

Here on the front porch of a weekend cabin in the unspoiled Berkshires, it's easy to kick back and reflect on what's really important in life — the rolling hills capped by ponderous slabs of granite, the scent of the pine needles carpeting the forest, the call of the hawk and the robin, the incessant whir of the powerBook 170 and CD-ROM drive I brought up with me, and the underbelly of the console TV Inside constantly playing VHS hi-fi cassettes of Mystery Science Theater 3000. I am moved to take off the headphones I'm using to listen to an Iggy Pop CD and reflect that it is, indeed, essential to get back to nature every now and then.

For those of you who live far away from the unspoiled Berkshires, you may get in touch with your spiritual side by sending in your simple and straightforward questions. To protect you from those who would encroach upon your meditations with filthy technology, we'll say your question was submitted by Bob (760-042076), Andy (725-11204), or one of the other MacUser experts. See the masthead in this issue for instructions on how to sign up.

**Thomas Pocket Prest**

**Temple Bar**

**London**

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The LCs don't have reset or interrupt buttons. You have to press Command-Control-power key to reset your Mac after a system crash.

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Although I knew how to fix it, I didn't know why it worked. So I asked Mac ultrawizard Bill Steinberg, the author of PBTools. He knows everything. He says it usually happens after you've reset (or zapped) the PRAM. (PRAM, or parameter RAM, is a small area of memory that is kept alive by batteries, even when the Mac is turned off, and holds such information as the date and the time. Under System 7, you zap the PRAM by holding down Command-Option-P-R as you start up the Mac.)

The technical reason has to do with the scrn resource, located deep within the System file, and whether or not it agrees with the scrn resource in your PRAM.

Compact Distress

Q. I've been spending most of my time lately recording sounds off my favorite CDs with the sound-input port of my new Mac. The only trouble is getting the right volume on my portable CD player for recording. Do you have any ideas?

Sue Paly
Fort Myers, FL

Andy: You know, it's kind of dippy, but I've collected a lot of tips on good sound sampling and the only one that really made a huge difference was to go down to Radio Shack and buy a recording-level attenuator, part number 274-300. This three-dollar adapter, which plugs into to your microphone-input jack, drops the line-level sound from your CD player (or whatever your sound source is) down to nice, friendly microphone levels so you get a clean recording.

I've also tried quitting all other applications and switching to 1-bit video before recording (which a friend of mine swears by), but nothing comes close to the effects of using the attenuator.

Stubborn CD-ROMs

Q. Sometimes I get a message on my Mac saying I can't dismount a CD-ROM or a cartridge because it's being shared across the network. But it's not! File sharing is on, but I've never shared a CD-ROM or cartridge in my life.

How can I dismount these recalcitrant discs?

Randi Jimenez
Santa Teresa, CA

Bob: From what I hear, that's an undocumented feature in file sharing and, I say, a royal pain. There are two easy and inexpensive ways around it.

The absolutely free solution is to turn off file sharing in the Sharing Setup control panel. Then you can eject the cartridge or CD-ROM.

The freeware alternative, UnMountIt, is more elegant. When you drag a cartridge or disc onto the UnMountIt icon, it shuts off file sharing briefly, dismounts the removable medium, and then restarts file sharing, saving you a trip to the Sharing Setup control panel. I use it all the time, and it's a peach.

UnMountIt is part of a package of three programs — called File Sharing Improvement Doohickey — written by Apple Developer Technical Support guru Jim Luther. The other two programs, in case you're wondering, are AppleShareSetup and Server Remote Control.

AppleShareSetup allows your Mac to close AppleShare message boxes (boxes that give you information such as "the file server has closed") after a specific amount of time, even if you're not there to click on the OK button. In addition, you can completely disable AppleShare alerts as well as some auto-mount features — a good security and control feature for systems administrators.

Server Remote Control allows you to start or stop a file server, using another Mac on the same network.

File Sharing Improvement Doohickey is well worth downloading for UnMountIt alone. You'll find it on CompuServe, America Online, and other fine telecommunication services. (On ZiffNet/Mac, MacUser's on-line service, you can find it in the Download & Support Forum, Library 14, under the filename FSIDOO.SIT.)

Andy: Supposedly, this anomaly is a safety feature. According to legend, some system-software engineers at Apple were pondering the problems that might arise from unmounting a cartridge or CD-ROM while other folks were sharing it. They decided the best way to eliminate the problem would be to make sure the Mac doesn't eject any removable media when file sharing is turned on.

If you wait to nudge that SyQuest cartridge or CD-ROM into its respective drive until after the parade of startup icons is through, you won't have to shut off file sharing to dismount the medium.

The real value I have to add to this discussion is an observation about the guy in image 17 of the Photo CD sampler that came along with my AppleCD 300 drive (see Figure 1). Is he refereeing a Senators versus Centurions basketball game in the Roman Empire? It looks like he's signaling a Centurion's fourth personal foul.

Bob: The first one to tell us who he is and what he's doing will win one of our ultra-spriffy (and rare) "I beat the System" T-shirts.

System 7 Up?

Q. Should I upgrade from System 7.0.1 to System 7.1?
I've read a lot about the new version but can't see how I'd benefit.

Joseph Parantela
New Haven, CT

Andy: Honestly, the single change the average user might take a shine to is the Fonts folder, which gives you one central location within the System Folder for dumping all of your font files. There are other features, such as WorldScript (which lets you switch between operating your Mac in English and in whatever your local language happens to be), bundled copies of QuickTime 1.5 (previously you had to either shell out more than $150 for the commercial version of the
Lots of Dots

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QuickTime package or download QuickTime on your own, and the long-overdue implementation of MODE32 features (which finally means that older Macs can be operated in 32-bit mode).

For now, don’t buy the new system software. Spend the money on a Super Nintendo with the new Super Empire Strikes Back cartridge instead.

**Bob:** If I were you, I’d spring for the upgrade. System 7.1 has been more stable than 7.0.1. Unexplained crashes and Type 1 errors seem to occur much less frequently since I’ve taken the plunge. QuickTime 1.6, included with more-recent copies of System 7.1, is also more stable and uses a lot less memory than its predecessors.

This is strictly conjecture, but by the time you read this, System 7.1 may not be the latest and greatest any longer. With the arrival of new technologies such as AppleScript, QuickDraw GX, and AOC-E (Apple Open Collaboration Environment), I suspect that System 7.2 (or 7.1.1) is just around the corner.

**Andy:** QuickTime 1.6 is indeed a vast improvement over 1.5, but you can get it for free from dealers, user groups, and on-line services.

If the upgrade to System 7.1 were free, I’d say go for it...but in my humble opinion, if you’re going to blow a hundred bucks on a major system-software upgrade, you’re better off waiting for the next one, which promises to be pure Tabasco from top to bottom.

**Forsaken Ilci**

**Q:** My Ilci has an empty ROM SIMM slot. Is it good for anything?

**Dave Pointexter**

New York, NY

**Bob:** I couldn’t find a single product from Apple or anyone else that goes into the ROM SIMM slot of a Ilci. I posted messages on ZiffNet/Mac and in the MAUG forum of CompuServe, but nobody else knew of a use for it either. As far as I can tell, it’s good for absolutely nothing.

**Andy:** For the uninitiated, the ROM SIMM (sounds like an alien foe in the original "Star Trek" series) is intended to allow the Mac to receive wholesale updates to its original set of ROMs without your having to go in for a whole motherboard swap. But, much like any one of the dozens of government resources Ross Perot is always working himself into a purple snit over, this powerful resource is going to waste.

**Setting Standards**

**Q:** I’m one of the people in my company who’s responsible for managing a network of nearly 100 Macs. From time to time, we need to distribute documentation and reference materials to the people on the network, but unfortunately, the company has yet to adopt a single standard for word processing. Our documentation files require the use of graphics and some pretty heavy formatting, so plain TeachText files are out. Is there a utility that will let us distribute non-application-specific documents?

**Andy Eng**

via the Internet

**Andy:** Here are two alternatives. First, you can prepare your documentation in a form that almost any word processor can understand. On on-line services, the most popular format is Microsoft Word 4.0, but as a practical matter, MacWrite format (not MacWrite Pro) is your safest choice. Yes, Apple’s newest Easy Open extension will help make file formats a moot point, but you still can’t go wrong if you assume your audience has a program that can deal with MacWrite files. On matters typographical, stick to the standard built-in LaserWriter fonts.

If, on the other hand, you’re in a situation in which your users are sufficiently cynical that you think you’ll spend most of your day patiently soothing them with “Yes, I know you have only Nisus, but trust me, you’ll be able to open a MacWrite document with it nonetheless” or if you don’t want anyone editing your documentation, distribute an encapsulated document. An exceptionally spiffy shareware product called Print2Pict can take the pages from a word-processing document and reduce them to a series of PICT-format graphics. These PICT pages are tucked into a small stand-alone application that can be used to read or print the document. All your users have to do is double-click on the file, and they’re on velvet, so to speak. You can get Print2Pict from the usual shareware sources: on-line services and user groups. (On ZiffNet/Mac, you can find it under the filename P2PICT.CPT in the Download & Support Forum.)

**Bob:** There is another shareware program that might fill the bill: Mark Wall’s DOCMaker, an easy-to-use application that creates self-opening, formatted documents and allows mixed text and graphics (see Figure 2).

The popular shareware magazine Inside Mac Games is published monthly in DOCMaker format and looks great. (The ZiffNet/Mac filename is DOCMAK.SE.A)

There are two commercial solutions to creating non-application-specific documents: Common Ground, from No Hands Software (415-321-7340), and Acrobat from Adobe (800-272-3623 or 415-961-4400). Common Ground allows you to include a miniviewer with your document, so recipients don’t need to have a copy of Common Ground: Acrobat requires each recipient to own a copy of Acrobat.

**Andy:** I’ve checked out prerelease versions of the latter two programs and was breathtakingly unimpressed. Both Print2Pict and DOCMaker outclass the commercial products by yards when the goal is simply to create a somewhat richly formatted application-independent electronic document. Admittedly, Acrobat and Common Ground have broader goals than their shareware brethren.

---

**Figure 2:** Anyone with a Mac, regardless of the applications installed, can open documents you’ve created in DOCMaker. Documents can display text, graphics, and even a table of contents.
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<table>
<thead>
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<th>Model Number</th>
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<td>3000 Megs</td>
<td>3.9 ms</td>
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<table>
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<tr>
<th>Amount of Insurance</th>
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Call for rates on higher amounts. Underwriting requirements may vary by state. Void where prohibited.

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ds/dh 10-pack

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video frame grabber card

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POWERBOOK DRIVES, MEMORY AND CASE KITS

<table>
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<tr>
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<th>INTERNAL</th>
<th>W/10MB COYOTE MEMORY</th>
<th>W/BRD XPRESS EXT CASE</th>
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<td>$728</td>
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Mirror's award-winning scanners start with a precision three-pass scanner engine for superb color registration and sharpness. Then we add hardware pre-scan gamma correction for top quality results in much less time. The Mirror Color Scanner is available in 600, 800 and now 1200 dpi models to fit every budget.

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Having great hardware doesn't get you much unless you've got great software. Our exclusive MirrorScan software delivers. No other scanning software can match our features. From full-color previews and interactive gamma controls, to built-in JPEG.

**Mirror Color Scanner**

$1099

(from includes Photoshop 2.5 and Read-It OCR)

**Mirror Coolscan Slide Scanner**

$1999

complete

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If you need to scan 35mm slides, you'll want to check out the new Mirror Coolscan™ ZFP System. Based on the amazing Coolscan technology from Nikon, this scanner is the first to bring professional quality color scans to your desktop for under $2000! Its remarkable color sensitivity, patented solid-state light source and 2700 dpi resolution will bring your work to life with stunning scans from slides or negatives.

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Mirror CoolScan Slide Scanner $1999

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Individual 90 Cartridges-$79 ea.

Removable Drive Cost-Per-Megabyte Chart

Removable Drive | Price | Cost per Megabyte
---|---|---
44 MB-$249 + $59 = $308 or $7 per MB
88c MB-$349 + $90 = $439 or $4.8 per MB
150 Mac Transportable (Cartridge included) $589 or $3.9 per MB

Products subject to availability/Prices subject to change.
### Memory

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### MODEMS

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<td>v.32bis S/R Fax 14.4LC NEW!</td>
<td>$165</td>
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<td>2400 Modem ONLY (NO CABLE)</td>
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<td>Fax 2400/9600/9600</td>
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### Multimedia

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### MORE MODEMS

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<td>Teleport S/LVER 96</td>
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<td>Teleport Brown II/24/16</td>
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<td>U.S. ROBOTICS Spotter 14.4 Mac</td>
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### NETWORKING

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<td>Asante EN/SCT Th/Tv/10-T</td>
<td>$309</td>
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<tr>
<td>Asante Mini EN/SCT 10+PowerBook</td>
<td>$293</td>
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<tr>
<td>Call for complete line of Asante products. Dayna LC/LCD/LCDII cf10-1</td>
<td>$159/159</td>
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<tr>
<td>Dayna Friendly Net Tn or 10-T</td>
<td>$69</td>
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<td>Dayna Etherprint 10-1</td>
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<td>UMAX ScanOffice</td>
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<td>UC330 6/00 Dpi Color</td>
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<td>UC340</td>
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### Media

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### Networking

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### PowerBook Memory

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<td>PB165C/180C-6/6-9/10</td>
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<td>DO-U-4/6/10</td>
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### PowerBook Needs

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<tbody>
<tr>
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<td>$69</td>
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<tr>
<td>Targus Carrying Case for PB</td>
<td>$32</td>
</tr>
</tbody>
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### Drives

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
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<tbody>
<tr>
<td>PLI Infinity 105 Turbo</td>
<td>$669</td>
</tr>
<tr>
<td>PLI 16GB Turbo External</td>
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<tr>
<td>PLI 540MB Turbo External</td>
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<td>PLI 11GB Turbo External</td>
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<td>PLI 16G Disk Array External</td>
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<td>PLI 1 GB Disk Array External</td>
<td>$2,689</td>
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<td>$2,939</td>
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### UMax Scanners

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
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</thead>
<tbody>
<tr>
<td>ScanOffice</td>
<td>$859</td>
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<tr>
<td>UC330 6/00 Dpi Color</td>
<td>$1,169</td>
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<tr>
<td>UC340</td>
<td>$1,399</td>
</tr>
<tr>
<td>UC120 1200 Dpi Color</td>
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### Media

<table>
<thead>
<tr>
<th>Model</th>
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<tbody>
<tr>
<td>SYQuest 44MB Card</td>
<td>$61</td>
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### Networking

<table>
<thead>
<tr>
<th>Model</th>
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</tr>
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<tbody>
<tr>
<td>Asante MacCon 3 Th/Tv/10-T</td>
<td>$239</td>
</tr>
<tr>
<td>Asante EN/SCT Th/Tv/10-T</td>
<td>$309</td>
</tr>
<tr>
<td>Asante MINI EN/SCT 10+PowerBook</td>
<td>$293</td>
</tr>
<tr>
<td>Call for complete line of Asante products. Dayna LC/LCD/LCDII cf10-1</td>
<td>$159/159</td>
</tr>
<tr>
<td>Dayna Friendly Net Tn or 10-T</td>
<td>$69</td>
</tr>
<tr>
<td>Dayna Etherprint 10-1</td>
<td>$349</td>
</tr>
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### PowerBook Needs

<table>
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<th>Model</th>
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<tr>
<td>PB160-180-4/6-9/10</td>
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<td>PB165C/180C-6/6-9/10</td>
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<td>DO-U-4/6/10</td>
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</tr>
<tr>
<td>DO-U-12/20</td>
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</table>
### MORE DRIVES
- Quantum 65 Pro/127 Pro .......................... 179/265
- Quantum 170 Pro/240 Pro .......................... 235/289
- Quantum 525/1,260 Pro .......................... 719/1,255

**FWB, INC.**
- Hammer 526/510/1000MBF ................ 1389/1719
- Internal 526/510/1000MBF ................ 1189/1569
- SCSI 144MB ....... 769
- FWB Hard Drive Kit .......................... 159

**Pinnacle Micro**
- PMO 650MB Optical Drive .......................... 2369
- PMO 128MB .......................... 949
- Recordable CD-ROM Drive ................ 3599

### MAC NEEDS
- SIMMs Installation Toolkit .......................... 8
- SIMM Remover .................................. 3
- Video-RAM 256K/512K ......................... 315/50
- Mac Pro Plus Keyboard .................. 129
- Kensington Turbo Mouse .................. 106
- LC/Classic 16mb Math CoProcessor 59
- LCII/FPU Centris .......................... 73/609
- Wrist saver/Mousepad .................. 12/12
- AXON Sport Serial Switch .................. 125
- WACOM (Others models Available) .......................... 315
- 12x12 Digitizer Tablet .................. 689

### PRINTERS
- OKI 860 Hammerhead .......................... 439
- OKI 1275 .................................. 4549
- GCC Write/Move II Portable Printer ............... 519
- GCC PLP II Quick Drive .................. 689
- GCC BLP Elite .......................... 849
- TI-PSTI/PS55 ................................ 1165/1299

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### ACCELERATORS
- Applied Engineering
  - TransWarp LCIII/40MHz .................. 379
  - SC/Classic C9-25MHz/FPU .................. 199/609
  - SC/Classic C03-40MHz/FPU .................. 290/429
  - 040 25/33/40 .......................... 809/89/1219
  - Quadralink/W-DMA .......................... 209/339
  - Plus Drive (3.5" 1.44MB Floppy) .... 289
  - Quick Silver Iia 32k Cache Card .... 289

### DAYSTAR DIGITAL
- New Turbo 040 Accelerators
  - Outperform new Macs with the Speedster!
  - Accelerates Quadra and Classic use the 040. And how you can put 040 power in your Mac for one third the price. Speedster instantly gives Quadra power you’ll notice right away. Instant screen refreshes in Photoshop, Fireworks, and QuarkXpress. Superb text generation with Illustrator; speedy recalls in Excel, and blazin special effects with Photoshop. Optional X2K cache boosts performance another 4-5x.
  - 25 MHz Turbo 040 .................. 949
  - 33MHz Turbo 040 .................. 1125
  - FastCache Turbo 040 .................. 172
  - 040/16MB Turbo No FPU ............... 689
  - 040/25MB Turbo No FPU ............... 779
  - 040/33MHz Turbo No FPU ............... 869
  - FastCache Quadra (700/900 Only) .... 249
  - FastCache Quadra (ALL QUADRA) .... 349
  - RAM Power Card .................. 430
  - Memory Chip Plus .................. 505/619

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- CeStar Label(#)1W+ .................. 185/229
- Supplies - HP Printer Supplies .......... CALL

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  - Plus Drive (3.5" 1.44MB Floppy) .... 289
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### NEWER TECHNOLOGY
- Variable OverDrive .......................... 289
- MicroDeck SCSI .......................... 135
- MicroDeck Color .......................... 259

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  - FastCache Quadra (700/900 Only) .... 249
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  - RAM Power Card .................. 430
  - Memory Chip Plus .................. 505/619

### RASTEROPS
- RasterOps Sweet 16 Bundle .................. 1699
- Sony 14"/71" MultiScan .................. 669/1169
- Sony GDM 2036s 20" MultiScan .......... 2299

### STORAGE PRODUCTS
- RAM Power \*_Charger/ Charger PLUS .................. 505/619

### DUO DOCKS
- DUO Mate 8 8bit Video .......................... 409
- DUO Mate 16SC 16bit V/I ..... 529

### HE LLB COMPANY
- 701 20th Ave. NE Bldg 1, Suite 120
- Bellevue, WA 98005
- (206) 454-7258
- Fax 7am to 6pm M-F & 9am to 4pm Saturday
- Email to Compuserve @ 73423,1272

### FORTUNE 1000 CO.
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- 800-848-1424
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**MiniCad+4**

- MiniCad+4: An unsurpassed mix of ease of use and powerful features defines MiniCad+. The award-winning MiniCad+ combines 2D-CAD, true 3D-CAD, a database, spreadsheet, programming, language, intelligent interface, and AutoCAD translator into one program. New features include s3 walk-through and AutoCAD, tolerancing, automatic roof, and floor tools, and more.

**Price:** $199.95

**Publisher:** GraphSoft

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**Language Explorer**

- Language Explorer animates the discovery of language in English, French, German, and Spanish.

**Price:** $32

**Publisher:** Nordic Software EDU0490

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**WristSaver or WristSaver Mousepad**

- The WristSaver eases wrist pain associated with Carpal Tunnel Syndrome.
- The WristSaver Mousepad provides a comfortable rest for your wrist, plus a conventional mouse pad.

**Price:** $15 ea.

**Publisher:** Insignia Solutions

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**Crossword Creator**

- Crossword Creator creates crossword puzzles quickly and easily. Just enter the words to instantly generate a puzzle. Build-in dictionaries for use in future puzzles.

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**Publisher:** Centron Software

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**Publisher:** Centron Software
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Ask for item # UPG 0032 $149
5. Power User 44MB Syquest Cartridge
Ask for item # MED 0035 $75
6. Microsoft Office 3.0
Ask for item # BUS 0285X $375*
7. Microsoft Word 5.1
Ask for item # WRD 0059 $295
8. Power User Double-Speed CD-ROM
Ask for item # CDR 0072 $299
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Marketing Plan Toolkit is an organized method for planning and managing the marketing process from strategy implementation. Requirements: Excel, Lotus 1-2-3 or compatible spreadsheet. BUS0926 $75

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Eco-Adventures: In the Oceans
Eco-Adventures: In the Oceans puts you aboard a research vessel to explore the Oceans of the World. Digitized sounds and full color underwater images bring the aquatic plants and animals to life on your Mac. ED00337 $35 ea.

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 Based on Wacom's legendary reputation for quality, the UD-1212R graphics tablet incorporates features that were never before available on a graphics tablet, such as "auto pressure range control" for optimal control over the pressure of the pen. The manufacturer is Wacom. Price: \$629.95.

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<td>Apple 14 RGB</td>
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<tr>
<td>Apple Audiovision Monitor</td>
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<tr>
<td>DAT Drive Cleaning Kit</td>
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Optical Drives

DGR Technologies’ line of Magneto Optical Drives continues to be the leader in Optical Technology as it has for the past two years, that is why MacUser made us the industry standard by which all others are compared. Our new line of optical drives provides storage solutions that are fast, reliable, and cost-effective.

<table>
<thead>
<tr>
<th>Model</th>
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<tr>
<td>128REMf</td>
<td>$1149.00</td>
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World's Fastest CD-ROM

Magic CD-ROM

The new Magic CD-Pro 6 disk changer is fast becoming one of our hottest selling items. The Magic CD-Pro 6's Quadraspin™ technology provides a 300% speed increase in transfer rate. And this PhotoCD compatible Pioneer drive is up to 5,000% faster than Apple's. Our custom AllCache software caches directory, database, QuickTime, Finder and application usage.

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Magic CD Pro 6 Quadraspin™...........$1399
Apple CD-ROM AllCache Upgrade ......$59

CD-ROM Encyclopedia........................$49
W/purchase of CD Drive
Cinderella the Original Tale CD ......$24
Arthur's Teacher Trouble CD............$24
Music Madness CD .....................$69
Oxford English Dictionary ..............$839
Great for Students!

The Journeyman Project ...............$59
Multi-Media Encyclopedia .............$59
Call for CD-ROM Catalogue +

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Magic 128MB Optical*.................... $879
Magic 256MB Optical**.................$1299
Magic 650MB Optical*...................$1999
Magic 128 / 256MB Cart. ..............$34/$65
Precision 128 Carts / 10 Pack* ........$290
Magic 650MB Cartridge .................$99

Magic SyQuest

Magic 45R SyQuest** .................... $299
Magic 88C SyQuest**....................$489
Magic 105C SyQuest* ...................$579
Magic SyQuest 45 Cartridge ..........$59
Magic SyQuest 88 Cartridge ...........$95
Magic SyQuest 105 Cartridge ...........$69
Magic 150 Transportable Cartridge .....$9.9

Magic DAT Tape

Magic 2.0GB w/Retrospect ..............$999
Magic 5-8.0GB w/Retrospect ...........$1199
Magic 16GB w/Retrospect ..............$1599
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- **HOT!** built-in SCSI Accelerator
- Sharp 32-bit video output
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- Built-in PMMU

**RailGun Pro with Video**
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- Sharp 32-bit video output
- Dual-Screen capability
- Built-in PMMU

### RailGun
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- 4MB SIMMs
- 16MB SIMMs
- 4MB 72-pin SIMMs
- 8MB 72-pin SIMMs
- LC/Quadra VRAM
- ColorBlaster LC

**Magic PowerBook Modems**
- Magic AFX 24/96 Data/FaxModem
- Mounts internally in any Macintosh PowerBook
- 2400bps modem
- 9600bps send & 4800bps receive fax
- Magic 14400 bps Data/FaxModem
- 14400 Fax, V.32bis, V.42bis, MNP 1-5, Internal PB

**Magic FaxModems**
- Magic VFX V.32bis Data/FaxModem
- Data/FaxModem
- Data/FaxModem w/VoiceMail

**PowerBook Accelerators**
- 140 Upgraded to 170
- 25mhz (68030/68882)
- 145/145B Upgraded to 170
- 25mhz (68882)
- 160 Upgraded to 180
- 33mhz (68030/68882)
- 210 Upgraded to 230
- 33mhz (68030)

**Magic 14.4 Data/FAX/Voice**
- $199

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<tr>
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<td>Digital Equipment Corp. DEC Laser 1152</td>
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<tr>
<td>QMS Colorscript 1000</td>
<td>$11499.95</td>
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• Newton MessagePad
• Newton MessagePad

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GO•DRIVE SERIES
2.5” POWERBOOK DRIVES

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LPS SERIES
3.5” LOW PROFILE

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ELS SERIES
3.5” LOW PROFILE, LOW POWER

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PRODRIVE SERIES
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3.5” FULL HEIGHT

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<td>15ms</td>
<td>1350mb</td>
<td>$1149</td>
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<td>2750mb</td>
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<td>$2215</td>
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CLUBMAC TAPE BACKUP SYSTEMS

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Capacity</th>
<th>Access</th>
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<th>External</th>
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<td>1.5ms</td>
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<td>M2694</td>
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CLUBMAC OPTICAL DRIVES

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<td>Fujitsu</td>
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<td>$292</td>
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<tr>
<td>Teac</td>
<td>128mb</td>
<td>3.5” LP</td>
<td>35ms</td>
<td>$769</td>
<td>$299</td>
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<tr>
<td>Epson</td>
<td>128mb</td>
<td>3.5” HH</td>
<td>45ms</td>
<td>$849</td>
<td>$287</td>
</tr>
<tr>
<td>Sharp</td>
<td>594/652mb</td>
<td>5.25” HH</td>
<td>40ms</td>
<td>$1769</td>
<td>$1799</td>
</tr>
<tr>
<td>Ricoh</td>
<td>594/652mb</td>
<td>5.25” HH</td>
<td>28ms</td>
<td>$2199</td>
<td>$2729</td>
</tr>
<tr>
<td>HP</td>
<td>1.3GIG</td>
<td>5.25” FF</td>
<td>24ms</td>
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<td>$499</td>
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FIVE YEAR WARRANTY

Seagate

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CLUBMAC TAPE BACKUP SYSTEMS

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<td>$1799</td>
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<td>Sharp</td>
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<td>40ms</td>
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<tr>
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<td>5.25” FF</td>
<td>24ms</td>
<td>$359</td>
<td>$499</td>
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NOW BUNDLED WITH RETROSPECT V.2.0
TAPE BACKUP SOFTWARE

Data Backup

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<th>Description</th>
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<td>CMO-JX750</td>
<td>Sharp</td>
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<td>CMO-9031E</td>
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<td>5.25” FF</td>
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NEW 1.8 GIG

All ClubMac Tape Backup Systems include ONE cartridge and ONE Year Warranty. * Data Compression

CLUBMAC OPTICAL DRIVES

TEAC 3.5” 1200MB EXTERNAL $799

SHARP 5.25” 850MB EXTERNAL $1799

DAT TAPE BACKUP SYSTEMS

<table>
<thead>
<tr>
<th>Model</th>
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DAT TAPE BACKUP SYSTEMS

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<th>External</th>
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<td>Python</td>
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<td>Hewlett Packard</td>
<td>35470A*</td>
<td>4mm</td>
<td>$1179</td>
<td>$1199</td>
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<tr>
<td>3.5GIG</td>
<td>Hewlett Packard</td>
<td>35480A*</td>
<td>4mm</td>
<td>$1259</td>
<td>$1279</td>
</tr>
</tbody>
</table>
NEW LOWER SYQUEST PRICES

44MB REMOVABLES
ClubMac 44mb External $299
ClubMac 44mb Internal $259

88C REMOVABLES
ClubMac 88c External $459
ClubMac 88c Internal $419

105MB REMOVABLES
ClubMac 105mb External $549
ClubMac 105mb Internal $509

NEC

CD-ROMs Solutions

$399
MultiSpin 74-1

NEC MultiSpin 74-1 280 ms Access Time $399 $499
NEC MultiSpin 38 480 ms Access Time $269 $369

ClubMac CD Bundle OVER $800 VALUE

FUJITSU

128 MB OPTICAL DRIVE
$929

SHARP 5.25" OPTICAL DRIVE
$1799

CALL FOR FREE CATALOG
1-800-258-2622

No Surcharge!
### SyQuest

<table>
<thead>
<tr>
<th>Unformatted Capacity</th>
<th>Access Time</th>
<th>Price</th>
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<tbody>
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<td>44 mb External</td>
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<tr>
<td>88C mb External</td>
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<td>105 mb External</td>
<td>14.5 ms</td>
<td>$598</td>
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### Scanners

#### UMAX

**All Scanners include free software**

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
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</thead>
<tbody>
<tr>
<td>UC630 - Color w/free Photoshop v2.5</td>
<td>$1078</td>
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<tr>
<td>UC1260s - Color w/free Photoshop v2.5</td>
<td>$1848</td>
</tr>
<tr>
<td>UCB40 - Color w/free Photoshop v2.5</td>
<td>$1248</td>
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<tr>
<td>Transparency Unit</td>
<td>$698</td>
</tr>
<tr>
<td>Auto Document feeder</td>
<td>$398</td>
</tr>
<tr>
<td>UG630 - Greyscale w/free Typereader</td>
<td>$488</td>
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#### Nikon

**New Super compact 35mm scanner!**

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coolscan - Color Fast, Compact 35mm External</td>
<td>$2998</td>
</tr>
</tbody>
</table>

### Software

#### Adobe

- Illustrator 5.0: $369
- Photoshop 5.0 (free with UMAX scanners): $549
- Premiere: $429
- FrameMaker: $519
- Quark Xpress 3.2: $598

### Modems

#### PROMETHEUS

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
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<tr>
<td>Promodem 144e Internal for Powerbook 14.4/14.45R Fax w/ V.42 &amp; V.42 bis</td>
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<td>Promodem 144e ext.14.4/14.4 SR Fax w/ V.42 &amp; V.42 bis</td>
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<td>Promodem 24e ext.24/96SR Fax w/ V.42 &amp; V.42 bis</td>
<td>$128</td>
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### Optical & DAT Drives

#### Fujitsu

**Dynamo**

128MB Optical 28ms, Only $918

Includes one free disc (3 year Warranty)

- 128 mb Panasonic Optical: 39 ms $788
- 128 mb Epson Optical: 29 ms $848
- 128 mb Fujitsu Optical 28 ms $918
- 256 mb Most Optical: 31 ms $1398

### Hard Drives

#### SyQuest

<table>
<thead>
<tr>
<th>Capacity/Access Time</th>
<th>Price</th>
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<tbody>
<tr>
<td>44 mb External</td>
<td>$308</td>
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<td>88C mb External</td>
<td>$498</td>
</tr>
<tr>
<td>105 mb External</td>
<td>$598</td>
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#### Toshiba

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<td>3401 Ext Drive 200ms, Multimission, DualSpeed, SCSI-II</td>
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<tr>
<td>Airbourne's External Drive 265ms, Multimission, DualSpeed, SCSI-II</td>
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#### UMAX

<table>
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<td>Internal External Drive</td>
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#### Quantum

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<td>3.5&quot; Disk Drives (2 year Warranty)</td>
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<td>5.25&quot; Disk Drives (5 year Warranty)</td>
<td>$284</td>
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#### Conner

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<tr>
<td>3.5&quot; Disk Drives (2 year Warranty)</td>
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</tr>
<tr>
<td>5.25&quot; Disk Drives (3 year Warranty)</td>
<td>$284</td>
</tr>
</tbody>
</table>

### Contact Information

- **AIRBOURNE COMPUTER TECHNOLOGIES**
  - 800-442-4836
  - Direct Sales & Support International 406-256-5806
  - Fax Number 406-256-5816
  - Top Products, Prices and Service

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Educational Software for the Holidays and a FREE Gift!!

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- Home, School and Academic Versions
- Lab Packs, Site Licenses and Network Versions
- Multimedia
- Hardware and Accessories

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708-888-8300 Illinois

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800-624-2926 • 708-888-8300 • Fax 708-888-8499/8689

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One per customer

Checks & School P.O.'s welcome • $25 min. on charge cards
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CIRCLE 112 ON READER SERVICE CARD.
We offer you the best overall value, customer service, technical support, and financing options. During our 8 years in business, we've become America's one-stop source for Macintosh solutions. Why have we been so successful when dozens of others have failed? The answer is: SERVICE, SERVICE, SERVICE. We believe in building relationships and making sure you get the best solutions you possibly can...that's why we're America's largest Mac mail order reseller. – Real Provencher, President

**CUSTOMER SERVICE**

When you order from us, you get computer experts, not clerks! All of our salespeople are trained in Apple's intensive program, as well as our own. On average, they have three years of Mac experience. They're ready to help you (with a smile!) both before and after the sale.

**TECH SUPPORT**

Our tech team is well trained, well informed, and well known for their ability to solve customers' problems with a minimum of inconvenience to the customer. We have the best tech support team in the business. Call them toll-free at 1-800-364-MACS. Please have your customer number ready.

**GUARANTEE**

OUR FAMOUS GUARANTEE: If you don't like it, we'll buy it back. If you're not 100% satisfied, call for your RMA number and return the product within 30 days of the ship date. We'll cheerfully refund your purchase price. Guarantee applies to all hardware except leases, PowerBooks, consumables, and special-order items.

**BUSINESS LEASING**

1. True Lease (10% buy-out option)
2. Installment Lease ($1 buy-out option)
3. Speed Lease... 90- or 180-day terms, with buy-out/conversion to other leases
4. 20/20 Lease... 10% security deposit, 20 equal payments, 10% buy-out
5. 90-day Deferred Lease... no payment for 90 days; 1st and last payment in advance

*All leases are subject to credit approval. All lease payments in our ads are based on the "True Lease" program at 48 months. Prices, lease prices, and rates are subject to change without notice. NOTE: Minimum lease payment is $50 per month.

1-800-364-LESS

HARDWARE THAT FITS • 610 S. Frazier

Canyon, TX 77301

### ACCELERATORS

#### NEW! Turbo 040 Accelerators

<table>
<thead>
<tr>
<th>Description</th>
<th>Price</th>
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</thead>
<tbody>
<tr>
<td>Mac IIci and IIl, math chip, 56 MHz Turbo 040</td>
<td>$929</td>
</tr>
<tr>
<td>Mac IIc and IIx, math chip, 33 MHz Turbo 040</td>
<td>$1099</td>
</tr>
<tr>
<td>FastCache Turbo 040</td>
<td>$179</td>
</tr>
<tr>
<td>40MHz Turbo 040 with FastCache</td>
<td>$1599</td>
</tr>
</tbody>
</table>

**Universal PowerCache Accelerators**

Math chip available. Supports 16 platforms.

- 33 MHz Accelerator... $339
- 40 MHz Accelerator... $509
- 50 MHz Accelerator... $639
- PowerCache Adapter... $69

**Photoshop Accelerator**

Includes PicturePress 2.5, Charger Plug-ins, and Kodak Photo CD access with clip art images.

Charger... $669

### SCANNERS

#### RealTech Scan 800

800 dpi color scanner with 200 brightness and contrast levels. Scans flat art in an 8-1/2 x 11-3/4 viewing area. Includes full version of Adobe Photoshop. Transparency Option allows scanning of flat art, transparencies, and slides in a 6 x 9" viewing area.

- RealTech Scan 800... $1099
- RealTech Scan 800 Transparency Option... $496

**UMAX**

- UC 630, UC 840 & UC 1260
- UC 630 Color Scanner... $1119
- UC 630 Color Transparency Option... $679
- UC 840 Color Scanner... $1299
- UC 840 Color Transparency Option... $679
- UC 1260 Color Scanner... $1859
- UC 1260 Color Transparency Option... $679

**RealTech Scan 800 with Transparency Option**

- $1,595

**E-Machines Monitor**

- Ultra LX... $2589
- 16" ColorPage (T661)... $1299

**E-Machines Video Cards**

- Future ISX... $649
- Future IXL... $799
- T20 (20" Trinitron Multi-Mode)... $1149
- E20 (20" Color Display)... $659
- EtherDock... $619
- PowerLink Presenter... $449

**SCANNERS**

- RealTech 15" Grayscale... $449
- ScanSnap 800... $13/mo.

**RASHEROPS**

- The Art & Science of Color

- RasterOps Video Cards
  - PaintBoard Turbo... $1799
  - PaintBoard 8 Li... $349
  - PaintBoard Li (24)... $849
  - PaintBoard Turbo XL... $1499
  - 24STV... $799

- Also available in Centris 7-inch size

- SONY 17" 1730
  - $1,169
  - 17" 1730... $1169
  - 1430... $699
  - 2036... $229

- **HARDWARE THAT FITS**

- 20" Trinitron Multi-Scan... $2599
- 20/20 Multi-Mode... $1699
- Sweet 16 (16" AVs, LCllls)... $1069

- **SuperMac**

- 20" Plus
  - $1,739
  - Lease: $48/mo.

- **SuperMac Video Cards**

<table>
<thead>
<tr>
<th>Description</th>
<th>Price</th>
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<tbody>
<tr>
<td>Spectrum/24 PDQ Plus</td>
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<td>Spectrum/8 NuBus</td>
<td>$399</td>
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<tr>
<td>Spectrum/24 Series IV</td>
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<tr>
<td>Video Spigot</td>
<td>$389</td>
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<td>Video Spigot &amp; Sound</td>
<td>$519</td>
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<tr>
<td>Thunder 24</td>
<td>$2289</td>
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<td>Thunderlight</td>
<td>$759</td>
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<tr>
<td>Thunderstorm Pro</td>
<td>$2809</td>
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</tbody>
</table>

* Also available in Centris 7-inch size

**DAYSTAR**

Digital

**ACCELERATORS**

- Futura llSX... $449
- E-Machines Video Cards
  - UC 630 Color Scanner... $1119
  - UC 630 Color Transparency Option... $679
  - UC 840 Color Scanner... $1299
  - UC 840 Color Transparency Option... $679
  - UC 1260 Color Scanner... $1859
  - UC 1260 Color Transparency Option... $679

- **RealTech Scan 800 with Transparency Option**

- $1,595

- **Lease: $44/mo.**
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SPECIAL SAVINGS
ON CUSTOM-TAILORED SYSTEMS.

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QMS 840AV Trinitron Intermediate Graphics Solution
Centris 640 AV (with CD), 8 MB of RAM, 230 MB hard drive, Apple AudioVision 14" color monitor, and KeyTronic MacPro Plus extended keyboard...

$4939

Quadrant 840AV (with CD), 8 MB of RAM, 230 MB hard drive, Apple AudioVision 14" color monitor, and KeyTronic MacPro Plus extended keyboard...

$3359

Quadra 800, 8 MB of RAM, 230 MB hard drive, Sony 230 MB hard drive, Apple AudioVision 14" color monitor, and KeyTronic MacPro Plus extended keyboard...

$6919

Quadra 950, 8 MB of RAM, 540 MB hard drive, Sony 230 MB hard drive, Apple AudioVision 14" color monitor, and KeyTronic MacPro Plus extended keyboard...

$5169

Quadra 800 AV (with CD), 8 MB of RAM, 230 MB hard drive, Apple AudioVision 14" color monitor, and KeyTronic MacPro Plus extended keyboard...

$6756

PowerBook Duo 230, 8 MB of RAM, 230 MB hard drive, 33 MHz 68030 microprocessor...

$1859

We install your card...install your memory)...and test all components together before shipping your custom-configured system.

POWERBOOKS

PowerBook Duo 210 4/80
PowerBook 160 4/80
PowerBook 165c 4/80
PowerBook Portable Docks

$199

$299

$399

$49

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$399

$499

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$249

$199

$49

$249

$249

$499

$249

$249

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$249

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$249

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POWERBOOKS

PowerBook Duo 230, 8 MB of RAM, 230 MB hard drive, 33 MHz 68030 microprocessor...

$1859

We install your card...install your memory)...and test all components together before shipping your custom-configured system.

INTERNATIONAL: 1-409-760-2400
IN CANADA CALL: 1-800-972-3018
FAX 24 HRS/DAY: 1-409-539-4141
### 7 reasons why our drives beat the competition

1. We offer the highest quality name-brand mechanisms available; fully-tested and burned in. Some of our competitors ship untested drives with no-name mechanisms.
2. Shielded 40 watt power supply (6.5 watt for FH drives) provides an additional margin of safety from electrical interference, keeping your data free of corruption.
3. External fuse keeps fuse replacement simple.
4. Power cable plug-in.
5. Two switched outlets provide power to additional peripherals, allowing 1-step system power-up.
7. Two 30-pin SCSI connectors for simple configuration...

---

### Name-brand mechanisms in the highest-quality enclosure available

<table>
<thead>
<tr>
<th>Model number</th>
<th>Internal price</th>
<th>External price</th>
<th>Formatted data capacity in MB</th>
<th>Access time in ms</th>
<th>Form factor</th>
<th>Warranty (years)</th>
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</tbody>
</table>

* Prices are constantly changing. We'll always give you the best price...just call us for current pricing.

---

### REMOVABLES

#### REALTECH MAGNETO-OPTICAL
- 128 MB Epson Drive w/1 disk (29 ms access time; 1 yr. warranty) ........................................... $999!
- Drive w/Diskette 5-pk. ........................................... $179!

#### REALTECH TAPE BACKUP
- Includes Retroscript 2.0 backup software.
- TEAC 155 MB Drive ........................................... $499!
- TEAC 600 MB Drive ........................................... $699!

#### REALTECH DAT
- DDD-DC Drive (2-8 GB capacity; 1 yr. warranty; includes Retroscript 2.0 backup software) ........ $1399!
- The RealTech DAT Drive uses industry-standard DDS-DC compression on a 90-meter tape. Depending on your data storage capacities may vary from 5 to 8 GB.

#### SYQUEST
- 44 MB Drive (External) ........................................... $399!
- 88c MB Drive (External) ........................................... $499!
- Internal SyQuest drives are available. Call for current pricing.

* Includes one disk or tape

---

### REMOVABLE MEDIA

- 128 MB Optical Diskette ........................................... $54!
- 5-pack of Optical Diskettes ........................................... $20!
- 652 MB M-O Cartridge ........................................... $159!
- 1.0 GB ZCAV M-O Cartridge ........................................... $199!
- 155 MB TEAC Tape ........................................... $179!
- 600 MB TEAC Tape ........................................... $219!
- 90-meter DAT Tape ........................................... $169!
- 180-meter DAT Tape ........................................... $219!
- 44 MB SyQuest Cartridge ........................................... $58!
- 88 MB SyQuest Cartridge ........................................... $98!

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Hours: 8 am-7 pm Central Standard Time

30-DAY MONEY-BACK GUARANTEE on all hardware (except Macintosh Quadra 800 and 950, PowerBooks, software and accessories). Call or write Customer Service Dept. for full details. Two-year limited warranty on drives. Warranty does not apply to drives used in Macintosh Quadra 800 or 950, PowerBooks.

**Hardware That Fits** is located at 1610 S. Flower St. in Carson, CA 90745.

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1-800-364-US-E R

CIRCLE 99 ON READER SERVICE CARD.
**$35.**

**UnderWare**

Firebreathing dragons vaporize your trash can in this unique desktop diversion. It gives you all the fun of a screen saver while you work! Other screen savers only run while your Mac is idle, but UnderWare runs in the background on your desktop. And these modules don't just blank out your screen, they actually interact with the icons and windows. Like folders sprouting legs and walking off your screen. You get over 30 modules and After Dark modules work too. This is the hottest desktop diversion of the year. "You can't be cool if you don't have it," says Guy Kawasaki. Well, what are you waiting for?

Minimum requirements: Mac LC, 4MB RAM, System 7, Color QuickDraw.

**$224.**

**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
6051 SupraFAXModem 144 LC ................................ $168
5575 SupraFAXModem 144 PB .......................... $298

**$39.**

**FREE Snoopy Doll**

**Year 2 Learn – PEANUTS**

Match wits with Snoopy and the PEANUTS Gang and get a FREE Snoopy stuffed animal with your order! In Year 2 Learn–PEANUTS, kids can join in five activities where they learn and practice math, geography, reading, coloring, and more. Real voice narration, zany sounds, and the appearance of Charles Schulz' much-loved characters make this a popular program with kids.

Minimum requirements: Any color Mac, 4MB RAM, System 6.0.7, a hard drive, 8-bit color and sound screen. You get over 30 modules and After Dark modules work too. This is the hottest desktop diversion of the year. "You can't be cool if you don't have it," says Guy Kawasaki. Well, what are you waiting for?

Minimum requirements: Mac LC, 4MB RAM, System 7, Color QuickDraw.

**$16.**

**Holiday Lemmings**

The Holiday Lemmings are here!!! Join your jolly green-haired friends in a wintertime romp through Lemming land. This special holiday version of Lemmings has 32 levels of award-winning Lemmings action in a snowy terrain, complete with bouncing snowmen, brightly wrapped holiday gifts, and an assortment of seasonal trimmings.

Minimum requirements: Mac Plus, 2.5MB RAM for B&W, 4MB RAM for color, System 6.0.5, a hard drive.

**$29.**

**The Disney Collection Screen Saver**

Delight in the magic of Disney with all your favorite characters in this latest addition to the After Dark family! Enjoy over 15 fantastic sound-packed displays including The Sorcerer's Apprentice, The Little Mermaid, and 101 Dalmatians. Includes screen-locking password protection.

Minimum requirements: Mac Plus, 2MB RAM, System 6.0.4.

**$99.**

**SuperPaint 3.5**

Aldus SuperPaint 3.5 combines the best of paint and draw packages into one program. It's won 15 major awards in the last six years because it provides more "graphics horsepower" for the money. And for a limited time, get a $10 free pizza coupon for Pizza Hut inside your SuperPaint box. Take a break from the holiday bustle and get some free pizza on Aldus. Minimum requirements: Mac SE, 2MB RAM, System 6.0.5, a hard drive.

Aldus Consumer Division
6493 SuperPaint 3.5
**Action! Bundle**

This bundle is all you need to create professional-quality, high-impact business presentations. It includes Action! multimedia presentation software, SoundEdit Pro, and Perfect Presentations ClipMedia 3. Action! is a revolutionary application that lets you create dazzling multimedia presentations with sound, motion, text, graphics, animation, video, and interactivity. Assemble your presentation scene by scene using built-in drawing and text tools, or import from other programs. Sixty ready-to-use templates are included. Perfect Presentations contains nearly 1000 digitized videos, graphics, photos, animations, and sounds to jazz up your work—all royalty-free! Then use SoundEdit Pro, the leading product of its kind, to create a fantastic sound track.

Minimum requirements: Mac IIci, 4MB RAM, System 7, color monitor, CD-ROM drive.

**Movie Movie**

Display, capture, and play back full-motion QuickTime movies with sound on your Mac. Colorful full-motion video helps your presentation communicate more effectively, and this is a great value for synchronized video and audio capture. Movie Movie displays video at the standard 30 frames per second and captures NTSC composite video input from ordinary video cameras, VCRs, or laserdisc players. It digitizes the video, automatically synchronizes the audio, and creates a digital file you can see and manipulate right on your screen. Movie Movie samples 8-bit audio at 22kHz and gives you manual control over the recording level. Then you can edit your footage with included ScreenEdit software.

Minimum requirements: System 7, QuickTime 1.5, 16-bit graphics card recommended.

**Adobe Audition**

Limited editions of two of the industry's leading graphics manipulation programs are now together in one package. Together Adobe Photoshop and Adobe Premiere give you everything you need to enter the world of digital image editing. Start with scanned photos or your own original footage. Or choose from 700 stock photos and dozens of QuickTime movie clips included on the bonus CD-ROM. With Adobe Photoshop 2.5 LE, you can add or correct color with a few simple keystrokes, execute delicate retouching, and even import filmstrips from Adobe Premiere LE and edit individual frames. With Adobe Premiere LE 2.1, you can combine video, audio, animation, still images, and graphics, then produce your QuickTime movie.

Minimum requirements: Premiere – Mac II, 4MB available RAM, System 6.0.7. Photoshop – Mac II, 2MB available RAM.

**Kai's Power Tools 2.0**

Kai's Power Tools version 2.0 has been totally redesigned to boost your creative productivity. Software enhancements include an advanced color picker, intelligent keypad control, new transparency controls, real-time previews, and more. These image generators and filters deliver truly superb effects. Apply effects to images from within Adobe Photoshop, Fractal Design Painter, and other programs.

Minimum requirements: Any Mac with coprocessor, 4MB RAM, System 6.0.5.

**Bernoulli MacTransportable Multidisks 150**

Enjoy all the benefits of a Bernoulli with the flexibility to read and write to disks of many capacities – 35MB, 65MB, 105MB, and 150MB. And the Multidisk 150 is downward compatible so it reads and writes to 90MB disks and reads 44MB disks. You get unlimited storage expandability, lock-away security, and transportability. The patented Bernoulli design resists head crashes and the sturdy disks can survive a drop of eight feet! This Bernoulli is internally terminated with a simple external SCsi connector, so it must be installed as the last device on your SCsi chain.

**Bullseye TrueType Font Collection**

Running low on inspirational fonts? With over 330 new typefaces, the Bullseye TrueType Font Collection can add typographical zest to anything from business letters to 3D flying logos. At under twenty five cents per font, this package is a serious bargain. And it's all on disks so you don't need a CD-ROM drive.

Minimum requirements: System 7.1, Productive 4864 TrueType Language: Spanish 2.0
**Design Your Own Railroad**
All aboard! Now you can design, precision-to-scale (HO, N, O, Z, G) layouts, right on your Mac. With Design Your Own Railroad, you control all the elements of model railroading – coupling, uncoupling, switching, bridges, crossings, everything. Once you've got a layout, climb aboard the train you created and barrel down the tracks. Minimum requirements: Mac Plus, 1MB RAM, System 6.0.7.

6428 Design Your Own Railroad

**Spaceway 2000**
Test your intergalactic combat driving skills! Spaceway 2000 is a high-speed, alien-infested freeway. Watch out for all the bad guys like Blockers who follow your movements like bad mines and keep you from passing. Use laser cannons, automatic shields, and more to battle your way through.

Minimum requirements: Mac Plus (G3 recommended), 2MB RAM, System 6.0.5, hard drive, 4MB RAM for color.

6095 Spaceway 2000
9950 Crystal Crazzy $30.
6007 20A $36.

**Sailing Master**
Don your sailing cap and deck shoes as you race against your Mac and learn how to sail without getting wet. Sail against as many as three boats, and learn about wind shifts, course options, skill levels, hazards, and other features offer a challenge for land lubbers and old salts alike. "Sailing Master is a lot of fun – well worth the price," says Macworld (Nov. '93).

Minimum requirements: Mac IIIE.

6418 Sailing Master

**Spaceway 2000**
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Minimum requirements: Mac Plus (G3 recommended), 2MB RAM, System 6.0.5, hard drive, 4MB RAM for color.

6095 Spaceway 2000
9950 Crystal Crazzy $30.
6007 20A $36.
**PowerBook Companion**

PowerBook Companion contains a wealth of practical solutions for the most common and difficult issues facing PowerBook users. This Second Edition has been updated to cover all the latest PowerBook models including the Deos and color PowerBooks. Topics include set up, software installation, getting connected, care and maintenance, hardware upgrades, peripherals, and components. And within each topic, the differences between portable and desktop computing are addressed. A disk containing a bunch of handy PowerBook utilities is also included. You'll get applications for battery management, cursor control, and file synchronization. "The companion book of the year." — MacUser.

Addison-Wesley
7038 PowerBook Companion

**ClarisWorks 2.0 with Quicken 4**

Until Jan. 31, 1994, get Quicken 4 FREE! It's the fastest, easiest way to organize personal and small business finances. ClarisWorks offers you a single application where you can seamlessly combine text, graphics, spreadsheets, and charts all within the same page on the same screen. It's perfect for small businesses, home offices, corporate managers, and notebook users.

Minimum requirements: Mac Plus, 2MB RAM, System 6.0.4.
Claris
6144 ClarisWorks 2.0 with Quicken 4

**SCSI MicroDock**

Expand the capabilities of your PowerBook Duo with this light weight, low-cost, extremely small docking bar. It lets you easily connect your Duo to ADB devices like a mouse and SCSI devices like a SyQuest or CD-ROM drive. And you can use the same SCSI cable to connect your Duo to another Mac, and have it appear as another hard drive on the other Mac's desktop.

Newer Technology
6094 SCSI MicroDock

**System 7 Pro**

System 7 Pro gives you System 7 with new PowerTalk, plus AppleScript and QuickTime software in one package. PowerTalk allows you to correspond and work with others using built-in mail and collaboration services. Use your modem or an AppleTalk network to send messages of any type — including text, images, video, and sound — to other System 7 Pro users. AppleScript is a system level "macro" language that lets you use pre-scripted automated tasks with the click of a button. With AppleScript, you can use your favorite off-the-shelf applications to create powerful, cost-effective solutions. QuickTime is Apple's industry-leading multimedia technology. It lets you view, copy, and paste video animations, images, and sounds as easily as you manipulate text.

Minimum requirements: 4MB RAM (5MB recommended), a hard drive, Apple SuperDrive floppy drive.
Apple
6797 System 7 Pro
5255 System 7 Personal Upgrade Kit

**Square One**

Square One stores all of your favorite files in one easy-to-use icon palette. To access a file, just double click on its icon. Group several files into a single work-group icon and open them all at once. No more time wasted rummaging through your hard drive, and no goody-hierarchical menus. Just point and click with Square One.

Minimum requirements: Mac Plus, 2MB RAM, System 7.
Binary Software
7027 Square One
## Keyboards

<table>
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<td>Suntouch Mac Extended Keyboard</td>
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<td>Suntouch MacPad Extended Numeric Pad for PowerBooks</td>
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## Monitors and Graphics Cards

### NEC
- **Silentwriter Model 1097**: $1399
- **SuperMac**: $2499
- **SuperMatch**: $999
- **SuperMatch 17**: $1049
- **SuperMatch 21**: $2379
- **SuperVision**: $1279

### Sony
- **SONY CPD-1320**: $345
- **SONY CPD-1364S**: $459
- **SONY CPD-1730**: $1075
- **SONY CPD-2038**: $2099

### SuperMac Graphics Cards
- **PrecisionColor Display 20**: $1799
- **PrecisionColor Display 20V**: $2499
- **PrecisionColor Display 21**: $2499
- **PrecisionColor Display 22**: $2499

### Radius
- **PrecisionColor Display 20/20V**: $799
- **PrecisionColor Display 20F**: $1799
- **PrecisionColor Display 20FE**: $1799

### SuperMac 4FG® Series Monitors
- **SuperMac 4FG® Series IV**: $779
- **SuperMac 4FG® Plus A**: $1279

### NEC
- **New NEC Fices Series Monitors**: Starting from $1095
- **New NEC Fices Series Monitors**: Starting from $1399

### NEC CD-ROM Drives
- **CDR-741**: $389
- **CDR-800M**: $539
- **CDR-800W**: $599
- **CDR-800W44 External**: $659

### Suntouch Mac Extended Keyboard
- **GIG External**: $2299
- **GIG External**: $3099

### Magneto Optical
- **Magneeto Optical 3.5**: $1089

## Scanners

### UMAX
- **UMAX UC-630LE**: $869
- **UMAX UC-840**: $1279
- **UMAX UC-1260**: $1799
- **UMAX UC-1300**: $2499

### Scanners
- **MAXUS ScanMate**: $1095
- **MAXUS ScanMate 1**: $1395

### TelePort/Gold
- **TelePort/Gold**: $295
- **TelePort/Gold**: $395

### Modems
- **PowerPort/Bronze**: $189
- **PowerPort/Silver**: $193
- **PowerPort/Gold**: $359

### Ethernet Cards
- **Farallon**: $79

### Networking
- **Farallon**: $143

### Memory
- **4MB SIMMs** for LCII, Centris: $65
- **6MB SIMMs** for LCII, Centris: $79
- **8MB SIMMs** for Quadra 900: $149
- **8MB SIMMs** for Quadra 700: $149

### Dataproducts
- **960 Toner Cartridge**: $429
- **1560 Toner Cartridge**: $429

### Toner
- **Dataproducts**: $429
- **Dataproducts** Remanufactured Toner Cartridge for Apple II, III, and IIIb: $65
- **NEC Long Life EP Toner Cartridge for NEC Model 95, 97, and 1097 printers**: $169

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**CIRCLE 39 ON READER SERVICE CARD.**

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TI microLaser Pro 600 $1399

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We stock all PowerBooks: 145, 165, 166c/168c, 185c, 240c, PowerBook batteries and chargers, carrying cases and mods.
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PowerBook 180c 4.160 CALL
Centris 610 8.230 w/CD ROM CALL $299
Centris 650AV 8.230 w/CD ROM CALL $376
Quadra 880 8.500 w/CD ROM CALL $376

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DayStar Turbo '94 25 MHz $1000
DayStar Value '94 20 MHz $700
Newer Quadra Overdrive $250
Quad MCache 50 MHz $125

Fax Modems
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Supra Fax Modem 14.4/14.4 $299
Twincom PowerTwin 14.4/14.4 $299
Global Village PowerPort Bronze $329
Global Village PowerPort Silver $339
Global Village PowerPort Gold $339

SIMMs
LIFETIME WARRANTY
4 MB, 80ns (with trade in) CALL
4 MB, 80ns (Centris, LC III) CALL
1 MB, 80ns CALL
10 MB PowerBook 160/180 CALL

Fax Modems
US Robotics Sportster 14.4/14.4 $249
Supra Fax Modem 14.4/14.4 $299
Twincom PowerTwin 14.4/14.4 $299
Global Village PowerPort Bronze $329
Global Village PowerPort Silver $339
Global Village PowerPort Gold $339

SIMMs
LIFETIME WARRANTY
4 MB, 80ns (with trade in) CALL
4 MB, 80ns (Centris, LC III) CALL
1 MB, 80ns CALL
10 MB PowerBook 160/180 CALL

CD ROMs
NEC MultiSpin 74-1 $1399
Apple CD390 w/3 GB $1399
Toshiba XM3461 $1399
Pioneer DMR-604x $1249

Storage Systems
All MacCenter storage products include F/W Hard Disk, Emkei PE, double shielded SCSI cables & ext. terminator.
Puma Optical Drives
Puma 250 $1399
Puma 120 $699/999

Eagle Syquest Drives
Eagle 44 $399
Eagle 86c $499
Eagle 105 $699

Cobra DAT Drives
(Includes 90m tape & Retrospect)
Cobra Turbo DAT 8.0GB $1499
Cobra DAT (2.0 GB) 4MB per min. transfer rate $1299

Falcon Hard Drives
Micropolis 1.2 GB $1099/1199
Micropolis 2.0 GB $1449/1549
Fujitsu 1.2 GB $1029/1099
Seagate Barracuda 1.8 GB $1799/1899
Quantum GB-120 $269/369

Fax Modems
US Robotics Sportster 14.4/14.4 $249
Supra Fax Modem 14.4/14.4 $299
Twincom PowerTwin 14.4/14.4 $299
Global Village PowerPort Bronze $329
Global Village PowerPort Silver $339
Global Village PowerPort Gold $339

SIMMs
LIFETIME WARRANTY
4 MB, 80ns (with trade in) CALL
4 MB, 80ns (Centris, LC III) CALL
1 MB, 80ns CALL
10 MB PowerBook 160/180 CALL

All MacCenter drives.

800 944 0944
Number 1 on Reader Service Card
Number 1 In Service
Introducing the NuDesign Color Printer!

Here are some of the things you can do with this great printer!

- Stunning business presentations
- Coffee mug imprints
- Color proofing
- T-Shirt transfers
- Create vibrant charts and graphs
- Re-print crisp, clear color photos
- Plaques
- Cap imprints
- Even temporary tattoos!

Introducing the Photo-Realistic Upgrade.

Dye-sublimation on the Prism? The photo realistic upgrade kit gives you incredible true dye-sub output on your printer! Call for Sample Output. Photo-Realistic Upgrade... $249.00

What does the NuDesign have over other printers?

The NuDesign Prints twice as fast as other color printers at 1/3 the price!

- Thermal Transfer printing
- Print high-quality Color output at a low cost per page.
- Proofing quality output
- Brighter, richer, more vibrant colors than other color printing technologies.

NuDesign Color Printer (MAC) $998
NuDesign Color Printer (PC) $898

An unprecedented low-cost, high quality color printer!
### Optical Drives from Nu Design

All Our Optical Drives include one free cartridge

<table>
<thead>
<tr>
<th>Model</th>
<th>Access Speed</th>
<th>With RW Software</th>
<th>Price</th>
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<td>128 MB 3.5” Series II</td>
<td>Fast 37ms</td>
<td>FW8</td>
<td>$798</td>
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<tr>
<td>128 MB 3.5” Series V</td>
<td>Fast 32ms</td>
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<td>$858</td>
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<td>128 MB 3.5” Fujitsu Dynamo</td>
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<td>256 MB 3.5” Series X</td>
<td>Fast 30ms</td>
<td>RW/128mb</td>
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<tr>
<td>600 MB Hyperspace 5.25”</td>
<td>Fast 28ms</td>
<td>1MV/sec Trans</td>
<td>$2598</td>
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### DAT Drives from Nu Design

All Our DAT Drives include one free 90m Tape

**DAT Specials!**

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<tr>
<th>Model</th>
<th>With Retro</th>
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<tr>
<td>NuDesign 2.1 GIG</td>
<td>$898</td>
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<td>NuDesign 5.0 GIG</td>
<td>$1248</td>
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### Fujitsu Drives

<table>
<thead>
<tr>
<th>Model</th>
<th>Internal</th>
<th>External</th>
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<tbody>
<tr>
<td>185 MB 3.5” 12ms, Fast SCSI</td>
<td>$238</td>
<td>$298</td>
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<tr>
<td>520 MB 3.5” 9ms, Fast SCSI</td>
<td>$598</td>
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<tr>
<td>1.1 Gig 3.5” 8.5ms, 3yr war, 200,000 MTBF</td>
<td>$958</td>
<td>$1018</td>
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<tr>
<td>2.4 Gig 5.25” 11.5ms, 5yr war, 300,000 MTBF, Fast SCSI</td>
<td>$1698</td>
<td>$1798</td>
</tr>
<tr>
<td>NEW! 240 MB 2.5” Powerbook Drive</td>
<td>$498</td>
<td>$578</td>
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*Mean Time Between Failure is the average life expectancy of a drive.

### Conner Drives

<table>
<thead>
<tr>
<th>Model</th>
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<tbody>
<tr>
<td>C 85 MB 3.5” LPS, 2 yr war, 150,000 MTBF</td>
<td>$178</td>
<td>$238</td>
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<tr>
<td>C 170 MB 3.5” LPS, 2 yr war, 150,000 MTBF</td>
<td>$198</td>
<td>$258</td>
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<tr>
<td>C 340 MB 3.5” LPS, 9ms, 2 yr war, 150,000 MTBF, Fast SCSI</td>
<td>call</td>
<td>call</td>
</tr>
<tr>
<td>C 540 MB 3.5” 8.5 ms, 2 yr War, 150,000 MTBF, Fast SCSI</td>
<td>$648</td>
<td>$708</td>
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</tbody>
</table>

These new Conner drives are so reliable, that Conner has been one of Apple's largest suppliers of drives. The 150,000 hours Mean Time Between Failure and the incredible speed of the 540 are just two reasons to buy a Conner.

### SeaGate Drives

<table>
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<td>1.9 Gig Barracuda 3.5” 8ms, 5 Yr warranty</td>
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<td>2.4 Gig 3.5” 9ms, 5 Yr warranty</td>
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<td>2.4 Gig Barracuda 3.5” 8ms, 5 Yr warranty</td>
<td>$2098</td>
<td>$2158</td>
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<td>2.1 Gig Wren 9 5.25” 12.5ms, 5 Yr warranty</td>
<td>$1438</td>
<td>$1538</td>
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<td>1.6 Gig Elite 1 5.25” 11.5ms, 1 Yr warranty</td>
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<td>$1798</td>
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<tr>
<td>3.4 Gig Elite 3 5.25” 11ms, 5 Yr warranty</td>
<td>$2248</td>
<td>$2348</td>
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### Syquest Removable Drives

<table>
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<td>$318</td>
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<tr>
<td>88C MB Removable</td>
<td>$498</td>
</tr>
<tr>
<td>105 MB Removable</td>
<td>$598</td>
</tr>
</tbody>
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**NuDesign Key Points**

- Thermal Transfer printing
- Print high-quality Color output at a low cost per page.
- Brighter, richer, more vibrant colors than other color printing technologies.

**NuDesign Printer (MAC)**

- $998

**NuDesign Printer (PC)**

- $898

---

**Fujitsu Specials!**

- 520mb 3.5” Internal $988
- 1.1 Gig 5.25” Internal $938
- 2.4 Gig 5.25” Internal $1698

---

**Hard Drive Headquarters**

- 520mb 3.5” Internal $988
- 1.1 Gig 5.25” Internal $938
- 2.4 Gig 5.25” Internal $1698

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**DAT Drives**

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
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<td>2.1 GIG</td>
<td>$898</td>
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<td>5.0 GIG</td>
<td>$1248</td>
</tr>
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</table>

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**Syquest Removable Drives**

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Now—Fujitsu reliability plus the fastest Optical in town!

Fujitsu DynaMo

128 Optical Drive
- 30 Msec access time plus 1.09 MB/sec data transfer — fastest 3.5" magneto-optical anywhere!
- Less than half the size of other 3.5" rewritable drives — stands horizontally or vertically.
- Unbeatable Fujitsu reliability
- 100% ANSI & ISO compatible
- 1-year warranty

Fastest 3.5" re-writable optical.
For reading and accessing your files pronto, Fujitsu drives deliver unrivaled 30 Msec data access and 1.09 MB/sec transfer times — this is the fastest 3.5" optical on the market today. We’ve done plenty of testing right here at MacDirect to prove it.

Fujitsu DynaMo 128MB Optical Drive .................... $928.00

Color & Greyscale Scanners from UMAX

above: Nikon’s CoolScan right: The UMAX 840 & 630 scanners

UMAX UC-630 With PhotoShop LE 2.5......................... $898.00
UMAX UC-630 With PhotoShop 2.5............................ $1098.00
UMAX UC-840 With PhotoShop 2.5............................. $1298.00
UMAX UC-1260 With PhotoShop 2.5............................ $1898.00
UMAX UC-630LE Greyscale, upgradable to color........... $698.00
UMAX Scan Office Greyscale Scanner
With Typewriter OCR Software, Oftoto and Publish It,........ $898.00
- An incredible OCR package with over $1000 in software alone,
- Attachments For All Umax Scanners:
  Transparency/Slide Scanner ......................... $698
  Automatic Document Feeder ......................... $428
  NIKON CoolScan Super compact, Fast, 35mm color scanner internal $1898.00
  NIKON CoolScan Super compact, Fast, 35mm color scanner External $2298.00

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CIRCLE 131 ON READER SERVICE CARD.
Monitors

16" Color/Page T16 II ........................ $2479
20" Color/Page T20 ............................ $2479

SONY
Monitor Only
14" CPD-1320 .25mm, to 1024x768 NI .......... $339
14" CPD-1304 .25mm, to 1024x768 NI ........ $399
17" CPD-1604S .25mm, to 1024x768 NI ...... $899
20" GDM-2036S 30mm, to 1280x1024 NI ...... $2099
Cable adapter (specify model) ................. $18.88

NEC Monitor Only
15" 3FGe .28mm, to 1024x768 NI ............... $599
15" 4FGe .28mm, to 1024x768 NI ................ $699
17" SFGe .28mm, to 1280x768 NI ............... $1099
21" SFGe .28mm, to 1280x1024 NI .............. $2279

NEC MultiSync 69G Monitor and a NEC MacFax 24X Color Card and get a NEC MultiSync 74 CD-ROM Ready FREE. Offer good until 12/31/93.

SuperMatch 17T .26mm, to 1024x768 .......... $1049
SuperMatch 20T to 1024x768 ................. $1649
SuperMatch 20T XL .25mm, to 1024x768 ...... $2499
SuperMatch 21 .28mm, 1152x870 ............... $2329

Video Cards

8-bit Cards
Spectrum 8-24 PDQ .............................. $159
Spectrum 8 Series III ......................... $389
24-bit Cards
Thunder 24 ................................... $2149
Spectrum 24 PDQ+ ............................. $1449
Spectrum 24 Series IV ......................... $789
Accelerators
Thunderstorm Deluxe ......................... $829
Thunderstorm Pro ............................ $2679
NEC MacFG 8x ................................ $689
MacFG 24x ................................. $1189

Future SX ....................................... $469
Future MX ................................. $5829
Future LX ...................................... $1039

Memory Call for Current Pricing

Standard Mac
4MB/8MB ................................. $147
8MB/16MB ................................ $229
Quadra 700 ................................ $329
4MB/8MB/16MB ......................... $329
4MB/8MB/16MB/30MB .......... $629
4MB/8MB/16MB/30MB .................. $699

GLOBAL VIAS RISC-based processor, 300 dpi, up to 9 ppm, 512K RAM, 2 credit card font slots, HP LJ-II emulsion, 250 sht. tray, one year limited warranty .......... $689
microLaser Plus PS17 - Same as above with 17-font Adobe PostScript 1.5MB memory ........................................ $765
microLaser Plus PS35 - Same as above with 15-font Adobe PostScript and 1.5MB memory ................................ $810
microLaser Plus PS35-External .............. $1195

Modems

Hayes External
Accura 2400 2400bps with Smartcom EZ ...... $75
Accura 96 +Fax96 9600bps data, 9600bps S/R
3 Group 3 Fax. V.42/V.42bis, Free Smartcom data and Fax s/w and 25-pin cable ................. $290
Accura 144 +Fax144 14,400bps data, 14,400bps S/R Group 3 Fax, V.42/V.42bis, Free Smartcom data and Fax s/w and 25-pin cable .......... $290

GLOBAL VIAS RISC-based processor, 300 dpi, up to 9 ppm, 512K RAM, 2 credit card font slots, HP LJ-II emulsion, 250 sht. tray, one year limited warranty .......... $689
microLaser Plus PS17 - Same as above with 17-font Adobe PostScript 1.5MB memory ........................................ $765
microLaser Plus PS35 - Same as above with 15-font Adobe PostScript and 1.5MB memory ................................ $810
microLaser Plus PS35-External .............. $1195

Scanners

ESPIN Action Scanning System for the MAC 1200 dpi, over 16 million colors. Photo Shop LE, image editing, cable & SCSI IU .......... $799
Optional auto. document feeder .......... $449
Optional transparency unit .......... $99

other configurations available. Please Call

PostScript Laser Printers
BLP Elite 300 dpi, 2MB Memory, 17 PostScript Fonts-TrueType compatible ........ $799
Other Configurations Available - Please Call
BLP Eclipse 300 dpi, 2MB exp. to 4MB, PostScript Level II, Edge-to-Edge Printing 4ppm, 17 fonts .......... $5149
HP Resolution, Large-Format Printer
SelectPress 600, 600 dpi, up to 11 x 17 paper sizes, 35 resident fonts, 8MB RAM, PostScript Level II, Edge-to-Edge Printing .......... $3849
Thermal Fusion Portable Printer
WriteMove II Portable Printer, 2.5 lbs w/ battery, 360 dpi, prints plain paper, envelopes and transparencies (QuickDraw compatible) .......... $479

Laser Printers
SilentWriter Model 95F 6ppm, 2MB memory exp. to 5MB, 300 dpi, 35 scalable fonts, Genuine Adobe PostScript, Level 2, HP laserjet III w/HPGL emulation .......... $869
SilentWriter Model 97 Same as 95F upgraded with 10 ppm and envelope feeder .......... $1055

Drives

Storage Drives
Infinity 88/WR4U 4.25", Zero-foot-print, 20ms average seek time, 32K buffer
External Mac Drive .......................... $599
Internal for Mac Centris 630 ................ $499
Single 88MB Cartridge formatted .............. $125
SQ3105 3.5", 14.5ms average seek time, 64K buffer
External Mac Drive .......................... $699
Internal for Mac Centris 610 ................. $699
Single 160MB Cartridge formatted ............ $99
Internal drives for the Mac Box & Quadra 950 available.

PLI Toshiba Mechanism
CD/ROM MS 200ms, 330 KB per sec., 256KB cache, interface included ........ $599

NEC
NEW MultiSpin™ Xce External 195ms, 450KB transfer, 2 yr. warranty ........ $559
New MultiSpin™ XSP Personal/Portable 200ms, 450KB transfer, 2 yr. warranty, White or Gray ......................... $429
MAC I/F required, Call for details and pricing.

Texel
Mac Bundle DM-5034 265ms, 64KB cache, includes: interface kit, speakers, headphones, Naziliths, Music Sampler, Animals, Grolleys Envy, U.S. History, Sherlock Holmes .......... $749

PLI
Toshiba Mechanism
CD/ROM MS 200ms, 250KB per sec., 256KB cache, interface included ........ $599
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<td>Maxtor 245 mechanism</td>
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- All drives carry a 30-day money-back guarantee.

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**APS ST 2.0<sup>2</sup>**

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- APS MS 1.2G5 1Q99 1169 1189
- APS 2.0S 2299 2399
- APS MS 2.1G 1169 1189
- APS ZFP 12325 1459 1469
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- **Recovered**
- **Religion**
- **Sales/Marketing**
- **Scientific**
- **Security**
- **Shareware**
- **Statistics**
- **Utilities**
- **Adult**
- **Novelty**
- **On-Line Services**
- **Repair Services**
- **Slide Imaging Services**
- **Supplies**
- **Training**

### MISCELLANEOUS

- Accessories
- Books/Catalogues
- Business Opportunities
- Consulting/Programming
- Data Conversion Services
- Data Recovery Services
- Desktop Publishing Services
- Diskette Copy Services
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<td>Quantum 160MB <em>Drive</em></td>
<td>$299</td>
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  - 15ms
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  - 5,400
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- **Capacity**
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  - 68MB
  - 105MB

- **Model**
  - SQ955
  - SQ510C
  - SQ210S

- **Speed**
  - 20ms
  - 20ms
  - 14.5ms

- **Price**
  - $345
  - $455
  - $455

### CD-ROM Drives

- **Brand**
  - Teac
  - Toshiba
  - Pioneer

- **Capacity**
  - 20MB
  - 650MB

- **Speed**
  - 65ms
  - 27ms

- **Transfer Type**
  - Single Disk
  - Single Disk

- **Price**
  - $379
  - $439

### Tape Drives

- **Type**
  - 250MB
  - 2Gig
  - 4-Big
  - 4-Big

- **Model**
  - QIC 150
  - Archive
  - Archive

- **Speed**
  - 7MB/min
  - 8MB/min
  - 11MB/min

- **Price**
  - $479
  - $629
  - $919

### Optical Drives

- **Capacity**
  - 20MB
  - 650MB

- **Speed**
  - 65ms
  - 27ms

- **Transfer Type**
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  - MultiFunction

- **Price**
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Platform Choose

Point for point, which platform is the better choice: the Mac or Windows?

M y wife — a Mac devotee — needs a new computer. During our discussion of what Mac might be best for her, I suggested she use a Windows machine. I've come to the conclusion that Windows has become an acceptable alternative, if only because Microsoft's Word for Windows is pretty much the same as Microsoft Word on the Mac. If you know how to use one, you can use the other, so why not use it on a Windows machine?

She then burst into a diatribe about how Windows is to a Mac what a transvestite is to a real woman. She uses this analogy whenever she can, to imply that Windows users are somehow easily fooled. Maybe this was true years ago, but things have changed. Let's compare a Windows machine with a Mac and try to see what lies in the future.

Here's how the Mac is better.
1. Robustness. The Mac crashes less than any Windows machine I've ever used. From my experience, I'd say that Windows crashes the whole system (requiring a reset of the machine) two to three times as often as the Mac does. Crashes really annoy people.
2. True drag and drop. To install a new feature in your Mac, you just drop an icon into a folder. With Windows, you run a complex install program that sometimes requires tweaking or editing of system files.
3. SCSI support. Apple's implementation of the SCSI interface is a dream come true for people who want to add peripherals to their machine. It's true plug and run.
4. Mouse feel. If you're going to use a mouse, don't you think the mouse should have a good feel to it? Apple has all sorts of amazing algorithms to make the mouse easy to use. With Windows, the mouse is jumpy and hard to control. Whatever algorithms Windows is using to control the arrow aren't doing the job.
5. Better-looking output. Fonts on the Mac have more hinting, and Mac documents look better, however subtly.

Now, all five of these reasons can be disputed. Many Windows users have few crash problems. The install programs are a pain, but how many do you have to run in a lifetime? SCSI support in Windows machines is improving. The mouse feel is a nonissue as long as the mouse actually works. Who cares if it's not perfect in Windows? Ever used a mouse with a Sun workstation? The better-looking output is especially debatable.

OK, does a Windows machine have any advantages?
1. Cheapness. It costs less to buy a Windows machine, MIPS for MIPS, but the machines are much shoddier than the Mac.
2. Newer software. Most development is being done for the Windows machines. This may be negated by some outstanding Mac-oriented software in the development labs. We'll see.
3. Greater variety of machines. Gee, people moaned and groaned when Apple broadened its line of computers. Now there aren't enough of them, if we are to believe this argument.
4. Cheaper, faster IDE hard drives. You can now get a 1.2-gigabyte hard drive with 8-millisecond access time for $850. Tough to argue against this factor.
5. Upgradability. Most of the newer Windows systems have provisions for newer chips and higher speeds. This means a machine can have a much longer useful life.

I make a list like this every few years to see which platform is gaining the advantage. As of today, I'd say it's a wash. The Mac still seems like the better machine overall, with clear advantages. But the other platform may be turning into the VHS of computers while the Mac becomes the Betamax. Remember how, during that battle between VCR standards, the defenders of Beta howled about superior quality? Today's Mac users make the same appeal, but the offices of America aren't flocking to the Mac in droves, are they? Only graphic artists and other sensitive people are addicted to the Mac. This artsy market, although large, won't stay viable if the same software packages can be shown to run on a PC under Windows. The word-processing and spreadsheet markets are what drive the business buyers.

Although the parallel between the Mac and Sony's Betamax is apt, it doesn't indicate a completely bleak future. Sony ended up producing VHS machines and made Hi-8 a fantastic alternative, especially for camcorders. And Sony took much of its Betamax technology and turned it into a broadcasting standard format called Betacam. If Apple follows the same path, the Mac will turn into a specialized, professional graphics workstation (à la Betacam) and Apple will roll out the PowerPC Mac (Hi-8) and sell a PC clone (VHS)! It's this last action that will forever gall the Mac diehards.
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