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Which Mac?

The choice is more complicated than ever. But we give you the data to help you decide.

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Would That It Were Be

AS BOTH A NEXTSTEP and Mac OS programmer and enthusiast, I'm excited that Apple is finally investigating a UNIX-based alternative to the Mac OS (“Plan Be,” January ’97, page 64). However, I do have some reservations.

My primary concern centers around the fate of the Mac OS GUI. Anyone who has used any other OS will concur that no other GUI is quite as refined, simple, and elegant as the Mac’s. X Windows and other UNIX GUIs (Nextstep excluded, of course) are among the worst out there. They’re ugly, obfuscated, and generally primitive in comparison to the Finder. I’ve looked at screen shots of the BeOS GUI, and from what I’ve seen, it doesn’t look much better than any X Windows manager — in fact, in some ways, it looks a lot like the worst user interface of all: Windows 3.1.

I support Apple’s decision to move to a more powerful, elegant basis for its OS, but if Apple implements OS 8 with Be’s front end, the company will upset a lot of users. The Mac will lose its inherent elegance and simplicity — the things that endear the machine to so many users.

Nik Spilka
knsplika@undergrad.math.uwaterloo.ca

I WAS UNDENIABLY GRATEFUL to finally see a comprehensive story on the BeOS. Having followed Be for about a year now, I was heartened and frustrated to see all its promises coming true while the Mac OS continued to flounder. Now the solution is obvious. Even though clones are adding some punch to the Mac market, the lethargic Mac OS is pulling the Mac community down. It's time for Apple to make the biggest gamble in its history, bigger even than the transition to the PowerPC.

Kenik Hassel
n9440539@cc.wwu.edu

WINTEL USERS will look at the power available to them with a Power Mac running the BeOS and consider it irrelevant, just as they have done with every Macintosh advantage before. In three years, when Windows NT 5.0 ships with the structural strength of the current release of the BeOS, the PC world will still fail to see what it could have had in 1997.

George Bethel
GeBethel@Walrus.com

WHAT'S THE DEAL with the BeOS? I work as a graphic designer and have a ton of little applications and extensions on my machine. If even a single one of these things does not work with the BeOS running on a Mac OS system, then forget about putting it on my Mac. Yes, I would love to have more speed. Yes, I would love to have better stability. But if even one part of the current Mac system software is missing from the new OS, why have it?

I thought the whole idea of updating the OS was to add features and functionality, not take them away. Apple needs to look to the core of its user base before making a giant leap to Be. That base is in publishing.

Kevin Barré
BARRE@rhodes.edu

YOUR COVER HEADLINE “Watch Out, Windows” (January ’97) could not be more out of touch. Come on guys, the desktop war is over. Ultimately, the only operating system that matters is the Internet browser. I haven’t noticed the little development called Microsoft Internet Explorer and all the flak it’s giving Netscape? In the end, what matters is how you integrate the world of the Internet with the desktop. The browser is the operating system.

Kevin Fletcher Tweedy
kft@who.net

Open Folder

What a month. Godish@aol.com assailed us as “SPOILED MAMBY PAMBY WHINING JERKS.” CMJBUELL@aol.com derided us as dim-witted whiners. And Tom Trinko characterized us as liberals, whose “only acquaintance with logic is that [the two words] share the same first letter.” What brought this on? Think Hormel canned meat product. Think spam (the unsolicited junk mail that taxes your time, finances, and computer resources by filling up your e-mail in-box).

In our January issue, we touched off a firestorm by audaciously suggesting that advertisers not be allowed to use such intrusive means of peddling their wares. The populist in Godish rebuked us “rich folk” for concerning ourselves with this triviality when problems such as homelessness, unemployment, and evil multinational corporations prevail. The barbed-tongued elitist in Godish yeared for the day we “get downsized and have to work at Burger King.” The Constitutionalist in Godish closed by suggesting that we “develop a little respect for the freedoms our forefathers fought and died for.”

With less vitriol, CMJBUELL pointed out that spam should have no financial impact because anyone who didn't already have an unlimited-access online account was simply stupid.

Soothing words for Tom Trinko, who dislikes spam for the very reason that he does have to pay for the deluge of junk. Tom chided us for not giving the fight against online pornography as high a priority as the fight against spam. Said Tom, “You're going to tell me the Founders intended the First Amendment to protect pornography but...”

Tom Trinko, who dislikes spam for the very reason that he does have to pay for the deluge of junk. Tom chided us for not giving the fight against online pornography as high a priority as the fight against spam. Said Tom, “You're going to tell me the Founders intended the First Amendment to protect pornography but...”

MARCii

Illustration / Margaret Macaulay

WRITE TO LETTERS

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LETTERS

The Rainbow Connection

COMPARING THE OUTPUT quality of dye-sublimation printers is tricky, and we appreciate the complexity of putting together "The Burden of Proof" (December ’96, page 96). We are concerned that the testing methods used by MacUser Labs may have misled your readers about digital proofing systems, particularly with respect to the Imation Rainbow Model 2730.

For the review, Imation provided a Rainbow 2730 proofing system to MacUser Labs. The Rainbow 2730 proofer is a highly sophisticated proofing device, designed for graphic artists, printing, and prepress professionals who require critical color accuracy, a high degree of flexibility, and excellent calibration between hardware, software, and printing media, to simulate actual printing processes.

Because the Rainbow 2730 proofer includes a broad range of options to help users accurately preview printing processes, all customers who purchase the system receive an on-site technical-service visit. We wouldn’t sell the product any other way. On-site technical support helps ensure that busy professionals do not experience the potential frustrations involved in setting up a new system. Further, this support ensures proper optimization of, for example, color tables and base materials, to accommodate customer-specific workflows. Unfortunately, MacUser Labs declined this service. We believe the image and color problems described in the test results obtained by MacUser Labs could have been avoided with this up-front assistance.

We believe that the "Features of Dye-Sub Printers" table was also misleading. It indicates that Imation offers a 90-day warranty for the Rainbow 2730. That oversimplifies our comprehensive customer-support program. Imation provides initial on-site technical support for the first 90 days of use. We also provide 24-hour phone support to all Rainbow customers for the life of the product. After 90 days, customers have the option of purchasing an extended on-site service agreement.

As we introduce new products, we look forward to supplying MacUser with the products for testing. It is our desire that the entire Imation product and service package offered to our customers will be included as part of the testing procedure.

Chuck Oesterlein
Imation

/ At no time in the course of our researching products and preparing testing did Imation offer on-site setup. The printer we received included all manuals and instructions necessary to set up and test the printer, and given our real-world testing environment — which mimics the experience of ordinary users — we proceeded to do so. We encourage Imation to better alert purchasers to its setup options and to any additional costs such options entail. Furthermore, we report on service contracts and warranties as included in the purchase price of a product. We do not report on extended warranties that may be purchased separately, as many are not directly under the manufacturer’s control. //JP

Clones Aren’t Clones

YOUR COMPARISONS of UMAX clones with Power Computing clones (see review, January ’97, page 33) is essentially flawed. Two cases in point:

You fail to mention that the Power clones ship with Speed Doubler. Comparisons between a clone plus Speed Doubler and one without are essentially worthless. Disable Speed Doubler on the Power machines and report that benchmark for a change.

The UMAX SuperMac S900 with a 225-MHz chip is shipping, so why is the report on a prototype? Does this indicate the article was rushed to publication without the intent of being thorough and accurate? In particular, your review claims low benchmarks for graphics on the UMAX machine compared to Power machines. Why were the tests done with a 4-MB IMS TwinTurbo card instead of the 8-MB card with which the system ships?

If these benchmark tests are to be informative and worthwhile for a particular subsystem, extraneous variables need to be isolated and equalized.

Paul Cheng
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We test Mac OS systems as they ship from the manufacturer. If Speed Doubler (or any other performance enhancer) comes installed on a system, then its presence is reflected in our test results, as it would be in any user's out-of-the-box experience. We do not include prototypes. UMAX certified the SuperMac S900/225 as a production unit, and as mentioned in the review, the company changed the shipping configuration when it was too late for us to retest it (or drop the product from the review). For a full report on the final shipping system, see this month's "Which Mac?" story. //JSA

Quicken Miscalculation?

YOUR GLOWING REVIEW of Quicken 7.0 (see review, January ’97, page 38) was apparently based on inadequate testing of the program’s features, judging from the problems Intuit has already fessed up to in its AOL support forum soon after the product release.

Quicken inaccurately records stock splits. Users have experienced errors when updating files from version 6 and have also been unable to connect properly for electronic registration. When updating stock prices, the program loses track of currently selected stock. And when you’re entering checks on the check form, if QuickFill fills in an amount for the first match and further typing then changes the payee, the amount remains the same instead of changing to the correct amount. There are also inaccuracies in the manual — including the omission from the back cover of the keyboard commands, repeatedly referred to in various places within the manual. These are hardly obscure or exotic features, and your reviewer should have tested them!

What’s particularly galling is that the exact same thing happened a year ago with the release of Quicken 6. The support forums were overflowing with the anguish of users swamped with problems that Intuit reps cheerfully admitted. Not least was the vapid "online banking" feature on which so much of Intuit’s advertising depended.

Philip Brandes
philip8023@aol.com

/ It’s true that Intuit has acknowledged several bugs in Quicken 7.0 and Quicken Deluxe 7.0, but many occur only sporadically or only on certain machines; if they had occurred during our extensive testing, we certainly would have mentioned them. The most grievous problem — mishandling of stock splits — was unfortunately not an issue in the real-world test portfolios we used for our review. //JSA

No Sacrificial Spam

I DUNNO ABOUT Andy’s column on spamming ("Junk-Mail Jihad," January ’97, page 212). I’d rather live with the junk mail than get the government involved. The cure might be far worse than the problem. No, I think it’s better to work this out by using market forces and civil courts. As far as I’m concerned, using the government to fix this problem is akin to swatting a fly with a Buick. Call me idealistic or whatever you like, but I say we avoid that kind of power — the Dark Side.

Griff Miller
miller@positron.com

Corrections

The correct author of the MovieStar review in our February ’97 issue (page 49) was Jim Shatz-Akin.
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Everyone knows Steve Jobs. Cofounder and former CEO of Apple, he's the man who coined the phrase *insanely great*, the man who created the very culture in which the original Macintosh grew. But, who’s NeXT? Besides being that thing Steve Jobs did after he left Apple, NeXT Software has never risen much above the din of a marketplace obsessed with more-mainstream operating systems.

Steve Jobs’ return to Apple is a stroke of marketing genius. How better to reassure the hoards of loyal Mac users than to embrace one of the men responsible for it all? Jobs has proven himself an articulate defender of the Macintosh. I’m especially thinking of his Oscar-worthy performance in the PBS special *Triumph of the Nerds*, in which he waxed poetic and wistful about the Apple that existed before he hired his personal Judas, the man known for his prowess in marketing colored soda water. Jobs is a man who embodies the passion that the Mac has always stirred in the hearts of its users. A passion that has been missing at Apple — for way too long.

The sheer charisma and marketing savvy Jobs brings back home is worthy of celebration, but there’s more to it than that. Jobs is a visionary. He has always been ahead of the curve, sometimes too far out. He created a market for the Macintosh where one did not exist, although arguably his refusal to license the Mac OS ultimately led us to today’s state of affairs. More than that, he saw that giving the powerful but arcane UNIX environment a graphical interface held potential, even if he had difficulty marketing his Nextstep operating system. Now it’s emulated by Sun, Hewlett-Packard, Digital, and Silicon Graphics. Jobs has an excess of vision, if not business acumen.

Boy Story
But let’s face it, Jobs is back at Apple only part-time — and only as an advisor. Not that I’d underestimate the potential impact of even a part-time Jobs. However, the real question before Mac users is, What is this NeXT thing anyway, and why should I care?

Taking a cue from Jobs’ latest success, the computer-animated movie *Toy Story*, think of it this way: The Mac OS is level-headed Woody, and Nextstep is slickly futuristic Buzz Lightyear. Both must band together to fight off Bill Gates, er, Sid, the nasty kid next door who crafts mutant toys, er, operating systems, out of salvaged parts.

Although Nextstep may not be well known among the rank and file of computer users, the digital elite — in search of a powerful workstation OS that still retains the ease of use and joie de vivre of the Macintosh — have embraced it. Among the computer industry’s cognoscenti, Nextstep has long been respected as the premier platform for building object-based applications. Those entrusted with building Corporate America’s next-generation data infrastructures get misty-eyed at the mention of WebObjects, NeXT’s Swiss-army knife of intranet development. And then there’s Nextstep’s legendary stability — it almost never crashes — a condition Mac OS users can only dream about.

It is the combination of these two proven operating systems that could win the day for Apple and NeXT — the Mac OS for its broad market appeal and Nextstep for delivering modern extras that might just catapult the combined platform ahead in the race to be best on the Internet.

Nextstep is the reason Mac users should be excited about Jobs’ return. There are also plenty of risks associated with Jobs’ homecoming. It’s 11 years later. The world has changed. The Mac has changed. We have changed. And Jobs’ return to Apple could appear a sign of desperation, another sad attempt to regain faded glory. Amelio risks presenting the computing pioneer as an aging rock star trying to go back out on tour one more time — much like the Who regrouping to perform *Quadrophenia*, complete with microphone tosses, windmill guitars, and high hopes for boffo box-office sales.

But it all comes down to this: Can Steve Jobs deliver the modern platform Mac users have been waiting for? Although NeXT offers a lot of exciting possibilities (as has always been the case with Apple), the destination is not the problem, the journey is. That’s where the rubber meets the road, and therein lies Apple’s most formidable challenge.

Elsewhere in This Issue . . .

This month we also introduce two new columnists to the pages of *MacUser*. Long known to our readers as our lead technical writer on issues such as the Mac OS and clones, Henry Bortman is also our resident curmudgeon. His new column will serve as a forum for voicing concerns about Apple, the industry, and Mac products — from the user’s perspective.

Those of you who cruise the *MacUser* Web site (http://www.macuser.com/) and read our Internet coverage in the pages of the magazine will be familiar with Jason Snell. His new column, *Net.cetera*, will focus on the tools, techniques, and trends that will continue to make the Mac one of the leading Internet and intranet platforms. \*
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SOMETHING'S MISSING. Today there are over 40 different Macs and Mac-compatibles on the market. Now, you could survey this scene and say, Hey, Mac OS licensing is really beginning to work. Look at all the choices we have. Look at all the ways clone vendors have found to innovate. Look at the range of performance, the variety of bundled hardware and software, the price options available.

Or you could say, Where the hell are the laptops?

Let's survey the stirring selections available to us from Apple: There's the PowerBook 190 series, the only remaining Macintosh products that don't use PowerPC chips. I'm sure lots of folks are chomping at the bit to ride that wave into the future. There's the 5300 series. These are particularly popular in chemistry labs, where they double as Bunsen burners - but don't get me started.

And there's the new 1400 series, which everyone (MacUser included) seems to be falling all over themselves to sing the praises of, due mostly to the fact that it's not awful. I know, it's got a built-in CD-ROM drive, which PC portables have had for over a year. It's got a nice screen. Well, duh. It's easy to take apart. My kid will like that. And it lets you make personal fashion statements by sliding a tacky BookCover into the lid. There's a sell.

But for charity's sake, let's call these pluses for the magic formula, as far back as a year ago? Would UMAX jump at the chance to jump into this market? You betcha.

So where are they? Well, it works like this. A clone vendor that wants to produce a Mac-compatible system goes to Apple and says, We'd like to license such-and-such design. Apple goes, Think, think, think. Engineers talk. Lawyers talk. Bean counters talk. Then Apple comes back to the done maker and says yes — or no. In the case of portables, it's always been no.

Wait, you protest, rushing to Apple's defense. Maybe the clone vendors haven't asked if they could license portable designs. Trust me, they've asked. Maybe Apple just doesn't have the engineering staff to support a clone license for portables, you suggest. I haven't heard that there's a hiring freeze at Apple recently. How many engineers would it take? Two? Three? That doesn't seem an unreasonable cost for Apple to bear to enable the growth of the Mac-portable market.

Or maybe, just maybe, Apple likes having a monopoly on Mac portables. Maybe the notion of some third party offering an alternative to the disaster known as the PowerBook 5300 was just a bit too much for Apple execs to swallow. Maybe they'd rather see customers who need advanced portable-computer technology switch to Windows machines. At least there are choices on the Wintel side.

I'd like to tell you a clone laptop is just around the corner. But I'd be lying. At this point, it looks like we're going to have to wait for the PowerPC Platform before we see third-party portables. And there isn't even a spec for PPCP-based portables yet. My prediction: Check in around Q1 1998.

In the meantime, I'm holding onto my 540c. The little hook that keeps the lid shut: It broke off. I have to hold the lid closed with a bungee cord. The little piece of plastic in the back that's supposed to protect the ports: It broke off too. The retractable feet: They collapse at random intervals while I'm typing. And I seem able to charge my batteries properly only when the full moon falls on a Thursday. But it's got built-in Ethernet and a 28.8-kbps modem. And I've upgraded it with a Newer Technology 117-MHz NuPower PowerPC processor daughter-card, which puts it neck and neck speedwise with a 1400 — not bad for a system built nearly three years ago.

Yup. That 540c is a darn solid little computer, perhaps the best portable Apple ever made. I bet some clone vendor would just love to bring the next 540c to market. ☺
Introducing StarMax™ Go ahead, pinch yourself. Motorola has launched an entire line of Mac OS-based desktops and minitowers running on PowerPC™ technology. Everything from 180 MHz to 240 MHz, 1.2GB to 2.5GB hard drives and starting at about $1,595. So now, you have a Mac OS alternative with an industry-low price. And with the assurance of the Motorola brand, you're getting the quality you'd expect from a global company. In fact, we're so sure of it, we gave all of our StarMax systems a five-year limited system warranty—the only one like it in the industry. And PowerPC™ with our new board design, Motorola systems running on the PowerPC 603e™/200 MHz microprocessor outperformed other Mac OS compatibles running the same chip (even one running at 240 MHz)! Call us if you still think you're dreaming. You can consider it a wake-up call.
APPLE HAS MADE ITS DECISION. The next step in Apple's Mac OS strategy is to use Nextstep, the UNIX-based operating system from NeXT Software — a company that's now lock, stock, and Steve Jobs a part of Apple Computer, after a $400 million announcement late last year.

Nextstep beat out several contenders — the BeOS, from Be; Sun's Solaris version of UNIX (spiked heavily with Java); Windows NT (which didn't even make it to the semifinal round); and a homegrown OS developed entirely within Apple — for the right to serve as the foundation of the Mac's future OS. Given that hardly anyone in the Mac community has even heard from NeXT in the last few years, Apple's choice might seem a curious one. So why did it do it? What's so great about what NeXT brings to the table?

First of all, although Nextstep isn't what would likely spring to mind if someone asked you to name a popular operating system, the NeXT OS has been around for over ten years — it's had time to mature and is now stable and reliable enough to be used by several large corporations for critical business applications.

In addition, it already contains many of the features that Mac users would expect from an Apple operating system. It supports the Mac HFS file system. It implements plug-and-play for PCI add-on cards. It enables applications to be localized easily for the international market. It has AppleTalk client software for connecting to servers and printing (although it doesn't currently support AppleShare-based file sharing). Nextstep also currently supports power management on Intel-based notebook computers, so that aspect of getting it to run on PowerBooks should be a relatively easy task.

A FIRM FOUNDATION

But although these are bonuses that will simplify the task of integrating Nextstep with the Mac OS, System 7 already does all these things too. So why switch? What are the advantages that the Nextstep OS's foundation provides? In our January story on the BeOS (see “Plan Be,” January '97, page 64), we laid out several fundamental technical criteria by which Apple's new-OS strategy should be evaluated: The new OS would need to be object-oriented, to provide full memory protection for applications and modern virtual memory, and would need to support preemptive multitasking, multithreading, and symmetric multiprocessing. Our initial research into Nextstep indicates that it can meet all these criteria when ported to PowerPC-based systems.

Yet it appears that Apple's acquisition of NeXT is motivated as much by the company's interest in becoming a key player in the enterprise/intranet market as it is by concern for the future of the Mac OS. It may well be that in choosing NeXT's offering over Be's, Apple was wowed by NeXT's WebObjects technology as much as by Nextstep and its cross-platform implementation, Openstep. After all, conventional wisdom these days is that the advent of the Internet may soon make users' choice of OS irrelevant.

THE CONTENDERS / Nextstep has all the virtues of a modern operating system

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*Currently running on Openstep-based systems.
*Currently running only on Intel-based notebook computers.
*Printing is supported; AFP client software is provided.
WebObjects is indeed a cool piece of technology. It greatly simplifies a corporate customer's task of integrating its existing databases (the lifeblood of many businesses) with the World Wide Web (the hot new thing). For businesses trying to reach customers on the Web or to move their internal communications to a corporate intranet, WebObjects has much to offer (see the "More Than a New OS" sidebar).

**QUESTIONS REMAIN**

But that doesn't mean that merging all Nextstep has to offer with the best of the Mac OS (both System 7 and the ill-fated Copland) will be easy. Short of a miracle, it's unlikely that Apple can deliver such a super-OS before 1999. The list of technical issues to be addressed for such a merger to succeed is formidable. Chief among them is that Nextstep doesn't currently run on Mac hardware. Coming in a close second on the issues list is Nextstep's imaging model: it is based entirely on Display PostScript, whereas the Mac OS is based on QuickDraw.

These are just the tip of the iceberg. Most of Apple's technologies — the QuickTime Media Layer (which includes QuickTime, QuickTime VR, QuickTime Conferencing, and QuickDraw 3D), ColorSync, Speech Recognition and PlainTalk, QuickDraw GX, OpenDoc, Game Sprockets, Apple Guide, and the Mac OS 8 Macintosh User Experience (the Copland customizable desktop) — need to be made reentrant and need to be ported to run on top of a Nextstep foundation. And although Apple has said that the first iteration of the new Nextstep-based OS won't run current Mac apps, users will certainly clamor for a future version that adds System 7 compatibility for running their existing Mac apps. That's a lot of work.

And remember: We're talking about the same Apple that took months just to deliver Mac OS 7.6, which required only that the company collect a bunch of already shipping OS bits and pieces and run it through QA — an "accomplishment" eerily reminiscent of The Old Apple, which worked on Copland for three years and never even coughed up a beta release.

**WHAT TO DO NEXT**

In fact, Apple has no intention of delivering the ultimate new OS in 1997. Quite the contrary: What Apple is likely to give you in 1997 is Nextstep ported to run on Power Mac hardware. Period. Apple has already admitted that System 7 compatibility will come later. How much later?

Apple appears as interested in the enterprise/intranet market as in the future of the Mac OS.

And what will it look like? At press time, the company wasn't prepared to say.

A largely unmodified Nextstep that doesn't run System 7 applications may be of questionable value to developers. Why would they want to write applications for Nextstep in its current form when much of it — the fundamental graphics model and the basic user interface, for example — might well change in the final merged OS? And as for users, Nextstep running on Mac hardware will be little more than a curiosity until enough compelling applications are available.

Instead of rushing to market with this System 7-hostile release, Apple could have chosen to delay delivery of the first implementation of the new OS until it had time to do more integration of Nextstep and Mac OS technologies. It could have chosen to resolve the graphics-model issue; or to implement the Mac OS 8 desktop look and feel in place of the Nextstep interface; or to port the QuickTime Media Layer to run on top of Nextstep; or to begin the task of making Mac OS APIs reentrant, so they could take full advantage of Nextstep's preemptive multitasking; or to integrate OpenDoc and Cyberdog with Nextstep's object model; and certainly to provide

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**HOW DOES NEXTSTEP STACK UP against System 7.5 — and the operating systems it beat out in the contest to be System 7.5's successor?**

The BeOS represented a remarkable improvement over System 7.5 and the original Mac OS 8 as planned — but it's still under development. So, although it meets all the requirements of a modern OS — Nextstep does as well — it would have taken Be or Apple some time to deliver a stable OS and for commercial applications to follow. Nextstep, on the other hand, has been shipping for years and has a stable technology base. Applications? Well . . .

Nextstep already has important components that are either missing or not yet delivered in the BeOS. These components will ease the transition to Apple's OS future: AppleTalk printing and file access and Macintosh file-system support already appear in the current, shipping version of Nextstep. Also supported is notebook-computer power management, albeit only for Intel-based notebooks. These are items Be wouldn't have delivered for some time, making the transition to an out-of-house foundation for its next OS more difficult for Apple. With Nextstep, Apple already has a head start. / JEFF HETTELKAU

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More Than a New OS

Powerful Web and development tools sweeten Apple/NeXT deal.

FORGET NEXTSTEP — at least for a moment. Put aside your concern over the challenges that Apple will face in transforming NeXTstep to the next Mac OS. Take a look, instead, at two other NeXT technologies Apple acquired when it made $400 million worth of nicey-nice with its ex-founder: WebObjects, which offers a powerful way to share live information from multiple sources over the World Wide Web, and Openstep, a cross-platform, object-oriented development environment.

Instead of viewing your Mac as a desktop computational island where the OS is king, think of its role in a multi-OS community, sharing information, sharing application-development efforts. Sure, this is a new way of looking at computing and it entails a bit of a paradigm shift, but as they say, “shifts happen.”

This particular shift gives Apple the opportunity to be more than merely the manufacturer of a great desktop system that dominates important — albeit niche — markets. If Apple succeeds in fully exploiting all of NeXT's technology, instead of merely cannibalizing what it needs to cobble together a replacement for the ill-fated Copland, it could take the lead in a new OS-agnostic world of shared information distribution and application development. If Apple fails . . .

WEBOBJECTS

WebObjects is a server-based technology that can package practically anything — data from a corporate database, Java and ActiveX applets, Shockwave and RealAudio files, data-acquisition forms — and insert it into HTML pages that it builds on the fly, in response to a client's request over the Web. It can also take any information provided by a user on a client computer and distribute it, as appropriate, to any database or other information-storage entity to which it is connected.

All this happens transparently to users. Since WebObjects is browser-independent, a WebObjects application can be accessed from Netscape Navigator, Microsoft Internet Explorer, versions of Mosaic from NCSA or Spyglass, or any other HTML browser. WebObjects supports Java applets, HTML 3.0, Netscape extensions to HTML, and SSL-secured links to a Netscape Commerce Server. WebObjects applications can hook up to an HTTP server through the standard CGI HTTP interface, NSAPI (Netscape), or ISAPI (Microsoft). WebObjects is designed as a

Apple's Iron Lady of R&D

NO-NONSENSE is a term often heard to describe Ellen Hancock, who joined Apple in July 1996 as chief technology officer. Some of her employees have even honored her with a nickname — The Iron Lady — which, considering the indecisiveness of her predecessors, is a considerable compliment. I talked with Hancock just days before Apple's announced acquisition of NeXT; here are some excerpts from that conversation — along with my interpretation of her comments.

EH: Where is the excitement about the Mac platform going to come from over the next few years?

AG: Well, first of all, I believe we are working toward a strategy that will provide us with an OS that responds to our customers' needs. Second, we have a fair amount of work going on relating to the Internet that will be very positive. Third, the combination of Java and OpenDoc will be an important part of our future.

Apple is betting big on Java to help the Mac regain its edge and help make it an equal, if not superior, citizen on the all-important Internet.

AG: What, specifically, are the things you will be doing on the Internet?

EH: We're very focused on the integration of the Internet with the operating system and what the user experience will be like relating to getting access to data. We are absolutely committed to providing offerings that allow people to get access to the Internet, helping people come up with a Web page, helping people install a Web server.

As Hancock will tell you herself, the Mac is doing quite well on the Web, with 64 percent of content creation, a healthy chunk of Web servers, and 20 percent of all surfing. The company's problem is to get the market to notice Apple's success.

AG: Is Copland dead, and if Copland is dead, why did you decide to kill that project?

EH: We planned to deliver at the end of next year an operating system that attempted to solve two problems: compatibility and providing new functionality. The plan also said that we would not add new OS functionality to System 7 until Copland shipped and that when Copland shipped, we would convert users to the new OS.

I believe those were flawed proposals. The world has never known an overnight conversion to a new OS, and I didn't think Apple would be able to be the first to make such a thing happen. And a year
complement to, and not a replacement for, Java, since Java services concentrate on the client side and WebObjects services focus on the server side.

The advantages that WebObjects has over a standard HTML-on-an-HTTP-server Web site are many and varied. The first and most obvious one is that since HTML is created on the fly by a WebObjects application, pages can be customized for each user. For example, if you fire up your Mac, launch Microsoft Internet Explorer, and access a product-catalog site, you might find not only a page personalized with your name, address, and order number but also a catalog that offers selections tailored either to your purchasing history or your prestated tastes.

More important from the catalog-publisher's point of view, the information appearing on that page can come from any number of sources — whether or not those sources use the same data-storage architecture. For example, one page could contain data from Oracle, Sybase, Informix, DB2, flat file, and ODBC-compliant databases plus data from any number of image-file sources. A WebObjects application can even yank data out of an Excel spreadsheet running on a Windows NT server.

In addition to having access to sources of data running on various hardware, WebObjects applications (written in C, C++, WebScript, and Objective C, with Java, JavaScript, and Visual Basic Script support under development) can run on multiple server platforms, including Windows NT, Solaris, OpenStep-, and Nextstep-based ones. And if your site starts to get too popular, you can spread the load by adding more WebObjects servers by bypassing the DNS-registration hassles of adding more HTTP servers — since WebObjects information management can take place on a different hardware platform from the HTTP server, the processing load can be more effectively balanced.

Currently, NeXT offers three WebObjects products: WebObjects, the entry-level version, is available free from NeXT’s Web site (http://www.next.com/) — but don't bother downloading it if you’re not running Windows NT, Solaris, or Nextstep 3.3. The free version of WebObjects will allow you to build simple interactive components, using an interpreted language. The midrange product, WebObjects Pro, lets you distribute your WebObjects applications across multiple servers and integrate them with Microsoft OLE. It adds the ability to compile in C, C++, and Objective C and includes a drag-and-drop development tool. The top-of-the-line WebObjects Enterprise is required for linking up to industrial-strength databases.

OPENSTEP

A major strength of WebObjects is that it’s object-oriented — that is, a WebObjects application is built out of components either supplied in the development environment or created by the developer and then reused in other applications, as needed. The savings in application-development time — and money — can be substantial.

This object orientation is the core of OpenStep, the other Toy Surprise inside the NeXT acquisition. (In fact, object-oriented development is the core of NeXT’s entire product line.) Openstep is an object-oriented application-development environment based on the popular and highly acclaimed application-development features of Nextstep.

Openstep’s claim to fame is that it makes applications easy to develop and easy to customize and that it makes it easy to create applications that run on different platforms. Once you start developing Openstep-based applications, you can reuse the objects that comprise them in future applications. The more you develop applications by using Openstep, the more component objects you develop and the easier and faster it is to develop your next application.

Currently, Openstep includes a drag-and-drop development environment equipped with reusable interface objects that provide the look and feel of our old friend, Windows 95. These applications will currently run under Windows NT, Solaris, and MACH (the UNIX kernel that is at the heart of Nextstep). The make-or-break question, of course, is if and when Openstep will be modified to create Mac-like applications that can run on Mac OS whatever on a PowerPC.

In any case, the dynamic duo of Web-Objects and Openstep — and the future they represent — may be why Apple chose to bet on NeXT. Despite the attractiveness of the competing Be deal, the BeOS is merely an OS. / RIK MYŚLEWSKI

ONLINE POLL

Q. What should be the foundation for Apple’s next major system-software release?

- BeOS 71%
- UNIX 3%
- OS/2 1%
- Windows NT 2%

An Apple internally generated system
Let's look at the facts. Microsoft Internet Explorer 3.0 was designed for the Mac by our Mac developers to be faster and easier to use. It requires no upgrade since it runs on existing Macs like 680x0 and Power Macs, and it only needs a 4MB RAM partition. (Netscape eats an 8MB partition.) Internet Explorer 3.0 supports Stylesheets, ActiveX, Java and native Mac technologies like QuickTime, QuickTime VR and AppleScript. It gives you lots of killer ways to customize your Web experience, as well as convenient access to e-mail and newsgroups. Microsoft Internet Explorer 3.0 is quicker and smarter and smaller and, incredibly enough, it's free* You can do a quick download from the Microsoft Web site, or call AT&T for a WorldNet connection and a free disk at 1-800-967-5363 ext. IE3. You may even want to keep Netscape for nostalgic reasons.

*Connect time charges may apply. ©1997 Microsoft Corporation. All rights reserved. Microsoft and Where do you want to go today? are registered trademarks and ActiveX and the Microsoft Internet Explorer logo are trademarks of Microsoft Corporation. Java is a trademark of Sun Microsystems, Inc. Other product and company names mentioned herein may be trademarks of their respective owners. Image courtesy of AURA/STScl and NASA.
Apple, Power to Take DVD Lead
Mac OS-system vendors outline plans for adopting new ultrahigh-capacity digital media.

It takes chutzpah to be the first company to embrace a new technology. Sure, many of us early-adopter types will support an aggressive vendor by plunging down our hard-earned equipment-buying dollars for the latest and greatest in Mac peripherals, but more-cautious Mac users often have a wait-and-see attitude. The rewards for being first can be substantial—but so is the risk.

DVD, the new digital-media standard that's set to explode onto the scene in 1997, offers just this challenge to Mac OS-system vendors—including Apple. And as the day gets closer when you can pop a DVD disc into your Mac or video player and watch two hours of full-motion, full-screen video, complete with Dolby surround-sound and multiple subtitle tracks, Mac OS-system vendors have begun to release details about whether they'll be leaders or followers in the DVD revolution. At this point, it appears it'll be Apple and Power Computing that first take the DVD plunge, with APS, DayStar Digital, Motorola, and UMAX waiting in the wings.

The time is right for DVD—finally. First announced in late 1994, the DVD initiative quickly became bogged down in a competition between two rival standards. This dispute was finally settled in late 1995, only to be replaced by another argument, this time about encryption technology. This last hurdle was overcome in late 1996, followed quickly by DVD-drive announcements from Hitachi, Panasonic, Pioneer, and Toshiba.

Although every last wrinkle has yet to be ironed out, one measure of unanimity among DVD-drive manufacturers is that they have finally agreed on what the acronym DVD stands for. Originally it was digital video disc, but as nonvideo uses became apparent, Toshiba suggested digital versatile disc. The new consensus? DVD doesn't stand for anything: DVD = DVD.

No matter how you define it, DVD will have a major impact on the delivery of digital media of all types, be it video, audio, still images, or multimedia. The simple reason for DVD's versatility is its ultrahigh disc capacity: A single-sided, single-layer DVD disc can hold a full 4.7 GB. Add another layer to the same side—a feature enabled by a new dual-focus hologram laser-lens technology—and the capacity jumps to 8.5 GB. But wait, there's...

The Perils of Radio Activity

The Microprocessor Age Dawned a mere 25 years ago, when the Intel 4004 climbed up out of the analog ocean onto digital terra firma. This pathetic 4-bit weakling, comprising a mere 2,300 transistors and stumbling along at a soporific 750 kHz, nevertheless had a unique evolutionary advantage over its analog ancestors: It could be taught new tricks; it could learn.

Because of its intelligence and versatility, the microprocessor quickly rose to the top of the electronic food chain. Today its evolution has led to such 64-bit monsters as the DEC Alpha 21164, which drives its 9.3 million transistors at 500 MHz. But microprocessors dine on data, and as they've grown bigger and more powerful, their appetites have become more and more voracious. And although their evolution has been swift and sure, the development of their data-serving subsystems has lagged far behind. As a result, microprocessors are beginning to starve. Their metabolisms now process data faster than their surrounding ecosystem (a.k.a. the logic board, ports, and pipes) can supply it. Your Mac OS system's PowerPC microprocessor, for example, whirs along three, four, five, or even six times as fast as the data path that connects it to RAM. It's trapped in that old army snafu:

Hurry up and wait.

The solution should be simple—or so you'd think: Just match the speed of the data path to the speed of the microprocessor, and all should be well, right? Wrong.

If you're sitting in your office as you read this, the bus that just passed by your window gave you a clue as to why the solution to data starvation isn't that simple. Did you catch that garish ad on its side? The one for "Live 105: The Randy Rocker's Radio Refuge?" Meditate on its Day-Glo message for a moment.

I knew you'd figure it out. "Live 105" gets its euphonious name because it transmits its smarmy modern-rock love ballads at 105 MHz. If you run a motherboard at a clock speed of that magnitude, it becomes, in effect, a tiny but powerful FM radio...
more: The DVD specification allows data to be pressed into both sides of the disc, for an astounding 9.4-GB single-layer capacity and a 17-GB dual-layer capacity — all on a disc the size of a standard CD-ROM.

**THE FUTURE OF DIGITAL VIDEO**

Using this level of capacity for text-based content makes "overkill" an understatement. DVD's real target is digital video. To that end, the DVD specification mandates MPEG-2 as the video-compression technology of choice. With MPEG-2, a single-sided, single-layer DVD disc can accommodate an average-length Hollywood feature film.

At this point in the Mac's evolution, however, playing an MPEG-2-encoded DVD disc requires special hardware — namely, an MPEG-2 PCI card. Thus, both Apple and Power Computing are in negotiations with E4, a small but aggressive startup company, to bundle E4's CoolDVD MPEG-2 card and software interface with their systems. Although no one from E4, Apple, or Power Computing was willing to comment on when actual products will be available or how much we'll pay for them, John Chan, E4's director of product marketing, is clear about his company's goal: "We want to own the market — and we will." Given what we've seen of the CoolDVD's elegant interface and impressive performance, he may get his wish.

In addition to MPEG-2 for video, the DVD standard mandates Dolby AC-3 audio for the U.S. and Asian markets; Europe is lurred with MPEG audio. The Dolby scheme provides 5.1-channel theater-quality surround-sound audio. (That extra tenth of a channel, by the way, is for a subwoofer.) E4's CoolDVD card will mix this complex audio stream down into a simple stereo signal, or if you're fortunate enough to have an audio system that will accommodate it, you can plug it into the CoolDVD's SPDIF optical-fiber audio connector, for surround-sound output.

Software-only MPEG-2 should be possible on the Mac when Apple ships systems equipped with the TriMedia digital signal processor, as it has announced it will do in mid-1997. CompCore Multimedia, a Wintel developer that plans to provide a software-only MPEG-2 product for Windows systems when Intel releases its multimedia-enhanced MMX microprocessors, says it's talking with Apple about porting its SoftDVD technology to TriMedia-equipped Macs.

**WHO'S ON THE BANDWAGON**

So, Apple and Power Computing are in negotiations with E4 and Apple is talking with CompCore Multimedia about future TriMedia-based DVD software. John Cook, Apple's group manager of Global Strategic Alliances, is heading up the new DVD Program Office, which will coordinate all DVD planning companywide. Bill Goins, Power Computing's director of product marketing, is calling DVD "a critically important technology" and promising that Power Computing "absolutely plans on pushing the technology envelope."

So, where does this leave UMAX, Motorola, APS, and DayStar? Simply put, they're waiting to see what happens. Bruce Berkoff, UMAX's director of product marketing, promises, "We won't be the first, but we will be the best" in DVD implementation. Company spokesperson Terri Thorson says that Motorola will get into the DVD business "as soon as Motorola sees enough titles on the market."

DayStar's David Methven, product manager, says that his high-end, content-creating customers are more interested in creating multimedia content than merely watching it; he predicts that DayStar will focus on CD-R and CD-RW drives until DVD-R and DVD-RAM drives become available in late 1997 or early 1998.

Among the more cautious Mac OS-system vendors, however, it was APS President Paul Mandel who best explained the reasoning behind a wait-and-see approach: "Pioneers get the arrows. Settlers get the land."

**Can you say 'massive electromagnetic-interference problems?' How about 'FCC?' I knew you could.**

A myriad of other bandwidth bottlenecks also keep your Mac OS system's microprocessor from achieving its full potential — in fact, the situation gets worse the farther you step back from the microprocessor itself. Your system's connection to storage lingers along at a mere 5 to 10 megabytes per second, its network connection is a measer 10 megabits per second, and even a 28-kbps modem connection to the World Wide Wait can cause sheer teeth-grinding agony.

But help is on the way in an avalanche of acronyms. High-speed-storage-channel schemes such as SSA, FC-AL, and FC-EL — coupled with network topologies such as ATM and 1000BASE-T — will blur the distinctions between storage and networking. Telecommunication protocols such as ADSL, VDSL, and HDSL will speed data over existing phone lines hundreds of times as fast as today's best modems. Although embryonic, most of these bandwidth breakthroughs are up and running — if not in the Real World, at least under the watchful eyes of ponytailed techies.

The Microprocessor Age is drawing to a close. Oh, those tiny silicon powerhouses will indeed continue to reach ever more dizzying peaks of performance, but their continuing improvement will no longer be the measure of desktop evolution. No, if you want to remain on the cutting MacEdge, keep your eyes on the systems that keep the microprocessor well fed.

-- RIK MYŚLEWSKI

**IN BRIEF**

**Copland Wasn't a Total Bust**

**Saving the Forest**

**Be on the Web**

**Gil's Got Guts**

**Very Portable Computing**

**Can you say 'massive electromagnetic-interference problems?' How about 'FCC?' I knew you could.**

For the foreseeable future, the only FM radio on your desktop will be the one tuned to NPR's nightly business report.
NEW & NOTABLE
Tektronix Phaser 600. Touted to be twice as fast as its liquid-ink competitors, this new solid-ink, large-format printer creates output of up to 34 x 44 inches on any paper stock. $11,995. Tektronix: 800-835-6100 or 503-682-7377; http://www.tek.com/.
Panasonic KXL-783M. Built-in speakers enhanced by Spatializer 3-D circuitry pump up this new portable 8x CD-ROM drive to give your PowerBook surround-sound reproduction. $499. Panasonic: 800-742-8086 or 201-348-7000; http://www.panasonic.com/.
miro miroVIDEO DV 100. High-speed FireWire technology distinguishes this new card, which has easy-to-use editing software included and which captures digital video from FireWire-equipped Sony camcorders directly to your hard disk. $999. miro: 800-474-6476 or 415-855-0955; http://www.miro.com/.
Presenter 3D. This upgrade to Presenter Professional 3.1, the 3-D modeling, rendering, animation, and directional-sound software, adds tools for creating QuickTime VR movies and supports Apple QuickDraw 3D. $1,995. Visual Information Development: 818-462-1905; http://erewhon.caltech.edu/vidi/.
3D Landscape 2.0. Create walk-through landscapes with a 2,200-plant database and use Shadow Caster, Seasonal Change, and Growth Over Time to predict their evolution. $60.
PictureTalk. This cross-platform client/server conferencing software captures, compresses, and sends screen images to a server for real-time transcontinental or local work sharing. $100 per concurrent user. PictureTalk: 510-467-5300; http://www.picturetalk.com/.
In The Mood. Original brush and ink illustrations of 1940s-style print ads have been digitized for this CD-ROM of cool black-and-white genre clip art. $229. Havana Street: 800-460-7624 or 512-892-5609; http://www.eden.com/~havana/.

FIRST LOOKS
NetObjects Fusion
New Web-page-design app on its way.

EVOLUTION ISN'T GRADUAL — current theory holds that it proceeds through sudden leaps. Internet evolution proves this. Web-page design, for example, first emerged as an arcane process that required detailed knowledge of HTML codes. Then products such as Adobe PageMill appeared, making it possible to create Web pages without learning HTML codes and by using an interface reminiscent of a word processor's instead.

The next evolutionary leap is at least as great as the jump from text editors to graphical Web authoring tools. The pioneering product of the next evolutionary leap is Fusion, a Web-page-design and site-management utility from Redwood City, California-based NetObjects. Where PageMill and its competitors made it easier to deal with the limitations of HTML, Fusion lets Web-page creators design pages as freely as if they were using Adobe PageMaker or QuarkXPress.

After-the-Fact HTML
The way PageMill and similar products work is by creating HTML code behind the scenes while you're entering text and importing images. You are, however, still hamstrung by HTML's limitations. If you want to create a complex page design, for example, you must embed text and graphics within tables — a counterintuitive process made only somewhat easier by PageMill and company.

Fusion ($695) offers a more intuitive approach: You place text on Web pages in text blocks that you can resize at will. Images, likewise, can be placed anywhere on a page and then dragged to whatever locations suit you. Only after you're done designing the page does Fusion take over, calculating the exact HTML code necessary to make your page render correctly in a Web browser.

At a glance, Fusion looks a lot like a page-layout program: You're presented with a pasteboard, complete with layout grid, and a tool palette. The palette includes tools for the placement and manipulation of text and pictures and the addition of sound, Java applets, Netscape plug-ins, and interactive form elements. All of these items, once placed onto a Fusion page, can be dragged just about anywhere — the only exception being that objects can't overlap, a limitation of HTML that even Fusion can't get around.

Being able to place text and graphics anywhere on a page makes Fusion feel unlike any other HTML editor. However, the beta version of Fusion we tested still bears some scars that may relate to its transition from Windows 95 to the Mac OS. Buttons on the tool palette became unselected without warning, attempts to move an entire text block inexplicably placed us in text-editing mode, and closing a site window automatically quit the entire application. In addition, Fusion doesn't support standard Mac conventions for editing text: We could make text bold or italic or adjust text alignment only by clicking on a floating palette — no keyboard commands worked. We hope NetObjects fixes these shortcomings before its final release.

In addition to offering page-design features, Fusion also helps manage your entire Web site by letting you make page-link changes on an easily modifiable site map.

PROS: Gives designers page-layout design freedom. Excellent site-management and navigation features.
CONS: Interface quirks hinder usability. Lack of keyboard shortcuts. Fails to anti-alias button text.

Site unseen
Fusion not only offers a much improved way to design Web pages but it's also a powerful tool for

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NetObjects Fusion provides new Web-page design freedom by allowing free movement of text blocks and images on a gridded pasteboard. Fusion also automatically generates navigational buttons and the HTML code they require.

creating entire Web sites. A tool bar at the top of Fusion's window (it has only one window — another vestige of its Windows 95 roots..) lets you step through all the stages of site management, from organizing your site to editing individual pages to, in the end, uploading your site to a Web server.

Fusion's site view lets you organize your Web site's component pages via a tree metaphor. You can drag and drop pages from place to place on the tree. The program also can automatically generate running navigational headers and footers for every page of your site by using built-in site styles. (Although Fusion's implementation of style sheets is internal to Fusion and is not compatible with the new Cascading Style Sheets HTML feature, the HTML code generated is compatible with all common Web browsers.)

Each site style can include a banner graphic, a navigational-button style, a default background pattern, and even default text colors. Fusion will ship with 50 already designed site styles.

Once you've selected a site style (or created one of your own), Fusion can automatically generate navigational text and place it on the site's banner graphic and navigational buttons. The program automatically overlays text and generates custom GIFs for every button and banner — creating a site that looks custom-built but saving the Webmaster hours of text and GIF editing in Photoshop. However, we were disappointed that Fusion didn't anti-alias the text it generates, in order to reduce jagginess on navigation buttons.

Once your site has been created (or updated), Fusion can automatically upload all the files in your site to your Web server via FTP. After setting up your server name, log-in name, and password, uploading a site to a temporary staging area for testing or to your final production server requires only a single button click.

NetObjects Fusion has the potential to change the way Web pages are designed and Web sites built — but it's not without its limitations. Any designer with experience in PageMaker or QuarkXPress will be both delighted by Fusion's improvements on PageMill and appalled at some of Fusion's interface clunkiness. Fusion may indeed deserve to be called the Next Big Thing in online publishing — but it's also truly a version 1.0 product. It'll have to shake out quite a few glitches before it can fulfill its potential. /JASON SNELL

Whistle InterJet 100
One-stop Web-server shopping.

HALF THE BATTLE of getting your office onto the Internet is assembling the hardware, software, and service you'll need. You've got to find and configure each piece and make sure it works with the others you've acquired. Whistle Communications' first product, the InterJet 100, comes as close as anything we've seen to making one-stop Internet shopping a reality.

The InterJet 100 is a compact, well-designed all-in-one hardware/software package that takes the pain — and the risk — out of setting up your own Internet server. Although the beta unit we tested was incomplete, the concept and Whistle's implementation are promising.

The InterJet 100 is about the size of a bread box and contains a UNIX-based computer and hand drive. There's also an IP router, a 33.6-kbps modem, and a four-port Ethernet hub — all stuffed into the same bread box. Once you've purchased an account from one of the service providers that Whistle has signed up, the InterJet can dial your provider and configure itself automatically for your network.

From your Web browser, you can create user accounts, establish public and private Web sites, and keep an eye on the server's status. The interface is smooth and easy to work with, although the little guy you'll find on Whistle's configuration pages is a bit, well, too cute.

Speed and flexibility are the InterJet's two current limiting factors: The first release will ship with a built-in 33.6-kbps modem; Whistle says ISDN will come later in 1997. Since its internal operating system is pretty well masked from even the system administrator, the InterJet is not the best choice for would-be Webmasters who want to run Mac CGI applications (that serve databases for example). You're limited to serving HTML and graphics files.

At $1,995, the Whistle InterJet 100 should be an attractive choice for small businesses with limited experience or interest in configuring Internet access and servers and whose access needs are basic. /SHELLY BRISBIN

PROS: Well-integrated hardware. Attractive, easy-to-use Web interface.

CONS: Available only from select ISPs. No ISDN support. No SCSI support.

The creative process has always been a mystery to some. To others, it’s a way of life. For them, we offer the S900. A computer designed specifically to meet the needs of the creative professional. The S900’s advanced architecture combines high performance and expandability with the familiarity of the MacOS. With worry-free service (standard 3 day on-site warranty) and at a price that can’t be beat, the S900 is setting new standards for an old pursuit: Art.
SUPERmac Computers that Work the Way You Do.

S900 KEY FEATURES

1. Standard Interleaved Memory
   Every S900 comes standard with interleaved memory for workstation-quality 128-bit access memory and best system performance. Others only provide 64-bit access memory.

2. Advanced Scalable Processor Design (A.S.P.D.)
   This modular configuration allows easy upgradability to add or change CPUs as desired. Costs less and is more flexible, allowing your system to grow as you do.

3. UMAX PCI-to-PCI Bridge
   The S900 allows burst communication between all PCI slots, no matter where devices are inserted, for greater expandability and easy set up.

• Ultimate Expandability
• Totally Upgradeable
• Advanced Design

SuperMac J700
SuperMac S900
SuperMac C600
**FIRST LOOKS**

**SyQuest SyJet**
New removable drive jets past Jaz.

SATCHELL PAIGE ONCE WARNED, "Don't look back. Something might be gaining on you." Iomega, maker of the de facto 1-GB removable-cartridge standard, the Jaz drive, would do well to heed his advice and to move full-speed-ahead with whatever follow-on product it may have waiting in the wings. The Jaz drive's current dominance is about to be challenged, big-time, by SyQuest's long-awaited SyJet removable-cartridge drive.

Although the SyJet ($499) and the Jaz are priced essentially the same — as are their cartridges — the SyJet's cartridges hold up to 1.4 GB (depending on the formatting method), compared to the Jaz cartridges' 1 GB. Unlike the Jaz drive, the SyJet has a door that closes behind the cartridge, protecting it, according to SyQuest engineers, from dust and other contaminants. Although this may be a good idea in theory, the door mechanism in our preproduction model didn't open fully, an annoyance that a SyQuest spokesperson promised would be fixed in final versions.

But speed is the heart of the battle, and even a preproduction SyJet has an impressive performance edge over a shipping Jaz. For example, the MacBench 4.0 Publishing Disk test, which mimics the exact drive-access operations used by Photoshop and QuarkXPress in real-world operations, shows the SyJet to have a significant speed advantage over the Jaz: It was nearly half-again as fast.

On the MacBench Disk test, which mimics the combined operations of Microsoft Word and Excel and nine other popular productivity applications, the SyJet runs neck and neck with the Jaz. In fact, the only tests in which the Jaz has a significant edge over the SyJet are those that mimic reading — but not writing — small blocks of data, the types of blocks that comprise Word files. Clearly, the SyJet is being groomed not for the small-file world of the office but for the large-file environment of desktop-publishing professionals, graphic artists, and video editors.

Overall, the SyJet drive put in an impressive performance. What's more, our test unit had an onboard cache of only 256K — half the 512K cache planned for the shipping version. SyQuest engineers plan to continue refining the SyJet's cache algorithms after the SyJet ships and to make upgrades available for downloading from the SyQuest Web site. Since the SyJet is equipped with flash ROM, upgrading its cache algorithms should be easy. If SyQuest engineers make good on their promise, the SyJet may actually get faster, the longer you use it. / RIK MYSLIEWSKI

**Adobe Type Manager**

"SUITCASE KILLER" is the first phrase that comes to mind when you see Adobe Type Manager Deluxe 4.0 and its companion utility, Adobe Type Reunion 2.0, at work. Our first look at beta versions of these font utilities showed them to be more than just major upgrades to the familiar Adobe type-management applications — their powerful font-handling and menu-customizing capabilities may well prove to be a two-fisted knockout punch to such popular utilities as Symantec's Suitcase 3.0 and Alsoft's MasterJuggler Pro 2.0.

Adobe Type Manager Deluxe ($49.95) upgrades the old ATM's font-rasterizing and -substitution features and then adds the font-set-creation capabilities of Suitcase and the diagnostic features of MasterJuggler Pro. Like those utilities, ATM Deluxe lets you remove Type 1 and TrueType fonts from your beleaguered System Folder and organize them, by name or by project, into sets that you can open or close with ease. But ATM Deluxe goes further, by automatically activating fonts when you open a document that requires them. (You can keep the fonts open or make them close when the application does.) Also new is the power to edit multiple-master typefaces from within the ATM Deluxe control panel.

Creating sets isn't completely intuitive — we ended up with two sets of everything when we tried to automate the process with the Add All command. Another wrinkle was that we couldn't get our beta version to automatically convert Suitcase sets — although Adobe promises that the final version will.

ATM Deluxe can also diagnose and work around many font failings. When you "verify" your fonts, those with serious problems are marked in red and ATM Deluxe will not let you use them. ATM Deluxe will also notify you of minor problems and try to work around them until they're fixed — for example, by creating a substitute for a missing PostScript file.

Another font foible that utilities have addressed is long, unwieldy, and cryptic font menus. Adobe Type Reunion ($60; bundled with ATM Deluxe, $69.95) comes to the rescue with unprecedented control over what those menus will look like. You can open and close ATM Deluxe sets from your font menu; you can choose which, if any, fonts will display WYSIWYG in the menu; you can customize the menu to show only the fonts you're using in a project; and you can use the menu to aid in design decisions — for example, by creating a tidy folder to hold display faces.

What you won't find in the Manager/Reunion bundle are some extras that come with other utilities. For example, neither ATM Deluxe nor ATR supports AppleScript; Suitcase not only supports it but also tells you how AppleScript can automate font tasks such as creating sets from font folders on project disks. ATM can't compress fonts; both Suitcase and MasterJuggler Pro can compress TrueType and screen fonts to minimize the hard disk space they use. And ATM Deluxe can't gather up project font files for service bureaus, as MasterJuggler Pro can.

Although they lack some niceties, Adobe Type Manager Deluxe 4.0 and Adobe Type Reunion 2.0 may finally take the pain out of type management. / SCHOLLE SAWYER

**PROS:** Faster in publishing tasks than its main competition, the Iomega Jaz.

**CONS:** Mediocre performance when reading small-block files.

INFO: $499; SyQuest: 800-245-2278 or 510-226-4000; http://www.syquest.com/.

**PROS:** Powerful control over font sets.

**CONS:** No font-compression features or font-gathering capabilities.


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New OmniPage Pro 7.0 gives you the recognition you deserve.

OmniPage Limited Edition or OmniPage Lite is the OCR that came with your scanner. They give you basic OCR.

OmniPage Pro keeps text in its original format and layout, including graphics.

OmniPage Pro even outputs to HTML.

Upgrade now to faster, more accurate OCR.

Sure, the OmniPage Limited Edition OCR that came with your scanner is good. In fact, that's why scanner makers like HP, Microtek and Agfa chose it above all others.

But if you want greater accuracy, full-throttle speed and a ton of new time-saving features, then it's time you moved up to OmniPage Pro®.

OmniPage Pro employs a new, more powerful OCR engine to recognize poor copies and degraded faxes. It integrates seamlessly with your favorite applications like Word, ClarisWorks and more. It even guides you through the OCR process using its AutoOCR Toolbar. All with the simple push of a button.

What's more, you get the advantages of the world's most popular OCR software without learning an entirely new program. So make sure you're getting all the OCR power and accuracy you deserve. Call now to upgrade, or visit a local reseller.

OmniPage Pro gives you almost twice the OCR accuracy with the same ease-of-use as OmniPage Limited Edition.

Increased OCR Accuracy: OCR developers have developed high accuracy OCR technology for increased output. The greatest improvements have been made on straightforward and hard-to-read documents.

Pricing and Availability: OmniPage Pro 7.0 (Windows and Mac) and WordScan Plus 4.0 (Windows) upgrade packages are immediately available at major resellers for an estimated street price of $129.

The Company:
Caere Corporation, with U.S. headquarters in Los Gatos, Calif. and European headquarters, Caere GmbH, in Munich, Germany, is a leader in OCR technology and desktop document management products. Caere has recently expanded its product line of OCR.
Adobe Photoshop 4.0

Image-editing stalwart gets subtle overhaul.

MICROSOFT MAY RULE the business world, with its combination of programs and operating systems, but the computer-graphics world is dominated by a single application. Whether for photography, illustration, fine art, animation, or online development, Adobe Photoshop has long been the program of choice, thanks to its power and its masterful interface.

With this latest release, Adobe has refined the program even more, adding such niceties as batch processing and nondestructive adjustment layers. At first glance, Photoshop 4.0 does not appear to be overflowing with new features or radical changes, but as you use it, you’ll find many well-designed, tightly integrated improvements.

Select Features
Photoshop’s system requirements have hardly changed. This version demands a megabyte more of hard-disk space than version 3 (or about 10 MB) and a minimum of 10 MB of RAM. Interface changes, on the other hand, are apparent from the moment you launch the program: Palettes, dialog boxes, and buttons have been recrafted, with a slight three-dimensional appearance; menus have been reworked; and the primary toolbox has been reorganized (see the “Familiar, Yet Different” figure).

Although we believe that the changes Adobe has made to the Photoshop interface are all useful improvements, we nevertheless found them somewhat disorienting at first. The crop tool, for instance, has been relocated from its spot in the toolbox's top tier to the marquee tool's new pop-up menu. That repositioning has made room in the toolbox for the indispensable Bézier-path tools, which were relegated to the Paths palette in version 3 of Photoshop.

You Gotta Move
Also new to the toolbox is a revamped move tool. The move tool is the only tool you can use to move the contents of a selection in Photoshop 4.0. This differs from earlier versions of Photoshop, in which you used selection tools (the marquee, lasso, magic wand, and pen) both to define portions of an image and to move them. In Photoshop 4.0, clicking within a selection moves the selection boundary rather than the selected pixels. (You can invoke the tool at any time simply by pressing Command-Option.)

Although this will seem strange to experienced users at first, the move tool makes it possible to control selection paths independently of their content. Selection outlines can be moved between layers of a document or even dragged and dropped from one file onto another, which is great for making selections of identical shapes in different images.

Photoshop 4.0 provides more-powerful collage and compositing features than previous versions. As in version 3, you can use the move tool to reposition a selected layer within your canvas. But in version 4.0, you can hold down the Control key to see a pop-up menu of all layers currently below the move tool. Within that menu, you can quickly choose which layer you want to move. To further aid compositing, Photoshop no longer crops pixels that fall outside the canvas.

Layers of Improvement
Although the program’s layer support was nothing to complain about in version 3, Photoshop 4.0 generally uses layers more intelligently. For example, when you drag and drop or paste selections into a document, the program automatically creates a new layer rather than a floating
selection, which unobtrusively keeps your document organized. And although this method can lead to layer pile-ups, improved merge tools make consolidation easy.

Other layer refinements include the versatile Free Transform command, which places handles around the boundary of a layer so you can scale, rotate, or shear it, either by dragging the handles or by entering numerical values in a dialog box. And, at last, individual layers can be flipped and transformed. These features are organized in the changed Layers palette, which makes it much easier for you to tell which functions affect layers and which affect the whole document.

In a helpful improvement to the powerful layer-mask feature, you can now specify whether a mask should initially hide or reveal its associated layer. You can also create a layer mask from the current selection.

Painting Your Changes

One of Photoshop's most powerful new features is the addition of adjustment layers, which let you perform nondestructive, modifiable edits. Using them, you can perform tonal adjustments and some special effects on entire layers or selectively, using brush tools, without altering your original image data. This way, you can quickly and easily try many different edits without sacrificing your original image.

Nine types of adjustment layers are available, including Curves, Levels, Hue Adjustment, and Posterize. After you've selected a layer type, the standard dialog box for the chosen effect appears. Effects applied via an adjustment layer affect only layers below that layer — unless you confine its effect to a single layer. Like any other type of layer, an adjustment layer can be hidden or deleted at any time, restoring all affected layers to their original state.

By default, an adjustment-layer effect is applied uniformly over the whole image. However, by painting in an adjustment layer with brush tools, you can apply the chosen effect in varying amounts to any part of your image. So, for example, by painting in a color-correction adjustment layer, you can apply varying amounts of correction to different portions of your image. This approach is a vast improvement over that of Photoshop 3, which required you to create a separate mask for each color adjustment.

For the operations they support, adjustment layers provide a form of nonlinear, unlimited undo. Because you can always remove an adjustment layer, you don't have to worry about saving multiple versions of a document. We're still waiting for a real undo tool, but this is a step in the right direction. We'd also like to see adjustment layers capable of more operations, most notably Gaussian Blur and Unsharp Mask.

Taking Action

Like version 3's Commands palette, Photoshop 4.0's Actions palette allows you to specify functions that can be triggered by a mouse click or a press of a function key. But actions go far beyond version 3's one-step commands. The Actions palette enables you to create scripts of multiple actions that can be played back on any image at any time. A set of simple VCR-like controls at the bottom of the palette allows you to record and play back action sequences.

To provide variable control, you can set a breakpoint next to any item within an action. This tells Photoshop to pause and wait for user input, affording you the opportunity, for example, to adjust the settings for a particular operation.

The Actions palette contains the simple yet powerful Batch command, which you can use for applying an action script to a batch of images.

Photoshop has needed action features for
a long time, but although version 4.0’s implementa-
tion is good, it still has a few problems. Not
every feature is scriptable. Most notably
absence is the ability to script the change of a
layer’s transfer mode.

Also, batch processing of scripts that cre-
ate or delete layers is impractical, because, like
version 3, version 4.0 requires you to enter a
filename when you save any document to
which layers have been added or from which
they’ve been removed. A final frustration:
Photoshop 4.0 cannot read Photoshop 3’s
Commands settings, so you’ll have to rebuild
them if you want to use them in the new
version.

AppleScript support, albeit limited, is an-
other boon for automated processing in
Photoshop 4.0. In addition to the required
suite (Open, Print, Quit, and Run), this version
of Photoshop provides just one scriptable
command, Do Script, which lets an external
application trigger a Photoshop action.

Snappy Grids

New in version 4.0 are a few utilitarian fea-
tures that aid workflow. As in a drawing or
CAD program, you can display nonprintable
grids and guides in your Photoshop image.
With snapping turned on, layers and selec-
tions automatically snap to the nearest grid
line, greatly simplifying the alignment of mul-
tiple layers (although we’d still like to see an
Illustrator-like Align command).

In a welcome change, the program no
longer limits zooms to factors of 2: You can
randomly zoom by typing any zoom percent-
age (to two decimal places) into the zoom box
in the lower left corner of a document win-
dow. To further aid zooming, the View menu
includes new automatic zoom-level com-
mands such as Fit on Screen, Actual Pixels, and
Print Size.

Zooming can also be controlled from the
new Navigator palette. Displaying a small
thumbnail of your document, this palette
includes a slider for variable-zoom control as
well as a draggable selection marquee for in-
teractively panning about in your document.
At first glance, the Navigator palette may seem
little better than scroll bars. But having zoom-
ning and panning so elegantly integrated into
a single, simple control is a luxury — espe-
cially for high-resolution images displayed at
high magnification.

Photoshop’s gradient tool has been com-
pletely redesigned and functions much more
like the full-featured gradient controls that are
available in high-end drawing packages.
Where Photoshop 3 simply created a linear or
radial gradient between the foreground and
background colors, Photoshop 4.0 allows you
to create and store multicolored gradients
with varying levels of opacity. For example,
you can have a gradient that fades from com-
pletely opaque blue to 50 percent opaque red.

World Wide What?

Like nearly everyone else in the Western
Hemisphere, Adobe has been thinking about
the World Wide Web. In addition to the but-
ton at the top of the tool palette that automati-
cally takes you to Adobe’s Web site, Photoshop
4.0 has several features to ease the develop-
ment of graphics for the Web.

Photoshop now ships with the GIF89a ex-
port filter, which lets you save indexed-color
images as GIF or interlaced-GIF files. In addi-
tion, the filter enables you to view an image’s
color palette and specify which colors are
transparent. The Indexed Color Mode Change
dialog box allows you to select Web as a pa-
ette option for remapping an image to the 216
colors common to Mac OS and Windows Web
browsers.

Version 4.0 also supports Macintosh Drag
and Drop from Photoshop to PageMill 2,
Adobe’s WYSIWYG Web-page-creation tool.
Despite these useful features, Photoshop could
be a little more Web-aware. In particular, we
would like to see the ability to attach URLs to
individual layers (à la Fractal Painter 4), to
facilitate automatic image-map generation.

Generally Faster, but Not Always

Although most of the changes in Photoshop
4.0 aim to make design and production easier
for users, Adobe also spent some time at-
tempering to boost Photoshop’s speed. On the
whole, Photoshop 4.0 is not dramatically
faster than version 3, but it definitely feels a
little bit peppier at a variety of routine tasks.
Files don’t open any faster, but we noticed a
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speed improvement of 20 to 30 percent on mode changes (from RGB to CMYK) and when applying the Gaussian Blur and Unsharp Mask filters.

Another routine operation that's faster in Photoshop 4.0 is screen redraw. The amount of time it takes for an image to fill in after you've closed a dialog box or when you bring a hidden image window to the foreground is noticeably lessened. The reason for this speed-up is a new under-the-hood feature called the Image Cache. This cache, which stores low-resolution versions of high-res images for use in updating the screen, is user-adjustable. You can set its level from 1 to 8; at the default setting of 4, redraw is appreciably speedier.

There is one operation, however, in which Photoshop 4.0 is actually slower than its predecessor: rotating objects. There are two ways in which you can rotate things in Photoshop 4.0: You can use the new Transform functions to rotate a layer, or you can use the new Rotate Canvas command (which replaces the Rotate commands found on Photoshop 3's Image menu).

Surprisingly, however, both of Photoshop's rotate features are noticeably slower than rotating in Photoshop 3. (Rotating using Photoshop 4.0's numeric Transform, in particular, is glacially slow.) This is a concern if you do a lot of collaging and layout work in Photoshop.

As with version 3, running the program on a multiprocessor machine is significantly faster than running it on a single-processor machine. We tested Photoshop 4.0 on a DayStar Genesis 720 (with four 180-MHz PowerPC 604e chips) and discovered that almost every one of Photoshop's operations was accelerated markedly.

**Documentation and Support**

As usual, Adobe's documentation is well written and organized and beautiful to look at. Version 4.0's, however, seems a little simpler than that of previous versions. Although the single 400-page user guide contains some tutorial information, Adobe no longer ships a printed tutorial. Rather, it provides a hybrid Mac/Windows CD-ROM that contains a few QuickTime movies and a lot of Acrobat files of tutorial information.

Conspiracy theorists in our midst suspect that this is an Adobeploy either to make you use a PostScript printer for printing the PDF files or to get you to spring for an expensive Adobe Classroom in a Book.

**The Bottom Line**

The latest version of Photoshop delivers a few significant new features, such as adjustment layers, which let you "paint" certain effects onto select areas of an image, and batch processing. But most changes in version 4.0 are subtle, extremely thoughtful refinements that make the program more useful and responsive. Except for an annoying reduction in rotation speed, Photoshop 4.0 is a great upgrade. /Ben Long

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REVIEW

FreeHand 7

A new champion emerges among Mac drawing programs.

FREEHAND 7, the latest version of Macromedia's venerable drawing program, combines a handful of groundbreaking innovations with improvements derived from cherry-picking the best features of competing programs. By combining these with a thoughtful interface overhaul, Macromedia has made FreeHand the reigning champion of the crowded drawing-package field.

Chief among FreeHand 7's breakthroughs is its innovative feature for finding and replacing graphics. This stunningly versatile tool lets you instantly change colors, stroke widths, scale, rotation, fonts, and path shapes. You can, for example, instantly double the stroke weight of every 1.5-point path, so your technical drawing will reproduce better on an old copy machine. You can even replace instances of one object with another.

Another all-new feature in FreeHand 7 includes support for Shockwave, Macromedia's technology for displaying zoomable graphics with scalable, anti-aliased type on the World Wide Web. FreeHand files can be converted to Shockwave objects via an Xtra plug-in module, although this process is given only passing mention in the FreeHand manual.

Web publishers will also appreciate new Xtras that allow you to attach URLs to images (or portions of images) and that let you import and export files in the Web-standard GIF and JPEG formats and even in Adobe Systems' Web-ready PDF (Portable Document Format).

Interface Improvements

FreeHand 7 has a new interface convention designed to unify the look and feel of Macromedia's content-creation programs. But even if you don't use Director, Extreme 3D, or xRes, you'll appreciate useful improvements such as the addition of a text tool bar, with standard type-size and -spacing controls, to FreeHand's main work window. We particularly liked the new tabbed, tear-off tool palettes. It's great to be able to tear off sections of the Inspector — the palette that reports on certain attributes of objects in your document — so you can, for example, view an object's stroke and fill types simultaneously.

Something Borrowed

Veterans of other drawing packages may get a sense of déjà vu upon seeing several FreeHand 7 improvements. There are shades of Adobe Illustrator in an expanded set of special effects and a tighter integration with Adobe Photoshop, of Deneba's Canvas in FreeHand's improved blends, of CorelDraw in the revamped color autotracer, and of all three in a fuller complement of export formats.

FreeHand's overhauled autotracing tool transforms bitmaps — photos, technical schematics, artwork — into editable vector-based art, now in up to 256 colors. Customization options include outline, centerline, and outer-edge tracing, as well as a setting for low, normal, and high levels of accuracy. (The program's improved blends, of CorelDraw in the revamped color autotracer, and of all three in a fuller complement of export formats.

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Effective Effects

FreeHand 7 offers some nifty new special effects that increase your design options. You can now wrap an envelope around an object and then pull on the envelope handles to distort the object. You can apply the Roughen effect to your

The Bottom Line

FreeHand offers the best collection of drawing features on the market today; spring for an extra $50, and get the FreeHand Graphics Studio 7, a truly terrific value that includes Extreme 3D, Fontographer, and xRes along with FreeHand 7. / Shelley Cryan
The new Mac OS 7.6.
Now, wherever your mind goes your computer will follow even faster.

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The job of a great operating system is to get out of the way. To let you fashion ideas, unencumbered by process. Nothing does that job better than Mac OS 7.6. It not only raises 'intuitive' to new and exciting heights, it's also a major advance in the ease with which powerful new functions can be deployed on your desktop.

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Enrich your ideas by enhancing your computer. Buy the pleasingly affordable Mac OS 7.6 at your local Apple software reseller or call 1-800-482-6376 ext. 1421. For more information, visit us on the web at www.apple.com.
Impressive upgrade links presentations to the Web.

ADOBE SYSTEMS' MASTER PLAN to meld its line of products into a well-coordinated, unified team is right on schedule with Adobe Persuasion 4.0. The latest version of the company's popular presentation program coordinates especially well with Adobe's graphics programs, Illustrator and Photoshop, and it links just as seamlessly to the World Wide Web.

Like most other presentation programs, Persuasion organizes a presentation as a series of slides. Persuasion slides consist of one or more layers that contain text and/or graphics, including movies and animation, as well as still images. You can set up any number of master slides in order to create a consistent look for text and graphics, and you can specify spiffy transitions between slides (or between layers within a single slide).

Creating a basic slide sequence in Persuasion is straightforward: Choose a template (one of many supplied with the program or one you've built yourself). Enter text by typing directly on a slide or by using Persuasion's outline, which turns your outline points into slide titles, subtitles, and body text automatically. To add graphics to your presentation, you can use the basic drawing tools built into Persuasion or import multimedia files in a variety of formats simply by dragging and dropping them onto a slide. (A CD-ROM's worth of images is included.)

With this version, for the first time, Persuasion imports native Photoshop and Illustrator files. Photoshop image layers translate automatically into Persuasion slide layers, so you can use Photoshop to create a graphic that "builds" as you add successive layers and then quickly incorporate the graphic into your presentation. This is a great feature, but its implementation has room for improvement: Persuasion doesn't support transparency, so transparent areas of your Photoshop images import as white space. And Persuasion's Import dialog box, which gives you a choice between OK and Cancel for flattening imported Photoshop images, can be confusing.

Charting a New Course

Persuasion 4.0 also includes Adobe Chart, a new helper program that uses spreadsheetlike tools — including some basic computational formulas — to let you create a variety of charts and tables within your presentation. It's especially handy for updating your presentation with new data without rebuilding your slide.

Persuasion's ability to tie into the Web lets you be even more up-to-date in your presentations. And it's wonderfully easy. If you're connected to the Internet, you can select a URL from within your browser and drop it into an image or text in your presentation in order to create a live link to information on the Internet or within your intranet. You can also embed links to other slides within your presentation, much as you might link Web pages. And the included Adobe Acrobat Distiller lets you export presentations as PDF (Portable Document Format) files for placement on the Web. Anyone who has the Adobe Acrobat browser plug-in can view those PDF files, although most multimedia elements are lost.

The Persuasion manual suggests that you can create an entire Web site within Persuasion, but although the program's linking capabilities are impressive, its files are far too large to be practical for online publishing.

Several new tools make Persuasion remarkably easy to use. Menu bars and key commands are more similar to those of other Adobe products. A new cropping tool lets you mask images to show only the portion you want for your presentation. The new Nudge floating palette lets you use arrows on the palette to position or scale graphics. And the new floating Layers palette helps you work with Persuasion's layers individually.

Persuasion 4.0 also introduces an eyedropper tool that lets you select a color from an imported image and put it into your active color palette. The eyedropper is great when you want to match your text or drawings to elements of an imported picture; we only wish it were easier to get at. To use it, you must access the Edit Color Scheme command, in the color-palette menu; select the eyedropper tool; pick the color; and drop it into your palette.

Other (minor) complaints: We found that a new utility for translating Microsoft PowerPoint 4 presentations to Persuasion format gave results that were mediocre at best. And although Persuasion was perfectly speedy on a PowerPC system, it was annoyingly slow on a 68040 Macintosh.

Persuasion 4.0 includes fully working versions for both the Mac OS and Windows, and the manual manages to cover both versions gracefully. And in a further cross-platform nod, you can save your Persuasion presentations in an interchange format that can be viewed with the Persuasion viewer on either platform.

The Bottom Line

Useful, unique features, such as the ability to import Photoshop layers and drag and drop live URL links into presentations, make Persuasion the best program for creating business presentations. / Carolyn Bickford

CorelDRAW™ 6 Suite for Power Macintosh™—the first complete graphics and word-processing package for Macintosh® users. The marriage of world-famous Corel® WordPerfect® with award-winning CorelDRAW 6—bundled together for the very first time—is a powerful union. This incredibly comprehensive suite combines innovative illustration, image editing, photo editing and 3D rendering with the efficiency of intuitive document creation.

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Outstanding color quality is new scanner's hallmark.

"GRAND COLOR FOR ABOUT a grand" could be the slogan of Epson's new Expression 636 desktop scanner. The new flatbed scanner, with an 8.5-x-11.7-inch image area, delivers impressive speed, minimal distortion, and outstanding color fidelity.

In terms of image quality — the ultimate determinant of scanner worth — the 636 is the best scanner we've seen in its price range ($800 to $1,800, depending on which of four software bundles you choose). In particular, its color fidelity — a traditional stumbling block for scanners in the 636's class — is exceptionally good. When we used its default scan mode, without any corrections or adjustments, the 636 surprised us with very good color that preserved most of the nuances of our tricky test images. The 636's color was so impressive, in fact, that its image quality topped that of all 16 desktop color scanners we tested in a recent article on sub-$1,000 scanners ("Low-Cost Color Scanners: Quality for Less," February '97, page 88). The 636 is also one of the fastest scanners in its class. Our tests showed that only one scanner in our recent roundup — the Nikon ScanTouch 110 ($500 estimated street) — matches the 636's speed.

The 636's scans also exhibited remarkably low signal noise, and the 636 was far more successful than most scanners in its class at capturing the full range of red, green, and blue color data. Like most other low-cost flatbed scanners, it did exhibit some "level dropping" (gaps in the range of captured data), particularly in the blue channel, but this was far less pronounced than we've seen with the 636's competitors.

No doubt, this is due in part to the Expression 636's 36-bit color sampling. The 636 assigns 12 data bits each to the red, green, and blue color channels, dividing each color into $2^{12}$ or 4,096, levels. Most scanners in its price range sample color at 24 bits ($2^8$, or 256 levels per channel) or 30 bits ($2^{10}$, or 1,024 levels per channel). The greater number of levels appears to pay off in greater precision and subtlety in the Expression 636's colors.

The 636 does have some room for improvement, however. Most notably, scanned images tended to be "softer" than the originals, which necessitated application of a sharpening filter in Photoshop. This was a problem even after we applied prescan sharpening corrections in the 636's scanning software. This program, a Photoshop-compatible plug-in, is the Expression 636's chief weakness.

The Acquire module is easy to use and toggles between Simple and Advanced modes. In Simple mode, you answer a few questions about your original (whether it's photo or line art, color or black-and-white, print or transparency, and so on) and the program performs a scan automatically. As we've said, the results are impressive but not perfect.

In theory, you should be able to improve on that in Advanced mode, which performs a low-resolution prescan and lets you apply sharpness and color corrections to the image before the final scan. In practice, we found these controls ineffectual. The color controls had little effect; the sharpness tools had practically none at all.

Sprucing up scans from the Expression 636 in Photoshop isn't terribly difficult. Still, it's always best to make as many adjustments as possible before you scan, because Photoshop can never restore data that isn't captured to begin with. If you're a graphics pro, the Expression 636's prescan options may not meet your needs.

Aesthetically, the 636 is boxy and less than elegant. When you add the optional transparency unit, it gets downright ugly. The unit, which is used for scanning slides, negatives, presentation transparencies, and other see-through media, nearly doubles the height of the entire scanner.

The 636 is available in four configurations, geared for users with different requirements. The Upgrade version ($799) includes only the scanner and the plug-in. The Executive version ($899) also comes with Adobe Photoshop LE and Second Glance Software's e-Paper, a document-management and -archiving package that includes Xerox's TextBridge optical-character-recognition software and business-card-scanning software. This option is meant for offices and light-graphics environments. The Artist version ($1,299) includes a full version of Adobe Photoshop; Kai's Power Tools, from MetaTools; Claris Home Page; and e-Paper.

The Pro version ($1,799) comes with Live Picture, Kai's Power Tools, Claris Home Page, e-Paper, and the transparency cover.

The Bottom Line

This scanner is exceptionally good for office use; graphics pros may want to consider using it with more-versatile third-party scanning software. / Rick Oldano


The Epson Expression 636 is an easy-to-use color scanner for small businesses, but graphics professionals may find its software wanting.
QuickSite for Macintosh 1.0.3

Web-site builder bogs down in weak Windows-style interface.

**POWERFUL WEB-PAGE-CREATION** tools for the Mac seem to be cropping up almost as quickly as Web pages themselves: Adobe PageMill, Claris Home Page, Microsoft Front Page . . . . But when it comes to creating and managing entire Web sites, there are precious few tools available. Adobe SiteMill and a few other tools can check links and help you administer a site, but DeltaPoint’s QuickSite is the first Mac product ambitious enough to attempt to simplify creation and modification of entire Web sites. It’s a great goal, but unfortunately, the product’s poor interface and primitive Web authoring capabilities severely limit its appeal.

**Windows Legacy**

From the moment you launch QuickSite, the program shows its roots as a Windows application. DeltaPoint has obviously spent little effort making QuickSite behave as a Mac application should, and the result is an inconsistent interface that makes QuickSite frustratingly difficult to use.

In order to get you started, QuickSite provides the New Project Wizard, a built-in utility that walks you through a series of steps to create a home page and site structure. The home-page-creation steps make sense: It’s easy, for example, to select a background image from among the samples that QuickSite supplies (in a folder that you can add to yourself). Then, as you view a thumbnail of your page, you choose styles for bullets and horizontal rules and enter header and footer information.

The Wizard proves less helpful when it’s time for you to set up your Web site. You’re given three options, for a Beginner, Intermediate, or Advanced site, and the structures for each are oddly arbitrary: What, we wondered, makes “a home page branching into two text pages and four menu pages” an Intermediate site? And what makes “a home page with two text pages, two menu pages, form, file, and URL menus” an Advanced site? A series of questions about what you want in your site would be much more helpful.

QuickSite organizes sites through projects — each Web site is a project, contained within a proprietary QuickSite database file. You can create a project either from scratch or via QuickSite’s Project Wizard, which provides you with a site skeleton you can then fill out quickly. When you’re finished creating or updating a site, QuickSite exports HTML and graphics files from the database and can upload them to an external Web server via Internet FTP.

The Project window, the space where you organize your site and where you do most of your work in QuickSite, bears a striking resemblance to a spreadsheet. Within this window, you can see all the pages, images, downloadable files, and other items that make up your Web site. Items are listed hierarchically, but not using the Finder-style expand/collapse triangles and indentations Mac users have come to expect. Instead, QuickSite uses nonindented, Windows-standard plus and minus symbols to designate pages and enclosed items. This arrangement makes it very hard to tell where a file is located in the site hierarchy.

**Unconventional Annoyances**

QuickSite’s interface problems go well beyond violation of Mac conventions. In fact, some of the program’s behaviors are bafflingly bizarre. For instance, in order to change a page’s title in the Project window, you have to carefully select the entire title and then delete it. What’s more, QuickSite cells containing editable text look no different from “cells” that are actually option buttons you can toggle with a double-click. Single-click in one of these uneditable cells, however, and you get an l-beam insertion point, even though you can’t enter any text.

QuickSite also ignores Mac OS technology that could bring vast improvement in ease of use. Most notably, you can’t click and drag pages to rearrange them within the Project window. Instead, you must move them by using unwieldy menu commands. The result is that users will find the Project window confusing and difficult to use, even after prolonged exposure to it.

**Primitive Tools**

QuickSite’s HTML editing tools are rudimentary at best. You can insert HTML tags but can view them only as raw HTML code — there’s no graphical HTML editing mode, unlike in PageMill and programs of its ilk. You can, however, add URLs to your project and then insert the hyperlinks throughout your document via a wildcard system — a sort of hypertext find-and-replace tool: For example, every instance of Apple in your HTML document can be replaced with the words Apple Computer, hyperlinked to http://www.apple.com/

Experienced HTML jockeys and people who use to working with PageMill will appreciate QuickSite’s provisions for entering HTML code directly into a page. However, if you take advantage of this, you’ll forfeit QuickSite’s strongest feature — the ability to automatically generate links to the other pages in your project.

**The Bottom Line**

For a truly useful site-building tool, wait for NetObjects’ Fusion, which is due out by the time you read this. /Jason Snell

QuickSite for Macintosh 1.0.3, $59.95; $79.95 to register trial download version (list). Company: DeltaPoint, Monterey, CA; 800-446-6955 or 408-648-4000; http://www.deltapoint.com/. Reader Service: Circle #405.

A spreadsheetlike interface, lacking Mac-standard expand/collapse triangles to denote hierarchical relationships, makes QuickSite for Macintosh hard to navigate.
Cubase 3.0 VST

All-purpose pro music package works to great effect.

PAGEMAKER VERSUS QUARK? Illustrator versus FreeHand? This is kid stuff. To experience real cutthroat competition among Mac OS-software vendors, you need look no further than the professional MIDI-software market. With each revision, the MIDI heavyweights — Opcode, Mark of the Unicorn, Emagic, and Steinberg — pile feature after feature into their sequencer/digital-audio programs, hoping to leapfrog the competition. Although Steinberg’s latest sequencer/digital-audio application, Cubase 3.0 VST, may not lap the pack, its outstanding real-time audio effects and equalization tools manage to set new standards.

Cubase contains the features expected in a professional sequencer/digital-audio application — real-time MIDI editing in list, graphical, and notation views; waveform editing; a multitude of synchronization options (SMPT, MIDI time code, MIDI machine control); an arrangements window with MIDI and audio data arrayed in movable blocks; graphical editing of controller data; QuickTime movie support; and an on-screen virtual mixing board.

In addition, Cubase allows you to employ the PowerPC processor for recording digital-audio tracks rather than requiring an add-on digital-audio card as does Mark of the Unicorn's Digital Performer. Depending on your Power Macintosh model, you can expect to be able to record from 8 to 32 audio tracks. (Cubase requires at least a Power Macintosh 6100/66.)

VST: Very Snazzy Tracks

Although all these features work in harmony on even first-generation Power Macs, the features that set Cubase 3.0 VST apart from its rivals are the digital-audio effects represented by the trio of trailing consonants in its name. VST stands for Virtual Studio Technology, which provides four quality digital-effects units and four bands of parametric EQ (equalization) for each of your digital-audio channels. Even better, these effects can all be adjusted and played back in real time. (The effects and EQ affect only digital audio, not MIDI data.)

The included effects are Choirus, a chorus/flanger combination with adjustable delay time, feedback, width, and LFO frequency; Exponential, a flexible reverb that allows you to simulate large as well as small rooms; Auto Panner, an effect that moves sound across the stereo field; and Stereo Echo, an effect that allows echo effects as simple as slapback or as complex as multilayer delays. Because these effects are based on a plug-in architecture, expect additional effects to be available from third-party vendors. You can use the effects in conjunction with one another, and you’re welcome to duplicate effects. For example, you can apply three discrete reverb effects as well as Auto Pan to a single audio track.

We made extensive use of Cubase’s VST features in our test projects and were quite satisfied with the quality of the effects and EQ. In particular, we were tickled to be able to change effect and EQ settings and hear the changes in real time. Although you can apply changes in audio track EQ in such programs as Opcode's Studio Vision Pro, you must apply the EQ change and then save it — there’s no way to preview that change. Certainly VST isn’t going to replace high-end Lexicon boxes in recording studios across the globe, but it’s more than adequate for quality demos and multimedia projects.

We were also pleased with the overall performance of the program. Although the manual recommends that you use a fast hard-disk drive and a powerful Power Macintosh (with a Level 2 cache), we were able to reliably play MIDI tracks plus eight channels of audio (with effects and EQ on most channels) from an Iomega Jaz drive running on a system — a Power Macintosh 6100/66 accelerated to 78.5 MHz with an add-on clock chip — that only slightly exceeded Cubase’s minimum requirements. Note: Your Power Macintosh must have a Level 2 cache card in order to record audio.

Our only complaints about Cubase 3.0 VST are largely based on the cosmetics of the application. The VST Effects interface looks exactly like a hardware effects unit — complete with a jog wheel and a tiny alphanumeric display and multiple "pages" of effect settings. We admit, it’s cute and accessible to audio pros, but those of us who are also familiar with computers would appreciate a single dialog box in which we were able to enter parameter values.

We also wish Cubase would take a cue from Opcode’s Studio Vision program and provide an integrated mixing board where you can view audio as well as MIDI tracks in a single window. Cubase requires separate consoles for MIDI and audio.

The Bottom Line

Cubase 3.0 VST is a solid sequencer and a well-integrated digital-audio editor. But its standout feature is its suite of real-time digital-audio effects and equalization tools. Overlook the minor interface shortcomings, and you’ll be pleased with this sequencer/digitizer.

/ Christopher Brennan

The Palace

Meet, greet, and maybe get lost at a cyberspace costume party.

**VIRTUAL COCKTAIL PARTIES** are the new spin for Internet chats. The Palace — software that gives you access to an array of virtual places to mingle and meet — is a cartoon masked ball. For all its kinetic kicks, however, The Palace still has some kinks.

The Palace’s appeal lies in its opportunity for self-expression. As you wander from room to room in a Palace site, you are represented by a visual stand-in, called an avatar, that you’ve created. You can outfit your avatar with props and even animate it.

You chat with other avatars via little word balloons. If you find someone intriguing, you can adjourn to a one-on-one chat. You can also jump to other Palace sites, including numerous commercial sites sponsored by the likes of Fox TV, or create and host your own Palace.

For all its fun, The Palace suffers from the awkwardness of infancy. It’s easy to get trapped, lost, and frustrated. Basic concepts (such as how to return to a previous Palace site) are unexplained. Site maps are nonexistent or skeletal, and hot spots are hard to find.

Buy the boxed version for $49.95, or download the software free from the Palace Web site (a $25 registration fee gives you access to all the special features).

The Bottom Line

The Palace is a great idea with lots of cool potential, but we’re still waiting for it to outgrow its awkward adolescence. / Brooke C. Wheeler


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DTP Toolkit

In the May issue, MacUser takes a comprehensive look at must-have tools for professional desktop publishers who specialize in design and production. With feedback from real-world desktop publishers, MacUser rounds-up products essential for doing their jobs effectively. If you’re a desktop publisher, find out from the experts what you’ll need to enhance your own toolkit.

MAY AD CLOSE:

TUESDAY, FEBRUARY 18, 1997

MacUser

COMING SOON

MAY ‘97

DON'T MISS IT!

CD-ROM Drives

If you haven’t yet ponied up for a CD-ROM drive, or if you’re looking to upgrade your existing one, then you won’t want to miss the May issue of MacUser. In the Labs Report, MacUser tests and reviews 8x and higher external CD-ROM drives. Find out whether there is a gain in speed and performance when upgrading to an 8x drive. There will also be helpful shopping tips including what types of ports and software to look for when buying a CD-ROM drive.

MacUser

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6 ppm: The Xerox Majestik 5765 Digital Color Copier/Printer
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Sending my 48 meg file to be printed.
Color calibrating? Three clicks, all done.
Traps and overprints? They all showed up.
Revisions? OK, so I'm a little obsessive.
The comp? It actually matches the screen.

What's next? I'm out of here.
REVIEWS

QX-Tools 2.0

Great QuarkXPress add-on set gets even better in upgrade.

SURPASSING A SUCCESS like QX-Tools 1.0 is no easy task: The debut version of the Quark XTension collection offered ten very useful design tools for about $100. But with QX-Tools 2.0, developer Extensis has managed to top itself handily: QX-Tools updates the original tools and adds five extremely useful new XTensions to the set — without any increase in price.

Whereas QX-Tools’ main competition, the XPert Tools collections, from a lowly apprentice production, looks to streamline nuts-and-bolts QuarkXPress production work, QX-Tools is clearly aimed at QuarkXPress designers. And, frankly, we can’t imagine designing without it.

The coolest addition is QX-Effects, a versatile tool for creating shadow, bevel, emboss, and glow effects directly within QuarkXPress. It offers a tremendous array of effects and easy-to-understand controls. QX-Effects nicely complements the QX-Filters XTension introduced in version 1.0, which lets you apply Photoshop filters to images from within QuarkXPress itself. These two XTensions in tandem let you create gorgeous continuous-tone effects — without ever launching Photoshop.

Even if you hate palettes, you’ll love QX-FineTune, a “palette of palettes” that lets you tweak most of Quark’s formatting options without using dialog boxes or typing in point sizes. You can adjust a host of parameters such as paragraph indents, leading, character spacing, drop-cap size, and rule weight interactively: Click on the size-up or size-down arrow next to the attribute you’re changing, and watch your page update accordingly. Terrific.

You can use another new XTension, QX-CopyStyles, to extract formatting information from a selected box or text block and reapply it elsewhere. It’s not as cool as having style sheets for objects, but it can save a lot of time when you need to make one page-element look like another.

When you want just one attribute on all your pages to change, you can use the new QX-FindChange XTension. It’s the mother of all search-and-replace tools: You can base searches on no fewer than nine tabbed pages of attributes, from colors to styles to tracking settings — just about any QuarkXPress attribute.

QX-DocStyles lets you define, name, and quickly call up document settings. There’s even a handy menu for selecting portrait or landscape.

As to the legacy XTensions from version 1.0, the most notable refinement is in QX-Bars, the tool-palette-creation XTension. It now has a SmartBar, which creates buttons for various actions as you perform them. QX-Filter and the other remaining QX-Tools XTensions remain much the same as in 1.0 — which is to say very good indeed: QX-Dingbats still displays all the special characters in a designated font set; QX-Layers aids page-layer navigation; QX-Viewer generates navigable thumbnails of your layouts; QX-Scaler automates scaling of groups of text and objects; QX-Tips & Tricks displays, well, tips and tricks on using QuarkXPress; QX-Print lets you control a variety of output characteristics; QX-Styles lets you apply multiple styles within the same paragraph; and QX-Manager lets you determine which XTensions load with your copy of QuarkXPress.

Despite our overall enthusiasm for QX-Tools, we did run into a few snags: We noticed, for instance, that QX-Print disables many page-setup options with System 7.5.5 and LaserWriter 8.4.1. We also found that QX-Viewer sometimes slightly slows QuarkXPress’ overall speed.

The Bottom Line

If you design pages in QuarkXPress and don’t already own QX-Tools, get it; if you do own version 1.0, spring for the $49.95 upgrade.

/ Eric S. Taub

Shadow (shown here), Glow, and Emboss are among the effects you can create by using QX-Tools’ QX-Effects XTension within QuarkXPress.
REVIEWS

CTX Opto
PanoView 600

LCD monitor is a costly but portable alternative to a CRT.

AT FIRST BLUSH, spending $3,000 on a 12.1-inch monitor sounds like a bad move. But the PanoView 600, from CTX Opto, is no ordinary monitor: It's a lightweight, active-matrix LCD monitor less than 2 inches deep, with built-in speakers — and it folds to a compact size. It's not for everyone, but if you routinely lug CRT monitors to meetings or if your desk space is at an extreme premium, the hefty price just might be worth it to you. But you'll have to get past the monitor's clumsy Mac setup and its lo-fi speakers.

The design of the PanoView is spare and functional: It offers most of the features of a desktop monitor plus the ability to fold up easily so that it's small enough to fit comfortably in an airliner's overhead bin. (Try that with a conventional monitor.) The screen sits atop a small stand, which tilts so that you can adjust the LCD's viewing angle for optimum image quality. Power is supplied via a small transformer box that includes an AC cord. CTX Opto supplies a VGA video cable, a Mac adapter, and cables for the PanoView's built-in speakers.

You adjust the PanoView with four small buttons located on the screen bezel, just below the LCD. They invoke easy-to-use on-screen menus with an impressive range of controls: no PowerBook screen has ever offered. In addition to standard brightness and contrast controls, you get vertical and horizontal image positioning; tracking; and even individual red, green, and blue color-level adjustments. You also use an on-screen menu to control speaker volume, balance, and tone and to choose among four audio modes: Simulated 3-D surround sound; standard stereo; pseudostereo, which approximates stereo sound from a monaural source; and mono, which merges two stereo channels into a monaural signal.

There is a power switch on the back of the PanoView, but we didn't use it, since the PanoView sleeps when it doesn't detect an incoming video signal.

Adapting to Adapters

We ran into a few glitches while setting up our PanoView. The supplied Mac-to-VGA monitor adapter supported only 640-x-480-pixel resolution, which the PanoView centered inside its larger 800-x-600-pixel LCD. We tried the monitor's Oversize feature, which expands any image to full-screen size, but found that the PanoView accomplished this by occasionally repeating rows and columns of pixels, which created noticeable distortion on the screen. We then found a monitor adapter that supported 800-x-600-pixel VGA resolution (compatible with newer PowerPC systems and PCI-based graphics cards) — and the results were much better. After we tweaked the Sync and Fine Tune controls, our PanoView displayed a rock-steady 800-x-600-pixel image that filled the entire screen. (At press time, CTX Opto was working to bundle a new Mac adapter that supports 800-x-600-pixel resolution with the PanoView. Until then, the additional adapter to support 800-x-600-pixel resolution will set you back about $20.)

Great Color Quality

Image quality on the PanoView is quite good, easily comparable to that of the best notebook LCD screens we've seen. That's no big surprise, since the PanoView uses an active-matrix LCD, much like the PowerBook 1400ce's and 5300ce's before it. Sharpness, contrast, and screen response were excellent, and colors were rich and saturated.

Color professionals who need to match screen image to printed output will have to stick with CRT-based displays, because there's no way to color-calibrate the PanoView (or any LCD screen, for that matter). What's more, the screen contrast varies considerably as you change your viewing angle. Within these constraints (which are familiar to many PowerBook users), photographic images we displayed on the PanoView looked realistic and were fine for business-communications purposes.

We didn't expect much of the PanoView's stereo speakers, given their location. Since they're embedded in the display's shallow (less than one-inch-deep) bezel, their resonance capacity is inherently limited. Even so, we were surprised at how poor their tone was — worse than that of a Mac's built-in mono speaker. You can get away with using the PanoView speakers for spoken-voice narration, but if you want music or sound effects to have any impact, plan on using external speakers with the PanoView.

The Bottom Line

Once you get it set up with the right adapter, the CTX Opto PanoView 600 delivers excellent image quality. Its built-in speakers are so-so, but the PanoView is far more portable than a CRT monitor. For many, this alone will be enough to justify its steep price. / Jeff Pittelka

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CIRCLE 80 ON READER SERVICE CARD
Claris Organizer 2.0

Easy-to-use PIM gets even easier with upgrade.

THE CHILI-PEPPER WALLPAPER may be the first thing that catches your eye in Claris Organizer 2.0, but even without the Decors option, you’d be able to tell easily that the program has received a major upgrade. Organizer retains the same basic organization as the original version, with four integrated modules (Contact, Task, Calendar, and Notes), but it’s got a new look resembling that of a loose-leaf daily planner — and several helpful new features are under the hood. Organizer continues to be appealingly easy to use, but it still has some shortcomings in the handling of multiple simultaneous events.

The least-important addition to Claris Organizer, the Decors feature, is the one you’ll notice first: It allows you to customize the way Claris Organizer looks, by filling windows, calendar borders, and other interface features with 1 of 14 custom patterns.

One of Organizer 2.0’s handiest new features is the Instant Organizer, which adds an Organizer pull-down menu to your menu bar. The menu allows you to search for or add new contacts to the Organizer database without launching Organizer itself. (Search results take a few seconds to appear, but they take less time than is needed to launch Organizer.) It also lists each day’s appointments and times and stores your list of often needed phone numbers. It’s convenient — and one of the only features Organizer 1.0 lacked in comparison to more-expensive “professional” PIMs.

Other minor deficiencies Organizer 2.0 corrects are version 1.0’s lack of calendar banners for multiday events and the absence of a reminder alarm for upcoming events. (Organizer 2.0 even includes a special checkbox in each contact entry for an automatic birthday reminder.)

Information Exchange
Organizer 2.0 expands the flexibility with which you can share info among its calendar, address-book, and notes features. You can attach any calendar entry — be it a banner for a multiday event, a meeting, or a to-do — to any other event, contact, or note or even to a non-Organizer file — such as a letter created in your word processor — by dragging and dropping or by using the grabber tool to create links. Type “Meeting with John Smith” as the title for an event, and you’re greeted with a window displaying a pick list of all the John Smiths in your database. You select one or all of the listed contacts to automatically attach them to an event.

Organizer 2.0 adds several refinements to the contact card — the page in which you enter and view information about your contacts. In the main view, you’re shown only those fields that contain data; if someone has no fax number, there’s no blank marked Fax, for example. This provides a clean, orderly view and reduces the cluttered look that plagues other PIMs. (In order to add new information to a contact card, you double-click on the appropriate area, and you’re shown fields to fill in.) You now get 11 customizable fields, a great improvement over the 4 furnished in version 1.0.

Instant Links is a mail-merge-like feature that uses AppleScript and a series of Organizer templates to build custom form letters and other word-processing documents. You get scripts and templates only for ClarisWorks 4.0 and MacWrite Pro and scripts for Netscape Navigator and Claris eMailer, but Claris plans to post other scripts on its Web site.

We liked the new file-synchronization feature, which lets you maintain two separate copies of Organizer (one on your desktop computer and one on a PowerBook, for example) and have them update each other automatically.

The chief drawback of the Organizer 2.0 package is the lack of group-calendar capabilities. The program’s inability to share file and schedule information over a network makes it unsuitable for office use. That’s fair enough, because Organizer doesn’t pretend to be a workgroup tool, but the Organizer calendar’s poor handling of simultaneous events makes it hard to use even for a busy family. The calendar stacks simultaneous event entries, so only the topmost one is fully visible. That prevents you from seeing at a glance that, for example, your club meeting and your child’s baseball practice fall at the same time. We’d love to see Claris adopt Now-Up-to-Date’s method of handling simultaneous events: NUD scales event entries so they are all visible at a glance.

The Bottom Line
Claris Organizer 2.0 is a great program for managing your personal schedule, as long as you don’t need to track lots of simultaneous events. / Jeff Battersby

Choosing the right Mac is easy if you know what to do...
In case anyone is wondering whether they could get one of these by Christmas - I ordered mine (a basic, no-frills version) on November 25; it was built on Nov. 27; and it arrived in my office on Monday December 2. Exactly one week and over a Thanksgiving weekend! In fact, it has arrived too early - I'm having to hide it in my office until I can put it under the tree.
every Mac OS system Power Computing has introduced to date has been followed by a trail of praise. And despite the human truth, that people will have a disparity of opinions, you'll find overwhelming endorsements of Power Computer machines just about anywhere you look on the internet.
"THE POWERTOWER PRO SERIES SOARS ABOVE ALL MAC RIVALS...MAC POWERUSERS WILL SOON BECOME POWERUSERS IN DROVES."

-MACWEEK 7.22.96

"POWER COMPUTING HAS THE CLEAR AND UNDISPUTED EDGE OVER APPLE IN BOTH PRICE AND PERFORMANCE."

-MACUSER SEPT. '96

Recently, Macworld nominated just two machines for Best Mac System of the Year. Both from Power Computing (PowerTower Pro and PowerBase), nothing from Apple, Motorola or Umax. Sorry. Plus, all three of our lines (PowerTower Pro, PowerCenter and PowerBase) have received the editor’s choice award from Macworld.

Whether you’re looking for the best desktop publishing/graphics machine, best small office/home-office machine or best education machine, the first place Macworld will tell you to look is to Power Computing. If that’s not reason enough, listen to what MacUser has to say. MacUser awarded both the PowerTower Pro and PowerBase their..."
Publishing and Design System


"POWER COMPUTING HAS FIELDED SOME KILLER MACHINES. APPLE WILL BE HARD PRESSED TO CATCH-UP."

-MACUSER MAGAZINE, JULY, 1996
Based on system design and features, there's no question the PowerBase is still the best SOHO Mac. Despite their aggressive pricing, you simply don't get as much with a Motorola StarMax or UMAX.
Comparison Shop

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2 GB HARD DRIVE
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Apple
- Trust, but get killed in specs, price, features, etc.

PowerComputing
- Upgradable CPU
- 30 day # back
- System of the year
- $2000 (in budget)
- Bigger cache
- Can get Zip/Fax installed
- This is what Mike Curtis said I should get!

EMC
- Can't use 25.5!
- Not CPU Upgradable
- What good is 5yr warranty if system is obsolete in a few months!

UNIX
- Is it too fast?
- Is it too stable?
- Not made in US
- Who fixes this?
- Do I ship to Taiwan?
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Okay, you're getting closer to choosing your new, wickedly fast Mac OS system. You've read what people have had to say on the web. You've seen the reviews. You even checked all the ratings and realized Power Computing machines outperformed everything on MacBench tests. But you have a brain for yourself.
## Check the specs

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**Center**

**PowerBase**

so you called each Mac maker and got their respective specs sheets. Next, you look at the cold, hard numbers and guess what? Power Computing wins again. You notice a bigger cache, a more upgradeable CPU and a larger bus size just to name a few advantages. Wow, your decision is getting easier and easier.
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Price: $4295

PowerCenter 150 Starter

- 150 MHz PowerPC 604 Processor
- 16 MB RAM (512 MB Max)
- 1 GB Hard Drive
- 8x CD-ROM Drive
- 512K Level 2 Cache
- 1 MB VRAM On-Board (4 MB Max)
- 3 PCI Expansion Slots
- Extended Keyboard and Mouse
- 1,200 in Bundled Software
- Low-Profile Enclosure
- Add $100 for Mini-Tower Enclosure

Price: $2095

PowerBase 200 Starter

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- 16 MB RAM (160 MB Max)
- 1.2 GB IDE Hard Drive
- 8x CD-ROM Drive
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- Power 15" Multimedia Monitor (vis: 13.7)
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Price: $1999

PowerComputing

TO ORDER JUST CALL 1-888-769-5893 TOLL-FREE
**WatchIT!**

Time-tracking utility proves cumbersome to use.

HOW DO YOU SPEND YOUR TIME at the Mac? If you bill clients on an hourly basis, the question is more than academic. WatchIT! can furnish the answer in vivid detail — if you have the patience to configure it and use it properly. And that’s a big if.

To set up WatchIT, you tell it which applications (or specific file windows) you want to track. When you’re working in a given file or window, you assign it a Job and Task category. At the end of any interval you choose, WatchIT! generates a report that shows the total time you spent working in a given window, application, job, or task.

You can even configure WatchIT! to collect info from multiple systems on a network and generate an office-wide time log. (In a rather Orwellian twist, the WatchIT! extension can be installed invisibly and used to track activity on an application-by-application basis.)

WatchIT! enters Paused mode after a period of keyboard or mouse-button inactivity you specify. When you resume work, you can assign the paused time to a given Job or Task. That’s fine, as long as you spent the entire interval on one thing, but there’s no provision for phone calls to multiple clients, for example.

The WatchIT! system extension proved remarkably stable. But WatchIT! installs no fewer than five additional miniprograms along with the extension.

In addition to all that clutter, you have to put up with extreme tedium to track windows. You must remember to assign a Job and Task designation each time you use the New command, for instance. Nevertheless, it’s the only way to log time accurately if you use a given application for work on multiple projects.

WatchIT!’s reports are output as FileMaker Runtime documents that constrain you to sorting by window, application, day, or machine, user, or job. You can subsort by one additional criterion, but there’s no way for you to see all your information simultaneously — unless you export it to a spreadsheet. Fortunately, free tech support is available via e-mail.

**The Bottom Line**

Great for monitoring others’ application use, but only marginally useful for personal time tracking. / Mark Binder and Jim Shatz-Akin


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**Tailor Visual PostScript Editor 1.1**

View, troubleshoot, revise, or repair PostScript documents.

A SWISS-ARMY KNIFE FOR working with PostScript, Tailor, from EnFocus Software, can open nearly any PostScript print-to-disk (PS, for short) or encapsulated PostScript (EPS) file — even EPS files nested within other EPS or PS files. And no matter what application created the file, you’ll be able to view and edit its PostScript content on-screen. You can adjust Bézier curves and lines, assign (or change) colors, edit text and change its style, and control other details that are normally inaccessible once a file has been separated from its original application.

Tailor provides several helpful warnings. It alerts you to any defects in the PostScript code as it imports a file — if it doesn’t find any problems, the file should output correctly to a PostScript device. It also warns you of missing fonts and allows you to choose whether to view a substitute font on-screen or to have Tailor try to convert the type characters to paths, using embedded font information.

When you have finished with a file, Tailor exports it as an EPS file, a downloadable PostScript file, or an Adobe Illustrator 3 document. Tailor allows you to extract an EPS graphic from an open file, creating a new EPS file, complete with screen preview. And it allows you to export text — formatted, as plain ASCII, or with Rich Text Format (RTF) tags.

Tailor supports AppleScript; a script called Tailor Converter, designed to automate repetitive operations, is included. A printed manual ships with Tailor, and there is also online documentation (in HTML format — a viewer is included).

For all its strengths, Tailor has flaws. Its tools look familiar, but they don’t all work as you’d expect. You need to be careful about where you place the cursor when you attempt to move an object, for example, or the object is likely to be resized, rotated, or otherwise transformed instead. And although Tailor does a good job of preserving PostScript subtleties, it strips documents of device-specific settings, such as print-screen angles and frequencies. It discards CPI comments as well, and it has several font-related limitations, including lack of support for multiple-master and composite fonts.

Unlike Tailor 1.0, which required QuickDraw GX, Tailor 1.1 runs on any Mac with a 68020 or more powerful CPU, System 7.5 or later, and at least 8 MB of RAM (12 to 16 MB is recommended). It needs a great deal of RAM for the files, which are held completely in memory as you work on them, so its RAM requirements should be taken seriously.

**The Bottom Line**

Despite the program’s weaknesses, Tailor will probably pay for itself quickly if you frequently deal with PostScript files from myriad sources — something service bureaus often need to do. / Kathleen Tinkel


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**REVIEWS**

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Everyday Animals, The Object Series, Number 18  

FROM YAWNING MUTTS to lop-eared goats, this disc has a barnload of personality. You'll find the Object Series’ trademark high-quality and quirky composition in all 120 drum-scanned RGB images, which come in three resolutions. Built-in clipping paths and helpful instructions save Photoshop fuss. / Scholle Sawyer


Pyst  

BIG SUCCESSES make the best targets for parody, and Myst, the most popular CD-ROM game yet, is certainly fair game. And that's without considering the spoop potential of its brother-versus-brother plot or its setting — an uninhabited island crammed with arcane books and improbable gadgetry. How sad, then, that Pyst, from Parroty Interactive, offers such misguided satire.

The joke: The Myst island has been trashed by visitors and you get to witness the chaotic aftermath. Fair enough, but we doubt that the same audience that delighted to the subtle puzzles of Myst will guffaw at such lame slapstick as kamikaze seagulls, demented rats, or Roseanne’s John Goodman belching in a hot tub as the island's King Mattruss.

A good parody takes rapier wit, comedic timing, and a sense of its subject. Pyst misses more than hits. / LaMont Ridgell


ZipZAPP Pro  

NO PIECE OF MAIL needs to go unsent for want of a ZIP code, thanks to ZipZAPP Pro, a CD-ROM database from True BASIC. It quickly produces the right ZIP code for any municipality. Search by city or town, ZIP code, or area code, and the corresponding information scrolls instantly into view. For large cities, ZipZAPP even provides exact ZIP codes for each street and address range.

No one-trick pony, ZipZAPP Pro's database can also furnish other useful information, such as any locale's time zone, travel distances between cities, or even the average income and growth rate of a given county.

ZipZAPP Pro is updated twice yearly. True BASIC has promised that the next revision, due in the spring of 1997, will correct a minor bug that skews column headers to the right. Registered users pay $29 for each upgrade — a savings of 25 percent. Subscriptions are offered at extra cost. / Brooke C. Wheeler

ZipZAPP Pro, $30 (direct); upgrade, $29. Company: True BASIC, West Lebanon, NH; 800-436-2111 or 603-298-8517; http://www.truebasic.com/. Reader Service: Circle #417.

Extraordinary Cartographic Motifs, Visual Language Library, Vol. IV  

SAILING SHIPS, compass rosettes, dragons, and globes are just a few of the mapmaker's flourishes you'll find on this CD-ROM. Unfortunately, although these 65 drum-scanned images have been separated from the maps where they originated, none are isolated from their backgrounds. That means lots of tweaking in Photoshop before you can use them as decorations. As long as you have to go to all that trouble, you might as well purchase one of Visual Language's truly superb CD-ROM map collections and see the motifs as their creators intended. / Scholle Sawyer


Muppet Treasure Island  

MUPPET TREASURE ISLAND crams into three CDs everything including the kitchen sink (watch for the explosion).

You're Hawkins, the pirate-hero, and you must go on three connected journeys to find buried treasure on Treasure Island. Along the way, you need to unearth clues to obtain a map, ship, and crew — if you can call the likes of Rizzo the Rat crew members — but you're never alone, as your faithful, wisecracking parrot Stevenson helps you along the way. You must also select the right eye patch, earn money for new clothes by splattering pirates with pies, and complete a series of chores while on the ship The Hispaniola.

The game is fun, but it lacks a few features that would make for smooth sailing. For example, figuring out how to navigate the game's crowded environment is not always obvious. Make sure to read the accompanying booklet for important insights.

Still, as one would expect from Jim Henson Productions, the graphics are gorgeous and the character interaction makes you feel like you're in their world. / LaMont Ridgell


Elroy's Costume Closet  

AFTER HITTING THE BRICKS in their last title, Elroy and Syd are back together for a fun-filled romp through Elroy's Costume Closet. In this story, Elroy and Syd are on their way home after discovering that the places they wanted to go to (such as the cherry bomb factory) are closed. They end up in a theater as the stars of . . . well, anything the costumes you choose suggest. You can dress Elroy and Syd in any of the more than 100 costume variations. And if you choose the right clothing combination, you kick off one of more than 75 animated skits. You can stream online to download more from Costume Headquarters (http://www.headbone.com/). The program encourages you to print your creations, color them, and make stick puppets or even paper dolls.

Wait 'til you hear what Elroy has to say when it's his turn to be the mermaid and walk the plank. / LaMont Ridgell

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CIRCLE 90 ON READER SERVICE CARD
THE MAC MARKET was ignited with the introduction of the monochrome laser printer almost a decade ago. Using a page-description language from Adobe, the first monochrome laser printers produced smooth-looking fonts at any point size, printed grayscale art and photographs, and challenged traditional printing techniques. The DTP revolution had begun, and the admission price would be over $8,000 — and that didn't include the price of a Mac.

Today's monochrome laser printers have evolved to feature higher resolutions, higher engine speeds, better paper handling, full network connectivity, and impressively low prices. And instead of be-all, end-all laser printers that print every kind of document — 50-page text files, highly detailed and illustrated documents, simple spreadsheets with pie charts — monochrome laser printers in the current crop are marketed to unique, separate segments. If you're printing 50-page text files, you want a fast printer; if you're printing highly detailed and illustrated documents, you want the best output quality; if you're printing a spreadsheet, you want a good combination of speed and output quality.

Which printer is best suited for the type of files you print most often? To find out, MacUser Labs rounded up 11 of the survivors and put them through their paces to find out which monochrome laser printer is right for you and your files.

Understanding Test Results
If you looked at our printer test results and picked the top performer in every test, then you could choose a printer that may not be appropriate for your pocketbook or for the files you print. When comparing test results, take into account what your normal printing needs are and go from there. Here are some tips on how to view our individual test files in light of the type of printing you do.

If your daily print jobs consist mostly of text documents for reports and memos, then the best performer in our 20-page-text-document test, the Xerox DocuPrint 4517mp,
Printer Values

might be an ideal choice for your office. But if you want to print on tabloid-sized media, then the Hewlett-Packard LaserJet 4MV would be our choice, for two reasons: the 4MV supports tabloid media, and the text quality is among the best of the bunch, due to HP's proprietary Resolution Enhancement technology, which smooths lines and fonts.

The HP LaserJet 6MP and the Xanté A-Writer 8300 finished well behind the pack in the text-document speed test, because they each have an engine rated at 8 pages per minute — the other printers we tested have 12-, 16-, or 17-ppm ratings. But the 6MP and the 8300 are very different printers — the 6MP is suited for small workgroups and personal use and has an estimated street price of less than $1,000 (the most economical of the printers we tested), whereas the 8300 is geared to DTP/graphic-arts use, with features such as optional 1,200-x-1,200-dpi resolution, full-bleed 12-x-25-inch output, and calibration abilities. The 8300 has good speed for an 8-ppm printer (see the "Numbers That Are Fit to Print" charts), but its real claim to fame is its output quality — it was rated the best by our jury — and its DTP-specific features, including gatefold printing, gamma adjustments, and calibration.

If your files are a mixture of text and simple graphics, take a look at the 17-ppm Digital LN17ps. If you want good speed and output quality but don't want to spend $2,550, we suggest you take a look at the 12-ppm HP LaserJet 5M.

Spec Check

When shopping for a laser printer, you will no doubt encounter a slew of buzzwords and features that might be unfamiliar. In this section, we explain what key features to look for and what they mean.

Engine Speed. This is one of the most confusing aspects of purchasing a printer. The vendor's ppm (page per minute) rating is based on the engine manufacturer's printing-rate claim. The ppm rating indicates how long it takes the printer engine to pick up a piece of paper and roll it through the marking engine and into the output tray. The problem with this rating method is that it doesn't account for the time it takes for a print job to travel from your Mac to your printer and it doesn't consider the processing of the job in the printer.

When we run our real-world battery of printer tests, we measure how long it takes from clicking on the Print button in the Print dialog box to when the last page falls into the output tray. In our simple 20-page-text-document test, none of the printers matched the vendors' ppm ratings. For example, the supposedly 16-ppm GCC Elite XL 616 performed more like a 9-ppm printer. As we went to press, GCC announced a processor upgrade (the unit we tested had a 25-MHz AMD RISC processor; the new processor will be a 40-MHz AMD RISC processor) and new NetWare support for the Elite printer series.

Resolution. Not long ago, the standard printer resolution was 300 x 300 dpi. Now, the resolution standard has increased to 600 x 600 dpi. The increase provides an obvious quality difference, for both text and graphics.

If you increase the amount of RAM installed in the printer, the Digital LN17ps, Lexmark Optra Lx+, Xanté A-Writer 8300, and Xerox DocuPrint 4517mp are all capable of resolutions as high as 1,200 dpi. A printer can also use one of many enhancement technologies to achieve the appearance of higher-quality output. Apple's FinePrint, HP's Ret, Lexmark's PQ11, and Xerox/Digital's TrueRes manipulate the dots on the paper to make lines and fonts smooth and crisp.

But these resolution-enhancement technologies don't change the appearance of grayscale graphics. Instead, some of the printers use a separate grayscale enhancement to give graphics more levels of gray without sacrificing detail. There are various techniques for enhancing grayscale output, but Apple's PhotoGrade, with the LaserWriter 12/640 PS, and Xante's XTScreen, with the Accel-a-Writer 8300, produced grayscale quality that impressed our jury.

THE MAC-TO-PC CONNECTION

NO MAC IS AN ISLAND, but sometimes it sure feels like it. For instance, when you're on the road with your PowerBook, finding a Mac-configured printer to use can be difficult — some people resort to sending their documents to a fax machine. If you work in the art department of a business, your department may be the only one that is Mac-centric. And some special-purpose printers simply don't come in configurations for the Mac.

Fortunately, GD Softworks has a solution. PowerPrint ($149) lets users connect a Mac to a PC-configured printer by using a serial-to-parallel printer cable and special software drivers. PowerPrint supports over 1,200 laser, inkjet, and dot-matrix printers. PowerPrint Pro, a network version, is available for $299. GD Softworks is also working on a PowerPC Platform version of PowerPrint. This version will allow users who use the Mac OS on a PowerPC Platform to print to PC-compatible printers. Since the PowerPC Platform will have a parallel connector, this version will come with a parallel cable. It should be available in February 1997.

GD Softworks, Burnaby, BC, Canada; 800-663-6222 or 604-473-3600; http://www.gd.com/; / ROMANLOYOLA

smart shopper

5 questions to ask when you're shopping for a printer:

1. Does the printer use standard SIMMs, or do I have to use SIMMs supplied by the vendor?

2. What is the minimum amount of RAM sufficient to get the maximum resolution from the printer?

3. On average, how many pages will I be able to print before the toner cartridge runs out?

4. Does the printer come with downloadable fonts in addition to the fonts in the printer's ROM?

5. Does the printer have a power-saving mode for when it's not in use?
**DESKTOP DRIVER / revamped LaserWriter 8**

APPLE AND ADOBE SYSTEMS have recently revamped their PostScript-printer driver. LaserWriter 8.4.1 PostScript Driver (the latest version at press time) is the long-awaited release; it offers a speed boost as well as many new features.

**Interface.** Among the new features in the upgrade are the ability to select a printer in the Print dialog box instead of in the Chooser; Page Setup options in the Print dialog box; and the option to use ColorSync profiles.

Printer icons can now be stored in folders instead of having to remain on the Mac desktop, which cuts down on desktop clutter. And a new Printer menu, for viewing and selecting any available printer, is located in the menu bar.

**Background Printing.** If you printed a 5-MB file with an earlier LaserWriter driver, it would spool a large, compressed file to your hard disk before sending it to the printer. Not only did that waste time but it also required lots of hard-disk space. LaserWriter 8.4.1 solves the problem with a one-pass printing solution; it sends the PostScript code to the printer as it is being processed by the driver. This saves time for monochrome printing, but the real speed difference can be seen with color printing, in which the file sizes often drift into the 100-MB range.

**Paper Handling.** Often overlooked features in a printer are its paper-handling capabilities. If the printer gets a lot of use, then it should have a large paper capacity to reduce the need for user intervention. The Digital LN17ps and the Xerox DocuPrint 4517mp have ample paper-handling features, including an optional ten-bin mailbox/collator, a duplexing unit, two universal-paper-tray units that can hold a total of 1,000 sheets, and an envelope feeder. These features are important assets in a busy workgroup environment. Be sure to also check whether the printer supports the paper sizes you need.

**Printable Area.** Printers that output letter-sized (8.5-x-11-inch) and tabloid-sized (11-x-17-inch) documents actually print on an area that's smaller than the physical piece of paper. This is common and should not pose a problem for most business documents. In electronic publishing, there is a need to see the entire letter- or tabloid-sized document to check crop marks and bleeds, where printing actually extends beyond the edges of the paper. The four tabloid printers in this review can print letter-sized documents on tabloid paper, and the Xanté printers are capable of printing gatefold prints with an imageable area measuring 11.89 x 24.9 inches.

**RAM.** Today's PostScript laser printers can operate with a minimal amount of RAM, which means their prices are lower. Printers can compress the information that needs to be processed or can send the information in bands.

We tested the printers with their standard...
memory configurations, which were as low as 3 MB on the HP LaserJet 6MP and the Genicom PowerPro 12 and as high as 12 MB on the HP LaserJet 4MV and the Xanté Accel-a-Writer 8200. Generally, the standard amount of RAM suffices, but we recommend upgrading to the printer's next-higher RAM increment — you should notice improvements in processing speed and have more room to temporarily store fonts in the printer instead of downloading them from your Mac. However, be aware that there is a point of diminishing returns when adding RAM to a printer — we would be hard-pressed to think of a situation in which you would need the maximum amount of RAM in order to output a print job.

Output Quality

For our graphics- and text-quality ratings, we assembled a group of desktop-publishing professionals and novices to participate in our jury. We looked at text quality, graphics quality, and overall print quality. Our results showed that all the printers had respectable output.

Regarding text quality, the HP LaserJet 5M received the highest marks, for having crisp, solid text. Even small, 6-point type looked very clean and not too heavy. It was a neck-and-neck race for just about all the other printers, but we found that HP's Resolution Enhancement technology made for superior output. The Genicom PowerPro 12 produced acceptable-quality text, but it was heavier than the output of the other printers.

Graphics quality was also a close race. While evaluating grayscale images, we looked for even, smooth gradations that had no mars or streaks. The Xanté Accel-a-Writer 8300 proved to be a strong contender in this area, capable of handling subtle shadow and highlight detail. The HP printers produced average graphics quality — we noticed more of a dither pattern with the HP printers than with the others. The Digital LN17ps, the Lexmark Optra Lx+, and the Xerox DocuPrint 4517mp turned out solid output and got above-average grayscale scores from our jury. Output from the GCC Elite XL 616 showed some banding and looked too light overall, with some of the highlight detail blown out.

The Bottom Line

When this crop of laser printers is broken into segments — for personal and small workgroups, small to medium workgroups, and publishing and the graphic arts — the results of our evaluations spell out good news for each group.

The HP LaserJet 6MP is not only inexpensive but is also able to output sharp text and decent grayscale graphics. We highly recommend this printer for personal or small-workgroup use. In the small-to-medium-workgroup segment, we chose the Digital LN17ps. Although it is very similar to the Xerox DocuPrint 4517mp, we found that the extra 2 MB of RAM that comes with the Digital printer made a difference in our speed tests, and the LN17ps proved to be a strong output-quality contender. And for those who want the best output quality for serious DTP work, we recommend the Xanté Accel-a-Writer 8300.

Tony Bojorquez is a freelance Mac consultant. MacUser Labs Project Leader Rick Oldano managed the testing for this report.
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Source Code 680397
Which Mac?

MacUser went into the Labs to test 38 new Mac systems, to help you figure out which will best fit your needs.

First adopters of the Macintosh will remember the days when Which Mac? could be answered with one phrase: Whichever Mac Apple has released this year. A more recent generation would probably have answered: A color Mac — if you can afford it. And users in the early 'gos, when Apple spewed forth new Mac models at an alarming rate, might have remarked: A Performa if it's for home or school; otherwise, get a Quadra.

Since the arrival of Mac clones, what used to be a simple decision has become as complex and nerve-racking as deciding which combination of deductions will slip by the IRS computer and which will be flagged for an audit.

Ask today's Mac cognoscenti which Macintosh you should buy, and you're likely to hear more questions than answers: Do you want an Apple machine or a clone? What kind of processor do you need — a PowerPC 601, 603e, 604, or 604e? And how about Level 2 cache? Or graphics RAM — 1, 2, or 4 megabytes? Or maybe you want to skip onboard graphics hardware altogether and go with a PCI accelerated-graphics card? Oh, and speaking of PCI . . .

Sheesh.

After years of having the option of buying any Mac you wanted, as long as it was Apple's, an explosion of options has made the Mac buying experience significantly more confusing, and potentially more rewarding, than ever before. It's this overwhelming selection of vendors, models, and configurations that screamed out for a comprehensive guide to buying the right new Mac OS system for you — this is that guide.

In these next few pages, we'll supply you with all the information you need to make a good buying decision, including the results of the most extensive lab test of single-processor Mac OS systems ever attempted (for our most recent evaluation of multiprocessor systems, see "Muscle Macs, January '97, page 76). We took 38 currently shipping Macs into our labs and examined every aspect of their performance and functionality. For testing, we used the just-released version 4.0 of MacBench, our industry-standard benchmark test suite (see the "How We Tested" sidebar). The results of these tests and our recommendations are presented in this special report.

Our recommendations are based on two assumptions: You know how much money you want to spend, and you know the kinds of tasks you want your Mac to perform. To help narrow your choice, we've divided our discussion into three categories — those for budget systems, priced at under $2,000 each; those for midrange Macs, which run $2,000 to $3,500 each; and those for high-end machines, which cost over $3,500 each. Within these categories, we recommend the Mac OS system that our tests show is best suited to your needs — whether you're a home user, student, businessperson, publisher, or multimedia designer.

Hopefully, we've distilled all the information you need to decide which Mac you should buy. And even if our recommendations don't jibe with the Apple — or Motorola or Power or UMAX — system of your eye, you'll find comprehensive lab data to help make up your own mind.

What we found may even surprise you.

BY CHRISTOPHER BREEN
The Budget Macs

It's remarkable how much computer muscle you can purchase for under $2,000 today. With the release of new generations of PowerPC processors, the "cheap" Mac of today outpaces top-of-the-line models of just a year or two ago. Macs in this price category exhibit surprisingly high speeds — and don't overburden your pocketbook.

The budget Macs ship with at least 16 MB of RAM and a 1.2-GB hard drive. Except for the Apple Power Mac 7200/120, each sports an IDE rather than a SCSI drive and each comes standard with an 8x CD-ROM drive. Most also have at least two PCI slots, a 256K Level 2 cache, and a PowerPC 603e running at a speed between 160 and 200 MHz. Most systems supply 1 MB of RAM for graphics, with Power Computing being the generous exception — the PowerBase models come with 2 MB of graphics RAM.

The UMAX SuperMac C600/180 and C600/200 and the Power Computing PowerBase 180 and 200 are the only under-$2,000 Mac OS systems that come with upgradable CPU daughterboards. To date, however, no upgrades have been released for these machines, and because of limitations imposed by their logicboard architectures, it's unlikely these machines will ever accommodate anything but a 603e processor. Apple claims that the Performa 6400 models can be upgraded via a simple motherboard swap but so far has not announced any upgrade plans.

Monitors are sold separately, so be sure to budget $350 to $500 for a 15-inch multisync monitor or $700 to $1,000 for a 17-inch monitor. Apple Performas, the Motorola StarMax 3000 series, and the UMAX SuperMac C600 series come with 28.8-kbps modems. For an additional $159, you can add a Global Village 28.8-kbps Platinum modem to the Power Computing models.

Test Results

As for overall processor speed, we found that you get significantly more bang for your buck from products that don't have a rainbow-colored apple on the front. The three Apple machines that fell in the budget price range — the Performa 6360, the Performa 6400/180, and the Power Mac 7200/120 — scored worst in our MacBench 4.0 Processor test. The Performas' low scores can be attributed to their lack of a Level 2 cache — all the clones come with a 256K cache. And although the Power Mac 7200 comes with a cache, its 120-MHz PowerPC 601 simply isn't able to keep up with the faster 603e processors in the other budget-system boxes.

Turning to disk access, an area of interest to DTP and multimedia users, the UMAX SuperMac C600/200 was barely edged out by the Power Computing PowerBase 200 in the MacBench 4.0 Disk test yet flew past the PowerBase 200 in the Publishing Disk test. An otherwise lackluster performer, the Apple Performa 6360, turned in a Publishing Disk score within the top three.

Due to the ATI accelerated-graphics chip set in the PowerBase 180 and 200, Power's machines fared well in all the graphics tests. This chip set provides an additional benefit unmatched by that of any other Mac — built-in 3-D-graphics acceleration. Gamers choosing a PowerBase can jump into the third-dimension without needing to get a dedicated 3-D-graphics accelerator.

Although performance should be a major consideration for anyone contemplating the purchase of a new machine, it shouldn't be the sole deciding factor — particularly if this is your first Macintosh. First-time Mac buyers need a computer with a solid price/performance ratio as well as one with enough software to be useful the first time they boot up. Except for the Power Macintosh 7200/120, which comes with nothing more than the Mac OS, all the entry-level Macs we examined come with generous suites of software. Common to all are copies of ClarisWorks 4.0, Quicken 5.5, and the Grolier Encyclopedia. Depending on the vendor, you also receive such useful applications as Norton Utilities, Symanite AntiVirus, Conflict Catcher 3, Descent, and the America Online sign-up kit.

Bargain Macs for the Budget-Conscious

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>RATING</th>
<th>PRICE (AS TESTED)</th>
<th>POWERPC/ CLOCK SPEED</th>
<th>MEMORY BUS SPEED</th>
<th>RAM</th>
<th>L2 CACHE</th>
<th>HARD-DRIVE CAPACITY (TYPE)</th>
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* Best performer in each test. Listing is alphabetical within groups of equal mouse ratings.

We tested the base configurations of all Mac OS systems available for $2,000 or less to find out which offered the greatest value. Price was the most important factor in our mouse ratings. When considering performance, we weighted most heavily scores from MacBench 4.0 tests that reflect basic productivity tasks. In addition, we gave points for including a modem, extra RAM, extra RAM for graphics, built-in Ethernet, bundled software, and an extended warranty. MacBench 4.0 scores are relative to those of an Apple Power Mac 6100/60 with a 30-MHz memory bus, a 250-MB hard drive, 2 MB of built-in graphics.
At Home

Your home Mac will likely serve more than one family member and so must satisfy a variety of needs. Grown-ups who are occasionally compelled to bring work home will want their Mac for word processing and moderate number crunching. When not busy with the toil of the workplace, these same adults will find their computer a handy tool for dealing with family finances and marveling at multimedia CD-ROMs. Younger members of the household will use the Mac to create artistic masterworks destined for the galerie du réfrigérateur, do homework, and play games. Everyone will use the modem.

Because gaming is so important to the home user, you need a computer fast enough to handle these processor-intensive diversions. You also want a Mac that’s easy to set up and use and that includes most of the necessary software and hardware required, right out of the box.

With budget in mind, we expect that you’ll buy a 15-inch color monitor. The systems with 1 MB of graphics RAM can display thousands of colors (at 16 bits) on these monitors — plenty for your purposes. With their 2 MB of graphics RAM, the Power Computing PowerBase models can display millions of colors (24 bits) on a 15-inch monitor.

Possessing all those colors won’t be much fun unless you have something to print them on. No home Mac system is complete without a color inkjet printer. Color inkjet printers from such companies as Apple, Epson, and Hewlett-Packard start at around $300 each.

Because your home Mac will entertain as well as enlighten, you should factor a pair of external speakers into your budget. For $100 and less, you can add rich sound to your gaming and multimedia experiences. And speaking of gaming, if you or a member of your family is serious about games, purchase a joystick. Quality Mac ‘sticks are available for under $80 each from Advanced Gravis, CH Products, Kernel Productions, and MacALLY. Game pads start at $29 each.

In School

Times have changed. Computers are now as necessary in the college dorm as calculators once were. The academic Mac is intended for scholarly purposes — writing term papers, doing Internet-enabled research, and accessing CD-ROM source material. But we suspect that your Mac away-from-home will also be used for less cerebral pursuits — sending e-mail, generating flyers and newsletters, and playing games.

Just how robust your processor must be will depend a great deal on your studies — engineering and science students are likely to require a Macintosh at the top end of the performance scale. Another concern is due to a bug in the Mac OS that conflicts with some IDE-equipped systems. We set the screen resolution to 640 x 480 pixels with a bit depth of 8 bits (256 colors) for all tests except the Hi-Res Publishing Graphics test, for which we set the resolution to 1,152 x 870 pixels with a bit depth of 8 bits (256 colors).
connectivity. Wired institutions are becoming more commonplace, and you’ll require Ethernet to make the connection. Students attending schools that don’t provide networks in the dorms—or who live off campus—will want a modem.

Student budgets are likely to be the most restricted of any computer user, so the school Macintosh should be both inexpensive and free from repair costs. Because no one can guarantee reliability with any computer, an extended warranty is an important consideration for students. Motorola clones are the only Macs that come with a five-year warranty. Regrettably, the StarMax 3000/160 lacks onboard Ethernet. Students requiring Ethernet will need to buy a PCI Ethernet card.

A Mac that can grow with you. Your computer should be upgradeable as well as have enough room to accommodate additional hard drives. And, of course, the cost of your Mac shouldn’t plunge your business into the red.

Although you can skip the Ethernet connection if you’re not networked, you’re likely to require a large monitor to accommodate fat spreadsheets and long client lists. A 15-inch monitor will suffice when you’re starting out, but you should anticipate purchasing a 17-inch monitor when your budget allows.

Because the paperless office has yet to be realized, you’ll need a printer. Although getting an inkjet printer is a reasonable short-term solution, your documents will have a more professional appearance when printed on a PostScript laser printer—600-dpi grayscale PostScript printers start at around $900 each.

Your business may depend on the integrity of your data, so a reliable backup system is a must have. Budget buyers will find that a medium-capacity, removable hard drive such as the Iomega Zip serves them well for backup purposes. The mail-order price of a Zip drive hovers around $199. Power Computing also offers an internal Zip drive as a preinstalled option.

Pushing Pixels
You’re a small publisher/graphic artist whose Mac must cope with page-layout, illustration, and imaging applications. With the world flocking to the Internet, it won’t be long before Web Page Designer appears on your business card as well. You and your Mac must be Internet-ready.

A fully functional desktop-publishing system requires speed, storage, and lots of RAM—factors that do not bode well for the buyer on a budget. Unlike home, school, and business systems for which processing power is helpful but not vital, DTP and imaging demand the most powerful Mac you can afford. In addition to a fast machine, you’ll need one with a high-capacity hard drive—graphics files can swallow several megabytes of disk space. Having extra hard-drive bays also benefits DTP users.

If you work in the visual arts, you’ll want to be sure you’re seeing the whole picture. For this reason, plan to buy at least 17 inches of

Best Budget Mac for Education

Motorola StarMax 3000/160 DT

Along with the PowerBase 180, we were impressed with the value of the StarMax 3000/160 DT. In its desktop configuration, it costs just under $1,500, yet it outperformed the higher-priced Apple Performas in our tests. Unlike the PowerBase 180, the StarMax 3000/160 has a modem and a PS/2 port (for those who want to use the less expensive PC keyboards and mice) and a five-year warranty. Regrettably, the StarMax 3000/160 lacks onboard Ethernet. Students requiring Ethernet will need to buy a PCI Ethernet card.

Best Budget Mac for Business

UMAX SuperMac C600/180

The SuperMac C600/180 is a smart choice for an office. It’s fast enough to tear through most jobs undertaken by business software, has a hard disk large enough to store the numerous files typical of small businesses, won’t break your budget, and comes with a modem. But probably the biggest factor for business users is on-site service free of charge for the first year of ownership—a service for which you must pay Power Computing an additional $49 for one year. Add to this the comfort of being able to buy a SuperMac box from a local dealer instead of via mail order, as you must for a Power machine, and we think you’ll agree that the security of knowing support is just around the corner makes the SuperMac C600/180 a best buy for business users.
monitor real estate. You should also add enough graphics RAM — or an accelerated graphics card — so you’ll be able to view your images in 24-bit color regardless of your monitor’s resolution.

Graphics programs consume a lot of RAM. Plan to purchase as much RAM as you can reasonably afford. Once your Mac is check-full, start shopping for an additional high-capacity, fast hard drive.

You’ll also need a reliable removable-media drive for archiving huge graphics files. Check with representatives of your favorite service bureau to find out which media they prefer to use.

![Image of a graphics card](image)

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**Visible Means of Support**

You’ve carefully read our test results, figured out the kind of processor you want and how many PCI slots and drive bays you need, made a list of RAM and hard-drive configurations, and confirmed the costs. But one vitally important question isn’t answered by our tests: What kind of tech support and customer service can you expect after you’ve made your purchase? Although a Mac OS machine is a fairly utilitarian tool, buying one is akin to purchasing a shovel — they don’t all work flawlessly year after year. To get your Mac system back on its little rubber feet, companies take different approaches, and it’s worth knowing what these approaches are before settling on a particular model. Here’s how the various Mac-system vendors shake out:

**Apple Computer.** If you’re shopping for a new computer, one factor in Apple’s favor is support. Although many of us have spent far too long on 800-505-APPL (Apple’s tech-support line), at least Apple has a track record. For better or worse, it’s been supporting Macs since day 1, and for the most part, it has an efficient system in place. So far, the clone vendors’ support systems are largely untested.

With a new Performa, you get a one-year, on-site service warranty, which means that if Apple determines you have a hardware problem that requires the attention of a technician, it will send a tech to your home or office. As with the clone vendors, this initial diagnosis is made via a call to technical support. Apple’s response time has been reported to be three to five days — although months-long service delays, due to parts shortages, were not uncommon for certain Performa and PowerBook models during 1995.

Non-Performa Macs also have a one-year warranty, but all repairs on these machines must be performed at an Apple-authorized service center or dealer. Performa and non-Performa owners have the option to purchase AppleCare, an extended-warranty program for on-site or shop repair. The price of AppleCare depends on the computer model you buy and how it’s configured.

**Motorola.** StarMax systems are covered by the most generous warranty in the business — five years. The first year is on-site, next-business-day service, Monday through Friday from 8 A.M. to 5 P.M. The second and third year, you must return the computer to one of Motorola’s local service depots. During years 4 and 5, the StarMax must be shipped, at customer cost, to the factory for repair. Motorola offers free phone support for problems with the Mac OS only for the first 90 days. Customers can purchase warranty upgrades to same-day service or extend on-site service past the first year.

**Power Computing.** On-site service is available from the company only if you purchase it separately. This service is available for $49 for one year, $149 for two years, and $199 for three years. Response time for on-site service depends on part availability.

If a user-installable component — such as a keyboard or hard drive — is defective, and Power determines that you’re capable of making the exchange, the company will often simply ship the part to you and have you swap it rather than send out a technician. If the problem is more serious and you haven’t purchased the on-site warranty, you are required to return the computer to Power and pay one-way shipping costs. Power Computing agrees to return your computer to you via the same shipping method you used — for example, if you ship via Federal Express’ second-day service, expect Power Computing to return your clone to you via second-day service from Federal Express.

**UMAX Computer.** The UMAX tech-support line operates seven days a week from 6 A.M. to midnight (central time), and the company claims that 85 percent of calls are answered in three minutes or less. UMAX includes a one-year, on-site warranty with all its computers and guarantees that a technician will arrive within three business days with the proper part in hand.

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**Best Budget Mac for DTP**

**Power Computing PowerBase 200** (minitower)

DTP and imaging require a fast computer, and according to our tests, the fastest overall Mac under $2,000 is the PowerBase 200. Although we tested a desktop system, we recommend the minitower configuration (about $900 more) because of its greater expandability. The PowerBase 200 is priced right and carries one more megabyte of graphics RAM than nearly all other budget systems, thereby supplying DTP users with more colors at higher resolutions. An added bonus is the ATI 3-D-graphics chip set, which is useful for those wishing to break away from two dimensions.

Buyers will surely want to invest in more RAM and, perhaps, a higher-capacity hard drive than the 1.2-GB drive that comes with the starter configuration of the PowerBase 200. The nice thing about Power is that you can make changes when you order directly from the company and thus can avoid paying for a drive you’ll be replacing anyway.

---

**Apple Computer**

Cupertino, CA 800-538-9556
408-996-1010
http://www.apple.com/

**Motorola**

Tempe, AZ 800-759-1107
512-434-1526
http://www.mot.com/computer/

**Power Computing**

Round Rock, TX 800-999-7279
512-388-6888
http://www.powercc.com/

**UMAX Computer**

Fremont, CA 800-232-8629
510-226-6586
http://www.supermac.com/
The Mac Midrange

With a budget of $2,000 to $3,500, we enter the Macintosh sweet zone. These machines are fast and generally have more memory and graphics RAM and larger Level 2 caches than their sub-$2,000 counterparts.

Within these budgetary boundaries, you’ll find systems sporting up to 32 MB of RAM and hard drives starting at 1 GB and swelling to 2.5 GB. In the Macs we examined, the drives are evenly split between the IDE and SCSI standards — with the Apple Performa 6400/200, Motorola models, Power Computing PowerBase 240, and UMAX SuperMacC 600/240 containing the less expensive IDE drives. The Apple Power Mac 7600/132 and 8500/150, the Power Computing PowerCenter models and PowerTower 180e, and the UMAX SuperMac J700 series have SCSI drives.

At the low end of the midrange-Macintosh price scale, we found 603e processors blazing away at 200 to 240 MHz. At $2,300 to $2,800, the PowerPC 604 makes a brief appearance in the Power Computing PowerCenter series as well as the UMAX SuperMac J700/150; PowerPC 604s also sneak into the lower-cost Power Mac 7600/132. At the $2,300 mark, the powerful 604e processor begins to appear, in Motorola models. All machines we examined that cost over $3,000 use a PowerPC 604e processor.

When it comes to Level 2 cache, Apple offers only 256K. Happily, most clone makers include a 512K cache once the base price exceeds $2,300. Power Computing offers a 512K cache even in the low-cost PowerCenter 150, and the high-performance PowerTower 180e has a generous 1-MB Level 2 cache.

Don’t expect higher prices to equate with additional RAM. For example, Power Computing places only 16 MB of RAM in its base models, regardless of how expensive the machine is. Apple is equally shy about exceeding the 16-MB barrier with its computers. Motorola is more generous, including 32 MB of RAM in its minitower configurations, but it offers only 16 MB in the desktop boxes. UMAX includes 24 MB in its C600/240 and J700/180 clones but only 16 MB in its less powerful SuperMac J700/150.

Bundled modems are absent on most midrange Mac OS systems. However, onboard Ethernet and upgradable CPU daughtercards predominate in most lines, save the Motorola clones. Software bundles vary more widely in this category than with the budget Mac OS systems.

Test Results

Once again the scores of Apple’s machines in our MacBench 4.0 Processor test were less than stellar. The Power Mac 8500/150, in particular, turned in poor results. Although we’re impressed with the audiovisual features built into the 8500/150, the $3,000 price of a bit steep. Users interested in these AV features would be better served by looking instead to the less expensive — and slightly faster — Power Mac 7600/152, which, like the Power Mac 8500/150, includes 24-bit composite- and S-video input. Better yet, for a few hundred bucks, they can add a PCI digital-video card to a non-AV-equipped clone.

We were far more taken with three lower-cost systems that delivered high Processor and Disk scores. Base configurations of the Power Computing PowerBase 240 and PowerCenter 150 and the UMAX SuperMac C600/240 cost $2,200 to $2,300, yet they performed

### Middle-of-the-Road Macs

<table>
<thead>
<tr>
<th>Product</th>
<th>Rating</th>
<th>Est. Street Price as Tested</th>
<th>PowerPC/ Clock Speed</th>
<th>Memory-Bus Speed</th>
<th>RAM</th>
<th>L2 Cache</th>
<th>Hard-drive Capacity (Type)</th>
<th>Graphics RAM</th>
<th>Number of PCI Slots</th>
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<tbody>
<tr>
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<td>$3,455</td>
<td>604e/180 MHz</td>
<td>60 MHz</td>
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<td>50 MHz</td>
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<td>16 MB</td>
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<td>604/180 MHz</td>
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<td>16 MB</td>
<td>512K</td>
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<td>UMAX SuperMac C600/240</td>
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<td>51.4 MHz</td>
<td>24 MB</td>
<td>512K</td>
<td>2.1 GB (SCI)</td>
<td>2 MB (MS TwinTurbo)</td>
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<tr>
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<td>603e/200 MHz</td>
<td>40 MHz</td>
<td>32 MB</td>
<td>256K</td>
<td>2.5 GB (IDE)</td>
<td>1 MB (built-in)</td>
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</tr>
<tr>
<td>Motorola StarMax 4000/160 MT</td>
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<td>603e/160 MHz</td>
<td>40 MHz</td>
<td>32 MB</td>
<td>256K</td>
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<tr>
<td>Motorola StarMax 4000/200 DT</td>
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<td>256K</td>
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<tr>
<td>Motorola StarMax 4000/200 MT</td>
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<td>40 MHz</td>
<td>32 MB</td>
<td>256K</td>
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<td>44 MHz</td>
<td>16 MB</td>
<td>256K</td>
<td>1.2 GB (SCI)</td>
<td>2 MB (built-in)</td>
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<td>40 MHz</td>
<td>16 MB</td>
<td>256K</td>
<td>2.4 GB (IDE)</td>
<td>1 MB (built-in)</td>
<td>2</td>
</tr>
<tr>
<td>UMAX SuperMac J700/150</td>
<td>⭐⭐⭐⭐⭐</td>
<td>$2,795</td>
<td>604/150/IDT</td>
<td>50 MHz</td>
<td>16 MB</td>
<td>512K</td>
<td>2 GB (SCI)</td>
<td>2 MB (MS TwinTurbo)</td>
<td>4</td>
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<tr>
<td>Apple Power Mac 8500/150</td>
<td>⭐⭐⭐⭐⭐</td>
<td>$2,999</td>
<td>604/150/IDT</td>
<td>50 MHz</td>
<td>16 MB</td>
<td>512K</td>
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<tr>
<td>MacUser BEST BUY</td>
<td>⭐⭐⭐⭐⭐</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

*Test would not run on this system.

Best performer in each test.

Listing is alphabetical within groups of equal mouse ratings.

Nearly half the systems we tested fell into the midrange category; those with base configurations street priced at $2,000 to $3,500 each. We weighted price and performance nearly equally, giving slightly more importance to tests that reflected business tasks than publishing tasks. Systems got extra points for having a modem; offering more RAM, hard-disk capacity, and graphics RAM; providing built-in Ethernet; having greater expansion capacity, including built-in digital-video capability; and offering a longer-than-usual warranty.

MacBench 4.0 scores are relative to those of an Apple Power Mac 6100/60.
as well as some systems priced at $2,800 — making them reasonable choices for cost-and performance-conscious home, student, and business users. A standout among these clones is the SuperMac C600/240, which includes 24 MB of RAM, a 2.1-GB hard drive, and a modem. The Power Computing systems include only 16 MB of RAM, a 1-GB drive, and no modem. Despite their comparatively low RAM and graphics RAM, the 604-based PowerCenter 166 and 180 provide the best value for midpriced systems. Both machines edged out the Motorola StarMax 4000/160 MT in all tests except the Publishing Disk and Floating Point tests. The Power Computing products also offer a significant advantage over Motorola’s — their processors can be upgraded, whereas the StarMax series’ cannot. Shoppers whose budgets prevent them from exceeding the $3,000 limit should look carefully at the PowerCenter models.

Skipping to the high end of this category, we were impressed by the performance of the Power Computing PowerTower 180e. Its Processor score was 16 percent higher than that of its closest competitor, the UMAX SuperMac J700/180. Clearly demonstrating that processor speed isn't the only factor you should consider when judging a computer's performance, MacBench 4.0 showed the 180-MHz PowerTower's processor subsystem to be roughly 19 percent faster than that of the 200-MHz Motorola StarMax 4000/200s. The higher score can be attributed to both the larger Level 2 cache in the PowerTower 180e — 1 MB versus 512K — and the 180e’s faster system bus. The PowerTower 180e also turned in admirable graphics scores — scores that will translate into better Photoshop performance, zip, text redraws in QuarkXPress and PageMaker, and better throughput for desktop audio and video applications.

At Home

Home users who spend over $2,000 for their Macs should have something more serious in mind than balancing their checkbooks. Home video productions, digital audio, 3-D dabbling, or hard-core gaming may all be good justifications for breaking the household budget. But because this is a home computer, with a 30-MHz memory bus, a 250-MB hard drive, 2 MB of built-in graphics RAM, and no L2 cache. This system is given a score of 100 for all tests. We tested all systems as configured by the vendors but with AppleTalk off and virtual memory on (disk tests on the SuperMac C600/240 and the PowerBase 240 were done with virtual memory off due to a bug in the Mac OS that conflicts with some IDE-equipped systems). Screen resolution was 640 x 480 pixels with a bit depth of 8 bits (256 colors) for all tests except Hi-Res Publishing Graphics, for which resolution was 1,152 x 870 pixels with a bit depth of 8 bits (256 colors).
we assume that cost is still a concern.

If you're considering home multimedia production you'll need a fast processor; at least 32 MB of RAM; and a high-capacity, fast hard drive. Desktop-video enthusiasts will be tempted by the built-in video capabilities of the Power Mac 7600/132. If your aspirations move beyond the limits of the 7600, you'll need to look into getting a dedicated video card.

It's time to upgrade your monitor to 17 inches, and if you intend to work or play in the third dimension, you'll appreciate having a 3-D-graphics-acceleration card — provided your computer doesn't already offer 3-D acceleration.

If you're contemplating a midrange purchase because you want to squeeze just a few more frames out of Marathon Infinity and MechWarrior 2, you're a serious enough gamer to consider a top-end joystick from ThrustMaster or CH Products. Need to take pictures of the kids? Think about a digital camera. Prices start at around $400 and range up to $900 for consumer-model cameras. If that's too expensive, have the kids sit in front of your Mac and use a Connectix Color QuickCam (around $180).

**In School**

It would be more than just a little shortsighted of us to assume that everyone who attends college is an undergrad who uses a computer for such simple tasks as word processing and Internet access. Macs on campus perform the same kinds of chores as are carried out in the workplace and, therefore, must be just as vigorous. However, because these machines are being purchased by students — or their parents — cost counts.

Students investing in a midpriced Mac are likely to be involved in science, engineering, graphic arts, music/audio, video production, or multimedia design — disciplines that demand the most from a computer. Applications that address these fields generally consume large amounts of RAM and storage. You'll need a Mac with RAM and hard-disk space to spare. As with any college Mac, yours should have a modem and, if possible, Ethernet. Depending on the kind of applications you use, you may also require a monitor larger than 15 inches.

If you're starting from ground zero, you'll need the same peripherals as other students — a printer; external speakers; and, if you like, a joystick. Because your studies are likely to be a bit more focused, you'll add devices appropriate to your interests. These may include a digitizing tablet, MIDI interface and synthesizer, video card, digital camera, or scanner. Because it's unseemly for graduate students to claim that the Mac ate their homework, you should consider an inexpensive removable-media drive for backup.

**Doing Business**

With a midpriced Mac, you can conduct business in earnest. In your hands, you'll have the power to crunch mounds of numbers, design and execute multimedia business presentations, administer an office network, fax and e-mail thousands of clients, and catalog and cross-reference a large inventory. Fortunately, most of these jobs aren't processor intensive and a Mac capable of doing your work needn't break the bank.

Like your home- and school-based colleagues, you'll be happier with more RAM and a high-capacity hard drive. If your business is doing well enough to afford one of these computers, expansion may be in your future. You'll definitely want an upgradable processor. And if your Mac is joining others in a workgroup, get an Ethernet connection.

Finally, it's likely that your needs will have grown beyond the capabilities of the bundled software. Clone vendors are beginning to offer special bundles that include business-oriented packages such as Microsoft Office. Be sure to check out these bundles.

Of course you need a fax/modem, but what to do when you need to fax a hard-copy document? Right, you need a scanner. For those on a tight budget, Visioneer's PaperPort Vx (around $300) is an adequate solution for grayscale scanning of hard copy. Quality color, single-pass scanners can be had for $600 and up each.
Pushing Pixels and Moving Pictures

Unlike home, academic, and business users who find their midrange Macs blazingly fast, many graphic designers and multimedia producers will discover that these models do little more than make their work tolerable. No more overnight vigils while your Mac cogitates over large rendering jobs; an end to extended coffee breaks while an underpowered computer applies a processor-intensive Photoshop filter; and finally, digital-audio tracks to spare when you use DECK II.

For most of your work, priority 1 is to secure the fastest processor your pocketbook allows — a 604e is a must. You'll also want to give your Mac as much RAM as you can afford. And because graphics, audio, and video files can be very large, expect to increase the capacity of your hard drive. For those interested in video production, a RAID array is in your future and these extra bays will help. Not only will your desk be tidier with the array tucked away, because you can run it from the fast internal SCSI-2 bus, you also save the cost of the Fast-and-Wide SCSI-2 PCI card necessary to run an array externally.

Plan on a 17-inch multisync monitor with enough graphics RAM to provide 24-bit color at every screen resolution available to you. If you want these millions of colors as well as optimal graphics performance, invest an accelerated graphics card.

Both DTP and multimedia require a removable-media drive to room to spare. The $500 Iomega Jazz offers 1 GB of removable storage for around $100 per cartridge. More-expensive, optical drives can store 2.6 GB of data per cartridge.

How We Tested

Evaluating the relative merits of Mac OS systems is a daunting task, now that more than 40 models are available for users to choose from. In pursuit of this goal, we logged hours of hands-on time with every single-processor model of Mac and Mac-compatible on the market in the U.S. To determine the new mouse ratings reported here, we conducted extensive system-performance testing and considered pricing, bundled hardware and software, and warranties and service.

Our ratings are based on the new 4.0 version of MacBench, the industry-standard benchmark for measuring Mac OS-system performance. We're particularly proud of the new graphics tests in MacBench 4.0, which replay verbatim the graphics calls made by 11 top-selling Mac applications that ZDBop (Ziff-Davis Benchmark Operation) profiled during development of MacBench 4.0. These new tests make it look as though the profiled applications are actually running on your Mac.

In this system roundup, we have provided basic system-configuration information for each model we tested and a complete set of the key MacBench 4.0 scores. But we realize that with the fast-changing pace of today's Mac-clone market, you also need up-to-date information about the latest models, configurations, and pricing changes. That's why we have also instituted MacUser Online CPU Report Cards as a major feature of our Web site (see figure).

If you've seen our report cards before, you probably already know what a valuable resource they are for anyone hunting down the latest Mac. If you haven't taken a look yet, you owe it to yourself to check them out. Even if you're an experienced report-card watcher, we encourage you to take another look: In response to your requests, we've enhanced the report cards to include more of the information you've asked us for about system features and configurations. And, of course, we've posted a complete set of new MacBench scores and mouse ratings, based on the evaluations we did for this report.

As in the past, we remain committed to maintaining our online report cards as the most comprehensive, up-to-date resource for comparative Mac OS-system shopping available anywhere. In essence, the MacUser Online CPU Report Card database is like an ongoing Which Mac? lab report that's always up-to-date and just a mouse click away.

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The Ultra Macs

**Considering the Bucks** you'll be dishing out for these systems, you have every right to expect the kind of bang that rattles windows and causes cows' milk to sour. These high-octane machines deliver, and they do so with the PowerPC 604e exclusively. Speeds of these 604e processors begin at 180 MHz, with the Apple Power Mac 8500/180, Power Computing PowerTower Pro 180, and UMAX SuperMac S900/180, and peak at 225 MHz, with Power Computing's PowerTower Pro 225 and UMAX's SuperMac S900/225.

As is typical of all Power Computing base models, the PowerTower 200e and PowerTower Pros ship with 16 MB of RAM each, whereas the Apple Power Mac 8500/180 and 9500/200 and the UMAX S900 series each have 32 MB. What they lack in RAM, the Power Computing clones make up for with their 1-MB Level 2 cache. The UMAX SuperMac S900s and the Apple Power Mac 9500/200 have 512K caches, whereas the Power Mac 8500/180 has a paltry 256K cache.

The PowerTower Pro series sports 8 MB of graphics RAM on the bundled IMS Twin Turbo graphics card. The SuperMac S900 series ships with this same graphics card, although the card in the SuperMac S900/180 and S900/200 has only 4 MB of RAM. The Power Macintosh 9500/200 also comes with an accelerated-graphics card, a 2-MB version of the ATI Xclaim GA.

Hard drives in the base-model configurations in the high-end-Mac category have a capacity of about 2 GB each. For those who just can't get a fast enough storage system, the PowerTower Pro can be configured with RAID arrays of either 4 or 8 GB each.

Having enough PCI slots shouldn't be a problem with most of these models either. Except for the Power Mac 8500/180 and the PowerTower 200e (which contain three PCI slots), all these computers come with six slots.

### Test Results

Those who have expressed concern that Apple will be unable to compete with clone makers

#### Top-of-the-Line Macs

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>RATING</th>
<th>EST. STREET PRICE AS TESTED</th>
<th>POWERPC/CLOCK SPEED</th>
<th>MEMORY-BUS SPEED</th>
<th>RAM</th>
<th>L2 CACHE</th>
<th>HARD-DRIVE CAPACITY TYPE</th>
<th>GRAPHICS RAM</th>
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<td>$6,450</td>
<td>604e/200 MHz</td>
<td>50 MHz</td>
<td>32 MB</td>
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<td>1 MB</td>
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<td>Power Computing PowerTower Pro 200</td>
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<td>604e/200 MHz</td>
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<td>Power Computing PowerTower Pro 180</td>
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<td>UMAX SuperMac S900/180</td>
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To find which systems best fit the needs of users at the high end, we tested all Mac OS systems available for a street price of $3,500 or more. In this category, performance counted most. We paid particular attention to the MacBench 4.0 Processor, Publishing Disk, and two Publishing Graphics scores. In addition, we gave points for expandability, extra RAM, graphics RAM, and hard-drive capacity, and built-in digital-video capability when deciding a system's mouse rating.

MacBench 4.0 scores are relative to those of an Apple Power Macintosh.
in regard to value for dollars may have a point. Once again, one of Apple's products turned in poor numbers in our price/performance comparison. The Power Mac 8500/180, although a capable multimedia computer, came in dead last in the Processor test for this price category. The overall fastest midrange Power Computing PowerTower 180e outscored the 8500 in every test except the Publishing Disk and CD-ROM tests. Note, however, that the 8500 provides video inputs whereas this capability can be added to the Power Tower 180e only via an optional video card.

The Apple Power Mac 9500/200 didn't fare much better. In the Processor test, it outscored the like-priced Power Computing PowerTower Pro 180. However, it just barely squeaked by the less expensive UMAX SuperMac S900/200 in the Processor test and, in this same test, lagged more than 11 percent behind the Power Computing PowerTower 200e. Considering that the PowerTower Pro 180 and the SuperMac S900/200 have substantially more graphics RAM than the Power Mac 9500 — 6 and 2 MB more, respectively — and that the PowerTower 200e costs $450 less than the Power Mac 9500, it's hard to recommend the Apple product to shoppers seeking the best performance or price.

The low end of the over-$3,500 Mac OS systems is competently held down by the UMAX SuperMac S900/200 and S900/180. These clones come configured with an accelerated-graphics card and 32 MB of RAM and turn in reasonable MacBench 4.0 scores, given their cost. They were bettered by the Power Computing PowerTower 200e in our Processor test but outshone the latter in the disk and graphics tests. DTP and multimedia users who can't stay much above the $3,500 mark should take a close look at the UMAX machines.

Once you're over the $4,000 hurdle, Power Computing rules the roost. Power was the first vendor to offer a Mac OS system with a 225-MHz 604e processor and is still the only vendor to offer an optional RAID array. The value of Power's high-end configurations is reflected in high Processor, Disk, Publishing Disk, and Graphics scores — scores that will be of vital interest to DTP and multimedia users who have deep pockets.

Doing Business
High-end machines are too powerful to be used for word processing alone. You'll want one of these systems only if you're the kind of person who demands the absolute pinnacle of power from a computer. And what will you be able to do with this power? Whip

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### MacBench 4.0 Scores

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6100/60 with a 30-MHz memory bus, a 250-MB hard-disk drive, 2 MB of built-in graphics RAM, and no L2 cache. This baseline system is assigned a score of 100 for all MacBench tests. We tested all Mac OS systems as configured by the vendors but with AppleTalk turned off and with virtual memory turned on. We set the screen resolution to 640 x 480 pixels with a bit depth of 8 bits (256 colors) for all MacBench tests except the Hi-Res Publishing Graphics test, for which we set the screen resolution to 1,152 x 870 pixels with a bit depth of 8 bits (256 colors).
out a full-blown multimedia presentation in nothing flat, jockey numbers in massive spreadsheets, teleconference, create glorious Web sites, sort hundreds of thousands of client files, touch up a photograph in the corporate quarterly report ... to be honest, there's very little you can't do.

Fortunately, you'll get by quite comfortably without ever visiting the top end of this category's price scale — no need to cancel the company picnic to pay for your fast Mac. Typical business users don't need the kind of performance that comes with graphics acceleration, RAID arrays, half-a-dozen PCI slots, and screaming-fast processors. Given a reasonable amount of RAM — 32 MB at least — a high-capacity hard drive, and enough graphics RAM to provide you with 24-bit color, you should be in hardware heaven.

What more could you want? You have the laser printer, the scanner, the fax machine, the DAT drive for backup, the computer-controlled messaging and speakerphone system, the massive monitor, the QuickCam teleconferencing kit, the ISDN line, and a rather comfortable chair. What's missing? APC.

It's a Windows-centric business world, and you're going to look mighty silly if you can't run company-created custom DOS and Windows applications. However, there's no need to taint your desktop with a DOS box. Purchase a PCI DOS card from Apple, Orange Micro, or Reply.

### Pushing Pixels

Now you're at the top of the game. Whereas the moderately priced Macs are competent tools for design, the top end can be a delight. To justify the purchase of a Mac costing over $3,500, you should be creating far more than the family newsletter. Your ultra Mac is perfectly suited for complex-graphics rendering, vast page-layout documents, professional photo retouching, CAD, and 3-D modeling.

Because you're in the "to heck with price, give me performance" bracket, 2 MB of graphics RAM just won't cut it. You need an accelerated-graphics card. As with any DTP professional, you'll want a wicked-fast hard drive. And to accompany the fast processor and hard drive, plan to add dozens of megabytes of RAM.

If you don't have a 21-inch monitor, now's the time. With 4 to 8 MB of graphics RAM, your accelerated Mac will be able to throw millions of colors onto a screen this size.

At the top end, loads of costly add-ons for DTP professionals are available. Thankfully, graphics service bureaus have the really pricey ones — slide scanners, drum scanners, plotters, and high-quality color laser printers — in-house. However, you'll still need a high-capacity storage device for transporting your files to the bureau.

### Moving Pictures

Unfortunately, video and multimedia professionals will discover that their over-$3,500 Mac is just the beginning of a more expansive (and expensive) system. Much of your real work will be performed by pricey add-on peripherals such as video cards, digital-audio systems, and CD-ROM writers. Your Mac can do its part, however. To accommodate these devices, you require lots of processing power, lots of PCI slots, lots of drive bays, lots of RAM, and lots of fast hard drives working together in an array. For you, budget is superfluous. You need the fastest Mac on earth.

As to add-on peripherals, a sympathetic loan officer would be a good start.

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**The Verdict: Apple Falls Behind**

REVIEWING OUR RECOMMENDATIONS, one glaring trend emerges — when one considers price versus performance, Apple products never win out against cheaper, faster Mac clones. Although we owe a huge debt of gratitude to Apple for bringing us the Mac in the first place, the truth is that Mac OS systems currently offered by Apple are not competitive — clone makers simply offer better systems for less money. We hope that when we address this issue later this year, Apple's name will again appear in our list of endorsements.

Odd, isn't it? We gathered together 38 Mac OS systems ranging in price from $1,495 to $6,950. We used MacBench 4.0 — the finest diagnostic tool at our disposal — to poke, prod, and probe each and every machine. We sat through endless meetings and poured over reams of spec sheets in order to hash out which features are likely to appeal to which type of user. And we ran extensive value-analysis spreadsheets to help back up what our guts told us about each system we examined. All to answer this one question, Which Mac should you buy?

The results are in at last, and the answer is bound to be a Mac without an Apple logo.

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**Contributing Editor Christopher Breen would like to thank the staff of MacUser Labs for telling him which clone ... or, Mac, he should buy.**

**MacUser Labs Senior Project Leader Kristina De Nike managed the testing for this report.**
Low-cost, high-capacity storage is always within reach with the SYS.230 Personal Storage System. That’s because it packs up to 230 MB onto a single rewritable-optical cartridge that costs only $10! Compared to the price for any of today’s magnetic removables, there’s simply no comparison. And unlike magnetic removables, rewritable-optical media is almost indestructible. Which means you never have to worry about data loss due to dust, magnetic fields, shock — or even airport security.

Plus, you can take the Universal SYS.230 System with you anywhere and use it with whatever you want. It’s small enough to slip into the palm of your hand, and it’s the only portable solution that works as both a SCSI and a parallel device. So you can use it with your laptop and your desktop, your Macintosh or your PC.

All of which makes the SYS.230 System perfect for storing and transporting images from the Internet, your digital camera or scanner — or for any other data-intensive application.

Why not join the millions who already rely on rewritable-optical storage? Call 800-347-4027 today for more information about the SYS.230 Personal Storage System. Because if you’d like to save big in more ways than one, we have to hand it to you.

The SYS.230 Personal Storage System can be purchased through the following resellers: CDW (800-334-4CDW), MacWarehouse (800-255-6227), MacZone (800-248-0800), Microsystems Warehouse (800-660-3222) and PrePress Direct (800-443-6600). Resellers, call Ingram Micro (800-456-8000), Optical Laser (800-776-9215) or TechData (800-237-8931).

*When purchased in package of five at suggested retail price of $40.95. SYS.230 is a trademark of Olympus Optical Company, Ltd. All other brand or product names mentioned herein are trademarks or registered trademarks of their respective holders. ©1996 Olympus Optical Co., Ltd.

CIRCLE 69 ON READER SERVICE CARD
Don’t Miss the PERFORMANCE of a Lifetime!

Ladies and Gentlemen, FWB is proud to announce the industry’s premiere Trade-Up Offer! Save 50% on the #1 selling disk utility software during this limited time engagement. Our award-winning cast features the biggest stars in storage management.

RAID TOOLKIT 2.0 tops the bill with RAID Level 0 data striping for double the performance, and RAID Level 1 disk mirroring for ultimate data protection. And now, with removable array support, you can swap RAID canisters (and Jaz™ array cartridges) “on-the-fly”.

Find out why nearly a million loyal fans have switched to HARD DISK TOOLKIT. Our new 2.0 is the most powerful disk management package available—with universal SCSI and IDE support, one-step disk set-up, and faster I/O for your Mac.

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The Best of ’96
The 12th Annual MacUser Editors’ Choice Awards

Half empty? Or half full?

Record losses. Turmoil at the top. The cancelation of Copland.

NINETEEN NINETY-SIX was a year in which the pessimists argued with the optimists about who were the realists. Today, as the MacUser Editors’ Choice Awards turn 12, our money’s with the optimists.

Our argument can be found on the next few pages. Therein you’ll see that the Mac marketplace remains richly innovative, chock-full of powerful products, and animated by a force essential to every thriving enterprise: competition.

This spirit of competition not only mobilizes Mac developers — it also surfaced at the MacUser editorial offices as we underwent our annual ritual of argument, wrangling, and — let’s admit it — internecine one-upmanship that precedes the editors-only vote for the best products of 1996.

Here are the results of those deliberations: the 1996 MacUser Eddy Awards. As you read about these exciting new products — winners and finalists — you may well be inspired to fill that half-empty or half-full glass to the rim and raise it in a toast. Drink up! The Mac is back.

By Rik Myslewski and the editors of MacUser

Breakthrough Technology of the Year
BeOS

The BeOS is everything the Mac OS isn’t: fast, reliable, and stable. It can perform 2, 3, 4, 10, or 20 things at once, barely pausing to catch its breath. It rarely crashes, but when it does, only one application “goes south” — not the whole machine. It delivers what the now-canceled Mac OS replacement, Copland, once promised. And more.

Now that the BeOS has been ported to run on Power Macs and Mac clones, Mac users have an alternative to the Mac OS — an alternative that shows just how shaky the foundations of the Mac OS truly are. For pointing the way to what the Mac could do if it had a better OS foundation, we award this year’s Eddy for Breakthrough Technology to the BeOS.
1996 EDDY WINNERS

Desktop Publishing and Graphics
the Web and beyond

ALTHOUGH INTERNET EVANGELISM may continue to dominate the popular press, Mac-savvy professional publishers — and the companies that supply their tools — have already integrated Web-page design into their day-to-day creativity. This year, the Web is no longer uncharted territory — it’s merely another place where Eddy Award-winning products can strut their stuff. Whether your creativity is bound for the page, the screen, or the Web, you can rely on such powerful software as the exceptionally capable Macromedia FreeHand 7. Adobe Photoshop users should add not only PhotoTools 2.0, Extensis’ powerful type tool, to their plug-in arsenal but also the prepress-expert-on-a-disk, ScanPrepPro 3.1, from ImageXpress. And no professional pixel pusher should ignore such award recipients as the Minolta RD-175 megapixel digital camera or the high-resolution Xanté Accel-a-Writer 8300 printer.

DESIGN TOOL

Extensis PhotoTools 1.0
Extensis — $99
A sleek interface adds unsurpassed text-handling capabilities to Adobe Photoshop.

Finalists
BeyondPress 2.0.4
Astrobyte USA — $595
The best Xextension for QuarkXPress users who want to create graphics-rich Web pages.

Specular 3D Web Workshop 1.0
Specular — $249
All the ingredients you need to make unique Web-page graphics and animations.

DEVELOPMENT TOOL

BBEdit 4.0.1
Bare Bones Software — $119
Simply the best professional Web authoring environment, bar none.

Finalists
CodeWarrior Gold 10
Metrowerks — $399
Now Java support has been added to this industry-standard compiler and development environment.

UserLand Frontier 4.1
UserLand — freeware
A fast, powerful — and free — alternative to AppleScript; now with CGI-writing capability.

GRAPHICS RESOURCE

Finalists
Mountain High Maps 2.1
Digital Wisdom — $695
Extensive layers and masks add unprecedented usability to this elegant map package.

Finalists
Grammar of Ornament, Professional Edition
Direct Imagination — $199
A gorgeous presentation of Owen Jones’ multicultural classic of ornamental design.

Finalists
Visual Language Library: Antique Celestial Maps, Volume III
Visual Language (distributed by Image Club Graphics) — $169
Elegance and beauty suffice this lovely collection of celestial and astrological maps.

Canvas 5
Deneba Software — $595
If you have room — or time — for only one graphics program, this jack-of-all-trades is a good choice.

Macromedia FreeHand 7
Macromedia — $599
A dynamite drawing package that sets new standards of elegance and power.

Finalists
Adobe Illustrator 6.0
Adobe Systems — $595
A solid upgrade to a solid product makes this powerful package a professional necessity.

Grammar of Ornament, Professional Edition
Direct Imagination — $199
A gorgeous presentation of Owen Jones’ multicultural classic of ornamental design.

Visual Language Library: Antique Celestial Maps, Volume III
Visual Language (distributed by Image Club Graphics) — $169
Elegance and beauty suffice this lovely collection of celestial and astrological maps.
MAC OS SYSTEM

Power Computing PowerTower Pro 225e RAID
Power Computing - $5,230 and up
The first system to outperform not only Apple's best but also anything the Wintel world had to offer.

FINALISTS
Apple PowerBook 1400
Apple Computer - $2,499 and up
The most feature-rich, flexible, and reliable PowerBook to date — and the first to sport a CD-ROM drive.

DayStar Genesis MP 720+
DayStar Digital - $8,499 and up
This multiprocessor system provides the ultimate in high-performance computing for demanding graphics professionals.

Power Computing PowerBase 240
Power Computing - $2,195 and up
Accelerated graphics and 3-D graphics, plus a 240-MHz processor, put this system in a class by itself.

UMAX SuperMac C600/240
UMAX Computer - $2,295 and up
Great performance, reasonable pricing, and a good bundle make this system a winner for retail buyers looking for a choice.

MONOCHROME PRINTER

Xante Accel-a-Writer 8300
Xante - $4,995
The ideal choice for desktop publishers who need high-resolution (1,200-dpi), full-bleed tabloid laser printing.

FINALISTS
Apple LaserWriter 12/640 PS
Apple Computer - $1,689
Fast and reliable, the perfect printer for small to midsized workgroups.

Hewlett-Packard Laserjet 6MP
Hewlett-Packard - $1,149
Excellent output quality distinguishes this small-office/home-office printer from the rest of the pack.

PAGE-DESIGN APPLICATION

Adobe PageMill 2.0
Adobe Systems - $149
Powerful frame- and table-creation capabilities extend the power of this Web authoring tool.

FINALISTS
Claris Home Page 1.0
Claris - $99
A surprisingly powerful yet easy-to-use entry-level Web authoring tool.

UniQorn 1.1
SoftPress Systems - $895
By incorporating Java and QuickDraw GX, this Web authoring tool goes where HTML fears to tread.

PRODUCTION TOOL

ScanPrepPro 3.1
ImageXpress - $695
This plug-in is the perfect complement to a scanner and Photoshop — it's like having a prepress professional to advise you on every image-processing decision.

FINALISTS
Font Box 2.0.2
Insider Software - $79
The most effective way for publishing professionals to keep their fonts well organized.

PhotoGIF 2.1
BoxTop Software - $45
No Web-page author should be without this powerful GIF-conversion tool.

PROFESSIONAL DIGITAL CAMERA

Minolta RD-175
Minolta - $9,995
Three-CCD design provides image quality never before seen in an under-$10,000 camera.

FINALISTS
Kodak Digital Science Professional DCS 410 Camera
Eastman Kodak - $7,995
A hard-working camera for the day-to-day needs of imaging professionals.

ScanView Carnival 2000S
ScanView - $29,995
Versatile usage options and exceptional image quality.

SCANNER

Agfa DuoScan
Agfa - $5,500
An innovative design with two scanning beds provides quality reflective-art and transparency scanning in one space-saving unit.

FINALISTS
Epson Expression 636
Epson America - $899 and up
Epson's ongoing series of affordable flatbed scanners just keeps getting better and better.

Howtek Scanmaster 2500
Howtek - $15,900
Precision hardware coupled with exceptionally powerful professional software for large-format, flatbed scanning.

Software Product of the Year
Adobe PageMill 2.0

In 1996, a slew of competitors arrived to take on Adobe PageMill 1.0, the WYSIWYG Web-page-creation standard. Adobe responded with version 2.0, an upgrade that erased any doubt about the ability of the company to retain its leadership position in this competitive arena. Not only does PageMill 2.0 make it easy for average users to become Web publishers but it also provides powerful tools for HTML veterans. The creation of complex layouts via the use of tables and frames was a difficult and time-consuming task for even the most well-versed Web authors, but with this version of PageMill, it's a piece of cake. In addition, the program's native support for Netscape plug-ins makes it the tool of choice for creating and previewing multimedia-rich Web sites.

MARCH 1997 / MacUser 101
ALTHOUGH THE MAC may be better known for its strengths in graphics and desktop publishing, it continues to please savvy bean counters who understand the benefits of a computing platform that's easy to maintain, simple to use, and low in training costs. Among this year's Eddy Award-winning business-software packages are Claris' powerful, easy-to-use FileMaker Pro 3.0 database manager; BestWare's M.Y.O.B. 6.0 for small-business accounting; and Microsoft Internet Explorer Starter Kit 2.1, our choice as the best Internet browser for the Mac. The In Focus LitePro 220 presentation projector and the superbly engineered MicroNet DataDock 7000 RAID array are examples of elegant Mac hardware that's comfortable in any business setting.

COLOR PRINTER

Tektronix Phaser 350
Tektronix - $3,495
Forget color laser printers — this speedy solid-ink printer will meet all of your business-printing needs.

FINALISTS
Apple Color StyleWriter 2500
Apple Computer - $349
A solid inkjet performer equally suitable for the home or the small office.

Epson Stylus Color 500
Epson America - $279
Not only is its output sensational but this inkjet printer is also bundled with a wealth of software goodies.

COMMUNICATIONS PRODUCT

Trancell WebRamp IP Router
Trancell Systems - $899
An elegant multifunction eight-port hub and router that demystifies ISDN and Ethernet.

FINALISTS
RNS DataShuttle ISDN 256/PCI
RNS - $1,695
A fast, efficient ISDN card with exceptionally easy-to-use setup software.

CONSUMER DIGITAL CAMERA

Olympus D-200L
Olympus America - $599
A brilliant balance of image quality and ease of use at an affordable price.

FINALISTS
Fuji Fujix DS-220
Fuji Photo Film U.S.A. - $1,200
Beautiful, ergonomically effective design coupled with a highly productive feature set.

Kodak Digital Science DC50 Zoom Camera
Eastman Kodak - $1,000
A solid performer designed to exceed the needs of image-conscious business users.

CROSS-PLATFORM PRODUCT

Reply DOS on Mac Card — PCI (Pentium)
Reply - $1,395
Ignore Apple's offerings — this is the card to get if you need a Wintel machine inside your Mac.

FINALISTS
PC MACLAN 6.0
Miramar Systems - $169
This PC-to-Mac network-connectivity utility is easy to install and intuitive to use.

uShare 4.1D for Apple Network Server
IPT - $995 (5 users)
Easy-to-use Chooser-level access from your Mac to an AIX-based Apple Network Server.

DATA-MANAGEMENT APPLICATION

FileMaker Pro 3.0
Claris - $199
The best general-purpose Mac database-management application just keeps getting better.

FINALISTS
DeltaGraph 4.0
DeltaPoint - $195
There's no better way to explain reams of data than by using this comprehensive charting package.

Panorama 3
ProVUE Development - $395
This client/server database couples astonishing speed with powerful scripting capabilities.
DISPLAY PRODUCT

**In Focus LitePro 220**  
In Focus Systems — $7,499  
Never has a bright, sharp LCD projector been easier to use — or sounded so good.

**FINALISTS**  
Mitsubishi Diamond Pro 91TXM  
Mitsubishi Electronics America — $1,699  
The most recent monitor incorporating Mitsubishi's DiamondTron technology is the sharpest ever.

**Proxima Lightbook Projector**  
Proxima — $4,999  
Full-size performance from a lightweight, easy-to-use, portable LCD projector.

INTERNET-ACCESS APPLICATION

**Microsoft Internet Explorer Starter Kit 2.1**  
Microsoft — $25  
This fast browser edges out the competition with its elegance and responsiveness.

**FINALISTS**  
Eudora Pro 3.0  
Qualcomm — $89  
Simply the best Internet e-mail client.

**Netscape Navigator 3.0**  
Netscape Communications — $49  
Still the pioneer in bringing multimedia capabilities to the World Wide Web.

INTERNET SERVER APPLICATION

**NetCloak 2.0.1**  
Maxum Development — $195  
Provides unprecedented control over how your Web site appears.

**FINALISTS**  
RushHour 1.1  
Maxum Development — $295  
Turbocharges graphics-file delivery from your Web server.

**Tango for FileMaker**  
EveryWare Development — $349  
This full-featured CGI provides a development environment for creating and serving FileMaker databases over the Web.

NETWORKING PRODUCT

**Apple Network Server 700**  
Apple Computer — $16,299  
If only Apple’s desktop systems were as elegantly designed as this fast and competitively priced AIX-based file/OPI/Internet/database server.

**FINALISTS**  
NetDoublet 1.2.2  
Asante Technologies — $99  
No savvy network administrator should fail to install this file-transfer-acceleration software.

**RunShare 2.0.2**  
RUN — $399  
Every prepress shop will benefit from this utility's large-file-transfer acceleration.

REFERENCE PRODUCT

**Select Phone 1997 Edition**  
Pro CD — $99  
An exceptionally versatile search engine complements this collection of 1 million U.S. phone numbers.

**FINALISTS**  
Bookshelf 1996-97 Edition  
Microsoft — $55  
This handy one-CD reference work combines a dictionary, thesaurus, world atlas, encyclopedia, almanac, dictionary of quotations, and much more.

**Cinemania 96**  
Microsoft — $35  
Over 25,000 movie reviews, enhanced by clips, quizzes, stills, and biographies, all Internet-updatable.

SMALL-BUSINESS-ACCOUNTING APPLICATION

**M.Y.O.B. 6.0**  
BestWare — $140  
A single-user package, loaded with flexibility, that's a joy to use.

**FINALISTS**  
Big Business 2.0  
Big Software — $199  
This multiuser package is strong in reporting and security and includes an HTML online-catalog creator.

**QuickBooks Pro 4.0**  
Intuit — $199  
As you'd expect from a Quicken sibling, this single-user package is both powerful and easy to use.

STORAGE PRODUCT

**MicroNet DataDock 7000**  
MicroNet Technology — $3,499 and up  
Phenomenally well engineered, easily upgradable — everything you've ever wanted in a RAID system.

**FINALISTS**  
FWB Hammer SledgeHammer • Pro  
FWB Hammer by StreamLogic — $3,679 and up  
Differential-by-design engineering ensures exceptional speed from this array.

**Panasonic KXL-D742**  
Panasonic Computer Peripheral — $399  
Compact, battery-powered, and engineered to be your PowerBook's perfect traveling companion.

Hardware Product of the Year

**Apple Network Server 700**

The most elegantly engineered computer that Apple has ever built isn't a Mac. The operating system isn't even the Mac OS — it's a version of IBM's UNIX operating system, AIX. Don't let that difference put you off, though — the Apple Network Server 700 is actually easier to upgrade and maintain than any Mac, and all the components — from fans to drives to power supplies — are hot-swappable, for no-downtime fixes and upgrades. This solidly designed computer, complete with a road-tested operating system behind it, is an excellent choice for an Internet, OPI, or file server. C'mon, Apple — let's see some of this sophistication migrate to the desktop.
Multimedia
Mac in motion

There's an excellent reason why the Mac continues to be the content-creation platform of choice among creative professionals: From 3-D and animation packages to authoring applications and desktop-video enablers, the Mac has the best collection of multimedia tools, bar none.

Animation Application

Adobe After Effects 3.1
Adobe Systems - $1,995
A powerful and indispensable animation and special-effects package.

Finalists
ElectricImage Broadcast
Electric Image - $2,995
Hollywood-quality tools at a desktop-video price.

FutureSplash Animator
FutureWave Software - $250
Brighten your Web page with quick-downloading vector-based animations.

Desktop-Video Product

Data Translation Media 100 Whole Deal
Data Translation - $22,990
Excellent image quality and QuickTime integration distinguish this top-flight hardware/software bundle.

Finalists
Avid Technology MCXpress 1.0
Avid Technology - $14,995
Powerful hardware teamed with a highly evolved editing interface.

Truevision TARGA 2000 RTX
Truevision - $10,995
High-quality, QuickTime-native, dual-channel, Motion-JPEG desktop-video card.

Graphics/Video Card

miro miroMOTION DC20
miro Computer Products - $799
The undisputed price/performance leader in the consumer-level digital-video arena.

Finalists
IMS Twin Turbo 128MB
Integrated Micro Solutions - $899
Impressive performance and excellent value distinguish this 8-MB graphics card.

Radius ThunderPower 30/1920
Radius - $1,399
Super-resolution graphics combined with 30-bit color accuracy.

Interactive-Authoring Application

mTropolis 1.1
mFactory - $1,195
Elegantly flexible, professional-quality multimedia-authoring software.

Finalists
Director 5.0
Macromedia - $929
A host of improvements distinguishes version 5.0 of this popular authoring tool.

Quarkimmedia 1.0
Quark - $995
Approaches multimedia authoring completely from a print-publishing perspective.

Multimedia Utility

Movie Cleaner Pro 1.3
Terran Interactive - $189
An invaluable QuickTime-compression tool for novices and experts alike.

Finalists
Berserk 1.0 for After Effects
DigiEffects - $289
Unique, compelling effects with pro-quality precision at a far lower price than competing packages.

MovieFlo 2.02
The VALIS Group - $699
Excellent morphing and mesh-distortion tools for creating eye-popping effects.

Music/Sound Product

LOGIC Audio 2.5.4
EMAGIC - $799
Everything the Mac music pro needs can be found in this powerful package.

Finalists
Cubase 3.0 VST
Steinberg North America - $399
This MIDI-sequencer/digital-audio/notation program stands out for its unique real-time effects.

Digital Performer 1.7
Mark of the Unicorn - $895
Stunning pitch-transposition effects and the most elegant interface in the Mac music arena.

3-D Application

Fractal Design Detailer 1.0
Fractal Design - $449
Take the guesswork out of adding texture maps to 3-D models by painting on them.

Finalists
Bryce 2
MetaTools - $249
Easily sculpt virtual worlds with this fast, feature-rich upgrade to the popular terrain-creation software.

Infini-D 3.5
Specular - $649
Impressive upgrade to an already well-rounded 3-D-animation-and-design package for novices and graphic designers.
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IT WAS A GREAT YEAR for those millions of users fortunate enough to have a Mac at home. More CD-ROMs, more games, more children’s educational software, more productivity tools and add-on hardware — all in all, everything you need to make a MacHouse a MacHome.

CHILDREN’S SOFTWARE

Trudy’s Time & Place House
Edmark - $40
A spunky little alligator named Trudy leads an exceptionally inventive adventure in geography, mapping, and time.

Finalists
Africa Trail
MECC - $48
Do Africa in this CD-ROM adventure based on an actual 12,000-mile bike trek.

Logical Journey of the Zoombinis
Broderbund - $40
Twelve sets of math and logic puzzles help save the adorable Zoombinis and guide them to a safe new home.

DESKTOP DIVERSION

Kai’s Power Goo
MetaTools - $49
This wacky image-distortion tool will have you singing the American Breed’s “Bend Me, Shape Me” as you do just that.

Finalists
Gryphon Bricks
Gryphon Software - $39
All the fun of Lego creativity with no risk of stepping on those damn plastic blocks.

The Residents’ Bad Day on the Midway
Inscape - $50
Tour a repellent-yet-fascinating carnival and learn the sordid pasts of its denizens.

DOCUMENTARY PRODUCT

Critical Mass: America’s Race to Build the Atomic Bomb
Corbis - $49
An exemplary combination of vivid storytelling and satisfying exploration of 1940s Los Alamos.

Finalists
Robert Winter’s Crazy for Ragtime
Calliope Media - $49
A well-designed exploration of ragtime and its importance to American culture.

Volcanoes: Life on the Edge
Corbis - $49
Stunning photographs enhance the wealth of volcano lore in photographer Roger Ressmeyer’s adventure.

GAME

Warcraft II: Tides of Darkness
Blizzard Entertainment - $55
Enjoy brutal medieval warfare in this addictive, fast-paced, networkable strategy game.

Finalists
Marathon Infinity
Bungie - $35
The ultimate Mac shoot-em-up adds new levels and map and shapes editors.

X-Wing Collector’s CD
LucasArts Entertainment - $49
The Mac’s best flight simulator/arcade game lets you fly multiple space fighters on over 100 missions.

INPUT DEVICE

Logitech Cordless MouseMan
Logitech - $69
What a mouse should be: smooth, programmable, and cordless.

Finalists
Connectix Color QuickCam
Connectix - $299
This remarkably affordable color-video camera captures compact digital images.

Logitech TrackMan Live!
Logitech - $149
Light, programmable, radio-controlled mouse for remote-control presentations.

PERSONAL ORGANIZER

Quicken Deluxe 7
Intuit - $60
Interface updates make this top personal-finance software easier than ever to use.

Finalists
Claris Organizer 2.0
Claris - $70
A well-integrated calendar and contact manager with innovative search tools.

Now Up-to-Date & Contact 3.6
Now Software - $70
This network calendar and contact manager shares schedules and e-mail addresses.

UTILITY

RAM Doubler 2
Connectix - $60
Double or triple your apparent RAM safely and effectively without slowdown.

Finalists
Now Utilities 6.5
Now Software - $89
An already impressive suite of productivity enhancements adds an improved Startup Manager.

QuicKeys 3.5
CE Software - $119
This upgrade lets you create macros that perform most tasks with one keystroke.

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Derek Van Aldyne Rising Star Award

Aaron Giles

Aaron Giles’ young career has affected two hot Mac markets: the Internet and games. While attending Cornell University, he created several Internet freeware tools, helped develop MacMosaic, and created JPEGView, which won a prize in the ’94 Apple Cool Tool competition. Aaron’s career as a game programmer began when, after discovering that LucasArts’ Rebel Assault wasn’t PowerPC-native, he wrote a patch and distributed it freely on the Net. LucasArts responded not by suing him but by hiring him to convert its titles to the Mac.
Capture images in motion

multimedia
digital camera

Five ways to capture

High Resolution, Sharpness and Color Accuracy...

That's what you need to capture a quality image with a digital camera. The RDC-2's advanced design supports these requirements, as well as offering exciting features that let you go beyond just taking stills. Now you can bring your images to life by capturing the movements and sounds of your subjects.

Still Mode captures high res images in vivid 24-bit color. Exclusive macro capability lets you take pictures as close as 1cm away.

Document Mode utilizes a sharpening filter to capture razor-sharp images of text and graphics.

Still with Sound Mode allows you to take a picture while recording 10 seconds of digital sound.

Sound Mode uses the RDC-2's built-in microphone to record pure digital sound in 8-bit, 11kHz WAVE file format.

Continuous Shooting records the movements of your subject in 1 second intervals. Play back as QuickTime or AVI files. (Requires use of PC cards to transfer data to your computer.)

Visit us at: www.ricohcpg.com
Here's your guide to the new QuickTime VR's lofty, if rocky, peaks.

Virtual Vistas

If you want to try your hand at QuickTime Virtual Reality, now may be the time. As you read this, a new version of Apple's QTVR software, chock-full of new features and Internet potential, has hit the market. Version 2.0 supports 3-D sprites, live QuickTime movies, stereo sound, and an open API for intrepid developers. You can even turn QTVR panoramas into image maps for the Web.

QTVR (http://qtvr.quicktime.apple.com/) may be hotter than ever, but it's still not cheap or easy to use. The obtuse command-line parameters in version 1.0 (which made less geeky folks shudder) remain, even though version 2.0 does do away with a hardware dongle, requires less RAM, and works faster.

Take heart. Even if you're not a programmer, all that is cool about QTVR can be yours with just a little time, patience, money, and technique. In this article, we'll start you on the road to QTVR confidence by walking you through the making of a basic panorama.

Anatomy of a Panorama

Imagine you're on vacation and really want to shoot the sweep of the Grand Canyon around you. You could do it with your regular camera — just turn through 360 degrees, and take several shots as you go. But later, when you're home trying to tape the shots together, you'll notice that the rocks at the edges don't quite line up.

QTVR authoring tools correct such distortion by warping images and "stitching" them together into one long PICT file. Then, to create the digital bubble of the QTVR environment, the software "dices" the photos into quickly displaying tiles and compresses them into QuickTime-movie format. When you move around with your cursor in the completed movie, the QTVR software dewarps the images so that you pan smoothly around the scene. You can look at 360 degrees as if you were standing in the center of a room, spinning on your heels.

Making Your Panorama

STEP 1: Get Your Gear Together. As you start to gather your equipment (see the "Equipment Checklist" sidebar), your first big decision will be what camera and lens to choose. In theory, you can use anything, but in fact, these are the choices that will make life easier or harder.

The basic factors that will affect your decision are the importance of image quality, how much time and money you want to spend on processing images, and how much scripting you're willing to do. (As you'll see in step 4, making a QTVR scene can involve a lot of scripting if you stray from recommended setups.)

If image quality is king in your world, then you'll want to use an analog camera. Regular cameras still take considerably better photos than digital ones. But if your material is destined for the Web, a digital camera is probably fine.

On the other hand, digital cameras will save you the time and money you'd have to spend on developing and scanning pictures. Also, you can buy QTVR pan and tilt heads designed specifically for a few of them, such as the Kodak Digital Science DC40 and the Apple QuickTake 150. However, you have no control over exposure, few lens options, and limited storage. The QuickTake 150 can store only 16 images at its highest-quality setting.

If you use a regular camera, you might have trouble renting a 15mm lens, which is recommended but which is also rare and expensive. The alternative is a cheaper, more common lens, such as a 28mm. This lens has a smaller field of view, so you'll have to shoot more
photographs to capture the entire panorama, 18 instead of 12. In the end, this means more photos to develop and scan, more processing time, more RAM, and a larger resulting file.

As for scripting, the software we suggest you use, the freeware Sanity SaVR, comes with premade scripts for a few camera/lens combinations, including a regular camera with a 15mm lens, a QuickTake, and a QuickTake with a Kaidan wide-angle lens. Using one of these setups will save you time you'd otherwise have to spend writing scripts and calculating rig adjustments by hand.

**STEP 2: Set the Scene.** Even if your photographic prowess is limited to documenting the family barbecue, you can still successfully produce a QTVR panorama by following a few guidelines (see figure 1).

In general, make sure the camera rig (the entire assembly; the camera, the tripod, and the bracket that holds them together) is level at all times during the shoot. If you forget to check frequently, you'll probably end up having to fine-tune the placement of your photos during the normally automatic stitching process.

Next, make some adjustments to your rig to line up the optical center of your camera (where the image comes into focus) directly over the rig's pivot point. You want the optical center of your camera to be the "nodal point" your panorama will spin around. Stand in front of the camera to make sure the center point of the lens eye lines up with the center of the rig. You'll need to get out a measuring tape to check that the center point is not slightly off to the left or the right.

Next, make sure the nodal point isn't too far backward or forward. The camera's optical center is closer to the center of the lens tube than to the center of the camera body. If you don't adjust for this, you'll get a distortion called parallax error, which makes objects change position relative to each other as your camera pivots. To make this adjustment, look through the camera's viewfinder and line up two vertical objects, such as the side of a building and a distant tree, on the left side of the frame. One should be close to you and the other in the distance. Then pivot the camera until both objects are on the right side of the frame. Watch to see if the two objects change their position with respect to each other. Adjust your camera by pushing it backward or forward over the pivot point of the rig until the movement is minimized.

The QuickTake and other point-and-shoot digital cameras don't have through-the-lens viewing, so determining the nodal point takes a lot of trial and error. Fortunately, one of the QTVR-rig manufacturers, Kaidan, supplies nodal-point settings for its custom brackets for the QuickTake and the Kodak Digital Science DC40.

**STEP 3: Shoot Your Panorama.** It's important to be well organized and meticulous during the actual shoot. Since you'll accumulate dozens of images, keep notes so you won't need to take time later hunting for the right picture.

Take the shots in sequence, from left to right — the order the stitching software (the "stitcher") expects them to be in.

A general guideline for lighting and exposure is to aim for evenly lit shots with similar exposure. The stitcher does an amazing job of blending images that have various exposures, but it can't work miracles. If one shot is much brighter than the next, you may end up with a dark band where the pictures overlap. You'll have the easiest time outdoors in strong overhead sunlight or under a reflective blanket of clouds.

In theory, shooting the 12 or more pictures...
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that comprise a panorama takes a short time. But between rotating the rig, checking that everything is level, and shielding for glare, you'll be lucky if the scenery hasn't changed much very much between the first and the final photo. You may wish you could scare off the tourists who walked by in the distance in shot #6, but it's really changes close to the camera that'll require touch-up in Photoshop later.

**STEP 4: Set Up the Software.** The QTVR authoring toolkit is built around MPW, the Macintosh Programmer's Workshop. As its name implies, it's made to be friendly to programmers, not average folk. Everything that happens inside MPW — and hence the QTVR authoring environment — is driven by a script. Those experienced with scripting will feel immediately at home; those who aren't should set aside some time to learn.

After installing both the MPW and the QTVR authoring environments, double-check that the tools (such as dice and msnm) are in the Tools folder of the MPW Shell application.

Next, seek refuge from the un-Mac-like face of the authoring tools in a very helpful utility called Sanity SaVR. Although this is an unsupported, beta AppleScript application not included with the QTVR authoring kit, it represents the direction the QTVR tools are headed. You'll appreciate Sanity SaVR's efforts to tack a much needed graphical user interface onto the QTVR tools (see figure 2). The 1-MB download is available over the Web at http://solutions.apple.com/pub/quicktime-vr/Goodies/Sanity_SaVR/Sanity_SaVR.html.

**STEP 5: Get Your Images Together.** After you've shot your scenes and installed the authoring tools, bring the images into the computer.

If you've used a regular camera, you can scan your negatives with a desktop slide scanner, but most QTVR veterans hand this task off to a film developer that processes Photo CD discs. This not only saves you time but also lets you take advantage of the QTVR software's premade scripts for Photo CD images. Make sure you tell the Photo CD developer to turn off automatic exposure compensation during the scanning process.

**STEP 6: Stitch, Dice, and Make Your Movie.** Once you have your scans together, you're ready to make your panorama.

Sanity SaVR comes with settings for a few camera setups. Choose the appropriate one in the dialog box by using the pull-down menu at the top. Then select your destination folder and the source folder containing your pictures. To avoid error messages, it's a good idea to keep your source and destination folders on the desktop and within the folder hierarchy so that you avoid hitting the 63-character pathname limit. Finally, click on the Make Pano button and let Sanity SaVR take over.

Sanity SaVR generates a text script based on the information you've supplied it, instead of making you create the script by hand. It then feeds this script to a program called ToolServer (which you downloaded with Sanity SaVR), which activates the individual tools in the QTVR authoring kit one after another.

If all goes as planned, a finished QTVR file (see figure 3) will appear in a few minutes in your destination folder.

**STEP 7: Stitch Fixes and Fancy Moves.** Of course, everything doesn't always go as planned. There may be times when you want to interrupt the sequence of QTVR tools to make some adjustments to your pictures or the stitch before the final panorama is completed.

Most commonly, you may want to get a look at the long PICT file, or SrcPict (source PICT), the stitcher creates from your individual photos. Even if the stitcher has done a great job, you might want to remove glare (or those tourists) from the image in Photoshop.

In such a case, edit the script Sanity SaVR created by cutting out the final two steps (dicing the stitched PICT file and making the movie). Paste those steps into a separate Simple text file so you can use it later. Drag the edited script file onto the ToolServer icon, and the script will activate only the tools you've specified, stopping when the photos have been used the keyboard to move each one up, down, left, or right. You can shrink or stretch the left edge of the image vertically or horizontally. Pressing the Return key locks the image in place and loads the next image.

**Scaling Beyond the Basics**

Now that you've got the basics, there's plenty more you can do. You can create complex QTVR worlds made up of multiple scenes linked together or turn your panorama into an image map for the Web. You can also learn how to make an "object movie," a different type of QTVR movie that lets you turn and examine an object with your cursor.

We've mapped out a few great places where you can find out more about QTVR in the bar at the top of each page of this article. Remember, the QTVR learning curve can be a tough climb, but you'll discover the coolest stuff when you reach the summit.

Jeffy Milstead is a senior project leader at MacUser Labs. His New Year's resolution is to be able to calculate the field-of-view parameters for new camera lens combinations while reciting the alphabet backward.
“Losing” your PowerBook is a harsh blow, no question about it. But what’s even worse is losing all your files.

Hardware can be replaced, but you may never recover your data. Not to mention all the time and energy invested in creating those files.

There’s only one real solution—regular and reliable backups. And if it wasn’t so hectic every time you got back into the office you’d remember to do it. Instead you just keep your fingers crossed and hope that today is not the day when you lose everything.

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Precise previews can guarantee your design isn’t full of hot air.

INEXPENSIVE BUT ACCURATE previews are key if you’d rather not spend the money on making something twice. Boeing used QuickTime Virtual Reality to show the 777 to customers before a single airplane was made. Architects routinely construct buildings on-screen before a shovel ever hits the dirt. After all, it’s a lot easier to redraw lines a client dislikes than to move bolts or repaint.

No matter how big or small the object you’re designing, you can make your Mac work for you too. But the first obstacle to the creation of realistic previews — whether you’re using fabrics, tiles, paints, wood finishes, or metals — is color. The trick is not to just eyeball shades on-screen but to also measure light readings from real materials in order to build yourself a reliable color palette.

Color-measurement devices, or spectrophotometers, such as the $1,295 Colortron II, from Light Source Computer Images, or the $1,345 Digital Swatchbook, from X-Rite, measure the spectral data of any reflective object and transfer it to the computer as color information. This color information is very accurate, but you need to calibrate your monitor for it to be useful for on-screen design. Check your Adobe Photoshop or spectrophotometer manual for calibration instructions.

In this example, we use a Colortron II, fabric samples, and Adobe Illustrator to design our hot-air balloon, named the Vaporware. The same steps can guarantee realistic color even with less lofty projects.

STEP BY STEP

1. TAKE COLOR SAMPLES FROM YOUR SOURCE MATERIAL. Use the spectrophotometer to measure your materials’ color. Watch out for thin fabric or pale colors that can throw off your readings. For our balloon, we used a Colortron II to measure nylon swatches supplied by the balloon manufacturer. The swatches were made of fabric so thin that the Colortron picked up the color of the table underneath. Sometimes placing black or white paper behind a material can help, but in this case, white paper made the readings too light and black paper made them too dark. Our solution was to fold the fabric several times. To measure difficult materials, you may need to use something such as the Colortron software’s average function. You can take measurements from various angles and average them to get a more accurate reading.

2. BUILD A COLOR PALETTE BY USING THE READINGS FROM YOUR MATERIALS. While measuring your materials, build a collection of colors for use in your project. As with most spectrophotometers, the Colortron’s software saves captured digital color information as EPS files called Palettes that can be imported into applications such as QuarkXPress and Adobe Photoshop. We built a palette from our balloon swatches and then imported it into Adobe Illustrator (File: Import Styles).

3. EXPERIMENT WITH YOUR COLORS IN A GRAPHICS PROGRAM. Once you have your palette, it’s time to go about the business of design. Our manufacturer gave us an Illustrator file of the balloon’s construction to work with. If you aren’t so lucky, you’ll need to draw or render your object from scratch. Using Illustrator’s paint-bucket tool, we created several
1. TAKE COLOR SAMPLES FROM YOUR SOURCE MATERIAL.

2. BUILD A COLOR PALETTE BY USING THE READINGS FROM YOUR MATERIALS.

3. EXPERIMENT WITH YOUR COLORS IN A GRAPHICS PROGRAM.

4. CHECK AND COMPARE THE PROTOTYPES WITH MATCHPRINT PROOFS.

5. GET YOUR DESIGN OFF THE GROUND. The final step is the manufacture of the actual project, using the digital prototype you've created. We sent our illustrations and a "cutting list" — a chart of the balloon panels, complete with color indications for each panel — to the factory for construction. Cameron Balloons built the balloon, and we received it three weeks later. When compared to the Illustrator prototype, this photo of the Vaporware's inaugural flight shows just how successful our technique was.

balloon prototypes by applying colors to the panels in different patterns. To get a good idea of how a design will really look, sometimes you need to experiment with more than one view of the object. In our case, we had trouble imagining our 75-foot-tall aircraft in flight, so we ended up using a snapshot of a balloon at a different angle to supplement the view our manufacturer supplied. We scanned the new photo, redrew it in Illustrator, and tried our color schemes on it as well.

As you test different designs, print out copies to compare to your source materials, as well as to see which design you, or your client, like best. Any colorStyleWriter or color inkjet printer will work — we printed proofs of our balloon on a Kodak XL7700 dye-sublimation printer. We compared the prints with the actual fabric and were satisfied that our digital colors were representative. You may want to pay a visit to a service bureau if you need high-quality prints to show a client; our "client" was pretty easy to please.

The final step is the manufacture of the actual project, using the digital prototype you've created. We sent our illustrations and a "cutting list" — a chart of the balloon panels, complete with color indications for each panel — to the factory for construction. Cameron Balloons built the balloon, and we received it three weeks later. When compared to the Illustrator prototype, this photo of the Vaporware's inaugural flight shows just how successful our technique was.
Creating PostScript Files

To create files that print anywhere, anytime, follow these rules of PostScript.

After last month's speculation about which OS we'll be using in the future, we thought we'd come back down to earth with some real-world problems — PostScript files. There are two fundamental questions: "What's the right way to make a PostScript file?" and "I've been given a PostScript file, but how do I know it will work?" We'll address these questions in two parts — in two columns.

Let's make sure we understand the problem. In most cases, service bureaus and prepress houses prefer to output files directly from an application such as Adobe PageMaker or QuarkXPress. Working with native files gives them greater flexibility for correcting errors in setup, typography, and so on. However, sometimes service providers ask you to supply PostScript files instead. Why? The No. 1 reason is compatibility. Any problems that arise if the versions of the operating system, applications, or fonts don't match can be avoided by using a PostScript file. That's because it captures not only the content of the pages but also those idiosyncrasies of the original system.

Usually you create PostScript files by using the Print command and clicking on File instead of choosing the printer as the destination. The printer driver then generates PostScript code and sends it to your hard disk instead of to the printer. In the current version of Apple's LaserWriter printer driver (8.4.1 at press time), you make the selection in the pop-up menu at the upper right of the Print dialog box. After you click on Save, you will be asked to designate where on your hard disk you want the file to be saved (it's a good idea to have a lot of disk space available, because PostScript can be verbose). So far, so good.

But creating a PostScript file that will print flawlessly from someone else's output device also requires that you make the right decisions when preparing the file. Is the final output black-and-white or in color? Does the output device have more than one tray? Although PostScript is device-independent, some device-dependent attributes must be embedded in the PostScript code.

To do all the above, you have to make sure to choose the correct printer driver (the software that turns WYSIWYG data into PostScript code) for the destination output device. You accomplish this by selecting the final printer's PPD (PostScript Printer Description) file. PPDs reside in the Printer Descriptions folder, in the Preferences folder, in the System Folder. You can usually choose the PPD in the Page Setup dialog box of your page-layout application, but you also need to click on the Setup button in the Chooser to make sure the right one is selected. Make sure, too, that you have the correct version of the PPD your service provider uses.

Driving Deeper

Now, when you print, you can select the other appropriate choices in the Print dialog box. After you choose File as your print destination, click on the pop-up menu immediately below (which should read General) and select Save as File. This will bring up a new set of choices. The next option is Format. If you're creating PostScript for someone else to output, choose PostScript Job from the Format pop-up menu.

The next option lets you select PostScript Level 1 or Level 2 compatibility. Unless your service provider instructs otherwise, always choose Level 1 compatibility. Your provider may have similar output devices of different ages, each of which may have PostScript interpreters. Using Level 1 as your default lets your provider use Level 1 — as well as Level 2-compatible machines.

Your next choice is data format: ASCII or binary. Binary creates smaller files than ASCII and usually turns out to be the better choice if your service provider uses a Mac to download the PostScript file into the output device. But if the code will be sent from a PC, then choose ASCII.

Finally, you'll reach the Font Inclusion pop-up menu. Of the choices appearing there (None, All, All But Standard 13, All But Fonts in PPD File), the safe choice is All. This option increases the file size and may duplicate fonts already installed in the output device. That's OK. These days, computers, networks, and processors are fast enough to handle the excess overhead, and it's a small price to pay to ensure font compatibility.

In our next column, we'll look at how to test what has been included in a PostScript file and what to do to verify that it will print properly before you commit to actual output.
Behind every good web site...

Every job requires the proper tool. When it comes to creating web sites, BBEdit 4.0 is the Swiss Army Chainsaw of HTML editors.

"BBEdit deserves a place in everyone's HTML toolkit..."

-- MacUser, August 1996

- Use drag & drop HTML tools to build your page quickly
- Spell check text; syntax check your HTML
- Preview your page using the browser of your choice
- Open from and Save to FTP server from the File Menu

HTML code from the www.macuser.com site displayed in BBEdit 4.0.
Robert Dietz
Principal, Dietz Design
Seattle WA

Clients:
Adobe, Adobe Magazine, M.S.N. Billboard, Photoshop, Union Bay Sportsware, Addison Wesley Publishers, Lumiotics

Systems:
Power Computing Power Center 150
Apple Power PC II/60/80 AV/AV, Power Mac 7200/120
TwinTurbo 128 MB, and as much RAM as we can get

“...No matter how much we invest in equipment it seems like we’re always needing more power. And more speed. Because clients demand fast turnaround, and I’m striving to do breakthrough creative in new media. Which means working in programs like Photoshop® and Director®. So we’ve installed the TwinTurbo 128 in every machine possible. That way, when we need to move an outrageous high-end image fast, we can.”

Photo realistic image quality from 640x480 to 1920x1080. 180 Mbyte/second image scroll rate. And the ability to move 24-bit images in real-time. Plus QuickTime compatible acceleration for true-color, full-screen, real-time video playback at 30 fps. Available with 2, 4 or 8 MB of VRAM.
If your file server or router goes down, you’ll hear about it from users. Wouldn’t you rather know first?

By John Rizzo

Keeping an Eye on Your Network

Mac networks have always been the most plug-and-play around, but that doesn’t make them impervious to broken cables, misbehaving routers, or crashing servers. Fortunately, you don’t have to wait for users to begin complaining about a network disaster before you take remedial action. Network-monitoring software can warn you of problems as soon as they occur or even spot symptoms before they bring down the network. Combining the right software with some troubleshooting techniques can keep network headaches to a minimum.

Network-monitoring packages generally fall into two categories: those that observe and analyze network traffic and those that monitor the status of specific devices—routers, servers, and so on. Traffic monitors are best suited for discovering networkwide configuration problems, whereas device monitors can locate isolated but critical network failures.

Traffic Reports
Network-traffic-monitoring software is based on the idea that a change in the level or type of traffic on your network often signals a problem. A drop in network traffic, for instance, can mean that a heavily used server has gone down or that a network segment has been disconnected by a misbehaving router. Similarly, an increase in traffic can signal a technical problem such as a packet storm—a flood of network signals broadcast by a malfunctioning network device.

Other changes in network-traffic patterns have nothing to do with device failures but result from the evolution of the network and its use in your organization. These changes may indicate that you need to reconfigure some portion of the network. Congestion on a segment may warrant the creation of a new one or the movement of a server or an imagesetter to its own segment. A gradual rise in overall network utilization—the portion of the total possible network bandwidth being used—can signal a slowdown in network performance you might not notice without a traffic monitor.

To detect a change in network-traffic patterns, you need to know what is normal for your network. Skyline and Satellite, from The AG Group, are good tools for finding the traffic baseline on multisegment networks (networks that have at least one router). Satellite is a data-collection engine that runs on a Mac and takes over its Ethernet port, making it unavailable for other network tasks, such as printing. To monitor an entire multisegment network, you install a copy of Satellite on one Mac on each segment. Each “satellite” delivers traffic information to Skyline, which runs on a central Mac. Skyline processes the Satellite data and generates graphs representing traffic patterns over time. You can look at this data in slices of time ranging from a minute to several days and can configure Skyline to report certain anomalies.

To create a baseline for your data usage, you might record hourly time slices over the course of several days. Skyline can display the overall network utilization for each segment and can provide statistics by protocol. For instance, you can see how much network bandwidth is being eaten up by Web-browsing and Usenet-reading users having Skyline count HTTP (Hypertext Transfer Protocol) and NNTP (Network News Transfer Protocol) packets. To see how heavily a printer on a network segment is being used, you can monitor PAP (Printer Access Protocol) traffic on that segment. You can also use Skyline to tell you which Macs, PCs, or other devices use the network the most.

After you’ve created a traffic baseline, you
can set Skyline to notify you when traffic moves significantly above or below it. Skyline can notify you via a dial box, a sound, or an alphanumeric pager message. NetMeter, another AG Group tool that uses Satellite data to monitor the network, can help you track traffic by issuing a variety of meters, charts, and audio and visual alerts. You can monitor total network traffic, or you can limit yourself to particular protocols or a heavily used Web, AppleShare, or NetWare server. You can even monitor your network while you’re on the road, by using NetMeter to access a satellite via an ARA connection.

If your network-monitoring needs are simpler — perhaps you have only one network segment — or if your budget can’t stand dedicating a Mac to run Satellite, you can use Neon Software’s TrafficWatch II for monitoring network utilization. TrafficWatch monitors a single network segment and displays bar charts of network statistics, including network utilization rates, packet sizes, error rates, and percentage of network traffic by protocol type. You can also call up a handy pie chart showing the portion of network traffic attributable to each node — workstation, server, printer, or router. For analyzing trends over time, you can save the data and export it to TrafficChart, a Microsoft Excel macro included with TrafficWatch.

Rating Network-Monitoring Products

**CyberGauge 1.0**
- **Price:** $139 (list).
- Pros: Inexpensive. Lets you save/review utilization data.
- Cons: Monitors only one IP router online. Can’t search for routers.
- Company: Neon Software.

**LANsurveyor 3.0**
- **Price:** $395 (list).
- Pros: Can query a DNS to find an IP address. Sends alarms to pager. Supports SMTP.
- Cons: Requires Skyline alarms.
- Company: The AG Group.

**NetWatchman 2.2.3**
- **Price:** $295 (list).
- Pros: Runs in background in less than 1MB of RAM. Alarms can activate AppleScript scripts.
- Cons: Interface needs lots of mouse clicks. AppleTalk only.
- Company: The AG Group.

**NetMeter 1.0**
- **Price:** $995 (list).
- Pros: Good use of multimedia to display real-time data and alarms. Monitors single node or entire network.
- Cons: Requires Satellite.
- Company: The AG Group.

**PageSentry 2.0**
- **Price:** $149; PageSentry PRO 2.0 (supports 100 servers), $395 (list).
- Pros: Tests a variety of IP services (HTTP, FTP, SMTP, DNS, Telnet). Sends alarms via e-mail or AppleScript.
- Cons: No traffic info. Few status indicators within the application itself.
- Company: Maxum Development.

**RouterCheck 3.0**
- **Price:** $649 (list).
- Pros: Diagnoses multirouter problems, reporting per router and per port. AppleEvent alarms.
- Cons: Not cheap for small networks with one or two routers. AppleTalk only.
- Company: Neon Software.

**Skyline/Satellite 1.1**
- **Price:** $795; additional copies of Satellite, $200 to $300 each, depending on quantity (list).
- Cons: Expensive. Requires dedicated network interface.
- Company: The AG Group.

**TrafficWatch II**
- **Price:** $945 (list).
- Pros: Multimetric (AppleTalk, IP, IPX, DECnet). Graphs traffic data by device, protocol, and network utilization.
- Cons: Viewing saved data requires export to spreadsheet.
- Company: Neon Software.

**COMPANY INFO**

**The AG Group**
Walnut Creek, CA
800-466-2447
510-937-7900
http://www.aggroup.com/

**Maxum Development**
Streamwood, IL
630-830-1113
http://www.maxum.com/

**Neon Software**
Lafayette, CA
800-334-6366
510-283-9771
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If your network is divided into segments or if it's connected to the Internet, the router or routers that make this possible are among the most important devices you manage. A failure or misconfiguration may prevent users from printing or may keep your Web server off the Net. Even if the router is working, your network may perform at less than its best if your Internet connection has slowed down. Neon Software's CyberGauge monitors a single IP router and calculates bandwidth utilization, using the industry-standard SNMP. CyberGauge is easy to use and doesn't require a dedicated Ethernet port, as does Satellite.

You can also monitor AppleTalk routers. Misconfigured routers are the source of a variety of network problems that are difficult to detect with traffic analyzers. For instance, a mysteriously vanishing network segment, known as a black hole, can occur when two or more routers have different AppleTalk-address numbers for the same Ethernet segment. Neon Software's RouterCheck can find black holes by looking at all the AppleTalk routers on a network, reporting the segment- and zone-configuration information, and recommending corrective action. RouterCheck uses both SNMP and AppleTalk to communicate with a wide variety of AppleTalk routers. It can notify you when a router configuration changes; when router ports stop responding; and when router responsiveness slows down, in the case of an overly taxed router. It notifies you via a dialog box, a sound, or a pager message.

To keep tabs on file and Internet servers, production printers, and other network workhorses, you need a tool that can locate and monitor specific AppleTalk devices. The AG Group's Net Watchman is a simple background application that creates a list of some or all of the AppleTalk nodes on a multisegment network. When a device goes down, Net Watchman notifies you with a page, an e-mail message, a dialog box, sounds, or an entry in a log file. Like CyberGauge, Net Watchman is simple and doesn't require a dedicated Mac. Its use is limited to AppleTalk devices, however. Neon's LANsurveyor can also track wayward devices and draw a map of your network (see figure 2).

If your network contains IP devices, you'll need a different tool to monitor them. PageSentry, from Maxum Development, uses SNMP to communicate with IP-based devices, such as Web servers, letting you know when devices disappear from the network. It can also tell you when a particular service or protocol stops functioning. You can set PageSentry to send an e-mail message or an alphanumeric page and to automatically restart a Mac-based server after a specified downtime.

Advance Notice

There is nothing more unpleasant for a network manager than a network failure. Implementing one or more early-warning systems to alert you to problems you may not have discovered on your own gives you a great advantage over the forces of entropy that sometimes seem to rule the network world. Network monitors can also help you solve problems before they strike. Locating the cause of poor performance and nonfunctioning network segments can be much like looking for the proverbial needle in a haystack. Network-monitoring tools can help you sift the statistics. More often, they act as a magnet that draws the needle out for you.

John Rizzo is a MacUser contributing editor.
Computer Shopper introduces NetBuyer, the best one-stop, online shopping service for computer buyers — and it's free!

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You’ll not only have plenty of speed, you have plenty to run on it. Twenty high-speed multiprocessing software packages are now available including Photoshop, After Effects and Premiere from Adobe, Electric Image, Strata Studio Pro Blitz, Apple QuickTime, Metrowerks CodeWarrior, and Deneba Canvas. Another 20 are in development!

As you can see, you can get money-making speeds from a DayStar upgrade for your existing system, or as one of a variety of DayStar Genesis MP computers. Either way, you’ll lose wait fast. So if you make money with your Mac, you will make more with a nPOWER solution from DayStar. After all. We invented it.

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The Plug-In Paradox

Plug-ins have made multimedia on the Web a reality, but it's easier to plug than to play.

IKE EVERYONE ELSE on the Web, I could not wait to get my hands on Netscape Navigator 2.0. Navigator 2 was supposed to revolutionize multimedia on the Web, thanks in large part to plug-ins. But plug-ins have been a mixed blessing. They've allowed Web designers to add much-needed spice to their Web pages — but at a price to users.

Plug-in Pains

Adding multimedia content to a Web page is pretty easy — just insert an <EMBED> or <OBJECT> tag and point to the relevant file on your Web server — whether it's a Shockwave movie created in Macromedia's Director, a FutureSplash vector-based animation created in FutureWave's FutureSplash Animator, or another kind of multimedia file in any of dozens of plug-in data formats. But if members of your audience don't have the required plug-in — and most of them won't, at least at first — they'll instead be interrupted by a "plug-in not found" error dialog box.

Of course, these users can opt to download the relevant plug-in, quit their browser, install the plug-in, relaunch, and go back to your Web site. But a lot of them may choose to skip your page entirely rather than go to all that trouble.

That's not the only problem. Data in popular formats — MIDI sound files, for example — will probably be supported by several different plug-ins. MIDI choices include LiveUpdate's Crescendo, Yamaha's Midi Plug, and several others. Unfortunately, having a MIDI plug-in doesn't mean that your browser is now compatible with any page that contains embedded MIDI. If a page you visit has been designed to work with a different MIDI plug-in, you might get no music at all, an error dialog box, or other strange behavior.

Netscape and Microsoft aren't ignoring this problem, but right now their solutions aren't great ones. Netscape keeps signing deals to bundle various plug-ins with Navigator — first up was Apple's QuickTime plug-in, which is included as a part of Navigator 3.0, and Macromedia's Shockwave, the Pointcast Network, and Inso's Word Viewer are on the way. Microsoft has built support for various audio and video formats directly into Internet Explorer, but Explorer's built-in support doesn't apply to pages designed for Netscape plug-ins. For example, even though Internet Explorer supports QuickTime, it won't play a movie on a page written for Apple's QuickTime plug-in.

Plug-ins also eat up a lot of RAM. For example, Macromedia recommends that you allocate 9 MB of RAM to Netscape Navigator in order to run Shockwave. Web authors should keep in mind that every plug-in they add to their pages escalates RAM requirements and prevents more and more low-RAM users from seeing their site as it was meant to be seen.

In the Pipeline

But don't despair: Microsoft and Netscape are both working to make sure that Web surfers aren't doomed to a life of downloading and installing big plug-ins in order to get access to the coolest Web pages. Microsoft's answer to plug-ins, called ActiveX controls, can be downloaded and installed on the fly. If you come to a Web page that requires a control you don't have, Internet Explorer will download the control and then display the content. Unfortunately, most ActiveX controls exist only for Windows, so if Mac users find a page that uses ActiveX, they may be out of luck. Netscape has promised to fix some plug-in problems in Navigator 4.0, which will be released as part of the Netscape Communicator suite (see "Navigator Is Dead; Long Live Navigator," February '97, page 20). Like Internet Explorer's ActiveX Controls, plug-ins needed for viewing multimedia-rich pages in Navigator 4.0 should download and install automatically and then display the relevant item. Microsoft says that it will eventually implement that method of plug-in support in Internet Explorer.

The Solution

Until Navigator 4 becomes widely available, Web authors should use plug-ins with caution. If you do use plug-ins on your Web pages, settle on one or two and use only those, to minimize potential RAM problems and to avoid frustrating plug-in-poor users. Place obvious links on your site to where Web surfers can download the plug-ins if they don't currently have them. And if you must use plug-ins, consider creating two versions of your site — one with all the multimedia bells and whistles and another without any embedded plug-in files at all. By using this approach, you'll keep your hot multimedia site intact without driving away people who aren't as plug-in-savvy.

MacUser Senior Editor, Online, Jason Snell operates several Web sites, including InterText and TextWeb.

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Talking Back to Your Mac

**Talking to Any** electronic gadget, particularly if it's acting up, isn't all that unusual. Having the machine understand and act on what you say — now, that's a neat trick. Macs have been able to speak and recognize your words for a while, but more powerful Macs and improved software from Apple have made voice control of your Mac truly useful. Apple's Speech Recognition software has recently been updated (it was in version 1.5 at press time) so that more Mac models can use it and so that it's less taxing on your Mac's speed. It's also easier to use, thanks to commercial and shareware AppleScript script collections.

Speech Recognition is not without gotchas, though, and needs a powerful system and some tinkering to get it to perform a good batch of tricks. In this article, we'll help you make your Mac sit up, roll over, open your applications, and even surf the Web, in response to your voice.

**Parts of Speech**

Before you can get your Mac to do your spoken bidding, you'll need the right software and the right hardware. The right software depends on the Mac you use. If you have a PowerPC-based system, get the latest version of Apple's PlainTalk software (which includes Apple's Speech Recognition software) for the best results. It's available from Apple's speech Web site (http://www.speech.apple.com/) and from MacUser Software Central (http://www.zdnet.com/macuser/software).

For the first time, PowerPC-based Performas can use Speech Recognition too, as long as they have PlainTalk 1.5 or a later version installed. You can also use Speech Recognition with audiovisual (AV) Macs, the only non-Power Macs that support it. For these Macs, you should get PlainTalk 1.3, the latest version that runs on them. Unfortunately, this version doesn't have the important option that minimizes the effect of Speech Recognition on your Mac's speed. No matter which version of PlainTalk you use, you must have System 7.5 or later installed on your Mac also.

PlainTalk contains both Speech Recognition (SR) and Text-to-Speech software. Be sure to install not only SR but also Text-to-Speech — it lets your Mac give spoken feedback to your commands. In addition, if you're the type who tinkers with your System Folder, you should make sure that it contains AppleScript. Speech Recognition uses it to automate many of the commands you're likely to use.

Besides a powerful Mac, Apple recommends a minimum of 16 MB of RAM. We recommend more. Speed and flexibility are much greater with more memory installed or with a boost from Connectix's RAM Doubler 2.

Last but not least, you need to have a 16-bit, PlainTalk-compatible microphone. Apple's PlainTalk mic, which comes with some Mac models, is a good choice. The mics built into many Apple and third-party audiovisual monitors also work. Unfortunately, that old mic that came with an LC or IIsi won't work.

For the best results, position the mic a bit above or below eye level and speak normally.

**Make Your Mac a Good Listener**

With your software and hardware in place, the next step is to configure the Speech control panel (see figure 1). It's a simple procedure, but the choices you make as you do so will have a significant impact on your Mac's speed and on Speech Recognition's responsiveness.

One way to keep Speech Recognition from slowing down your Mac is to control when it "listens" for commands. To maintain the most speed, have your Mac listen only while you're holding down a specific key (the Esc key, by
default. To do so, select Listening from the Options pull-down menu in the Speech control panel and select the “Listen only while key(s) are pressed” option.

You can instead have it breathlessly await your commands all the time, but it’s more likely to slow down your Mac — just choose the “Key(s) toggle listening on and off” option in the Speech control panel. This option will probably increase the number of misfired commands too — it listens to everything you say and may mistake your casual conversations for your commands all the time, but it’s more likely to slow down your Mac — just choose “Required before every command” from the Name list pull-down menu. Name your Mac however you want by typing it into the Name box.

Vocabulary Building

The Speakable Items folder (see figure 1) is the key to pleasant discourse with your Mac. This folder contains the instructions — the aliases and AppleScript scripts — for carrying out your commands. When you issue a command, PlainTalk looks here to find an item matching what you’ve said. Although more than a couple of dozen items go into this folder automatically when you install Speech Recognition, you’ll probably want to add to your Mac’s vocabulary. Sure, you’ll be able to carry out some useful Finder commands, such as closing an open window, but you won’t be able to control applications, using the original set of items.

It’s easy to make an application (or any folder or file) speakable: You just click on its icon and say, “Make this speakable.” Speech Recognition does as you ask and even drops an alias of the item into Speakable Items. Tell your Mac to open the item, and — voilà — it opens. Be careful how many items you add to this folder, though. In our testing, we found that the more items you store, the slower Speech Recognition runs.

This brings us to the tricky business of naming files and phonetic pronunciation. If you’ve ever listened to MacinTalk speech synthesis, you’ve had a firsthand demonstration of the difference between phonetics and American English spelling. Since Speech Recognition is based on MacinTalk, you’ll sometimes have to adjust the spelling of the items in your Speakable Items folder. If you use Eudora to read your e-mail, for example, name its alias “open Eudora.” If you’re not sure how something will sound to your Mac, open SimpleText, type the command you want to use, select the text, and choose Speak Selection from the Sound menu. We used this method to make the screen-sharing application Timbuktu (Timbuktoo) speakable.

Outside Help

Once you’ve told your Mac to “close all windows” or “start file sharing,” a few times, you’ll realize that Speech Recognition isn’t much good unless you can use it to control more than the Finder and the launching of your applications. You have two choices: dive headfirst into the world of AppleScript, or get some help. If you’re an AppleScript scripter already, controlling applications with speech is fairly simple. You can create scripts that invoke menu commands within one or more applications and make the scripts speakable.

If the idea of cooking up your own scripts from scratch leaves you cold or petrified, there are tools around that can ease the chore or even eliminate the need for scripting altogether. If you use ClarisWorks, Microsoft Excel, Microsoft PowerPoint, Microsoft Word, or Netscape Navigator, consider Scantron Quality Computers’ $49 EZ-Speak (see review, December ’96, page 44). It’s a collection of over 200 scripts and aliases that control these applications. The speakable items you get with EZ-Speak include menu commands, a few Finder goodies, and over 100 bookmarks for popular Web sites. Since such a large quantity of speakable items is bound to slow your computer to a crawl, get rid of the ones you don’t need, such as items for a program you don’t use or Web sites you won’t visit.

Shareware authors, too, have been dabbling in Speech Recognition. Jonathan Lapin has a collection of scripts called SR 2.0 (http://www.vannevar.com/Mac_SR/index.shtml) that can be modified and used for such tasks as checking your mail and logging onto the Internet via PPP. Lapin’s Web site is also a treasure trove of Speech Recognition tips.

A Final Word

If ordering your computer around appeals to you, and if high RAM demands or the prospect of opening up the AppleScript editor hasn’t managed to dull your enthusiasm, now’s the time to load Speech Recognition. The software is more useful than ever, and hardware is powerful enough to make the technology worthwhile.

MacUser Associate Editor Shelly Brishin reflects the Mac when it follows her verbal instructions. It says, “You’re welcome,” thanks to one of Jonathan Lapin’s scripts.
Help Folder

How to tame large herds of fonts, the dual-platform Jaz blues, and Net cookies.

Full o' Fonts

Q. I have an enormous number of fonts. Unfortunately, I have so many of them that they don't all display in my various font pull-down menus. What can I do to organize them?

Joe Olivier
via AOL

CHRIS: I offer the same advice as anyone who's ever passed within a hectare of my crowded office: "Maybe you need to clean this place up." Before ganging your plethora of fonts together into cozy suitcases, it wouldn't be a bad idea to clean out some fonts you may not need. And what do we recommend for just such a cleaning, Bob?

BOB: Why, Font Box, of course. This cool tool from Insider Software sifts through your fonts, checks the reliability of each one, eliminates duplicates, resolves ID conflicts, moves orphaned fonts (Type 1 screen fonts lacking their printer counterparts), and provides several ways to organize your newly cleaned font library. One dose of Font Box should remove a few of those fonts from your menu as well as free up a fair chunk of hard-disk space.

CHRIS: Now that you've tidied up, let's get your font house in order.

If you're really serious about organizing your fonts, you'll want a font utility that lets you create application-specific groups of fonts—a group for your page-layout program, another for your graphics applications, and one more for your word processor, for example. Organizing fonts in this fashion guarantees that your font menus will be far less congested. Currently you have several utilities to choose from: Symantec's Suitcase, ALSoft's MasterJuggler Pro, Adobe's Adobe Type Manager Deluxe, and DiamondSoft's Font Reserve.

BOB: As we write, Adobe Type Manager Deluxe and Font Reserve are in beta, but they should be released by the time you read this. Both look promising.

CHRIS: If you use an extension manager such as Casady & Greene's Conflict Catcher 3 or Now Software's Now/Startup Manager, you have a partial solution to font fat within your grasp. These babies let you create not only sets of extensions but font sets as well. Of course, unlike the font-specific utilities we mentioned earlier, these packages make you restart your Mac in order to change font sets.

BOB: And speaking of restarts, you can also give Ed Hopkins' $10 shareware program Fonts Manager a try. It works like Apple's Extension Manager and allows you to create font sets that can be swapped at startup.

Discordant Jaz

Q. I have both a Mac and a PC, and I'd like to use my recently purchased Jazdrive with both. Is there any way for me to get access to the complete Jaz Tools for both the Mac and PC?

Lane Weiss
Madrid, Spain

CHRIS: I've got a bone to pick with Iomega on this very subject. Let me start by saying that I really like my Jaz drive. It seems solidly built and has a more convenient power supply than that hulking brick attached to my Zip drive. However...

BOB: Here it comes...

CHRIS: ... did it ever occur to the fine folks at Iomega that we are living in a cross-platform world, where people routinely work with Macs as well as PCs?

BOB: Hang on, partner. I know where this is leading. You're whining because the installer erases Jaz Tools for DOS and Windows when you load Jaz Tools for the Mac.

CHRIS: Exactly! The same thing happens with the Zip drive. Run Zip Install, and the darned thing vaporizes the tools for the other platform. I paid for the cartridge. Shouldn't I be the one to decide what gets erased and what doesn't?

BOB: OK, I agree. Iomega should give you the

Tips / Online

Flashier FlashSession

Tired of sitting around while America Online dials, logs on, logs off, redials, logs on, logs off, and so on because you're checking on an account that has multiple screen names? If you have a dial-up Internet account and AOL 2.5 or later, you can cut out one of the steps in the process.

With the AOL application open but not connected, use the pull-down Location menu to select TCP Connection. Now fire up your PPP/SLIP Internet account, select Activate FlashSession Now from the Mail menu, check the screen names you would like to use, and click on the Go Ahead button. Because you're logging in via your Internet provider, you don't need to redial with each connection. AOL will simply log in and out for each screen name in succession.

One additional speed benefit you may gain from this procedure is a faster connection to AOL. AOL may not offer a local 28.8-kbps connection, whereas your Internet provider probably does.

Haseeb Omar
via the Internet
HANDS

option. But you're not completely hosed — at least not if you have an online account. Just go to the omega forum on AOL or to omega's Internet site (http://www.omega.com/) and download Jaz Tools for the particular flavor of computer you own.

CHRIS: Hang on a sec. I'm going there now to check this out.

BOB: While Chris is online, let me mention that my just acquired Jaz drive, which has never been sullied by evil-empire operating systems, is thus far functioning flawlessly. I can't imagine why Chris would want to use his with a PC anyway, much less own a PC. . . .

CHRIS: I heard that. OK, since print is a not a time-based medium, I've already downloaded the over-5 MB Iomega Tools software, installed it on my PC, and made a discovery or two.

1. Downloading 5+ MB takes a long time. I still contend that having the choice of keeping or trashing the other platform's tools would be a nice gesture to us cross-platform types.

2. In order to use Jaz Tools for the PC, you have to first fire up the Guest program on the PC. This is a fairly painless procedure — just insert the Jaz Windows/DOS installation floppy, run the appropriate Guest program (Windows 95, Windows 3.1, or DOS), and watch as the Jaz drive becomes a fully functioning member of your PC's hard-drive family. Once the Jaz drive has checked in, you can access Jaz Tools.

3. According to the documentation, you have to run Guest only once in Windows 95 — the driver remains on your startup drive, and you needn't bother with the Guest program again. Apparently Windows 3.1 and DOS users aren't as blessed — they have to use Guest every time they want to mount their Jaz drive. To obtain a permanent driver, these users have to shell out $49 for another Jaz Tools disk.

Are Net Cookies Crummy?

Q. What is this cookie thing on the Web? Whenever I go to the Adobe site (http://www.adobe.com/), there's a dialog box that appears indicating that Adobe wishes to set a "cookie."

Martin Lazatin
via the Internet

CHRIS: Martin, if you poke around in your Netscape folder (it's inside the System Folder's Preferences folder), you'll find a file called MagicCookie. If you use Internet Explorer 2.0, the file is called cookie.txt (follow the path System Folder: Preferences: Explorer: Cache). These files contain data that's been sent from an Internet site's server. Numerous Internet sites — including Adobe's — like to save bits of data to a cookie file in order to keep track of how you use the site.

Such data can include the current date and time, a list of links you've clicked on when visiting a particular site, and customization options.

BOB: If you want to get rid of these warnings and you don't mind collecting cookies, go to Navigator's Network Preferences dialog box (under the Options menu), click on the Protocols tab, and uncheck the appropriate box (see figure 1). You'll be free of that dialog box forever. (You don't get the dialog box if you're using Explorer.)

CHRIS: As Bob hints, the real question is whether you mind companies collecting information about your online habits.

Now hang on. Before you sign your paycheck over to the local talk-radio loony, stock your pickup with nonradiated canned foods, and move to a county where the moose population is twice that of bishops, dig this: Cookies aren't the tyrannical tools of Big Brother. To begin with, cookies can be retrieved only by the sites that issued them. So, for example, the congregation at The Shrine of the Most Holy Hanky will have a record of which of its links you've accessed but will never suspect that you've recently browsed Beezlebub's House of Hoochie-Coochie.

BOB: Wow! You have the URL for that one?

CHRIS: Down, boy.

Also, cookies can't be used to unlock the personal secrets contained on your hard disk. No one will discover — at least not through a cookie — that you like to surf the Web while dressed as a marmot.

BOB: True enough. But I'm not willing to help a Webmaster create more-effective advertising. If you're like me and you want to keep your cookie jar covered, try this technique, contributed by reader Mark A. Nicolia via the Internet.

Drag the cookie file out of the folder in which it resides (Netscape folder for Navigator users, Cache folder for Explorer), and replace it with a folder with the same name. If you use Navigator, you'll name the folder MagicCookie, for instance. The browser won't be able to create a new cookie file, since files can't replace folders, nor is it possible to write information to a folder.

CHRIS: Scott Barnham's freeware program Cookie Cutter is a bit more flexible. It lets you selectively allow cookies for some sites and deny them for others.

The Last Word on Gold Plating

BOB: David Lerner, a highly respected Mac technician at Tekserve, in New York City, says this of our advice on whether or not to use gold-plated DIMMs (Help Folder, September '96, page 101):

"The rule is simple: [Get] SIM Ms tin-plated to match the SIMM sockets, [get] DIMMs gold-plated to match the DIMM sockets . . . eventually you might get fretting corrosion.

Tips / Browsers

A Page Too Long

Wouldn't it be nice if you could preview the page breaks in your Web browser so that you knew whether a document you were about to print was just one or two lines too long for a single page? Current browsers don't provide such a preview, but there's workaround if you use desktop printing.

Before printing, select the printer icon on the desktop and choose Stop Print Queue from the Printing menu. Now print the Web page and wait for the Printer Queue window to appear. If you see that more than one page is being spoiled to the printer, open Page Setup and scale the size of the printout — say to 90 percent. Now again choose Print. If the printer queue continues to indicate that more than one page is being spoiled, reduce the size of the page further.

Because you've stopped the queue, no pages are actually printed. Once you've found the proper scaling percentage, open the desktop printer, delete those files that have more than one page, and select Start Print Queue from the Printing menu. Your Web page will print to one piece of paper.

Stuart Cheshire
via the Internet
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CIRCLE 10 ON READER SERVICE CARD

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when mixing dissimilar metals.

Mike Frost, president of RAM maker Technology Works, concurs: “Match the metals. SIMM sockets are tin; DIMM sockets are gold. It might not matter for years, but why take the chance?”

CHRIS: Who am I to argue with these experts? Well, OK, I’ll argue this much: My buddy who’s designed and constructed more circuit boards and handled more computer chips than just about any sentient being on earth had this to say: “If I were sending a probe to Jupiter, I’d make sure that all metals matched. Otherwise, I wouldn’t be too concerned about it. In most climates, failure due to corrosion is rare.”

SimpleText, Be Gone

Q. In the accolade you gave Tom Bender’s TextEdit Plus (Help Folder, November ’96, page 144), you advised us to get rid of SimpleText and use TextEdit Plus instead. But how exactly is this done? My system still asks for the missing SimpleText when I double-click on a ReadMe file.

J.S. Penner
via the Internet

BOB: I hate it when this happens. We should have explained what to do after eliminating all traces of SimpleText and its even crummiest predecessor, TeachText.

CHRIS: Start by opening the Macintosh Easy Open control panel. Uncheck the “Always show dialog box” and “Include applications on servers” check boxes, and check the “Auto pick if only 1 choice” check box. Now, click on Delete Preferences. A dialog box will warn you that you’re about to delete any Easy Open links you’ve got lying around (at least that’s what the words in the cryptic dialog box mean). Click on Delete, and then close Macintosh Easy Open.

Next, create a startup set in Extensions Manager, with only Macintosh Easy Open active. Restart, and then rebuild the desktop (hold down Command and Option during startup). Restart again, with your normal complement of extensions active, and double-click on a SimpleText document. This will bring up a dialog box (assuming you’ve gotten rid of all your copies of SimpleText and TeachText on all mounted volumes) that lets you choose Text-Edit Plus as the substitute application. That done, all SimpleText and TeachText files should open in Text-Edit Plus.

Lock Mess Monster

Q. I read your advice in the November ’96 Help Folder about disabling the Help key (page 139), but I’ve been unable to apply the same techniques to the Caps Lock key. Do you have any suggestions?

Lee A. Licata
Ankara, Turkey

CHRIS: Oh boy, oh boy, oh boy . . .

BOB: Uh-oh. I can see Chris is gearing up for something big. He’s put on the orange overalls and the miner’s helmet, which can mean only one thing . . .

CHRIS: ResEdit!!!!

BOB: Before Chris plunges into the codey depths, I should offer two far-easier-than-ResEdit solutions: Physically remove the Caps Lock key with a key-cap puller, or download a copy of David Sumner’s OptionCaps. It’s an extension that forces you to press Option-Caps Lock if you want the Caps Lock key to do its stuff — making it impossible to accidentally engage Caps Lock.

CHRIS: My turn? My turn? Lee, the reason you can’t use a macro program to disable Caps Lock is because it’s different from most of the other keys on your keyboard. Like the Shift and Control keys, it alone can’t generate a character. Although the Help key doesn’t appear to generate a character either, it is capable of it. Go ahead, open Key Caps and see for yourself. Push Help, and the cursor moves forward. Push Caps Lock and — nada.

Therefore, in order to keep Caps Lock from generating capital letters, you must change the characters produced when Caps Lock is pressed. And this means using Apple’s ResEdit. Here’s what you do:

(1) Open your System file (in your System Folder), locate the U.S. - System 6 file, and Option-drag it to the desktop. This will create a copy of the file. (2) Open the copy with ResEdit. (3) Open the KCHR resource. (4) Select the one resource (it’s ID 16383), and open it with a double-click. (5) Press the Caps Lock key. You’ll notice that the on-screen picture of the Caps Lock key darkens. (6) Drag the lowercase letters in the upper window to the appropriate spots on the picture of the keyboard; drag a to the A key, for example. Change only the letters; leave the numbers alone. (7) Use the Save As command to give your hacked file a unique name — something like No Caps Lock will do nicely. (8) Drag your No Caps Lock file to the closed System Folder. You’ll be asked whether you want the file placed in the System file. Indicate that it’s okay and with you. (9) Restart your Mac. (10) To get rid of Caps Lock, open the Keyboard control panel and select the No Caps Lock layout you just created. From this day forward, pressing the Caps Lock key will seemingly have no effect when you type.

BOB: Gee, that was swell. Why would you want to go through all this trouble when you could use OptionCaps instead?

CHRIS: For the most important reason on earth: In such first-person-perspective shoot-em-ups as Marathon, Quake, and DOOM, I configure the Caps Lock key as the “always run” key. Using OptionCaps would force me to hit the Option key first, wasting valuable milliseconds and increasing the risk that I’ll be fragged in a heated network battle.

Tips / System Tricks

HotSauce on Your Hard Disk

I’ve been playing around with Apple’s HotSauce, formerly called Project X — the application that allows you to navigate the Internet in 3-D. Discovered that you can also browse your hard disk in this fashion.

Just drop your hard disk’s icon onto the HotSauce stand-alone application’s X-space Window, and HotSauce will catalog your disk and display your files (as shown here) — even the invisible ones. You can then use the X-space window as a 3-D Finder for launching applications and opening files. If you prefer a 2-D list view, click on your hard disk’s name and press Command-S for Finder view.

Bill Stephenson
via AOL


Bob LeVitus is the author of 20 computer books and is a columnist for the Houston Chronicle. Christopher Brees recently coauthored The Macintosh Bible Guide to Games, published by Peachpit Press.

You can find the shareware and freeware programs referenced in this article at MacUser’s Software Central (http://www.zdnet.com/macuser/software/). You can also find them in the MacUser areas on CompuServe (GO ZMC/MACUSER) and America Online (keyword MACUSER).
THE NEW EPSON® PHOTOPC™ 500 DIGITAL CAMERA WITH SUPERIOR IMAGE QUALITY. Roses are red, violets are blue, but only if you take their picture with the EPSON PhotoPC 500. The digital camera with 640 x 480 pixel resolution that gives you the most lifelike pictures around. It’s got all the reduction flash to its optional lenses and filters. But no other camera has Epson’s unique ColorTrue™ in-camera processing and ClearOptics™ system, for accurate, vivid images that add impact to documents or e-mail messages. The PhotoPC 500 is flexible, too. With an optional LCD to preview, playback, or erase images. Memory that expands to hold 200 JPEG images. PC/Mac compatibility. And our free Internet Sampler Pak (valued up to $300) that lets you access and create Web pages. So, when it comes to digital photography, a camera by any other name just isn’t as good. For more information, visit www.epson.com to download some sample images, or call 1-800-GO-EPSON and ask for operator 3015.

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Seeing Double

Using more than one monitor with your Macintosh system gives you room to roam, and it's a lot easier than you may think.

IF PROLIFERATING applications and windows are overtaking your Mac's screen, you may think replacing your monitor with a bigger one is the natural solution. But before you bulldoze your current screen real estate to make way for an expensive new high-rise monitor, consider an alternative: adding onto your property.

Since the days of the Mac SE, the OS has supported multiple monitors whose desktops can be arranged in perfect alignment to each other. Adding more monitors offers a cost-effective way to increase your display area without tossing your existing investment.

Although 21-inch monitors often top $2,000 each, good 14- and 17-inch monitors can be found for $500 to $1,000 each. Smaller displays are typically sharper, and since windows displayed on them tend to be smaller, scrolling and screen updating are faster. The easy availability of small monitors and the lure of a larger Mac desktop have led some MacUser editors to top their Mac systems off with as many as three monitors. But why stop there? We've had as many as six running with one Mac in our lab. Here are some tools and tips to make a dual-monitor setup work. You can use the same techniques to add even more.

Get a Graphics Card
Besides finding a good-quality monitor to be a second display, you'll need a graphics card to run it. The first thing to consider is the maximum bit depth and resolution you'd like your new monitor to display. If you need only 832 x 624 pixels of 24-bit color, a 2-MB graphics card will suffice. For a crisp 1,152 x 870 at 24 bits, you'll need a 4-MB card. For even higher resolutions, consider getting an 8-MB card. If you don't need 24-bit color, you can get a 2-MB card that can support 1,152 x 870 pixels at 8-bit color — it's a bargain at as little as $200.

If your current monitor is already connected to a graphics card (rather than the Mac's built-in video port), we recommend that you buy the card for your new monitor from the same graphics-card vendor, for compatibility and top performance. Whether you buy a new graphics card or use an existing one, the way you pair cards and monitors can significantly affect the screen view you'll have. If you're doing DTP or other graphics-intensive work, pair the larger monitor with the better graphics card and leave your e-mail, word-processing, or other text-heavy work for the low-resolution monitor.

The second factor to consider when pairing cards with monitors is speed. You should arrange your monitors so that the one you use most is running on the fastest graphics circuitry. We recommend running MacBench 4.0's Graphics test on each display system (the combination of graphics circuitry and monitor) to see how they compare. If you're a desktop publisher, you should run the Publishing Graphics tests too. Note that MacBench results can be compared fairly only when both display systems are set to the same resolution and bit depth.

Avoid Interference
If you plan to use both monitors at the same screen resolution and refresh rate — 1,152 x 870 pixels at 75 Hz, for example — you can place the two monitors right next to each other. If, however, you plan to run them at differing resolutions or refresh rates, you may need to separate them by 6 to 12 inches, to avoid interference. Magnetic interference manifests itself as a visible shaking of the displayed images where the monitors are closest to each other. TCO-compliant monitors — which tend to be a bit more expensive — have fewer magnetic emissions than other monitors and can be placed closer to each other than non-TCO-compliant models.

A Triple Threat / three heads are better than one

640 x 870 pixels

1,152 x 870 pixels

1,024 x 768 pixels

15-inch black-and-white portrait monitor

17-inch color monitor

USING THREE RELATIVELY INEXPENSIVE MONITORS lying around the MacUser offices and two graphics cards, one editor created a megasystem that displays over 2 million pixels. This setup lets him view the office calendar, surf the Web, analyze test data, and edit his current projects at the same time.
**Choose Your Resolution**

The first time you start up your computer with a new graphics card and monitor, the Mac OS gets information from the graphics card, which in turn checks the monitor cable or cable adapter for special circuitry called sense codes. These codes tell the card which resolutions and frequencies the monitor supports. After this process has been completed, the card defaults to a resolution and refresh rate that are compatible.

But the chosen configuration often doesn't provide the resolution you want. You can make changes to the default resolution via the Monitors control panel: Select a monitor icon in the control panel. Click on the Identify button to find out which icon corresponds to which monitor. Once you've selected a monitor's icon, click on the Options button, and you'll get a list of options for that monitor. After you've selected a resolution for each monitor in this way, you can set the number of colors (the bit depth) from the list of choices available in the main window of the Monitors control panel.

**Align Your Displays**

You may notice that your Mac has your monitors reversed: It thinks your second monitor is on the left, even though you've actually placed it on the right. That's because the Mac orders monitors according to which slots their graphics cards occupy inside your Mac. Fortunately, this is easy to fix: Open the Monitors control panel, and drag the icon of the monitor you want to move to the other side of the window. Note that there is only one limitation on the placement of these monitor icons—they must be touching each other so they form a continuous desktop and the mouse has a way to get from screen to screen.

If you have an AV Mac, the Monitors control panel will display an extra icon: a "ghost" monitor icon that's associated with the AV Mac's built-in video-out circuitry. Unless you have an NTSC monitor or television set connected to this circuitry, you'll want to get the virtual display system out of the way, to minimize the chances of losing your mouse pointer. The best way to banish the ghost is to align this icon with the lower-left corner of your leftmost monitor (see figure 1). That way, if you lose your mouse's pointer, you can find it by dragging up and to the right.

On one of the monitor icons, you'll see a visual representation of a menu bar. You can drag the bar to any monitor icon to make that monitor your primary monitor (it will display the menu bar after you restart). If you hold down the Option key while clicking on a monitor's icon, you'll see a small Mac icon with a smiley face, indicating which monitor will display the "Welcome to Macintosh" message and startup icons. This icon too can be moved.

Once your monitors are in proper order, it's time to start perfecting their alignment. To accomplish this, open a window (Stickies works just fine) and expand it so that it appears across both monitors — this will give you a visual cue as to how well the displays are aligned. If the window on the left-hand monitor is lower than it is on the right monitor, go to the Monitors control panel and move the left monitor's icon up just slightly. Reboot your Mac, and repeat this process until you get it just right.

**Safeguard Your Setup**

The alignment of your displays is now perfect, but that alignment will be ruined if you change the resolution of either monitor. You can bulletproof your Mac in order to make it difficult for you or anyone else to change resolutions. One way is to hide the Monitors control panel somewhere else on your hard disk. Even if this file isn't in the Control Panels folder, it's still usable — just hidden from easy access. Second, if you use the Mac Control Strip, you'll want to remove the Monitor Resolution module from the Control Strip Modules folder (within the System Folder). This will prevent anyone from changing the resolution of your monitors via the Control Strip.

Remember, it's only your displays' resolutions that are critical to their screen alignment. You can still change the bit depth on each without mucking up their alignment to each other. Since you've hidden your Monitors control panel, the easiest way to do this is via the Monitor Bit-Depth module in the Control Strip. Keeping the Control Strip and this module active is a smart idea — that way, you can switch your monitor to black-and-white, for superfast scrolling in Word or Excel, when it's needed.

And while we're on the subject of scrolling, you should remember that the Mac OS needs to communicate with each graphics card every time the contents of a screen change. So be careful not to allow windows to overlap onto two screens unless it's absolutely necessary; otherwise, your scrolling speed will slow to a crawl.

Jeff Pittelkau is director of MacUser Labs.

The latest version of the MacBench benchmark software is available online on ZD Net from Ziff-Davis Benchmark Operation at http://www.zdnet.com/zdbop/.
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<td>189</td>
<td>189</td>
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</table>

CD Drives & Writers

Yamaha CD Writer CDE100 External Only 1024x Cache Buffer • Multi Session • 4x CD Rom

Panasonic PD4x/650MB 4x CD ROM & 650MB Optical Drive in one!

Pinnacle Apex 4.6 GIG Optical 21X, 3700 RPM, 1624K Buffer, 3.5MB/sec.

Fujitsu 640mb 3.5" Optical 30ms, Compatible with 123/230mb

All Power Raids come pretested and configured with specially configured Ultra SCSI 3 Wide AV Drives for your specific needs. All you do is plug and play. Plus they carry a 5 YEAR/24 HOUR REPLACEMENT WARRANTY on all Power RAID components.

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Complete Video Workstations configured to your specifications available.

CIRCLE 75 ON READER SERVICE CARD
Quantities are Limited...

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TWENTY ONE INCH DISPLAYS

21 Inch DiamondTron Monitor
• Rated Superior to Triniltron
• Two year Mfr's Warranty
• Largest Aperture Grille monitor available
• Up to 1600x1200 on Macs and PCs
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SuperMac SuperMatch 20 Plus
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SuperMac Super Match 20 TXL
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SuperMac Super Match 20 TXL
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21 Inch DiamondTron Monitor from $1999

TRINITRON BLOWOUT-LOWEST PRICE EVER!

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• Industrial Grade CRT
• Two page WYSIWYG output
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SuperMac SuperMatch 20 Plus
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SuperMac SuperMatch 20 TXL
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SuperMac SuperMatch 20 TXL
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20" RESOLUTIONS PCI & NUBUS

Radius Thunder II & IV GX Cards
$1199

Radius Thunder II & IV GX Cards
$1199

RasterOps SuperScan MC 21
$999

RasterOps SuperScan MC 21
$999

Rat erOps OptiColor 128 4MB/8MB
$1999

Rat erOps OptiColor 128 4MB/8MB
$1999

Rat erOps OptiColor 128 4MB/8MB
$1999

HARD TO FIND NUBUS DISPLAYS IN STOCK!

NEC

Radius SuperMatch 21 TXL
$1699

Radius PrecisionView 21
$2899

SuperMac SuperMatch 20 Plus
$999

SuperMac SuperMatch 20 TXL
$1099

SuperMac SuperMatch 20 TXL
$1399

SEVENTEEN INCH DISPLAYS

SuperMac/E-Machines T1611Mr
$599

SuperMatch 17: TRINITRON
$799

PrecisionColor Display 17
$899

PrecisionColor Display 17
$899

Pre cisionView 17
$899

SuperMac SuperMatch 17
$899

SuperMac SuperMatch 17
$899

SuperMac SuperMatch 17
$899

PORTRAIT DISPLAYS

Radius Pivot Display
$199

PrecisionColor Pivot
$599

Color Pivot LE
$399

Radius Full Page Display
$199

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$199

Portrait Display Labs 1700
$399

E-machines ColorPage 15 with NUBUS card
$499

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TABLOID LASERS

QMS 860 HammerHead
- 600 dpi 1 lx
- PostScript Levels 1 & 2
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- Powerful RISC processor
- $1999

QMS PS2210/2220
- 20,000 page monthly duty cycle
- 32ppm • Dual-tray input
- $2499

GCC Elite XL series 800dpi
Hewlett-Packard 4MV
- 20,000 page monthly duty cycle
- 22ppm • Dual-tray input
- $4999

GCCC SelectPress 1200dpi
GCCC ELITE XL808 & XL1208
- 20,000 page monthly duty cycle
- 22ppm • Dual-tray input
- $CALL

Radius Proof Positive PTR 220/230
Dye-Sublimation
Ask about Printers available in 220v!

LETTER/LEGAL

QMS PS1700 for Macs and PCs
- True Adobe Postscript
- 17ppm output
- Dual Paper output, Duplex Option
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Hewlett-Packard 5mp
Apple Select 360
- 600dpi • 16ppm, 600dpi
- $CALL

GCC WriteMove II portable printer for Powerbook

POWERBOOK/QUADRA

PowerBooks/Duos
Quadra 800 8/250/CD NEW
Quadra 840AV 8/250/CD w/ Spigot Power AV
Quadra 900/950
FREE ClarisWorks with every CPU purchase!!

TRUEVISION Targa 2000
- 16-bit audio up to 48KHz
- NTSC: 30 frames/60 fields per second,
- Supports PAL broadcast standards

Video Vision Studio, PCI and Nubus
- 24bit Full-Screen, Full-Motion Video
- Includes Adobe Premiere and VideoFusion
- Breakout bar supports dual input

Video Vision Studio Array 4-12GB
Radius Spigot Pro AV $999
- 24bit Full-Screen, Full-Motion Video

Radius Spigot Power AV $799
- 24bit Full-Screen, Full-Motion Video

Video Vision Telecast
- Full-motion, broadcast-quality video
- Available as upgrade for Video Vision Users

microMOTION DC20 M-JPEG PCI video capture & playback
Spigot II Tape Now Bundled with Adobe Premiere
VideoSpigot Cards Nubus/LC/IIsi

NEW AND FACTORY
RECERTIFIED MODELS
OF MOST ITEMS
AVAILABLE

THE MOST KNOWLEDGEABLE SALES STAFF IN THE INDUSTRY!

800/375-9000

MARCH 1997 / MacUser 145
### CALL CLUBMAC FIRST!

#### REMOVABLE STORAGE

<table>
<thead>
<tr>
<th>Drive Type</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zip 100MB Drive</td>
<td>$199.95</td>
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<tr>
<td>1.0GB Drive</td>
<td>$149.95</td>
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</tbody>
</table>

Includes One Free Cartridge

### CD-ROM DRIVES

**ClubMac**

- 670XK/sec data transfer

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
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<tbody>
<tr>
<td>CD-ROM Drive</td>
<td>$129.99</td>
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Includes One Free Cartridge

### MEMORY

#### ClubMac Slashes Memory Prices

<table>
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<tr>
<th>Model</th>
<th>Price</th>
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<tbody>
<tr>
<td>32-Bit 72pin SIMMS</td>
<td>$35</td>
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<tr>
<td>68-pin SIMMS</td>
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<tr>
<td>32MB SIMMS</td>
<td>$109</td>
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<tr>
<td>8-Bit 35pin SIMMS</td>
<td>$22</td>
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<tr>
<td>256MB DIMM</td>
<td>$45</td>
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<tr>
<td>1GB DIMM</td>
<td>$225</td>
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Fluctuate frequently, please call for latest prices.

### RECORDABLE

#### YAMAHA

<table>
<thead>
<tr>
<th>CD Recorder</th>
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<tr>
<td>4X DAT Drive</td>
<td>$879.95</td>
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In Stock

### TAPE BACKUP

#### Tape Media

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<thead>
<tr>
<th>Media</th>
<th>Price</th>
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<tr>
<td>512MB</td>
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### HARD DRIVE STORAGE

#### Quantum

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<th>Drive</th>
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<tr>
<td>Tempest 1280MB</td>
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<td>Tempest 3.2GB</td>
<td>$439.95</td>
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### Cache Memory for PowerMacs & PowerPC

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<tr>
<td>256K level 2 cache 7100, 8100</td>
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<tr>
<td>512K level 2 cache 7100, 8100</td>
<td>$149</td>
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### ACCELERATORS

#### PowerBooks

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<td>PowerBook 2200</td>
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<td>PowerBook 3500</td>
<td>$90.95</td>
</tr>
<tr>
<td>PowerBook 4400</td>
<td>$109.95</td>
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</tbody>
</table>

### ORDER 24 HOURS A DAY • 7 DAYS A WEEK

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(714) 768-8130

### Corporate/Educational Sales

(800) 258-2621

FAX: M-F: 5am - 5pm PST
## GRAPHIC CARDS

<table>
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<th>Model</th>
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<td>Precision Color Pro 2400P (Mac)</td>
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<tr>
<td>R013 1014</td>
<td>TheeColor 30/1600</td>
<td>$1299</td>
</tr>
<tr>
<td>R013 1061</td>
<td>PowerCard 120/1600</td>
<td>$1299</td>
</tr>
<tr>
<td>R013 1060</td>
<td>PowerCard 320/1600</td>
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## NETWORKING

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<td>Ethernet Cat 5 Hub</td>
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<td>A030 1030</td>
<td>Ethernet Cat 5 Cable</td>
<td>$29.95</td>
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<td>A030 1031</td>
<td>Fast Ethernet 100M Hub</td>
<td>$29.95</td>
</tr>
<tr>
<td>A030 1032</td>
<td>Fast Ethernet 100M Cable</td>
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## SOFTWARE

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<tr>
<th>Model</th>
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<tr>
<td>A109 1370</td>
<td>Adobe Illustrator 6.0</td>
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<tr>
<td>A109 1372</td>
<td>Apple PhotoPC 500</td>
<td>$499</td>
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## DIGITAL VIDEO

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<tr>
<td>A109 1380</td>
<td>PowerVision Studio 2.5.1</td>
<td>$1399</td>
</tr>
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</table>

Call 1-800-258-2622 for a FREE subscription to the ClubMac Catalog.
### QuarkXPress 3.32/QuarkXPress 3.5 Upgrade

- The layout software design pros prefer
- Plus, multimedia capabilities

**Quark Xpress 3.32**

<table>
<thead>
<tr>
<th>Name</th>
<th>Price</th>
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<tbody>
<tr>
<td>Datezut</td>
<td>$118.00</td>
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<tr>
<td>Adobe Mac. Plus/Pro Connect 8.0</td>
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<td>Adobe Mac. Plus/Pro Connect 9.0</td>
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**Quark Xpress 3.5**

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<tr>
<td>Detract</td>
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<tr>
<td>Vires 5.0 for Mac</td>
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**QuarkXPress 3.32/QuarkXPress 3.5 Upgrade**

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**Extensions**

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**Firefox**

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**Fractal**

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<td>Fractal Design Ruler 2.0/4.0</td>
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**GraphSoft**

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<td>MacGraf 6</td>
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**GT Interactive**

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<td>Interactive D 4.0 for Mac</td>
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**Insight**

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<tr>
<th>Name</th>
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<tr>
<td>Insight</td>
<td>$69.99</td>
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**Java**

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<tr>
<td>Java 2.0</td>
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<td>Java 2.0</td>
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**Macromedia**

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**Microsoft**

<table>
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<tr>
<th>Name</th>
<th>Price</th>
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<tbody>
<tr>
<td>MS Word 2000 for Mac</td>
<td>$69.99</td>
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<td>MS Word 2000 for Mac</td>
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**Motion**

<table>
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<td>Motion 3.0/4.0 for Mac</td>
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<td>Motion 3.0/4.0 for Mac</td>
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**Oracle**

<table>
<thead>
<tr>
<th>Name</th>
<th>Price</th>
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<tr>
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<td>$69.99</td>
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**Peak**

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<tr>
<td>Peak 1.0</td>
<td>$49.99</td>
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<tr>
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**SAP**

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<td>SAP 2000</td>
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**SAS**

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**Sun**

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<thead>
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<th>Name</th>
<th>Price</th>
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<tr>
<td>Sun Solaris 5.0 for Mac</td>
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<tr>
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**System 7.6**

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<th>Name</th>
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<tr>
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**System 7.6**

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<td>System 7.6</td>
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**WebSphere**

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<td>WebSphere 5.0 for Mac</td>
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**Windows**

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<tr>
<td>Windows 95</td>
<td>$54.99</td>
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**Windows**

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<tr>
<td>Windows 95</td>
<td>$54.99</td>
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<td>Windows 95</td>
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**Xtra**

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<tr>
<th>Name</th>
<th>Price</th>
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<tbody>
<tr>
<td>Xtra 2.0</td>
<td>$29.99</td>
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<tr>
<td>Xtra 2.0</td>
<td>$29.99</td>
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**Xtras**

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<td>Xtras 2.0</td>
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### Monitors

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<th>Product Description</th>
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<td>9695</td>
<td>Monochrome 20MB 3.5 drive External Drive</td>
<td>$384.89</td>
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<td>959000</td>
<td>Multitech Plastics 20MB Ext HD</td>
<td>$238.52</td>
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<tr>
<td>9969</td>
<td>Road Runner 50MB PowerBook Drive</td>
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### Audio

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<tr>
<td>919854</td>
<td>Adesso Soft Touch Keyboard</td>
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<tr>
<td>907605</td>
<td>Tri-Form Extended Keyboard</td>
<td>$73.18</td>
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<td>910690</td>
<td>Tri-Form Extended Keyboard in Pointer</td>
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### Apple

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<td>944110</td>
<td>Extended Keyboard II</td>
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### Floppy

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<td>Iomega Zip 100 Cartridge 1GB</td>
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<td>92170</td>
<td>Iomega Zip 100 Cartridge 1GB</td>
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### Video Cards

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<th>Price</th>
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<tr>
<td>83400909</td>
<td>230MB 3.5&quot; drives</td>
<td>$57.42</td>
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### Printers

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<th>Product Description</th>
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<tr>
<td>16063</td>
<td>Epson Stylus Color 500 Inkjet Printer</td>
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### Global Village

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<td>Global Village Teleport</td>
<td>$199.95</td>
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### Scanners

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<tr>
<td>91976</td>
<td>Verbatim 230MB 1.2G Zip</td>
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<td>91977</td>
<td>Verbatim 230MB 1.2G Zip</td>
<td>$27.09</td>
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</table>

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- Provides 100MB of Space on Each Card
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- J IDE Port
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32MB ...... 360
36MB ...... 365
48MB ...... 520

PB500
4MB/8MB ...... 74/86
16MB/32MB ...... 158/288

PB-DUO
DUO 4MB ...... $75
DUO 8MB ...... 89
DUO 12MB ...... 135
DUO 20MB ...... 220
DUO 32MB ...... 363
DUO 36MB ...... 370

PB1 90
4MB/8MB ...... $70/105
12MB/16MB ...... 137/191
32MB 70NS ...... 349

PB 150
4MB/8MB ...... 555/90
12MB/20MB ...... 218/280
28MB ...... 390

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ATLAS 4.3GB EXTERNAL DRIVE ...... 970
ATLAS 4.3GB INTERNAL DRIVE ...... 999

APPLE
EXTERNAL CD DRIVE ...... $1075
APPLE CD/ROM 600KB 4X CD-ROM ...... 269

INMAC
ZIP 100 EXTERNAL DRIVE ...... $199
ZIP 100MB CARTRIDGE ...... 49.50
ZIP 100MB CARTRIDGE 3 PACK ...... 139
ZIP 100MB CARTRIDGE 10 PACK ...... 192
JAZ 1GB EXT SCII DRIVE ...... 223
JAZ 1GB CARTRIDGE ...... 123
JAZ 1GB CARTRIDGE 5 PACK ...... 479

NEC
NEC 4V 4X 200MB INT CARTRIDGE ...... $180
NEC 4V 4X 7CHANG SCII ROM 350MS ...... 369
NEC 6X CD DRIVE 14MS/900KB ...... 369

Pinnacle MICRO
PINNACLE APEX 4.2GB EXT DRIVE ...... 1589
PINNACLE MICRO RECORDABLE ...... 1295
PRO TAHOE 230MB OPTICAL DR ...... 695
Pinnacle VERTEX 2.6GB AG ...... 1619

MEDIA

Harry

COD 650MB 74 min. ...... 8
DOS 4mm 1.3GB Data Cart ...... 7
DOS 4mm 206 Data Cart ...... 8
DOS 4mm 4GB Data Cart ...... 23
DOS 4mm Cleaning Cartridge ...... 10.90
DB 8mm 2.5/5GB Data Cart ...... 7.50
DAT 4mm 120 min. Tape ...... 9.99
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600MB/521 MO Cartridge ...... 51
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650MB/1024 MO Cartridge ...... 51
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4MV 16PPM 600 DPI LASER ...... $849
6MP 8PPM 600 DPI LASER ...... 955
3PPM 300 DPI LASER ...... 399
3PPM 300 DPI LASER ...... 399
DESKET 600 MAC ...... 395
DESKET 855 CXI 7PPM ...... 509
DESKWRITER 680C MAC ...... 319

APPLE
COLOR LW 12/600 ...... $6465
LASERWRETHER 16/600 ...... 2219
LPR TECHNOLOGY 1200 W/GO ...... 2219
CUR Stampwriter 220W ...... 399
CUR Stampwriter 2500 ...... 375

EPSON
STYLUS COLOR INKJET ...... $499
STYUS COLOR PRO X ...... 1825
STYUS COLOR PRO X ...... 135
STYUS COLOR PRO X ...... 2225
1200C PRO MAC SCANNER ...... 1202
1200C MAC SCANNER ...... 1025
LOCAL TASK CARD INTERFACE ...... 145
1200C TRANS ADAPTER ...... 659
1000 COLOR SCANNER ...... 625
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VISIONEY

POLAROID

VMAX

COOLSCAN III EXT 15/20 ...... 1125
SCANTOUCH AX 1200 ...... 1055
COOLPRINT DIGITAL ...... 1835
SUPER COOLSCAN IS ...... 2049
SUPERCOOLSCAN SF100 AUTOFS ...... 529

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PB515 Mini A/C Adapter for Duo ...... 50

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PB511-Battery PB1000 ...... 49
PB512-Slimpack Ext. Battery PB1000-180c ...... 145
VSTC1000-VST-thingpack complete ...... 115

PB5300 Series
VSTBAT5300-VST PB190/5300 Battery NiMh ...... $163
VSTBAT5300-VST PB5300 Bat/Chargr/AC Adapter ...... 329
PB522-Apple AC Adapter ...... 59
PB519-NiMh Internal Battery PB5300 ...... 189
PB520-Supercharger Bat/Chargr PB5300 ...... 95
PB521-Supercharger Bat/Chargr PB5300 ...... 69
PB521 Mini A/C Adapter PB5300 ...... 69
PB521 Mini A/C Adapter PB5300 ...... 69

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Newer NUPOWER OM w/19.2 Modem ...... 510
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Newer NUPOWER 117 MHz 64M ...... 650
Newer NUPOWER 117 MHz 64M ...... 899
Newer NUPOWER 117 MHz 64M w/modem ...... 1040
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APLAM295SC/A-APL PB500 Power PC Upgd. ...... 215
APLAM8081/A-APL PB500 Power PC Upgd. ...... 1299
## Video Cards

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<tr>
<th>Model</th>
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<tr>
<td>TWIN TURBO 128MB PCI 2MB V</td>
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<td>TWIN TURBO 128MB PCI 4MB V</td>
<td>$569</td>
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<td>TWIN TURBO 128MB PCI 8MB V</td>
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## True Vision

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<td>TV 28173 - TARGA 1000 PCI FOR MAC</td>
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<td>TV 281732 - TARGA 2000 PCI FOR MAC</td>
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<td>2V281749 - BRAHADO 1000 MAC</td>
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## Radium

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<td>#0446 - THUNDER IV GX-1300</td>
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<tr>
<td>#0485 - THUNDER IV GX-1 132</td>
<td>$815</td>
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<td>#0513 - THUNDER IV GX-1600</td>
<td>$1085</td>
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<td>#0528 - THUNDER 30-1600 PCI</td>
<td>$1085</td>
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<tr>
<td>#0531 - THUNDERCOLOR 30/1152 PCI</td>
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<td>#0552 - PRECISION COLOR 8/1600</td>
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<td>#0553 - PRECISION COLOR 24/1600 PCI</td>
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## RasterOps

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<td>#R02562 - VIDEO TIME</td>
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<td>#R02566 - 24MXTV</td>
<td>$1689</td>
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<tr>
<td>#R02618 - PAINTBOARD 11</td>
<td>$1655</td>
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<td>#R02665 - LIGHTNING-NUBUS</td>
<td>$745</td>
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<td>#R02722 - PAINTBOARD PRIS</td>
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## Accessories

### FPU

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<tr>
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<tr>
<td>CENTRIS FPU 25 MHz</td>
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<td>DUO/660 FPU 33 MHz</td>
<td>$52</td>
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<td>COLOR CLASSIC FPU 25 MHz</td>
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<td>LCB FPU 33 MHz</td>
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<td>LC/CCI FPU 16 MHz</td>
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<td>LC575 FPU 33 MHz</td>
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### VRAM

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<td>256K VRAM</td>
<td>$131</td>
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<td>512K VRAM</td>
<td>$202</td>
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<td>1MB VRAM (MP72/75/8500)</td>
<td>$49</td>
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<tr>
<td>2MB VRAM (MP9500)</td>
<td>$119</td>
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### Cache

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<tr>
<td>256K CACHE CARD</td>
<td>$72</td>
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<td>512K CACHE CARD</td>
<td>$282</td>
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<td>1MB CACHE CARD</td>
<td>$329</td>
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<tr>
<td>256K DIAM Cache</td>
<td>$69</td>
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<td>512K DIAM Cache</td>
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<tr>
<td>1MB DIAM Cache</td>
<td>$259</td>
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### Necessities

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<tr>
<td>CONNECT: RAM Doubler*</td>
<td>$55</td>
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<td>CONNECT: RAM &amp; SPEED Doubler</td>
<td>$89</td>
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<tr>
<td>KENSINGTON TURBO MOUSE</td>
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<td>MAC/10 KEYBOARD</td>
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## Accelerators

### DIMMs

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<td>128MB 60NS</td>
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<td>64MB 60NS</td>
<td>$480</td>
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<tr>
<td>32MB 60NS</td>
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<tr>
<td>16MB 60NS</td>
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<tr>
<td>8MB 60NS</td>
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### 72-PIN SIMMS

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<tr>
<td>32MB 60NS</td>
<td>$220</td>
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<tr>
<td>16MB 70/60NS</td>
<td>$106/109</td>
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<tr>
<td>8MB 70/60NS</td>
<td>$49/52</td>
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<tr>
<td>4MB 70/60NS</td>
<td>$25/26</td>
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### 30-PIN SIMMS

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<tr>
<td>16MB 70NS</td>
<td>$150</td>
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<tr>
<td>8MB 70NS</td>
<td>$78</td>
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<tr>
<td>4MB 80/70NS</td>
<td>$33/34</td>
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<tr>
<td>4MB PAL FOR II/IX/60</td>
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<tr>
<td>2MB 80/70NS</td>
<td>$26/28</td>
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## PC SIMMS

### 64-PIN SIMMS FOR IIFX

<table>
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<tr>
<td>16MB70NS</td>
<td>$179</td>
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<tr>
<td>8MB 70NS</td>
<td>$110</td>
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<tr>
<td>4MB 70NS</td>
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## Modems

<table>
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<tr>
<td>#137339 Teleport Gold II 14.4</td>
<td>$112</td>
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<tr>
<td>#137390 Teleport Flat Comm Slot 28.8</td>
<td>$209</td>
</tr>
<tr>
<td>#137397 Teleport Flat Internet 28.8</td>
<td>$209</td>
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<tr>
<td>#137270 PowerPort Platinum PC Card</td>
<td>$209</td>
</tr>
<tr>
<td>#137380 PowerPort FlatPro PCCard</td>
<td>$469</td>
</tr>
<tr>
<td>#137335 PowerPort/PB500 Mercury 19.2</td>
<td>$338</td>
</tr>
</tbody>
</table>

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### Power Computing

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#### PowerBase Series Computers

<table>
<thead>
<tr>
<th>Model</th>
<th>Processor</th>
<th>RAM</th>
<th>Hard Disk</th>
<th>CD Drive</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>#83734</td>
<td>603e, 180MHz</td>
<td>16/1.2GB</td>
<td>8X CD Prof.</td>
<td>$1495.00</td>
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</tr>
<tr>
<td>#83737</td>
<td>603e, 180MHz</td>
<td>16/1.2GB</td>
<td>8X CD MiniTower</td>
<td>$1595.00</td>
<td></td>
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<tr>
<td>#83733</td>
<td>603e, 200MHz</td>
<td>16/1.2GB</td>
<td>8X CD Prof.</td>
<td>$1795.00</td>
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<tr>
<td>#83736</td>
<td>603e, 200MHz</td>
<td>16/1.2GB</td>
<td>8X CD Minitower</td>
<td>$1895.00</td>
<td></td>
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<tr>
<td>#83732</td>
<td>603c, 240MHz</td>
<td>16/1.2GB</td>
<td>8X CD Low Prof.</td>
<td>$2195.00</td>
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<tr>
<td>#83735</td>
<td>603e, 240MHz</td>
<td>16/1.2GB</td>
<td>8X CD MiniTower</td>
<td>$2295.00</td>
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#### PowerCenter Series Computers

<table>
<thead>
<tr>
<th>Model</th>
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<th>RAM</th>
<th>Hard Disk</th>
<th>CD Drive</th>
<th>Price</th>
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<tbody>
<tr>
<td>#91537</td>
<td>604, 132MHz</td>
<td>16/1GB</td>
<td>CD-ROM Low Prof.</td>
<td>$1895.00</td>
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<tr>
<td>#91535</td>
<td>604, 132MHz</td>
<td>16/1GB</td>
<td>CD-ROM Low Prof.</td>
<td>$1995.00</td>
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<tr>
<td>#91538</td>
<td>604, 150MHz</td>
<td>16/1GB</td>
<td>CD-ROM Low Prof.</td>
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<td>16/1GB</td>
<td>CD-ROM Low Prof.</td>
<td>$2195.00</td>
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#### PowerTower Series Computers

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<th>Model</th>
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<th>RAM</th>
<th>Hard Disk</th>
<th>CD Drive</th>
<th>Price</th>
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<td>#86649</td>
<td>604e, 180MHz</td>
<td>16/2GB</td>
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<td>#83731</td>
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<td>32/2GB</td>
<td>CD, 8X CD, Jaz Drive</td>
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<td>32/2GB</td>
<td>CD, 8X CD, Jaz Drive</td>
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#### PowerTower Pro Series Computers

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<td>8X CD-ROM, Jaz Drive</td>
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<td>32/2GB</td>
<td>8X CD-ROM, Jaz Drive</td>
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**PowerComputing**

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**Motorola StarMax Series**

Stable, reliable performance from the creators of the PowerPC™ chip

<table>
<thead>
<tr>
<th>Model</th>
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<th>Hard Disk</th>
<th>CD Drive</th>
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<td>#81534</td>
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<th>Model</th>
<th>Per Month</th>
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FREE!
- Quark 600 Value
- Adobe Premiere WebCam Basic System Lease

Digital & Multimedia Systems

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FREE!
- Viewsonic 17EA AV Monitor
- SyQuest 1700 DAT Tape Drive

Laser Printers

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Optical & CDR Drives

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Optical Cartridges

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Hard Drives

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SyQuest Cartridges

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<td>Quantum 14GB</td>
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*Denotes no reader service number.
### 168-Pin DIMMs

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### Powerbook Series

**For Power Computing PowerBase Systems**

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### PB Accessories

- **PowerComputing PowerBase System**
  - 8 MB EDO 3.3 volt: $59
  - 16 MB EDO 3.3 volt: $85
  - 32 MB EDO 3.3 volt: $179
  - 64 MB EDO 3.3 volt: $367

### NEW EDO DIMMs for Macs

**For Motorola Starbase Gateway 120 Systems**

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**Powerbook Series**

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**PB Accessories**

- **PowerComputing PowerBase System**
  - 8 MB EDO 3.3 volt: $59
  - 16 MB EDO 3.3 volt: $85
  - 32 MB EDO 3.3 volt: $179
  - 64 MB EDO 3.3 volt: $367

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- **SYB-QUENT**
  - EZ FLYER 32MB Card - $250
- **SONY**
  - 12MB 8.1.5 MD Disk - $96

### Media

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<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
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<tr>
<td>17&quot; HD-res. Trinitron (R)</td>
<td>$285.00</td>
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<tr>
<td>17&quot; Hi-res. Trinitron (R)</td>
<td>$325.00</td>
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<tr>
<td>PowerSync Res. Adapter (N)</td>
<td>$35.00</td>
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<tr>
<td>Apple 14&quot; MS Multi-Scan (R)</td>
<td>$265.00</td>
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<tr>
<td>CPUs (Best PowerComputing, Faster)</td>
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<tr>
<td>Mac SE/4/160 w/Ext. Kybd (U)</td>
<td>$145.00</td>
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<td>Mac Ilex/4/160 (U)</td>
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<td>Mac Ilex/4/160 (U)</td>
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<tr>
<td>PCOS 8/16BG w/14&quot; MS Mon (R)</td>
<td>$1299.00</td>
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Gone Fishin'

I WAS IN A LITTLE TROUBLE. My Uncle Karl had telephoned the
previous week to inform me that he and my Auntie Di would be
coming to town for a while, and — oh, by the way — he and I
would be doing some fishing. Swell. Me — a guy who's never been
closer to a fish than the lox piled on top of my bagel — expected to
hook a live one out in the bug-choked wilderness.

What was I to do? Probably the same thing you, our fish-loving read-
ers, would do: Turn on the Macintosh. Why? Because the Mac supports
a boatload of educational and, more important, entertaining fish-
related multimedia products.

Floundering About

Karl would know something was
fishy if I couldn't tell a gill from a fin
or a wrasse from a bass, so I decided
to begin my expedition with the
OceanLife series (for volumes 2 through 4; for
volume 5; $49.95 per volume list),
from Sumeria (415-904-0800). Itsive volumes cover the exotic
aquatic life of the Western Pacific,
Micronesia, the Hawaiian Islands,
Australia's Great Barrier Reef, and
the Caribbean — admittedly a cast
of characters we're unlikely to see in
California. But I was after the hard
facts on fish, and no other Mac
multimedia product covers the field
as thoroughly as OceanLife.

Each volume contains QuickTime
footage of the local underwater
inhabitants, accompanied by text
and narration describing the habits
and habitats of the individual
species. Volumes 3, 4, and 5 also
each include a section describing
behaviors, such as schooling,
spawning, locomotion, and pairing.

Although all the volumes proved
extremely educational, the video on
volumes 2 through 4 is a bit jumpy
and pixelated. (Volume 1, Western
Pacific, was under reconstruction
and unavailable for review.) Volume
5, The Caribbean, tops the other
volumes, with improved QuickTime
footage, a new navigation tool bar,
maps containing information on
dive shops and sites, and a 3-D
rotating fish (shown here) complete
with labels identifying such
accoutrements as the swim bladder
and the vertebral column.

Hoping to further increase my
piscine knowledge, I then speared
several underwater-themed Photo
CD collections. The Fisheye View
series (for each; $19.95 per volume
list) — Reef Collection, Coral
Collection, and Fish Collection —
from Quantum Leap (800-762-2877
or 305-447-0745), carries high-
resolution images of a variety of
ocean inhabitants. But although
many of these pictures (125 to 150
per volume) are breathtakingly
beautiful, the accompanying
narration — an important element
— is far drier than its subject.

Two less successful image
collections are Ocean Magic and
Aquatic Art (for each; $19.95
per volume list), from Gazelle
Technologies (800-843-9497 or
Aquazone is a simulation of a fully functioning aquarium: You must feed your fish, change the water, administer medication, and maintain a certain water temperature unless you want them to become so many lifeless, floating pixels. In contrast, El-Fish is more like an exercise in genetics: Take two fish, mate them, and see what kind of small-fry they produce. Although the El-Fish fish swim more fluidly than those in Aquazone, some drawbacks make El-Fish less appealing. For example, it takes a long time to render each of the offspring, and after your wait, you’re pretty much left with only a great-looking screen saver. For the true aquarium experience, look to Aquazone.

**Gone Fishin’**
It then hit me that I hadn’t a clue what kind of fishing Karl preferred. Since he lives in Iowa, I figured we could pretty much rule out marlin. But was he a fly-guy or a bait-and-tackle man? Best bone up on both.

For the gentle art of fly-fishing, I had a look at [Fly Fishing: Great Rivers of the West](http://www.actwin.com/fish/index.cgi). It gives you travel and fishing tips, although the fishing lessons aren’t extensive. It includes written instruction and QuickTime movies demonstrating such basic techniques as “landing a fish” (pulling it out of the water) and getting the right gear. The main thrust of the program, though, is to take you on a tour of six western rivers — the Deschutes, Green, Henry’s Fork, Madison, San Juan, and Yellowstone. It shows you scenic photos of each area and has maps with likely fishing spots. It also gives plenty of travel info, from lists of lodgings to names of fishing guides who can answer your specific questions once you’ve reached your fishing destination.

If Karl turned out to be a Bass Master, I figured [Trophy Bass](http://www.actwin.com/fish/index.cgi), from Sierra Online (800-649-4904 or 206-649-9800), would teach me what to do. Although I had a great time reeling in the big boys in the game portion of the program, I was out of my league once I shifted to the instructional side. Less experienced anglers will likely be overwhelmed — there are, for instance, a jillion ways bass perform each of these jobs to continue their survival. Their food sources are most abundant. Instinct dictates the way bass perform each of these roles to continue their survival.

**Hook, Line, and Dinner**
By now, I was feeling pretty confident — that is, until I thought of the following: What if we were to actually catch a fish and Karl wanted to eat it? Even though Aunt Di had cleaned and cooked her share of Karl’s victims over the years, I knew she wasn’t about to do so on her vacation. Returning to the software pile, I emerged triumphant with a cool new electronic cookbook — [Williams-Sonoma Guide to Good Cooking](http://www.actwin.com/fish/index.cgi). This disc’s 1,000 recipes (137 of which are seafood-related) are searchable (by, for instance, ingredients or caloric content) and beautifully photographed, on — there are, for instance, a jillion links to more fishing sites than you can shake a pole at. To learn about bass, bass, and more bass, check out Bass Anglers Sportman Society (http://www.outdoors.net/bass/index.html). And finally, aquarium enthusiasts will find useful info at FINS (Fish Information Service; http://www.actwin.com/fish/index.cgi). To take the shortcut to the famed Fish Cam, hold down Control-Option-F in Netscape Navigator.

**Here’s the Catch**
My time with Karl couldn’t have been better. He arrived with a nasty cold and, despite my coaxing, refused to budge from his couch and hot-water bottle. We whipped up a batch of fish sticks, flipped the tube on to Jethro’s Wide World of Bass Antics, and traded stories about The One That Got Away. Now that’s my kind of fishing.

---

*Occasional scuba diver and MacUser contributing editor Christopher Breen did not harm any fish in preparing this article.*
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The Game Room

BY ROMAN LOYOLA

BEFORE THERE WERE VIDEO GAMES, there was pinball. And before there were pinball machines, there were board games. This month I look at how well those games work on the Mac, reviewing two pinball simulators and a computerized version of a classic board game.

Pro Pinball
When Starplay Productions released Crystal Caliburn and Loony Labyrinth, it set a precedent in giving a realistic feel to Mac pinball games. The problems with the Starplay games, though, were that the layout of the table wasn't used effectively and the ball looked like it was floating on an invisible layer just above the surface.

After the release of those two games, I didn't see another realistic Mac pinball game — until now. Pro Pinball will satisfy your need for an electronic pinball game that feels like the real thing. Ever so better, it has an improvement over the Starplay games: the ball actually looks like it's rolling on a surface rather than floating.

Pro Pinball offers lots of items to shoot at, such as two ramps, a couple of spinners, and lots of targets. Its multiball mode adds to the challenge. The balls have good bouncing power, which is useful when a ball is in play on the table. At other times, it's a disadvantage — it's unrealistically hard to control the ball when you're trying to cradle it with a flipper.

The object of Pro Pinball is to complete six missions. With each mission, a different animation appears on the table top. The animations add variety, but they also divide your attention — get too involved in watching the animation, and you can lose your ball. If you want to see the animations, you'll need to practice using your peripheral vision.

I still prefer Crystal Caliburn and Loony Labyrinth, because I like their pace better. But Pro Pinball has great action and excellent sound and, most important, it feels like pinball.

3-D Ultra Pinball: Creep Night
Sierra's sequel to 3-D Ultra Pinball doesn't have quite the same realistic feel as Pro Pinball, but that doesn't mean it's not an enjoyable game. The strength of 3-D Ultra Pinball: Creep Night is in its variety of tables and other features.

In Pro Pinball, you have one table to play; Creep Night has three tables from which to choose (shown here). The other big difference is that the tables in Creep Night aren't constructed like traditional pinball tables; instead of being long and vertical, Creep Night's tables stretch across your screen horizontally. They can be divided into a central table and two peripheral ones. Having so much variety on your screen simultaneously adds to this game's replayability.

As you may have guessed by the title, the theme of Creep Night is a haunted house (a cartoonish one). The goal is to close a vortex evil creatures use to travel from the underworld to the earth. There's lots of stuff to shoot at on the tables, and there are also unique features, such as cranes that pick up your ball, wandering targets to shoot at, and a video-game mode you can access if you make the right moves.

Unfortunately, the arcade-like game you play in this mode detracts from the overall quality of Creep Night. It's simplistic and feels as though it's been thrown in just for the sake of variety.

You'll need plenty of RAM to play Creep Night — it requires 11 MB, but I had to boost the RAM requirement to 15 MB on my AV Power Mac 7100/66 in order to get the game to run smoothly.

In all, Creep Night is a good video pinball game. Its haunted-house theme is more than a little goofy, but it's not as unrealistic as Pro Pinball, and it needs a lot of RAM. It does have some unique features that create an interesting effect — it feels more like a video pinball game than a pinball simulator.

Scrabble
My parents wanted me to take a college-prep vocabulary class in high school. I threw a fit and took the class I wanted to take instead: BASIC programming. Later I found out it was their secret passion to have a son who reignited as the world champion in Scrabble. Maybe they had the right idea. I still haven't used my BASIC knowledge to review games, and this month in particular, I sure wish I knew more words that begin with "$ and end in $.

There are plenty of reasons to improve your Scrabble-playing skills by using the electronic version of this familiar game (shown in the background). It has much of the charm of the original and should satisfy Scrabble aficionados.

You can play it on a LAN or over the Internet. Playing against others on a computer may not be the same as huddling around a board, but it does let you play with friends all over the world.

Scrabble has an annoying opening cut-scene that can't be avoided. The music gets tiresome — you can turn it off. The board is angled on your monitor, which means that letters near the top are smaller than letters at the bottom. It's sometimes hard to see the top ones, as well as the bonus squares, if you're at a distance from your monitor. Scrabble also has some features you can't get from the board-game version — a built-in dictionary to make it convenient to challenge an opponent's words and a hint feature that gives you suggestions for words based on your tiles.

If you're always losing tiles, don't find a worthy opponent, or simply want to play Scrabble over the Internet, you'll find this game a must-have.

Roman Loyola, a MacUser associate editor and the keeper of The Game Room, is disappointed that his first name is worth only five points.
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Dear Shareholder:

Hi! I'm Andy of Apple Shareholder Relations ... and I'm taking "time out" from our hectic days of developing advanced Hardware and Software Concepts to bring some good news to you, our Happy Happy Stockholder!

Why "Happy Happy"? Because you're one of the cutting-edge "early adopters" of our breakthrough stockware platform and one "Happy" just won't cover your delight at the news this letter will bring you!

Enclosed is your first-quarter dividend for 1997. Yes, dividend. At Apple Shareholder Relations, we have been just as alarmed as you by the "analysis" practiced by certain New York-based "investment advisors" and "financial journals." Far removed from the technology scene here in Silicon Valley, they're hardly qualified to judge the marketability of breakthrough technologies such as NewtonGI, the first truly Personal Digital Assistant that can be operated gastrointestinal. Furthermore, we at Apple take extreme umbrage at the journal's injudicious use of the phrase "Better to invest in the production of a Bob Hope/Dennis Rodman buddy-cops movie."

But the dividend you now hold in your hand is "proof positive" of their shortsightedness. And please examine it closely ... surpassing even the most optimistic forecasts of those in the Media, this dividend provides temperature readings in both Fahrenheit and Celsius.

"Yes, Andy," you're saying. "This concrete and highly practical demonstration that my investment in Apple is a sound one has made me Happy. But what about the 'Happy Happy' with which you opened this letter?"

Well, I'm saving the best news for second. We at Apple are never content to sit on our laurels, reaping shareholder benefits solely from our breakthrough concepts of the past. And so, after months of detailed market research so expensive that you'd be really impressed but, we wish to stress, not so expensive that you might start to look hard at Compaq, we're ready to begin a brand-new Apple venture.

We held extensive focus-group meetings, asking hundreds of qualified consumers to rate over 1,000 proposed products and product lines. And the results, tabulated by an accounting firm not unlike those working for many Fortune 500 companies, conclusively identified one unique technology absent from all of our competitors' product lines, one surefire profit opportunity that all of those questioned identified as a product they intended to purchase within the next month: Food.

Yes, we at Apple don't know why we didn't think of it ourselves, either: an enormous chain of themed cybercafes, offering a variety of Food™ and Coffee™ for customers to buy directly from Apple, avoiding the costly and sometimes persnickety VAR channel. In the most strenuous if not legally binding terms, I promise you, our valued Shareholder, that this is a can't-miss opportunity. Why?

1. Location. We will place our first Apple Cafes in Los Angeles and New York City. Owing to the ever increasing number of broadcast- and cable-TV networks creating original programming, it is inevitable that eventually there will be a sitcom featuring attractively unemployed Twentysomethings who hang around our Coffee™ shop all day and night. Translation: free national publicity.

2. Hot, hot, hotness! Pick up a People magazine. Inside you'll find photos of top TV comedians such as Dan Aykroyd and John Goodman at The House of Blues; Hollywood megahypersuperstars such as Bruce Willis, Demi Moore, and Arnold Schwarzenegger at Planet Hollywood; supermoguls such as Steven Spielberg and Jeffrey Katzenberg at Dive; fabulous supermodels at The Fashion Cafe. The message is clear: Celebrities love to hang out at theme restaurants! And don't think the Coffee™-drinking, star-crazed public doesn't know it! Who wouldn't scramble into an Apple Cafe for a glimpse at gold-plated glitter gods? And while they stare goggle-eyed at Sylvester Stallone, Quentin Tarantino, and Harrison Ford, they'll be gulping down $3 cup after $3 cup of Folgers Instant.

3. Chemical addiction has become an ugly phrase of late, but nonetheless the stock exchanges are full of highly profitable companies reaping megabucks for their shareholders from the pythonlike stranglehold their completely legal products have upon the neurochemistry of their quivering customers. And unlike tobacco cravings, caffeine addiction is still fashionable!

4. Furthermore, unlike heroin addicts, Coffee™ addicts are actively and adorably grateful to anyone or anything who or that can bring them coffee. Scratch a dog behind its ears, and an hour later, it's bringing you your slippers. Supply a Coffee™ addict with a cup of our patented Ultra-Viscosity Kenyan Jumper Cableccino, and with one hand, she'll hand her waiter a Visa Gold card, while the other points to a $9,200 Power Mac digital-video system on the wall.

The list, we claim, is endless. Our main competition has been making a fortune quarter after quarter by marketing good ideas years after others have already done them to death. Now, we at Apple are pleased to say, it's time for Apple to put this time-tested principle to work for you, our Shareholders.

P.S. The postage meter here at Apple Shareholder Relations seems to be on the fritz again. Please make ten copies of this letter and send a copy to each of the Shareholders on the attached list, first deleting the bit about the first-quarter dividend. We'll pay you back later.
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