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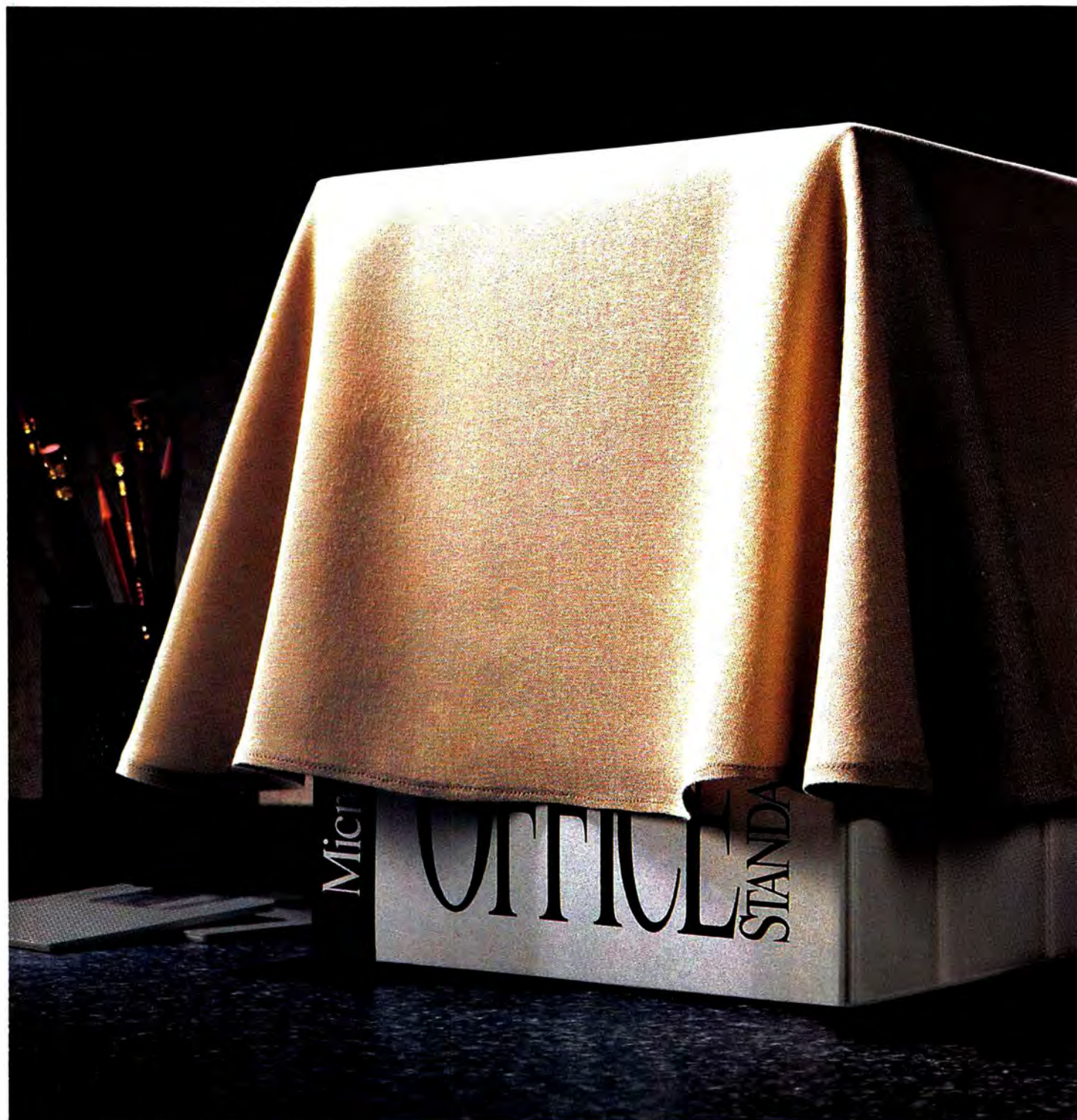
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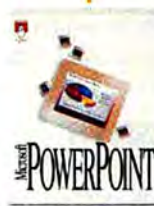
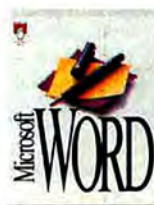
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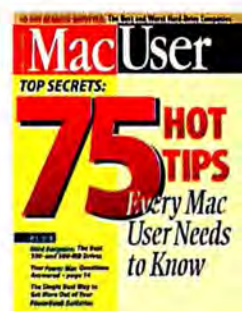
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Cover illustration / Lisa Orsini

COVER STORY

75 Ways to Raise Your Mac IQ

Is your Mac slowing you down — or are you slowing down your Mac?



YOU COULD SPEND A LOT OF MONEY to speed up your Macintosh — or you could check these tips and speed yourself up. We're talking about 75 tips, tricks, and techniques, from the familiar but overlooked to the obscure, that will enable you to tap into the inherent power and brilliance of System 7 — all without spending a cent.

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Room to Grow: Midsized Hard Drives

MacUser ZD LABS YOU CAN NEVER HAVE TOO MUCH STORAGE. Fortunately, you can now get more capacity for less money than you ever thought possible. MacUser Labs tested 29 of these price/performance beauties in the 300-to-500-MB range — with some surprising results. Plus: What MacUser's readers think about hard-drive vendors' service and support.
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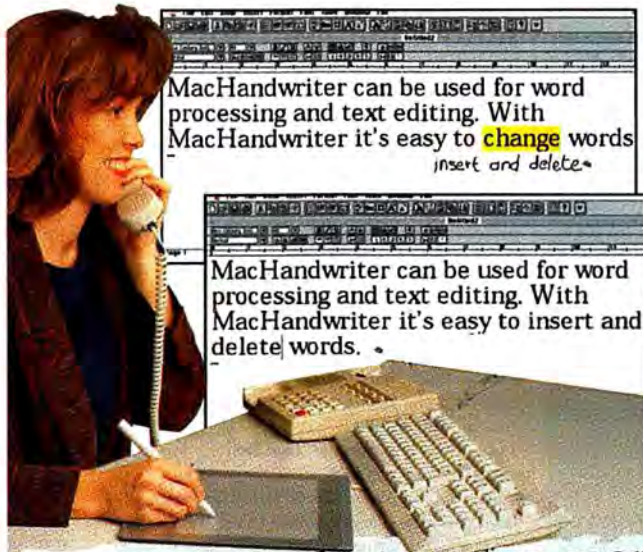
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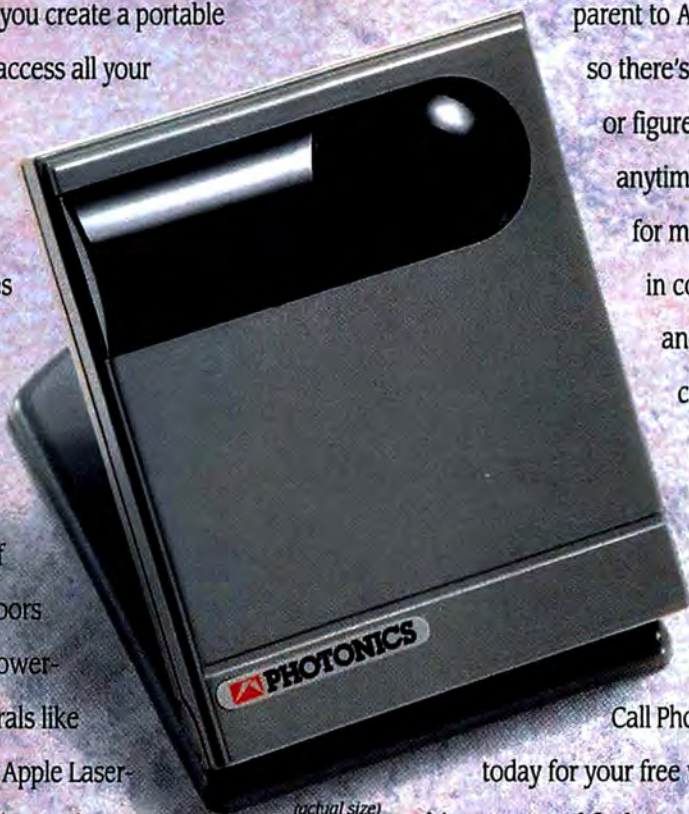
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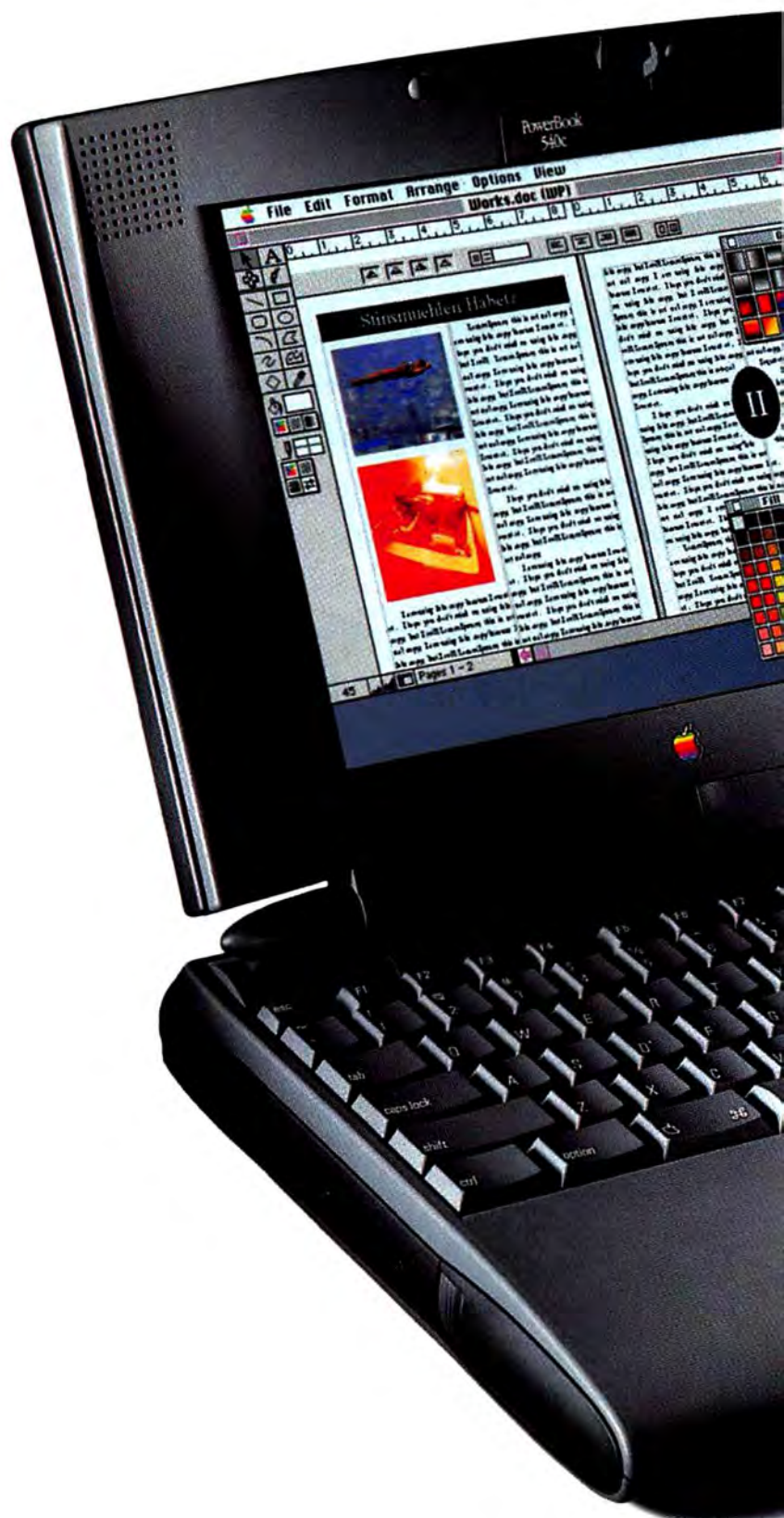
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More power. The PowerBook 500 series is designed around the Motorola 68LC040 processor—a chip that offers far more power than the chips that powered previous PowerBook models.



The revolutionary new Apple trackpad makes pointing and clicking even more intuitive than before.

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The 500 series offers the possibility of even more power later, because you can upgrade to PowerPC™ technology when it's available for PowerBook. (Contrast this with 486 notebooks that aren't upgradable to Pentium technology.)

More precision. Kindly direct your attention to the revolutionary new Apple trackpad pointing device that replaces the trackball and is centered on the comfortable palm rest.

The trackpad brings a new level of precision to PowerBook computing.



The trackpad's ultrasensitive surface senses the touch of your finger, tracks it across the pad and moves the cursor across the screen accordingly.

This intuitive method of moving the cursor, combined with the new dual-scan and active-matrix screens, gives you much more precise control over the location of the cursor and makes extremely detailed work

possible (it's actually precise enough for photo retouching) wherever you happen to be.

The PowerBook 540c has what may well be the finest screen ever to grace a notebook computer: an active-matrix, 9.5-inch display capable of showing thousands of colors at the same time.

Combined with QuickTime™ video and built-in stereo sound, these screens make for truly spectacular presentations in the most unspectacular locations: on a crowded plane, in a noisy diner, wherever.

More expandability. The new PowerBook 500 series includes a lot of things that aren't standard on ordinary notebook computers.

Things like built-in file sharing and networking. Stereo sound and video-out. Macintosh PC Exchange™ software, eWorld™ and PowerBook File Assistant file-synchronizing software. And we've even

included Apple Remote Access software that allows any

modem-equipped PowerBook to work with the Macintosh® computer on your desk, and with your network, as if you were sitting in your office. Even during those times

when your office happens to be thousands of miles away.

Still, there's a lot of room to grow. These are the first PowerBook computers to come with a built-in Processor Direct Slot (PDS) for third-party expansion modules. And they're also the first ones to offer the optional plug-in PowerBook PCMCIA Expansion Module, so you can use two Type II or one Type III PCMCIA card for even more flexibility.

You can even install an optional 19,200-baud internal modem to send and receive information quickly, and when it becomes available, a third-party cellular interface for convenient wireless access to your office network.

More battery life. Even the batteries have been thoughtfully redesigned. The PowerBook 500 series can use two PowerBook Intelligent Batteries. These high-powered NiMH batteries use special processors within each pack to monitor battery power and the new PowerBook Control Strip — power management software that tells you exactly how much time you have before you need to recharge the batteries.

| | PowerBook 520 | PowerBook 520c | PowerBook 540 | PowerBook 540c |
|--------------|--|-----------------|--------------------------------|---------------------|
| Processor | Motorola 68LC040 @50/25 MHz | | Motorola 68LC040 @66/33 MHz | |
| Display | FSFN Gray-Scale | Dual-Scan Color | Active Matrix Gray-Scale | Active-Matrix Color |
| Hard Drive | 160MB | 160MB | 240MB | 320MB |
| Memory | 4MB DRAM expandable to 36MB | | | |
| Battery Life | Up to 7 hours with 2 batteries | | Up to 6 hours with 2 batteries | |
| Audio | 16-bit stereo in and out, built-in stereo speakers and mono microphone | | | |

The result is 40% more battery life than before — up to seven hours per charge — when using both batteries.

They recharge faster, too — in as little as two hours for both batteries when the PowerBook is asleep or shut down. And the batteries even recharge while you're using the PowerBook.

More information. While this has been an abundance of information, by any standard, it can't serve as a substitute for a personal demonstration. Something that can be easily arranged at your authorized Apple reseller. To find the one nearest you, simply call 800-732-3131, ext. 100. (In Canada, call 800-665-2775, ext. 910.)

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LETTERS

The Power and the Story

EARLIER THIS WEEK, I purchased a Power Mac 7100. Considering that I moved up from a Mac SE, even emulation zips along at Indy-car speed to my amazed eyes! Worthy of its name, my Power Mac is revealing to me a world of exciting possibilities. And with my new LaserWriter Select 360 — which I purchased thanks to your review ("A Printer on Every Desk," May '94, page 112) — my documents jump out like Pop Tarts from a hot toaster.

Despite these productivity gains, I miss my old SE and HP DeskWriter. Printing a one-page document with that combination afforded me enough time to grab a drink and a snack from my kitchen. Ten pages allowed me to engage in some quality cable-TV channel surfing. With my Power Mac and Select 360, that wonderful free time has all but vanished.

Neil J. Squillante
New York, NY

I CAN UNDERSTAND enthusiasm for the Power Macs, but I think Henry Bortman and company went overboard in the May issue ("Power Macs: Full Speed Ahead," page 76).

The machines are fast, but much of the native software is not scheduled for release until this summer or later. If you need speed or if you like having new toys, buy a Power Mac now. Otherwise, you might want to wait

until more software is available, when some of the initial hardware and software problems will be resolved, and when Apple usually releases new models and lowers prices on existing models.

Steve Fine
via ZiffNet/Mac

/ As we said in our Power Mac articles, "the largest factor in your decision [about when to switch to a Power Mac] is how soon the software you use will be available in native PowerPC form . . . You may not be able to get native versions of your applications . . . until months after the first Power Macs ship." It sounds like you're one of those people, so wait. But they're still great machines. / HB

CONGRATULATIONS and kudos to you all for an excellent series of articles on the new Power Macs! I was resigned to asking five or more "experts" about the new platform and going with the majority opinion. The completeness and precision of your reporting makes this (thankfully) unnecessary.

Jim Chowning
Everett, WA

THANKS FOR AN EXCELLENT review of the new PowerPC-based Macs. In your review, you mentioned that the operating-system upgrade was based on the "90/10 rule" — that Apple took native the 10 percent of System 7 that is used 90 percent of the time. Throughout the article, you state that the Power Macs will be even faster when the rest of the operating system is made native.

Based on my own in-depth analysis of Apple software promises, I recommend application of the Angeloni 10/90 rule: There is only a 10-percent chance that Apple will ever go native with the remaining 90 percent of the system code.

Vincent L. Angeloni
via the Internet

/ You, sir, are a pessimist. Although it's possible that not every itsy-bitsy teeny-weeny part of the Mac OS will be native at some point (I just can't see how a native Date & Time control panel would enhance users' Mac experience), it is in Apple's interest to make native as soon as possible those parts of the



OPEN FOLDER

Who says games aren't educational? Ten-year-old J.D. Zamfirescu ("your probably most highly specialized computer program checker"), from New York, New York, took exception to our review of SimCity 2000 (Reviews, May '94, page 69). The problem? "When getting to 120,000 people, you're able to build arcologies, colossal buildings that can hold a lot of people, so when I got to 100,000 people, I continued, not knowing that I was secretly losing \$27,000 a year!" Sounds like J.D.'s got a bright future with the city of New York.

And a political career could be in the cards for young Mike Noonan, from Swansea, Massachusetts, who writes: "I'm just a new customer asking if you can help me out by giving me stuff about computer science, cause that's what I want to be when I grow up. So could you please give me products. Thank you."

Special-interest software abounds, but there's still a niche to be filled, according to Melody Lipinski, of Anaheim, California. "Why are there so many computer programs for men? And why are they so spacy?" she asks. "Aliens, spaceships . . . get with it! Grow up! We need more programs for women. The flower and garden programs are fine, but how about something a little updated, like adventures for women or CD-ROMs with male nudes?" Yeah! Where's *The Emily Post Guide to Etiquette* on CD-ROM?

Dittoheads everywhere wrote in about Michael Swaine's reference to Rush Limbaugh in his March '94 column ("Rush to Judgment," page 31). "Although I don't mind Dittoheads any more than I do Trekkie or Deadhead, I prefer to think of myself as a graduate of the Limbaugh Institute of Advanced Conservative Studies," writes Tim Harkleroad, a ventriloquist/comedian from Bristol, Tennessee, whose letterhead sports a photo of Tim and his dummy — which looks surprisingly like . . . Rush Limbaugh. Dittohead, indeed.

Write to Letters

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To send your letter electronically via MCI Mail, CompuServe, or ZiffNet/Mac (our on-line service), see "How to Reach Us," on page 4. Our Internet address is letters@macuser.ziff.com. All letters become the property of MacUser, and we reserve the right to edit any letters we print. Include a return address and a daytime phone number. If you write to us on-line, please specify whether you want your electronic address printed.

ASK DR. POWER MAC

To answer your questions about upgrade and compatibility issues during this period of transition to Apple's new PowerPC-based computers, we've created a special letters section where you can Ask Dr. Power Mac.

I'M ABOUT TO BUY a 6100/60, probably with a CD-ROM drive. I'll want the SoftWindows software when it's upgraded to 486 compatibility later this year. I'm not a power user. So do I truly need 16 MB of RAM to run SoftWindows, or can virtual memory do the trick?

Don Mozes
via ZiffNet/Mac

/ You need the 16 MB. Using virtual memory instead of real RAM when you really need the memory will slow your Mac down something fierce, independently of SoftWindows.

I WANT to get a Power Mac 6100/60 in the AV configuration, but I'm a little short of cash. If I get a 6100/60 now, can I buy a plug-in card later to get AV capabilities?

Ryan Voges
via ZiffNet/Mac

/ At press time, Apple was not offering the Power Macintosh AV card as a separate product, so if you want AV capabilities, you'll have to buy an AV-equipped 6100.

YOUR TABLE detailing the Power Mac upgrade options for existing Macs did not list the Apple Power Macintosh Upgrade Card as being available for either of the AV Macs. Does Apple plan to release a different card for the existing AV Macs?

Eugene Cohen
via the Internet

/ Apple is not supporting the Upgrade Card as an option for the 660AV, and the 840AV doesn't even have a 68040 PDS in which you could install an Upgrade Card. You need a logic-board upgrade to transform your AV Quadra into a Power Mac.

I HAVE A PERFORMA 550. Does Apple have any plans to make the PowerPC available to 68030 owners, or would that present technical problems?

Brandon McClimon
Cranbury, NJ

/ An '030-based Macintosh isn't inherently disqualified from PowerPC upgradability. Apple recently announced that the entire Performa series (including the 550) is upgradable. In addition, DayStar Digital has announced plans to provide PowerPC upgrades for all color-capable desktop Macs.

Mac OS that benefit from the speed boost. Apple's long-term survival depends on the success of the Power Macs; that's a powerful motivator. / SCS

THIS IS NO DOUBT a lonely cry from the wilderness. I'm going to buy a Mac, and it's not going to be a Power Mac, even though I can afford it. The advice I hear from all corners is, "If you're in the market for a Mac, get a Power Mac. It's the future." That may be, but nowhere do I hear, "Figure out what you want to do, find the software that does it, and buy a computer that runs the software that meets your needs." More and faster isn't always better. Meanwhile, the introduction of the Power Macs has lowered the price of 68040 LC machines. I'm happy about that.

André Vellino
via the Internet

Tech Support in 3-D

I'M WRITING in response to your April '94 article "Entering the World of 3-D" (page 97). Although the article rates the features of our MacroModel product highly, Macromedia's technical support is rated as poor.

In consulting with your staff, we discovered that you issued your "poor" rating not because of the quality of support but because of our support policy. Macromedia offers free technical support for 90 days following the customer's first call. If customers want to continue using our tech-support services after 90 days, they can purchase any of a wide range of service extensions. Policies like this are typical of other vendors with large installed bases.

Rix Kramlich, 3-D Product Manager, Macromedia
San Francisco, CA

/ We did not mean to imply that the quality of Macromedia's customer service was poor. Instead, we were criticizing the high cost of the company's tech support. Most of the other vendors in the review provide free, unlimited support for their products without sacrificing quality. / CE

Stealth Public Relations

I TALK TO PEOPLE who say that Apple doesn't have a color laptop, which it does — but I've never seen a TV commercial for one. They say that Macs are too expensive, but with Apple's new prices, Macs have a higher price/performance ratio than comparably equipped IBM-compatibles — but I have never seen a TV commercial for that.

One IBM user I talked to said that PCs are

faster. I can't blame him for not knowing that the Power Macs blow PCs away, because I haven't seen a commercial for the Power Macs yet. But I have seen three ads for the Pentium, each about 500 times!

I have never seen a commercial for the AV Macs, which can be commanded with your voice *without* extra hardware or software. But I've seen a commercial for the Compaq Presario that claims that the Presario can be commanded with your voice, even though the fine print indicates that this requires buying extra software.

Apple had better get its act together, or even though Macs are far superior, the company will lose the computer wars.

Chad Milios
via ZiffNet/Mac

/ Here's the topper: Did you know that the Pentium commercial was created on a Motorola-based Mac running the ElectricImage Animation System? Now if Apple would only advertise that. / PP

Internet Exit Ahead

I LOVE *MacUser*, but I hate the way you've chosen to make yourselves accessible to the public. I tried to send you mail via the information superhighway, but I found out that there was no off-ramp to your part of the world! Can't you get an Internet address?

Clint McIntosh
Jacksonville, FL

/ Send your letters to *MacUser* via the Internet at letters@macuser.ziff.com. CompuServe and ZiffNet/Mac users can still reach us at 72511,422. / JS

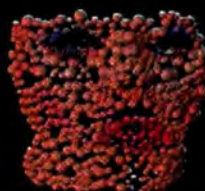
CORRECTIONS

Our story on the Newton MessagePad 110 (New on the Menu, May '94, page 37) listed an incorrect toll-free phone number for Newton upgrade information. The correct number at Apple is 800-756-4333. Also, the \$99 upgrade price does not include shipping and handling, which costs \$19.95.

In "A Printer on Every Desk" (May '94, page 112), the photos of the Apple LaserWriter Select 300 and the Apple LaserWriter Select 360 were actually of the Apple Personal LaserWriter 300. The Apple LaserWriter Select 300 should have been listed as being upgradable to Adobe PostScript Level 1 and having a PhotoGrade option. The right price for the consumables for the Texas Instruments microLaser Pro 600 PS23 is \$199 for the imager cartridge (rated at 15,000 pages per cartridge) and \$179 for the OPC cartridge (rated at 30,000 pages per cartridge). Also, the microLaser Pro 600 PS23 should have been listed as being Energy Star-compliant.



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CIRCLE 86 ON READER SERVICE CARD





Listen and Learn

IT TAKES TWO TO SPEAK THE truth," Thoreau wrote, "one to speak, and another to hear." When

MacUser subscribers speak about their experiences with products, we're ready to listen hard. And if you're thinking about buying a Mac peripheral, you'll want to know what we learned by listening.

MacUser and the Ziff-Davis Research Department commissioned Chilton Research Services, an independent market-research firm, to survey 10,000 *MacUser* subscribers to discover how satisfied you are with some of the most important products you buy — hard drives, monitors, and printers. We were also interested in discovering which companies were delivering the best service and support.

Before I spill the beans on the survey results, let me remind you that the No. 1 factor you'll want to consider continues to be whether a product actually lives up to its maker's claims. After all, no one but Hoover markets a product by saying it sucks.

The *MacUser*/ZD Labs staffs spend thousands of hours testing actual product performance. We run products through a gamut of real-world-applications tests, and this year we added MacBench 1.1 (one of the first native applications available for the Power Macs) to the lineup. MacBench has quickly become the industry-standard benchmark test for testing Macs, and one of the best things about it is that you can try it for yourself by downloading it from ZiffNet/Mac (see page 4 for details on how to access ZiffNet/Mac).

To augment this extensive testing process, we have long called companies anonymously to test firsthand the quality of their service and support. As the adage goes, when you buy a product, you don't just buy the product — you buy the company. This is especially important as products become

increasingly harder to differentiate. When hard drives' speed and performance fall within a relatively narrow range, knowing whether or not a drive's maker will give you adequate service and support suddenly becomes a key decision factor. The best way for us to gauge the overall quality of service and the only way to measure long-term reliability accurately is to conduct a large study that is statistically fair and unbiased.

To gather this information, we sent a four-page survey to 10,000 subscribers, inquiring about their experiences with specific companies and their products. This issue contains the results of the hard-drive study (see "Room to Grow: Midsized Hard Drives," page 92); we'll present the monitor and printer results in upcoming issues. (I'll give you a sneak preview of that data, though.)

According to our readers, APS and La Cie were the best of class, providing high-quality hard drives with good service and support. Other hard-drive manufacturers delivered products the readers liked, but — and here's the catch — survey respondents thought some of these manufacturers should do a better job when it came to service and support. Apple was a good example of this. Readers liked Apple's products but were definitely not happy with the accompanying service and support.

One interesting anomaly surfaced: It appears that the quality of Apple's service and support differs among the product lines. In

contrast to the hard-drive results, the results for monitors ranked Apple at the top, with Mirror Technologies, for the overall quality of technical support; in the printers category, Apple was judged the best, along with Hewlett-Packard and GCC, for overall technical support.

Besides application testing, MacBench, and this new subscriber study, we also now have usability testing in our repertoire. Us-

ability testing brings another dimension to our product knowledge. By sitting ordinary people down in a lab and watching them use a product or set of products to complete a set of tasks, we can see how users actually work with products and what stops them in their tracks. It provides a practical mea-

sure of a product's worth that goes beyond tabulating a list of esoteric features, many of which some people will never need.

Our first usability-test results, printed last month (see "Apple's PowerTalk," July '94, page 100), revealed how some elements of System 7 Pro could use improvement. When Apple unveils new system-software interfaces, we'll be looking to see if it made those improvements. In the meantime, watch for our next usability-test results this fall, when we report on ease of use in the fastest-growing software category of all: integrated applications.

Uncovering the truth about products requires not one but a multitude of techniques — whether it's creating new benchmarking-software standards, surveying thousands of readers, or recruiting testers for the usability lab. And you'll find this kind of truth only in *MacUser*. ☐

We surveyed 10,000 subscribers to find out what you think about the service and support you get from specific companies.

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Apple 



Duty Now for the Future

THINGS HAVE GONE TO HADES

in a handbasket lately, and it was time for someone around here to

take the bull by the horns. That's why we are now the leader of the entire United States of America, from top to bottom and from sea to shining sea. Seizing upon the precedent set by our predecessor, Joshua Norton, back in 1853, we have penned a proclamation; had it notarized in front of witnesses; and then had a ripping good meal with the witnesses, now chamberlains in our new cabinet, at a restaurant in Boston's North End, which we have commissioned as the East Coast Seat of Colonial Government.

Therefore, we shall now be properly addressed as Norton II, Emperor of the United States (although friends and colleagues may continue to call us anything except Buckethead), and we shall use the royal *we* until it annoys people to such an extent that they smite us in a tender area. Not wishing to be grabby at this juncture, we shall defer on claiming the *and-Protector-of-Mexico* bit of the title until we have had the chance to scope the place out for ourselves. In the meantime, municipalities with pleasant climes, local color, and a top-notch package of tax incentives are urged to contact us at this magazine with their bids to become the site of the Emperor's Basilica and the Royal Triple-Loop Corkscrew Coaster.

Leave It to Weasels

Why have we taken this admittedly drastic action? Partly because we always thought our puss would look great on a ten-dollar bill, but primarily for the same reason Norton I did: We have problems that need to be fixed pronto, and someone has to do it. Specifically, our platform centers on two odious issues:

First up, newsstands that shelve all the technical magazines *right* next to the

pornography. We realize that both target audiences are social pariahs, but come on — what if *your* Mom came in and saw you standing next to a whole rack of magazines with names like . . . well, with lots of verbs and gerunds in the titles? Yes, Nina's Corner in Harvard Square, we're talking to *you*: Rack our computer magazines next to the comic books, where they belong, or face the awesome wrath of the Royal Militia. We have helicopters.

Once that's out of the way, we're going to solve Troubling Problem No. 2: the fact that Mom and Dad have gone to Cancun for vacation and left the keys to the legal cabinet in the hands of entirely the wrong people. Within the high-tech pen in which we all wallow, the legal weaseling has assumed mythic proportions.

Look at the case of MIT student David LaMacchia. For a couple of months between November 1993 and January 1994, he operated a BBS on the Internet that let its users exchange copies of commercial software. Now, let's not sugarcoat this: He set up this BBS explicitly as a place where folks could come and get commercial software for free, which in our book, and the books of all right-thinking subjects of the Empire, is a major no-no. Depending on your point of view, there may be lots of *excuses* for such action but no valid *reasons*. The Law caught wind of this and wants to prosecute. Not campus officials, not local or state officials, but federal prosecutors. U.S. attorneys have handed

down a federal indictment for *wire fraud*.

Now they didn't charge him with actually downloading and using any of the software himself; as far as the indictment is concerned, he just provided the means for the crime. They didn't even try to indict any of the folks who actively participated in piracy. Nope, it's wire fraud, just as though

he'd broken into a bank's computers and electronically transferred a million bucks into his personal account. It's just wire fraud, as in a possible \$250,000 fine and hard jail time!

Why wire fraud, you ask? Almost solely because the government doesn't *have* a law that adequately

covers what LaMacchia did. If he'd taken one copy of WordPerfect, slapped it on a disk, and sold it to someone for ten bucks, they could definitely indict him on a criminal statute against copyright infringement. Software publishers could also handle the matter with civil suits. But that's not what happened. Our helpful suggestion to Big Government: Don't put someone away for armed robbery when he only got caught shoplifting. If a new law is needed, then *draft the legislation*.

MayberryNet

Another troubling aspect of the indictment is that prosecutors cited the anonymity of some of LaMacchia's users as being something of a smoking gun. Many users interacted with his BBS via a well-known site in Finland that offers an anonymous Internet service. The implication made in the indictment was that these users didn't want their identities known; therefore, they were

PROBLEM:

Your privacy is being invaded on the lawless electronic frontier.

SOLUTION:

Join Andy's Army, and get involved now.

up to something sneaky. Our fear is that this could indicate that The Gummint thinks of anonymity as a privilege and not a basic right, and the implications of that are downright scary.

And what about the government's Clipper-chip technology? It's like putting Barney Fife in charge of all of our country's communications, after which he decides to make every home in the United States just like those in Mayberry, with nothing more than an unlocked screen door barring exploration and surveillance. When the government starts demanding that I stick to using technology they can easily monitor, I start pricing real estate in Canada. For criminy's sake, if I want to blow up a building, I can just send my secret plans to Boris and Natasha by mail in a sealed envelope!

Again, I'll qualify my statements a bit. I won't deny that the ability to eavesdrop on phone communications (voice, fax, data) is an important tool for law enforcement. And I'm not even particularly opposed to the concept. In 99 percent of all phone systems, an authorized phone tap still involves a guy


driving out to the site to install it and a team of people in hard chairs monitoring the traffic. But do I trust my government enough to give them the ability to punch one button to open a back door in my town's digital phone system and to punch one more to break through my security web? With technology that might allow them to search days' worth of digitally recorded calls for a bunch of keywords? Uh-uh.

The entire point might even be moot. Public outrage has blossomed to such an extent that free, non-Clipper encryption schemes are being developed. Personally, I'm so disgusted by the whole fiasco that the topic of personal-communications security will largely decide whom I vote for — or more likely don't vote for — in the next presidential election.

Ten-Hup!

Ladies and gentlemen, the war will be a rough one, but our fight is the fight of the just. At the moment, the law is fumbling through the dark, groping around with hardly a clear idea of how to proceed in the

technological fantasia of tomorrow, and until it gets its bearings, a lot of people are going to get stepped on. The only reason why phone wiretaps were permitted at all was because of a highly questionable reading of outdated laws regarding the telegraph. The government got away with it all those years ago, for good or for bad, and for good or for bad, we're now stuck with it. So while we're preserving the natural wetland habitat of the Spotted Chesterfield and telling various corporations that maybe they should stop pouring mercury into our well water, let's give our kids another gift: freedom of information. If we want them to enjoy it in the future, we must be vigilant now and ensure that our legislators, through ignorance, don't poison the well through perpetuation of obsolete laws.

In the meantime — and we're sorry for saving this for the very last — conscription of all able-bodied men and women into the Royal Militia shall commence immediately. Report to Buzzy's Roast Beef in Boston (the Royal Provisioners) on July 11, in sneakers, at noon sharp. 



Even though PowerBooks are portable, they aren't always convenient. Batteries die, data gets lost or stolen, and controlling the cursor is, well, a curse.

Connectix PowerBook Utilities™ (CPU) solves these problems and makes your PowerBook a real pleasure to use.



CPU is the award-winning, number one selling PowerBook utility. **And now CPU works with all the new '040 PowerBooks.**

Order CPU from your favorite dealer or call us at (800) 950-5880 toll-free today.

A PowerBook with CPU installed:

- Extends your battery life
- Displays accurate battery status
- Allows keyboard shortcuts for menus and dialogs
- Protects your files
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- Saves your LCD screen when inactive
- Keeps the cursor visible
- And has over a dozen other enhancements.

CPU
CONNECTIX
POWERBOOK
UTILITIES

You never thought you'd lose your looks, either.

BUT YOU WILL.

AND THE ODDS ARE YOU'LL LOSE YOUR DATA, TOO.

In the last 12 months alone, half the respondents in a recent MacUser subscriber survey had lost data. It happened to them. And you can bet it's going to happen to you. Fortunately, you can avoid the inevitable with Retrospect from Dantz.

THE NUMBER ONE BACKUP SOFTWARE FOR THE MACINTOSH. We're not talking about some after-the-fact recovery utility that sends you digging through the trash and sifting through the scraps. But rather, full-blown, 100% seamless restoration. Something you'll definitely want when the data really hits the fan. With automatic backups, point-and-click operation, unparalleled performance, total support of every type of storage device, and ridiculously simplified network operation.

RETROSPECT HAS SWEEPED THE TOP INDUSTRY AWARDS. From the MacWeek Diamond Award to the coveted MacUser Editor's Award. So whether it's for a single user, or an entire network, Retrospect will keep you covered. And at a price you can afford—less than \$200 for individuals, a bit more for networks. To learn how Retrospect can help you, visit your local dealer. Or call Dantz at 1-510-253-3020 to receive a free copy of our white paper: Backup—Personal Computing Insurance.

What have you got to lose?
CIRCLE 28 ON READER SERVICE CARD

dantz

BACKUP BY



RETROSPECT

CREATIVE FORCES ARE DRAWN TO THE VIEWSONIC 17



Your mind's eye visualizes the finished work and you are drawn to the screen of the new ViewSonic 17. This is where perfection is found. The image on the screen is vital to you — not all monitors are created equal. That's why we developed the New Generation ViewSonic 17 color monitor. There is a difference!

The revolutionary super dark screen of the ViewSonic 17 is designed to increase contrast and produce pure, sharp colors. In addition to a vivid, luminescent image, our digitally controlled 17" monitor offers ViewMatch,™ a color control system designed to accurately match the screen to printer output. To customize settings, such as screen size or pincushioning, there is OnView,™ an easy-to-use array of on-screen adjustments. And the monitor supports non-interlaced resolutions up to 1,600 x 1,200 pixels.

The ViewSonic 17 is even equipped with BNC connectors, which allows two systems to be attached to the monitor at the same time. As a matter of fact, the entire line of ViewSonic's 15- through 21-inch New Generation monitors is MAC and PC compatible, and meet Swedish MPR-II standards for low radiation.

Unleash your creative forces with the new ViewSonic 17 ... and See The Difference!

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17" CRT's hold 15.5" to 15.7" diagonal viewable screens.
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ViewSonic®
See The Difference!™



Newton's Niche

HE WAS A KLUTZ, HAD TROUBLE communicating, and was born prematurely. And Apple chose

to name the Newton MessagePad after him.

I guess they put some thought into product names, after all.

In his defense (as if Sir Isaac Newton needs defending), the original Newton had his successes in certain esoteric specialties. And sure enough, specialties (so-called vertical markets, such as medicine and real estate) are exactly where Apple will be pitching its Newton MessagePad now.

The reason is obvious. MessagePad sales figures have been dropping like Newton's apple, down to apparently under 30,000 for the first quarter of this year.

This situation has inspired various (not necessarily equal or opposite) reactions: Gaston Bastiaens, head of the Apple PIE division, which markets the Newton, is out; related consumer products have been shelved; and PIE is now shifting its efforts from general consumer to vertical markets.

That last reaction, at least, is smart: The Newton's vertical markets, with little encouragement until now from Apple, have been prospering, in a small way. And that makes sense.

Traditional models for computer-software sales focus on the all-important installed base of machines. If you're selling real-estate software for the Mac, you can at best hope for some fraction of that fraction of Mac users who also are real-estate agents.

The Newton model is entirely different: Since the machine costs little more than a premium software package, you can sell the Newton as part of the solution, and the installed base becomes irrelevant. The potential market for that Newton realty product is all the real-estate agents in the world.

Because any single significant vertical segment comprises more potential users

than current Newton owners, it's pretty obvious why PIE is moving to vertical markets.

A little *too* obvious, perhaps?

Certain questions suggest themselves regarding the nonvertical (let's say horizontal) market PIE is moving away from — questions you would think Apple would have asked itself sometime during Newton development.

- Who was going to write the horizontal-market applications?

Big, established software companies can't sell applications for less than several hundred dollars apiece unless the installed base is enormous. Therefore, Apple, being reasonable, did not expect big, established software companies to write much software for the MessagePad.

- Where would MessagePad users buy the low-cost horizontal-market software that was not developed by big, established software companies?

Computer-store shelf space is precious, and it would not have been reasonable to expect MessagePad applications to elbow out established Mac and PC applications. Delivery is also a problem, since MessagePads don't have disk drives and PCMCIA cards are expensive. A reasonable expectation would have been that many MessagePad users would download their software.

- What, exactly, would these low-cost horizontal-market programs, not developed by big, established software companies, downloaded by MessagePad users, be?

A reasonable list of necessary horizontal-

market programs for the MessagePad would include notepad, address-book, to-do-list, appointment-calendar, and communications applications. Nothing else seems essential. And Apple, seeing a need and filling it, bundled all that with the MessagePad (leaving out some of the communications features for later versions).

This leaves utilities.

So in other words, prior to the release of the MessagePad, a reasonable prediction of horizontal-market applications would have been utilities from small software companies, delivered online at low cost — that is, shareware.

Clearly, vertical markets were the way to go, and it didn't take plummeting sales figures to see that.

So what was Apple thinking?

Did the members of the Newton team think that third-party software would not be a significant factor in the success of the Newton? Did they think that vertical markets were ultimately the path to Newton success but that before addressing the real (vertical) market, it would be smart to sell to an imaginary (horizontal) market to snare the gadget freaks who would buy any new toy? Or did they just not think?

I put that question to an insider. His answer: They just didn't think; Newton development was a seat-of-the-pants thing. In other words, Apple brought just as much strategic planning to introducing the MessagePad as it did to introducing the Macintosh.

I find that somehow reassuring. And I'll take any reassurance I can get right now. I keep remembering that Isaac Newton was an orphan. ☹

What was Apple thinking when it launched the Newton? Or did anyone think at all?

- ORG CHARTS, BAR CHARTS, FLOW CHARTS AND PIES.
- CALENDARS, TABLES AND TIMELINES.
- PREFORMATTED CHARTING TEMPLATES PLUS FREE-FORM DRAWING.
- PRESENTATIONS WITH IN-PLACE EDITS OF CHARTS AND DRAWINGS.
- WORD PROCESSING WITH COLUMNS AND OUTLINING.
- ONE SEAMLESSLY INTEGRATED PACKAGE FOR THE POWER MACINTOSH.

WOW! I GOTTA HAVE THIS.



Think of it as a whole new way of looking at your business.

Some people look at business and see an endless progression of boring, unproductive meetings.

Others look at it and see an endless progression of opportunities. Opportunities to build consensus between colleagues. To sell new ideas. And advance their careers.

Which way do you see it?

That could depend on the tools you use to prepare for those meetings. Which is a good reason to look at ClarisImpact™ software from Claris. And at the new Power Macintosh™ computers from Apple.

It's eight packages in one.

As you've probably heard, the Power Macintosh paves the way for a new generation of powerful business applications.



Powered by the new PowerPC chip, Power Macintosh computers run blazingly fast, while providing the expandability, compatibility and A options you need to embrace the future, today.

Applications like ClarisImpact 1.0.

What makes it so powerful? For starters, buying ClarisImpact is like buying eight sophisticated business graphics programs for the price of one.

Just fire it up, and you can create org charts to document the ever-changing corporate hierar-



chy. And create flow charts to simplify the most complex of processes.

You can build timelines to help everyone get their work done on time. Create calendars to help workgroups coordinate that time. Draw pictures more powerful than words. Cook up pie charts. Build bar charts. And more.

You can even build on-screen presentations, slides, handouts and overheads.

And refine your reports with the integrated, full-featured word processor.

It's one of a kind.

Unlike other business graphics solutions, ClarisImpact is fully integrated. Which means combining text and graphics is a snap. Editing your images is every bit as easy—you never even have to leave the document you're working on.

Since you're using just one program, you only have to learn one user interface.

And because ClarisImpact was designed for businesspeople, not artists, it includes 2,400 useful clip art images and a wide variety of preformatted templates to help you make your points most effectively.

No other business package gives you so much. For that matter, no package of its kind is optimized for the Power Macintosh, either.

So you can get everything done faster. And easier. The Power Macintosh way.

It's Power Macintosh fast.

As you'd expect from any computer named Macintosh®, the Power Macintosh runs thousands of powerful, off-the-shelf business programs.

But that's just the beginning.

At the heart of every Power Macintosh is a PowerPC™ 601 microprocessor, the first of a new family of ultra-high-performance RISC chips developed in a unique collaboration between Apple, IBM and Motorola.

Which means software rewritten to take advantage of this chip runs blazingly fast—faster than the same software would run on a Pentium-based PC.*



With eight charts and graphics modules in one integrated package, ClarisImpact gives you everything you need to make your business look its best.

Which also means ClarisImpact running on a Power Macintosh is, quite simply, one of the fastest business graphics packages you can find.

To try ClarisImpact, call Claris at 800-544-8554, ext. 322, for a free demo disk!

For the name of your nearest authorized Apple reseller, call 800-732-3131, ext. 600. And discover the power in the new Power Macintosh. The power to be your best. Apple



Introducing ClarisImpact for Power Macintosh.

TIME magazine's images at Lillehammer were breathtaking.



**PowerPro 601
Now Shipping!**
Power Macintosh 8100
performance for half
the price!

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Thanks to DayStar, they arrived in New York in record-breaking time.

We're DayStar, and we helped TIME do just that. This was the first time the magazine used a Macintosh instead of a high-end CEPS workstation, and you can bet it won't be the last. When images travel this well, this quickly and easily, you know you've got a winning team. We worked hand-in-hand with TIME to acquire breathtaking images. These images were scanned, batched in Lillehammer, Norway and transmitted to the editors in New York. The same images were on the streets within days.

Find out more about how you can successfully partner with DayStar to keep your quality levels high and turnaround time low, by calling 1-800-962-2077.

Blow your competition away with DayStar's full line of imaging products, including the new PowerPro 601 PowerPC upgrade.

DayStar's world class products make your Mac the ultimate imaging workstation!



TIME and DayStar used a Macintosh Quadra and a color-corrected display with DayStar's ColorMatch Colorimeter 24 and Image 040 accelerator. After the images were scanned, DayStar's PhotoMatic software helped acquire and transmit the images in batch mode.



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CIRCLE 36 ON READER SERVICE CARD

NEW ON THE MENU

DOCUMENT DISTRIBUTION /

ENVOY DISPATCHES DOCS

WordPerfect challenges Adobe and others in quest for paperless office.

PORTABLE DIGITAL DOCUMENTS have been touted as the answer for corporations that want to distribute information without chewing up trees. But so far, the market hasn't exactly taken off. Now WordPerfect thinks it has a solution that makes sense for users of its products — as well as anyone else who wants to create and distribute electronic documents.

Designed to be fast and affordable (\$189), WordPerfect's Envoy offers most of the features available in other portable-document-creation products, such as Adobe Acrobat, No Hands Software's Common Ground, and

Farallon's Replica. What Envoy brings to the table is the ability to create fully formatted documents, complete with hypertext links and annotations, and then distribute them freely without requiring recipients to buy a viewer application. Instead of requiring recipients to install special software in order to view a document, Envoy allows embedding of a run-time viewer in the document itself. WordPerfect also plans to make a stripped-down Envoy viewer application available at no cost later this year.

Envoy also comprises a creator-and-viewer application and a Chooser extension that creates an Envoy document by printing from other applications. The Envoy application lets you jump between linked passages, and bookmark and thumbnail tools let you move quickly to key sections. Dragging any file onto the Envoy application creates a new document automatically.

To aid in collaborative editing, Envoy lets users emphasize text with a bright-green highlighter or add text notes, which can be assigned distinct properties such as color or

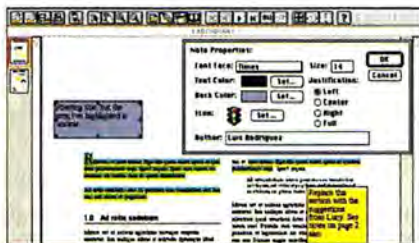
typeface, to make them easy to identify by author or priority level.

The run-time viewer, which adds about 300K to the size of an Envoy document, offers every viewer feature in the stand-alone application except one: It can't view any Envoy documents other than the one it's embedded in. You can choose to password-protect a file or cripple the run-time version so recipients can't modify the document or copy text from it.

If a font used in an Envoy document is missing from a recipient's computer, Envoy substitutes a font whose metrics map to those of the original. You can also choose to embed TrueType fonts in your documents. Whatever method you use, column, line, and page breaks will always be preserved.

Unlike Acrobat, Envoy is not based on PostScript. This may give Envoy a boost in speed, but it may also decrease the fidelity of viewed documents, especially those that contain PostScript fonts. It also doesn't allow the creation of documents from PostScript files, an option offered by Acrobat Distiller. However, PostScript-based vector graphics from applications such as Illustrator and FreeHand remain scalable in Envoy.

Users of competing programs can use WordPerfect's competitive-upgrade promotion to purchase Envoy for \$99. 800-321-4566 or 801-225-5000. / Nancy Peterson



In addition to highlighting text in Envoy, you can attach notes with certain colors, fonts, and so on for easy identification.

QMS' New Color Laser Printer Ups the Resolution, Lowers the Price

DESKTOP COLOR LASER printing has been heralded as The Next Big Thing for a couple of years now. QMS struck first, last year, with the ColorScript Laser 1000, and now it's improving on the shortcomings of that model with its Magicolor laser printer.

The main differences between the two printers are resolution and price. The new Magicolor offers 600-x-600-dpi color and monochrome output, compared to its predecessor's 300 dpi. It also offers better screening — as many as 106 lines per inch — which should appeal to graphic artists as well as business users.

As for price, the Magicolor comes in two flavors: a \$9,999 version, which has 12 MB of RAM and is capable of 600-dpi monochrome or 300-dpi color output, or a \$10,999 version, which has 28 MB of RAM and is capable of 600-dpi monochrome and color output. The ColorScript Laser 1000 cost \$12,500 at introduction (owners of that printer can upgrade to the Magicolor for \$2,499).

The Magicolor can print monochrome at 8 ppm and color at 2 ppm.

For fast processing, it has a 33-MHz Intel RISC chip that's coupled with job spooling and automatic switching among PostScript Levels 1 and 2, HP PCL 5C, and HP-GL emulations. LocalTalk, serial, and parallel ports are standard. Optional interface cards for Ethernet and token-ring networks allow it to support such network protocols as EtherTalk, TCP/IP, and NetWare simultaneously.

The Magicolor prints on plain letter- and legal-sized paper and transparency media. Per-page costs range from 9 cents (9-percent coverage) to 70 cents (72-percent coverage). 800-523-2696 or 205-633-4300. / Tony A. Bojorquez



TECHNOLOGY TRENDS /

APPLE DIPS INTO TALIGENT POOL

Future OS to include object-oriented technology.

SYSTEM 7 ISN'T the only operating system in which Apple has a hand. Pieces of Taligent, the object-oriented technology forged by Apple, IBM, and Hewlett-Packard, will be included in some Apple operating systems as early as 1995. In the future, you will be able to run the complete Taligent operating system on your Mac.

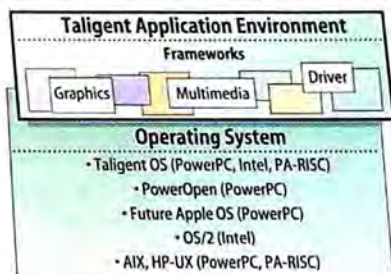
Developed by its eponymous company, Taligent is a task-oriented programming/user environment based on libraries of code called frameworks, which are designed for specific functions. Because the frameworks provide much of the functionality of Taligent applications, the applications can be relatively small — a boon for developers as well as users.

In a complete Taligent environment, the Taligent user interface — known as People, Places, and Things — sits on top of the frameworks. It consists of icons that represent users, network resources, and application functions. The interface is almost fully drag-and-drop, letting you drag multiple live elements (such as incoming scrolling data or QuickTime movies) into document windows without needing separate applications open for each element.

Apple plans to draw on frameworks from Taligent's own products: Taligent Object Services (TOS), a fully object-oriented operating system that supports transparent access to major networks, databases, and messaging and directory services, and the Taligent Application Environment (TAE), a multiplatform run-time environment that will ship in early 1995. Developers will be able to create application modules by altering the TAE frameworks and will also be able to add new operating-system features that any Taligent-based application will be able to

incorporate without needing rewriting.

In 1995, Apple will include some TAE frameworks in its PowerOpen-compliant UNIX for PowerPC-based machines. IBM has added some Taligent frameworks to its OS/2 developer kit already and will include frameworks



Elements of the TAE, called frameworks, can be incorporated into any number of operating systems, including the Macintosh OS.

in Workplace OS and AIX.

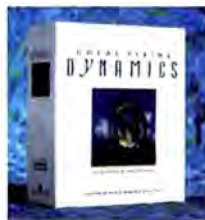
Mac users won't be able to run the full TAE on today's System 7, as TAE requires preemptive multitasking, which won't appear in the Macintosh OS until at least 1995. However, Apple is investigating using selected TAE features in future versions of System 7.

/ John Rizzo

ACCOUNTING SOFTWARE /

Great Plains Dynamics Plows More Fields

GREAT PLAINS DYNAMICS first scored big points with corporate Mac users thanks to its graphical interface. Now its latest version may convince even more users to switch from a mainframe accounting system to one based on personal computers.



With Dynamics C/S+, Dynamics' client/server version, Great Plains has added big-business features such as account numbers that can have as many as 66 characters and 41 segments (for creating highly detailed reports) and support for 367 accounting periods per fiscal year (with any number of years).

Great Plains has also addressed corporate concerns about performance. For instance, Dynamics C/S+ supports distributed processing — users can send processing-intensive tasks, such as posting and reporting, to any computer on the network. A suite of tools lets you customize reports, set up security access, and even create new on-screen buttons that take you directly to your work set.

In its initial version, Dynamics C/S+ supports the Mac operating system as well as Windows. By the end of the summer, a native PowerPC version and several UNIX versions will be available. Dynamics C/S+ comprises 13 modules; prices range from \$5,000 to \$40,000. 800-456-0025 or 701-281-0550. / Cheryl England

MACUSER/ZMAC UTILITY OF THE MONTH



Move It, Lose It, or Alias It

SMOOTHMOVE, this month's ZMac Utility, provides a novel way to move, copy, or alias files by choosing a menu command. By attaching a pop-up menu of common folder destinations to the Finder's Special menu, SmoothMove lets you select files and then move them instantly to the Trash, the Apple menu, your System Folder, or other favorite locations. Holding down a modifier key places a copy or alias of the file at the chosen destination, such as a frequently used folder.

Created by John and Sheila Wallace, of Fluent Software, SmoothMove is available exclusively from the ZiffNet/Mac service on CompuServe (GO ZMC:MACUSER), ZiffNet Selections on AppleLink, and ZiffNet/Mac services on eWorld (Shortcut: MacUser). / Mark Simmons

ON-LINE SERVICES /

Now Entering eWorld . . .

APPLE'S NEW ON-LINE SERVICE has opened its virtual doors as a news, information, and entertainment source for Mac users. (See New on the Menu, March '94, page 39.) An eWorld starter kit now comes with every new Mac. Owners of older Macs can order a kit by dialing 800-775-4556 or 408-974-1236. eWorld costs \$8.95

per month, including two hours' worth of night or weekend calls. Beyond that, eWorld costs \$4.95 per hour at night and on the weekend and \$7.90 per hour on weekdays.

/ Jason Snell



POWERPC UPDATE

ISOLATE POWER MAC SLOWPOKES

Utility identifies mismatched system software.

POWER MAC SLOWDOWN is often caused by extension and control-panel conflicts, but Casady & Greene's new Conflict Catcher II 2.1 lets you identify the culprits that are bogging down your Power Mac as a result of mismatched code.

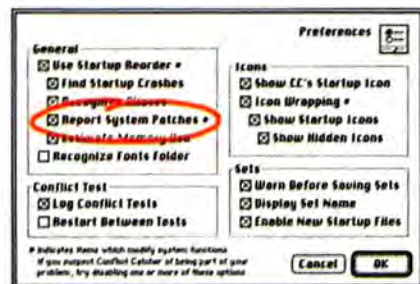
Many extensions and control panels install patches, pieces of code that replace or add to existing code in the Mac's system software. In the 680x0-only days, only a single type of patch existed, but the advent of the Power Macs has brought three kinds of patch: emulated, native, and fat. An *emulated* patch consists of 680x0 code, which

which will execute the fastest. A patch should generally be of the same type as the code it's patching; it's especially important that native code be patched with native code. \$79.95; upgrade from version 2.0, free via updater available on most on-line services or from Casady & Greene; upgrade from version 1.0, \$29.95. 800-359-4920 or 408-484-9228. / Stephan C. Somogyi

Motorola Adds Clever PPC Compiler

MOTOROLA HAS COMMITTED its PowerPC expertise to a set of compilers for Apple's Macintosh Programmer's Workshop and Metrowerks' CodeWarrior, the current leading development environments for the PowerPC. The new compilers for C, C++, and FORTRAN code offer the ability to optimize for the PowerPC 601, 603, 604, and 620 processors simultaneously. This will result in more-timely delivery of native applications and faster applications that can exploit the performance of the entire PowerPC processor line. Orders for the MPW compiler, initially priced at \$349, were to begin in July. CodeWarrior should be available in a beta version sometime toward the end of 1994.

/ Sean J. Safreed



can slow down your Power Macintosh measurably if it adds to native code. A *native* patch consists of PowerPC code, which can sometimes also cause slowdowns. A *fat* patch contains both 680x0 and PowerPC code, and the operating system can pick

Speed Up Your Power Mac

ITCHING FOR EVEN MORE speed from your Power Mac? A new cache card and a clock accelerator are designed to enhance your Power Mac's performance.

Mobius has announced two Power Mac Level 2 cache cards that have larger caches than Apple's. The Speedster Cache 601 is available in a 512K version for \$299 and as a 1-MB cache



SIMM for \$499; in contrast, Apple's 256K cache SIMM for the Power Macs, which comes pre-installed in the 8100, costs \$299. 510-654-0556.

KS Labs has introduced the Alacrity PM 6100, a hardware clip that attaches to the processor clock on the 6100's logic board, bumping its speed up from 60 MHz to 80 MHz. A fan for cooling off the overrevved processor ships with the clip. A clock booster for the 66-MHz 7100 was to be available in June. The company offers a 30-day money-back guarantee too. \$165. 800-450-0353 or 614-374-5665. / SCS

TECHNOLOGY TREND /

Will PowerPC Control Your Next TV?

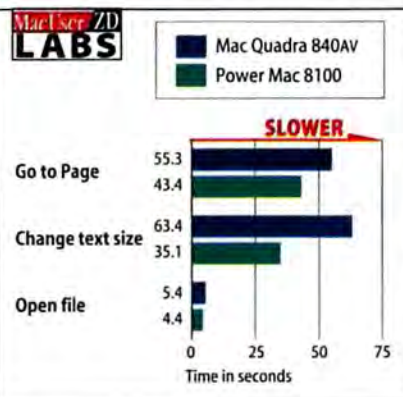
WHILE THE BRUNT of the publicity about the PowerPC is aimed at the desktop-computer market, the adage "toasters to teraflops" is becoming reality. IBM recently announced the PowerPC 403GA, a powerful processor designed for so-called embedded systems and the first member of IBM's 4xx family.

Embedded systems are single-purpose, dedicated hardware designs such as laser printers, video games, and ignition computers in automobile engines. In contrast to general-purpose, desktop computers, on which you can run all kinds of software, embedded systems are designed to do one thing only.

Ford Motor Company announced last year that it would build a next-generation transmission computer with an embedded PowerPC chip from Motorola. Although no one had announced the adoption of the new 403GA at press time, IBM proposes that good uses for its 4xx chips would be in PostScript-laser-printer controllers and TV-set-top computers. PowerPC, coming to a home appliance near you. / SCS

Power Mac Time Trials

ALDUS PAGEMAKER is now available as a native application. How fast is it? We ran tests on a 2-MB PageMaker file, using a Mac Quadra 840AV with on-board video running in 8-bit mode and a Power Mac 8100 with its VRAM running in 8-bit mode. Each had 16 MB of RAM, a 1-GB Apple hard drive, and a 16-inch Apple monitor. We found that PageMaker running in native mode was as much as 181 percent faster in one of our tests. / SJS



NEW & NOTABLE

HARDWARE /

NEC MultiSync 2V. Providing resolutions as high as 1,024 x 768 pixels on a 14-inch (13 inches viewable) screen, this multiple-scan monitor is Energy Star-compliant. It also features a dot pitch of .28 mm, for detailed on-screen images. \$355. 708-860-9500.

▼ **La Cie Joule Modular Storage System.** By allowing you to stack as many as seven devices while using a single SCSI cable, Joule makes hard-disk and removable-media drives plug-and-play. This sleek system consists of a base containing a drive, power supply, fan, and SCSI port; full- and half-height mounts that form the unit's spine; drive modules that attach through slots in the mounts; and a top cap, which holds the single SCSI cable that connects the unit to your Mac. Price varies by component. 800-999-0143 or 503-520-9000.

Practical Peripherals MacClass Modems. This family of high-speed modems includes the MC288LCD V.FC (\$529), a V.34 28,000-bps modem that also features a vertical mount, external-speaker volume control, a three-line LCD that displays configuration and connection data, and support for operation over leased lines. Its pared-down sibling, the MC288MT II V.FC (\$399), uses the same V.34 protocol. 805-497-4774.

Fujitsu DynaMO 230. A 3.5-inch magneto-optical drive that accepts existing 128-MB cartridges as well as new 230-MB cartridges, the DynaMO 230 runs at 3,600 rpm and has an average seek time of 30 milliseconds. It's available as an external drive (\$1,100) or as an internal kit (\$1,225) for the Quadra 800 and 840AV. 408-432-6333.

Polaroid Polaview. The Polaview line of color LCD panels is designed for screen projection of multimedia presentations. The top-of-the-line Polaview 3000 (\$6,695) is an active-matrix panel with 24-bit-color capability as well as an integrated video adapter. The Polaview 1800 (\$4,995) is an active-matrix panel with 21-bit color; a video adapter is optional (\$995). The Polaview 1500

(\$3,495) is a passive-matrix panel with 18-bit color. Each comes with a wireless remote control. 800-662-8337, ext. 970.

Newer Technology Quadra Cache. This slotless 128K cache card plugs in to the Quadra motherboard's CPU socket (you move the CPU chip onto the cache card), leaving the Quadra's PDS and NuBus slots free for further expansion. The card works in all Quadra and Centris models except the Quadra 840AV. \$375. 316-685-4904.

SOFTWARE /

Hard Disk Toolkit 1.5.1. The latest version of this disk-management package supports SCSI Manager 4.3, which ships with the Power Macs and the Quadra AV models. \$199. FWB. 415-474-8055.

STF AutoPak. AutoPak is an add-on package of four modules for FaxSTF 3.0 that lets it perform OCR on incoming faxes, automates the printing of received faxes, and allows conversion to fax format to run in the background. AutoPak also includes a developer kit for creating fax-enabled applications. \$89 (\$129 bundled with FaxSTF 3.0). STF Technologies. 816-463-2021.

SoundEdit 16. The latest in the SoundEdit series of sound-input and -editing programs, SoundEdit 16 offers a refined interface and support for 16-bit sound as well as for multitrack QuickTime soundtracks. \$379. Macromedia. 415-252-2000.

American Heritage Talking Dictionary. This CD-ROM features "real voice" pronunciations for 72,000 words and definitions for over 200,000 words and a 500,000-word thesaurus. \$59.95. SoftKey. 617-494-1200.

▼ **Far Side Screen Saver.** The wacky world of Gary Larson is plenty weird when it is captured, unmoving, in the morning paper. But his cow-populated imagination runs wild (and in 256-color animation) in this four-module set. \$40. Delrina. 416-441-3676.

Star Wars Screen Entertainment. Animation and clips from the original *Star Wars* movie are featured in this 14-module screen saver, which uses Delrina's Intermission screen-saver engine. Animations of characters such as the Jawas and R2-D2 are mixed in with slide shows of movie posters, original storyboards, and character bios — including information that never appeared in the movie itself. \$36. LucasArts. 415-721-3342.

MACINTOSH PRICE INDEX

THE UNITED COMPUTER EXCHANGE index reflects average sales prices of new and used Macs as of May 9, 1994. Prices (except those for compact models) do not include a monitor or a keyboard. The United Computer Exchange is a national clearinghouse of used microcomputer equipment.

| Mac Model | New | Used |
|-----------------------|---------|---------|
| Plus (1/20) | * | \$275 |
| SE (1/20) | * | \$375 |
| SE/30 (5/40) | * | \$700 |
| Classic (2/40) | * | \$475 |
| Classic II (4/40) | * | \$600 |
| Color Classic (4/80) | * | \$700 |
| LC (2/40) | * | \$325 |
| LC II (4/40) | * | \$425 |
| LC III (4/80) | * | \$600 |
| II (5/40) | * | \$400 |
| IIx (5/40) | * | \$550 |
| IIx (5/40) | * | \$700 |
| IIcx (5/40) | * | \$500 |
| IIci (5/80) | * | \$750 |
| IIfx (8/160) | * | \$1,200 |
| IIvx (4/80) | * | \$875 |
| Centris 610 (4/80) | * | \$950 |
| Centris 650 (8/230) | * | \$1,575 |
| Centris 660AV (8/230) | * | \$1,600 |
| Quadra 605 (4/80) | \$799 | \$700 |
| Quadra 610 (8/230) | \$1,779 | \$1,450 |
| Quadra 650 (8/230) | \$2,069 | \$1,750 |
| Quadra 660AV (8/230) | \$1,849 | \$1,600 |
| Quadra 700 (8/230) | * | \$1,400 |
| Quadra 800 (8/230) | * | \$1,850 |
| Quadra 840AV (8/230) | \$3,079 | \$2,450 |
| Quadra 900 (8/230) | * | \$1,775 |
| Quadra 950 (8/230) | \$3,599 | \$2,475 |
| Portable (1/40) | * | \$375 |
| PowerBook 100 (4/20) | * | \$700 |
| PowerBook 140 (4/40) | * | \$850 |
| PowerBook 145 (4/40) | * | \$975 |
| PowerBook 145B (4/80) | \$1,349 | \$1,050 |
| PowerBook 160 (4/80) | * | \$1,375 |
| PowerBook 165 (4/80) | \$1,699 | \$1,400 |
| PowerBook 165c (4/80) | * | \$1,375 |
| PowerBook 170 (4/40) | * | \$1,350 |
| PowerBook 180 (4/80) | \$2,049 | \$1,775 |
| PowerBook 180c (4/80) | \$2,549 | \$2,050 |
| Duo 210 (4/80) | * | \$1,050 |
| Duo 230 (4/120) | \$1,529 | \$1,200 |
| Duo 250 (4/200) | \$1,999 | \$1,700 |
| Duo 270c (4/240) | \$2,799 | \$2,450 |

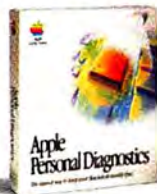
* = discontinued model

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

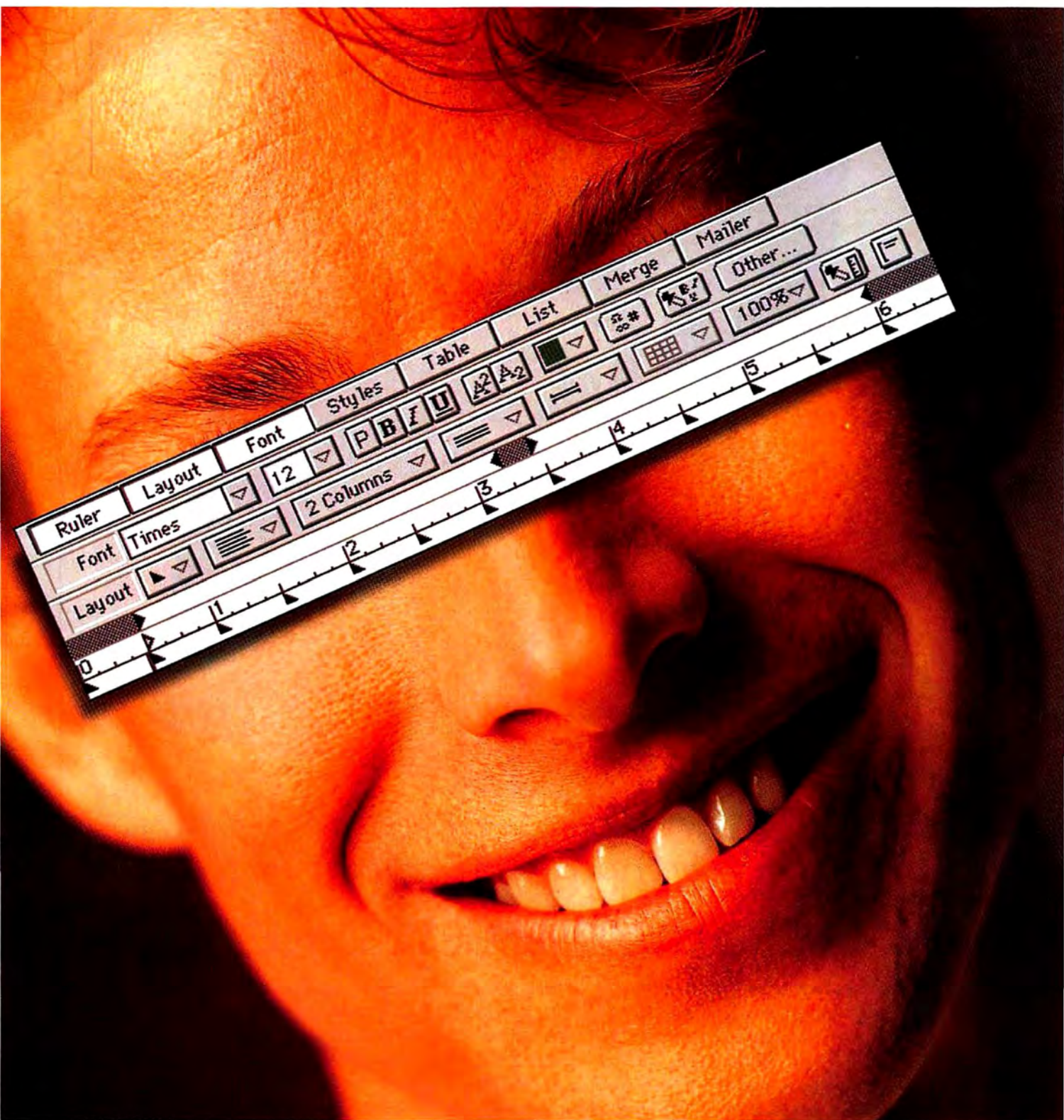


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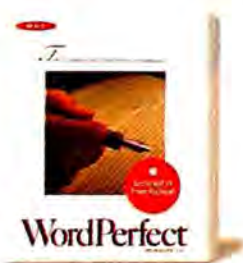


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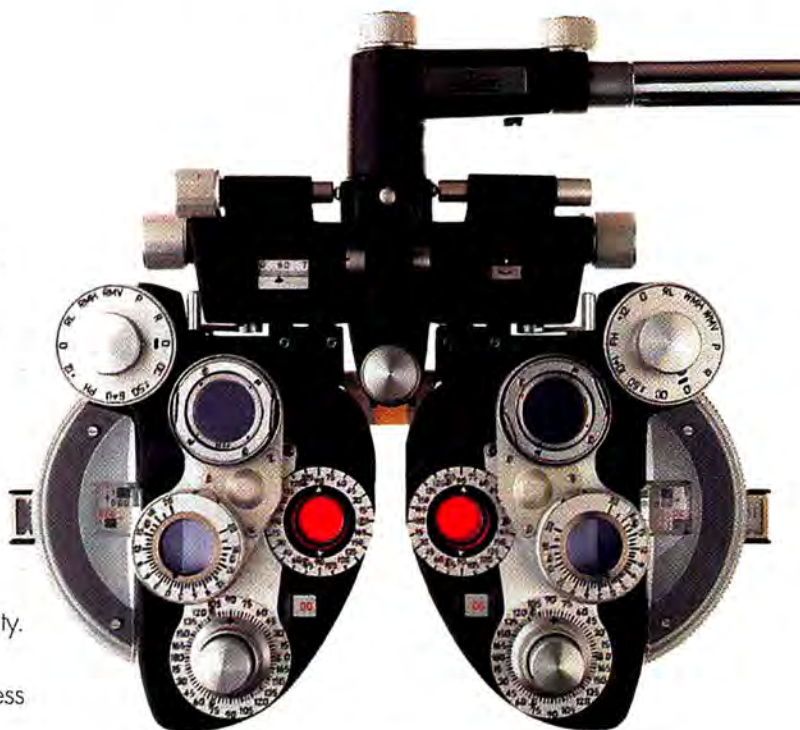
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REVIEWS & Quick Clicks



HP LaserJet 4M Plus / Speed and solid networking features send HP's laser printer to the head of the class.

IF YOU THINK that the Hewlett-Packard LaserJet 4M is a tough act to follow, you're right. But HP's successor to that venerable 8-page-per-minute workgroup printer is sure to generate at least as much applause as the LaserJet 4M did when it was first introduced. The 600-dpi, 12-ppm HP LaserJet 4M Plus is the latest addition to HP's line of PostScript laser printers. Compared to its predecessor, the LaserJet 4M Plus offers improved speed, connectivity,



and paper handling — all at the same price as the LaserJet 4M. And the LaserJet 4M Plus is no slouch when compared with the competition either. For printing complex documents, we found the Hewlett-Packard printer faster than the Apple LaserWriter Select 360 by a wide margin, due to the speed provided by the LaserJet 4M Plus' built-in Ethernet connection.

and paper handling — all at the same price as the LaserJet 4M. And the LaserJet 4M Plus is no slouch when compared with the competition either. For printing complex documents, we found the Hewlett-Packard printer faster than the Apple LaserWriter Select 360 by a wide margin, due to the speed provided by the LaserJet 4M Plus' built-in Ethernet connection.

A Definite Plus

The \$2,479 HP LaserJet 4M Plus is not just a good network printer; it's a superb network printer. Tailor-made for small workgroups, the LaserJet 4M Plus is speedy — it has a 12-ppm Canon engine with a duty cycle of 20,000 pages per month and a 25-MHz Intel 80960KB RISC processor. The printer comes with 6 MB of RAM, expandable to 38 MB — a definite plus if you need to store lots of fonts.

Out of the box, the LaserJet 4M Plus is

network-ready. The printer comes with an HP JetDirect MIO (modular input/output) card for Ethernet (10BASE-T as well as BNC) and LocalTalk connectivity, plus an HP Bi-Tronics parallel and an RS-232 serial interface. The MIO, parallel, and serial interfaces are simultaneously active and switch between the printer's built-in Adobe PostScript Level 2 and HP PCL 5e printer languages. The one important option that's missing is a SCSI interface for attaching a hard drive.

In addition to the LaserJet 4M Plus' 600-dpi resolution setting, you can opt for the 300-dpi setting; both settings are available with or without HP's Resolution Enhancement technology (REt). Also, the LaserJet 4M Plus offers EconoMode, a toner-saving option that produces surprisingly legible draft-mode output.

Easy Being Green

The LaserJet 4M Plus is not only well equipped and fully featured but it's also one of the most environmentally conscious printers we've seen. It meets the EPA Energy Star standard for power consumption and features a mode called PowerSave, which reduces power consumption to less than 30 watts when the printer has been inactive for a user-specified period of time. Other environment-friendly features include HP's toner-cartridge-recycling program and the use of a transfer roller in the print engine instead of an ozone-producing corona wire.

Setting up the LaserJet 4M Plus is easy. As with most other Mac printers, an installer program directs the printer driver, screen fonts, and a utility program to the correct locations on your hard disk. The printer comes with a power cord and a toner cartridge as well as with software that lets you connect it to a PC running Windows or DOS.

Managing the LaserJet 4M Plus' many features is a breeze. A 16-character display gives you access to all of the printer's features, but you can also configure most options with software, using either the PostScript Level 2 printer driver or the HP LaserJet Utility. An added bonus is the

Reviews Rating Key

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

printer's documentation — it's among the best we've seen. Clear, step-by-step instructions illustrated with helpful screen shots take you through the process of setting up the printer, configuring settings, and troubleshooting problems.

In addition to speed and versatile networking capabilities, an important feature of any network printer is paper handling. The LaserJet 4M Plus is first-rate in this area as well and can meet most, if not all, of the demands of the busiest workgroups. The printer comes with a 250-sheet letter-sized tray and a multipurpose tray, which holds 100 sheets or 10 envelopes. The output tray holds 250 facedown sheets. Additional features include an optional assembly with an adjustable 500-sheet tray that sits under the printer and gives it a total input capacity of 850 sheets (including the multipurpose tray). The tray can hold letter, legal, A4, or executive-sized paper. Also available are a power envelope feeder that holds 75 envelopes and a 1,000-sheet output-stacker option. By this fall, you'll also be able to buy a user-installable duplexing assembly option.

The LaserJet 4M Plus also supports a special feature called Resource Saving. If the printer is equipped with at least 7 MB of memory, it can store downloaded resources in memory. This feature comes in handy if you're sharing the printer in a cross-platform environment that requires frequent switching among printer languages. With Resource Saving, you need to set up your printing environment and resources (PostScript or PCL and downloaded fonts) only once, rather than after every switch.

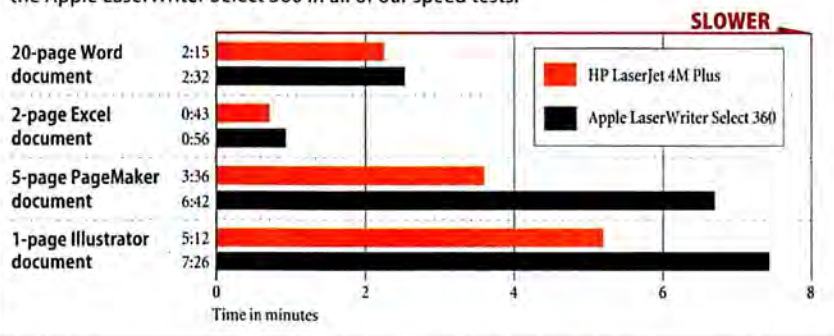
Off to the Races

To find out just how capable the HP LaserJet 4M Plus is as a network printer, we tested its print engine and RIP performance and compared the results with those of the Apple LaserWriter Select 360, a workgroup printer that also aims to replace the outmoded HP LaserJet 4M. To validate the printer's rated engine speed, we used a 20-page Microsoft Word text document. A second test, designed to simulate a real-world business application, involved printing a 2-page Microsoft Excel document incorporating text and simple graphics.

Our RIP tests used a 5-page Aldus PageMaker document and a 1-page Adobe Illustrator document. The PageMaker document

Fast to the Finish

From text to graphics, the Ethernet-capable HP LaserJet 4M Plus was the clear winner over the Apple LaserWriter Select 360 in all of our speed tests.



incorporated a broad range of image and font components and taxed every aspect of printer performance; the Adobe Illustrator document contained a complex PostScript graphic.

Our test platform was a Quadra 600 equipped with 8 MB of memory and running System 7.1. The HP LaserJet 4M Plus was connected to the Quadra via the printer's built-in Ethernet connection; the Apple LaserWriter Select 360 was connected via its built-in LocalTalk connection.

Our page-per-minute tests clocked the HP LaserJet 4M Plus printer at 9 ppm and the Apple LaserWriter Select 360 at 8 ppm. In the real-world business-application test, the LaserJet 4M Plus boasted a similar speed advantage.

The HP LaserJet 4M Plus really outdistanced the Apple LaserWriter Select 360 in our RIP speed tests. For the PageMaker test, the LaserJet 4M Plus required slightly more than three and a half minutes, compared to almost seven minutes for the LaserWriter Select 360. In this test, the HP LaserJet 4M Plus' built-in Ethernet capability proved an important advantage; the Apple LaserWriter Select 360, with its LocalTalk interface, just couldn't keep up. In the Adobe Illustrator test, the HP LaserJet 4M Plus again was faster than the Apple LaserWriter Select 360, although not by as wide a margin. Here, the LaserJet 4M Plus' faster processing made the difference.

Quality Print

The output quality from both printers was top-notch. The HP LaserJet 4M Plus and the Apple LaserWriter Select 360 each produce text that is crisp and legible, even at small

point sizes. For graphics, however, we found the LaserJet 4M Plus' output quality slightly superior to the LaserWriter Select 360's. The LaserJet 4M Plus offers more line screens (108 lines per inch) and gray levels (122) than the LaserWriter Select 360 does. Moreover, in our PageMaker test, the LaserWriter Select 360's output showed slight banding in its gray ramps whereas the LaserJet 4M Plus' output was flawless.

The Bottom Line

The networkable 600-dpi HP LaserJet 4M Plus offers an excellent feature set for workgroups. In addition to having versatile paper handling and convenient controls, this PostScript laser printer is the most environmentally conscious output device we've seen. And finally, the HP LaserJet 4M Plus is speedy — it consistently outperformed its closest rival, the Apple LaserWriter Select 360, in all of our speed tests.

With a street price of just under \$2,000, the LaserJet 4M Plus costs about \$500 more than the LaserWriter Select 360. Still, if you're looking for a fast, feature-rich printer that produces high-quality output, we recommend the HP LaserJet 4M Plus without reservation. / David Kison

Hewlett-Packard LaserJet 4M Plus

Rating: ★★★★★

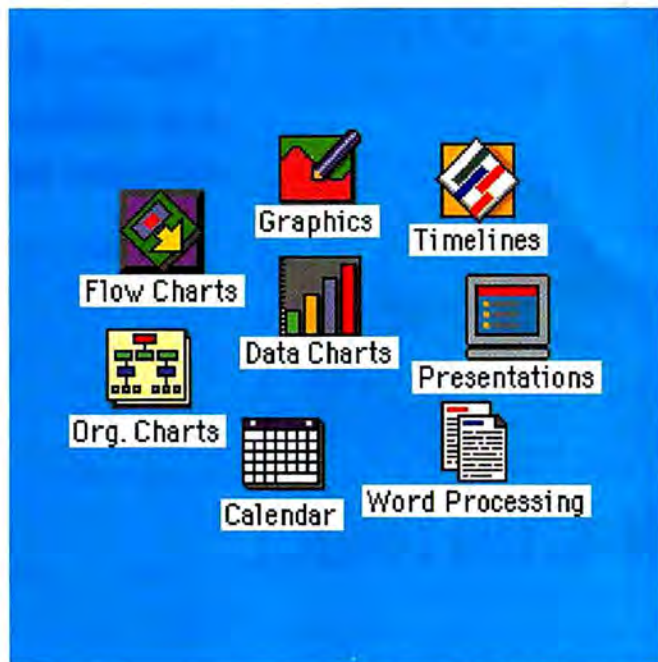
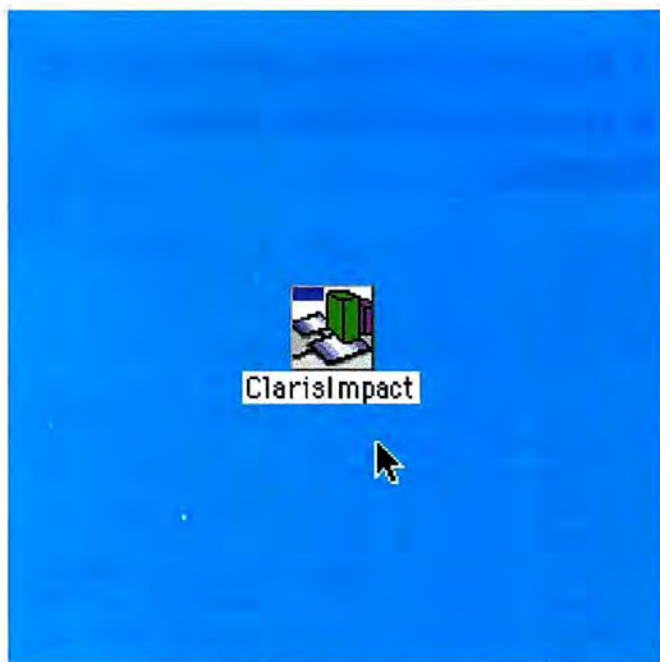
List Price: \$2,479.

Pros: Excellent output quality. Superb networking features. Flexible paper handling.

Cons: Lacks a SCSI interface.

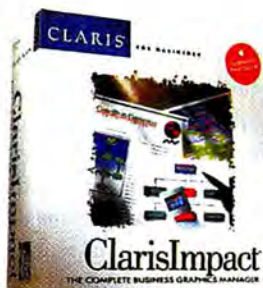
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REVIEWS Multimedia

Director 4.0 / Bigger, faster applications are easier to create with the latest release of Director.

STREAMLINED PERFORMANCE and a more finely tuned interface mark the latest release of Director, the Mac's premier multimedia authoring and animation program. Version 4.0 boasts welcome enhancements to the program's movie-playback facilities and memory-management scheme as well as important new additions to Lingo, Director's powerful scripting language. With the new version, Director maintains its position as the most comprehensive program for a wide range of interactive authoring tasks, but we were disappointed to find that some of the program's less im-

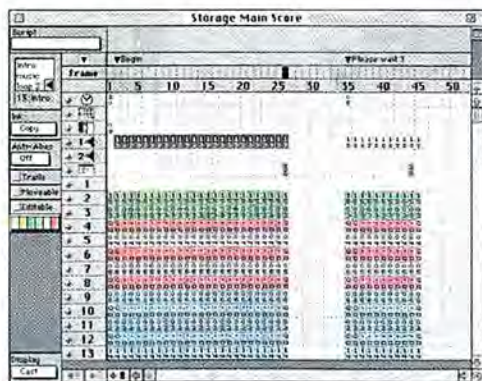
a long way toward addressing this problem. The new release makes it easy to clear used elements from memory. You can even set memory-purge priorities (Never, First, Last, and Normal) for individual cast members. That means you can protect essential elements of your presentation, such as interactive control buttons, from purges and specify that other elements be purged from memory immediately after they've played.

Also noteworthy are special tools for optimizing playback of Director files from CD-ROMs. Director 4.0 is the only authoring system that provides these tools.

Numerous small enhancements to the Score window, Director's primary work area, make it easier to organize and edit your projects. In the Score window, each column represents an individual movie frame, and rows (called channels) represent the layers in which cast members appear. Version 4.0 supports more channels than the previous version — 48 compared to 24 — and additional channels are available for transition effects, sound, timing changes, and 8-bit-palette effects.

Editing tools are more intuitive in version 4.0. You can, for example, move cast members within the Score simply by dragging and dropping — a real time-saver over the previous version's cut-and-paste method. A new color-coding feature is incredibly useful for visually organizing complex Scores. There are also new facilities for searching the contents of a document by any number of attributes — for example, you can search for all elements mapped to a specific color palette or for all QuickTime movies in a presentation.

QuickTime support is also improved: Version 4.0 makes it much easier to preload QuickTime movies into RAM for smoother playback. Another welcome addition is the ability to play a Director movie from within another Director movie and maintain all interactive controls for each movie — a great feature for interactive learning applications that reference one another. And last,



Color coding in Director 4.0's Score window helps you organize and edit complex projects.

pressive features weren't improved in version 4.0 and several truly helpful tools from the previous version are missing altogether.

Stretching the Envelope

With Director 4.0, Macromedia eliminated several restrictions that hampered users in the past. You're no longer limited to 512 elements, called cast members, in a Director document — the new version allows a total of 32,000 cast members per movie. In addition, the size of Director 4.0 files is unlimited: The previous version restricted file sizes to a maximum of 16 MB. These enhancements are a real boon to professionals who want to assemble complex interactive multimedia projects, such as games and interactive learning applications.

Memory handling has always been one of Director's weaknesses, but version 4.0 goes



Director's Cast window lets you scroll through thumbnails of all of your multimedia elements. Version 4.0 supports as many as 32,000 cast members per movie.

playback of sampled sound files is much smoother: Version 4.0 eliminates many of the annoying clicks and pops that hampered playback in the past.

Learning the Lingo

Macromedia has also improved Director's Lingo programming language. Version 4.0 boasts more commands than its predecessor — highlights are object-oriented commands that simplify scripting and enable you to reuse code, plus several advanced mathematical functions that provide a wider range of options for programming complex game logic.

A truly welcome addition is a long-overdue debugging feature that flags errors in your Lingo scripts before Director runs a project. You can also compile Lingo scripts, which not only speeds up their execution but also helps protect your scripting secrets by making it harder to disassemble scripts.

The Director 4.0 package includes much-improved Lingo documentation — you'll find separate tutorials and reference manuals dedicated to Lingo. Helpful examples of the more complex aspects of using Lingo for interactive problem solving are especially welcome.

Overall, we liked the improvements in version 4.0, but we do have a few gripes. We encountered several repeatable bugs while creating Projectors (stand-alone movies you can play without the Director application). We were also disappointed to discover that MIDI support is completely eliminated in version 4.0, as are the built-in sound effects that used the Mac's sound synthesizer. Sampled sound effects, now your only option, require much more disk space than the previous version's built-in effects.

Director's painting module is quite good, but the program's anti-aliasing capabilities are badly in need of improvement. Type handling is still fairly rudimentary — you won't find controls for kerning and line

spacing, for example. And Macromedia has eliminated the Overview mode, which provided an easy way for novices to create a presentation by stringing together a series of images, animation files, and sounds without resorting to the more complex Studio mode. Our final complaint is that Macromedia discontinued the useful Accelerator program, which speeds the playback of Director files that don't contain interactive elements.

Once you've registered your purchase of Director 4.0, Macromedia gives you a CD-ROM containing examples, technical documentation, and a collection of XObjects (similar to HyperCard's XCMDs). XObjects extend the functionality of Director and enable it to control video decks and laserdisc players. The free CD-ROM, previously available only as an expensive option, is a real plus.

The Bottom Line

For serious multimedia professionals, Director represents the most powerful authoring tool available for creating sophisticated interactive applications. Version 4.0 aims to make authoring tasks quicker and more convenient. To a large extent, the program succeeds, but there's still room for improvement in several key areas, including anti-aliasing, type handling, and sound.

/ David Biedny

Director 4.0

Rating: ★★★★★

List Price: \$1,195.

Pros: Improved support for complex interactive applications. Optimized playback speed for CD-ROM applications. Improved editing tools.

Cons: No Overview mode for novices. Poor anti-aliasing and type handling.

Company: Macromedia, San Francisco, CA 94103; 415-252-2000.

Reader Service: Circle #402.

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So, how productive would you be if you were as organized as you've been pretending to be? Get Now Up-to-Date and Now Contact and find out. Or pick up the phone and call us today for more information at 1-800-689-9410

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

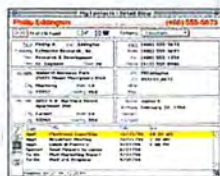


The QuickContact and Reminder menus instantly access your most important contacts and your day's events.

Now Up-to-Date allows you to schedule to-dos and appointments instantly—simply click on the date and enter your information.



Now Up-to-Date and Now Contact work together, linking calendar events with your contact information, so that you'll always have the phone number handy when reminded to make a call.



MacHandwriter / Pen-based computing moves to the desktop.

WISH YOU COULD WRITE, draw, and otherwise interact with off-the-shelf Mac software at the stroke of a pen? The MacHandwriter add-on tablet lets you do just that. Entertaining though it is, however, the MacHandwriter is burdened by all of the problems of pen-based systems, most notably inaccurate handwriting-to-text translation.

Plug and Write

Setting up a MacHandwriter is simple: Just install the software, plug the tablet in to an ADB port (an extra ADB port on the tablet allows you to keep all of your existing ADB devices), and pick up the pen. The cursor helpfully changes into a hand any time you can use the MacHandwriter stylus for text input, which is almost any time you would normally type on a keyboard. Unlike the Newton MessagePad, however, the MacHandwriter recognizes only hand printing; its cursive-handwriting recognition is limited to just a few character combinations, such as *fo* and *he*.

The MacHandwriter's software can translate your scratchings into text fairly quickly, but it's rarely very accurate: It either gets words just right, or it gets them spectacularly wrong. Worse, using the MacHandwriter pen to edit mistakes is tricky, although many of the pen strokes you find in Pen Windows or other pen environments for selecting text and inserting carriage returns, tabs, and the like apply here. Communication Intelligence does not include an on-screen keyboard — an odd omission, considering that even the Newton MessagePad has one.

Using the MacHandwriter for graphics feels natural and is a boon for people with repetitive-stress injuries. As users of other graphics tablets know, drawing with a pen puts the mouse to shame. Unfortunately, however, the MacHandwriter's pen isn't pressure-sensitive; that option costs an additional \$125.



Although it's OK for graphics use, the MacHandwriter leaves a lot to be desired if you're looking for accurate handwriting recognition.


The MacHandwriter has several other limitations. Getting used to the disconcerting sensation of writing on one plane (the tablet in your lap) and seeing the results on another (the monitor) takes time. The MacHandwriter maps its tablet area to a main monitor only, which may frustrate anyone with a multiple-monitor system. You can issue regular keyboard commands, such as Command-Open, by holding down a button on the side of the pen and writing the command's keyboard-equivalent letter

(O for Open, for example), but you have to use a keyboard for commands that require use of the Shift, Option, and/or Control keys. And forget about foreign accents: The software recognizes only English-language characters.

The Bottom Line

It's somewhat of a backhanded compliment to say the technology used for the MacHandwriter software is as good as any other pen computing technology today. The product is easy to install and works well with graphics applications, but using the MacHandwriter to enter even small amounts of text is an exercise in futility. Pen technology is improving though, and maybe version 2.0 — or 5.0 — of the MacHandwriter software will tempt us to toss out our keyboards once and for all. / Joe Clark

MacHandwriter

Rating: 

List Price: \$399.

Pros: Easy to install. Feels natural. Works with other ADB devices.

Cons: Poor handwriting recognition. Pressure-sensitive pen not included. Keyboard required for many commands.

Company: Communication Intelligence, Redwood Shores, CA; 800-802-7888 or 415-802-7888.

Reader Service: Circle #403.

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CIRCLE 31 ON READER SERVICE CARD

Collage / Specular's Photoshop companion breaks new ground in image composition.

IF YOU USE Adobe Photoshop to create large-scale high-resolution composite images, you know how tedious the process can be and how tough it is to make changes. Specular aims to change all that with Collage, billed as an object-oriented image-composition program. A companion product to Photoshop, Collage shows much



Soft drop shadows, among other effects, are easy to create with Collage, Specular's innovative image-composition tool.

promise and boasts several cool features, but we found version 1.0.1 marred by surprisingly slow speed and several gaps in its feature set.

Bit-Map Assembly

Collage works its magic by treating bit-mapped images like objects in a draw program. Once you've saved a selection as an object, you can move it to the front and to the back and add special effects without having to worry about accidentally changing surrounding images and backgrounds.

Collage isn't the first program to do nifty tricks with bit-mapped images — Fractal Design's Painter X2 lets you accomplish the same thing. What sets Collage apart is its use of proxies — screen-resolution versions of your images. Instead of manipulating 300-dpi 20-MB images, you work with faster-moving 72-dpi proxies. Working at this low resolution lets you apply the program's effects, including rotate, skew, and crop; set opacity; create drop shadows; and use Photoshop-like calculation commands — all faster than you could at 300 dpi.

Once everything's in place, you render an image much as you would a 3-D image — you choose the final resolution and image size and let the computer churn it out. As long as the resolution of your original images matches or exceeds your final resolution, the rendering looks great.

Collage is easy to learn and master. To get the most out of the program, you need to mask out backgrounds in a program that supports alpha channels — Photoshop, Specular's Infini-D, or Pixar's Typestry will do. However, it would be nice if Collage had its own masking tool so you wouldn't have to continually switch back to the source program to create and edit masks.

One of Collage's best features is its automatic drop shadow. By adjusting the offset, sharpness, and color of drop shadows, you can achieve a soft airbrushed look, a tinted glowing effect, or a hard-edged shadow behind your images. The Feather command lets you blend images together seamlessly.

Collage ships with several Photoshop-like third-party filters, including Gaussian Blur, Add Noise, and Unsharp Mask.

Molasses, Anyone?

You'd think that Collage's proxy-image approach would allow the program to zip right along. But we found the program speedy only when working with relatively small files that contained fewer than five medium-resolution images. Handling larger images will make you think someone's poured syrup on your processor.

With the program's viewing resolution set to High (the only mode that shows the results of applying the feathering and softness functions), we created a complex composite of 15 images, each anywhere from 300K to 15 MB. We cropped the items and added drop shadows, feathering, and opacity effects.

As we built the composite image, our test computer (a Quadra 800 with 15 MB allotted to the program) took longer and longer to carry out commands. By the end, nearly every action — from moving an object a few pixels to changing the softness of a drop shadow — took about a minute to finish.

Undos took nearly twice as long as that, and reverting to a previous version of the image took three and a half minutes.

Switching to the program's Low resolution setting helped — screen-refresh times dropped to an average of ten seconds — but even that wait soon became interminable. The program's lowest viewing resolution, Draft, displays images as white boxes, but it has limited use. You can also hide images to speed things along, but then, of course, you can't see them.


Rendering is also time-consuming. A 3.5-MB final image required about 20 minutes to render at 225 dpi. And you need plenty of room on your hard disk — after rendering, our 10-MB image had ballooned to 50 MB.

Our wish list for Collage is long, starting with CMYK support. Currently, Collage supports only RGB and gray-scale images. We'd also like to see it incorporate a few of Photoshop's handy features, including a grabber hand in order to scroll around the document and a zoom-drag feature. And when you move images, you see only their bounding-box outline, which makes precise positioning difficult. Some of the commands can't be canceled in midstride, and you can't delete unwanted items from the Element palette. In addition to the skew tool, we'd love to see perspective and distort functions. In short, we'd like to see Collage become more like Photoshop, since we quickly filled our machine's 40-MB RAM allotment when we had both programs running simultaneously.

The Bottom Line

Collage offers innovative technology, but we were disappointed with its speed. Specular is planning a major revision that addresses many of the current version's shortcomings and that may be available by the time this review appears. / Jim Benson

Collage 1.0.1

Rating: 

List Price: \$349.

Pros: Easy to learn. Excellent automatic drop shadows.

Cons: Slow. Lacks masking tool. No CMYK support.

Company: Specular International, Amherst, MA; 800-433-7732 or 413-253-3100.

Reader Service: Circle #404.

WriteNow 4.0 / Nimble, quick, and PowerBook-friendly word processing from SoftKey.

BILLED AS THE LEAN, mean Mac writing machine, the latest version of WriteNow is the snappiest performer you'll find in a Mac word processor. Small in size and low in price, WriteNow 4.0 eschews bells and whistles for ease of use and speed. And fast it is — most common operations such as opening and saving files and entering, editing, and spell-checking text are significantly speedier than those in either Microsoft Word or WordPerfect.

Write Lite

WriteNow's slim, trim size — a quality that will have special appeal to users of PowerBooks and low-end Macs — is what gives the program its speed. The application requires only 348K of hard-disk space and about 600K of RAM. Another strong selling point is WriteNow's cost, a street price of less than \$100. Of course, you get what you pay for — you won't find tool bars and built-in drawing and charting programs, nor will you find sophisticated features such as indexes, tables of contents, controls for spacing between paragraphs, and the ability to position items at specific page coordinates.

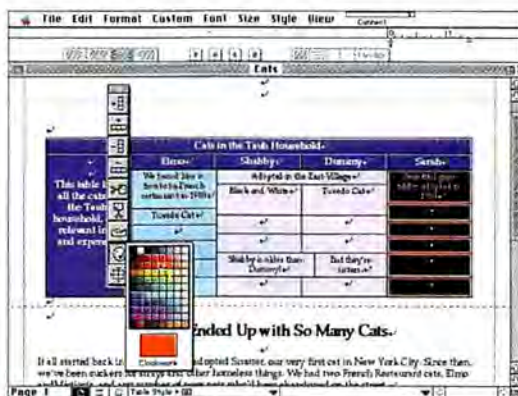
But WriteNow is no schlump of a word processor either. In addition to the previous version's well-designed character and paragraph styles, version 4.0 boasts some of the most flexible and easiest to use table features we've seen. There's also a print-merge helper, controls for importing and editing graphics, a color picker, and special PowerBook optimization features.

Table This

WriteNow's new tables are elegant and simple. When you select the Insert Table command, the program brings up a dialog box with eight predefined formats to choose from. Once you've inserted a table, formatting and editing it is easy with WriteNow's floating Table Tool palette. You can split and combine ranges of table cells, add and delete rows and columns, and quickly change the borders and background colors of selected cells.

To resize an entire table or selectively

reposition the borders of individual rows, columns, or cells, you simply click on and drag the appropriate borders. And because you can combine cells both vertically and horizontally as well as reposition individual borders, you can design highly customized tables that would be difficult or impossible to create with Word. A new color palette lets



Creating tables is a snap with WriteNow 4.0's new Table Tool palette.

you choose from 88 colors for text and table backgrounds. The one catch with WriteNow tables is that they can't cross page breaks, so you can't create a table larger than a page.

WriteNow 4.0 is more adept than the previous version at handling graphics. You can now import EPS, MacPaint, and PICT files. Once you've placed a graphic in your document, you can easily crop, resize, and scale it by dragging on its boundary-box handles. A hand grabber tool lets you precisely position graphics within boxes. WriteNow still can't wrap text around graphics, however, and a bug in its EPS implementation prevented us from downloading fonts used in EPS graphics to our printer.

In addition to graphics, you can also open text and RTF files as well as files created with a wide variety of other word processors, including Word, MacWrite II, WordPerfect PC 5.0, and Microsoft Works. However, WriteNow doesn't support any links between inserted material and its source, nor does it support publish-and-subscribe or any other form of interapplication communication.

WriteNow's new Merge Helper takes some

of the drudgery out of creating template documents for merging names and addresses with form letters. The Merge Helper window displays two pop-up menus: one for entering merge statements (IF, IF ELSE, and so on) into your documents and another for inserting field names from data documents.

Thanks to WriteNow's low memory requirement and nimble performance, the program has long been a favorite of PowerBook users. But version 4.0 goes even further, with a special PowerBook installation option, which installs a battery-level indicator in the menu bar. It also lets you configure the application to load most of its resources into RAM so the program makes fewer hits on your PowerBook's hard disk and uses the battery more frugally. SoftKey recommends that you allocate at least 700K of RAM to WriteNow when using this optimization.

Overall, we liked the latest iteration of WriteNow, but one aspect bothered us. The program allows you to view documents in the page-layout mode only. That means you're stuck looking at headers, footers, and page breaks all the time, which we found

rather distracting.

The Bottom Line

WriteNow 4.0 is fast, inexpensive, and easy to learn. It's a great tool for those whose first priority is creating basic documents quickly or for those who own a PowerBook or low-end Mac. However, if powerful formatting and layout features, indexes and tables of contents, and other sophisticated word-processing tools are at the top of your list, you'll still want to look to Microsoft Word or WordPerfect. / Eric Taub

WriteNow 4.0

Rating: ★★★★★

List Price: \$119.95.

Pros: Speedy performer. Inexpensive. Requires little disk space and RAM. Easy to create tables.

Cons: Inflexible page-layout-only view. Limited formatting and layout features. No controls for spacing between paragraphs.

Company: SoftKey International, Cambridge, MA; 617-494-1200.

Reader Service: Circle #405.

Tektronix Phaser 300i / Phase-change printer gets a welcome boost in speed and image quality.

CONQUERING THE SNAIL-LIKE speed of its predecessor, the Tektronix Phaser 300i is a new phase-change solid-ink printer capable of producing strong, vibrant color on just about any type of media you can pass through its feed slot. Like its predecessor — the Phaser III PXi — the 300i specializes in producing full-bleed tabloid-sized documents, but the difference is that the 300i can produce higher-quality output at faster speeds.

Alike but Different

From the outside, the 300i looks almost exactly like the III PXi. But look inside, and you'll spot the differences — new circuit boards, motors, and print heads give the 300i its speed advantage. The printer works by heating wax pellets and spraying the resulting liquid on the page. It has 124 jets (31 each for cyan, magenta, yellow, and black), compared to 96 for the III PXi. More jets and faster paper handling, coupled with new technology that enables all of its jets to be active during printing, give the 300i an impressive speed boost over the III PXi.

You need to set aside plenty of office space for the massive 300i — it is 13.5 inches tall, 27 inches deep, and 25 inches wide and weighs in at a hefty 90 pounds. Equipped with LocalTalk, serial, and parallel ports and a 24-MHz AMD 29000 RISC processor, the printer comes standard with 10 MB of RAM, expandable to 22 MB in 4-MB increments. Networking features allow the 300i to switch automatically among ports, built-in printer languages — PostScript Level 2, HP-GL, and PCL 5 — and network protocols. Tektronix also provides an optional \$695 networking card that supports the EtherTalk and Novell NetWare protocols (TCP/IP support costs an additional \$295).

The printer's standard paper tray handles letter- and legal-sized media. For larger sizes, you can purchase an adjustable \$395

12-x-18-inch tabloid-sized tray. You can also feed pages manually.

If you print on plain paper, the cost per page is cheap — only 50 cents per page, due to the low cost of the color wax pellets. But the most remarkable aspect of phase-change printers is their ability to print on almost anything porous. The 300i can handle a wide range of paper sizes, grades,



Full-bleed tabloid-sized output is a specialty of Tektronix's Phaser 300i, a new phase-change color printer that produces vivid color output on a wide variety of paper sizes, weights, and grades.

weights (13 to 120 pounds), and finishes.

One thing we don't recommend printing with the 300i is transparencies. That's because the printer's phase-change inks are highly opaque, so light has a hard time penetrating the ink. If you must print transparencies, you need to purchase a laminator from Tektronix, which costs about \$1,000, as well as the company's special transparency sheets.

Tektronix provides several tools that help optimize the 300i's image quality. A 106-line screen setting produces excellent-quality halftones. You can tweak colors, using TekColor Dynamic Correction software. To sharpen photographic images, you can activate the printer's Finepoint option. Be forewarned, though, that if you want to use the Finepoint option to sharpen an entire tabloid-sized color image, you'll need plenty of RAM — at least 18 MB.

To find out how the 300i stacked up

against its predecessor, we used four test documents to compare output quality and speed: a ten-page Microsoft Word text document, a complex tabloid-sized Adobe Illustrator document, a five-page Microsoft PowerPoint presentation, and a tabloid-sized QuarkXPress document with text and graphics. Our test platform was a Quadra 650 with 40 MB of RAM, connected to the 300i via the printer's built-in Ethernet port.

For fairly simple jobs, such as printing the Word and PowerPoint documents, the 300i printed the documents twice as fast as the III PXi. To print the PowerPoint document in Premium mode, for example, the 300i took only 19 minutes, compared to 37 minutes for the III PXi. For more-complex documents, the 300i was still faster than the III PXi, but not by as wide a margin. To print the QuarkXPress document in Premium mode, the 300i took about 27 minutes, compared to 31 minutes for the III PXi — a 16-percent speed increase.

In addition to being quicker, the 300i also bested the III PXi in output quality. Blends between colors were noticeably smoother, dither patterns were less pronounced, and the 300i's Finepoint option made photographic images sharper and more detailed.

The Bottom Line

If the poky performance of phase-change solid-ink printers has put you off in the past, now's the time to take a second look. The Phaser 300i's \$9,995 price tag is steep, but the printer is a versatile and talented performer, especially for those who need to print full-bleed tabloid-sized color documents. Not only is the Phaser 300i significantly speedier than its predecessor, the Phaser III PXi, but it also boasts better output quality. And the printer's low 50-cent cost per page for plain paper is icing on the cake. / Roman Victor Loyola

Tektronix Phaser 300i

Rating: ★★★★★

List Price: \$9,995.

Pros: Improved speed and output quality. Excellent color saturation. Low cost per page. Flexible media handling.

Cons: Bulky. Unsuitable for printing transparencies.

Company: Tektronix, Wilsonville, OR; 835-6100 or 503-682-7377.

Reader Service: Circle #406.

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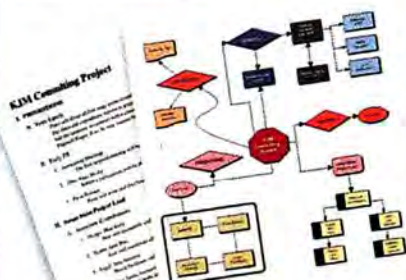
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Cirrus 2.0 / Canto's scriptable front end for scanners offers productivity improvements and image editing.

SCANNING NEOPHYTES and color-savvy professionals alike are target users for Cirrus 2.0, a scanning and image-manipulation program that offers a versatile alternative to scanner manufacturers' applications and Photoshop plug-in modules.

Simple Controls

The Cirrus scan controls are deceptively simple, considering how much power they give you over density, gamma, contrast, brightness, and color balance. In most cases, you can choose among several intuitive methods for defining settings. For example, you can set gamma correction numerically in a dialog box, by dragging a slider, or by clicking and dragging on a graphical representation of the gamma curve. If you want to reuse scan settings, you can easily tag and store them.

Like Ofoto, its competitor from Light Source, Cirrus also runs in a fully automatic mode, finding and straightening the edges of pictures for you. Unlike Ofoto, it doesn't let you calibrate your scanner's color with a two-step scan-and-print method. Instead, it ties in to Apple's ColorSync system-level calibration — a fine idea, except that Cirrus includes ColorSync device characterizations for about only a dozen of the more than 70 scanners it supports. Canto has also included support for oversampling (10- or 12-bit-per-channel color) for those scanners that support it in hardware.

In addition, Cirrus provides a range of image-editing tools. Although these tools can't replace a full-featured image-editing application such as Photoshop (Cirrus lacks a CMYK mode, for example), the advanced features that are provided are first-rate. In addition to its collection of photographic and special-effects features (sharpen/soften, noise, mosaic, and so on), Cirrus offers a useful image-combining feature. The mixer controls transparency, feather, and threshold parameters for simple collage effects.

Unfortunately, Cirrus doesn't work as seamlessly with Photoshop as most plug-ins do. Cirrus' Acquire filter is actually a patch that launches Cirrus alongside Photoshop.

After configuring the scan within Cirrus, you must save the scan to disk and then open it from within Photoshop.

Scan-o-matic

To enhance your productivity, Cirrus works hand in hand with AppleScript and comes with many editable sample scripts. You can use the scripting features to set up predefined parameters for a variety of image types or conditions and then save them for future use — thus turning complicated scanning procedures into single-command operations. And because Cirrus supports multiple sequential scans, users with automatic document feeders can write scripts that transform a desktop scanner into a high-capacity image-acquisition station.

Also, what you gain in productivity isn't sacrificed in image quality and speed. We found Cirrus' output and scan times similar to many Photoshop plug-ins', with little difference in image quality.

The Bottom Line

With its productivity-enhancing scripting features and bonus image-editing tools — not to mention a native PowerPC version that should be available by the time this review appears — Cirrus is a good choice for scanner operators looking for a step up from simple acquisition plug-ins. Its automatic-scanning capabilities also make it a viable alternative for novices, although Ofoto might be better suited to their needs. Realistic users who don't expect Cirrus to combine all the features of Ofoto and Photoshop combined won't be disappointed. / Anita Epler

Cirrus 2.0

Rating: ★★★★★

List Price: \$395.

Pros: Scriptability. Support for more than 70 scanners.

Cons: Weak Photoshop-plug-in support. No CMYK mode.

Company: Canto Software, San Francisco, CA; 800-332-2686 or 415-431-6871.

Reader Service: Circle #407.

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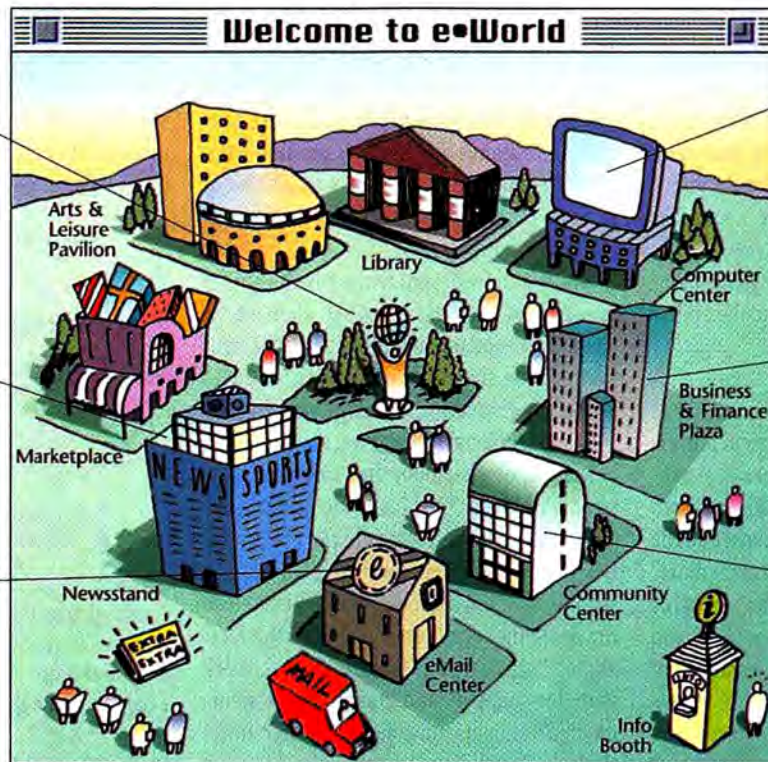
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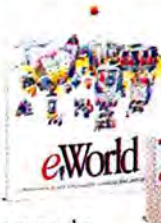
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IntelliDraw 2.0 / Aldus' innovative drawing tool gets smarter and more versatile.

FOR CREATING detail-rich drawings, Aldus' IntelliDraw has few peers. The program's initial release broke new ground in the drawing-software arena, introducing innovative tools and features that streamlined the process of creating and editing complex drawings. Version 2.0 adds even more time-savers, including drag-and-drop "smart" clip art, a spelling checker, hyphenation, and object grepping for speedier screen redraw and scrolling. New artistic capabilities include eye-catching warp and polymorph distortion effects and the ability to bind text to shapes.

Smart Art

IntelliDraw's best new time-saver is powerful but easy-to-use smart clip art. The program comes with a 13-MB collection, and you can create your own art and add it to the collection. What makes the clip art "smart" is that it's not static. Many objects — such as animated gears — are dynamic, and you can modify object properties in a variety of ways, including specifying dimensions numerically, duplicating, and stretching. There's a set of 3-D stairs, for example, that you can stretch and distort while maintaining the connections between the steps and the risers. Clip art created with IntelliDraw's "symmetricon" tool is especially easy to modify — when you make changes to one side of an object, the other side mirrors that change automatically.

Moreover, you can use any clip-art image as a master. You can copy the master as many times as you like and edit each copy as a separate object. Or to make global changes to all copies, simply modify the master. Because of this capability, clip-art items are called templates in IntelliDraw-speak.

The master-to-clone relationship of templates is closely related to the linking features introduced in the first IntelliDraw release. As before, you use the Links Browser window to manage object links, but mastering the workings of this control window is still a daunting task.

Drag-and-drop support for clip art makes it easy to move objects from a librarylike

palette and drop them into documents.

A noteworthy new text feature is IntelliDraw's ability to attach text to any shape. To do so, you draw a shape, type the text, select both, and then choose Attach Text to Curve from the Text menu. To adjust the text's placement along the curve, you use the controls in a dialog box that's accessible from the Object menu. This process takes a bit of practice when you're working with non-standard shapes.

Another new design feature is the ability to warp any object-oriented element or group of elements, including text. The program allows two types of warping — envelope and perspective. Envelope warping lets you create effects by dragging any point in a rectangle, or envelope, that surrounds the selected objects. You can even create your own points in the rectangle for maximum flexibility. Perspective warping works in a similar fashion, although you're limited to dragging the four corner points of the rectangle. This warping feature doesn't work with bit-mapped and non-Illustrator-format EPS objects, and as with other functions in IntelliDraw, results are less than immediate when you're working on a low-end machine.

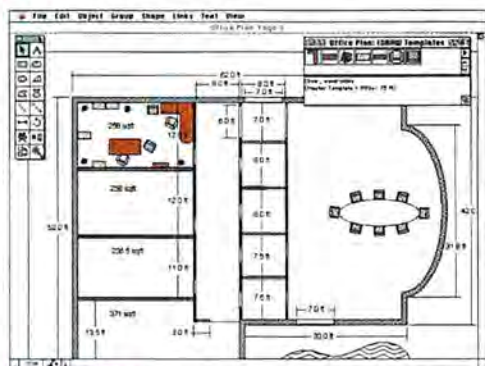
For truly funky effects, IntelliDraw has a new polymorphing feature. If you select two shapes and issue the Polymorph Shapes command, the result is a composite of the original shapes and their colors and sizes. IntelliDraw also gives you control over the process, so that as the shapes blend into each other, you can display the results at any point. Unfortunately, each original shape can consist of only one object. You can, however, link two polymorphs for more-complex results. By saving polymorph steps as frames in an animation, you can save the sequences you create as QuickTime movies.

For simple page-layout projects, version 2.0 adds user-editable hyphenation capabilities and spell checking to IntelliDraw's previous text features, which include basic formatting and linked text boxes.

The primary addition to IntelliDraw's import and export capabilities is support for

the common Adobe Illustrator 1.1 and 88 formats. That means you can edit the drawings you create in IntelliDraw with any of the many programs that support those formats as well as use IntelliDraw to edit drawings created in other programs. IntelliDraw also now supports Photo CD images and allows TWAIN image acquisition for direct control of scanners from within the program.

Although the novelty of many of IntelliDraw's features steepens the learning curve, most users will find it worthwhile to master the program's innovative tools. The documentation is fairly complete, but it's poorly organized, so you really have to dig around



Floor plans and other types of detailed drawings are IntelliDraw 2.0's forte. A helpful new feature is drag-and-drop "smart" clip art, easily accessible from a palette (top right).

to find the help you need.

Aldus recommends a Mac SE/30 or later, System 7, and 8 MB of RAM. A compatible Windows version is also available.

The Bottom Line

If you're looking for a program with lots of built-in drawing aids, look no further than IntelliDraw. With version 2.0's time-saving enhancements and new design features, Aldus has succeeded in making a good program even more versatile. / Shelley Cryan

IntelliDraw 2.0

Rating: ★★★★★

List Price: \$199.

Pros: Drag-and-drop "smart" clip art. Polymorph and warp features.

Cons: Nonintuitive linking controls. Poorly organized documentation.

Company: Aldus, San Diego, CA; 800-888-6293 or 619-558-6000.

Reader Service: Circle #408.

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GOLD DISK

CIRCLE 25 ON READER SERVICE CARD

Kai's Power Tools 2.0 / Far-out Photoshop filter collection gets a tune-up.

IT MAY BREAK ALL THE RULES of interface design, but Kai's Power Tools remains a must-have for most Photoshop users. Version 2.0 of HSC Software's splashy collection of special-effects filters is no less visually intense than the previous version's, but its revamped interface makes it a more effective production tool.

Filter Magic

Kai's Power Tools (KPT) 2.0 consists of 33 filters that produce a wide range of special effects. Some of the filters are standard, such as those for creating artistic noise and smudging and sharpening, and others specialize in downright psychedelic imagery. At the heart of the package are four primary filters — Fractal Explorer, Gradient Designer, Gradients on Paths, and Texture Explorer. Controlling these filters can be a challenge to newcomers to the product, because of KPT's interface, which is decidedly nonstandard.

The good news is that version 2.0 offers real-time picture previews that show you the effects of your current settings — a welcome addition. Beneath these pictures, scrolling pop-up menus give you quick access to various image-transformation options. Overall, these controls make for quick experimentation, but there's a catch — it's sometimes difficult to find the ones you need. There's no visual indicator for the numerical intensity controls, for example, and you have to know to click in a specific area in the main dialog box to gain access to KPT's pop-up menus.

Real-time previews are not the only addition to version 2.0 — the new Apply Modes controls for the four main filters work much like the channel operations and brush modes in Photoshop. You can use Apply Modes, for example, to apply a color to only those pixels that are lighter or darker than the current selection. The Apply Modes feature gives you more control over the creative process of image transformation than in the previous version of KPT, plus it saves you steps.

The latest version also provides two new



Real-time picture previews that instantly show you the effects of your current settings are a welcome addition in the Kai's Power Tools 2.0 package.

filters — Page Curl simulates a curled page corner, and Seamless Welder takes any image and turns it into a tiling texture.

KPT works well with any package that accepts Photoshop plug-ins, including Fractal Design's Painter and Adobe Premiere.

The Bottom Line

Although the Kai's Power Tools interface may leave you scratching your head at times, the package provides the most stunning collection of special-effects filters you'll find anywhere. We highly recommend it to all Photoshop aficionados. / Sean Safreed

Kai's Power Tools 2.0

Rating: ★★★★★

List Price: \$199.

Pros: Stunning special-effects filters.

Cons: Nonstandard interface.

Company: HSC Software, Santa Monica, CA; 310-392-8441.

Reader Service: Circle #409.

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CIRCLE 43 ON READER SERVICE CARD

Apple Color Plus Display and Apple Multiple Scan 20 Display / Image is everything.

IF YOU'RE CONCERNED with your image — your monitor's screen image, that is — two new Apple monitors can brighten the picture. Bargain hunters will find that Apple's latest low-cost offering — the \$305 Apple Color Plus Display — boasts image quality that closely rivals that of its more expensive predecessor, the 14-inch Apple Macintosh Color Display. At the opposite end of the monitor spectrum, the new \$2,149 20-inch Apple Multiple Scan 20 Display represents the company's first foray into the multifrequency-monitor arena. A worthy first effort it is — the Apple Multiple Scan 20 Display performed as well as the recommended 20-inch monitor in our most recent large-screen-monitor roundup ("Big-Screen Bargains," June '94, page 82) — the Sony GDM-2038 — and is priced at about \$150 less than the Sony monitor.

Apple Color Plus Display

The Apple Color Plus Display offers an attractive price/performance alternative to the ubiquitous Apple Macintosh Color Display. Both monitors have a resolution of 640 x 480 pixels and are compatible with the on-board video of all Mac computers and video cards as well as most PowerBooks.

The main difference between Apple's two low-cost models is that the Apple Macintosh Color Display uses a Trinitron tube and the Apple Color Plus Display uses a less expensive shadow-mask tube. As a result, Apple can price the Apple Color Plus Display at about \$200 less than the Apple Macintosh Color Display. And the really good news is that there's only a slight difference in image quality between the two monitors. In fact, our image- and color-quality tests showed the Apple Color Plus Display to be superior to its more expensive sibling in several areas — most notably image stability and color accuracy.

In our comparative tests, the Apple Color Plus Display's scores proved equal to those

of its predecessor for misconvergence and brightness and nearly equal as far as MTF measurements, pincushioning, maximum color range, and spatial uniformity were concerned. This means that the Apple Color Plus Display's image is bright and stable but not as sharp, square, and color-rich as the Apple Macintosh Color Display's and



For new Mac owners, the 14-inch Apple Color Plus Display (left) provides solid image quality at an affordable price. The Apple Multiple Scan 20 Display (right) is a top-notch autosynchronous 20-inch monitor capable of meeting the needs of the most-discriminating graphics professionals.

that its brightness is not as uniform across the screen.

Some potential buyers of the new Apple Color Plus Display may also be put off by its plain casing. In addition, its curved shadow-mask tube differs from the flatter surface of the Apple Macintosh Color Display's Trinitron tube. But these are superficial differences — image quality is what really counts, and in that regard, we found the Apple Color Plus Display a worthy second to the Apple Macintosh Color Display and a good choice for cost-conscious buyers.

Apple Multiple Scan 20 Display

Equipped with a state-of-the-art Trinitron tube, the Apple Multiple Scan 20 Display is autosynchronous, which means it supports multiple resolutions (a maximum of 1,280 x 1,024 pixels) and works with Macs as well as PCs. Even better, if you own a Quadra, Centris, or Power Mac or use a Mac Display Card 24AC or one of several supported

third-party video cards, you can switch resolutions without restarting your computer, thanks to the Apple Multiple Scan 20 Display's software controls.

Switching resolutions is as simple as selecting a setting in the Apple Multiple Scan 20 Display's Monitors control panel. You can see the change take effect immediately — a nice feature. However, NEC and Radius take an even more convenient approach with their multifrequency monitors, which let you switch resolutions (and bit depth, with Radius monitors) on the fly without opening a control panel.

The Apple Multiple Scan 20 Display's digital control panel displays five buttons that let you adjust almost any setting you could ask for — brightness, contrast, centering, sizing, misconvergence, rotation, pincushion, and white point. And the Apple Multiple Scan 20 Display saves your settings for each resolution and adjusts to them automatically when you switch. The one drawback is that the plus and minus buttons for contrast and brightness are used for adjusting other settings as well, which can be confusing.

The Apple System Energy Saver control panel reduces the Apple Multiple Scan 20 Display's power consumption after a specified period of activity to a level below the EPA's Energy Star specification of 30 watts. With energy saving enabled, we found that the monitor used only 12.85 watts, compared to 124 watts for a full white raster screen. One slight drawback of this feature is the loud and extended beeping that occurs when the monitor wakes up from its energy-saving mode.

To evaluate the capabilities of the Apple

Multiple Scan 20 Display, we subjected it to the same suite of tests we used in our June monitor roundup and compared the results with those of the Sony GDM-2038 — the winner in the 20-inch-display category. We found that at a resolution of 1,024 x 768 pixels, the two monitors received nearly identical scores in all of our Microvision SpotSeeker III and Minolta Color Analyzer CA-100 tests. Both monitors made strong showings in our sharpness and geometry tests and performed extremely well in the screen-uniformity and color-purity benchmark tests. The one minor exception was that, overall, we found the more expensive Sony monitor to be slightly brighter than the Apple Multiple Scan 20 Display.

The Bottom Line

For first-time Mac buyers, the low-cost 14-inch Apple Color Plus Display delivers surprisingly good quality for the price. It's not as sharp or color-savvy as its more expensive sibling, the Apple Macintosh Color Display, but it's a worthy choice for budget-conscious buyers.

Apple's second new monitor offering, the Apple Multiple Scan 20 Display, is sure to garner applause from desktop publishers and graphics professionals. In our tests, the company's first multifrequency monitor stacked up well against the top-rated Sony GDM-2038. Although the Apple Multiple Scan 20 Display isn't quite as bright as the Sony monitor, it does feature Energy Star compliance and a competitive price tag.

/ Stephen Chan

Apple Color Plus Display

Rating:

List Price: \$305.

Pros: Inexpensive. Good image quality for the price.

Cons: Not as sharp or color-rich as the Apple Macintosh Color Display.

Company: Apple Computer, Cupertino, CA;
800-538-9696 or 408-996-1010.

Reader Service: Circle: #410.

Apple Multiple Scan 20 Display

Rating: ★★★★★

List Price: \$2,149.

Pros: Excellent image quality.
Autosynchronous. Digital controls.

Cons: Not as bright as the Sony GDM-2038.

Reader Service: Circle: #411.

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CIRCLE 13 ON READER SERVICE CARD

GeoQuery 4.0 / GeoQuery's data-mapping program helps put your business on the map.

YOU DON'T HAVE TO BE a cartographer to map business data with GeoQuery. Aimed at marketing professionals and field-based sales organizations, GeoQuery specializes in easy-to-use tools for manipulating, analyzing, and presenting business data on maps. The latest release boasts more-detailed maps than the previous version as well as new mapping features that make GeoQuery even easier for business professionals to use.

New Engine

At the heart of GeoQuery 4.0 is a new proprietary graphics engine that replaces the previous version's QuickDraw graphics engine. As much as 10,000 times more precise, the new engine supports higher-resolution, more detailed maps. GeoQuery 3.0 maps, for example, displayed only state boundaries, interstate highways, and about 1,200 cities. County boundaries and U.S. routes were available as separate add-ons costing an additional \$195 each. Version 4.0 adds counties, 5-digit ZIP codes, state highways, and more than 25,000 cities and landmarks to the standard \$295 GeoQuery package.

For users with limited disk space, GeoQuery also provides a set of low-resolution atlases that require only 6 MB of disk space rather than the 14 MB required for the high-resolution versions.

For those who require maps that are even more detailed, the \$495 GeoQuery Plus package contains additional state and major local roads as well as the ability to map data by 9-digit ZIP+4 codes. ZIP+4 codes result in a level of precision that approaches that of street-addressing systems but without the high cost and huge storage requirements.

To help you manage GeoQuery's highly detailed maps, the program provides a feature called automatic detail control, a configurable mechanism for displaying map and data symbols at a level of detail appropriate to the selected scale. As you zoom in on a map, for example, GeoQuery automatically displays more detail — when you zoom out, the program reduces the level of detail to avoid clutter.

Version 4.0 also supports hot links between a main map and its related inset map, which shows a higher level of detail. Inset maps are independent of their origin maps, and you can even create an inset from an inset map.

GeoQuery provides two options for mapping data: pushpin plotting and region shading. Pushpin maps use symbols to represent data records, and in many instances, you may have several pushpins at the same map location, such as a single ZIP code. GeoQuery can now scatter the pushpins

underlying data record for any pushpin simply by clicking on the pushpin. With GeoQuery's pushpin-selection tools (box select, circle select, and lasso), you can select a group of pushpins and create summary and descriptive reports of all the records associated with them. For example, you can create a report that gives the sales volume for all clients within 50 miles of a city or the number of active customers within a specific sales territory.

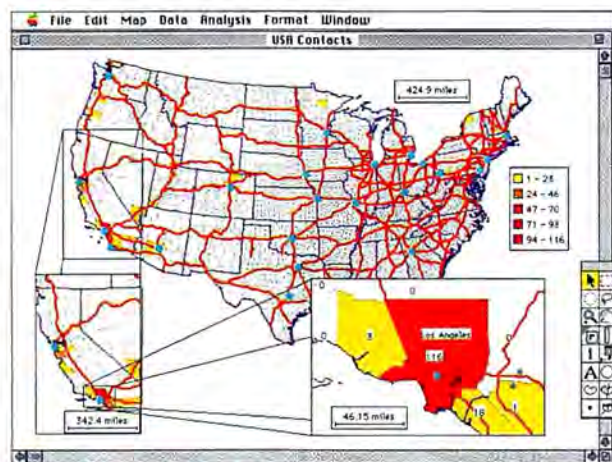
Version 4.0 includes several new tools that make it easier to navigate maps and specify areas for reporting. In addition to the new zoom tool, there's the Go To command, which allows you to zoom in directly to a specified state, city, town, place, or ZIP code by entering its name in a dialog box, and a new data-loading option that enables

you to tell GeoQuery to zoom to the smallest area that contains the data file you are currently loading.

GeoQuery, like most other mapping programs, lets you organize and work with related objects, using map layers. For example, state, county, and city boundaries are each stored in a different layer. Most programs also enable you to set color, pattern, line thickness, font, size, and style for all

objects in a layer, but GeoQuery goes one step further. The program's hybrid layer/object system not only lets you set the attributes for all objects grouped on a layer but also lets you control attributes of any individual object. So, for example, you can select a red circle to represent all the restaurants on a map layer except your favorite one, which you can choose to represent with a gold star.

Unlike more-expensive mapping systems, such as MapInfo, GeoQuery does not provide a programming language and sophisticated data-mapping tools, both of which require high-end systems and mapping specialists. In addition, it does not incorporate an internal database. Instead, GeoQuery offers a variety of ways to connect



Accessible and affordable. GeoQuery lets you analyze business data visually by viewing it on a map. For a closer look, you can create inset maps with live links to origin maps.

around a central point, rather than stacking them on top of one another (as did the previous version), making it easier to judge the density of the data records.

Territory Assignments

Once you've mapped your data, you can use GeoQuery's excellent tools to manipulate and analyze it. A major enhancement in this area is the four new Assignments commands, which let you assign each region on the map (a county or state, for example) to an individual and then merge regions to create territory boundaries — a real boon to sales organizations that frequently need to define and update sales territories.

GeoQuery also provides a good complement of reporting tools. You can view the

to other applications, such as spreadsheet programs, database programs, and contact managers, for source data. This may not be as convenient as working with data stored within the program itself, but GeoQuery makes the data-exchange process as painless as possible, given the absence of an internal database.

First, GeoQuery supports Apple events for communicating with programs such as Symantec's ACT!, ACI US' 4th Dimension, and Data Description's Data Desk statistics package. Second, GeoQuery supports publish-and-subscribe, so any program capable of publishing a spreadsheet or a tab-delimited text file can establish a hot link with GeoQuery. Third, GeoQuery can import tab-delimited text files. And finally, GeoQuery can import data from the Macintosh Clipboard.

One advantage of this approach is that because GeoQuery doesn't incorporate a database program and heavy-duty data-manipulation tools, it's fairly slim, making it a viable choice for users working in the field with PowerBooks.

GeoQuery requires System 7.0 or later and a minimum of 7 MB of disk space and 4 MB of RAM.

The Bottom Line

GeoQuery's relatively modest disk-space and memory requirements, coupled with support for color as well as monochrome maps, make it an ideal choice for PowerBook-equipped mobile sales and marketing professionals. The program is the most affordable and accessible tool we've found for mapping business data on the Macintosh. However, if you need complex data-manipulation tools or sophisticated mapping features, such as Albers projections, geocoding, or street-address mapping, the more expensive MapInfo is a better choice.

/ Jeffrey Sullivan

GeoQuery 4.01

Rating: ★★★★★

List Price: \$295; GeoQuery Plus, \$495.

Pros: Easy to use. Flexible connectivity options. Inexpensive.

Cons: Requires external source for data.

Company: GeoQuery, Naperville, IL;
800-541-0181 or 708-357-0535.

Reader Service: Circle #412.

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Apple QuickTake 100 / Point 'n' shoot meets click 'n' drag

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standard resolution (320 x 240 pixels) or 8 at high resolution (640 x 480 pixels). A display panel tells you how many pictures you've taken and shows the resolution, flash, and self-timer settings.

A Convenience Camera. The QuickTake 100 is easy to use, with autofocus (4 feet minimum), autofocus, and autoexposure. Shutter speeds range from 1/30 to 1/175 second and apertures from f2.8 to f16. These aren't the hottest specs you'll see in a camera, digital or otherwise, but other cameras don't include handy software for Mac-based camera control, as does the QuickTake 100.

Snappy Software. Once you've connected the camera to your Mac with the included serial cable, the QuickTake application lets you control the camera from your Mac and view or delete pictures while they're still in the camera. You can use the QuickTake application to download files to your Mac or use the QuickTake Setup control panel to put a camera icon on the desktop. In the latter case, the camera acts like a storage device, with its picture files accessible from within applications and the Finder. Once you've moved pictures to your hard disk, the QuickTake application lets you easily perform basic editing, including rotating, cropping, and resizing images as well as saving them in various bit depths and file formats.

With its limited resolution and camera controls, the QuickTake 100 isn't suited to producing finely detailed photographic art. And its \$749 price is steep. But for businesses wanting to incorporate photos in Mac-produced documents or presentations, the QuickTake 100 is a real photo opportunity. / John Rizzo

Apple QuickTake 100 ★★★★★ / List Price: \$749. Company: Apple Computer, Cupertino, CA; 800-767-2775 or 408-996-1010. Reader Service: Circle #413.

The 7th Guest / The skeletal hand beckons

NO OTHER GAME for the Mac looks or moves like *The 7th Guest*, the hit CD-ROM finally ported from Windows to the Mac by Virgin Interactive Entertainment and Trilobyte Software. This two-CD-ROM horror game (one CD-ROM for the game plus one filled with game-based music) lets you move through a fully rendered 3-D environment as you watch ghostly visions unfold.

A Scary Story. The story involves a crazed toy maker, Henry Stauf, and his mystical creations. Although the toys are popular, they turn out to have a horrific effect — their owners die. Having retreated to his newly constructed mansion, Stauf invites six guests, for reasons revealed only gradually throughout the game. You play the part of Ego, a character who explores the mansion after the story is over, solving puzzles (22 in all) and attempting to figure out what happened — with the assistance of some unquiet ghosts.

Gorgeous Graphics.

The 3-D, first-person-perspective graphics are by far the best part of this game. The full-screen animation (best viewed on a 68040 Macintosh, although you can use a 68030 one) is awesome. The soundtrack can be overbearing, however, muffling the sounds of characters talking.

Puzzles Lacking Plot. The puzzles, which vary from simple to incredibly tough (there's a hint book in the mansion's library), are somewhat unsatisfying. Diverse in type (word puzzles, mazes, chess moves), they aren't well connected to the story's plot. Also, you can't save the game in the middle of a puzzle; if you're interrupted and need to quit, you have to start over.

Although its puzzles leave a bit to be desired, *The 7th Guest* is a visual treat well worth exploring. / Tony A. Bojorquez

The 7th Guest ★★★★★ / List Price: \$79.95. Company: Virgin Interactive Entertainment, Irvine, CA; 800-874-4607 or 714-833-8710. Reader Service: Circle #414.



WillMaker 5.0 / Estates lawyer in a box

OF COURSE, YOU KNOW you *should* have a will. If the cost of visiting an attorney is holding you back, consider using Nolo Press' WillMaker 5.0 — it's an inexpensive way to create a relatively sophisticated, legally sound will. A will created with WillMaker lets you distribute your money and property through as many as 100 individual bequests, name a guardian and property manager for your children, name an executor, and take care of remaining debts. Version 5.0 includes several new features, notably a much improved on-line help system. It also now lets you create a living will, a health-care proxy, and a final-arrangements document.

A Painless Process. The easy-to-use legal

software consists of a series of questions to be answered; as a nice touch, WillMaker displays each response in a sample context. If you need help at any point, you can press Command-H to get a resizable window containing explanatory text — legal definitions, recommendations, and other useful advice. When you're done, just print your will (which is valid in any state except Louisiana) and find three witnesses to watch you sign it.

Legal Limitations. WillMaker's clearly written manual is not shy about telling you when you should consult an attorney. WillMaker does not, for instance, let you bequeath

property conditionally (giving your car to your cousin Paul on the condition that he waxes it every week); you need a real live lawyer for that kind of legal gray area and others, such as naming coguardians for your children.

Those who do need an attorney will appreciate Nolo's 30-day money-back guarantee. But for the rest of us, WillMaker is a gem. With its terrific new help system and ability to make living wills and final arrangements — at a fraction of the cost of engaging an attorney — WillMaker 5.0 is an easy choice.

/ Joseph O. Holmes

WillMaker 5.0 ★★★★★ / List Price: \$69.95. Company: Nolo Press, Berkeley, CA; 800-992-6656 or 510-549-1976. Reader Service: Circle #415.



HyperCard 2.2 / The hypermedia pioneer gets color and more

AS IF TO COMMEMORATE its return from Claris to the company with the rainbow-striped logo, Apple's HyperCard has an improved, color-capable interface. The venerable "software erector set" can now also create and play animations, generate stand-alone applications, control other applications, and support non-Roman alphabets.

Interface Tweaks.

Some new interface features — new button and field types and better control over layering of objects and tracking of the mouse — make

HyperCard stacks look and act more like real Mac applications. For visual interest, you can now colorize buttons, fields (although not field text), backgrounds, and cards as well as display color pictures. HyperCard's paint tools are still black-and-white, but most stack developers probably prefer to create color pictures in more-sophisticated applications and then import them.

Adding Motion. The animation support consists of Motion Works' included ADDmotion II software. Designed to integrate well with HyperCard, ADDmotion II offers a 24-bit-color paint editor, a waveform sound editor, timelines, path-based-animation tools, and more. There's also a QuickTime stack for playing movies.

Super Scripting. An important new feature of HyperCard is support for the Open Scripting Architecture (OSA) and therefore for AppleScript (version 1.1 is supplied). OSA

support means that stacks can drive and be driven by other OSA-compliant applications; it also means that stacks can include scripts written in any OSA-compliant language (such as AppleScript or UserLand's Frontier), not just in HyperCard's own HyperTalk language. We initially doubted that OSA would be accessible enough

to mainstream HyperCard users, but the extensive supplied documentation and on-line tutorials for AppleScript and OSA won us over.

The App Stands Alone.

Being able to generate stand-alone applications is

a long-awaited feature, smoothly implemented here — you simply select an option in the Save As dialog box. The generated applications aren't very compact, since they include more than 700K of overhead, but we found that ours could fit on an 800K disk (just barely). The stand-alone capability is just one facet of a new technology that will allow third-party developers to produce stack translators — making it relatively easy, for example, to move stacks to other platforms such as Windows machines and the Newton.

Judging from this solid upgrade, HyperCard's return to Apple looks like good news for all stack users. / Michael Swaine

HyperCard 2.2 ★★★★★ / List Price: \$249; upgrade for 2.0 and 2.1 registered users, \$89; upgrade for those who bought Claris HyperCard between November 1 and December 31, 1993, \$39. Company: Apple Computer, Cupertino, CA; 800-282-2732, 800-637-0039 (Canada), or 408-996-1010. Reader Service: Circle #416.



The Complete MAUS / Dark comix on CD-ROM

THE COMPLETE

MAUS proves that a profound work of art is able to be enhanced on CD-ROM. Art Spiegelman's graphic novel based on his father's memories of the Holocaust earned a Pulitzer prize for its print version. What can putting it on a CD-ROM add? Plenty, in this case.

Much More Material. The Complete MAUS contains all the material in MAUS: A Survivor's Tale and more, including video clips of Spiegelman discussing his work, hundreds of preliminary sketches and photos, essays by Spiegelman, and transcripts of his interviews with his father. The interface is appealing and simple to navigate.

Peering at Panels. Spiegelman is clearly committed to documenting his artistic process in ways that only CD-ROM allows. Unless you've got a 21-inch or larger monitor, though, you can't view an entire page of MAUS at an acceptable resolution. Voyager partially solves the problem by having you toggle between a full-screen view that shows the overall design of each page and a close-up view for reading individual panels.

As other writers and artists see what Spiegelman has achieved with this disc, we hope they too will be challenged to transmute the promise of CD-ROM into something new and wonderful. / James Bradbury

The Complete MAUS ★★★★★ / List Price: \$59.95. Company: Voyager, New York, NY; 800-446-2001 or 914-591-5500. Reader Service: Circle #417.



Spectral NuMedia / NuBus cure for AV-Mac envy

UNTIL RECENTLY, NuBus-enabled-Mac users interested in "affordable" 16-bit, near-CD-quality audio recording had to buy a \$1,300 Digidesign Audiomedia II digital audio card. No longer. The AT&T DSP3210 chip that adds 16-bit sound and accelerated Photoshop 2.5 performance to the AV Macs is now available on Spectral Innovations' \$695 NuMedia card.

Well Equipped. The NuMedia sports a microphone input as well as analog and digital inputs and outputs. Additionally, the 7-inch NuBus format allows the card to fit into a Quadra 610 via a NuBus adapter. Included in the box are Passport Designs' Producer software, for creating multimedia presentations, and an audio CD of license-free music and sound effects from Killer Tracks.

Sound and Support. This audio card has signal-to-noise specs just

lower than those of the Audiomedia II in quality — a difference nearly indiscernible to the untrained ear. Although the NuMedia works well with OSC's DECK II and Alaska Software's DigiTrax, two applications for recording and editing 16-bit sound, it doesn't enjoy the Audiomedia II's broad software support. However, upcoming products from Opcode and Macromedia will provide additional support (another upcoming product worth noting is the NuMedia 2, a \$495 version of this card that lacks digital ins and outs).

The NuMedia provides an effective, bargain-priced means for musicians and multimedia users to explore the crystal-clear universe of 16-bit audio. / Christopher Breen

Spectral NuMedia ★★★★★ / List Price: \$695. Company: Spectral Innovations, San Jose, CA; 408-955-0366. Reader Service: Circle #418.

*Suggested U.S. list price. **Larger model lists at \$11,995. †Pantone, Inc.'s check-standard trademarks for color. Adobe and PostScript are trademarks of Adobe Systems Inc. which may be registered in certain jurisdictions. ©1994 Hewlett-Packard Company PE12110

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| S&P 500 Index | 447.87 | 441.48 | |
| NASDAQ Composite | 731.28 | 719.86 | |
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Apple Update

Apple is expected to unveil PowerPC microprocessor near the RISC-based Macintoshes amount of compatibility to the products will place Apple price/performance figures according to the report. PowerPC 601 chip: a high speed 66MHz chip, and an 60MHz.

The latest.



Musical Instrument Digital Interface.



Hourly weather updates.

From: John Nag
To: 1 Bruce Ca
Subject: Changes

John:
How are you doing now I'm afraid anything important think about this several things

E-mail.



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Topics Messages

Topic: Quark & Placing P

I could hazard a few guesses playing with Photo CD. For the resolution of the image (768x512), though I do not works.

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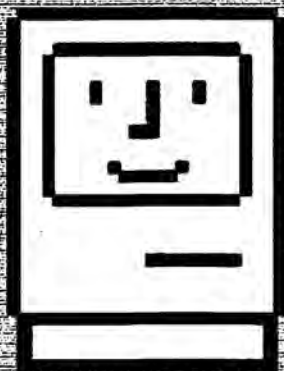
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PopupFolder / Hierarchical menus right where you need 'em

STORING FOLDERS within folders was fine back when one floppy disk held an

entire word processor; nowadays, those folder windows can really stack up on the screen and flipping through them is much like digging through a crowded file drawer — that is, unless you have PopupFolder.

Natural Navigation. Incredibly unobtrusive, PopupFolder quickly becomes second nature. Clicking on a folder or a storage icon (such as a hard disk, CD-ROM, or server volume) brings up a hierarchical list with which you can launch applications and open documents as many as five folder levels down — just drag to the file's name and release. You can also save documents by dragging them down through the menus to a folder. This hierarchical-list capability works in Open and Save dialog boxes too.

Unnecessary Extras. PopupFolder offers some extra customization options, but they're not as well implemented as the program's main feature. You might love having a small-icon view on your desktop, for example, but PopupFolder rearranges your icons oddly. Luckily, you can deactivate any feature you don't like.

In giving you quick access to your files, PopupFolder is absolutely spectacular. Now all we need is a PopupFolder equivalent for real file drawers. / Carolyn Bickford

PopupFolder ★★★★★ / List Price: \$59.95. Company: Inline Software, Lakeville, CT; 800-453-7671 or 203-435-4995. Reader Service: Circle #419.

Crystal Caliburn / Electronic pinball's Holy Grail

COMPLETE WITH BUMPERS, scoring lanes, multiple balls, and ramps — all presented dazzlingly on the screen — Crystal Caliburn will delight those who yearn for the feel of a traditional pinball machine in a computer game.

Pinball Knights. Crystal Caliburn's theme is the legend of King Arthur and his search for the Holy Grail. You must "accolade" Arthur's

12 knights (add them to the Round Table) by shooting through side ramps, shoot for the Holy Grail, and then quickly return to Camelot Castle, negotiating two spectacular 3-D ramps in the latter instances.

Challenging and Realistic. Crystal Caliburn is a true test of your electronic flipper technique. In addition to the ramps, there's plenty to shoot at — bumpers, tunnels, and pits that lock balls. Locking three balls starts a Multi-Battle, adding two more balls to the one already in play. The sound effects and colorful graphics effectively simulate a real pinball machine, and the movement of the ball is life-like, although it's sluggish on a Mac less powerful than an LC III. If we could just figure out how to prop up the front legs of the machine with virtual ashtrays . . . / Roman Victor Loyola

Crystal Caliburn ★★★★★ / List Price: \$59.95. Company: StarPlay Productions, Boulder, CO; 800-203-2503 or 303-447-9562. Reader Service: Circle #420.

Replica / Paperless document distribution the Farallon way



THE NETWORKING GURUS at Farallon have entered the paperless fray with Replica, another product for distributing documents across platforms (Mac and Windows machines) and among users who may not have the same applications. Replica competes with Adobe's Acrobat and No Hands Software's Common Ground, aiming more toward the casual-user market of the latter package than the high-end digital-publishing market of the former.

Replicating. Replica has four parts: Creator, Shortcut, Replicator, and Viewer. Creator is a Chooser extension that converts any print job within any application to a Replica document. Shortcut lets you switch to the Replica Chooser driver for just one print job, so you don't need to remember to switch back to your printer. Replicator lets you convert files into Replica documents by dragging and dropping them onto the Replicator desktop icon. You can embed the freely distributable Viewer in any Replica document so that the recipient can just double-click on a file to view it.

True to Type. Replica's TrueType-based-font approach strikes a middle ground between Common Ground's imaged fonts (which are highly transportable but not resolution-independent) and Acrobat's reliance on PostScript fonts. Replica is able to embed TrueType outlines in documents, so they will print at the highest resolution of the recipient's printer whether or not the recipient has the font. Type 1 PostScript fonts are


included in the package as 72- and/or 300-dpi bit maps (of course, they will print at other resolutions as well if both parties have the same fonts).

Paper Jams and Gems. Although we were impressed by the capabilities of the Viewer (which includes searching), embedding it is awkward. You first have to produce a Replica document, and then you must save that document from within the Viewer in order to embed the Viewer. Another problem is Shortcut's corruption of the File menu (Farallon was working on fixing this bug at press time). On the plus side, networked users will welcome Replica's cross-platform-network features (integration with Timbuktu Pro and Microsoft Mail). Replica's ability to preserve the editability of spreadsheet-type tables and PICT draw graphics (you can copy draw objects from a Replica document and edit them in any draw program) is another plus.

Replica is probably best suited to people who need its network mail feature and those who need to exchange documents between Macs and Windows machines (where TrueType is far more prevalent). Overall, we still prefer Common Ground's greater simplicity for individuals and casual use, but Replica is a valuable tool for simplifying Mac-to-Windows connectivity. / Gregory Wasson

Replica 1.0 ★★★★★ / List Price: \$99 (discounts for multiuser packs). Company: Farallon Computing, Alameda, CA; 510-814-5000. Reader Service: Circle #421.



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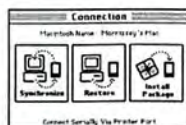
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*MacLinkPlus Library, a product of DataViz, Inc. **Available summer 1994. ConversionPlus Library, a product of DataViz, Inc. †Look for the on-line Newton demonstration on the following services: AppleLink, America Online, CompuServe and the Internet.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

75 Ways to Raise Your Mac IQ

Pull up a chair in front of your favorite Mac, and start learning how to work more effectively. **By Joseph Schorr**

IMAGINE ADDING dozens of new features to your Mac, giving your desktop a sharp new look, and boosting your overall productivity — all without spending a penny on additional hardware or software. Forget about upgrading — at least for the next few minutes. This isn't another one of those articles that tells you about the two dozen System 7 add-ons and utilities you *wish* you had. No, this is all great stuff you can do *right now*, with your own Mac, *just the way it is* (assuming you are running at least System 7). We promise, you won't have to buy a thing to make these tips and tricks work for you.

Most of these tips aren't deep, dark secrets. Quite a few are simple, well-documented shortcuts beloved of many Mac enthusiasts yet still undiscovered by plenty of longtime users. If you're still using your Mac according to the *Macintosh Basics* tutorial that came with the machine, you're in for a few surprises.

What follows is a roundup of choice tips designed to help you unlock more of System 7's power. So grab this article, and head off to the nearest Mac. You'll want to start experimenting — and saving time — right away.

5 Quick Ways to Select Files

The more experienced you become with your Mac, the less you'll use the mouse. Pointing and clicking may be intuitive, but having to lift a hand from the keyboard to press a mouse button tends to slow down fast typists. Here are five ways to select a file without using a single mouse-click:

- ▶ **Type a letter.** To select an icon in an active window or on the desktop, just type the first letter or letters of the icon's name. You'll jump right to the file, even if the icon itself is beyond the boundaries of the window.
- ▶ **Use the Tab key.** The Tab key cycles you through all the icons in a window in alphabetical order. Shift-Tab does the same thing in reverse alphabetical order.
- ▶ **Press the arrow keys.** In icon views, the → and ← keys move you to the next icon in either direction.

▶ **Move up or down.** In every view, the ↑ and ↓ keys move you to the next file above or below your current selection.

▶ **Use the tilde key.** The ~ (tilde) key always takes you to the last file, alphabetically speaking, in any view.





4 Keyboard Shortcuts for List Views

If you use the Finder's list views — by name, date, and kind, for example — you can view nested folders in outline form. These views allow you to see the contents of several layers of folders within a single window, but collapsing and expanding the hierarchical outline by clicking on the triangles to the left of each folder can be tedious. Instead, try the following:

1. Press **Command-→** to expand a selected folder by one level.
2. Use **Command-Option-→** to expand a selected folder and *all* the folders nested within it.
3. To quickly expand all the folders in a window, try this: Press **Command-A** (to select all the folders at once), and then press **Command-Option-→**.
4. Conversely, to close hierarchical folders that have been expanded, try this sequence: Press **Command-A** to select all the files, and then press **Command-←**. All the folders on all the levels collapse simultaneously, leaving only the outermost level of folders.



10 Speedups for Working with Windows

Opening and closing files, folders, and windows — these are among the most basic of Mac activities. You probably perform these tasks dozens — no, hundreds — of times a day. Fortunately, Apple has provided plenty of shortcuts that make traditional double-clicking and mousing around from window to window seem downright archaic:

- **Command-O**. To easily open a file, folder, or disk in the Finder, select it and then use an old familiar key-stroke: **Command-O**.
- **Command-↓**. You can also open any file, folder, or disk by selecting its icon and pressing **Command-↓**.
- **Shift-click**. Shift-click to select multiple items, and then use either of the previous two shortcuts to open them all simultaneously.
- **Command-↑**. You can move to the window that encloses the one you're currently working in by pressing **Command-↑**.
- **The Option key**. Dig through a few nested folders, and your desktop quickly becomes cluttered with open windows. To prevent this, hold down the Option key while you open a folder. The current window will close automatically. The same trick works when you launch a program or open a file.
- **The Command key**. Hold down the Command key while clicking on the title bar of a window, and you'll see a pop-up menu showing a hierarchical listing of the window's enclosing folders. Select the folder level you want from the menu, and you jump right to it.



- **Command-Option**. Now try holding down both the Option key and the Command key while clicking on the title bar and selecting a folder level. You'll simultaneously jump to the new window and close the current one.
- **Closing windows**. Hold down the Option key while closing a window, and all the windows on the screen will close automatically.
- **Command-Option-W**. Alternatively, you can clear your screen of all open windows with a single key combination: **Command-Option-W**.
- **Startup tip**. Another oft ignored shortcut: Hold down the Option key while starting up your Mac, and any windows that were left open when you last shut down will close automatically as your machine starts up.

Avoiding Floppy-Disk Demons

► **Command-Y.** Ejecting floppy disks by using the Eject Disk command leaves the disk's ghosted icon on the desktop. The better way to eject floppies is to press Command-Y (Put Away, on the File menu). When you select a disk's icon and press Command-Y, the disk pops out of the floppy drive and its icon disappears.

► **Command-period.** If you disregard the preceding tip, use the Eject Disk command to eject a floppy disk, and then try to close that disk's window, your Mac may ask you to *reinsert* the disk. Sometimes this happens even if you try to throw away the ejected disk, press Command-period. You may see a dialog box asking for the disk again. Ignore it, and press Command-period; the icon will disappear, and the Mac will let you carry on with your work.

► **Avoid closing windows.** You don't have to close the windows of a disk before ejecting it. The disk will pop out just as quickly with all of its windows open. Just select the open disk's icon and press Command-Y. Bypassing the window-closing routine can save you several keystrokes every time you eject a disk.

► **Option key.** If you've left windows open when you eject a disk, try holding down the Option key the next time you insert the disk. All open windows will automatically be closed when the disk mounts.



3 Hints for Accessing Buried Desktop Icons

1. To eject a disk or to open the Trash, you have to return to the desktop level. There's a much-ignored Finder command to get you there fast: Command-Shift-↑. No matter how deeply buried in nested folders you may be, this command will move you to the desktop level right away.

2. If your desktop icons are buried under windows, then simply use any of our selection tips to find and open them — without moving any of your currently open windows.

3. If you simply must move a window in order to find an icon, then try this: Hold down the Command key, and drag an unactivated window. Your active window will stay in place.

3 Paths to a Faster Chooser

The Chooser is, admittedly, a little awkward to use, but here are a few shortcuts that simplify things:

1. When the Chooser opens, you can select the device driver you want simply by typing the first letter or letters of its name — if you want to pick a LaserWriter, for example, type L.

2. Press Tab to toggle among the driver field, the AppleTalk Zones field, and the device field.

3. As before, you can select the zone or the device you want by typing the first letter or letters of its name.

Eliminate the Rename Delay

► **Use the Return key.** If you want to rename a file under System 7, you generally select it with a single click and then wait a moment until the "renaming rectangle" appears around the text. It's easy to bypass this delay: Select the icon, and immediately press Return. The filename is instantly highlighted and ready for typing.

► **Press the ← key.** To add just a prefix to a filename, select the file and then press the ← key. The blinking cursor will now precede the filename, and you can type the prefix.

► **Press the → key.** Likewise, to add a suffix to a filename, select the file and press the → key to quickly move the blinking cursor to the end of the filename.

► **Use the ↑ and ↓ keys.** Pressing the ↑ or ↓ key also takes you immediately to the beginning or end, respectively, of a selected filename.



The Trash contains 2 items, which use 5K of disk space. Are you sure you want to permanently remove these items?

Cancel

OK

QUICK TIP #1

Let Your Mac Do the Filing

If you've dragged an item out onto the desktop to work on it, you can select it and press Command-Y (Put Away) to automatically return the file to the folder or volume from which it came. This works even if you've moved the item's folder or if you've restarted the Mac.

Taking Out the Trash

► **Bypass the warning once.** To bypass the Trash's warning message, hold down the Option key while choosing the Empty Trash command.

► **Toss locked items.** Holding down the Option key while choosing the Empty Trash command also allows you to throw away locked items.

► **Eliminate the warning forever.** You can turn off the Trash's warning message once and for all: Select the Trash icon, choose Get Info from the File menu (or press Command-I), and uncheck the "Warn before emptying" check box.

► **Restoring files.** Ever dragged something into the Trash and then realized you didn't want to throw it away? Command-Y (the Put Away command) can help you retrieve the item and stuff it back into the folder it was in before you trashed it. Just open the Trash, select the icon, and press Command-Y. If you've dragged several items

from various folders and disks into the Trash and try this trick, each item will be returned to its proper place.

► **Make multiple Trash icons.** You can make aliases of the Trash and place them in every folder — or in every corner of the desktop. Then, no matter where you are, the Trash is always just a short drag away. Remember, though, no matter which Trash alias you dump files into, only the original Trash icon will bulge to show that it contains files.

QUICK TIP #2

Quick-'n'-Dirty Connections

When presented with the dialog box for connecting to a network, you can select the Guest option simply by pressing Command-G — assuming, of course, that you have guest access privileges.

than it did before. Here are six tips for serious window cleaning:

1. Hold down the Option key before clicking on the Special menu. You'll now see a Clean Up by Name command rather than a Clean Up by Window command. (Actually the command changes to reflect the most recent list view you used for sorting.) When you use the command, the Mac lines up your icons in a grid and sorts them alphabetically — or according to date, label, size, kind, version, or comments.

2. Try the same Option-key trick when cleaning up in small-icon view. Ordinarily, the small-icon view looks terrible — a bunch of tiny, hard-to-read icons randomly adrift in an ocean of white window space — but if you use the Option key, the Mac will line up the icons in perfectly neat columns to fill the window. First, drag the window to the size you want, and then use the Option-Clean Up command; the icons will line up in columns that are just long enough to perfectly fit the window.

3. The same rules apply to cleaning up the desktop too. Click anywhere on the desktop, and then hold down the Option key while choosing the Clean Up Desktop command. The command changes to Clean Up All and forces all of your scattered desktop icons to line up perfectly along the right edge of your screen. Your startup volume appears in the upper right corner of the screen.

4. In the Views control panel, choose Staggered Grid instead of Straight Grid under Icon Views. When icons are lined up in a straight grid, their names tend to overlap. With the staggered grid, even long filenames can be seen fully when the icons snap into position.

5. You can make your icons snap to an invisible grid by checking the Always Snap to Grid box in the Views control panel. Here's the neat thing: If you have Always Snap to Grid checked, you can temporarily disable it by holding down the Command key while dragging an icon. Conversely, if you normally don't use Always Snap to Grid but have a few items you'd like to align, just press the Command key to temporarily enable Always Snap to Grid. Whatever items you're dragging will snap into perfect alignment.

6. If you have Always Snap to Grid off and want to tidy up a window full of icons in one shot, try this: Press Command-A to select all the icons, and then hold down the Command key and use the mouse to drag just one icon a fraction of an inch. Because all the icons are selected, the entire window will snap into alignment along a straight or staggered grid, depending on which setting you picked in the Views control panel.



Stop Digging for the Apple Menu Items Folder

► **Make an alias.** Keep an alias of the Apple Menu Items folder on your Apple menu. Otherwise you have to dig through your System Folder to find the folder every time you want to add something to or delete something from the Apple menu.

► **Keep it handy.** Alternatively, keep an alias of the Apple Menu Items folder on your desktop.

► **Make a drop slot.** If that's too messy, then try creating a white rectangular drop slot. Simply draw a white square in a graphics program, and paste it onto the alias' icon in its Get Info box. Replace the alias's name with several spaces. Voilà! The icon is invisible; all you see is a white, rectangular drop slot. Now you can drag Apple-menu items to the drop slot and have them instantly appear on the menu.

6 Hints for Keeping House in System 7

Have you ever noticed that choosing Clean Up Window from the Special menu doesn't do a whole lot to tidy up a cluttered window? Oh, it slides your icons around a bit — a few millimeters this way or that — but generally, you're left with a window that doesn't look much better



6 Simple Steps to Custom Icons

Even as you read these words, people who want to equip their Macs with custom icons are shelling out hard cash for fancy icon-editing software. You don't have to! Icon editing is one of the bonuses built in to System 7, yet not many users know how incredibly easy it is to turn ordinary icons into works of art. Here are the steps:

STEP 1. In the Finder, select the file, folder, or disk icon you want to modify and press Command-I (Get Info, on the File menu).

STEP 2. Select the icon in the Get Info window by clicking on it or by pressing the Tab key.

STEP 3. Use Command-C to copy the icon to the Clipboard.

STEP 4. Now the fun part: Open a new document in a paint or draw program, paste in the icon (Command-V), and start doctoring it. Change its colors, add new elements, or superimpose two icons to create a new one. Try this: Grab an application icon and scale it to 75 percent. Then paste it over a plain folder icon: You get a customized folder emblazoned with the application's icon.

You can, of course, also create brand-new icons from scratch. One caution: Restrict yourself to a 32-x-32-pixel square — an icon's maximum size — so that your work doesn't get scrunched when you paste it back into the Finder.

STEP 5. Copy your finished icon to the Clipboard.

STEP 6. To apply the new icon, go back to the file icon you wanted to modify, choose the Get Info command, and select the icon in the Get Info window. Then choose Paste to replace the file's original icon with your newly minted one.



4 Things You Can Do with Sound

With no additional hardware or software, you can give your Mac a unique startup sound, as long as you have a Mac that has a built-in microphone for digitizing sounds:

► **Startup sounds.** Using the Sound control panel, record your custom sounds. This saves the sound file in your Mac's System file. To make the sound play automatically at startup, drag the file from the System file into the Startup Items folder.

QUICK TIP #3

A Double-Click Trick

It's no news to any Mac enthusiast that you can use the General Controls control panel to change the desktop's color and pattern. But what you might not know is that you can save a newly created pattern as part of your Mac's permanent collection by double-clicking on the mini desktop in the control panel.



► Record lengthy sounds.

The Sound control panel allows you to record sounds of only about ten seconds, but it's easy to get around that: Just record several separate ten-second sound bites and place them all in your Startup Items folder. They'll play back one by one, in alphabetical

order, according to their filenames.

► **Play sounds in order.** To have sound files play back in a custom sequence, just rename them 1Sound, 2Sound, 3Sound, and so on.

► **Helpful sounds.** Remember, a startup sound can be more than a novelty. Instead of writing yourself a reminder, record it by using the Sound control panel and place it in the Startup Items folder. When you restart your Mac, you'll hear your reminder.

5 Tips for Creating a Personal List View

In System 7.1, the Date & Time control panel lets you customize the way dates and times appear in list views. Experiment with this control panel and the Views control panel to come up with a list view that works for you. Here are a few suggestions:

1. Use a compact date format, so list views are easier to read. If you don't need to know that a file was created on a Tuesday, for example, change the Weekday pop-up menu to None.

2. Use the Views control panel to eliminate information you don't need. If you never use labels, uncheck the Show Label box. Likewise, you might want to turn off Show Version or Show Kind.

3. To truncate time and date listings, replace the AM and PM suffixes with single-letter abbreviations. Or use just a single character, such as a bullet (•), to indicate PM times and leave AM times suffix-free.

4. Be creative with the prefix fields available in the Date Formats section of the Date & Time control panel. You can use characters such as brackets and bullets to make a date listing easier to read.

5. If you're the kind of person who prefers to read information in perfectly aligned columns, try using a monospaced font for your list views. The dates and times will line up perfectly every time.

| Hard Drive | |
|--------------------|----------------------|
| Name | Last Modified |
| Icons | • Dec 1993 •, 12:01a |
| • M.T.O.B. | • Mar 1994 •, 4:40p |
| MacUser | • Apr 1994 •, 6:04p |
| MAGAZINES | • Apr 1994 •, 11:20p |
| New Picture | • Apr 1994 •, 12:56a |
| Other Projects | • Apr 1994 •, 6:13p |
| Programs | • Apr 1994 •, 5:56p |
| Secrets | • Apr 1994 •, 10:09p |
| Storybook Weaver | • Apr 1994 •, 8:36p |
| System Folder | • Apr 1994 •, 11:14p |
| Aladdin | • Aug 1993 •, 2:58p |
| Apple Menu Items | • Apr 1994 •, 5:55p |
| AT&T Font Database | • Dec 1992 •, 5:08p |
| Checklist Info | • Jun 1993 •, 3:05p |
| Clarisa | • Apr 1994 •, 8:04a |
| Clipboard | • Apr 1994 •, 5:54p |
| Control Panels | • Apr 1994 •, 3:09a |
| Extensions | • Apr 1994 •, 4:26a |



10 Ways to Avoid (or Cope with) Disaster

If it hasn't happened to you yet, it probably will soon: Your Mac will suddenly, and without warning, *freak out*. Here are some practical ways to help your Mac avoid bouts of bizarre, unpredictable behavior — and a few tips for coping with Mac weirdness when it happens:

1. Don't connect equipment to or disconnect it from your Mac while the computer is on. It's OK to plug in (or unplug) a modem or printer while the Mac is on, but steer clear of ADB devices (keyboards and mice) and all SCSI devices (drives, scanners, and so on).
2. Rebuild the Desktop file (an internal Mac database that tracks which files are where and what they look like) on each of your volumes about once a month. To do this, hold down the Command and Option keys during the entire startup process.
3. If you're connecting a chain of SCSI devices to your Mac, make sure each device has been assigned a unique SCSI-ID number before you start up.
4. Don't simultaneously run two (or more) utilities designed to perform the same tasks: Running two screen savers at the same time or two virus-protection programs will probably confuse your Mac.
5. If you're transporting files on floppy disks, always make *two* copies, on two floppies — three is even better. Assume your disks will randomly go bad, and you'll never be disappointed.
6. Clean your mouse; it's easy. Rotate the panel on the bottom of the mouse to release the ball. Then simply wash and dry the ball, and use a pair of tweezers to remove the gunk, hair, and dust globs from the three rollers inside the mouse. Most problems with sticky, jerky,

malfunctioning mice are due to dirt in the mechanism.

7. If you're suddenly plagued with crashes or freezes, restart your Mac while holding down the Shift key; this turns off all system extensions and control panels. If this solves the problem, you know your crashes were the result of a conflict involving at least one of the extensions. Try adding them back into the System Folder (and then restarting) one at a time until you home in on the offending software.

8. If you get bizarre errors — your hard disk suddenly tells you it's "not a Macintosh disk" after you've been using it for two years — and restarting with all system extensions off doesn't help — turn off your Mac, disconnect any SCSI devices, and try to restart.

9. If the preceding two tips don't help, try performing a "clean" reinstall of your system software: This involves dragging either the Finder or the System file into another folder and changing the name of your current System Folder (to anything other than System Folder) *before* you run the Installer. Dismantling your old System Folder in this manner ensures that the Installer will place a completely new copy of the system software on your hard disk.

10. If you get a flashing question mark when you try to start up your Mac, restart and notice whether or not you get the happy Mac first. If you do, then your system software is probably damaged and you'll need to reinstall it. If not, then you have a hardware problem such as loose cable connections or two SCSI devices with the same ID.

When a Disk Dies

If your Mac says a floppy disk is unreadable or damaged, don't always believe it. Before you give up on a floppy that contains files you need, try the following:



1. Reinsert the disk.
2. Insert the disk into a floppy drive on another Mac.
3. Launch Apple File Exchange, and then insert the floppy disk and do a straight Mac-to-Mac file transfer to get the file off the disk.
4. Open and close the metal shutter on the disk to make sure it isn't stuck.
5. If the metal shutter is bent or jammed and appears to be the cause of the problem, rip the shutter off the disk, being careful not to touch the Mylar inside the disk's case. Pop the disk into the drive; it should work just fine without the shutter. This is a last resort, but it will let you rescue files from a damaged floppy. ☒

Joseph Schorr is a journalist, playwright, and Mac trainer/troubleshooter for a publishing company.

M For more tips, check out the MacUser 1001 Tips — 1994 Edition stack. It's available in the MacUser Forum on ZiffNet/Mac (GO MACUSER) and the ZiffNet Selections area on AppleLink. See page 4 of this issue for information on how to sign on to these services.

You got a Mac. And then a few more. You tied them together. People started sharing. Everything.



Now they're sharing their frustration. With you.

Time for a Workgroup Server.

Funny thing about the Macintosh[®] computer. With little fanfare and an idea known simply as "plug and play," it turned a whole lot of novice users into networkers.

And is it any surprise? All you have to do is plug an inexpensive connector into the back of a Mac[®], and you're networked. You can share printers. You can share modems. You can even share files with your peers.

This kind of "peer-to-peer" network is all some workgroups need.

Others, however, soon find they're ready to take the next step: a Workgroup Server dedicated to improving the ebb and flow of vital information.

How do you know if you're ready? Just ask yourself a few simple questions.



Do I have more than five computers tied together in a peer-to-peer network? Is one printer always backlogged while others sit idle? When people share files, are their systems slowing down? Is

there confusion about who has the latest data and where it resides?

If you answered yes to any of these questions, it's definitely time to consider a Workgroup Server from Apple.

Workgroup Servers provide a centralized place for users to store and share files. Which means your shared files don't get lost, your systems don't slow down and users always have access to the latest information.

A server also gives you a place to put network applications and services—accounting programs, databases, e-mail and more—for everyone to use.

And that's just the start. With print spooling software, users won't wait forever for your overworked LaserWriter[®] printers. With FileWave software, you can distribute new programs and upgrades from the server, without trekking from Mac to Mac. With Dantz Retrospect Remote, you can back up every system on the network—both clients and servers—automatically. While with Apple[®] Remote Access software, your users can

access the network from anywhere.

"OK," you say, "but how difficult is it to use a Workgroup Server?" It's as easy as using a Macintosh. All you have to do is connect the components, turn on the power, and you're ready to go.

Choosing the right server for your workgroup is just as easy. We have six models for all kinds of needs, from the Workgroup Servers 60, 80 and 95 to our newest models based on the high-performance PowerPC[™] chip: the Workgroup Servers 6150, 8150 and 9150.

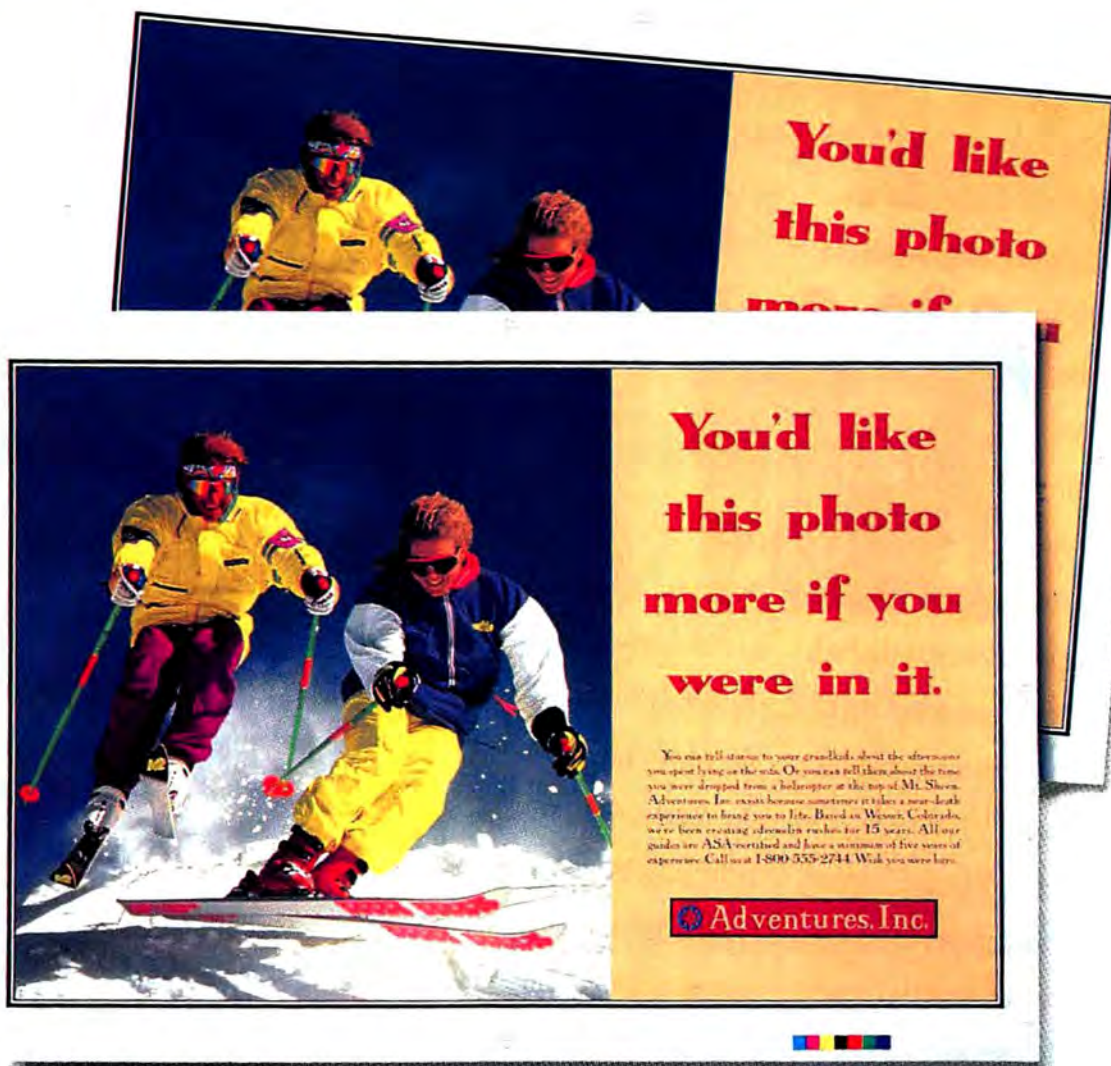
No matter which one you choose, you're backed by our expert telephone support, 24 hours a day, seven days a week.



For the name of your nearest authorized Apple reseller, simply pick up the phone and dial 800-538-9696, ext. 430.

Get your hands on a new Workgroup Server today. And discover the power you need most for your workgroup environment. The power to be your best.





One of these is a color proof and one is output from our new printer. We forgot which is which.

We paid \$70 and waited three days for one of these. The other popped out of our new Tektronix Phaser™ 480 in minutes. Pull out your loupe and start guessing. And while you're down there staring, note our output's phenomenal color. PANTONE®-approved, it's perfect for matching those tricky product colors, logos and skin tones. You might also notice the full 11" x 17" print area. Yes, Virginia, there are tabloid-sized full bleeds. And it shares easily: the Phaser 480 is a work group printer for Macs,

PCs or workstations. Plus, it boasts a powerful RISC processor and true Adobe® PostScript™ Level 2. Spread-sized bleeds? Reprint quality comps? Pre-film proofing right at your desk? Welcome to preproduction heaven. So head down to your nearest Tektronix dealer to see for yourself. And by the way, our guess is that the one on the bottom is our print. Well, then again ...



Tektronix

For a free print sample or dealer location call 800/835-6100, Dept. 32A.

Phaser is trademark of Tektronix, Inc. All other marks are trademarks or registered trademarks of their respective companies.



Choosing the Right PowerBook

Picking a perfect PowerBook isn't as easy as it seems. Let us guide you through the maze. **By Cheryl England**

APPLE HAS DONE IT AGAIN. In May, the company introduced six innovative PowerBooks — and discontinued four others. Consequently, you may feel that nearly everything you thought you knew about PowerBooks is wrong — and if you're shopping for a new PowerBook right now, this ignorance is definitely *not* bliss.

In some ways, of course, the change in Apple's PowerBook line was a godsend. The new PowerBooks are Apple's fastest portables ever, with more features, better displays, and lower prices than their predecessors. But the new models' innovations may give you the feeling you're in unfamiliar territory without a map: Because the new PowerBooks are offered in a variety

of configurations, you must now ask not just, Which model should I buy? but also, In what configuration? Other weighty choices include, Trackpad or trackball? One battery or two?

If you're feeling overwhelmed by questions such as these, relief has arrived: After much deliberation and debate, we've come up with PowerBook recommendations for various

types of users. Of course, we realize that not everyone fits perfectly into the molds we've created. But chances are that you'll have many of the same work habits as one of our profiled users, even if we've labeled that user a student and you're a professional consultant. So find the description that matches you best, and then take a spiffy new PowerBook for a test drive.

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Hints for Picking a PowerBook

It's well known: You can't have everything. Yet many first-time PowerBook shoppers don't realize just how many trade-offs are involved in using a notebook computer. For instance, a fast processor and a color screen take their toll on a PowerBook's battery life. Sure, you can add an additional battery, but all of a sudden, your slim, trim PowerBook has packed on unsightly inches and unwanted pounds. Early on, figure out what the one or two most important PowerBook features are for you — cost, display quality, weight, battery life, ease of use, or speed. Let these features govern your choice.

Many people instantly assume that long battery life is a top priority. They have a point — once the battery runs down, a portable computer is no longer portable. To Apple's credit, the company has been consistently upgrading the quality of the batteries it includes with PowerBooks. With all currently shipping products, you can get two to four hours' use, assuming you learn some battery-conserving work habits. If you load a 500-series PowerBook with two Intelligent Batteries, you can achieve six hours of fairly intensive use — more than sufficient for most people.

For the rare occasion when you'll be working away from an AC outlet for longer than six hours — on an international flight, for example — you can always purchase a spare battery to take with you. (Of course, you could also get an airline VIP-lounge membership and plan layovers every few hours to recharge your batteries. On second thought, batteries aren't *that* expensive.)

Shop, Look, and Listen

Once you know what your top priorities are — say, low cost and light weight — then you can start to sort out what other features you need. Sure, a high-quality, active-matrix display (color or gray scale) is eye-catching, but a PowerBook that has one can easily cost \$1,000 more than one that doesn't. On the other hand, you might find that the least expensive type of screen, a passive-matrix gray-scale one, is irritating to look at. These displays are not nearly as crisp as active-matrix ones, and they have quirks you don't find on desktop displays. For instance, when you move a cursor quickly across a passive-matrix screen, you momentarily see a ghosted trail.

Some people find a good compromise to be the dual-scan

figure 1

Portable Performance / PowerBooks — and a PC

To get an idea of how the current line of PowerBooks and PowerBook Duos stacks up, we tested each model's speed, employing three popular general-business applications: Microsoft Word 5.1, Microsoft Excel 4.0, and Aldus Persuasion 2.1. For comparison, we additionally tested an IBM ThinkPad 750c notebook computer running the Windows 3.1 counterparts for each of the applications (Word 6.0, Excel 4.0, and Persuasion 3.1). We equipped each of the PowerBooks with 12 MB

of RAM and Quantum hard-disk drives. The ThinkPad 750c has a 33-MHz Intel 486SX microprocessor, which, like the Macintosh's 68LC040, lacks an integrated math coprocessor. The ThinkPad 750c comes equipped with a 640-x-480-pixel active-matrix color LCD screen; the model we tested was configured with 8 MB of RAM and a 200-MB hard-disk drive. The PowerBook most comparable to the ThinkPad is probably the 540c.



Word Replace

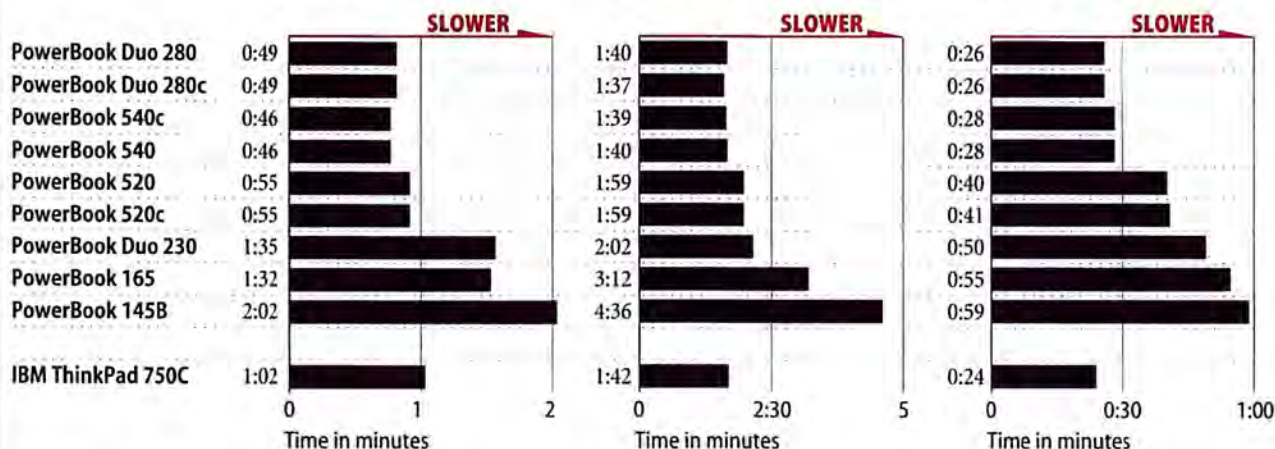
In this disk-intensive test, every instance of the word *the* in a 250-page manuscript was changed to read *teh*.

Excel

Recalculating the data in a 1.8-MB Excel spreadsheet and then charting the results tapped processor, video, and disk speed.

Persuasion

Fast generation of 54 presentation-slide thumbnails required fast processor, video, and disk-access speed.



passive-matrix color display of the PowerBook 520c. This display is sharper and less prone to ghosting than older, passive-matrix color screens. Even better, this display makes the 520c the most affordable color PowerBook you can buy.

Another increasingly important consideration is sound. If you require hi-fi audio for presentations, the PowerBook 500s — with their built-in stereo speakers and CD-quality output — offer the best sound you can get in a notebook computer.

Know Thy Work Habits

You also need to take your work habits into account when picking a PowerBook. For many people, transferring files between a desktop Mac and a PowerBook quickly becomes an organizational and logistical nightmare. By far the easiest, and most universal, way to transfer files (Mac as well as DOS) is to copy them to and from a floppy disk. Yet this method has its limits: You can't transfer very large files without using a compression utility, and transferring numerous files via floppy quickly becomes tedious.

We think the best way to transfer files is to connect your PowerBook to your desktop Mac via a LocalTalk connection or a SCSI cable. With a LocalTalk connection and System 7's file sharing enabled, you've got your own, one-person network. With a SCSI-cable connection, available on all PowerBooks but the 145B, the PowerBook's hard disk appears as a volume on the Mac's desktop. You can copy files to the PowerBook's disk just as you would to an external hard disk.

In either of these situations, however, you still have to worry about file synchronization — that is, making sure you have the same (most recent) version on both your PowerBook and your desktop Mac. Software utilities such as the File Assistant program Apple ships with the PowerBook 500 series and Duo 280s can help with the chore, but their use still requires a fair amount of effort. The only surefire way to avoid having to synchronize files is to have only one set. And that means storing your working files on a Duo's hard disk and using a Duo Dock as your desktop machine.

If a PowerBook is going to be your primary computer, you should be more concerned with speed than if you plan to use one only occasionally. Our lab tests showed that the Duo 280 and 280c, which are each built around a 68LC040 microprocessor that runs at 66 MHz internally on a 33-MHz bus, are the fastest PowerBooks. They are followed closely by the PowerBook 540 and 540c, which are based on the same 66/33 chip. Even better, Apple has stated that you will be able to upgrade these models (and the 50/25-MHz PowerBook 520 and 520c) with a PowerPC by early next year.

Another option to keep in mind is PCMCIA technology for PowerBooks, which Apple expects to make available this summer for the PowerBook 500 series. This technology, which is already available for PCs and the Apple Newton MessagePad, lets you add peripherals such as wireless modems, network

Assault on Battery

To test the new Intelligent Batteries supplied with the 500-series PowerBooks, we created a punishing, worst-case scenario: We ran some PowerBooks continuously, with their hard disks spinning constantly and without screen dimming activated, until their batteries drained completely. Note that color displays are much more demanding than their gray-scale counterparts and that active-matrix displays are slightly more power-hungry than passive-matrix versions. Under more-prudent working conditions than ours — using a RAM disk for working applications and activating the PowerBooks' other built-in energy-saving features — you can expect much longer battery life.

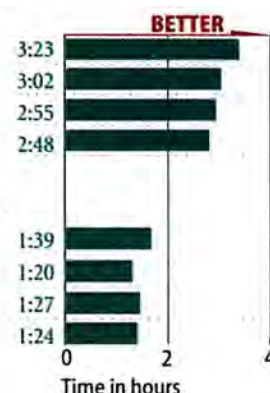


Two-Battery Configurations

| | |
|----------------|------|
| PowerBook 520 | 3:23 |
| PowerBook 520c | 3:02 |
| PowerBook 540 | 2:55 |
| PowerBook 540c | 2:48 |

Single-Battery Configurations

| | |
|----------------|------|
| PowerBook 520 | 1:39 |
| PowerBook 520c | 1:20 |
| PowerBook 540 | 1:27 |
| PowerBook 540c | 1:24 |



adapters, or storage devices to your system in the form of credit-card-sized cartridges. A PCMCIA expansion module that fits into the left battery compartment of the PowerBook 500s will accommodate either two Type II PCMCIA cards (5 millimeters thick) or one Type III card (10.5 millimeters thick). PowerBooks initially will support only a single Type II card at a time, and just a handful of PCMCIA peripherals are slated to be available at introduction. But Apple has scheduled a second-phase PCMCIA rollout for the fall, and the company promises to add dual-card support and a wider range of supported peripherals.

One final hint: Equip your PowerBook with the most memory and the biggest internal hard drive that you can possibly afford. It's harder — and often more expensive — to add more storage capacity to a PowerBook later than it is with a desktop Macintosh. You can get external hard drives and optical drives for a PowerBook, but they compromise the machine's portability.

Finally, remember that PowerBooks will keep getting better and cheaper, in accordance with computer-industry law. This one may be your first, but it probably won't be your last. Plan carefully and get your portable-computing odyssey off to a good start.

The PowerBook at Work

In the virtual workplace of tomorrow, workers carry all the information they need in lightweight, tablet-sized computers that can be easily networked via wireless connections. Colleagues collaborate in real time, regardless of their physical locations — at home, in the office, or on the road.

But until this vision becomes a reality, office workers who want to be productive outside the office will have to juggle the pros and cons of various PowerBook models. For the time being then, consider the following business-user profiles and follow the advice that most closely matches your needs.

THE WEEKEND WARRIOR

Characteristics: If you're a Weekend Warrior, you use a PowerBook only occasionally and seldom far from a power outlet. The stereotypical Weekend Warrior takes work home evenings or — that's right — weekends.

What We Recommend: PowerBook Duo 230 (\$1,579).

Configuration: 4/120.

Why We Recommend It: As with any computer you use only occasionally, cost should concern you more than speed, display quality, or fancy features. Additionally, you'll find that the slimmer, trimmer, and lighter a PowerBook is, the less you'll dread carrying it around in your briefcase, gym bag, or tote bag. The Duo 230 offers the best combination of low cost and light weight of all the PowerBooks.

But the real reason a Weekend Warrior will love a Duo 230 is because it makes transporting files almost a no-brainer. If you have a Duo Dock II on your desk at work, you get all the advantages of a typical desktop Mac — support for a large color monitor, a floppy drive, a full complement of ports, and a standard-sized keyboard. When you want to take work home, you just pull out the Duo and take it with you. If all of your working files are not already stored on the Duo's hard disk, you can treat the Duo like a giant floppy disk, transferring files to and from a Duo Dock's hard disk.

You may want to keep a mini dock (Apple's or any of several from third parties) at home. A mini dock lets you hook up a full-sized keyboard to the Duo and lets you attach a larger monitor or a floppy drive if you find you can't work well without them.

What's Cool: Inexpensive. Light weight. Reasonable speed. Highly flexible when combined with various docks. Long battery life. Optional Duo Dock turns the Duo 230 into a desktop Mac.

What's Not: Low-quality display. Apple has no announced PowerPC-upgrade plans.



THE ROAD WARRIOR

Characteristics: If you're a Road Warrior, chances are slim you're reading this article in your office. You spend much of your time traveling, and you're looking for a PowerBook that will serve as your main computer. The stereotypical Road Warrior is the salesperson whose work revolves around handling lots of text- or table-based data — often on airplanes or in hotel rooms.

What We Recommend: PowerBook Duo 280 (\$3,159).

Configuration: 12/240/14.4-kbps modem.

Why We Recommend It: Because you carry your computer nearly everywhere, light weight is a prime consideration. And because the PowerBook is your main computer, it should have a variety of features — a fast processor; a clean, crisp display; 12 MB or more of memory; a mid-sized hard drive; a fast fax modem; and an external floppy drive for transferring DOS files. The latest PowerBook Duos — the gray-scale 280 and the color 280c — offer all these features at reasonable (albeit not bargain-basement) prices.

The most attractive attribute of the Duo for the Road Warrior may be the gadget factor: By carefully selecting from a wide variety of Duo peripherals and accessories, you can be sure you have exactly the system you need for every trip while avoiding packing nonessentials. If you're planning to give a presentation, for example, your packing list might include a high-capacity, portable hard drive or a display-adaptor mini dock with ports for hooking the Duo to almost any type of monitor, including a TV. Other gadgets might include a portable printer, an LCD projection panel, or a set of speakers. Remember to place indispensable items in a carry-on bag for airline flights. Only items that are not essential should be trusted to the baggage handlers.

There are some drawbacks to this approach, however: Gadgets can be expensive, and the more you have, the more you must remember and the more you can lose. Some PowerBook add-ons include cables, connectors, and small, dark pieces of plastic that blend amazingly well with the carpets and paper-strewn tables in hotel rooms. If you're going to buy in to the gadget-packed lifestyle, get systematic about your PowerBook gear and do as you were taught in kindergarten: Pick up your toys when you're done.

What's Cool: Light weight. Excellent speed. High-quality display. Easily configurable via mini docks. Via optional Duo Dock, turns into a desktop Mac. Color version available. Apple has announced a future PowerPC-upgrade path.

What's Not: Requires lots of add-ons, such as mini docks, cables, and connectors, that can get misplaced. Single battery limits on-the-road usage time.





THE PRESENTER

Characteristics: If you're a Presenter, you use a PowerBook to create and give presentations — everything from static slide shows to multimedia spectacles. Your travel schedule may have you on the road all the time or as seldom as once every few months; in any case, you want an all-in-one PowerBook system you can have at the ready whenever it's time to travel.

What We Recommend: PowerBook 540c (\$5,539).

Configuration: 12/320/19.2-kbps modem.

Why We Recommend It: Today's leading-edge presentations include such hardware-hungry elements as QuickTime movies, animations, and special effects. That's why we recommend the most fully equipped PowerBook money can buy. The 540c sports a fast processor, a high-resolution active-matrix color screen, and stereo sound — all of which are necessities when you're previewing or editing presentations.

To support the hefty power requirements of all of its features, the 540c comes with two long-lasting Intelligent Batteries. (Carry a spare battery with you, though — the worst thing that can happen to a Presenter is to have the PowerBook's battery die in the one conference room in the known universe that lacks an available power outlet.) The PowerBook 540c is also well equipped for communication. Built-in LocalTalk and Ethernet make it easy to connect to networks, and the 19.2-kbps modem is ideal for downloading presentation changes from the home office.

What's Cool: Excellent speed. High-quality display supports two resolutions. Optional 19.2-kbps fax modem. Stereo speakers. Includes two Intelligent Batteries. Can substitute a PCMCIA module for one of the batteries. Apple has announced a future PowerPC-upgrade path.

What's Not: Most expensive, heaviest PowerBook.

THE VALUE SHOPPER

Characteristics: If you're a Value Shopper, your goal is A Good Deal. You aren't overly concerned with any single factor, such as cost or weight; instead, you want bang for the buck.

What We Recommend: PowerBook 520 (\$2,269).

Configuration: 4/160.

Why We Recommend It: The PowerBook 520 gives you a little bit of everything — a floppy drive, two battery bays, a full complement of Mac ports, and good speed. Even better, the 520 is affordable, with a street price of \$2,000 or less. Apple should stock up on these crowd pleasers.

What's Cool: Reasonable price. Good speed. Color version (520c) also available. Can substitute a PCMCIA module for one of the batteries. Apple has announced a future PowerPC-upgrade path.

What's Not: Display limited to 16 grays. Only one configuration option.



THE EXECUTIVE

Characteristics: The Executive travels once a month or so and needs a PowerBook that's easy to use. The Executive also wants to stay on the cutting edge of technology.

What We Recommend: PowerBook 540 (\$3,849).

Configuration: 12/240/19.2-kbps modem.

Why We Recommend It: Like the Presenter, the Executive should own a PowerBook that causes few headaches. For instance, the PowerBook should include at least 12 MB of RAM, so that when you try to open an important file, you don't get an out-of-memory message. Likewise, the hard-disk capacity should be large enough to hold all of the Executive's everyday applications and files without requiring compression.

The 540's Intelligent Batteries also make battery-life management reasonably easy. With two such batteries installed, the Executive should be able to work during an entire cross-country flight. And because the Executive needs to keep in constant touch with the office, the 540's built-in communications capabilities — LocalTalk, Ethernet, and the optional fax modem — are a great boon.

In short, we believe the Executive's PowerBook should have just about everything the Presenter's does. Note the phrase *just about*. Unlike Presenters, most Executives don't need a color screen or a superhuge hard drive.

What's Cool: Excellent speed. High-quality display. Optional 19.2-kbps fax modem. Trackpad is status symbol. Includes two Intelligent Batteries. Can substitute a PCMCIA module for one of the batteries. Apple has announced a future PowerPC-upgrade path.

What's Not: Heavy. Second-most-expensive PowerBook.



The PowerBook on Campus

At Apple, employees refer to the company's complex of buildings as the campus. Just as on a college campus, it has cafeterias, a bookstore, a gym, a library, and even small offices that double as sleeping quarters when a deadline looms. Yet as much as Apple tries to maintain the atmosphere of an academic institution, it is still very much a part of the

corporate business world. Fortunately, though, Apple continues to deliver notebook computers that meet the needs of students — and their educators.

Cheryl England is a *MacUser* senior editor. Project leaders David Kison and Roman Victor Loyola oversaw the testing for this report.



THE STUDENT

Characteristics: The Student uses a PowerBook for taking notes in class or in a lab, writing papers, solving mathematical equations, and possibly conducting on-line research.

What We Recommend: PowerBook 145B (\$1,259).

Configuration: 4/80.

Why We Recommend It: The 145B is the oldest PowerBook in Apple's current lineup, yet it scores big points for one factor: Price. If, like most students we know, you're on a tight budget, the 145B is your best PowerBook option. (You should also be able to get some great deals on used PowerBooks.)

Don't worry — in this case, inexpensive doesn't mean cheap. The 145B is a solid performer. It runs most standard productivity software at acceptable speeds. And don't worry that there's no math coprocessor. Most scientific programs colleges frequently use come in versions that run on 68030 Macs such as the 145B. If you're planning to major in architecture or engineering, however, you're better off buying a 68LC040 or PowerPC Mac and a high-resolution color monitor.

You'll also note that the 145B comes with a relatively paltry 4 MB of RAM and a choice of an 80- or 120-MB hard drive. Still, students should be able to work just fine within these hardware limits. For instance, 4 MB of RAM and an 80-MB hard drive can seem like a lot if you choose application software wisely — say, ClarisWorks instead of Microsoft Word and Excel — and install a minimum System 7 configuration. Nevertheless, if you can afford an extra 4 MB of RAM, or at least a memory-boosting utility such as Connectix's RAM Doubler, the investment would be well worth it.

But enough of the logical arguments. There's also the emotional argument — a PowerBook, any PowerBook, is cool. Be forewarned, though — we've heard tell of professors who have banned portable computers from their classrooms, due to the clacking noise of typing. Our advice? Sit in the back; type gently; and above all, be cool.

What's Cool: Inexpensive. Reasonable speed. Good feature set. Floppy drive for easy transfer of Mac and DOS files.

What's Not: Oldest PowerBook still in Apple's lineup. Apple has no announced PowerPC-upgrade plans.



THE EDUCATOR

Characteristics: As an Educator, you use a PowerBook to outline lectures, write papers, design tests, and possibly communicate with other educators and researchers via the Internet.

What We Recommend: PowerBook 520 (\$2,269).

Configuration: 4/160.

Why We Recommend It: Like the Student, the Educator uses a PowerBook primarily for various text-based tasks — writing, calculating, and brainstorming.

Fortunately, the hardware required to perform these types of information-management tasks efficiently is minimal. For instance, like the Student, the Educator should be able to work efficiently with only 4 MB of RAM. But because Educators are part of the everyday working world — holding down a responsible, salaried job — we think they should own an up-to-date PowerBook. That PowerBook should be reasonably priced but not necessarily the lowest-cost one Apple offers. Thus, we recommend the PowerBook 520.

We think the PowerBook 520's 160-MB hard drive is sufficient for most educators. Faculty members can archive files on floppies or other removable media or trash them at the end of a semester or on a project-by-project basis. And although the PowerBook 520 does not include a modem, you can easily (and inexpensively) add a speedy 9.6-kbps one to your setup. The 520 does, however, have a built-in floppy drive, which makes it easy for you to accept and read DOS files from students or colleagues who use PCs.

Finally, Apple has announced that it will introduce a PowerPC upgrade for the 520, so it won't be left in the dust, unable to graduate to the chip Apple is making the state of the art. In addition, many scientific applications are being reworked for the PowerPC. If your branch of education deals with scientific calculations, then the upgrade path is definitely something you'll want in a PowerBook.

What's Cool: Reasonably priced. Good speed. Uses Intelligent Batteries. Can substitute a PCMCIA module for one of the batteries. Apple has announced a future PowerPC-upgrade path.

What's Not: Display limited to 16 grays. Only one configuration option.

continues ►

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Whirlwind Graphics...A Price That's A Breeze.

The Mirror Tornado makes images fly across your screen. And Tornado gives you 24-bit accelerated video performance at a fraction of what you'd expect to pay.

Features That Devastate The Competition.

Looking only at price, you might think that the Mirror Tornado was a lightweight. The fact is, this 7" single-slot NuBus solution gives you all the key features available in accelerated video boards. Features like the industry's most efficient hardware QuickDraw acceleration; unparalleled monitor support from 13" to 21" with resolutions up to 1152x870; bit depths from 1-24 for up to 16.7 million colors; hardware pan and zoom; virtual desktop and much more. All for hundreds of dollars less than the competition.

Blast Through Photoshop With A ChargeCard!

For optimum performance, add the optional ChargeCard Photoshop Accelerator. This DSP daughterboard gives you both video and processing acceleration in one NuBus slot. The result is Photoshop filter acceleration you must see to believe. ChargeCard includes DayStar's powerful Charger Suites software.



Performance That Rivals Boards Costing Thousands.

You're probably thinking "It sounds good, but how fast can an inexpensive video accelerator really be?" Macworld wanted to know that, too. After testing several 24-bit cards, they reported that "our test revealed that most artists and designers will derive as much benefit from inexpensive accelerated video cards as from expensive ones...we were rarely able to distinguish the performance of one accelerated video card from another."

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Mirror invites you to unleash Tornado video power on your applications for 30 days. If you aren't astounded by its speed and value, simply return it for a full refund. No questions asked. Guaranteed. You have nothing to lose... place your order today, and tomorrow you'll be blown away by the power of Tornado.

| | | |
|----------------|-------------------|---------------------|
| Tornado | ChargeCard | Bundle Price |
| \$699 | \$599 | \$1199 |

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Media: MRB

| 24-Bit Video Boards | Board Price | DSP Price | Max Size | All NuBus | Pan/Zoom |
|--------------------------------------|--------------|--------------|------------|------------------|------------|
| Mirror Tornado | \$699 | \$599 | 21" | Yes | Yes |
| Radius PrecisionColor Pro 24X | \$1799 | \$999 | 21" | No ¹ | No |
| RasterOps PaintBoard Turbo | \$1199 | \$919 | 20" | No ¹ | Yes |
| PaintBoard Lightning | \$999 | \$919 | 20" | No ² | Yes |
| SuperMac Thunder/24 | \$1999 | \$499 | 21" | No ² | Yes |
| Spectrum Power 1152 | \$1399 | \$599 | 21" | Yes ² | Yes |

All charted information was obtained from the "Technical Support" personnel of the respective companies.
¹ The video board can be installed in all NuBus Macs, but the combined solution (with Photoshop acceleration) can not.
² The 13" video board is not compatible with all NuBus Macs.

Call for information about Mirror's "Tornado-Ready" line of monitors, too. Don't forget to ask about other Mirror values including: color scanners, optical drives, DAT drives, SyQuest drives, CD-ROM drives, hard drives and more!

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figure 3

Getting Down to Specifics / features of PowerBooks

Here are the vital statistics for all the configurations of currently shipping PowerBook models. Study them carefully to find the capabilities that best suit your work habits and your pocketbook. In general, you should set your sights on the most RAM and the biggest hard-disk

drive you can afford, pay close attention to weight if you'll be carrying your PowerBook wherever your travels take you, and make sure that your PowerBook has ports for any external peripherals your work may require.

| | PowerBook Duo 230 | PowerBook Duo 280 | PowerBook Duo 280c | PowerBook 145B | PowerBook 165 | PowerBook 520 | PowerBook 520c | PowerBook 540 | PowerBook 540c |
|---|----------------------------------|----------------------------------|----------------------------------|----------------------|---------------------------------|----------------------------|----------------------------|----------------------------------|----------------------------------|
| Estimated price (configuration) | \$1,579 (4/120) | \$2,639 (4/240) | \$3,759 (4/320) | \$1,259 (4/80) | \$1,449 (4/80) | \$2,269 (4/160) | \$2,899 (4/160) | \$3,159 (4/240) | \$4,839 (4/320) |
| Estimated price (configuration) | \$1,569 (4/80)* | \$3,159 (12/240/14.4-kbps modem) | \$4,299 (12/320/14.4-kbps modem) | \$1,369 (4/120) | \$1,549 (4/160) | | | \$3,849 (12/240/19.2-kbps modem) | \$5,539 (12/320/19.2-kbps modem) |
| Estimated price (configuration) | \$2,379 (4/160/14.4-kbps modem)* | | | | \$2,339 (4/160/14.4-kbps modem) | | | | |
| Processor | 68030 | 68LC040 | 68LC040 | 68030 | 68030 | 68LC040 | 68LC040 | 68LC040 | 68LC040 |
| CPU clock speed | 33 MHz | 33 MHz | 33 MHz | 25 MHz | 33 MHz | 25 MHz | 25 MHz | 33 MHz | 33 MHz |
| Maximum RAM | 24 MB | 40 MB | 40 MB | 8 MB | 14 MB | 36 MB | 36 MB | 36 MB | 36 MB |
| Display type | gray-scale | gray-scale | color | monochrome | gray-scale | gray-scale | color | gray-scale | color |
| Display technology | passive-matrix | active-matrix | active-matrix | passive-matrix | passive-matrix | passive-matrix | dual-scan passive-matrix | active-matrix | active-matrix |
| Weight | 4.2 lb | 4.2 lb | 4.8 lb | 6.8 lb | 6.8 lb | 6.3 lb | 6.4 lb | 7.1 lb | 7.3 lb |
| Dimensions | 10.9 x 8.5 x 1.4 in. | 10.9 x 8.5 x 1.4 in. | 10.9 x 8.5 x 1.4 in. | 11.3 x 9.3 x 2.3 in. | 11.3 x 9.3 x 2.3 in. | 11.5 x 9.65 x 2.25 in. | 11.5 x 9.65 x 2.25 in. | 11.5 x 9.65 x 2.25 in. | 11.5 x 9.65 x 2.25 in. |
| Battery life | 2.5 - 4 hr | 2 - 4 hr | 2 - 4 hr | 2.5 - 3 hr | 2.5 - 3 hr | 2 - 4 ¹ hr | 2 - 4 ¹ hr | 1.5 - 3 ⁵ hr | 1.5 - 3 ⁵ hr |
| Battery type | Type I NiMH | Type II NiMH | Type III NiMH | NiCd | NiCd | Intelligent Battery (NiMH) | Intelligent Battery (NiMH) | Intelligent Battery (NiMH) | Intelligent Battery (NiMH) |
| Colors/grays at 640 x 400 pixels | 16 grays | 16 grays | 32,768 colors | black-and-white | 16 grays | NA | NA | NA | 32,768 colors |
| Colors/grays at 640 x 480 pixels | NA | NA | 256 colors | NA | NA | 16 grays | 256 colors | 64 grays | 256 colors |
| Mountable as external SCSI device | ◊ | ◊ | ◊ | | ✓ | ✓ | ✓ | ✓ | ✓ |
| Ports | | | | | | | | | |
| ADB | ◊ | ◊ | ◊ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 30-pin SCSI | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Audio-in | ◊ | ◊ | ◊ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Audio-out | ◊ | ◊ | ◊ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Number of serial | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 |
| Video-out | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| PDS | ✓ | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ |
| Modem | optional | optional | optional | none | optional | optional | optional | optional | optional |
| AC adapter included | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Microphone | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ |
| Security slot | ◊ | ◊ | ◊ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| LocalTalk | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Ethernet | | | | | | ✓ | ✓ | ✓ | ✓ |
| Floppy drive | optional | optional | optional | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Speaker | mono | mono | mono | mono | mono | stereo | stereo | stereo | stereo |
| PCMCIA module | | | | | | optional | optional | optional | optional |
| Upgradable to color active-matrix display | | | NA | | | ✓ | ✓ | ✓ | NA |
| PowerPC-upgrade announced | | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ |

*Includes floppy adapter and external floppy drive.

¹4 to 7 hours with two batteries.

⁵3 to 6 hours with two batteries.

◊You can get this feature with a dock.

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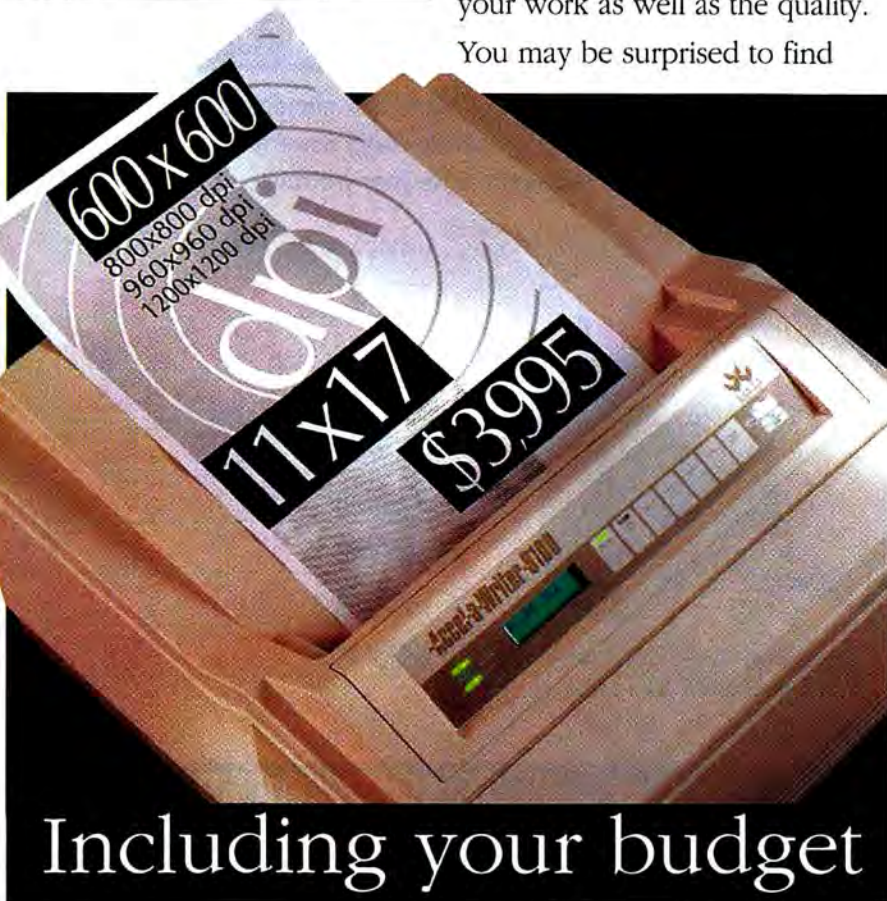
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the Accel-a-Writer 8100, you can upgrade to 800 x 800, 960 x 960, and even 1200 x 1200 dpi.



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you won't be forced to compromise your budget either. At \$3,995, it is the most aggressively priced printer in its class.

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| Capacity | Internal | Tsunami |
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| 170MB | \$199 | \$259 |
| 270MB | \$269 | \$329 |
| 340MB | \$299 | \$359 |
| 540MB | \$399 | \$499 |
| 1080MB | \$749 | \$849 |
| 1400MB | \$1099 | \$1159 |
| 1650MB S | \$1979 | \$2039 |
| 1800MB | \$1199 | \$1259 |

| Capacity | Internal | Tsunami |
|----------|---------------|---------------|
| 2000MB S | \$1919 | \$1979 |
| 2050MB S | \$2269 | \$2329 |

S=Seagate mechanism (1 year warranty)

PowerBook Drives (2.5" Internal)

| | |
|-------|--------------|
| 85MB | \$199 |
| 170MB | \$259 |
| 256MB | \$349 |

LaserWriter 630 installation kit available

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SyQuest Drives

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| 88C MB 5.25" | \$399 | \$459 |
| 200MB 5.25" | \$559 | \$599 |
| 105MB 3.5" | \$349 | |
| 270MB 3.5" | \$599 | |
| Cartridges | 44MB \$69 88MB \$99 105MB \$79 270MB \$99 200MB \$109 | |

Each drive comes with Silverlining™ and one free SyQuest cartridge.

CD-ROM Drives

| Drive | External |
|--------------------|--------------|
| Toshiba Dual Speed | \$639 |

Optical Drives

| Drive | Internal |
|-----------------|---------------|
| 230MB | \$1009 |
| 230MB Cartridge | \$59 |

Each drive comes with Silverlining™ and one free 3.5" optical cartridge.

DAT Drives

| Drive | Internal | External |
|-----------|---------------|---------------|
| 5.0GB DAT | \$1099 | \$1159 |
| TurboDAT | \$1299 | \$1359 |

Tape Drives

| Drive | Internal | External |
|-------|--------------|--------------|
| 155MB | | \$569 |
| 600MB | \$729 | \$789 |

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| 120MB | \$199 |
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| 525MB | \$449 |
| 1000MB | \$799 |
| 1200MB | \$929 |

*Drive enclosures vary.

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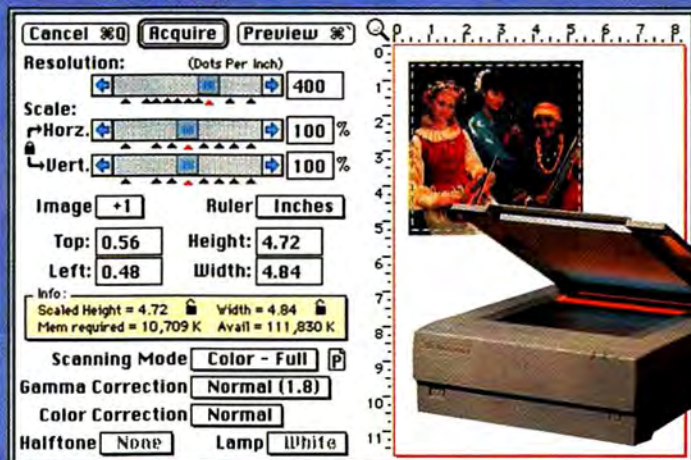
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Macworld, November 1993

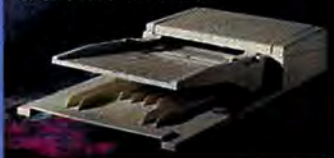


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Room to Grow: Midsized Hard Drives

If you haven't shopped for a hard drive recently, be prepared for some pleasant surprises.

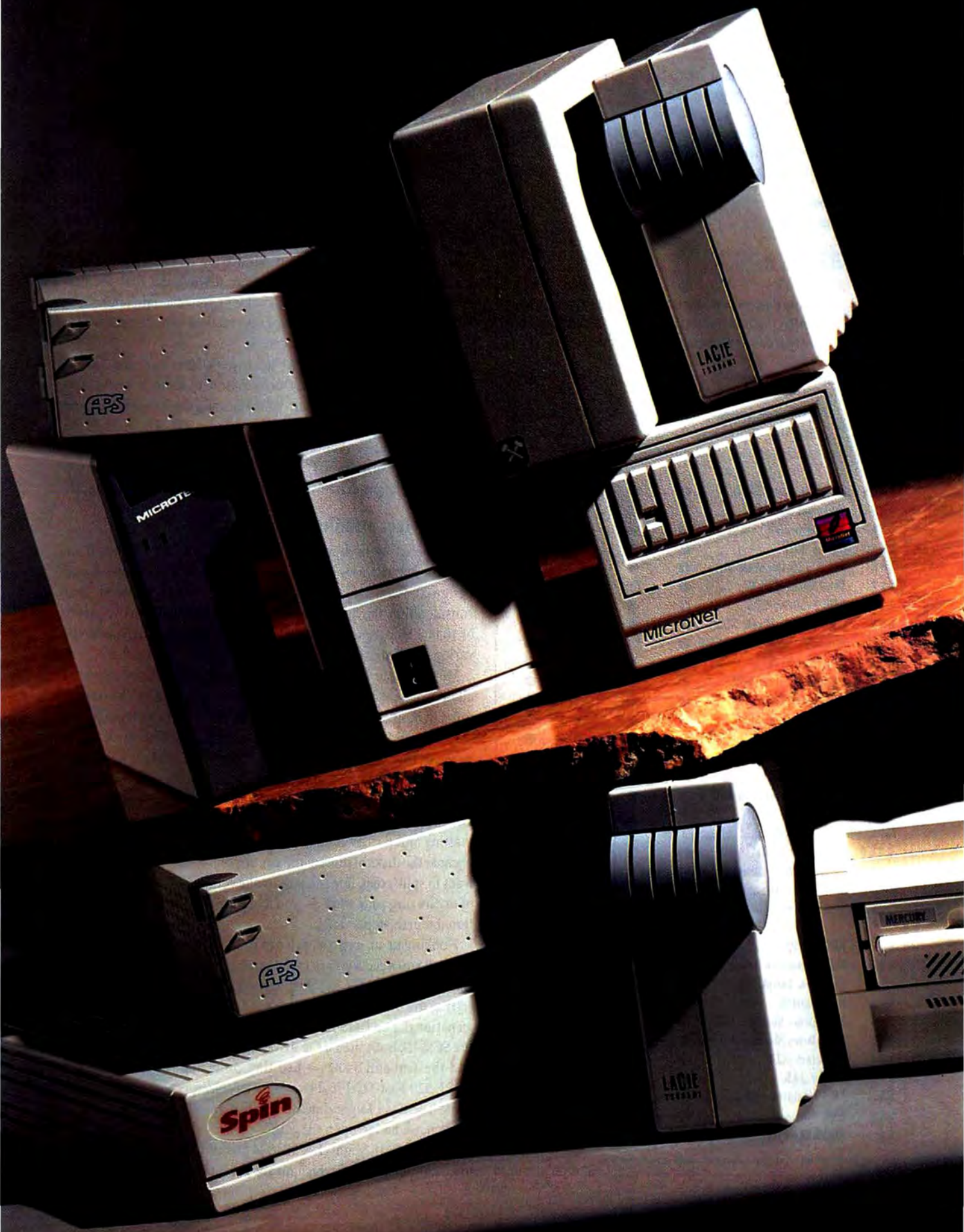
You can never have too much storage. Luckily, hard-drive prices have plummeted in the past couple of years — you can now get more capacity for less money than you'd ever thought possible.

In April '92, when MacUser Labs tested forty-one 200-MB drives (see "Sizable Storage: 200-Megabyte Hard Drives," page 108), the least expensive models cost around \$660. Today, that same amount can get you a high-quality 500-MB drive — and if you shop

around, you can find respectable 300-MB drives for under \$400.

What's happened? Have all the hard-drive vendors adopted cardboard cases held together with masking tape? Not at all; in fact, many vendors have added features that didn't exist two years ago *and* have increased the length of their drives' warranties. The cause of your good fortune is good ol' American competition — hard-drive vendors are scrambling over each other to offer you a lot more for a lot less than ever before.

By Kristina De Nike and Mark Frost



The Bottom Line

IF YOU'RE BUYING AN EXTERNAL HARD DRIVE, you should be shopping in the 300-to-500-MB range. Quality storage is approaching the magic "buck-a-meg" level — and today's software needs more megabytes than ever. Our recommendations are based on several factors, including price/performance; customer service; case quality; and support materials such as packaging, software, and documentation.

⊕ = OUTSTANDING

● = ACCEPTABLE

⊖ = POOR

500-MB CATEGORY

★★★★ APS Q 540



Quality design and construction at a great price makes the APS Q 540 (\$549 direct) a great buy. Digital active termination ensures top-notch performance.

★★★★ FWB PocketHammer 530FMF



High speed, portability, and excellent software distinguish the FWB PocketHammer 530FMF (\$1,299 list, \$1,060 street) — although its price is steep.

| | PRICE/ PERFORMANCE | CUSTOMER SERVICE | CASE QUALITY | SUPPORT MATERIALS |
|---------------------------------------|-----------------------|---------------------|-----------------|----------------------|
| ★★★★ La Cie Tsunami 540Q | ⊕ | ⊕ | ● | ● |
| ★★★★ MicroNet SS-540 | ● | ● | ⊕ | ● |
| ★★★★ Microtech 500 | ● | ● | ● | ⊖ |
| ★★★★ Mirror 520 | ● | ● | ● | ● |
| ★★★★ Relax 525 Quantum Vista | ⊕ | ● | ● | ● |
| ★★★★ Third Wave 525 Q | ● | ⊖ | ⊕ | ● |
| ★★★★ TMS ProDrive 525 | ⊕ | ● | ● | ● |
| ★★★★ MacProducts Magic 520F | ● | ● | ● | ● |
| ★★★★ MegaDrive Mercury 535MB | ● | ⊕ | ● | ● |
| ★★★★ MicroNet SS-515 | ⊖ | ● | ⊕ | ● |
| ★★★★ Optima MiniPak 500 | ● | ● | ● | ⊕ |
| ★★★★ CMS Platinum 2525 | ● | ⊖ | ⊖ | ● |
| ★★★★ CORE 520 Fast-SCSI | ⊖ | ● | ⊖ | ⊕ |
| ★★★★ GCC UltraDrive 500S | ⊖ | ● | ⊕ | ● |
| ★★★★ MacWarehouse Power User Pro 540M | ● | ● | ● | ⊖ |
| ★★★★ MASS MASSterDrive 510 | ⊖ | ● | ● | ● |

300-MB CATEGORY

★★★★ La Cie Tsunami 340Q



Despite a case that would benefit from some improvements, a great price and solid performance earn the La Cie Tsunami 340Q (\$359 direct) its place in the spotlight.

| | PRICE/ PERFORMANCE | CUSTOMER SERVICE | CASE QUALITY | SUPPORT MATERIALS |
|---------------------------------------|-----------------------|---------------------|-----------------|----------------------|
| ★★★★ APS Q 340 | ● | ⊕ | ⊕ | ⊕ |
| ★★★★ MacWarehouse Power User Pro 340M | ● | ● | ● | ⊖ |
| ★★★★ Spin 340MB | ⊕ | ● | ● | ⊖ |
| ★★★★ MegaDrive Mercury 340MB | ● | ⊕ | ● | ● |
| ★★★★ MegaDrive Mercury 460MB | ● | ⊕ | ● | ● |
| ★★★★ Microtech 320 | ● | ● | ● | ⊖ |
| ★★★★ Mirror 345 | ● | ● | ● | ● |
| ★★★★ CMS MightyLiteML 324 | ⊖ | ⊖ | ⊖ | ● |
| ★★★★ CMS Platinum 2450 | ● | ⊖ | ⊖ | ● |
| ★★★★ MASS DiamondDrive 320 | ⊖ | ● | ● | ● |

Listing is alphabetical within groups of equal mouse ratings.

Why You Need More

OK, so the drives are getting better and the deals sweeter. You can even pick up a quality drive in the 200-MB range for around \$300 — but would you want to? Applications have also changed a lot in the last couple of years. Unless your work is limited to simple word-processing and spreadsheet chores, your Mac is getting mighty hungry for storage space.

Thanks to QuickTime and glitzy multimedia products, the need for gobs of space to hold all those massive files is steadily growing. If you're working with any sort of page-layout or image files, you'll also need more space — or the self-discipline to archive or throw out nonessential files. And all you wizards of DTP, animation, 3-D graphics, and image manipulation are discovering that the new Power Macs make it possible to try things you just didn't have time for before. The result is lots of experimentation — and lots of files to keep as examples of what you can do.

The bottom line? You need a place to put all this stuff, and 200 MB just doesn't cut it anymore. Our recommendation: If you've outgrown the drive that came with your Mac, skip the 200-MB class and vault directly to the new midrange — 300-to-500-MB drives. If you haven't yet outgrown your internal drive, read on anyway — the way file sizes are growing and chubby applications are proliferating, you may need a larger drive by the time you finish reading this report.

The Perfect Middle

We gathered 29 midrange drives from 18 vendors and put them through our rigorous battery of speed, service-and-support, and design-and-construction tests to see which drives are worth your consideration. Furthermore, we conducted a comprehensive survey of 10,000 Mac users to see what their experience has been with the various hard-drive vendors (see the "MacUser Poll" sidebar).

We began our search for the ideal midrange hard drive where we all do when it's time to add storage capacity: plugging the darned thing in. Apple has made a point of showing off just how plug-and-play its computers and compatible peripherals are. We all know, however, that sometimes things just don't work out that way. Three basic steps are involved when you add a drive to your Mac: attaching cables, setting the drive's SCSI ID and terminating the SCSI chain, and then turning the whole system on. There's a fourth step — formatting and partitioning the disk — but you can usually avoid it, because the disks of most of today's drives come preformatted. If you want to split a disk into more than one volume — a convenient way of organizing your work — you'll need to pay attention to this optional fourth step, though.

Hooking up an external drive to your Mac ought to be easy. Basically, all you need for easy installation is the proper cables, an easy way to terminate the drive (if necessary), and a simple method of setting the drive's SCSI ID. All the vendors except La Cie, CORE International, and CMS Enhancements offer a simple way to change the SCSI ID. Both the La Cie drives we tested — the Tsunami 540Q and the Tsunami 340Q — had tiny, confusing DIP switches. The CORE 520 Fast-SCSI had two SCSI-ID selectors that simply didn't work. The CMS MightyLiteML 324 had an easy-to-use dial, but to get to it, we had to open the case.

Both the CMS MightyLiteML 324 and the TMS ProDrive 525 are internally terminated, which means you either have to put the drive

MacBench / repeatable, reliable testing

MacUser ZD LABS

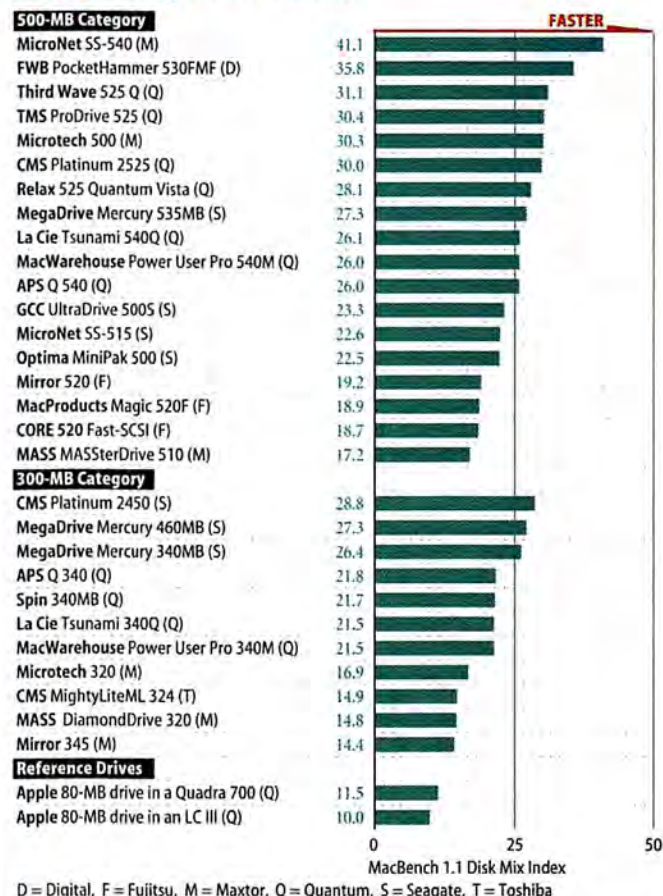
YOU NEED TO KNOW the overall speed of the hard drive you're thinking of buying. Arcane terms such as *access time* and *maximum throughput* mean little in the real, day-to-day world of manipulating files and applications — you want to know how your drive will perform with a variety of applications. And it wouldn't be a bad idea if you could test a candidate drive yourself.

MacBench solves this problem. It tests the four major components of a Mac's performance: its processor, floating-point unit, video system, and storage system. The MacBench Disk Mix test, an automatic compilation of many individual storage tests, emulates the storage activities of popular applications, including Photoshop, 4th Dimension, DiskTop, DiskFit Pro, and the Finder. PhotoShop emulation provides an indication of how well a drive handles large-file transactions; 4D emulation tests access and retrieval of small amounts of data; the Finder, DiskTop, and DiskFit Pro are emulated to provide information on how well the drive performs common file-copying tasks.

To create the Disk Mix test, Ziff-Davis Benchmark Operation (ZDBOp) used a profiling tool to record File Manager calls generated during typical day-to-day use of the aforementioned applications by a group of businesspeople. ZDBOp then extracted from those profiles periods of the most-intense I/O transactions — that is, times when the disk subsystem, not the processor, was truly the performance bottleneck. MacBench's Disk Mix test manages those sequences in such a way that scoring is accurate and repeatable and correlates well with file-system performance in the test applications for a wide variety of drives, drivers, and Macs. Disk Mix presents results as scores normalized to that of an LC III, which is given a score of 10.0. The LC III used to provide the normalization score contained a stock Apple 80-MB drive formatted with Apple's HD Setup.

You can get a copy of MacBench to do your own testing. The easiest way is to download it from ZiffNet/Mac. If you prefer, you can also fax a request for it to Jennie Faries at ZDBOp, 919-380-2879 (fax). The most recent version of MacBench, version 1.1, works with 680x0 Macs as well as with Power Macs. / Jeff Pittelkau

Bigger Equals Faster



If you're buying a new drive, you might as well get a fast one — and MacBench provides the speed information you need. The fastest midrange drive we tested, the MicroNet SS-540, was over four times as fast as the MacBench 10-point standard of an LC III's Apple 80-MB drive. The three slowest drives in the 300-MB category weren't even 50 percent faster than the benchmark Apple 80-MB drive in an LC III, even though our tests were conducted with a Quadra 700 that had 20 MB of RAM.

at the end of your SCSI chain — not a big deal unless you already have another peripheral that's internally terminated — or open the drive's case and remove the terminating resistors, which is a hassle.

In most cases, the drives' installation manuals are helpful, covering the three essential setup steps, with separate manuals detailing how the formatting software works. FWB's outstanding software manual has a wealth of information both about its software and about storage in general. GCC's and Optima's manuals are well organized and contain useful illustrations.

If you need the option of reformatting or partitioning your disk, simple but flexible formatting software is a must; the drives from APS, CORE, FWB, MegaDrive, MicroNet, and Mirror come with software that fits this description. MacWarehouse, Relax, and Spin,

on the other hand, include software that doesn't support partitioning at all, and MASS Microsystems sent us a version of its formatting software that was incompatible with the MASS DiamondDrive 320. Also, keep in mind that if you're hooking up your new drive to either a 68040 AV Mac or any Power Mac and want the best possible performance, you'll need formatting software that installs a driver compatible with Apple's new SCSI Manager 4.3.

If you run into difficulty installing the drive, it's good to know that there's a friendly and adequately informed tech-support representative to get you on your way. Toll-free tech support is a plus that's available from APS, CORE, La Cie, MacWarehouse, MASS, Microtech, Mirror, and Spin. CMS deserves a spanking for charging users \$10 via a 900 number for tech support.

At What Cost Speed?

A faster drive can often make using your Mac a snappier experience. For some, however, a faster drive speeds things up only marginally.

An easy way to figure out if a faster drive will speed up your daily chores is to look at the drive-access light on your Mac (if it's got one) or listen for the telltale sound of your drive chattering away during those times when you wait most for your Mac. If the drive isn't working while you're waiting, it means that the delay is caused by your microprocessor's thinking and not by the drive's transfer of data; in this case, chances are a faster drive won't help you out. But if a faster drive is what you need, pay attention to the results of our MacBench Disk Mix benchmark test, in the "MacBench" sidebar.

When you're looking for pure horsepower, your first thought should be about which mechanism a drive uses. Generally, the higher the disk capacity of the mechanism, the faster the drive, because sectors where the data is stored on a hard disk are more closely packed on higher-capacity drives and more of these sectors pass under the read/write heads in the same amount of time. This was proved in our testing — the drives in the 500-MB category were generally faster than those in the 300-MB one.

Other factors besides disk capacity can make a drive fast or slow. The speed at which the drive mechanism's platters spin dictates a drive's sustained-throughput capability — high sustained throughput is important for digital-video and -audio applications. Large, intelligent caches also help most users of other kinds of software, since caches can accept data from a Mac and return control to the user without a delay while that data is actually written to the disk, so most applications seem snappier.

In our tests, the fastest drive in the 500-MB category was the MicroNet SS-540. The SS-540 uses a Maxtor MXT-540SL mechanism, which has a high, 7,200-rpm, rotational speed. Close on its heels was the FWB PocketHammer 530FMF, based on a Digital DSP3053LS mechanism, which has a large (512K), efficient cache.

In the 300-MB category, the speed champs were the CMS Platinum 2450 and the MegaDrive Mercury 460MB, each based on the Seagate ST3550N mechanism. The Mercury 340MB, based on a Seagate ST3390N mechanism, was a close third.

Another factor that affects a drive's speed is its driver software. An example of a good drive with a poor driver is the Microtech 500: Although this drive uses the same type of Maxtor mechanism as the fast MicroNet SS-540, Microtech's driver fails to turn on the mechanism's write cache, making the drive about 25 percent slower than the MicroNet one.

How does increasing the speed of your current hard drive by 20 percent sound? Well, Apple's new SCSI Manager 4.3 can do just that — under the right conditions (see figure 3).

SCSI Manager is the part of the Mac's system software that orchestrates interactions with SCSI devices. SCSI Manager 4.3 improves transaction speed by moving data *asynchronously*, which means that when your Mac sends data to a drive, you can regain control of the Mac while the data is still transferring. Only SCSI devices formatted with software designed for SCSI Manager 4.3 can move data asynchronously, however.

The speed enhancement also depends on how efficiently your drive is designed to handle data. If it pauses between sending or receiving chunks of data, the improvement will be pronounced,

The MacUser Poll

YOU SHOULD EXPECT MORE from a hard-drive vendor than respectable drive performance at a respectable price. The drive you choose should be well built, quiet, and reliable. The vendor should stand behind it with responsive, knowledgeable service and support. Only then should you be satisfied.

Can today's hard-drive vendors provide such satisfaction? According to our survey of 10,000 *MacUser* subscribers, the answer — with a few notable exceptions — is, Yes.

From October 1993 through February 1994, working with the Ziff-Davis Research Department and Chilton Research Services (an independent market-research firm), we collected readers' opinions on top Mac hard-drive vendors (not necessarily vendors whose drives are represented in the accompanying story). As shown by the average scores in the table at right, these 16 representatives of the hard-drive industry earned high scores in many categories, including an impressive 8.76 (on a scale of 1 to 10) for reliability.

Readers were more critical when reporting their opinions of hard-drive vendors' service and support. The average quality and responsiveness scores were 7.83 and 7.74, respectively, and satisfaction with hard-drive warranties submarined to a mere 7.0 — the lowest average score of all categories.

In addition to calculating average scores for each category, we examined how well each vendor fared versus its competitors. Two vendors — La Cie and APS — emerged in a close race for top hard-drive supplier, and a few others — notably PLI and Relax — garnered scores low enough to suggest that they should reassess their commitment to customer satisfaction.

La Cie and APS dominate the rankings, listed in order of overall satisfaction in the table. None of the other hard-drive vendors came close to enjoying the across-the-board levels of satisfaction reported by La Cie and APS customers.

The only category in which APS dropped significantly behind La Cie was for drive quietness. However, our survey requested information on all drives used in the last two years, and late last year, APS upgraded the design of its case to improve quietness. Future surveys might well show La Cie and APS ranking above average in every category.

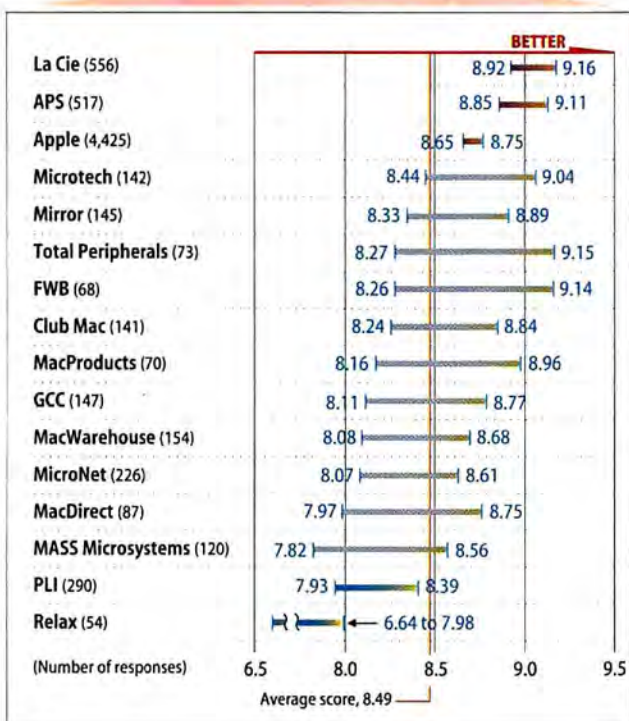
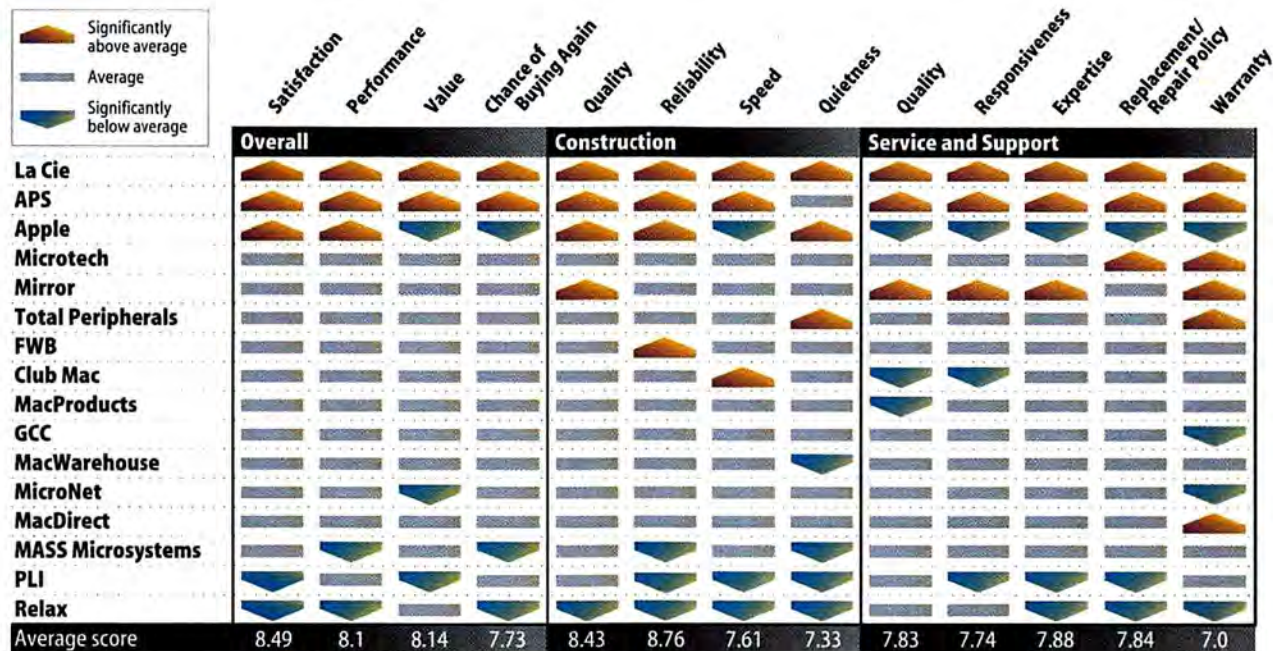
Apple was not as fortunate — its rankings were downright bizarre: In the 13 categories, Apple had 5 above-average and 8 below-average rankings — nothing in between. Although users of Apple's hard drives reported an above-average overall satisfaction, they took Apple to task in every measure of service-and-support satisfaction.

Scoring for all the companies included internal as well as external drives. Over 90 percent of the survey responses for Apple's hard drives concerned internal drives — far and away the largest percentage. However, when we performed the same ranking analysis, using data only from responses about external drives (results not shown), Apple fared even worse. Of its 5 above-average rankings, 4 dropped to average — the fifth, overall performance, dropped all the way to below average. None of Apple's below-average rankings budged.

Based on their opinions of Apple's old external hard drives, it seems that our readers aren't exactly clamoring for Apple to reenter the external-hard-drive business. Recently, however, Apple did just that, with a new quartet of attractive drives manufactured for them by La Cie. It remains to be seen whether the goodwill that our readers feel toward La Cie will overcome the ambivalence they exhibit toward Apple. / Rik Myslewski

We asked 10,000 MacUser readers to tell us how satisfied they were with important aspects of their hard drives' quality and reliability and their vendors' service and support. We converted their responses into

above-average, average, and below-average rankings for each company. Generally, our readers reported a high degree of satisfaction, and some clear favorites emerged.



Doing the Numbers / overall satisfaction

Rating hard-drive companies is not a simple matter of tallying ballots and declaring a winner. Sophisticated statistical analysis is essential for producing fair and unbiased results. This chart shows how we derived our overall-satisfaction rankings, as an example of how we created rankings for each category.

Of the 10,000 randomly chosen MacUser subscribers that we surveyed, 4,500 provided opinions on as many as four hard drives. We ignored responses that did not indicate a specific manufacturer as well as those about vendors for which there were fewer than 50 responses each — samples too small to ensure statistical accuracy.

Using standard statistical techniques, we calculated a *confidence range* for each company in each category — the range within which there was 95-percent confidence that a precise average score would occur if given an infinite number of responses. In the chart at left, each company's confidence range is shown as a horizontal bar.

We then compared the confidence range to the overall *average score* for each category, calculated so that companies with many responses didn't have more influence on the average than companies with few. For each category, companies were assigned a rating of above average, average, or below average, depending on whether the average score for that category fell above, within, or below the confidence range for that company. Detailed data on all the companies and the categories is available on ZiffNet/Mac.

figure 1

Features of Midsized Hard Drives / 500-MB category

| | ✓ APS Q 540 | CMS Platinum 2525 | CORE 520 Fast-SCSI | ✓ FWB PocketHammer 530FMF | GCC UltraDrive 500S | La Cie Tsunami 540Q | MacProducts Magic 520F | MacWarehouse Power User Pro 540M |
|---------------------------|----------------|-------------------------|-----------------------|---------------------------------|---------------------------|---------------------------|---------------------------|--|
| List price | \$549 | \$1,197 | \$1,896 | \$1,299 | \$1,599 | \$609 | \$699 | \$850 |
| Street price | \$549 (direct) | \$930 | \$1,400 | \$1,060 | \$1,599 (direct) | \$609 (direct) | \$699 (direct) | \$850 (direct) |
| Mechanism manufacturer | Quantum | Quantum | Fujitsu | Digital | Seagate | Quantum | Fujitsu | Quantum |
| Mechanism model | LPS540S | LPS525S | M2624FA | DSP3053LS | ST3610N | LPS540S | M2624F-512 | LPS540S |
| Formatted capacity | 514.2 MB | 499.5 MB | 493.8 MB | 508.8 MB | 508.6 MB | 514.2 MB | 493.8 MB | 514.2 MB |
| Termination | active | switchable | external | external | external | switchable | external | external |
| Warranty | 2 years | 2 years | 5 years | 2 years | 2 years | 2 years | 5 years | 2 years |
| Portable | | | | | | | | |
| AC outlets | | | | | | | | |
| Power light | ● | ● | ● | ● | ● | ● | ● | ● |
| Access light | ● | ● | ● | ● | ● | ● | ● | ● |
| FCC Class B certification | ● | ● | ● | ● | ● | ● | ● | ● |
| Partitioning software | ● | ● | ● | ● | ● | ● | ● | ● |
| Backup software | ● | ● | ● | ● | ● | ● | ● | ● |
| Password protection | ● | ● | ● | ● | ● | ● | ● | ● |
| Automatic setup | ● | ● | ● | ● | ● | ● | ● | ● |
| Money-back guarantee | ● | ● | ● | ● | ● | ● | ● | ● |
| Loaner drives provided | ● | ● | ● | ● | ● | ● | ● | ● |
| Toll-free tech support | ● | ● | ● | ● | ● | ● | ● | ● |
| ✓ MacUser RECOMMENDS | | | | | | | | |

because those pauses will occur in the background. When testing with a drive based on a Quantum LPS525S mechanism, we discovered only a 7-percent boost in speed, but a similar drive based on the Maxtor MXT-540SL mechanism enjoyed a 20-percent speed improvement.

SCSI Manager 4.3 comes with every AV Mac and Power Mac. Apple will offer a version of SCSI Manager 4.3 that will be compatible with every 68040 Mac, but you won't see as much of a speed boost as with

an AV or Power Mac, because the older Macs have an older, slower version of SCSI.

Formatters that support the new SCSI Manager include Charis-Mac's Anubis 2.52 and FWB's Hard Disk ToolKit 1.5 as well as software shipping with the drives from MicroNet and CMS Enhancements. Other popular formatting applications such as Transoft's SCSI Director and Casa Blanca Works' Drive7 should be compatible with SCSI Manager 4.3 by the time you read this.

figure 2

Features of Midsized Hard Drives / 300-MB category

| | APS Q 340 | CMS Platinum 2450 | CMS MightyLiteML 324 | ✓ La Cie Tsunami 340Q | MacWarehouse Power User Pro 340M | MASS DiamondDrive 320 | MegaDrive Mercury 340MB |
|---------------------------|----------------|-------------------------|----------------------------|-----------------------------|--|-----------------------------|-------------------------------|
| List price | \$389 | \$961 | \$1,422 | \$359 | \$650 | \$899 | \$809 |
| Street price | \$389 (direct) | \$750 | \$925 | \$359 (direct) | \$650 (direct) | \$775 | \$650 |
| Mechanism manufacturer | Quantum | Seagate | Toshiba | Quantum | Quantum | Maxtor | Seagate |
| Mechanism model | LPS340S | ST3550N | MK2326FB | LPS340S | LPS340S | 7345-SCSI | ST3390N |
| Formatted capacity | 325.2 MB | 433.1 MB | 322.7 MB | 325.1 MB | 325.2 MB | 327.5 MB | 326.1 MB |
| Termination | digital active | switchable | internal | switchable | external | external | external |
| Warranty | 2 years | 2 years | 1 year | 2 years | 2 years | 2 years | 2 years |
| Portable | | | ● | ● | | | ● |
| AC outlets | | | | ● | | | |
| Power light | ● | ● | ● | ● | ● | ● | ● |
| Access light | ● | ● | ● | ● | ● | ● | ● |
| FCC Class B certification | ● | ● | ● | ● | ● | ● | ● |
| Partitioning software | ● | ● | ● | ● | ● | ● | ● |
| Backup software | ● | ● | ● | ● | ● | ● | ● |
| Password protection | ● | ● | ● | ● | ● | ● | ● |
| Automatic setup | ● | ● | ● | ● | ● | ● | ● |
| Money-back guarantee | ● | ● | ● | ● | ● | ● | ● |
| Loaner drives provided | ● | ● | ● | ● | ● | ● | ● |
| Toll-free tech support | ● | ● | ● | ● | ● | ● | ● |
| ✓ MacUser RECOMMENDS | | | | | | | |

| MASS MASSterDrive 510 | MegaDrive Mercury 535MB | MicroNet SS-515 | MicroNet SS-540 | Microtech 500 | Mirror 520 | Optima MiniPak 500 | Relax 525 Quantum Vista | Third Wave 525 Q | TMS ProDrive 525 |
|--------------------------------------|--|----------------------------|----------------------------|--------------------------|-----------------------|-----------------------------------|--|-----------------------------|---------------------------------|
| \$1,429 | \$1,199 | \$1,295 | \$1,675 | \$849 | \$688 | \$919 | \$699 | \$767 | \$645 |
| \$1,050 | \$960 | \$1,250 | \$1,360 | \$849 (direct) | \$688 (direct) | \$919 (direct) | \$699 (direct) | \$767 (direct) | \$645 (direct) |
| Maxtor | Seagate | Seagate | Maxtor | Maxtor | Fujitsu | Seagate | Quantum | Quantum | Quantum |
| LXT-535S | ST3655N | ST3610N | MXT-540SL | MXT-540SL | M2624F-512 | ST3610N | LP5525S | LP5525S | LP5525S |
| 508.1 MB | 517.8 MB | 508.6 MB | 519.1 MB | 519.1 MB | 493.8 MB | 508.6 MB | 499.5 MB | 499.5 MB | 499.5 MB |
| external | external | external | external | external | external | external | external | external | internal |
| 2 years | 2 years | 2 years | 2 years | 2 years | 5 years | 1 year | 2 years | 1 year | 2 years |

Solid and Reliable

Assuming you've now narrowed your list to hard drives that are speedy and easy to set up, you need to see if your finalists are built to last. The case material should be sturdy; metal cases or internal cages are strong, diffuse heat well, and shield the mechanism from magnetic fields. At minimum, there should be shielding between the mechanism and the power supply inside the case. A well-designed hard-drive case comes with two grounded 50-pin SCSI connectors

and a fan to keep both the mechanism and the power supply cool.

The cases of the CMS Platinum 2525 and 2450 show some attention to design, with helpful indicator lights and handy controls, but they have no fan and the mechanisms are held down by nothing more than breakable plastic knobs. The CORE case is poorly constructed.

In Your Hour of Need

Possibly the most important aspect of buying a drive is knowing how well you'll be treated if it has problems. Representing ourselves as average users, we called each vendor's tech-support service to see how easily we could reach the representatives and how skilled they were at getting us up and running. We also evaluated each drive's warranty as described in the documentation.

On each of three separate occasions, we asked each vendor three common questions about setting the SCSI ID, terminating the SCSI chain, and partitioning or formatting the drive. Although it took a few attempts to get through to La Cie's tech support, the company's representatives were well informed. We also found both Mirror Technologies and MacWarehouse especially pleasurable to deal with. When we called, we were able to talk to a representative who answered the questions promptly, correctly, and politely.

You will find that warranties vary, depending on the vendor and the drive mechanism. No matter how big a hard drive you buy, you ought to get a 30-day money-back guarantee, a one-year warranty from the drive vendor, and a five-year warranty from the mechanism manufacturer.

Although we did find that La Cie's tech-support department could be somewhat difficult to reach, the company's drives come with a 30-day money-back guarantee; a guaranteed 48-hour turnaround time on repairs; and the offer of a loaner drive if you need data recovery. Also high on our good-support list were APS, MegaDrive, Microtech, and Mirror.

| MegaDrive Mercury 460MB | Microtech 320 | Mirror 345 | Spin 340MB |
|--|--------------------------|-----------------------|-----------------------|
| \$1,099 | \$389 | \$458 | \$339 |
| \$880 | \$389 (direct) | \$458 (direct) | \$339 (direct) |
| Seagate | Maxtor | Maxtor | Quantum |
| ST3550N | 7345-SCSI | 7345-SCSI | LP5340S |
| 433.1 MB | 327.6 MB | 327.6 MB | 325.2 MB |
| external | external | external | external |
| 2 years | 2 years | 1 year | 2 years |

figure 3

The New SCSI Manager

MacUser ZD LABS We obtained a 20-percent higher MacBench Disk Mix score when we used a Maxtor MXT-540SL-based drive and the SCSI Manager 4.3-compliant Anubis 2.52 driver compared to the score we obtained for the same drive with the noncompliant Hard Disk ToolKit (HDT) Primer 1.3.1 driver installed. When we performed the same tests, using compliant and noncompliant drivers, on a slower, Quantum LP5525S-based drive, we saw only a 7-percent speed increase.

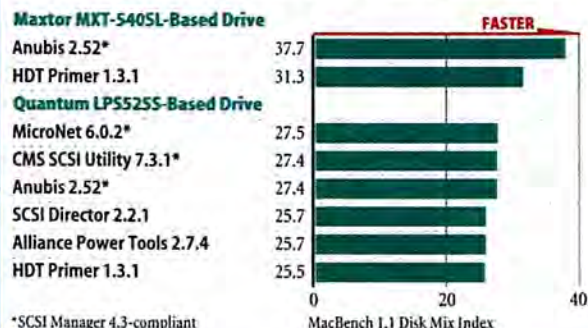


Figure Out Your Priorities

If this is your first external-hard-drive purchase, you should regard all the considerations mentioned in this report — documentation, software, speed, construction quality, and after-sale support — as important. If you've installed an external drive before, documentation and software are less of a concern.

But no matter who you are, the speed of the drive, the quality of its

construction, and the worthiness of the vendor's service are all essential considerations.

In "The Bottom Line," you'll find our specific recommendations, but a couple of drives that didn't quite get our nod are worth singling out. The MicroNet SS-540 is incredibly fast and has a well-built case. Unfortunately, it's priced about as high as many drives offering twice the capacity — but for those who need speed at any cost, it's a great choice. The La Cie Tsunami 540Q has an excellent price and good performance, but its case isn't quite as good as that of the APS Q 540 and the drive costs a little bit more. The APS Q 340 has a better case than the La Cie Tsunami 340Q, but the Tsunami drive is less expensive and La Cie offers loaner drives as part of its after-sale support.

For the title of best-bargain midrange drive, it's a tug of war between equivalent drives from La Cie and APS. According to popular opinion, you won't go wrong with drives from either company: Our 10,000-user survey ranked both tops in overall satisfaction — along with Apple, which recently introduced a new line of external hard drives and which our readers ranked below average in technical support. And as the price war continues, stay alert: The prices of La Cie and APS drives change frequently, so if you're down to a choice between equivalent drives from the two companies, pay close attention to what they're charging that day — or that afternoon.

Kristina De Nike is a project leader at ZD Labs. Mark Frost is a MacUser senior editor.

M MacBench, our benchmark software used to test hard drives for this report, is available on-line on ZiffNet/Mac, along with more-detailed data from our MacUser Poll on hard-drive companies. See page 4 for instructions on accessing ZiffNet/Mac.

Directory / vendors of drives tested

APS Technologies

Kansas City, MO
800-235-3707
816-483-3077
816-483-6100 (fax)

CMS Enhancements

Irvine, CA
714-222-6195
714-222-6310 (fax)

CORE International

Boca Raton, FL
800-920-2673
407-997-6055
407-997-6009 (fax)

FWB

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

GCC Technologies

Bedford, MA
800-422-7777
617-275-5800
617-275-1115 (fax)

La Cie

Beaverton, OR
800-999-1385
503-520-9000
503-520-9100 (fax)

MacProducts USA

Austin, TX
800-622-3475
512-476-5295
512-499-0889 (fax)

MacWarehouse

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

MASS Microsystems

Milpitas, CA
800-522-7979
408-956-5999
408-956-5995 (fax)

MegaDrive Systems

Beverly Hills, CA
800-322-4744, ext. 400
310-247-0006
310-247-8118 (fax)

MicroNet Technology

Irvine, CA
714-453-6000
714-453-6101 (fax)

Microtech International

East Haven, CT
800-626-4276
203-468-6223
203-468-6466 (fax)

Mirror Technologies

Edina, MN
800-621-8469
312-661-1313
312-664-9784 (fax)

Optima Technology

Irvine, CA
714-476-0515
714-476-0613 (fax)

Relax Technology

Union City, CA
510-471-6112
510-471-6267 (fax)

Spin Peripherals

Newton Upper Falls, MA
800-466-2900
617-965-9882
617-965-6257 (fax)

Third Wave

Austin, TX
800-624-9307
512-477-9845
512-476-9241 (fax)

TMS Peripherals

Boca Raton, FL
800-275-4867
407-998-9928
407-998-9983 (fax)



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HANDS ON Desktop Publishing

COLOR PRINTERS /

NEWGEN'S DYE-SUB PRINTER BREAKS FROM THE PACK



FULL-BLEED TABLOID output is available from several dye-sublimation printers these days that use engines from Shinko or Mitsubishi. But the new Chromax dye-sublimation printer, from NewGen Systems, is the

first one to employ a Minolta engine.

The key feature of the Minolta engine, according to NewGen, is the superior registration it provides — as tight as .01 millimeters — which yields sharp 300-dpi output without the ghosting common to dye-sublimation technology. Media flexibility is another plus: The Chromax uses one-, three-, or four-color ribbons and prints on paper in sizes up to oversized-B, which allows printing of a tabloid page with full bleed.

To further boost color fidelity, the new printer supports EfiColor and ships with EfiColor Works, Electronics for Imaging's color-matching software. The Chromax uses

PhoenixPage PostScript Level 2 emulation and comes with its own PostScript color-rendering dictionaries, with support for Apple's ColorSync 2 expected to follow.

And the Minolta engine is fast, printing a four-color full-bleed tabloid page in just a little over 6 minutes. A 33-MHz RISC processor, coupled with NewGen's virtual memory — which works with an internal 170-MB hard drive — lessens processing times as well. The Chromax ships with 48 MB of RAM (expandable to 192 MB). Parallel, serial, and LocalTalk ports are standard (Ethernet is an option). \$15,995. 800-756-0556 or 714-641-8600. / Pamela Pfiffner

3-D MODELING /

Making 3-D Art in a 2-D World

CREATING 3-D OBJECTS used to require mastering a complex 3-D program or faking it in a comfortable 2-D application — both time-consuming enterprises. That's changing, thanks to new, native PowerPC versions of Alias Sketch! and Adobe Dimensions.

Adobe Dimensions 2.0. Unlike most 3-D programs, which create raster images from vector models, Dimensions works in a PostScript environment, so it's popular with computer artists who rarely work in 3-D. Not just a companion to Illustrator, it comes into its own in



version 2.0. Until now, users had to create and modify text and paths in a 2-D draw program and import them to Dimensions for rendering as a 3-D object; with version 2.0's new pen and text tools, users can work on 2-D objects without leaving the application.

A more fluid interface in this version allows users to view an object simultaneously in 2-D and 3-D. You can also change the extrusion, bevel, or lathing of an object without losing assigned 3-D properties such as lighting or perspective. Other new features include user-selectable perspective, custom colors, interruptible screen redraw, multiple levels of undo, object-alignment commands, printing from the application, and EPS export. \$199 (upgrade from 1.0, \$69). 800-833-6687 or 415-961-4400.

Sketch! 2.0. Where Dimensions 2.0 offers beefed-up 3-D abilities, Sketch! 2.0 is designed to make advanced 3-D modeling as easy as 2-D design. Alias Research has replaced the Curve-o-matic line tool with a pen tool that provides a Bézier interface for Sketch!'s NURBS-

based geometry. A new lofting tool enables you to create an object from a series of 2-D or 3-D curves, and a new text tool lets you enter Type 1 fonts.

With new floating palettes, often used controls are always available. Snap settings, object lists and attributes, and a help bar sit at the ready (roll them all up to save screen real estate).

Sketch! 2.0 is bundled with Sketch!Net, an extension that distributes rendering over a network of 680x0 Macs and Power Macs. \$995 (upgrade from earlier versions, \$199). 416-362-9181. / Sean J. Safreed

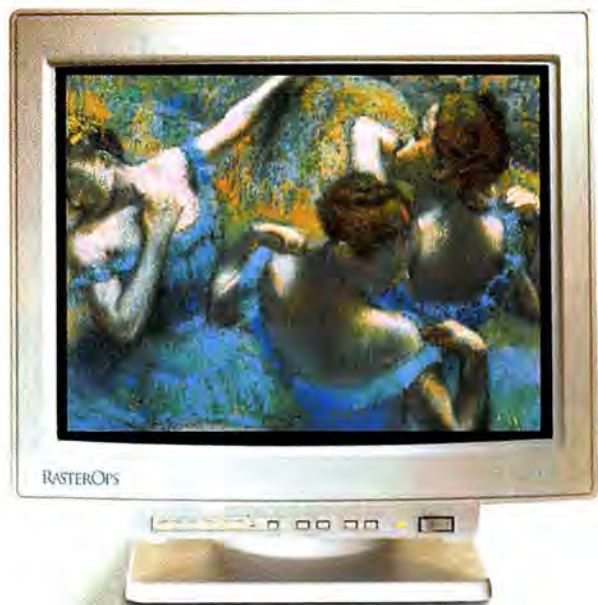


CD-ROM / Kitchen Kitsch and More

OK, I ADMIT IT: I'm into this retro thing, so I flipped for the latest PhotoDisc CD-ROM of 300-dpi stock photos. Appropriately named *Retro Americana*, the \$299 disc contains hundreds of black-and-white stills from the '20s through the '60s. You'll find precocious kids, dreamy teens, spooning couples, industrious housewives, hammy husbands, and happy families that seem straight out of *Ozzie and Harriet*. Like all the other PhotoDisc titles, the CD-ROM also has low-res for-position-only images and an easy-to-use on-screen catalog. Ah, family values. 800-528-3472 or 206-441-9355. / PP



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| | ClearVueColor 17 (1024 x 768) • \$1,049 | ■ | ■ | ■ | ■ |

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CIRCLE 75 ON READER SERVICE CARD

Larger Than Life

Want to make a big statement with posters, billboards, and other oversized output? Here's how to get monster pages from your Mac. BY MITZI WALTZ

Picture this: Tabloid-sized pages aren't big enough to contain your vision anymore. You want to create propaganda broadsheets that rival those Big Character posters that got students marching in Tiananmen Square, graphics blown up to cover entire walls, giant charts that make your booth's displays blare in blazing color from across the convention floor. But what if you have only a laser printer? Your options are larger than you think.

Tile-and-Tape

If all you have is a desktop printer, you're not necessarily limited to printing 8.5-x-11-inch images. Almost any laser printer, coupled with a word-processing, page-layout, or graphics application, allows you to tile, or print a huge image as a series of single pages, which you then painstakingly match up like tiles on a wall and tape together. Setting the tiling areas manually in the application gives you control over where page breaks occur, but automatic tiling spits out pages in order. For matching up edges of tiled images, be sure that registration marks (sometimes called printer's marks) are turned on in the application (for more tips, see the "Tips" sidebar).

Software designed for large-format output makes the job easier. PosterWorks, from S. H. Pierce & Co., lets you import EPS, TIFF,

and Scitex CT files into layouts as big as 10,000 square feet. You can output the layout as multiple tiles on your PostScript printer or turn it into a job file (the image plus the tiling information) for processing at a PosterWorks Large-Format Service Bureau. We're not talking just nifty signs and posters here — we're talking *billboards*.

PosterWorks lets you adjust the size and specify the placement of tiles (see figure 1). For example, if your poster has text that sits above an image at the top of the page, you can set up the tiles on-screen so that a face or a word isn't cut in two by a page break. Registration marks make putting pages together easier, and you can also reprint single tiles or sections without having to repeat the entire job — a feature that's handy when your toner wears thin in the middle of a project.

Another way to get large images from your desktop printer is to take your single-page printout to a copy shop for enlarging. Most of the larger shops offer poster-sized blowups that can be laminated.

At Your Service (Bureau)

Cut-and-paste jobs may be fine for creating informal presentations, but if you need high-quality color work or if time is of the



essence, you might be better off letting the pros handle it. Many service bureaus can handle large-format output. Seek out a bureau equipped with a high-volume, high-quality color electrostatic plotter, such as a Xerox Versatec 8954 or CalComp 68444 GA. (Electrostatic devices apply an electrical charge to precise areas of the paper, which attracts liquid toner to those areas.) These devices can provide output that ranges from poster- to wall-sized. The Versatec 8954, for example, can create prints that are 52 inches wide and any length. These long strips can be pasted together to form murals or go on billboards.

Service bureaus can take advantage of

TIPS / helpful hints for big prints

YOU DON'T NECESSARILY NEED to increase the dimensions of your document before you print it — the smaller the document, the less disk space it requires. You can enlarge the document when you send it to the large-format printer.

Make sure your software supports large-format printing on your output device. Some applications impose limitations on page size or enlargement percentage. Check to see if your large-format printer can automatically enlarge any image to fit the paper size. (Here's a key to help you through the alphabet soup of paper sizes: A = 8.5 x 11 inches, B = 11 x 17 inches, C = 17 x 22 inches, D = 22 x 34 inches, and E = 34 x 44 inches.)

Scaling up an image can result in jaggies. Take the size of the final printed image into account when scanning your image.

Make 300 dpi your minimum starting resolution, and ensure that your printout's resolution will be at least 75 to 150 dpi at its scaled size. For example, a 4-x-5-inch image that will be printed at 24 x 30 inches should be scanned at 400 dpi.

If you're using a service bureau, make sure you send your job as an EPS file with all of the graphics files linked, unless the service bureau tells you to do otherwise. Remember to include each font that you use as well. / Mitzi Waltz and Tony Bojorquez

specialty software, such as a high-volume version of PosterWorks and proprietary large-output software from Visual Edge Technologies. The service-bureau version of PosterWorks handles the scaling and tiling, and the Visual Edge software takes a PosterWorks job that has been converted into TIFF and creates a ready-to-print file by applying its own color and halftone algorithms. It also uses software interpolation to eliminate the jaggies that can plague scaled-up images.

Service-bureau prints vary in cost and quality, with prices ranging from \$5 to \$15 per square foot. Mounting and laminating options are available to make your creations more durable, as are special papers and inks — including film that can be backlit and new waterproof inks for outdoor uses.

To find a large-format service bureau, check out the Yellow Pages or graphic-arts sourcebooks or ask software vendors for referrals. Although S. H. Pierce & Co. dominates the market with PosterWorks, Cactus and Onyx (which sells a PC-based package) also provide front-end systems to service bureaus for large-format printing. Cactus' application doesn't include an end-user application to allow file creators to control the tiling process, however, so you have to entrust your image to the service-bureau operator.

In case no local company can handle your job, several high-volume service bureaus let you submit your project by modem or on a SyQuest cartridge and will ship back the printed results. Colossal Graphics, in Palo Alto, California, is probably the best-known large-format printer in the Macintosh market. Colossal Graphics combines PosterWorks with its own proprietary software interpreter and works with clients from all over the U.S.

You may be able to proof a large-format job on your office printer, although colors will vary. If you're planning a large run, almost any service bureau will provide you with a free proof; otherwise, an 11-x-17-inch proof for checking color and composition will cost you about \$15.

The Inside Job

Sending output to a service bureau is great if you have to do it only now and then. But if creating large-format presentations, displays, advertising, point-of-sale materials,

or legal graphics is what you do all day, you may want to consider investing in your own large-format-printing system. Whereas the printers and electrostatic plotters used at service bureaus can cost more than \$100,000, you can now find an inkjet unit for less than \$10,000.

Plotters themselves are nothing new. Pen plotters, which are employed primarily for CAD (computer-aided design), use pen and ink to draw blueprints, line illustrations, and other vector-based graphics. For areas of solid color, the pen scribbles rapidly back and forth to fill in the area. Pen plotters are generally monochrome or two-color printers, and they lack the rich color we're accustomed to with inkjet and thermal devices. A bit newer — and of more interest to desktop publishers — are those plotters and large-format printers that use inkjet or thermal technologies to give you photo-realistic output of PostScript images (see the "Directory" sidebar).

Unlike traditional plotters, today's large-format printers generally include Chooser-level printer drivers for the Macintosh and, in some cases, a PostScript interpreter that's housed in a separate box — a PC, in the case of LaserMaster's DisplayMaker. Most of these units provide a wide selection of PDFs (Printer Description Files) for most popular programs, helping users handle margin requirements and sometimes even getting around built-in page-size restrictions in applications.

The paper source is either a roll or large, precut sheets of coated paper. Most large-format printers come equipped with an automatic paper cutter. The quality of paper varies from vendor to vendor; most vendors make available premium thick, glossy stocks that yield rich, deep colors but are also quite expensive. For example, a 36-inch-by-100-foot roll of heavyweight paper for Hewlett-Packard's new DesignJet 650C/PS costs \$79.95, whereas a 36-inch-by-150-foot roll of regular inkjet paper costs \$44.95. Thinner

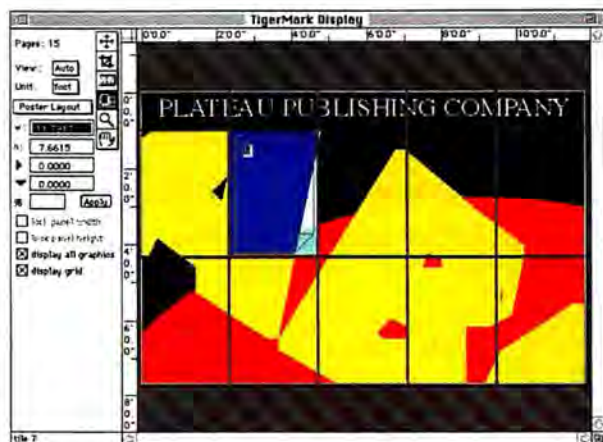


figure 1 / PosterWorks lets you create layouts with variable-sized pages, such as this 15-panel, 8-x-10-foot trade-show display. You can customize an individual panel's height and width by selecting it with the custom-panel tool.

stock yields nicely saturated colors, but it's not as durable. After printing, you can have the paper laminated, which serves the dual purpose of protecting it and enriching its colors.

Clearly, vendors of desktop printers recognize the potential of large-format output for graphic artists. Unlike the earlier-model 650C, for example, HP's DesignJet 650C/PS includes PostScript as well as scatter halftoning, which HP says decreases banding in large areas of color. LaserMaster's DisplayMaker produces photo-realistic images by using a special screening technology — called SmoothTone — that eliminates the coarseness associated with halftone screens and results in smooth color gradations.

Summagraphics' SummaChrome, on the other hand, is a large-format thermal-wax printer. Like its desktop counterparts, the SummaChrome uses four wax ribbons to transfer ink to special paper, resulting in deep colors. This unit's list price — and media costs — are a bit higher than the others', however.

Big Headaches?

Printing with a large-format device should be as straightforward as printing with a desktop device, but it may present similar problems as well. For example, color fidelity can be troublesome, according to users, because color-management tools are generally geared toward high-end prepress work, not plotter output. The DisplayMaker supports the TruMatch color-matching system, and PosterWorks 3.5 incorporates the EfiColor

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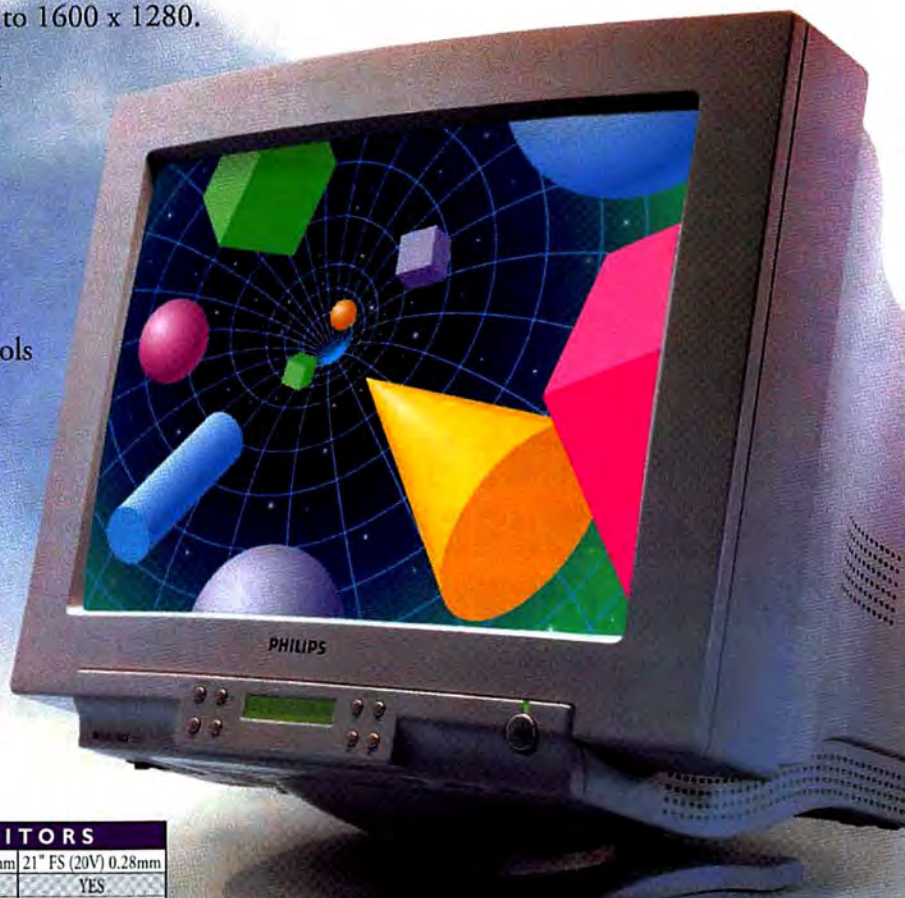
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| MAX. RESOLUTION | 1280 x 1024 | 1600 x 1280 | 1600 x 1280 |
| OPTIMUM RESOLUTION | 1024 x 768 at 80 Hz | 1024 x 768 at 100 Hz | 1280 x 1024 at 76 Hz |
| MAC RESOLUTION | 832 x 624 at 75 Hz | 1024 x 768 at 75 Hz | 1152 x 870 at 75 Hz |
| DOT RATE | 110 MHz | 135 MHz | 150 MHz |
| SCAN RATE (H) | 30-66 KHz | 30-82 KHz | 30-82 KHz |
| SCAN RATE (V) | 50-110 Hz | 50-120 Hz | 50-160 Hz |
| AUDIO INPUT | YES | | |
| DIGITAL CONTROL | YES (OSD) | YES (LCD) | YES (LCD) |
| ENERGY STAR | YES | YES | YES |
| WARRANTY | 3 YEARS | 3 YEARS | 3 YEARS |

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CIRCLE 66 ON READER SERVICE CARD

color-management system, from Electronics for Imaging.

Other problems may arise too, so for the majority of users, the simplest, most cost-effective way to deal with the challenges of large-format printing is by tiling or, better yet, finding a service bureau that specializes in large-format printing. But if you dream big ideas on a daily basis, large-format printers can help you make those dreams a reality. ☐

Mitzi Waltz is a Portland, Oregon-based technology writer and the sysop of Extreme Books BBS, an on-line bookstore.

DIRECTORY

Colossal Graphics ColossalJet

List Price: \$85,000 (66-inch output) or \$95,000 (96-inch output).

Technology: Inkjet.

PostScript: Adobe Level 2.

Print Size: 48 x 66 inches or 48 x 96 inches.

Resolution: 300 dpi.

Company: Colossal Graphics, Palo Alto, CA; 415-328-2264.

Hewlett-Packard DesignJet 650C/PS

List Price: \$9,995 (D-sized output) or \$11,595 (E-sized output).

Technology: Inkjet.

PostScript: Adobe Level 2.

Print Size: D or E.

Resolution: 300 dpi.

Company: Hewlett-Packard, Santa Clara, CA; 800-752-0900 or 208-323-2551.

LaserMaster DisplayMaker

List Price: \$23,995.

Technology: Inkjet.

PostScript: Level 2 emulation.

Print Size: 36 inches x as long as 18 feet.

Resolution: 300 dpi with diffusion.

Company: LaserMaster, Eden Prairie, MN; 612-944-9330.

PosterWorks

List Price: \$395.

Company: S. H. Pierce & Co., Cambridge, MA; 617-338-2222.

Summagraphics SummaChrome

List Price: \$27,000.

Technology: Thermal-wax.

PostScript: Adobe Level 2.

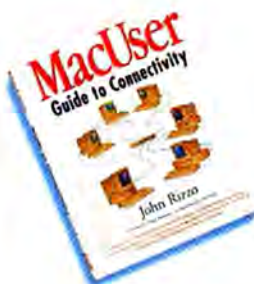
Print Size: 24 x 40 inches.

Resolution: 400 dpi.

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CIRCLE 6 ON READER SERVICE CARD

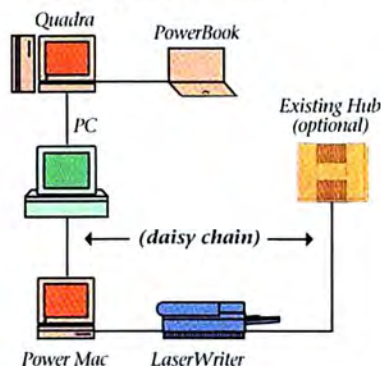
Q.

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HANDS ON Bridges

ON-LINE SERVICES / GOING GRAPHIC

GRAPHICAL ON-LINE INTERFACES are popping up everywhere. The most heavily graphical is that of Apple's eWorld. Its bright, cartoony graphics provide easy navigation through eWorld services and third-party services such as Reuters News Service.

Unlike Prodigy, which transmits low-resolution graphics continually, eWorld automatically downloads compact, high-quality graphics from the various eWorld publishers to your Mac's hard disk when you first log on, updating them only when changes occur. eWorld costs \$8.95 per month, which includes two hours of night or weekend calls, plus \$7.90 an hour during

weekdays and \$4.95 an hour at night and on weekends. 800-775-4556 or 408-974-1236.

Mac users of GENie, from GE Information Services, can now use a graphical interface to access the formerly text-only on-line service. New tool palettes let you access areas such as the Filing Cabinet, for reading messages off-line. The front-end software is available free from GENie Client Services (800-638-9636).

CompuServe users running System 7 Pro now have a new graphical-interface option: the PowerTalk Gateway for CompuServe (\$5). It lets you send mail with attachments from mail-enabled applications such as WordPerfect and supports the connection methods of the Communications Toolbox. To obtain the software, type GO CISOFT.



InterCon Systems (703-709-9890) has added Usenet news to WorldLink, its graphical Internet front-end software and on-line service (\$29.95 plus \$9 a month for an Internet account at 2,400 bps or \$19 for 9,600 bps). You can send and retrieve Internet e-mail, read newsgroups, and perform ftp file transfers from Internet sites.

/ Shelly Brisbin and John Rizzo

Multiplatform Connections

DISTANT AND FOREIGN LANS are within your reach with two new multiprotocol routers. The high-speed, low-priced TransTalk EN WAN router (\$1,499), from International Transware (415-903-2300), enables data transmission to remote LANs at speeds as fast as 2 MB per second. Its software is stored in its memory, so you can upgrade protocols without buying new hardware. It supports

AppleTalk, TCP/IP, and DECnet.

The SNMP-manageable GatorRoute iR (\$3,295), from Cayman (617-932-1100), routes packets using AppleTalk, TCP/IP, and DECnet, plus Novell's IPX. Although the Gator-

Route iR is an Ethernet router, you can add

Cayman's LocalTalk Expansion Card (\$200) to a slot to hook LocalTalk Macs to your Ethernet network. / Nancy Peterson



NETWORK ADMINISTRATION / Simple Software Distribution

FILEWAVE 2.0, from Wave Research (510-704-3900), represents a unique approach to automated software distribution. In Wave's approach, a centrally administered, virtual FileWave volume on each user's hard disk acts as the main repository for distributed software (FileWave can also control files sent to users' System Folders and perform system updates). During idle time, FileWave installs and updates files as needed and tracks file usage. Assigning multiple



file updates to groups of users is a simple drag-and-drop operation for administrators.

Compatible now with Apple's PowerPC-based servers, the FileWave software (\$895 for server and administrator software as well as software for 20 users, \$395 for 10 additional users, \$1,795 for 50 additional users) will be available in a native PowerPC version by the end of the year. / Karen J. Ohlson

Ethernet Accelerator Outruns FDDI

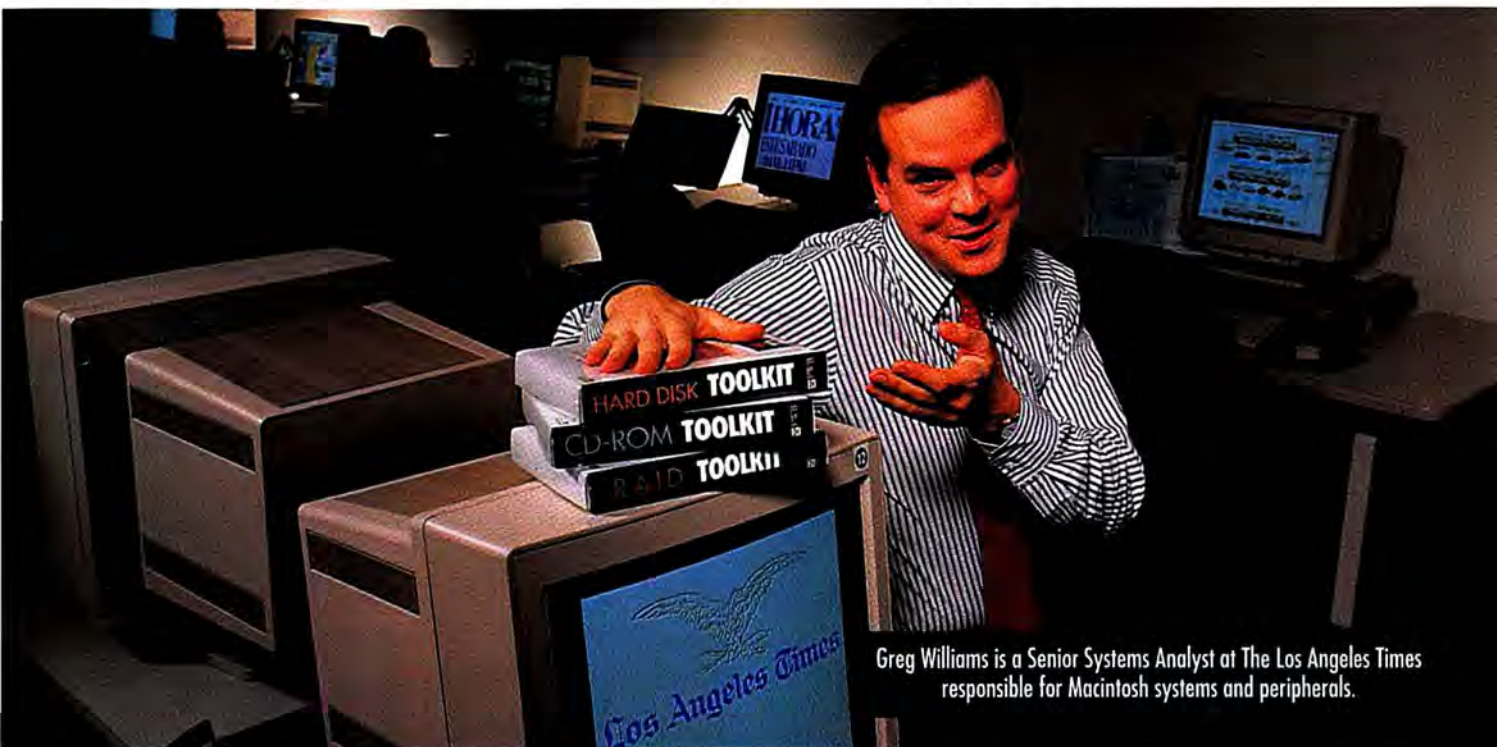
A FIVEFOLD SPEED INCREASE for Ethernet file transfers — that's what you get with the RunWay Ethernet Accelerator card (\$675 for 10BASE-T card; \$800 for three-port, auto-sensing 10BASE-T/10BASE-2/AUI card), from Run (201-529-4600). Run says that when you use the included RunWay file-transfer software with this fully functioning Ethernet card, your file transfers will be 50 percent faster than with the RunWay software only and several times faster than on FDDI networks. A prerelease unit we tested transferred a 20-MB file in just 23 seconds, at a rate of 912K per second. / JR

NETWORK APPLICATIONS / Lotus Soft on Power Macs

THE POWERPC BANDWAGON is leaving without Lotus Development, which has announced that it won't port much of its software to run native on Apple's RISC computers. Lotus will port only its cc:Mail client and Notes 4.0 client software — but not until 1995, after Notes 4.0 for 680x0 Macs ships. Server software will not be ported, nor will Lotus 1-2-3 for Macintosh and AMI Pro — even though Novell and Microsoft are busily porting applications to the PowerPC. / JR



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



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

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CD-ROM ToolKit
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Hard Disk ToolKit
— MacUser Magazine



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

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

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

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



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HAMMER

Network Help

How to speed up printing, use echo packets to troubleshoot a network, and avoid server-update overloads. BY KURT VANDERSLUIS

Speedier Printing

Q. Why does printing seem to take longer under System 7 than it did under System 6? Am I just imagining this? If not, what can I do about it?

A. System 7 does a few things differently. First, each time it prints, a Mac running System 7 sends the printer Apple's user dictionary, which contains data defining special PostScript routines that Macs use frequently during a print job. Under System 6, however, only the first Mac to print after the printer is powered up downloads the user dictionary, on its first print job. Depending on the speed of your Mac and LaserWriter, System 7's method adds 4 to 10 seconds to every

print job. There's nothing you can do about this.

Printing documents created with the screen fonts Geneva and New York, which are the default fonts in many applications, also takes longer under System 7. System 6 substitutes Helvetica for Geneva and Times for New York during printing, but System 7 uses the TrueType versions of Geneva and New York to print. Unfortunately, these TrueType fonts are not resident in most LaserWriters' ROM (as are Times and Helvetica) and must be downloaded, a process that takes 10 to 30 seconds for each font. Your Mac also sends TrueType's user dictionary to the printer if it is not in the printer's memory, adding another 10 to 40 seconds to every print job.

To save time, check to see if any of your

applications use a font such as Geneva or New York as the default font and, if so, change the default to one of the printer's ROM fonts. An even easier option is to remove these TrueType fonts from your System Folder, which forces your printer to substitute fonts it has in its ROM. Or if your



Write to Network Help

c/o MacUser

950 Tower Lane

18th Floor

Foster City, CA 94404

You can also send your question to
Kurt VanderSluis on AppleLink
at KVANDERSLUIS.

BREAKING THE RULES / overriding PrintMonitor

Q. Is there any way to redirect a file already spooled on PrintMonitor to a different LaserWriter without canceling the print job and selecting a different printer in the Chooser?

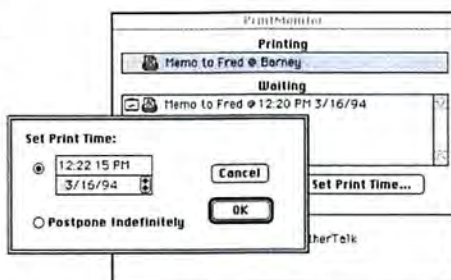
A. Yes. You won't save much time, but there is a way, using Apple's resource-editing program, ResEdit. Follow this three-step procedure to switch to a different printer:

1. Open PrintMonitor, and postpone printing the document by selecting the job and then changing the date or time in the Set Print Time dialog box.

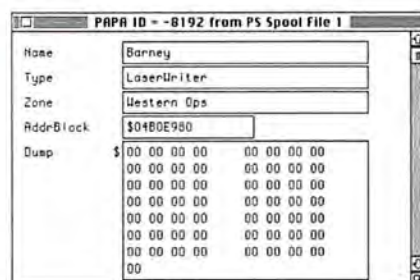
2. To change the name of the designated LaserWriter inside the spool file, launch ResEdit and, from within it, open the spool file in the PrintMonitor Documents Folder (in your System Folder). Go to the PAPA (Printer Access Protocol Address) resource, and open resource -8192. Type in the exact

name and zone of the LaserWriter you want to use. Make sure you type both names correctly. Quit ResEdit.

3. Reopen PrintMonitor. The spool file will appear in the window. Select it, and set the printing time to the current time. Your printed image will then go to the LaserWriter you listed in the PAPA resource.



1. Postpone print job.



2. Change printer in ResEdit.

MacUser

COMING SOON:

OCT

BIG TOP 50 CD-ROM TITLES

For the second year in a row, the 50 best CD-ROM titles are selected in different categories, including reference, business, educational, games and desktop publishing. The editors help buyers pick the real winners. Buyers profit every month when they take MacUser for a spin.

MULTIMEDIA AUTHORING TOOLS

MacUser compares the top two multimedia authoring tools on the results they produce — alone or with the programming language — from simple business presentations to complex multimedia products with sound, QuickTime, graphics, and more. Also, a look at cross-platform development. All in the best-authored magazine for buyers: MacUser.

HIGH-END HARD DRIVES

This October, MacUser tests 3 dozen 1GB+ hard drives for quality, service and support. The drives are MacBench tested, then challenged by PhotoShop, QuickTime, digital video and file transfer tests. A user profile evaluates your storage needs, and the effects of Apple's new SCSI Manager are examined in this mouse-rated report. MacUser helps steer buyers to the best hard drives.

OCTOBER AD CLOSE:
TUESDAY,
JULY 26TH, 1994

LaserWriter has a hard drive for fonts, you can use the LaserWriter Utility to copy the TrueType fonts to it.

But wait, there's more. Another waste of time occurs when the LaserWriter is busy and has stopped accepting input from the Macintosh. In this case, System 7 asks the LaserWriter for a status message every few seconds. Sometimes the LaserWriter gives the signal that it is ready to start accepting data again but the Mac insists on getting the status report before sending any more data. This can eat up as much as 10 seconds every time.

I recommend upgrading to the LaserWriter 8.0 driver as soon as you can. It's available from on-line services such as America Online and CompuServe and MacUser's service, ZiffNet/Mac, as well as from user groups. This driver makes use of PostScript Level 2 and optimizes PostScript commands before sending them to the LaserWriter; the speed difference is really significant.

Network Echoes

Q. When I use the MacPing network-management program, it tells me my LaserWriter is not returning all the packets MacPing sends it, yet everything seems to print OK. What's going on?

A. MacPing (\$169), available from Dartmouth College (603-646-2643), checks the quality of the network connection between devices by sending a group of echo packets from your Mac to distant nodes and receiving them back. Not all kinds of devices have the echo function built in, so you sometimes have to use a different type of packet. MacPing chooses the appropriate type of packet to send, which for LaserWriters is the status-request packet.

What's happening to you is that MacPing is choosing the wrong *time-out* value, the length of time MacPing is willing to wait for the return packet. If the return packet arrives after this time, it's counted as no response. For some reason, MacPing frequently chooses a time-out value that is too low, particularly for printers and some servers, which can be sluggish in returning packets, especially if they are busy.

To change the time-out value, find Adjust Timers, on the MacPing menu. Set the time-out value to 2,500 milliseconds (2.5 seconds), which should be sufficient for

printers within a LAN. If MacPing still tells you the printers are not returning all of their packets, you may have a wiring problem. If you're checking across a WAN, you may want to set the time-out value even higher to give the packet enough time to complete its trip across the WAN link and back.

By the way, you can also use Apple's Inter-Poll to check network connections. The main advantage of MacPing over Inter-Poll is that you can check all the devices on a network at once, rather than one device at a time.

Sneaky Server Updates

Q. I notice there's network traffic between my Mac and the AppleShare server even when I'm not doing anything on the server. Is that normal?

A. Yes. The traffic's there because every ten seconds, your Macintosh asks a file server for the modification date and the number of bytes free on each mounted volume. If anything has changed (for example, a folder has been created or deleted), every workstation that has a server volume mounted will have to update the desktop information that describes the volume. In addition, once every minute, the workstation sends an echo packet to the server to get a feel for the network's timing. It then adjusts some of its time-out values.

In some situations, the process of retrieving a mounted volume's updated desktop information can severely slow down your Macintosh, even if you aren't actively using the volume. The following factors increase the frequency of volume-information updates; you may be able to control some of them:

- The volume's structure is quickly or continually changing.
- The directories that are changing contain a lot of files.
- The server is busy processing file and application requests.
- The network is unreliable, and packets must be retransmitted.
- Numerous workstations have the server mounted.
- The volume's file structure is many levels deep.

When several of these factors are present, the network's performance can suffer, connections can be lost, and some Macs may even crash. ☹

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| Emulations | PCL5/Adobe® PostScript 2 | PCL5E/Adobe PostScript 2 |
| 40MHz Processor Upgrade | Optional | Not Available |
| Compatibility | Mac/DOS | Mac/DOS |
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Apple Shares Its Servers



PowerPC servers are here, but they won't fit easily into mixed Mac/PC networks until later this year. Here's how Apple plans to get its multiplatform-network act together. BY JOHN RIZZO

WITH MAC-ONLY sites as rare as cigarette smokers in California restaurants, products that unite Macs and PCs on networks are now seen as necessities rather than luxuries. But when it comes to marrying its own networking products to Windows, Apple has been acting like a confirmed bachelor who's afraid to make a commitment. After years of singing, "Someday my Windows clients will come," Apple has finally announced a cross-platform network strategy focused on Windows users and the new PowerPC Workgroup Servers: the WS 6150, the WS 8150, and the WS 9150.

Starting at the end of this year, Apple will begin shipping Windows client software for its network services running on all the WS servers. And PowerPC servers will not only run a variety of server software but will also run one of three operating systems. The first is the familiar Mac OS, which is used on the AWS 60 and the AWS 80. The two other OS choices (which are running on Macs for the first time) are PowerOpen, Apple's version of UNIX based on IBM's industry-standard AIX, and a native PowerPC version of Novell NetWare, the world's most popular network operating system.

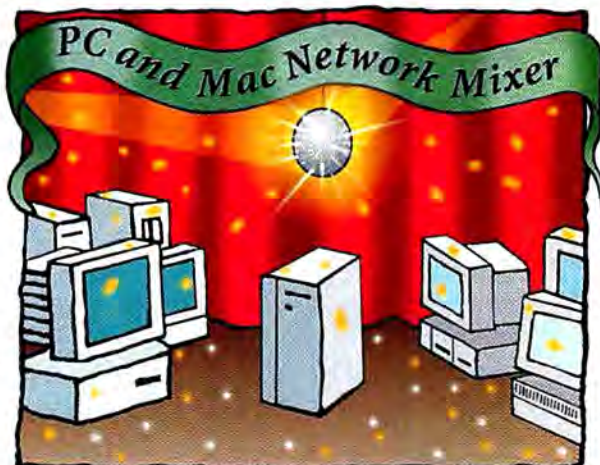
With industry-standard operating systems running on the servers and Windows-client support for Apple network services, we should begin to see the type of networking many of us have long wished for.

Mac OS: Not Yet

The ability to run the Mac operating system on the new servers is not very exciting at this time, since the services (AppleShare File and Print Servers, PowerShare, AppleSearch, Apple Remote Access) run only in 680x0-emulation mode at speeds that could well be slower than on the older AWS 60, 80, and 95 models. A native PowerPC version of AppleShare isn't expected until sometime next year. (And yes, you inferred correctly that the WS 9150 runs the standard Macintosh OS, not A/UX, which is the OS the AWS 95 uses.)

Apple is playing down the importance of AppleShare for the new servers and is instead emphasizing the third-party native server software that runs on the Mac OS, such as ACI US' 4D Server, Aldus' Color Central image-management system, and Cantos' Cumulus image-database manager. Unfortunately, as of press time, there were still no native e-mail server-software packages announced, let alone available.

A native version of AppleShare is actually less significant than the fact that Apple plans to ship Windows client software for its network services by the end of this year. The first products will let Windows and DOS clients access AppleShare's file and print services and let Windows clients join serverless Macintosh networks, using the equivalent of



System 7's file sharing. Future PC client software will include PowerTalk for Windows for mail and directory services and, eventually, all of Apple's network services.

Of course, products are already available that let PCs join Mac networks. Farallon's PhoneNET PC and Timbuktu, the CCC Coactive Connector, and COPS' COPSTalk each provide PCs with some AppleShare file and print services. The AppleTalk protocol stack underneath Farallon's products was supplied by Apple several years ago, when Apple was less interested in multiplatform networks. Indeed, the success of products such as the Coactive Connector has shown Apple that PC users are interested in buying AppleTalk products.

Apple's Windows client software will run on a rebuilt version of Farallon's AppleTalk protocol stack. The new AppleTalk stack

POWERPC SERVERS / *what's the right operating system for your network?*

WITH THREE OPERATING SYSTEMS to choose from for Apple's new PowerPC workgroup servers, you should be able to find the perfect OS for your network.

The simplest choice for Mac-only networks may be to use the Mac OS running AppleShare and PowerShare. Mixed Mac/PC networks can use the Mac OS with Apple's new Windows client software. Most enterprise networks will work best with the native PowerPC version of Novell

NetWare, although its setup is quite complex and requires a NetWare-knowledgeable administrator — a resource that even large Mac-only network sites are unlikely to have. Apple's new UNIX OS, PowerOpen, is suitable for all three environments — Mac-only, mixed Mac/PC, and PC-only; in fact, PowerOpen running on IBM hardware may be the platform and OS of choice for some PC-only networks. Bear in mind, though, that only NetWare is expected to be PowerPC-ready before 1995.

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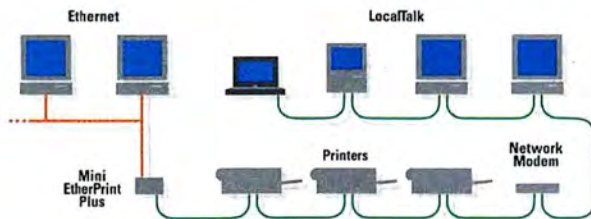
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should perform better and will support such standards as Microsoft's ODI (Open Data-Link Interface). Best of all, Apple will allow third-party developers to use the stack to create their own products. An open, standardized AppleTalk for Windows will make it easier for businesses to set up mixed Macintosh/PC networks, since Windows products from Apple and third parties will work together.

PowerPC NetWare: Fast!

Of course, there are network managers who will have nothing to do with AppleTalk. This is where NetWare comes in. The native version of NetWare 4 for Apple's PowerPC workgroup servers, expected to ship in the fourth

NETWARE ON A PowerPC server should be twice as fast as on today's 486 servers — and you don't have to give up hardware features for the speed gain.

quarter of 1994, will serve Mac, PC, and UNIX clients, just as current NetWare server software does. Even though Apple will sell this version of NetWare under its own auspices, it will unfortunately be just as complex to install and maintain as today's 486-based NetWare, although Novell plans to let administrators do more from a Mac than they can now. Novell and Apple will also ship native NetWare client software for Power Macs.

The obvious advantage of running NetWare on a PowerPC server rather than on the popular 486 platform is speed. NetWare on a PowerPC server should be twice as fast as on today's 486 servers. You don't have to give up hardware features for the speed gain either: The WS 6150, the WS 8150, and the WS 9150 come bundled with RAID software for disk mirroring, and the WS 8150 and the WS 9150 have built-in DAT drives for backing up data.

There will be some software trade-offs, however. The PowerPC version of NetWare, NetWare 4.1, includes distributed-enterprise features such as directory services. However, since Network Loadable Modules (NLMs) — plug-in modules from Novell and third parties — for NetWare 3.11 are still widely used, there will be fewer add-ins

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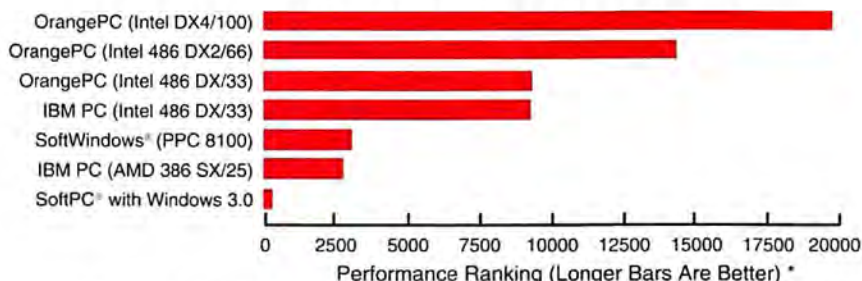
CIRCLE 134 ON READER SERVICE CARD

to choose from for PowerPC NetWare servers than for 486 NetWare servers. This will be the case for at least the next year or so. Novell promises that the leading NLMs will run on PowerPC servers, but only if they are for NetWare 4.x and have been recompiled for the PowerPC.

Over time, Novell will probably announce NetWare ports to other RISC platforms. But

the company's early adoption of the PowerPC 601 puts it in a strong position to have server software ready for future hardware that uses the upcoming PowerPC 620 chip. Motorola claims that this chip, designed specifically for use in servers, will have near-supercomputer power. The 620 chip may ship in quantity in 1995, with servers possible by the end of that year.

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* Benchmark results are based on the Processor Harmonic measurements from PC Bench version 7.01.
SoftPC with Windows was run on a Quadra 700. SoftWindows was run on a Power Macintosh 8100.
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CIRCLE 130 ON READER SERVICE CARD

PowerOpen: IBM-Style UNIX

Since high-performance servers often run UNIX, Apple will offer PowerOpen, possibly sometime next year, as an upgrade path for the A/UX-based AWS 95 and for UNIX-based servers on multiplatform networks.

The PowerOpen operating system will be a native version of UNIX based on IBM's popular AIX 4.x. PowerOpen will also include a Mac interface, as does today's A/UX. PowerOpen's advantage is that although few applications have ever been written to take advantage of A/UX, lots of database programs and other multiuser applications

IT'S CURIOUS that Novell can port NetWare to the PowerPC faster than Apple can port its much less complex AppleShare software.

have already been written for AIX that can be recompiled to run under PowerOpen.

Because of the wide availability of potentially compatible applications, PowerOpen will be both more useful and more popular than A/UX has ever been. It's just too bad that Apple didn't get together with IBM earlier to develop PowerOpen. We need it now that the new PowerPC servers are shipping — not next year. The same is true for NetWare, of course, but at least its native version isn't as far off. It's curious that Novell can port NetWare to the PowerPC faster than Apple can port AppleShare, especially when you consider the complexity and size of NetWare code compared to that of AppleShare.

It's also unfortunate that Apple is only now realizing that multiplatform networks are key to the survival of the Mac. Why has Apple been dodging the Windows-client issue for so long, when many users would have jumped on Windows client software for Apple network services a year or two ago? Farallon has created some good products with Apple's PC AppleTalk protocol stack, but only Apple can create an AppleTalk standard. At least now we have some tangible products on the horizon, instead of being asked to wish upon a star.

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

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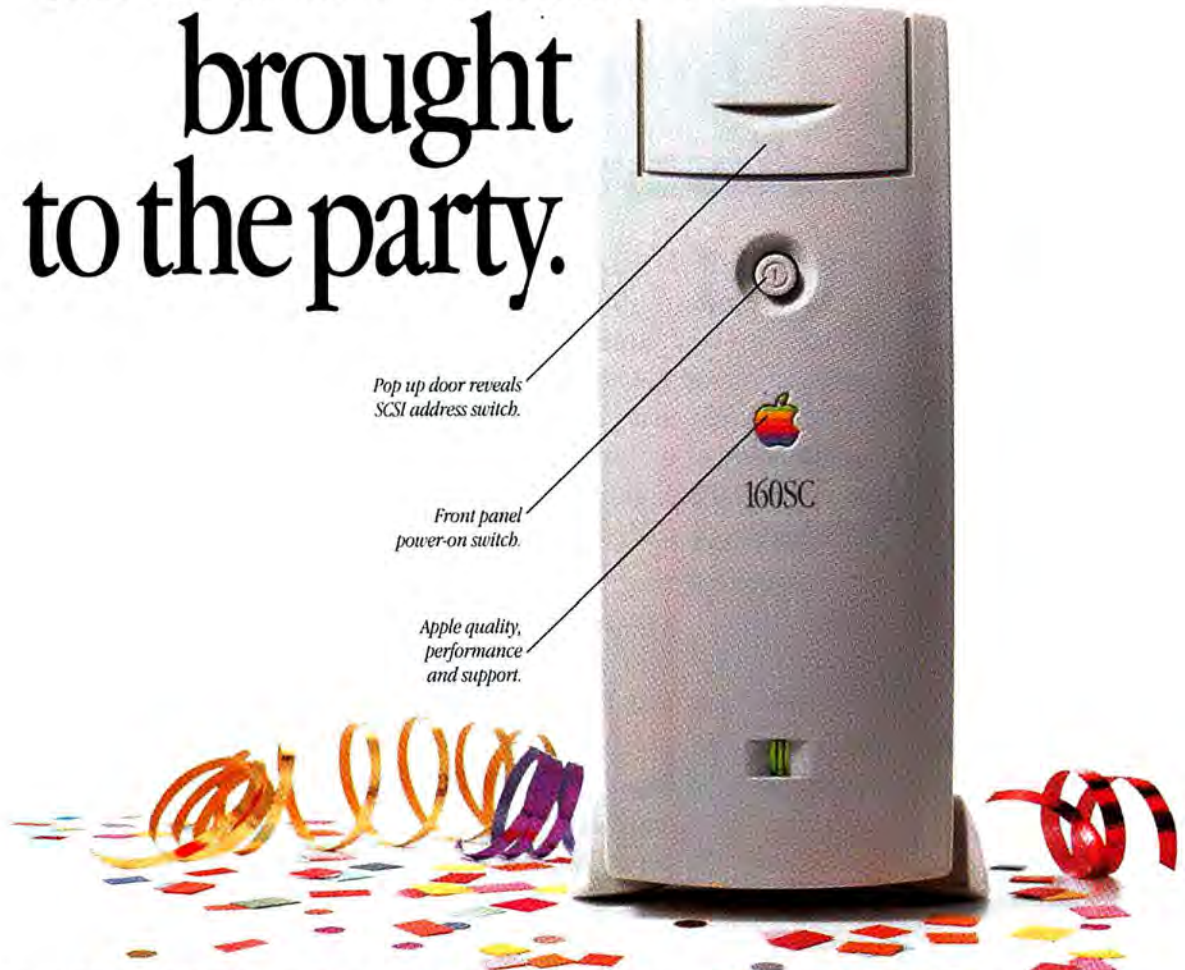
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CIRCLE 41 ON READER SERVICE CARD

HANDS ON

Mobile Office

BATTERY CHARGER / CHARGING SMARTER

WHEN IS A SMART BATTERY in one of Apple's 500-series PowerBooks not quite as smart as it could be? When the battery's not getting reconditioned (drained of all power and then fully recharged) regularly — a situation you can easily prevent by using a reconditioning charger. The first such charger announced for these batteries is the External Smart-Battery Charger (\$179.95), which was due in July from VST (508-287-4600).

Reconditioning ensures that the microprocessors in the batteries continue to provide correct information about



the batteries' usage history and charge levels, adjusting power-level reporting as the batteries' capacity changes over time. Although the 500-series PowerBooks can recondition batteries internally, this happens only if you keep two batteries in the PowerBook — tough to do if you want to use one battery compartment for a PCMCIA card — and you remember to switch the batteries between compartments at appropriate intervals. Popping the batteries into VST's charger is a more convenient option.

The Smart-Battery Charger takes advantage of the batteries' built-in chips to ensure that the batteries are charged safely and efficiently. If any errors are detected in midcharge, the charger stops automatically. If power is interrupted, the charger intelligently resumes charging once power is restored. VST reports that the charger can power up two fully drained PowerBook Intelligent Batteries in roughly 90 minutes.

The Smart-Battery Charger requires an Apple PowerBook 500-series AC adapter (\$130) as its power cord; VST plans to offer a charger-adapter bundle at a discount. / Jim Shatz-Akin

NETWORK CONNECTIONS / Traveling Light

IF CONNECTING TO ETHERNET is a frequent occurrence for your PowerBook or PowerBook Duo, you'll appreciate Asanté's two newest Ethernet adapters, the Micro EN/SC and the NetDock.

The pocket-sized Micro EN/SC is a SCSI Ethernet adapter that draws power from the PowerBook's ADB port and includes a built-in HDI-30 connector — hence it doesn't require a power adapter or SCSI cable. The compact, 4-ounce unit comes in two models: a 10BASE-T-only version (\$299) and a 10BASE-T-and-thinnet-connector version (\$369). Be forewarned: The self-terminating Micro EN/SC provides no SCSI pass-through, so you can't have another SCSI device attached. Asanté's NetDock adapter (\$259) also draws its power from the PowerBook. Featuring the same quarter-moon shape as the Apple PowerBook Duo Floppy Adapter, the 4-ounce NetDock offers a 10BASE-T connector and an ADB port instead of a floppy port. / Mark Bieler



Carry-on Case

IF LEATHER'S YOUR BAG, perhaps it's your PowerBook's bag too. The new NoteBook Traveler Leather Carrier (\$199.95), from Kensington (800-535-4242 or 415-572-2700), comes with a padded compartment for your PowerBook, a strap-in compartment for your portable printer, an accordion folder for files, and other nooks and crannies.

Madson Line (800-851-1551 or 415-927-3600) also offers leather carrying cases for PowerBooks. You can choose among black, brown, and green leather cases in two sizes. The Mobile Professional Briefcase (\$249) includes a protected zipper pocket for an AC



adapter and several extra pockets. The Productivity Case (\$179) is three inches narrower, providing room for your PowerBook plus one other bulky item. / Nancy Peterson

Getting Ramped Up

SKIMPING ON RAM when you buy a 500-series PowerBook isn't wise. If you add RAM later, you'll have to throw out your original memory module and replace it with a new one, since these PowerBooks have only one memory-expansion slot.

Apple-added RAM may not be your best starting point, though. Even if you need only the maximum that Apple offers — 12 MB — you may be able to get a better deal from Lifetime Memory Products (800-233-6233 or 714-969-2421), Newer Technology (800-678-3726 or 316-685-4904), or TechWorks (800-688-7466 or 512-794-8533). These companies offer RAM configurations of 2 to 32 MB for the new PowerBooks, with list prices ranging from around \$300 to \$2,400. / NP





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CIRCLE 38 ON READER SERVICE CARD

RAM-Disk Heaven



RAM to spare and hours of battery life are a PowerBook's most precious commodities. Creating a RAM disk is a dead-simple way to maximize both.

BY SHARON ZARDETTO AKER

THE POWER-HUNGRY triumvirate of a PowerBook are its CPU, backlight, and hard drive. You can notch down the CPU speed (from 25 megahertz to 16 or from 33 megahertz to 25) and you can turn off the backlight, but what can you do about that spinning hard disk? The easiest solution is to replace it (to some extent) with a RAM disk that eats memory instead of battery power. You'll get an extra hour or more from a battery charge, guaranteed.

Building a Disk

A RAM disk is simply a portion of your Mac's RAM that acts like a hard disk but makes disk access much faster. To set up a workable RAM disk (one that contains a minimal System Folder and one or two applications), you need 8 megabytes or more of RAM. You can figure out how big a RAM disk you need — and whether or not you can accommodate it — by creating a temporary folder on your hard disk and dragging in, or copying, the files you need. (You'll need to know how big this folder gets, so turn on Calculate Folder Sizes in the Views control panel.)

Start by adding a streamlined version of

your System Folder, with few fonts and sounds and only *necessary* extensions. My RAM disk's System Folder includes two extensions: Thunder, an interactive spelling checker, and Tempo II+, a macro utility. Do not copy the System file and the Finder into the temporary folder, but make a note of their sizes and add them to the overall count.

Before you add an application to the folder, decide how much of it you really need on the RAM disk. With Word, for example, I keep only the application, a glossary, a dictionary, a custom dictionary, and preferences files on my RAM disk.

Unfortunately, putting something on a RAM disk doesn't cancel its need for a RAM allocation to work in. Even when you have a System Folder on a RAM disk, you still need 2 to 3 megabytes of free RAM for the operating system. The same holds true for an application: You can put it on a RAM disk, but it still needs a RAM allocation in which to run. Luckily, you can plan to use a ridiculously low RAM allocation for your applications (I use 400K for Word!). Applications need a large RAM allocation under normal circumstances so that more of the code can load into RAM, minimizing trips to the hard



disk. But if the trip the application is making is to a RAM disk, not to a hard disk, you won't notice any slowdown while the application is accessing the code.

Now it's time to calculate the size of your RAM-disk folder (don't forget to count the System file and the Finder). Add to the resulting figure the amount of free RAM you need for the system software and an application to run. If you're lucky, the total will be just under the amount of RAM you actually have in your PowerBook. If your folder runneth over, cut down on the number of fonts or extensions you've included.

Creating the Disk

Creating a RAM disk is easy: Just go to the Memory control panel, and set the size you need. When you restart your Mac, the RAM

POWERBOOK SECRETS / RAM disks unlimited

A FEW SIMPLE UTILITIES can make using a RAM disk a piece of cake. If you want some way to save your RAM disk's contents, you have several options — including using File Assistant (\$79), from Apple (800-776-2333 or 408-996-1010); Maxima (\$99), from Connectix (800-950-5880 or 415-571-5100); or RAMDisk Saver (\$69.95), from Atticus Software (203-348-6100) — each of which can automatically save your RAM disk's contents to the hard disk at shutdown and reload them to the RAM disk at startup.

If you want more RAM but don't want to pay for the real thing (or if you're already maxed out), check out RAM Doubler (\$99), from Connectix. This inventive utility fools your Mac into thinking it has twice as much RAM as it actually has. It does this by using a combination of virtual-memory techniques and by grabbing unused memory from allocations you've already made. As long as you have at least 8 megabytes of physical RAM to start with, the effects of virtual memory

are minimized and you don't have to worry about hits on the hard disk.

If doubling your RAM isn't good enough, you can triple or quadruple it by changing the RAM-multiplication factor RAM Doubler uses. You can accomplish this feat either by tinkering with ResEdit (see the "RAM Doubler" tip in Help Folder, July '94, page 146) or, if you'd rather not mess with ResEdit, by spending \$5 on a shareware utility called MaxRAM, from Spencer Low, a student in Vallejo, California. For those who are concerned that modifying RAM Doubler might be dangerous, the tech-support gurus at Connectix say there is no particular risk involved but the more you expand your RAM, the more likely it is that your Mac's performance will suffer. If you have lots of RAM to start with and are running small applications, expanding your RAM by a factor of 3 is probably OK. The best test is just to try it! (You can find MaxRAM on ZiffNet/Mac in Library 1 (Applications) of the Download & Support Forum, filename MAXRAM.SIT.)



disk will appear on the desktop; if you check About This Macintosh (on the Apple menu), you'll see that the size of the RAM disk has been added to your overall system-software allocation.

Now you can copy the items from your temporary folder to the RAM disk. Use Get Info on the applications you've copied to the RAM disk, and lower their RAM allocations. To set up the RAM disk's System Folder, create a folder by that name on the RAM disk and drag your hard disk's System file and Finder into it. Once the System file is on the RAM disk, open it and throw out any extraneous sounds or other nonvital resources.

Use the Startup Disk control panel to specify the RAM disk as your startup disk, and then restart. Note that a RAM disk, and its contents, will live through restarting but *not* through shutting down.

Danger! Danger! Danger!

What about the documents you're working on? If you leave them on your hard disk, the application will be hitting the disk not only when you want to open or save a document

but also (probably) as you scroll through it, which wipes out any power savings. On the other hand, if you move precious documents to the RAM disk, you may lose them (or so we are warned), because RAM disks are by nature ephemeral. But let's face it: Those warnings are for desktop machines, on which a RAM disk can be wiped out by a fluctuating power supply. The PowerBook has an uninterruptible power supply in its battery, and even if the battery runs down, RAM is preserved when the PowerBook goes into forced sleep. The most likely hazard is that you'll forget to save your files back to your hard disk before you get rid of the RAM disk. I have no problem keeping documents on a RAM disk or with recommending that you do it too; just make sure you save them to the hard disk every hour or so.


Remember that when you shut down your PowerBook and then restart, the RAM disk may look as though it survived the ordeal — but it didn't. The Memory control panel recreated it at startup according to the settings you used the last time, but everything that was in it is history. Of course, the chances

of losing everything are slim: When you use the Shut Down command, your Mac thoughtfully warns you that you're in danger of wiping out the contents of the RAM disk.

Doing It All Over Again

To get rid of a RAM disk, erase everything on it (after copying any important documents), turn off the RAM disk in the Memory control panel, and restart. Don't worry about having set the RAM disk as the startup disk; if it's no longer there, the PowerBook will start from the internal disk, as usual.

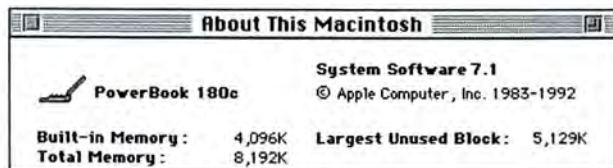
After you have created your RAM disk, make a compressed file of its contents and store that file on your hard disk. When you re-create the RAM disk, drag the compressed file to the RAM disk and decompress it there. A self-extracting archive, although a little bigger than a standard compressed file, is very convenient for this.

RAM disks are a boon, so set one up now. Believe me, you won't regret it. 

Sharon Zardetto Aker is the author of *The Mac Almanac*, published by Ziff-Davis Press.

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across subjects that blend in with their backgrounds — for instance, people wearing dark-blue suits that meld into a navy-blue slide background, making their heads seem to float in mid-air. This problem can occur any time a color in an image is similar to that of your slide background and bleeds to the edge of the slide. Changing the color of the slide background may fix the problem for some of the photos but may create a problem for others. Fortunately, the fix is easy and looks good. You can run a frame around each photo to separate it from the background, place a drop shadow behind each one, or do both (see figure 1).

Here's how to do it: When you have a few slides to fix and the

photos are all the same size, use a master slide for the quickest results. Draw two same-sized boxes on the master — one for the framing color and one for the drop shadow. The boxes should be slightly larger than the size of the photos. Offset the boxes slightly, with the drop-shadow box behind the frame. Make sure the fill colors you choose for each box work well with your presentation's color scheme (see the "Color Schemes" sidebar). Then assign this master to the appropriate slides, centering each photo in its framing box. If you use PowerPoint, you can make only one master slide; if you need that master for other purposes, add your drop shadows and frames by copying and pasting them onto each slide that needs them instead of by using a master slide to do the job.

4. Face subjects toward text. Unless a shot is directly head-on, you have to deal with photo subjects facing one direction or another. This is true not only with pictures of people but also with objects such as cars, cereal boxes, and fax machines. When your photo accompanies text on a slide, make sure to face the subject toward the text. It's

Say It with Slides

A PICTURE IN YOUR PRESENTATION is worth a thousand words. Here's how to make sure the image conveys the words you want. **BY SHELLEY CRYAN**

Maybe you're wary of using images in your presentations, because it's too hard to control how they turn out — or maybe you just need a few pointers to help you get started. In either case, try these simple tips for creating images that look good *and* convey the message you want to send.

1. Choose the right photo format. Programs such as Aldus Persuasion and Microsoft PowerPoint let you import photos in either EPS or PICT format. Your choice depends on how you plan to show your presentation — on slides or on a Mac.

If you plan to use 35mm slides, go with EPS rather than PICT format. PICT images appear more pixellated on slides. If you send

your EPS files to a service bureau to create the slides, ask the bureau to use a PostScript film recorder for final output, or you may get jagged images.

If you plan to show your presentation on a Mac display, save photos in PICT format. They'll display more crisply on-screen than EPS images will, and they take up less disk space.

2. Make images big enough. You'll be safe if an image covers at least 20 percent of the slide. Be careful when you use a large, bright image in a slide, though: If it's sandwiched between two dark slides, you'll annoy your audience members and leave them seeing tracers.

3. Highlight the subject. You may often run



figure 1 / Solve the problem of subjects that blend into a slide's background by adding a narrow frame in a contrasting color (chosen to work well with your color scheme, of course) or using a drop shadow. We added both in this example.



figure 2 / Replacing a busy background (left) with a plain color (right) can ensure that you don't lose your subject in all the clutter.

disconcerting, and can be confusing, to see pictures of subjects facing away from information about them.

5. Use object transitions. Entrance transitions can help draw your audience's attention to, for instance, a photograph, and exit transitions help return attention to slide text or graphics. To create such transitions, you need a specialized program such as Astound, from Gold Disk (800-982-9888 or 905-602-4000), which has a superb collection of object transitions.

For cosmetic enhancements to your photos, you need to turn to an image-editing program, since presentation software is limited in this area. Adobe Photoshop is a powerful tool, but if you don't already own it, lower-end programs, such as Color It! (\$149.95), from MicroFrontier (800-388-8109 or 515-270-8109), will work just fine


for tips 6 and 7 and will save you hard-disk real estate and money.

6. Crop out unnecessary detail. Make sure your audience can immediately zero in on the important part of a photo. First, decide what the most important element is. For instance, if you've scanned in a photo of two people shaking hands on an agreement, what's the most important element — the people or the agreement? If the people are well known, use the full picture. If the agreement itself is paramount, crop the photo and use just the clasped hands.

With most image-editing programs, cropping is a matter of using the marquee tool to select the area that you'd like to keep and then applying a crop command.

7. Cut out distractions. If your subject is sitting in front of a busy, distracting background, you should consider using image-

editing software to replace the background with a solid color or an unobtrusive gradient (see figure 2). Use the paintbrush tool, magnifying the image to make it easy to see what you're editing. To quickly select similarly shaded areas for recoloring, experiment with the magic-wand tool, available in many image-editing programs. You can also use this technique to replace a background color that clashes with your presentation's color scheme.

So if you aren't a designer but you have an important presentation to make, take heart: Applying these basic techniques will help you create images that get your point across in a clear and elegant way. 

Shelley Cryan runs a consulting business in New York that specializes in helping companies computerize their graphic-design departments.

COLOR SCHEMES / choosing the right colors

YOU DON'T NEED FORMAL TRAINING in color theory to create presentation images that impress your audience rather than making them squint and snicker. Just follow these guidelines:

- Borrow color schemes from the design templates that come with your presentation program. You can also use the ColorUP utility, from Pantone (800-222-1149 or 201-935-5500), which works with Microsoft PowerPoint and Aldus Persuasion, to help select colors.
- Use light text on a dark background for 35mm slides. For overhead transparencies, dark text on a light background usually works best.
- Use the same color for like elements. For example, all slide titles in a presentation should be the same color.
- Use warm colors — reds, oranges, and yellows — to highlight important elements. These colors grab attention and appear to be in the foreground.

- Apply the brightest color on a slide to the element you want your audience to see first. For instance, make the headline the brightest red on the slide and make less important elements, such as bullet points, a duller color.
- Be careful when you're trying to create an exact color match, such as a color in a corporate logo. Even if you create a perfect match, the color can appear quite different, depending on the surrounding colors on the slide. A particular shade of orange, for example, may look like a different shade of orange when it's next to purple than it does when it's next to yellow.
- Be conservative with the number of colors you use in a slide. Bar charts, especially, often suffer from too many contrasting colors. As a general rule, limit your slides to five colors or fewer, unless you use some colors that are similar, such as dark green and black.

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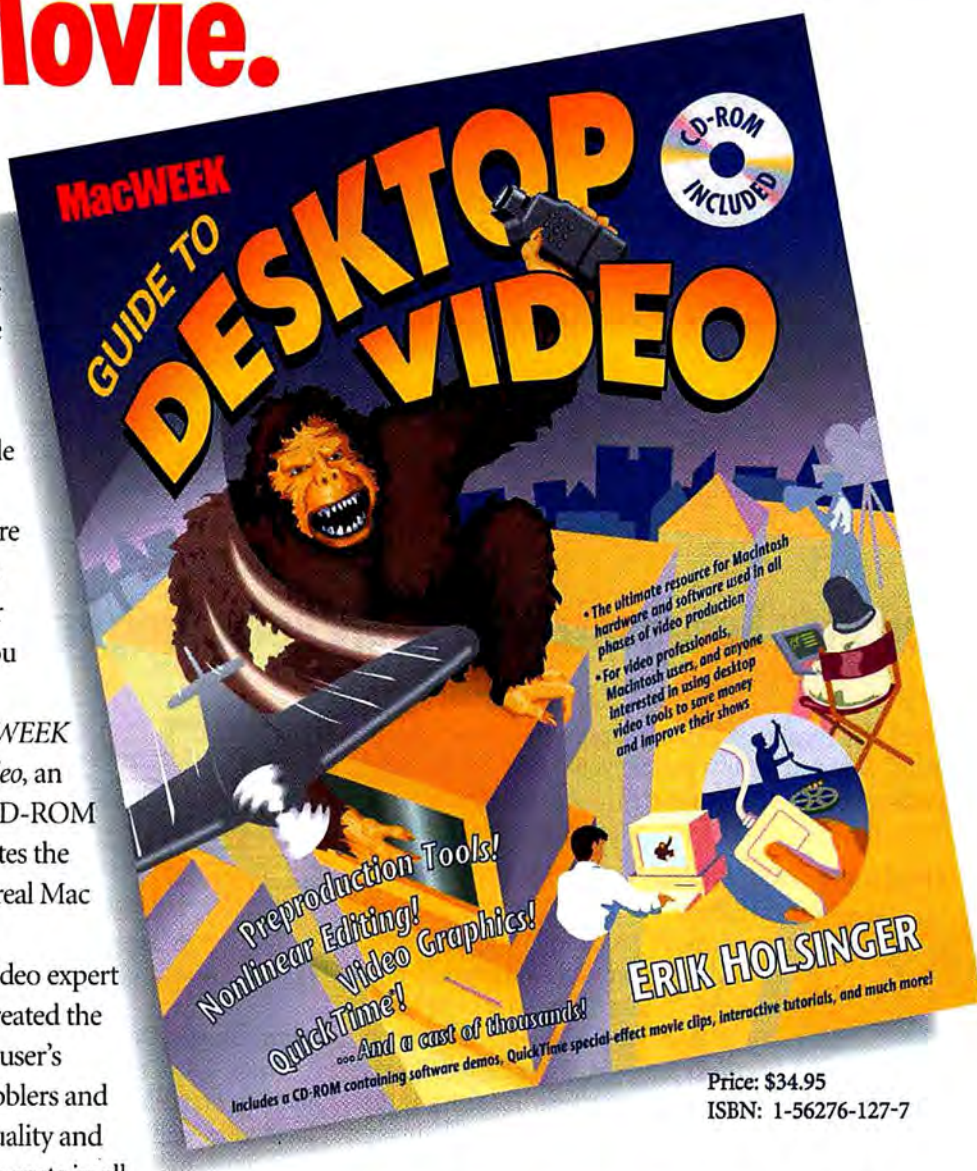
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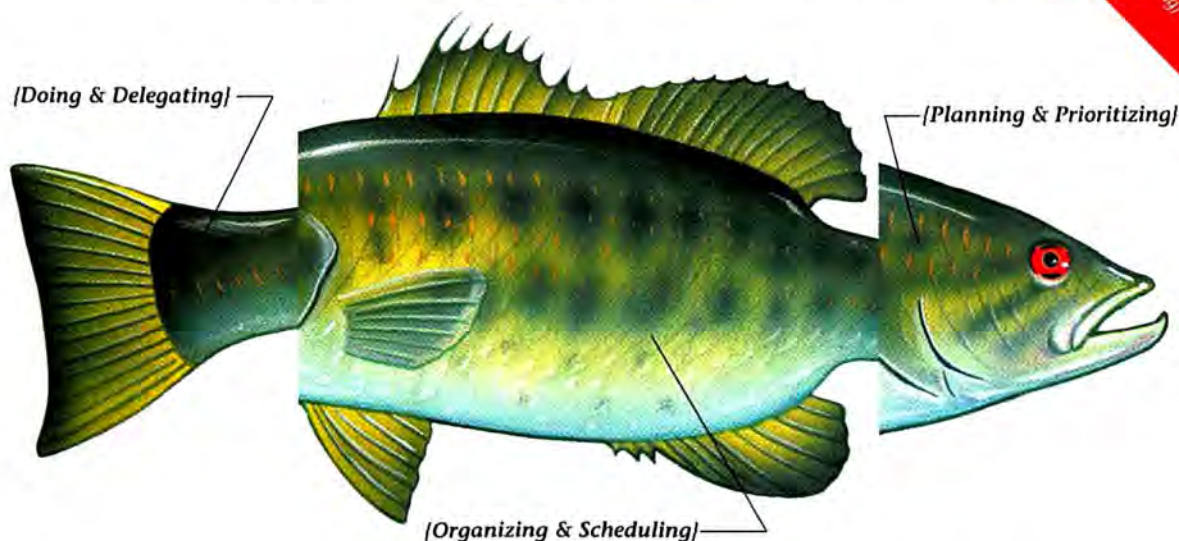
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Help Folder



RAM and speed, last-chance data recovery, and the case of the mysteriously missing memory. BY ANDY IHNATKO AND BOB LEVITUS

/ TIPS COMPILED BY CHRISTOPHER BREEN

Fast Mac Fever

Q. What's the best way to speed up my Mac cheaply? Should I buy real live SIMMs, increase RAM with software, or invest in an accelerator card?

Jonathan Shrier
Beijing, China

BOB: Adding RAM will *not* speed up your Mac, but it can give you lots of other benefits. For instance, it lets you open more programs simultaneously, open large files, and use more extensions and control panels. RAM Doubler, from Connectix (800-950-5880 or 415-571-5100), provides these benefits and is easy to use, not very conflict-prone, and much cheaper than real live SIMMs (you can find it for around \$60).

Where speed is concerned, I'm not a big fan of accelerators. If you need a screamingly fast Mac, I recommend upgrading to a newer, faster model.

ANDY: I agree — an accelerator card usually doesn't pay off in the long run. A logic-board upgrade is a better investment.

But I disagree on the point about adding memory to gain speed — more memory *can* make your Mac run faster. For instance, if adding RAM lets you increase the RAM allocation of an application, that application is now able to load more of itself into memory

instead of rummaging through your hard disk every time you need to do such tasks as grammar checking.

BOB: More RAM also lets you increase the size of your disk cache (in the Memory control panel), which theoretically speeds up your Mac. But most people can't see a difference in speed between having a disk cache set to 32K and having one set to 384K.

Reviving Your Drive

Q. Nothing I've tried has revived my hard drive, which was trashed during a power outage. If I sent it to Apple or Quantum, could they get my data back?

Susan Hall
via the Internet

ANDY: Once incense has been burned, incantations sung, and sacred oils applied to no avail, it's time to call DriveSavers (415-883-4232). The folks there can't change water into wine, but they're working on it. In the meantime, rest assured that if they can't recover your data and fix your drive, you might as well give up.

BOB: Right. Don't waste your time with Apple or Quantum. Just tell Scott at DriveSavers that Bob and Andy of *MacUser's* Help Folder sent you. I can't swear he'll give you a better deal, but maybe he'll autograph your hard drive.

Shrunken-RAM Mystery

Q. All of a sudden, I can't open some of my programs unless I disable extensions and reboot. I frequently have to close windows to make up for a sudden lack of memory, even though I have 24 MB of RAM on my Quadra. What caused my RAM to shrink?

Also, how much RAM do I need to work simultaneously in three of the four programs I use most often — Photoshop, Ofoto, Illustrator, and OmniPage?

Sally Wilkinson
via ZiffNet/Mac



TIPS / Telecom

POWERTALK

You may be able to recover e-mail mysteriously deleted in PowerTalk. PowerTalk deletes e-mail in your In Tray if you delete from your Key Chain the personal-gateway software that received the mail. Reinstalling the gateway won't get your mail back, but there is a way to recover the mail if it was sent via AppleMail.

Place whatever mail remains in your In Tray into a folder (if you're going to want to return this mail to your In Tray later, place it in the Trash, which is the only folder that lets you do this — and be sure not to empty the Trash, or you'll lose your mail). Go to the IPM Bin, a folder in the PowerTalk Data folder, in your System Folder (this is where PowerTalk stores e-mail). The mail you moved out of your In Tray won't show up here, but the mail that seemed deleted will. The messages will appear as files with eight-digit hexadecimal names, such as 0000003F. Drop these files onto the AppleMail icon, and use AppleMail to open and save them.

David Thompson
StarNine Technologies
Berkeley, CA

BOB: It sounds to me like 32-bit addressing is turned off. Open your Memory control panel, turn it on, and restart your Mac. Your Mac can see only 8 MB of RAM unless 32-bit addressing is turned on, regardless of how much RAM is actually installed.

If you still cannot simultaneously run three of the four programs you mention, try

Write to Help Folder/Tips

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Don't want to wait for an answer? Post your question on ZiffNet/Mac, *MacUser's* on-line service, and get a reply from Bob (76004, 2076) or Andy (72511, 204). We pay \$25–\$100 for any undocumented tips we publish. Send them to Christopher Breen (72241, 1036).

adjusting the minimum and preferred memory sizes in each program's Get Info window until you can run the programs. (To open a Get Info window, click on a program's icon once and then press Command-I.) You can save time by making sure the sum of the minimum memory allocated to the three programs you want to use is less than your available RAM — the total of installed RAM minus the amount of RAM your system software uses. Select About This Macintosh from the Apple menu, when you're at the Finder level, to see how much RAM your system software uses.

ANDY: Concerning the question of how much memory you need — I'd say enough to choke a horse, if you want to run OmniPage, Photoshop, and a third program at the same time. Those programs are cookie monsters when it comes to RAM — 24 MB is probably the minimum you need to satisfy their combined appetites. RAM Doubler, from Connectix (800-950-5880 or 415-571-5100), solves the problem by using compression and management techniques (such as not allowing memory to become fragmented) to double the amount of apparent RAM installed in your machine. Better yet, with a simple ResEdit hack, you can triple or even quadruple your memory, using RAM Doubler. If you've got a copy of the July '94 *MacUser* lying around, you can find the instructions in the "Tips/Utilities" sidebar in Help Folder, page 146.

BOB: RAM Doubler is a miracle, but even miracles have limitations. If you set the

TIPS / Telecom

INTERNET E-MAIL

Here's a trick for converting a file so you can send it through the Internet gateway from on-line services, such as CompuServe or America Online.

Compress the file with a compression utility; encode the compressed file in BinHex format (.hqx), using a utility such as StuffIt or Compact Pro; and open the .hqx file in TeachText or some other word-processing program. Copy the body of the text, and paste it into the body of an empty e-mail file.

Now you can send the file just as you would any e-mail message. Be sure to send a separate message telling the recipient which type of file — application, extension, control panel, and so forth — you've sent.

The recipient can see your file by compressing a file of the same type and encoding it in BinHex format, opening this file in a word-processing program, deleting the file's text, copying the text from the e-mail message you sent, and pasting it into this hollow shell. Once the recipient has saved it as a text file, all that person has to do is decode and decompress it.

John C. Shelton
Hanover, PA

memory allocation of a single program, such as Photoshop, higher than the actual RAM installed in your Mac, speed will probably suffer.

RAM-Thrifty Screen Saver


Q. Can you recommend a screen saver that uses very little memory? Is there a screen-saver option already on my Performa 200?

Karyn Brinker
Minneapolis, MN

BOB: Sorry, Karyn, but there's no built-in screen saver on your Performa. PowerBooks are the only Macs that include screen-blanking software at this time. You'll have to install a screen saver yourself. The best one for you depends on how thrifty you need to be with your RAM.

For a killer screen saver that uses little RAM and is also free, try Darkside of the Mac, which you can find on-line and in user-group software libraries. (On ZiffNet/Mac, it's stored in the Download & Support Forum, in Library 1 [Applications], as DARKSI.CPT.) Darkside has 40 modules and requires only 64K of RAM, and because it's an application rather than a control panel, you can quit out of it if you need to free up memory.

If you don't own a modem, it may be easier to buy a commercial package such as After Dark, from Berkeley Systems (800-344-5541 or 510-540-5535). It requires more memory than Darkside — anywhere from 2 to 4 MB — but gives you more variety. You can choose from almost 100 modules, including Star Trek, Disney, and Marvel Comics, if you buy all five After Dark editions. The street price of each edition is around \$30, a small price to pay to amuse your friends and protect your screen from burn-in. Be forewarned that After Dark is a control panel, which is loaded into RAM when you boot; you can reclaim that RAM only by disabling After Dark and rebooting.

ANDY: Delrina (800-268-6082 or 408-363-2345) also makes some captivating screen savers, for around the same price as After Dark. In fact, at press time, Delrina planned to ship a set of Far Side modules at the end of May. Using Delrina's screen-saver engine, you can cycle through its modules as well as After Dark's, so you won't soon get tired of your screen-saver images. The only drawback is that those high-resolution images require a lot of RAM — 3 to 7 MB. 

TIPS / System Software

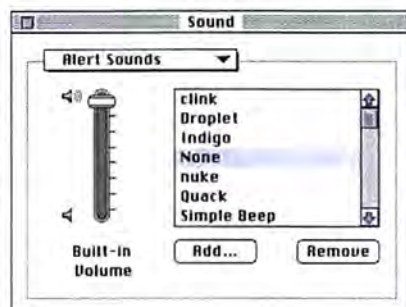
ALERT SOUNDS

You can get rid of the sound that beeps at you when alert messages come up on-screen without losing sounds from your applications — just by manipulating the Sound control panel.

Use the Add feature of the Sound control panel to record a blank sound — the shorter the sound, the better. Name the sound None, and select it as your beep sound. You can now turn up the volume in the Sound control panel to an acceptable level for your applications without hearing those annoying beep sounds.

A Mac with a built-in microphone will record a certain amount of noise when you're recording your blank sound; you can use sound-editing programs, such as Macromedia's SoundEdit Pro or Opcode's AudioShop, to delete most of it.

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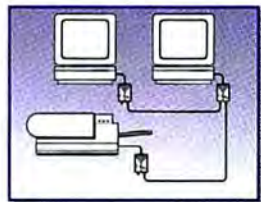
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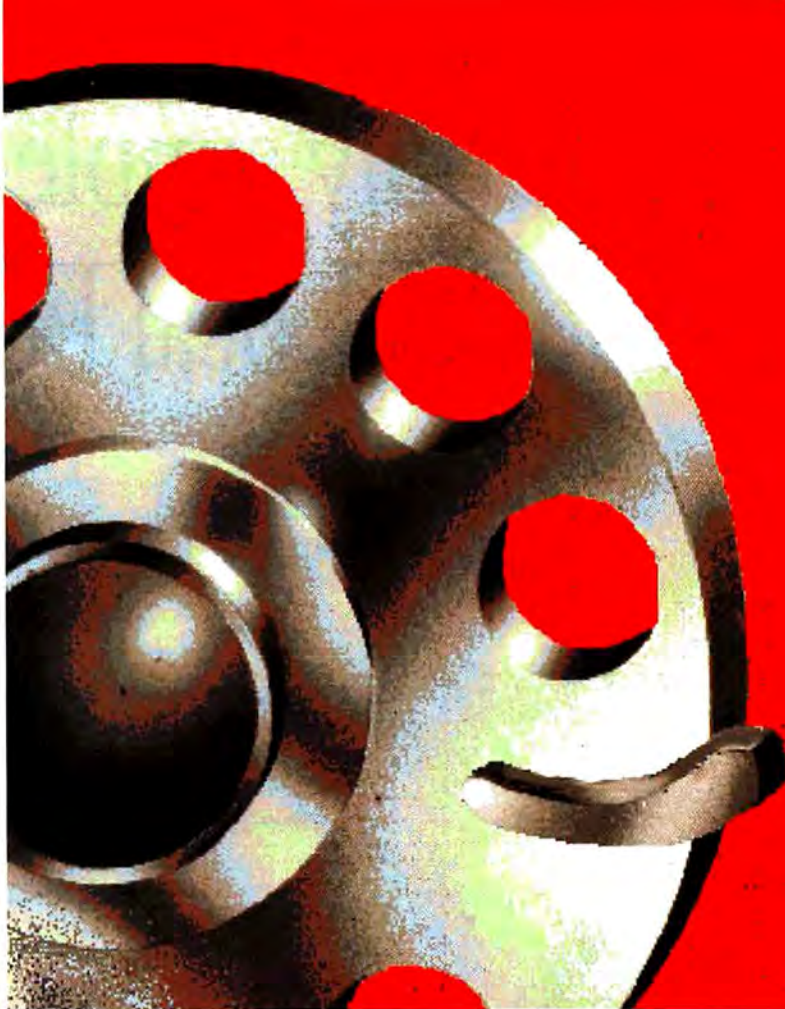
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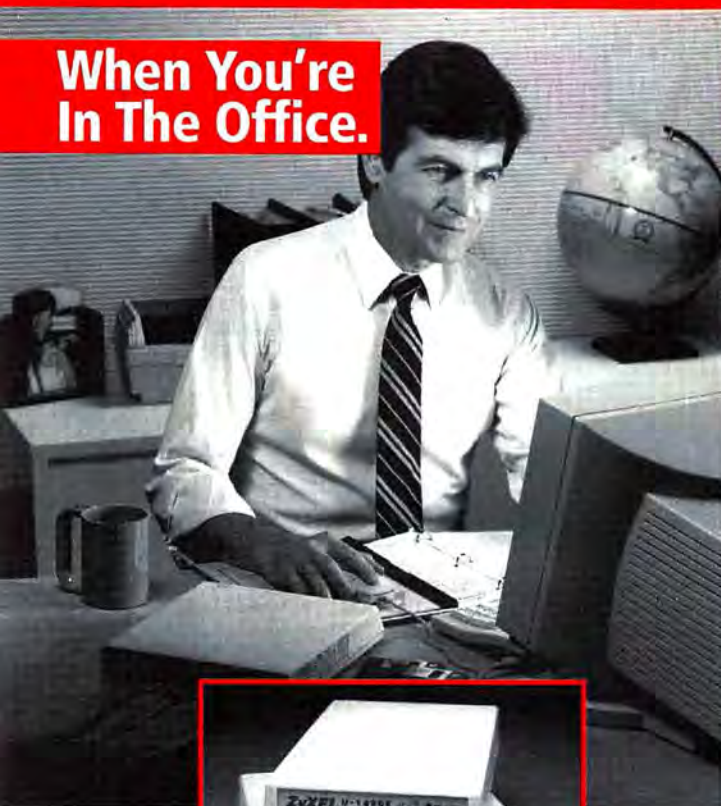
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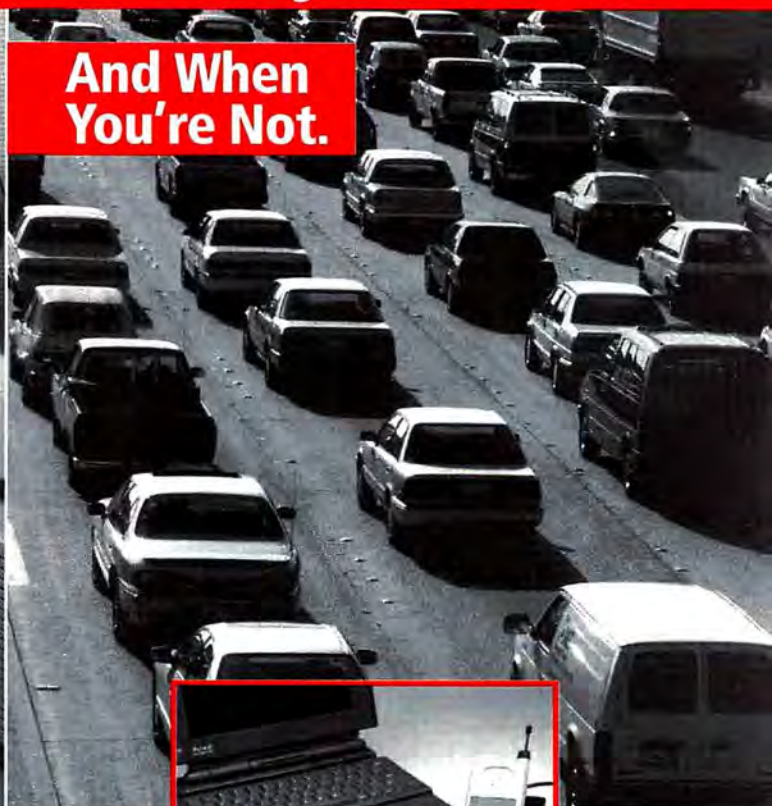
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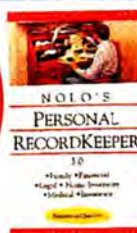
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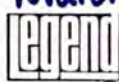
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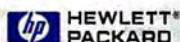
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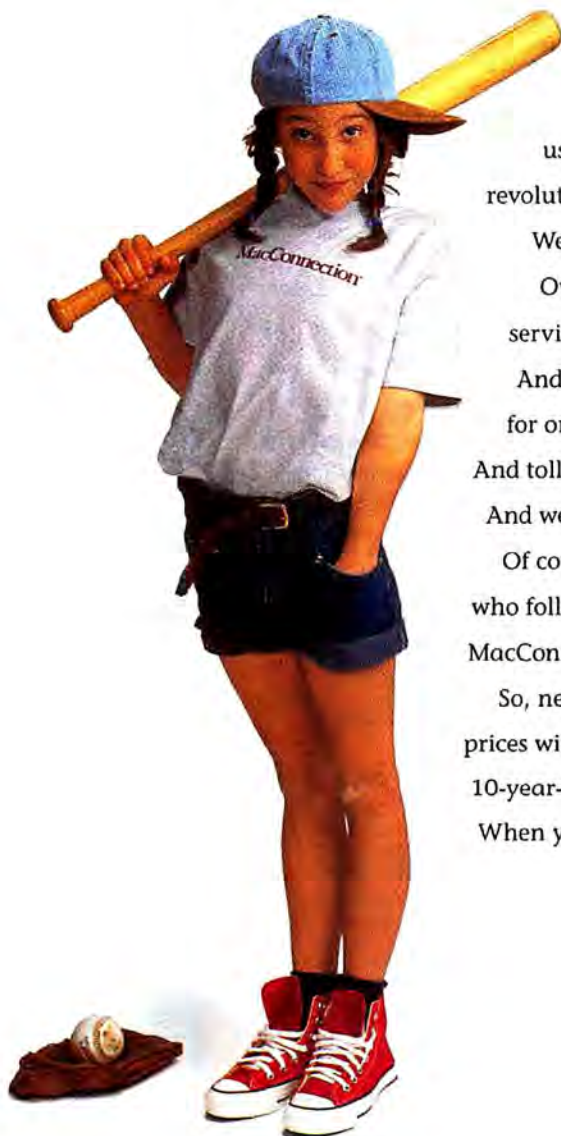
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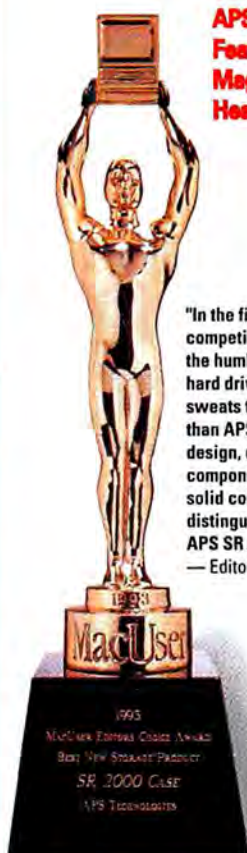
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4. Which of the following products have you bought in the last 6 months? (check all that apply)

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Accounting
Spreadsheets/Financial Planners
Project Managers/Planners
Word Processors
Database Managers
Graphics/Presentation Software
Integrated Software
Communications
Utilities

03 04
☐ 01 ☐ 01
☐ 02 ☐ 02
☐ 03 ☐ 03
☐ 04 ☐ 04
☐ 05 ☐ 05
☐ 06 ☐ 06
☐ 07 ☐ 07
☐ 08 ☐ 08
☐ 09 ☐ 09

HARDWARE

Modems
Scanners
Microcomputers
Printers/Plotters
Monitors/Displays
Storage
Add-in Boards
Networking

03 04
☐ 10 ☐ 10
☐ 11 ☐ 11
☐ 12 ☐ 12
☐ 13 ☐ 13
☐ 14 ☐ 14
☐ 15 ☐ 15
☐ 16 ☐ 16
☐ 17 ☐ 17

5. If so, what function do you serve in the buying process? (check all that apply)

☐ 01) Initiation/ Determine Need
☐ 02) Selection of Brand and Model
☐ 03) Selection of Source
☐ 04) Authorization
☐ 05) Other

6. Over the next 12 months, how much will your organization spend on computer products or services? (check one)

☐ 01) over \$5 million ☐ 05) \$50,000 - \$99,999
☐ 02) \$1 - 5 million ☐ 06) \$10,000 - \$49,999
☐ 03) \$500,000 - \$999,999 ☐ 07) under \$10,000
☐ 04) \$100,000 - \$499,999

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Title

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Company Name

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City

State

Zip

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 041 042 043 044 045 046 047 048 049 050 051 052 053 054 055 056 057 058 059 060 061 062 063 064 065 066 067 068 069 070 071 072 073 074 075 076 077 078 079 080
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1. For how many micro computers do you buy products?

(check one) ☐ 01) 1-4 ☐ 02) 5-49 ☐ 03) 50+

2. Your primary job function is: (check one)

☐ 01) Administrative/ ☐ 03) Engineering/R&D
 General Management ☐ 04) Finance/Accounting
☐ 02) MIS/DP, Communications ☐ 05) Marketing/Sales
 Systems, Programming ☐ 06) Computer Dealer/VAR

3. For which of the following products are you involved in selecting brands/models to be bought by your company or organization? (check all that apply)

4. Which of the following products have you bought in the last 6 months? (check all that apply)

SOFTWARE:
 Accounting ☐ 01 ☐ 01
 Spreadsheets/Financial Planners ☐ 02 ☐ 02
 Project Managers/Planners ☐ 03 ☐ 03
 Word Processors ☐ 04 ☐ 04
 Database Managers ☐ 05 ☐ 05
 Graphics/Presentation Software ☐ 06 ☐ 06
 Integrated Software ☐ 07 ☐ 07
 Communications ☐ 08 ☐ 08
 Utilities ☐ 09 ☐ 09

HARDWARE:

Modems ☐ 10 ☐ 10
 Scanners ☐ 11 ☐ 11
 Microcomputers ☐ 12 ☐ 12
 Printers/Plotters ☐ 13 ☐ 13
 Monitors/Displays ☐ 14 ☐ 14
 Storage ☐ 15 ☐ 15
 Add-in Boards ☐ 16 ☐ 16
 Networking ☐ 17 ☐ 17

5. If so, what function do you serve in the buying process? (check all that apply)

☐ 01) Initiation/ Determine Need
☐ 02) Selection of Brand and Model
☐ 03) Selection of Source
☐ 04) Authorization
☐ 05) Other

6. Over the next 12 months, how much will your organization spend on computer products or services? (check one)

☐ 01) over \$5 million ☐ 05) \$50,000 - \$99,999
☐ 02) \$1 - 5 million ☐ 06) \$10,000 - \$49,999
☐ 03) \$500,000 - \$999,999 ☐ 07) under \$10,000
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Silentwriter 640

640



\$719

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NEC Silentwriter 640 carries a TWO Year Warranty. NEC Silentwriter 1097 carries a ONE Year Warranty.

NEC

ClubMac's CD Bundle includes:

- Mayo Clinic
- Toolworks Encyclopedia v6.0
- The Animals
- Atlas Pack (World & US)
- Lucas Game Pak II
- Pair of QuickStart Speakers

MultiSpin 3Xp

3Xp



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|--|-------|--------|
| MultiSpin 3Xp (Portable, 250ms access time) | \$399 | \$499 |
| MultiSpin 3Xi (Internal, 195ms access time) | \$439 | \$539 |
| MultiSpin 3Xe (External, 195ms access time) | \$469 | \$569 |
| MultiSpin 4X Pro (External, 180ms access time) | \$935 | \$1035 |

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|--|----------------------------|--------------------------------|---------------------|
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| ClubMac 2X Speed (Ext., 320ms access time) | | | |

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Offer expires 08/31/94

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| PrecisionColor Display/20v | \$1679 |
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| PrecisionColor 24X | \$824 |

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HP DeskWriter 560C Inkjet Printer

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*Req 2 for non-Mac III, Ivi, Ixv, Performa 600

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| | | |
|---------------------------------------|-------|-------|
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| | |
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- 10ms access time
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| 270mb | 11ms | \$259 | \$319 |
| 340mb | 11ms | \$299 | \$359 |
| 540mb | 10ms | \$399 | \$459 |
| 1080mb | 9.5ms | \$739 | \$799 |
| 1440mb | 10ms | \$909 | \$969 |
| 2100mb | 10ms | \$1239 | \$1299 |

GO-DRIVE SERIES 2.5" POWERBOOK DRIVES

| Capacity | Access | Internal | External |
|----------|--------|----------|----------|
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CLUBMAC 105mb 3.5" Removable drive

- Fast 14.5 ms access time
- 64K intelligent read "Look Ahead" buffer
- On-the-fly error correction
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| ClubMac 200mb (5.25") | \$559 | \$599 |
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| | CARTRIDGES |
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| | SQ310 \$59 |
| | SQ327 \$89 |

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| 2-4GIG | ClubMac DAT/DC | DDS-DC | 60m, 90m | \$949 | \$999 |
| 4-8GIG | ClubMac DAT/2 | DDS-2 | 60m, 90m, 120m | \$1329 | \$1379 |
| 2.0GIG | HP DAT | DDS | 60m, 90m | \$949 | \$999 |
| 2-4GIG | HP DAT/DC | DDS-DC | 60m, 90m | \$1109 | \$1159 |
| 4-8GIG | HP DAT/2 | DDS-2 | 60m, 90m, 120m | \$1379 | \$1429 |

ClubMac DAT and DAT/DC drives include Retrospect v2.0 Backup Software, ONE 90 Meter Tape and a TWO Year Warranty. HP DAT drives carry a ONE Year Warranty. The ClubMac DAT/2 drive includes Retrospect Remote v2.0 (3 pack) Network Backup Software, ONE 120 Meter Tape and a ONE Year Warranty.

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CLUBMAC 5.25" 650MB SHARP OPTICAL

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-Macworld Editor's Choice, December 1993

CLUBMAC 5.25 650MB SHARP OPTICAL

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| Fujitsu (M2511A-DYNAMO) 3.5" 128mb DYNAMO | 40ms | | \$869 |
| ClubMac (OMD-5010) 3.5" 128mb Epson Optical | 40ms | \$759 | \$789 |
| ClubMac (JY-750) 5.25" 650mb Sharp Optical | 40ms | \$1669 | \$1699 |
| MaxOptix Tahiti III (9400) 5.25" 1.3GIG Optical | 19ms | | \$2499 |
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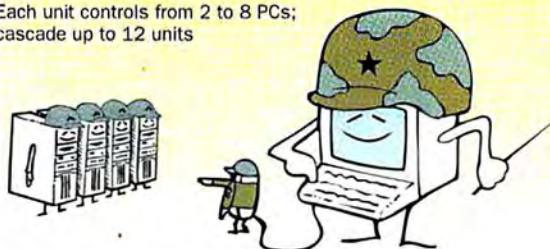
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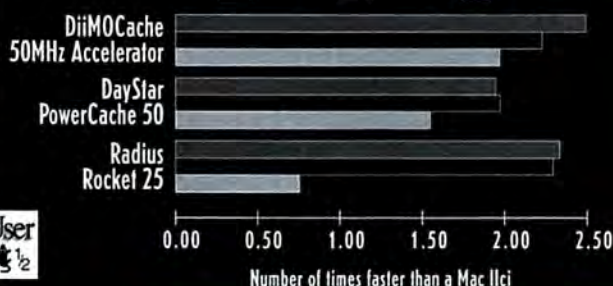
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| Apple LaserWriter Pro 630 | \$1895 |
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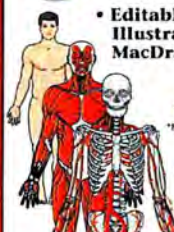
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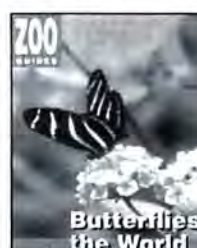
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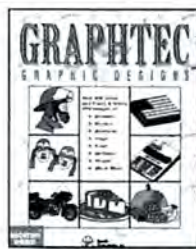
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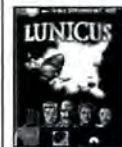


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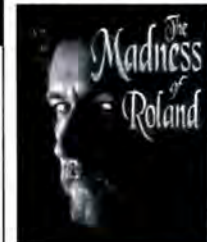


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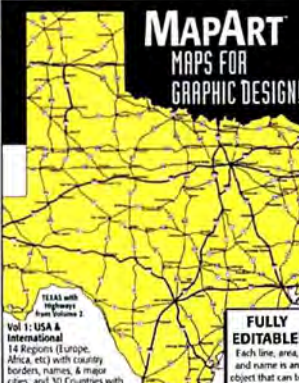
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Know Your Enemy

MAC USERS LIVE IN dangerous ignorance about the Intel-based PC market.

And they'd better start learning more about what's happening with PC-based technology, because Microsoft is going to start World War III shortly by rolling out its next operating system, Windows 4.0 — referred to as Chicago. The new operating system will be the closest Microsoft has come to duplicating System 7. Unless Apple does something about this threat, it will lose a lot of business.

Chicago adds to Windows features Mac users take for granted. For instance, Chicago users will be able to create folders within folders on the desktop, something that wasn't possible in previous versions of Windows. Although this was doable with OS/2, IBM couldn't convince the market to create enough device drivers to make OS/2 popular. A device driver in the PC world is kind of like an extension in the Mac world: If you add a scanner to your PC system, you need a device driver and the device driver has to be written specifically for your operating system. Because hardware companies are not in the software business, most of them wrote device drivers only for Windows. OS/2 may have 5 million users by now; Windows probably has as many as 40 million — eight times as many — thanks to the availability of Windows device drivers.

But Chicago will also do something System 7 cannot: true preemptive multitasking. You will be able to format a disk or download a file while working in your word processor, for example.

Exactly why Apple hasn't incorporated true multitasking into the Mac OS mystifies me. Even the now-defunct Amiga allowed multitasking. This capability is supposed to be a feature of a future Mac OS as well as of the infamous Pink operating system, under development by Taligent, but I'll be surprised if we see this feature on the Mac before 1996.

The Vision Thing

Overall, though, Microsoft still doesn't get it. And hardware/software integration on the PC is still mediocre, compared to integration on the Mac side. But that doesn't mean Microsoft won't stop trying. When the Macintosh was developed, it was the idea of one man (Steve Jobs) and the vision of a slew of highly talented programmers and designers who had to sell Steve on their concepts.


Microsoft is largely the vision of one man (Bill Gates), and that vision is somewhat limited, as witnessed by the copycat approach Microsoft takes to developing products. Chicago is like the Mac OS and like OS/2, but it offers nothing new or more advanced. Microsoft is always one step behind in the world of ideas and vision but constantly in the right place at the right time in the world of marketing.

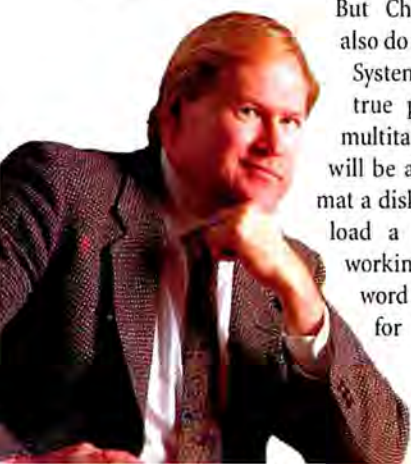
In fact, competing with Microsoft is like playing H-O-R-S-E in basketball. That's where you're required to make the same shot your opponent makes. If the other person misses a shot, then you get to take one, and if you make it, your competitor has to duplicate it. Microsoft is great at duplicating the shot made by the competitor but never really makes any shots of its own. Windows, Pen

Windows, Windows for Workgroups, Chicago, Works, Word, and so on are mostly derivative. Other Microsoft products, such as FoxPro and Flight Simulator, have been purchased from other vendors and repackaged. Scratch almost any Microsoft product, and you'll find that it's NIH (Not Invented Here). The usual NIH attitude is that if a product wasn't invented in-house, it's no good — even if it's actually far superior. (IBM is particularly fallible in this regard.) In fact, it turns out that the NIH stuff is almost always better. Gates saw this and reversed the formula. He made NIH a theme, becoming America's richest man in the process. That's the real genius of Bill Gates. Microsoft invents very little, and it cleans up!

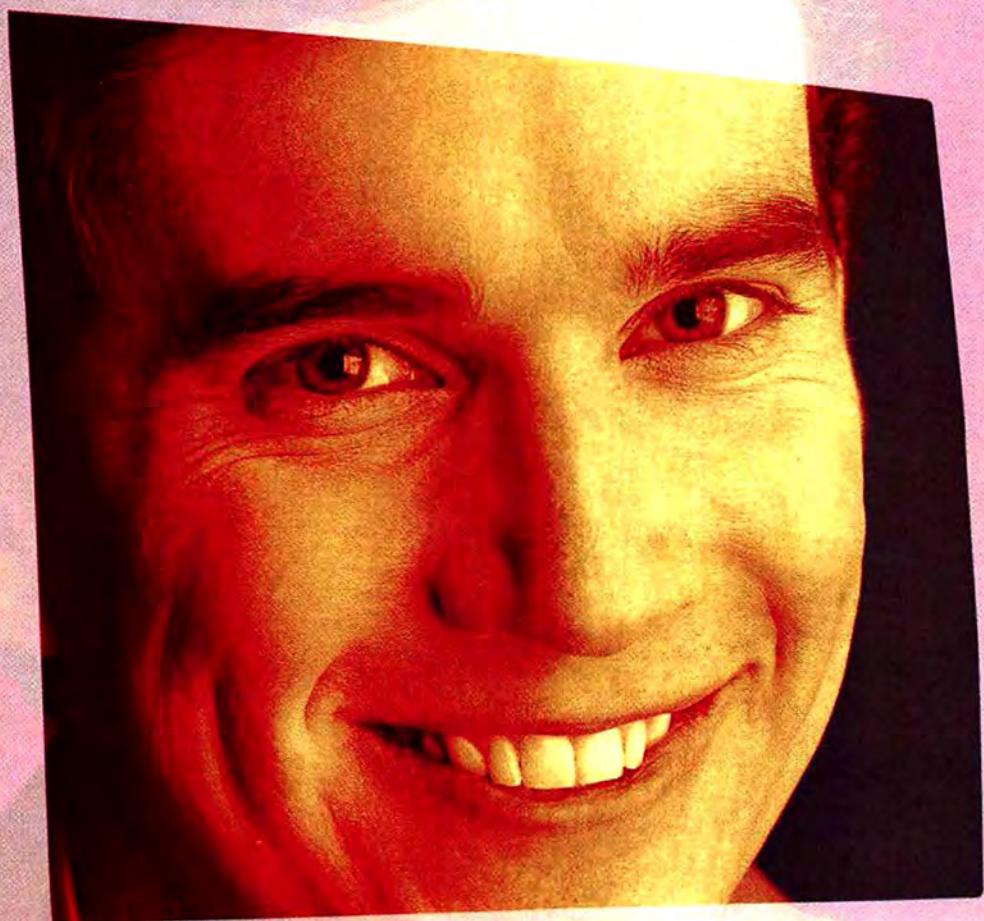


Microsoft's other advantage is that it's riding the Intel surf. The PowerPC may be the best chip in the game, but Intel is still dealing the cards. If the Microsoft/Intel axis manages to lure every Mac developer into developing high-end graphics apps for Windows *before* developing them for the Mac (a reversal of the usual order of things), the Mac's days are numbered. Fortunately, important products such as Adobe Photoshop are still developed for the Mac first, so graphic artists are staying put in the Mac world — so far.

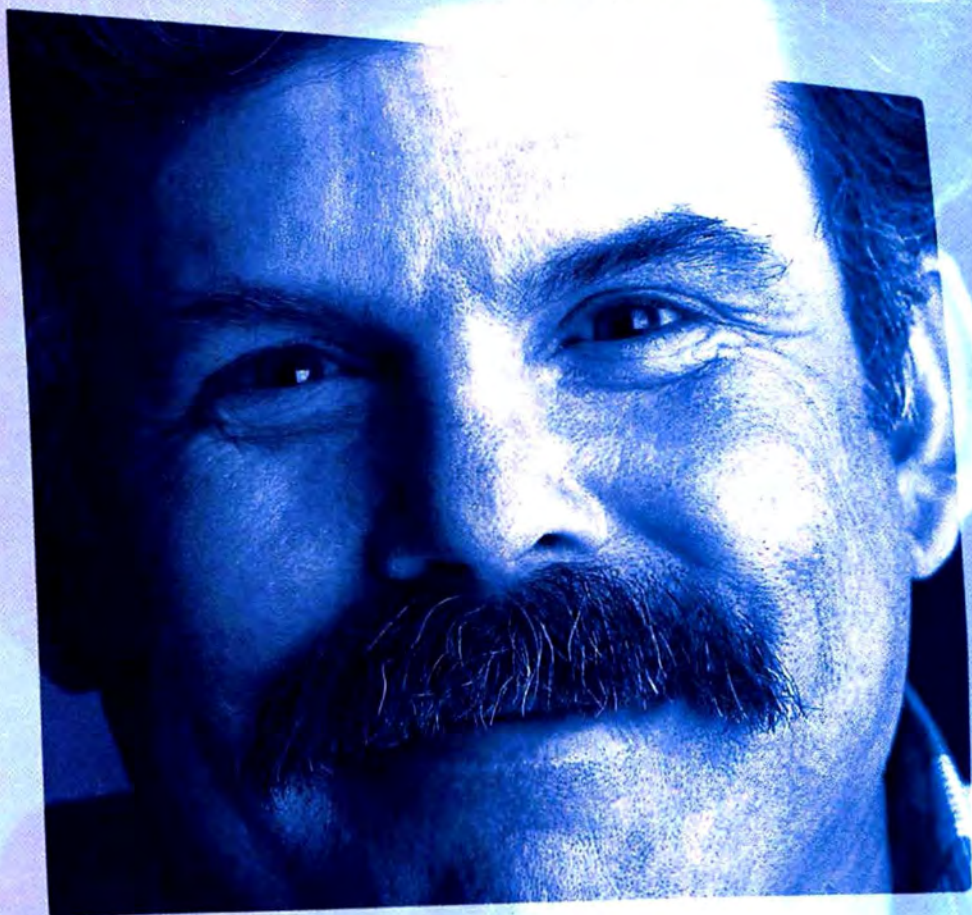
Overall, though, there is reason for concern. Mac users have become lax about defending their platform from attack. Some have even sold out to the competition. The key to reversing this trend is information and awareness. 



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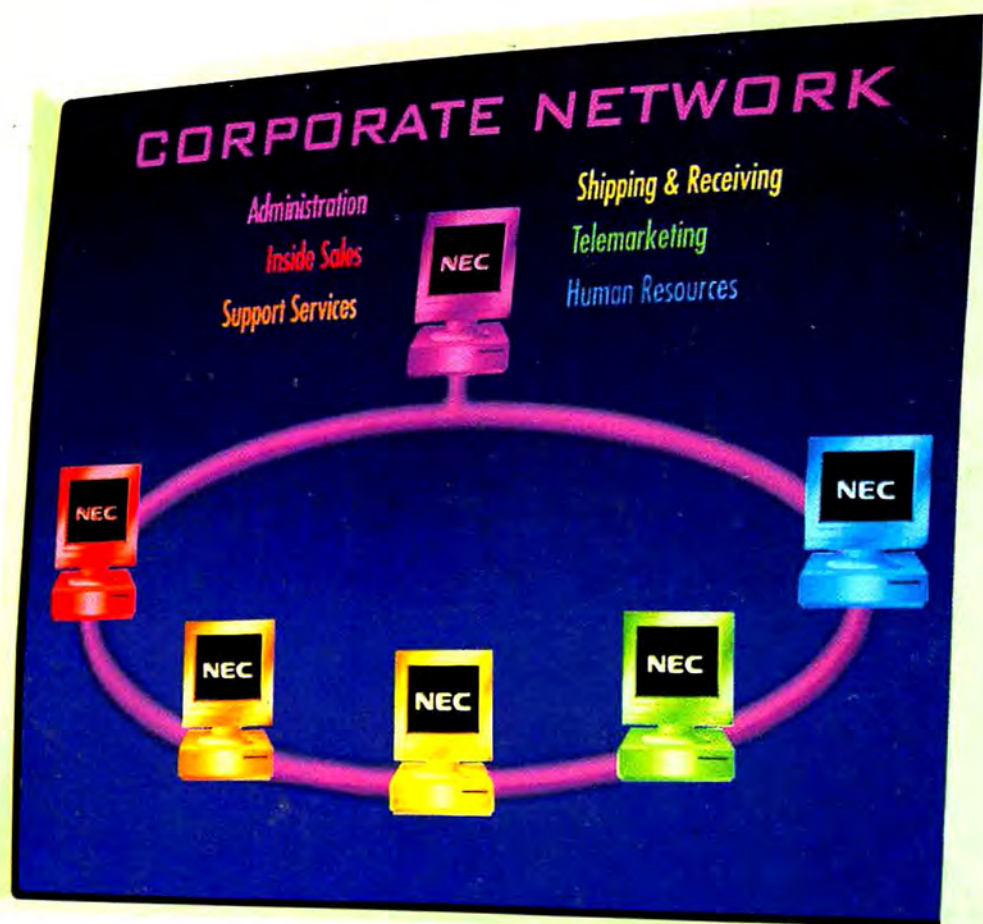


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