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MacUser

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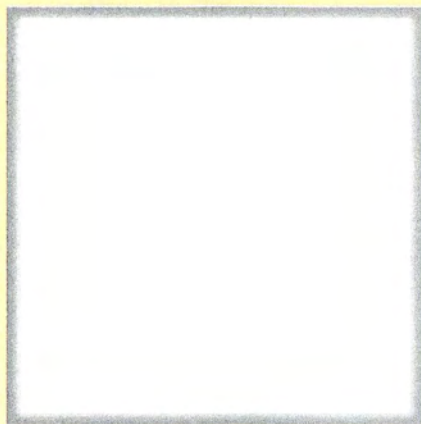
MAC SYSTEM



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You are on

Your Power Mac.™

You open

Microsoft® Excel 5.0a.

You begin

With a hunch.

You begin

At zero.

1

You open a worksheet.

You type "Jan."

You use AutoFill

And the rest of the months

Are filled in for you.

Automatically.

2

You enter numbers.

You click AutoFilter

And the data you want to see

Rises to the top

So you can focus on

What you need to focus on.

in
here
revelations

happen

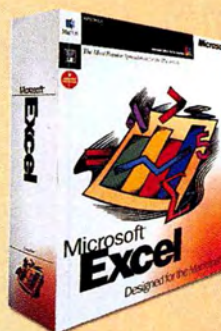


3

You want to slice
And dice your numbers.
You build a PivotTable®
To see them
From any perspective
You want.

4

You see
Patterns form.
You come
To understand.
You get it.



Microsoft®

WHERE DO YOU WANT TO GO TODAY?™

in
here
mistakes
a r e
forgiven

Y You are on
O Your Power Mac™
H You are in
A Microsoft® Word 6.0.1.
V Your mind
E Is racing.
J Your fingers
O Are racing
B To keep up
T With your thoughts.
O



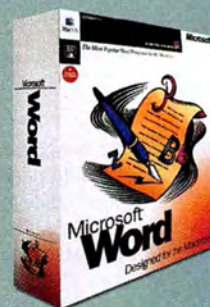
Y You begin
O A new sentence
U With
W A lowercase letter.
R This mistake is corrected
I Automatically.
T
E

Y Knowing there are
O 100 levels
U Of Undo.
R And 100 levels
E Of Redo.
V Just in case.
I
S
E

Y You begin a new
O Sentence with
U An abbreviation
W You created.
R It becomes
I An entire phrase.
T Automatically.
E

Y In
O Print preview
U You change
R Margins
E Typefaces
V And words.
I
S
E

Y Until you have finished.
O You click AutoFormat.
U And the block of words
W Can become
R A letter.
I A proposal.
T A story.
E Automatically.
Y You write. Because you can.



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WHERE DO YOU WANT TO GO TODAY?™

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COVER STORY

CHOOSING THE RIGHT MAC



When to buy and what to buy are only some of the issues facing the prospective purchaser. We can help.

PICKING A MACINTOSH, whether for home or business, is tough. There's a perplexing plethora of choices:

A Mac or a clone? Used or an upgrade option? Identify yourself among our profiles of typical users, and we'll lead you to the right system.

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CIRCLE 7 ON READER SERVICE CARD

LETTERS

The Other Adobe

AS A GRAPHIC DESIGNER, I am to some degree at the mercy of Adobe ("The Other Microsoft," November '95, page 21). Although I don't use a single Microsoft application, I can't help but feel the negative impact Microsoft has had on the computer industry's ability to move forward. And yet I am completely comfortable with the control Adobe has over the publishing market. Adobe has *earned* it. PostScript is the standard for all digital typesetting, and Adobe invented it. It wasn't bought from a small company that didn't know better.

Microsoft's programs seem to get more and more stagnant as time goes by, but I am consistently impressed by programs such as Photoshop, which get more and more powerful with every upgrade. It seems Adobe has also recharged PageMaker in a way only it could, restoring innovation to a program that has been resting on its laurels for too long.

The fact that innovation can still be found down there in Mountain View after all these years is a testament to the quality company that is Adobe Systems. That's much more than we can say about the folks up in Redmond.

Brendan Bolles
mrb@server.berkeley.edu

THERE IS ONE OTHER major difference between Adobe and Microsoft that I see — the quality of their products. I recently purchased Adobe Premiere 4.0. Unlike recent Microsoft upgrades, Premiere does not run

any slower on my Quadra than earlier versions I have used. Its software also seems to conform to the Mac user interface rather than forcing its own interface on an operating system that already has a better one.

Darrin Cardani
via the Internet

Gates at the Gates

JOHN C. DVORAK was right on track ("Barbarians at the Windows," November '95, page 210) — a refreshing change in a publication that is sometimes too inward-looking. I think Apple was hoping Windows 95 would go down in flames, so it could catch up with Copland. Apple needs to keep the focus on the future and meet the challenge to put the Mac OS back on top!

Michael Ash
via the Internet

THE GLOOM AND DOOM Dvorak summons up can be cut with a paper knife. Yes, the folks at Apple are very confused about what they should be doing. But, nevertheless, they have a fine system that can withstand the assault of Bill Gates.

Perry Myers
via the Internet

DVORAK WRITES an entertaining column, but he's no Edward Gibbon. The Roman Empire did not fall because Romans became fat and lazy. Instead, the Empire's fall was caused by a precipitous decline in the population of the Roman aristocracy (loss of market share?) coupled with a succession of mediocre emperors (Scullius and Spindlerum?) who relied too much on mercenary armies of barbarians to protect the empire's borders (Microsoft Word and Excel remain the dominant word-processing and spreadsheet apps on the Mac).

Finally, although Rome fell in the fifth century A.D., it was succeeded by numerous Roman Empire wannabes. I guess we can look forward to Attila the Gates peddling his lame OS as being "just like a Mac" well into the next century.

John Howard
drspanky@aol.com



OPEN FOLDER

Peace and love: That's what the global village known as the Internet will bring to the world, right? That's the way it sounds to Gregoire Faist, who wrote: "I would give the Nobel Prize to the genius who created the Internet." That's appropriate — give a prize named after the man who invented gunpowder to the U.S. defense department, which constructed the Internet to create a network that could survive nuclear attack. Just make sure it's not the Nobel Peace Prize.

We shouldn't complain that the Internet is a legacy of the Cold War — it would be belly-aching after hearing about Ward Larkin, who compared his past in war-torn third-world countries to life as a Mac user: "Save the metal-on-metal click of the safety being released from a fully automatic rifle aimed point-blank at my chest, nothing has come close to the frustration of trying to deal with Macromedia's customer-service department." Things might be different if you were waiting for Windows 95 tech support.

Great art is sometimes created during times of war, and a letter we received from Ben Jacobs-Swearingen makes it clear that we're a nation at peace. Ben sent us a verse in the style of Alexander Pope decrying the price of new Macs. Ben's six stanzas brought tears to our eyes, though not necessarily from the poem's emotional impact. A sampling: "By now you know what this bad poem means / I want you to lower your price in reams / For not all of us do have the money now / To buy that which our dreams now do sow." From what we hear, Apple was about to give Ben a steep discount on a new Power Mac until they heard he had tried to rhyme *means* with *reams*. Sorry, Ben — the deal's off.

Maybe poetry is a dying medium. Reader Bill Duckworth seems to have latched onto a much more appropriate art form for the '90s: "I have a great idea for an Apple T-shirt. Do you know whom I could contact at Apple with the idea?" Inspirational T-shirts are no doubt the province of new Apple Fellow Guy Kawasaki. Just make sure your new slogan is catchier than "Windows 95: So What?"

WRITE TO LETTERS

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New PowerBooks

YOUR ARTICLE introducing the PowerPC-based PowerBooks ("PowerPC Portables," November '95, page 74) states, "Although the 603e performs similarly to the 604, it is a different chip entirely."

It is a different chip entirely, but does it really perform similarly to the 604? Your own benchmark tests suggest that megahertz for megahertz, not only does the 603e not perform similarly to the 604 but it doesn't even perform as well as the 601 or the 603.

Mark Mineart
ARMADO@eworld.com

/ We apologize for our unclear wording. The 603e performs similarly to the 604 in that the two chips handle tasks in much the same manner — however, that does not mean their speeds are identical. The 603e's lack of an L2 cache, which can really speed things up, also hurts these PowerBooks. / CE

ARE YOU AS BOTHERED as I am that Apple has not produced a multimedia laptop incorporating a CD-ROM drive? I've owned seven different Mac models, going back to the original 512K, and I have purchased countless Apple add-ons. There beats in me a Mac heart.

But how long can one wait? Today's software is on CD-ROM. I actually purchased an IBM 755CD ThinkPad back in May. I love the computer, although Windows is still just a marvelous advertisement for the Mac OS. And once the CD-ROM-based software gets spinning, using it is usually not that much different from running Mac software.

Wake up, Apple! I can't be the only Mac fanatic who wants an Apple-made Mac (or even a decent clone) that can do the wonderful things my ThinkPad does.

Claude O'Connor
via the Internet

LATELY YOU HAVE taken on a decidedly negative tone when discussing anything about Apple. From your review of the new PowerBook 5300 series to the always fatalistic Mr. Dvorak, you take every opportunity to point out areas where you perceive PC-based hardware to have some minor edge, and from this you prognosticate the demise of the Macintosh.

The leading PC magazines did not berate Windows 95 for offering no real advantages over the Mac operating system. Compared

to existing PowerBooks, the 5300 series may be more conventional in design, but the new machines offer significant performance and expandability advances, with little impact on street prices. Compare Apples to Apples, and stop trying to sell me a Windows machine.

Daniel M. Webster
via the Internet

/ The last thing we want to do is sell you a Windows machine — witness our December '95 cover story, "Windows 95: So What?" We do like Macs and have even been criticized for liking them too much! However, our reputation rests on our ability to objectively look at the computer industry — and that includes Apple's failings. This will become even more important as, over the next few years, Apple begins to have some competition in the field of Macintosh OS-compatible notebook computers. / CE

Hindenbook

THE LESSON WE LEARN from the recent PowerBooks-on-fire fiasco should be clear: License the Mac OS as if there's no tomorrow. A successful operating system is too valuable an asset to tie its fate to a single hardware brand. Would anybody worry about the future of Microsoft Windows if a few Compaq notebook computers caught on fire?

However, maybe the problem is more serious. Recently, John Dvorak wrote in *PC Magazine* that IBM should let OS/2 be developed by a separate company, to foster the success of that operating system. Maybe Apple should get rid of its hardware business, in order to save the Macintosh OS from oblivion.

In any case, I will seriously consider an IBM CRRP notebook when it's time to replace my PowerBook, and I am not sure this is entirely against Apple's interests.

Vincenzo Tschinke
via the Internet

Of Multitasking and Memory

YOUR MAC TO PC column is usually one of my favorites in the magazine, but the November '95 installment ("Mac Meets Windows 95," page 123) had a good deal of technically inaccurate information.

Preemptive multitasking has nothing to do with allowing "multiple applications to reside in [their] own memory space." Instead, it allows one application or background task to get control of the computer

even when other applications don't explicitly yield control. Applications' having their own memory space is a feature known as memory protection.

Memory protection and preemptive multitasking are both needed features — other operating systems such as UNIX have had them both for years — and it would do good for users in the Mac community to understand what both are, why we need them, and how difficult it may be for Apple to deliver them both along with backward compatibility.

Rob Newberry
via the Internet

I'M A MAC USER who is very impressed with Windows 95's multitasking. However, as I write this, I'm downloading a movie over my Ethernet connection to the Internet and downloading a program from eWorld — and a desktop poster program is changing my desktop picture every 30 minutes. I'm not jealous of Windows 95.

Joe Ledgett
mtjoe@u.washington.edu

Working It Out

I ENJOYED YOUR review of ClarisWorks 4.0 (November '95, page 52), but I would like to offer an alternative view. You look at each module and explain that the individual modules are not as full-featured as stand-alone programs. This approach treats an integrated package as a low-end "jack of all trades" approach for those who cannot afford a full set of stand-alone applications.

On the other hand, my view is that ClarisWorks is *more* full-featured than a collection of stand-alone packages. Most of my documents contain mixtures of text, graphics, and spreadsheets. ClarisWorks excels at creating these integrated documents. For writing a letter, the graphic capabilities of ClarisWorks are far above those of my stand-alone word-processing program. My spreadsheets often require text blocks and graphical elements for embellishment. Again, ClarisWorks handles this mixed-mode situation much better than my stand-alone application does.

The interapplication communication some of these stand-alone packages offer does not provide anywhere near the seamless integration of ClarisWorks. I would say that it's the best choice for producing



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LETTERS

mixed-mode documents, and it does so at a bargain price too.

Michael Harris
via the Internet

LIKE A LOT of other people, I'd like to see someone — anyone — really challenge Microsoft. But that doesn't blind me to the fact that ClarisWorks 4.0 is inferior to a stand-alone word processor such as Microsoft Word. However, you seem to believe that ClarisWorks compares favorably to Word.

I, on the other hand, think the lack of drag-and-drop editing is inexcusable in today's world. ClarisWorks' Tables feature uses a spreadsheet as a model, so cells continue to grow horizontally as you type, instead of wrapping around like Word's cells. I've been using style sheets for over ten years, and I've never seen a system as clunky and inflexible as ClarisWorks'.

The bottom line is that you guys gave this application a rating of 4.5 out of 5. Relative to other integrated programs, that may be an accurate assessment. But if you're really

going to insist on comparing it with stand-alone programs, ClarisWorks is going to look pathetic every time.

Dennis Globus
PinotEnvoy@aol.com

MOO Hogs

I ENJOYED YOUR article about MOOs and MUDs ("Meeting in the MUD," November '95, page 135). I've been having fun with them for years, but I have some serious concerns about their educational value:

At my school, we have determined that borderline-academic students have an inordinate interest in anything that promotes procrastination. A MUD or a MOO is perfect for them. It is anonymous, endlessly interesting, and available at any time. Even students with good grades are spending all their free time playing MUDs, dropping extracurricular activities and real socializing in favor of the artificial social construct a MOO presents. Even when faced with all the good things MOOs have done, I'm still not convinced.

I've also had to counsel several students

about inappropriate conversations initiated by anonymous participants in MUDs. I am not one to champion censorship, but these programs do offer the twisted mind the opportunity to expose itself anonymously.

Derek Smith
via the Internet

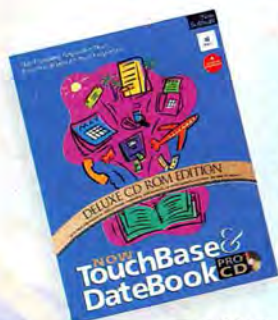
/ Like many technologies, the Internet can be dangerously misused. MUDs and IRC (Internet Relay Chat) have great potential for good, but stories abound of people practically destroying their lives by spending all their waking hours in MUDs or on IRC channels. Thanks for the important reminder.
/ JS

Performa Warning

YOUR REVIEW of the Macintosh Performa 5215CD (November '95, page 39) mentions the ease of expanding the machine's RAM for "do-it-yourself types." I would like to comment on your approach to at-home RAM expansion.

Where you mentioned the ease of RAM expansion, I think you should have also mentioned that the expansion of RAM, by anyone other than an authorized Apple

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dealer, during the first year voids the warranty. Few new Apple customers realize this, and fewer still read the warranty information included with their computer.

Andrew Keller
andrewk@halcyon.com

I Seem Desperately Needy

YOUR ISDN ARTICLE ("It Sounds Darn Nice: ISDN," November '95, page 100) was excellent but was lacking one key piece of information — whom to contact for Mac ISDN interface hardware. I called my local service provider, and he has no clue about the Mac. The Mac catalogs all think I'm crazy. So what do I do now?

Monty Lee
montylee@wsp1.wspice.com

First, we suggest that you find another service provider — one staffed with folks who know about Macs and who can suggest compatible equipment. Alternatively, try calling your telephone company or check out Dan Kegel's ISDN Web page (<http://www.alumni.caltech.edu/~dank/isdn>) for listings of vendors that sell ISDN equipment. / CE

Andy's Outing

THANKS TO ANDY IHNATKO for promoting the donation of used computer equipment to our schools ("Outing Your Mac," November '95, page 25). Besides giving kids access to technology, there is another reason why we Mac users should give this idea serious consideration: Most donations of used equipment are from businesses that are PC-oriented. It doesn't take a Bill Gates to figure out that our classrooms could become filled with used 386-based PCs. Let's give our kids a better choice.

Jo English
DrJosey@aol.com

I APPLAUD ANDY'S suggestion to salvage an old 40-MB drive, almost laughably low-capacity for actual day-to-day use in today's world. An external drive with a bootable System Folder, Norton Utilities, and the like would have helped me out a couple of times in the past.

But there's also another use for a low-capacity drive mechanism in an external case: as a font-storage hard drive attached directly to a PostScript laser printer. If you use a lot of nonresident fonts, the time lag for downloading them during every job gets to be a drag, and printers with limited RAM

can't hold more than a few at a time. But even a puny 20-MB drive can hold hundreds of fonts; attach it to the printer's SCSI port, use the downloading utility that came with the printer to format the disk, and download the fonts just once — then sit back and relax. And as an added bonus, you can remove all those PostScript font files from your Mac's own hard disk, unless you use Adobe Type Manager or some other program that relies on their presence.

Jeff Saxe
via the Internet

ANDY'S MENTION of his Exidy computer brought tears to my eyes. My first computer was an Exidy Sorcerer. It still resides somewhere in my basement, collecting dust and wondering what ever happened to polyester suits.

It was 1978. Those sleek lines. That punchy keyboard. That joystick I soldered together. 32K of RAM! A word processor that selfishly demanded 8K of RAM. CP/M. A power supply that ran hot enough to burn toast on top of the case!

The Sorcerer is dead — long live the Macintosh!

Zenon M. Feszczak
via the Internet

Rock Around the Mac

"ROCK AROUND THE MAC" (November '95, page 140) was a great article. However, it's missing the Internet address of CDnow! What is it? This is a place I think I'd like to contact.

David Beller
via the Internet

Ding ding ding! The eagle-eye prize goes to you for pointing out this most onerous omission. Bring your credit cards and your willpower to the online music store at <http://www.cdnow.com>. / KMB

CORRECTIONS

The toll-free number we listed for MaxConcept ("Breaking the Speed Limit," December '95, page 113) was incorrect. You can contact MaxConcept at 619-530-9062 or 619-530-9032 (fax).

The power brick for the Bansai MFX-1 fax transmitter ("Quick Clicks," October '95, page 75) is 2 1/8 x 1 7/8 x 3 1/8 inches.

The e-mail address we listed for Aladdin Systems ("New & Notable," December '95, page 52) was incorrect. You can contact Aladdin at info@aladdinsys.com.

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The Best Test

WHEN YOU GO OUT TO BUY A CAR, YOU usually rely on two things: a firsthand impression, whether it's from kicking the

tires or taking it for a quick spin around the block; and an expert opinion, whether it's from your next-door neighbor with the half-dismantled Chevy in his garage or from the latest copy of *Consumer Reports*.

But how about when you go out to buy a Mac? Kicking the tires or the keyboard won't do you a lot of good. But you *can* take it for a spin. And you can get reliable performance data from an unbiased source. The tool that makes those things possible is called MacBench.

MacBench is our answer to some very important questions: What's the best way to test a Mac, a graphics card, or a hard drive? We ask ourselves these questions constantly, because they are the key to our ability to bring you useful data about Macs and peripherals. If you're going to spend thousands of dollars on a computer, you want some assurance that you know exactly what kind of performance you're getting for your money, especially now that you have more than one vendor to choose from.

Some say the only way to test Macs is with real applications. We agree that application-based testing has its place, but getting locked into a single approach to testing can lead you to collect results that appear more meaningful than they are. If you pick test applications arbitrarily, the data you collect will also be arbitrary. That's how some magazines approach the problem.

Not *MacUser*. Ziff-Davis Benchmark Operation (ZDBOp) has just finished version 3.0 of MacBench. In the two and a half years since MacBench was first released, it has become the industry standard (developers use it, buyers use it, and even competitors use it). With the release of version 3.0, many leading system and storage vendors will be

bundling MacBench with their products.

We call MacBench a "subsystem level" benchmark. This kind of benchmark is ideal for isolating the specific reasons why one Mac's processor, storage device, graphics accelerator, or CD-ROM drive is faster than another. Although MacBench is a subsystem-level benchmark, it's no stranger to applications. Five of its seven main scores are based on extensive profiling of common user tasks in more than a dozen applications — but not

arbitrarily picked applications. They're the ones people use every day. For example, the Graphics Mix and Disk Mix scores are both based on profiling common tasks performed in the 13 best-selling programs that have the largest share of the Mac software market. The profiling data is then weighted according to each program's market share. When you run these tests, MacBench is exercising your Mac the same way you do.

Business applications exercise a Mac's graphics and disk subsystems differently than DTP apps do. Publishing and design programs are represented in MacBench's standard Disk and Graphics Mix tests, but because their market share is much smaller than programs such as Word and Excel, they have little influence on these scores. That's why version 3.0 also includes two new MacBench tests: the Publishing Graphics Mix and the Publishing Disk Mix. These are based entirely on profiling QuarkXPress and Photoshop. These new tests will let you make more-discriminating buying decisions.

For this issue of *MacUser*, we've tested

Apple's current desktop Macs, Performas, and PowerBooks, as well as systems from Power Computing, Radius, and DayStar Digital. It's the most comprehensive set of Mac OS-system test results you'll find anywhere. If you want to see how your own Mac measures up, you can get a personal copy of MacBench by downloading it from CompuServe or from our Web page, at <http://www.macuser.ziff.com/~macuser/>. I guarantee you'll find it more enlightening than kicking tires.

If you pick test applications arbitrarily, the data you collect will also be arbitrary.

The Best and Brightest

MacBench 3.0 is not the only new thing we're introducing with this issue. First of all, I'm pleased to announce that the 11th

annual Eddy awards are going online. Each year, *MacUser* editors spend months testing and evaluating and arguing about products that will get the coveted Eddy awards. This year, you can check out the finalists and winners on our first ever Eddy Web site, at <http://www.zdnet.com/~macuser/eddy95>. You can download demos and link to reviews and articles previously published in *MacUser*, and we even have RealAudio commentary from the editors who bring you this magazine.

We're also cosponsoring an online contest with Microsoft to celebrate Excel's ten-year anniversary. You can win a Power Mac 8500/120 or a host of products from Microsoft. Here's how it works: Go to the *MacUser* Web site (see above), and fill out the forms under the Excel-contest icon. List your favorite features, recount your coolest stories, and offer creative predictions. We'll be the judges, and you may be the winner. The contest begins on November 13 and lasts through January 12. (Winners will be announced in late February). ☐

NEW ON THE MENU

COLOR MONITORS /

Slim, Sleek, and Affordable

NEC brings LCD monitors down to a manageable price.

IN FUTURISTIC FILMS, computer monitors are always flat. High-quality liquid-crystal-display (LCD) monitors exist today, but their exorbitant prices have prevented widespread adoption (except by those like Bill Gates, who can afford to decorate his house with LCDs). Now NEC is releasing two LCD multifrequency monitors that won't send corporate financial officers into sticker shock.

The NEC MultiSync LCD200 (\$3,999) and LCD300 (\$5,999), both slated for release in late January, are high-resolution active-matrix monitors that cost about half as much as current comparably configured LCD monitors. These new LCD monitors also occupy half the desktop space and consume about half the power of their CRT-based cousins. The LCD300, for instance, requires about 45 watts or less. Each NEC model is only 6.7 inches deep. The LCD200 weighs 16.1 pounds, and the LCD300 is just 15 pounds.

Unlike other LCD monitors, the NEC models output analog signals directly from the graphics cards instead of converting the video signals to digital. As a result, analog LCD monitors offer more-consistent color than the dithered spectrum offered by digital LCD monitors. The displays require no special graphics cards.

Unlike CRT monitors, in which the size of the tube and the viewing area don't always match up, the 12-inch LCD200 and the 13-inch LCD300 take advantage of the whole display area. Both models offer several resolutions, but thanks to NEC's FIT technology, even images displayed at lower resolutions fit the entire screen, enlarging the viewing area and eliminating the borders that occur when

lower-resolution images appear on digital monitors.

The LCD200 boasts an optical resolution of 1,024 x 768 pixels and a dot pitch of .24 mm. Besides 1,024 x 768 pixels, the monitor supports resolutions of 640 x 480 and 800 x 600 pixels. The LCD200 comes with NEC's On-Screen Manager, which lets you adjust the monitor's image with front-panel controls.

The LCD300 offers higher resolution than the LCD200. It has an optical resolution of 1,280 x 1,024 pixels and a dot pitch of .20 mm. Besides 1,280 x 1,024 pixels, it supports a resolution of 640 x 480 pixels. 800-632-4636 or 708-860-9500. / Pamela Pfiffner



PHOTOGRAPHY / JIM KARAGEORGE

Online Services Caught in the Web

THE INTERNET keeps growing in popularity, and commercial online services are struggling to stay on top in a world where the Web is king. The first service to defect to the Internet is Apple's eWorld, which will be transformed from an online service to a Web site in the next few months.

eWorld Wide Web. In mid-1996 Apple will replace the current eWorld software, based on America Online technology, with Internet-based systems. At that point, eWorld content will be available to anyone with Web access. In addition to traditional Web pages, eWorld plans to use new Internet technologies to create chat areas, message sections, and more —

essentially a complete online service, but on the Web instead.

Among the Web sites Apple will provide are eWorld on the Web, featuring the best of the current eWorld content; the Learning Community, an education-based resource; and Apple Salon, an arts-and-leisure service. Ask Apple, Apple's online technical-support system, will also be available to all Internet users.

This transition will spell the end of Apple's efforts as an online-access provider. Apple officials believe that the company's strength is in providing content, not an Internet dial tone. Existing eWorld customers will eventually relocate to an independent Internet service

provider, such as PSI or Netcom.

AOL and CompuServe. The other major services aren't following Apple yet — they're just beefing up their Internet connectivity. America Online recently unveiled Global Network Navigator, a separate online service that will provide standard Internet access. And for several months, CompuServe users have been able to use their existing accounts to connect directly to the Internet via the Point-to-Point Protocol. In addition, both companies have been stocking up on Net savvy, buying Internet-oriented companies left and right.

Netcom. Ironically, as the online services loosen their grip on their proprietary systems,

PowerPC Platform Opens Clone Doors

UMAX joins the ranks of Mac OS licensees.

MAC OS LICENSEES haven't exactly been coming out of the woodwork. In the U.S., they number three, to be exact: DayStar Digital, Power Computing, and Radius. The number of Mac OS licensees outside the U.S. is inching upward. Taiwan-based UMAX, known in this country for its scanners, recently said that it will begin shipping Mac clones in Taiwan and China by the end of 1995 and in the U.S. by late 1996.

But there's a good reason why the number of Mac OS licensees worldwide hasn't hit double digits: Apple.

Any vendor shipping a Mac today has to rely on Apple's ASICs (custom chip sets) for things such as floppy-drive, SCSI, and network controllers. You know that parts shortage Apple keeps saying is the reason it can't build enough systems to meet customer demand? With only Apple as the source of these critical ASICs, clone vendors are constrained by the same shortages as Apple. Apple could sign up a dozen licensees, but there'd just be more vendors fighting over the same scarce parts.

A solution to this impasse may finally be in sight, with the launch of the PowerPC Microprocessor Common Hardware Reference Platform — PowerPC Platform, for

short. With this new multivendor standard in place, third parties that want to build Mac OS-compliant systems won't have to rely exclusively on Apple for the technology.

Formerly known as CHRP (Common Hardware Reference Platform), the PowerPC Platform was developed jointly by Apple, IBM, and Motorola as a set of system specifications that defines the minimum hardware a compliant system must include. To qualify as PowerPC Platform-compliant, systems must be able to run the Mac OS as well as Windows NT, OS/2, Solaris (Sun's UNIX operating system), AIX (IBM's UNIX operating system), and Novell's NetWare.

The standard—formerly-known-as-CHRP has been a hot topic ever since the three participating companies announced their intention to develop it, back in November 1994. One year later, version 1.0 of the PowerPC Platform is a reality. Now the rush is on. Expect to see many more vendors offer systems that can do the Mac thing. More than a dozen companies have announced their intention to support the PowerPC Platform (see the "Lucky 13" list).

Having a standard is great, but how will it translate into more Mac OS-compliant systems? The PowerPC Platform will help

The Lucky 13 / vendors committed to supporting the PowerPC Platform (so far)

- Apple Computer
- Canon
- ▶ DayStar Digital
- FirePower Systems
- IBM
- IPC Technologies
- Motorola Computer Group
- ▶ Pioneer
- ▶ Power Computing
- ▶ Radius
- TNPC (Taiwan New PC Consortium)
- ▶ UMAX
- Zenith Data Systems
- ▶ current Mac OS licensee

alleviate the parts shortage that plagued earlier licensing efforts, by defining a set of open hardware specs for various system interfaces. The specs will enable anyone to build compatible chip sets. Several vendors in addition to IBM and Motorola have already indicated their intention to manufacture these chips. With multiple chip-set providers in the market, availability will increase and prices presumably will decrease.

By the way, because PowerPC Platform systems are designed to support PC as well as Mac operating systems, they'll include dual hardware interfaces — IDE and SCSI ports, for example, and PC and ADB (Mac) keyboard and mouse connections.

But there's a catch. Although 13 system vendors have committed to the PowerPC Platform so far, less than half of them are currently licensing the Mac OS. Those that haven't yet jumped on the Mac OS bandwagon all point the finger at Apple: System vendors say they'll have hardware ready when Apple has a version of its system software that will run on the PowerPC Platform — the current version of System 7.5 doesn't. Apple says that it will have a PowerPC Platform-compliant version of the Mac OS available in the second half of 1996. Apple's line: When the hardware vendors are ready, the Mac OS will be ready. Ever heard the one about the chicken and the egg?

It's anyone's guess when we'll see PowerPC Platform systems. My guess? Check back this time next year. / Henry Bortman

ILLUSTRATION / MARGARET McMULLIN

one Internet service provider is looking more like a traditional online service. Available for Windows for some time, Netcom's Netcruiser software is now available for the Mac. Netcruiser is an all-in-one application that simplifies Internet access by letting you log on, surf the Web, read newsgroups and e-mail, and more — all from one application.

But unlike CompuServe Information Manager or the America Online application, Netcom's software isn't proprietary — you can replace some or all of its functionality with popular Internet applications such as Netscape Navigator or Qualcomm's Eudora. 800-353-6600; info@netcom.com. / Jason Snell



BUSINESS PRINTERS /

New Crop of Color Lasers Ready

IF 1995 WAS THE YEAR color laser printers became a reality, 1996 may mark the year they reach critical mass. New players are readying color laser printers for release this spring, among them Digital Equipment, engine-manufacturer Canon, and Panasonic. Driving several of these devices is technology from Electronics for Imaging, which is migrating its Fiery controller from color laser copiers to desktop printers. What marks this latest crop is faster print speeds and better output quality.

Digital Colorwriter LSR 2000.

► The Digital Colorwriter LSR 2000 is the first color laser printer to incorporate EFI's Fiery XJE controller, a scaled-down version of its popular PostScript processor for color laser copiers. EFI claims that its 100-MHz controller is capable of producing pages at the Canon engine's rated speed of 3 ppm in color and 12 ppm in monochrome. The PostScript printer produces 600-x-600-dpi continuous-tone color output. It ships with 32 MB of RAM (upgradable to 48 MB) and a 340-MB internal hard drive. Parallel, Ethernet, and SCSI ports are standard. Pricing for the unit, expected to ship in January, hadn't been set at press time. 800-344-4825 or 508-493-5111.

Canon 360PS. The manufacturer of the engine found in the Digital printer as well as in color laser printers from Apple and Lexmark plans to introduce a color laser printer

under its own label. Because it also uses EFI's controller, the Canon 360PS will have specs similar to those of the Digital printer: 600-dpi continuous-tone color output at 3 ppm, with advanced image-processing and memory-compression schemes. It too will ship with 32 MB of RAM; a 340-MB hard drive; and parallel, Ethernet, and SCSI ports. The 360PS, scheduled to ship in February, will start at about \$10,000. 800-652-2666 or 516-488-6700.

Panasonic KX-P8475.

Based on an engine manufactured by parent company Matsushita, the Panasonic KX-P8475 is rated to produce pages at 3.5 ppm in color and 14 ppm in monochrome. It contains a 33-MHz

RISC PostScript Level 2 controller. The printer also offers 600-dpi color and monochrome output. Slated for release this spring, the KX-P8475 ships with 8 MB of RAM (upgradable to 72 MB) and a parallel port; LocalTalk, Ethernet, and token ring are extra. Base price is about \$6,500. 800-742-8086 or 201-348-7000.

Tektronix Phaser 550. Tektronix was first out of the gate with the Matsushita engine. In its second incarnation, the printer offers a higher resolution of 1,200 x 1,200 dpi for both color and monochrome and a faster color-output speed of 5 ppm at 600 dpi, thanks to all-new software and hardware components. Tektronix also announced

PhaserLink, an Internet-based printer-management utility that takes advantage of Netscape Communications' browser to monitor printer status, change printer configuration, access technical support, and so on. Like the earlier Phaser 540 color laser printer, the Phaser 550 ships with SCSI and parallel ports; Ethernet, LocalTalk, and other network options are sold separately. The Phaser 550 is priced at \$6,995. 800-835-6100 or 503-682-7377. / Pamela Pfiffner



Take Better Notes

LONG CRITICIZED for its awkward, Windows-inspired interface, Lotus Notes is making amends with Mac users of this information-management system. Notes 4.0, slated for release at the end of 1995, offers significantly improved mail, navigation, and preview features as well as a built-in Web browser.

Unlike its predecessors, Notes 4.0 includes true e-mail, with an interface based on Lotus' popular cc:Mail. Document handling, Notes' traditional strength, is improved as well, with three "panes" — Navigation, Index, and Preview — through which users can locate documents and folders, inspect lists of their names and attributes, and then preview full-scale document images from which sections can be cut and pasted into other documents.

Notes administrators can automate routine tasks with the new LotusScript 3.0 scripting language. Users can also automate tasks with the simpler Agent Builder. Maximum concurrent database sessions will increase from 200 in Notes 3.0 to 1,000 in version 4.0. To provide the needed horsepower, Notes 4.0 servers — which will first be offered for Windows NT, Windows 95, OS/2, and HP-UX systems, with other platforms to follow within 60 days — will be able to take advantage of up to six multiprocessors. Pricing hadn't been set at press time. 800-346-1305 or 617-577-8500. / Rik Myslewski

MACUSER/ZMAC UTILITY OF THE MONTH



The Mac, from A to Z

PULLING OUT YOUR HAIR trying to tell the Power Macintosh 5200/75 LC from the Performa 5215CD? Want to impress your friends by citing the intro date of the ill-fated Macintosh IIvx? We have some very good news for you. ZMac's famous Macintosh Catalog Database is back, and it's packed with all the specs, all the pricing information, and all the technical trivia any obsessive-compulsive Mac maven could ever wish for. Every Mac ever made by Apple is covered in exhaustive detail, along with a complete survey of Mac-compatibles (clones, in the vulgar vernacular). And if you don't have FileMaker Pro 2.0, help yourself to a run-time package that includes Claris' FileMaker Pro User software!

Created by Mark Simmons, the Macintosh Catalog Database is available exclusively from ZD Net/Mac on CompuServe (GO ZMC:MACUSER), eWorld (shortcut:MacUser), and the World Wide Web (<http://www.zdnet.com/~macuser/>), starting December 30. / Mark Simmons



3-D ACCELERATION /

New Cards Speed QuickDraw 3D

Apple and Newer fuel high-end rendering.

MODELERS AND ANIMATORS working in 3-D can boost productivity with two new cards that accelerate QuickDraw 3D's interactive renderer: Apple's, aptly named the QuickDraw 3D Accelerator Card, and Newer Technology's, code-named the Z/Render card. If you use applications — such as Strata's Studio Pro 1.75+ and Specular's Infini-D 3.1 — that incorporate QuickDraw 3D, you'll want one of these cards.

Apple QuickDraw 3D Accelerator Card. Apple's card packs a lot of features into a small space. The PCI card includes an Apple-designed proprietary chip and 128K of static RAM for caching texture maps.

The QuickDraw 3D Accelerator Card is not a graphics card, however, although it does accelerate the display of 3-D graphics in any window on any display attached to a PCI-based

Power Mac. The card has the unique ability to apply trilinear anti-aliasing (a high-quality method of smoothing mapped images onto 3-D objects) to texture mapping during acceleration. In addition, the card can speed the display of transparent objects and solid geometric constructions. \$399. 800-776-2333 or 408-996-1010.

Newer Z/Render. Owners of 6100-, 7100-, and 8100-series Power Macs with NuBus slots will want to check out Newer's graphics card. Newer's NuBus card replaces the PDS-based graphics card in these systems with a new graphics card capable of higher resolution and QuickDraw 3D acceleration. It supports single-buffered and double-buffered display to provide flicker-free 3-D animations. It also accelerates the display of 2-D and 3-D graphics, using the GLint chip, from 3Dlabs.

At its base configuration of 2 MB of VRAM and 2 MB of DRAM (\$1,775), the card can display single-buffered graphics in

256 colors at a resolution of 1,600 x 1,200 pixels or double-buffered graphics in thousands of colors at a resolution of 832 x 624 pixels. Upgrades offering 2 MB of

VRAM and 2 MB of DRAM or 6 MB of VRAM and 6 MB of DRAM boost the supported bit depth of the card. A PCI version of the as-yet-unnamed card was expected in January. A more expensive but faster version, featuring texture-map acceleration, will be available by Q2 of 1996. 316-685-4904. / Sean J. Safreed

UTILITIES /

Do Your Work in Double Time

KEEPING APPLICATIONS OPEN in the background while working in another may seem innocent, but the other applications siphon processor speed from the application you're using. You can drive a stake through the hearts of these vampirish background programs with Orchard Software's CPU Doubler.

An \$80 control panel, CPU Doubler makes a foreground application run faster by increasing the amount of processor time that application receives. Orchard Software says CPU Doubler can speed up foreground applications by as much as 100 percent, depending on the number of open applications and active extensions. You can exclude any background processes, such as printing, from being affected by CPU Doubler.

CPU Doubler is compatible with Connectix's Speed Doubler and RAM Doubler; it includes Orchard Software's Cron Manager, which automatically opens documents at a specified time. 617-876-4608. / Carolyn Bickford

SOUND /

New Apps Edit Audio, MIDI

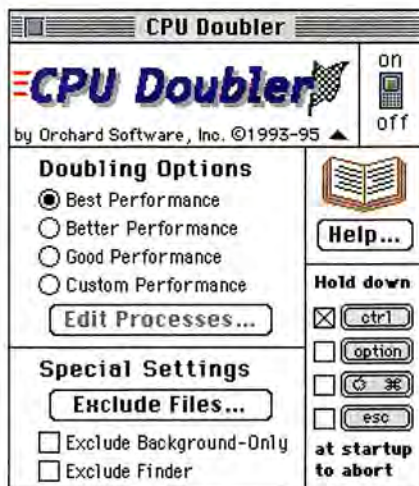
GOOD AUDIO IMPROVES any multimedia title or presentation. Now two new tools from InVision Interactive and Macromedia make Mac audio sound better.

CyberSynth. With QuickTime 2.0, Apple put a MIDI synthesizer into every Mac, but the quality is



frankly less than professional. InVision, the sound-design firm behind *Seinfeld's* catchy bass riff, replaces the QuickTime Musical Instruments extension with its own MIDI synthesizer, which features 500 professionally produced sounds. The library includes the standard 128 General MIDI instruments, a host of drum and rhythm loops, and realistic sounds. The software can play back any MIDI or QuickTime MIDI track and ships with a simple yet complete MIDI sequencer. CyberSynth supports the OMS (Open Music System) driver, for hooking into sequencers such as Studio Vision Pro.

Any of the 1,000 sounds in InVision's library can be plugged into CyberSynth. \$249. 415-812-7380. **SoundEdit 16 v. 2.** Macromedia has responded to the needs of multimedia and sound professionals with version 2 of SoundEdit 16, which offers a batch-processing application and supports AppleScript, to automate sound-file conversion and compression. Newly supported audio formats include Sun .AU, popular on the Internet, and QuickTime 2.1's IMA format, which compresses 16-bit audio to a quarter of its original size. SoundEdit 16 ships with three Xtra plug-ins for CD-audio import, loop tuning, and multitap preverb. Audio plug-ins that support the Adobe Premiere plug-in format also work in SoundEdit 16. \$399. Upgrade, \$129. 800-288-4797 or 415-252-2000. / SJS



Save yourself the embarr

“I said yellow ochre, and
I mean yellow

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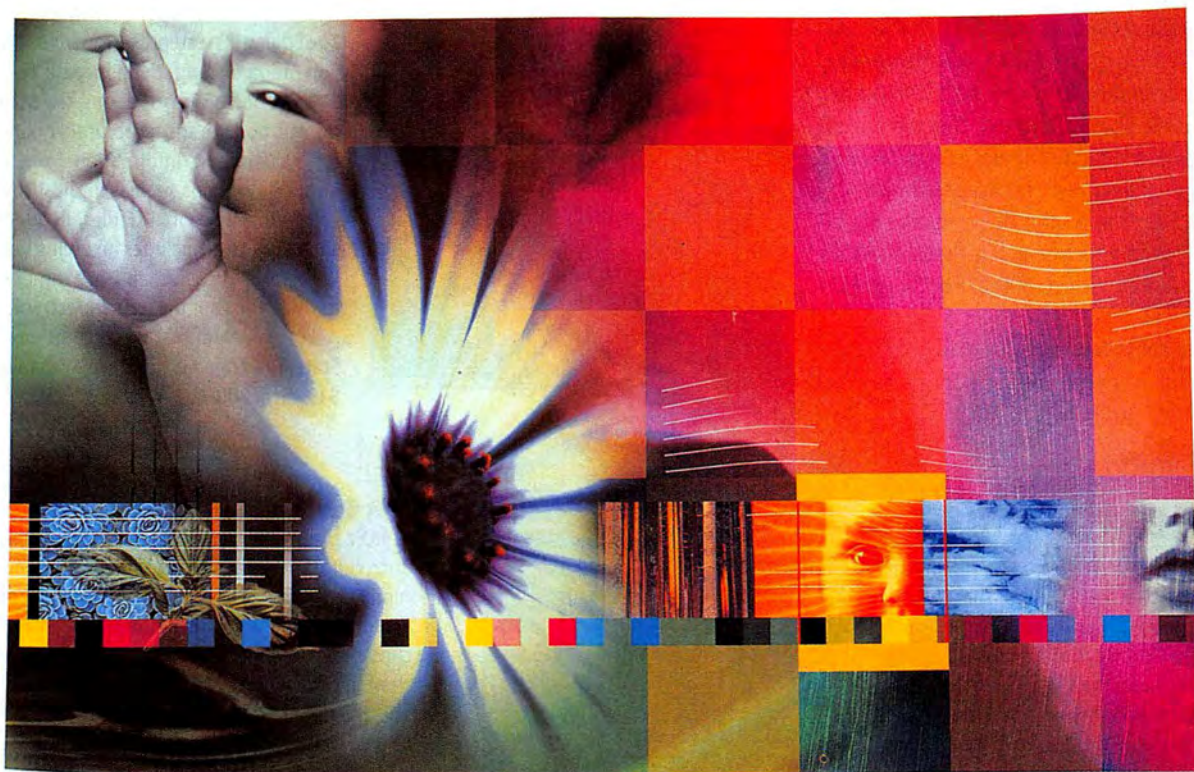
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assessment of having to yell,

when I say **yellow ochre,**
ochre."

PRINTS TO FULL 11x17 BLEED



YOU'VE GOT TO SEE IT IN **EPSON** COLOR.

IMAGE EDITING /

Fast 'n' Easy Photo Fixes

EXORCISE THOSE RED-EYED demons in your photos with two inexpensive photo-editing packages. Storm's EasyPhoto Reader and Adobe PhotoDeluxe enable you to make family snapshots look their best for sending on greeting cards or via e-mail.

Storm EasyPhoto Reader.

► Designed to capture photos as large as 5 x 7 inches at 600 dpi in color, this compact scanner comes with Storm's EasyPhoto 1.5 software at a street price of just \$259. The scanner connects through your serial port, and the scanner driver automatically brightens dark areas as it scans your picture.

The EasyPhoto software, also sold separately for \$59, compresses the pictures into JPEG format and creates a searchable catalog for them on your hard disk. Using easy-to-understand filters with before-and-after previews, you can adjust contrast on an overexposed picture, remove scratches, and clear up the red-eye effect caused by camera flash. EasyPhoto saves the scans as a digital slide show, which you can distribute with Storm's free viewer. 800-275-5734 or 415-961-6600.

Adobe PhotoDeluxe. ► If you already have a scanner — or a digital camera — you can

acquire and touch up your photos in Adobe PhotoDeluxe, the \$89 consumer-oriented cousin of Photoshop. You can fix photographic flaws such as red eye and scratches

in PhotoDeluxe, as you can in EasyPhoto. PhotoDeluxe lacks a catalog, but it does provide the ability to run Photoshop-compatible filters such as Kai's Power Tools. It contains several painting and retouching brushes à la Photoshop, but for novices, one-click but-

tons replace the complex steps of adding drop shadows and other effects to images.

PhotoDeluxe also gives you step-by-step instructions for integrating the photos into printable greeting cards or calendars or digital slide shows. 800-888-6293 or 415-961-4400. / Carolyn Bickford



Mr. Mojo Risin'

THE SEAMY UNDERBELLY — or perhaps underrefrigerator — of virtual reality awaits you in *Bad Mojo* (estimated street price, \$55), a new game from Pulse Entertainment that turns Kafka's man-into-cockroach premise into an itchy realistic adventure (hint: keep your cat away from the screen). You help Roger the scientist-turned-cockroach negotiate graphically visceral 3-D-rendered sewers, roach motels, and sharp-bladed garbage disposals on his quest to discover his true identity and redeem his wretched, roached existence. 310-264-5579. / Karen J. Ohlson

All Taxed Out

TAXES ARE BAD ENOUGH, so tax-preparation software shouldn't cost an arm and a leg. Parsons Technology's \$19 Personal Tax Edge may give other tax programs a run for the money.

Like its higher-priced competitors, Personal Tax Edge uses a step-by-step interview to help you prepare your federal income-tax return. It also includes IRS instructions, tax-saving tips, a tax-law update, and an accuracy guarantee and lets you import information from personal-finance programs such as Intuit's Quicken and others that support TFX files. In addition, Personal Tax Edge includes an online version of J. K. Lasser's *Tax Guide*, and you can use the program to file your tax return electronically.

For preparing state income-tax returns, State Tax Edge versions are available for only \$19 each. 800-223-6925 or 319-395-7300. / CB

CD-ROMS /

Face the Music

MUSICAL MAYHEM ERUPTS in this eclectic array of CD-ROMs that has you moshing to Mozart, turning back time with *Forrest Gump*, and tracking down tunes via Music Central.

Digital Beethoven on Cyberspeed.

"Years ago we had Beethoven, and now we have Mariah Carey. Where's the justice?" screams the leather-clad Great Kat, a Juilliard graduate who aims to right history's wrong. The Bureau of Electronic Publishing revives the classics with this fast-paced CD-ROM title that drops you smack in the middle of the Great Kat's den, where you can play in a cyberorchestra, take a guitar ride through music history, or get the lowdown on bungee-jumping composers. \$60. 800-828-4766 or 201-808-2700.



► **Forrest Gump: Music, Artists and Times.** This three-disc CD-ROM collection, distributed by GTE Entertainment, lands such cultural icons as Joan Baez, Neil Young, and Brian Wilson on Forrest's wooden bench to reminisce about the '70s. The full text of each 45-minute interview — along with song clips and lyrics, classic performance clips, and the entire text of the movie — are all accessible through an interface "that even Forrest would understand." \$40. 800-483-8632 or 619-431-8801.

Microsoft Music Central 96. Music buffs can dig up dirt on more than 80,000 albums, sorted by genre, artist, awards, or release date. Rock, jazz, country, and world-music artists are represented in biographies, album reviews, and photos as well as music clips and performance footage. For the latest dish on the music biz, passport-carrying Internet travelers can also use Music Central to download up to 150 new album reviews and artist updates each month. \$45. 800-426-9400 or 206-882-8080. / Nikki Echler

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NEW & NOTABLE

HARDWARE /

Hunter Digital NoHands Mouse. Put your pedal to the metal with this input device that completely eliminates the need for you to use your hands while you control your Mac. Instead, you move the cursor by tilting one foot while clicking with the other. The foot pedals are interchangeable, so it doesn't matter if you're right- or left-footed. Expected to cost less than \$125. 310-471-5852.

Sony Multiscan sfil

Displays. Designed for home and office, Sony's new multiple-frequency monitors feature aperture-grille Trinitron CRTs. The \$649 Multiscan sfil (viewing area, 13.9 inches) and the \$1,099 Multiscan 17sfil (viewing area, 16 inches) each offer a .25-mm dot pitch and a maximum resolution of 1,280 x 1,024 pixels at 60 MHz. The \$2,299 Multiscan 20sfil (viewing area, 19.1 inches) has a .30-mm dot pitch and a maximum resolution of 1,600 x 1,200 pixels at 60 MHz. 800-352-7669.

Proxima Desktop Projector 2400. Featuring 640-x-480-pixel resolution and the ability to display up to 2 million colors from a 24-bit color palette, this portable LCD projector weighs just 21 pounds. \$6,295. 619-457-5500.

Epson ActionScanning System II. Targeted at first-time home and small-business scanner users, this 24-bit-color flatbed scanner offers a maximum interpolated resolution of 2,400 x 2,400 dpi. Bundled software includes image-editing and OCR packages. \$499. 800-289-3776, ext. 3000, or 310-782-0770.

Hitachi 172. The 5.25-inch magneto-optical drives in this series use 2.6-GB media. Sporting a SCSI-2 interface, the drives are available in external (\$3,100) and half-height internal (\$2,600) configurations. 800-448-2244 or 415-589-8300.

Dataproducts Typhoon 40. The latest in the Typhoon series of high-speed workgroup printers, the Typhoon 40 is rated at 40 pages per minute at 300 or 400 dpi. Duplex printing is standard, as is an internal 80-MB hard-disk drive and 16 MB of RAM. The printer uses the PhoenixPage emulation of PostScript; an Ethernet card (\$995) is optional. \$30,995. 800-980-0374 or 703-860-8084 (fax).

Polaroid ProPalette 8000. This digital color film recorder offers 8,000 lines of resolution for 35mm positives or negatives. Able to print in 16.8 million colors, the ProPalette 8000 is equipped with a 35mm camera back that automatically loads and rewinds film. \$13,995. 800-816-2611, ext. 972.

SOFTWARE /

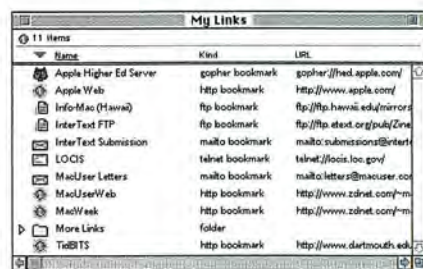
The Native Americans. Based on the book and the miniseries of the same name, this CD-ROM looks at America through the eyes of the continent's earliest inhabitants. In addition to providing a view of the history of native Americans, this disc features hundreds of images; sound and video clips; the full text of the original book; and the miniseries' original soundtrack, composed by Robbie Robertson. \$40. Image Smith. 310-325-5999.

SimIsle, Missions in the Rainforest. The latest in Maxis' series of Sim software is this simulation game set on a group of exotic islands. Each island brings with it several unique scenarios that must be dealt with in order to save the island. Obstacles include offshore oil leaks; illegal-drug producers; and that old SimCity standard, the devastating earthquake. \$40. 800-526-2947 or 510-933-5630.

Reading SEARCH: In Search of the Lost Folktales. Aimed at improving reading comprehension for children ages 7 to 12, this CD-ROM game sends players on a time-travel adventure to gather clues, artifacts, and folktales in settings ranging from Mayan villages to a Tang Dynasty palace. \$70. Great Wave Software. 408-438-1990.

Alien Tales. Was Shakespeare an alien? That's one question posed by this CD-ROM game, designed to improve children's reading skills. Players compete in a game show (complete with host and sidekick) against aliens who claim to have written famous Earth books. So does that mean Stephen King is really a Reticulan? \$45. Brøderbund. 800-521-6263 or 415-372-4700.

CyberFinder. Available only online, this utility makes collecting Internet addresses—from Web sites to FTP directories to e-mail addresses—as simple as creating an alias in the Finder. Bookmarks can be stored as individual files or in folderlike Libraries. Double-click on an item to automatically launch the appropriate Internet program and go to the address in question. \$30. Aladdin Systems. <http://www.aladdinsys.com> or info@aladdinsys.com.



MACINTOSH PRICE INDEX

THE UNITED COMPUTER EXCHANGE index reflects average sales prices of new and used Macs as of November 7, 1995. Prices (except those for compact models, Performas, and LCs) do not include a monitor or a keyboard. The United Computer Exchange is a national clearinghouse of used microcomputer equipment.

Mac Model	New	Used
Classic II (4/40)	•	\$325
LC III (4/80)	•	\$400
Performa 5215CD (8/1GB)	\$2,299	\$1,650
Performa 6220CD (16/1GB)	\$2,499	\$1,900
Ilisi (5/40)	•	\$300
Ilci (5/80)	•	\$450
Ilifx (8/160)	•	\$550
Quadra 605 (4/80)	•	\$500
Quadra 610 (8/160)	•	\$750
Quadra 630 (4/250)	•	\$700
Quadra 650 (8/230)	•	\$1,125
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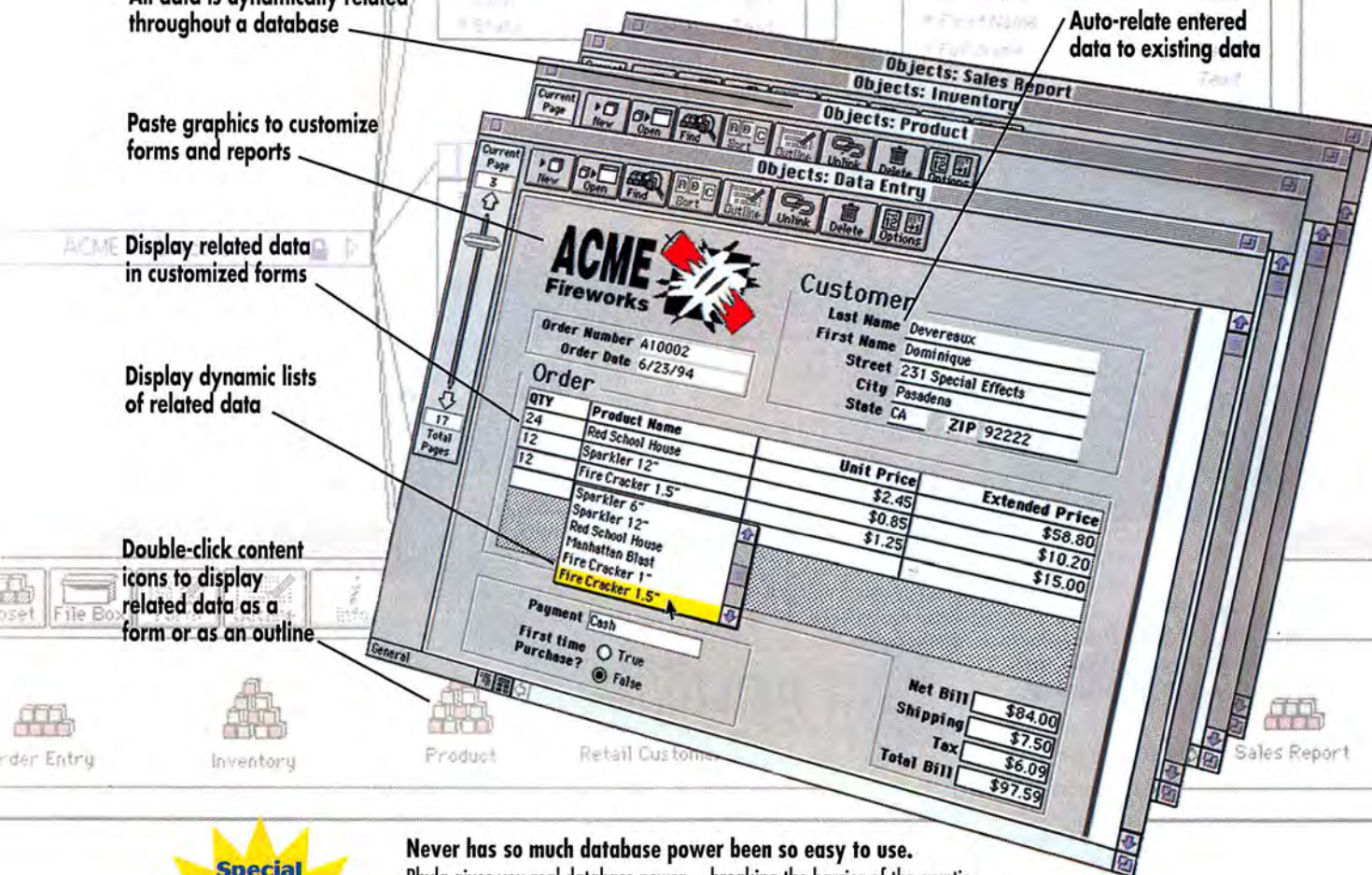
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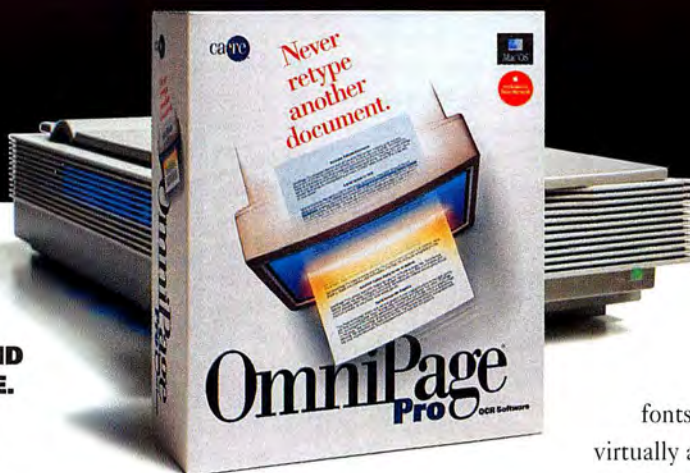
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REVIEWS & Quick Clicks



Radius PressView 17 SR and 21 SR / Award-winning screen play for Photoshop pros.



GETTING THE picture hasn't always been as easy as it should be for imaging pros who use expensive color monitors. The colors you see on your monitor often aren't what you see in your output, and calibration can be a hit-or-miss proposition. Until now, that is. The display experts at Radius have come up with two new monitors that are sure to win applause, especially from prepress and Photoshop users. The Eddy Award-winning PressView 17 SR features top-notch color and unprecedented sharpness and brightness for a 17-inch monitor. The PressView 21 SR is the latest iteration of Radius' top-of-the-line 21-inch monitors. What makes each monitor stand out — in addition to its image quality — is Radius' new software, which provides the most sophisticated level of control over a display you can find, bar none.

At \$2,499 for the PressView 17 SR and \$3,999 for the PressView 21 SR, Radius' new monitors are pricey. But after we saw the quality of the image (especially impressive on the 17-inch monitor) and put the control software through its paces, we concluded that if you make your living using Photoshop to prepare press-ready color files, the new monitors are worth every penny.

Capable of displaying resolutions of up to 1,600 x 1,200 pixels, each system uses a specially manufactured premium aperture-grille monitor from Mitsubishi. Radius houses the monitors in neutral-gray cases and equips them with light-shielding hoods

to minimize reflection. You even get a special black "stealth" robe to wear while using the monitors, which eliminates reflections from your clothing. In addition to the software, each monitor comes

with its own display calibrator.

There's much more to setting up the new PressView monitors than simply connecting a video cable. For starters, you need to connect a cable between your Mac's serial port and the monitor, to enable the Radius PressView application to control the display. You also have to attach the ProSense calibrator to your ADB chain — the unit has two ports and a short cable, so you can add it in-line with other devices.

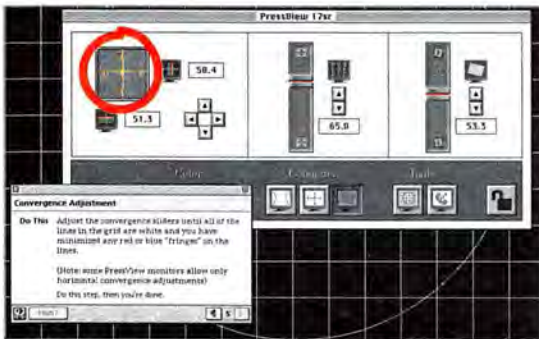
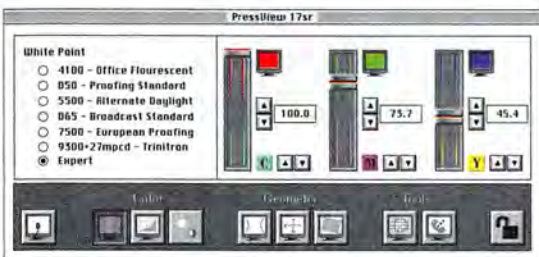
Then there's the software. The PressView application lets you adjust the monitor by controlling size, position, convergence, pincushion, tilt, moiré, and more, while the ColorSentry software runs in the background and makes sure all saved settings remain correct when you change resolution or shut down. The PressView-application controls are the most sophisticated we've seen for any software-controlled monitor. However, even experienced users will need some time to master them. Fortunately, the software comes with good Apple Guide support to help you learn the controls.

You can use the ProSense calibrator and accompanying software to adjust the monitor's red, green, and blue output levels as well as the color tables in your graphics card's or built-in video circuitry's DAC (digital-to-analog converter). Worth noting is that the ProSense software is compatible with Radius graphics cards that feature 30-bit DACs, such as those in the Radius Thunder 30 family. That means you can calibrate the white point and gamma of your PressView display without losing any of the available colors.

Another big plus for color-conscious users is ProSense's support of all the popular color-management systems, including Apple's ColorSync II, EFI's EfiColor, Kodak's KCMS, and Agfa's FotoFlow. ProSense also comes with Radius' ColorMatch Photoshop separation tables for creating a monitor profile, which ensures that files are accurately translated from the CMYK to the RGB color space. Radius provides ColorMatch separation tables for SWOP coated 3M Matchprint, SWOP coated DuPont proof, Euroscale coated 3M Matchprint, and Toyo

REVIEWS RATING KEY

★★★★★	OUTSTANDING
★★★★	VERY GOOD
★★★	ACCEPTABLE
★★	POOR
★	SERIOUSLY FLAWED
●	DANGEROUS



The PressView application that comes with the PressView 17 SR and 21 SR monitors from Radius offers an unprecedented level of control over the display. But the flip side of the controls' sophistication is their steep learning curve. Fortunately, there's Apple Guide support to help you master the software.

coated press output. The combination of ProSense's color-management support and the ColorMatch separation tables goes a long way toward delivering print-to-display color matching, especially for Photoshop users.

By the time this review appears, Radius will offer a ProSense upgrade with a "Teach and Learn" feature, which will let you measure the current calibration settings of your PressView display, save them to a file, and then use that file with another PressView monitor to achieve the same display performance.

During our setup of the PressView 17 SR, we found the monitor's image positioning to be good and its geometry excellent, right out of the box. To calibrate the monitor, we launched ProSense, set a white point of D50 (the print-proofing standard) and a gamma of 1.0 to get the best match for our monitor-testing gear (a gamma of 1.8 is recommended for print proofing), and clicked on the Calibrate button. The entire process from launch, including the automatic calibration-accuracy measurements, took less than two minutes.

When you quit the ProSense application, your monitor's calibration settings are written to the color-management system you've specified and a Photoshop monitor profile

is created, if you've selected that option. Then you'll probably want to go back to the PressView application and tweak the red, green, and blue levels to get the monitor's white point to exactly match your paper stock as it appears under your lighting conditions.

The PressView manuals do an OK job of explaining the calibration process, and they provide a few helpful hints. We found ourselves referring to them often. Unfortunately, some of the instructions aren't quite complete. For example, the manual tells you how to start using your monitor profile in Photoshop, but it neglects to mention that you must first quit the ProSense application to save the file and make it available to Photoshop.

To get an objective view of how the new PressView monitors compare to others in their class, we ran the MacUser Labs standard suite of monitor tests. Using our Power Mac 7100's built-in VRAM-based graphics, we tested the 17-inch monitor at 832 x 624 pixels and the 21-inch at 1,152 x 870 pixels.

In our MTF (modulation-transfer function) sharpness test, the 17-inch monitor achieved a very impressive score of 70-percent contrast between single-pixel white and black lines (a score of 50 percent is acceptable). The 21-inch monitor achieved a score of 61 percent — a very good showing, but not as impressive as the 17-inch monitor's.

When calibrated, each monitor had a brightness reading that was lower than that of other monitors we've tested. However, that's by design — because they're less bright, they can achieve higher-quality color matching. If you disable calibration,

the PressView monitors are very bright.

In our color-tracking tests, which measure how accurately the monitor displays subtle shades of gray, the 17-inch monitor achieved an excellent 99-percent accuracy (a score above 90 percent is considered acceptable) and the 21 SR scored 95 percent. In our misconvergence test, which measures how well a monitor's red, green, and blue beams align with each other, the 17-inch monitor once again rated an excellent and the 21-inch monitor rated a very good.

Although the PressView 17 SR is a top-notch performer, it may not be for everyone. At a 1,600-x-1,200-pixel resolution, the image displays at about 136 pixels per inch, or about twice the resolution of a standard Mac monitor. At this resolution, type is downright tiny, so if you frequently work with type in page-layout programs, the 21-inch display may be a better choice. However, for power Photoshop users on a budget or with limited work space, the 17-inch monitor is a great deal. At an 832-x-624-pixel resolution, it's capable of displaying razor-sharp WYSIWYG images.

The Bottom Line

Billed as Color Reference Display Systems, the Radius PressView 17 SR and 21 SR each offer obvious advantages to prepress users who require the ultimate in color accuracy and consistency between display image and printed output. Although it takes some time to master the monitors' sophisticated software controls, the results are well worth the effort. Our only caveat is this: Once you get used to the exceptional display quality of the PressView systems, you'll have a hard time looking at other monitors. Compared to the PressView monitors, they simply look, well, *wrong*. / Jeff Pittelkau

Radius PressView 17 SR ★★★★★

Price: \$2,499 (list).

Pros: Exceptional image quality. Excellent color calibration. Powerful software controls. Support for all popular color-management systems. Radius ColorMatch separation tables for on-screen print proofing.

Cons: Steep learning curve for software controls. Some inaccuracies in manual.

Company: Radius, Sunnyvale, CA; 800-227-2795 or 408-541-6100.

Reader Service: Circle #401.

Radius PressView 21 SR ★★★★★

Price: \$3,999 (list).

Pros: Very good image quality. Excellent color calibration. Powerful software controls. Support for all popular color-management systems. Radius ColorMatch separation tables for on-screen print proofing.

Cons: Steep learning curve for software controls. Some inaccuracies in manual.

Reader Service: Circle #402.

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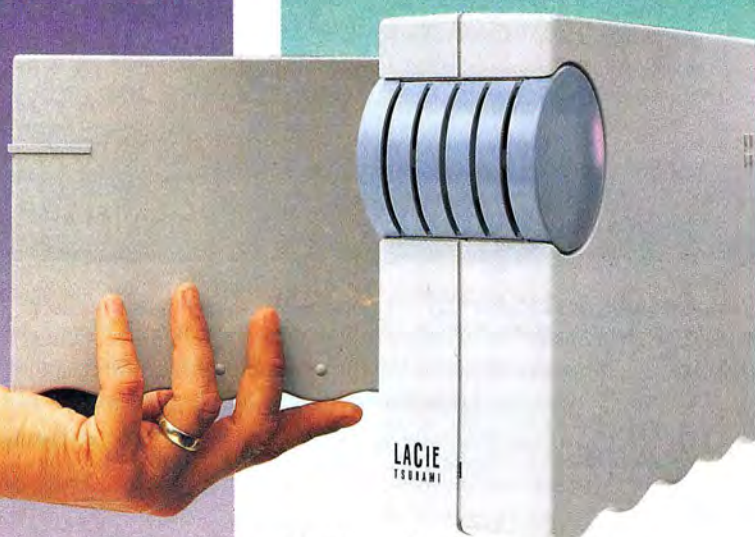
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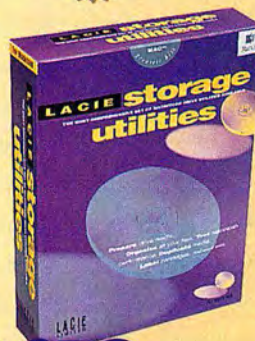
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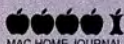
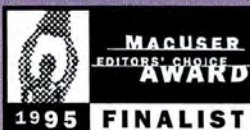
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Microfield Graphics SoftBoard 205

Compact electronic whiteboard records your scribbles and schematics.



YOUR TEAM CAN brainstorm without pausing to take notes if you're writing everyone's ideas on a Microfield Graphics SoftBoard instead of a whiteboard. This unique electronic whiteboard digitizes each stroke made with its markers into a series of pictures in its own software application. Meeting participants can take everything that was written on the whiteboard with them and replay it — or use the same technology to attend the presentation from a distance, dialing in by modem. The standard-sized version won a 1994 Eddy Award; the latest SoftBoard — Model 205 — is a personal version, small enough to fit into the most crowded of meeting rooms, into a cubicle, or on top of a desk.

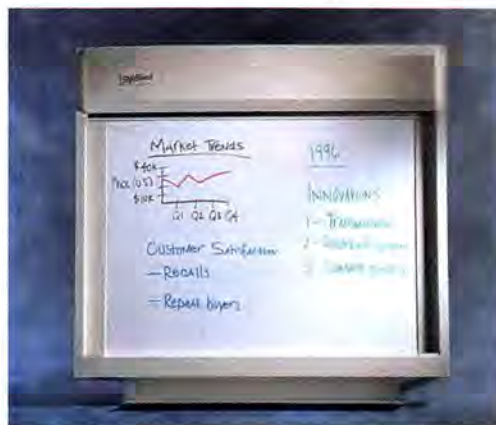
Mark My Words

The SoftBoard looks like a conventional whiteboard, and you can write on it with regular markers, without having to hold your hand in an awkward position. From a cable on its lower left edge, the SoftBoard connects to a Mac through a serial port. A receiver, which runs along the top of the SoftBoard, sends laser beams along the surface of the board. You attach one of the four color sleeves to each marker. As you draw on the SoftBoard with the marker, this sleeve reflects the receiver's laser beams. A fifth sleeve attaches to the eraser and works in the same way. The receiver interprets the reflections and reproduces everything that's happening on the whiteboard in an image that appears on the attached Mac.

The SoftBoard 205 is 39 inches high by 40.5 inches wide and has a 25.5-inch-high by 34-inch-wide writing area. Installing it was a breeze, thanks to easy-to-understand documentation on how to connect and set up the power-cable and serial-line connections. We were able to use the software — the recording program, SBRecord; the runtime viewer, SBView; and the remote-access program, SBRemote — without having to change any of the default settings. Among the settings you can change are the pen colors and the playback speed. You use

a fourth program, SBdiag, for setup — it let us know that the receiving sensors had shifted out of alignment slightly during shipping and gave us succinct on-screen directions on how to use the included Allen wrench to make necessary adjustments.

SBRecord, the key SoftBoard program,



Compact enough to squeeze into the smallest of offices, the SoftBoard 205 relieves meeting participants from having to take notes — or even having to be present at all.

runs on the connected Mac. It has buttons that look like the buttons on a home cassette or CD player. As soon as you click on the Record button, SBRecord saves each mark or erasure you make on the board as a page in a series of pages. When the meeting is over, you click on the Stop button and can save the recorded actions as a file, which anyone with the freely distributable SBView program can play back like a movie or review screen by screen.

SBRemote's interface allows remote meeting participants to dial in and view the marks being made on the SoftBoard on their own computers. If the people at the other site have their own SoftBoard, they can also send a digitized image of their whiteboard to you — the image of each SoftBoard appears in its own window on each connected Mac.

Silent Vision

None of the SoftBoard software lets you record sound with it, which can be problematic if some points need explanation.

SBRemote users have to dial in on a conference call as well as on a modem line in order to participate in the meeting. And since the SoftBoard connects through a serial port, you may need to juggle printer, SoftBoard, and modem connections unless you buy a serial-port expander.

We tried hard to confuse the SoftBoard into making false marks. We found that if we held the marker at an angle close to the writing surface, the marker's color would appear as a color different from what it actually was on the Mac. And if we didn't move the pen more than a quarter inch away from the surface between separate letters or marks, it could generate false lines. But with a little care, we had no trouble creating text and drawings that transmitted accurately in SBView.

Besides the wall-mounting kit that comes with the SoftBoard 205, you can buy kits that let you set it up on the wall of a cubicle or on top of a desk. Each optional kit costs \$99.

The Bottom Line

The SoftBoard brings the simplicity of a whiteboard to the computer, although without sound, viewers of SoftBoard files could end up missing essential meeting discussions. But if other methods, such as teleconferencing and shared collaboration, don't work as well as a meeting in front of a whiteboard, the SoftBoard is a great start on sharing your meetings with others who may otherwise not be able to participate. With the SoftBoard, participants can focus on listening rather than on jotting down notes. And if you have participants dialing in for a conference call, you can now also have them dial in for visual brainstorming. / Nathan Garcia

Microfield Graphics SoftBoard Model 205

Price: \$2,795; cubicle mount, \$99; legs, \$99 (list).

Pros: Easy to set up and use. Remote meeting participants can see whiteboard on their computer. Compact.

Cons: No sound recording.

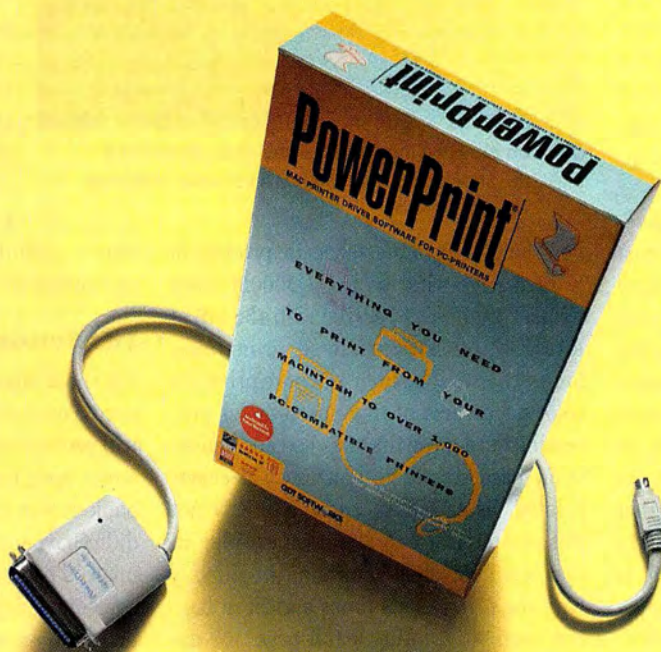
Company: Microfield Graphics, Beaverton, OR; 800-334-4922 or 503-626-9393.

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NEC SuperScript Color 3000M / Three color-printing technologies in one.

NEC'S FIRST ENTRY into the world of hybrid color printers, the SuperScript Color 3000M, is both versatile and inexpensive. The Color 3000M gives you three printing modes — dye-sublimation, regular thermal-wax, and variable-dot thermal-wax. You switch among printing modes by changing paper and the printer's ribbon.

The Color 3000M is a QuickDraw printer, so your Mac has to handle all the processing chores, which makes printing quite slow. But if all you need is good-quality color printing at a low price and you don't need PostScript, the Color 3000M fills the bill.

Easy Setup

Setting up the Color 3000M took less than ten minutes. You install the ribbon for the printing mode you want into a cassette, which you place in the printer. You clip the paper feeder onto the top of the printer, load the appropriate paper into the paper tray, connect the printer to a serial port, and install the printer driver.

Each of the three print technologies requires you to trade off print time and cost per page for output quality. Of the three technologies, regular thermal-wax printing is the fastest and cheapest but produces the least-attractive output. It's fine for business graphics such as Excel charts, but it doesn't work well with photographic images or graphics with subtle color gradations. On the other hand, it's the only technology that lets you use plain paper. The Color 3000M's engine speed for thermal-wax printing is about one page per minute, and printing a three-color page will cost you about 55¢.

By using a fine dithering pattern with varying dot sizes, variable-dot thermal-wax printing gives you much-better-looking results than regular thermal-wax printing. It requires special thermal-transfer paper, however, which makes it somewhat more expensive than regular thermal-wax printing. The Color 3000M's engine speed for variable-dot printing is about ten minutes a page, and each color page costs about 80¢ in paper and consumables.

Dye-sublimation printing provides the best quality, but it also has the highest cost per page — about \$3 — for its special paper

and consumables. As with variable-dot printing, the engine is rated to print one page in about ten minutes.

Protracted Printing

Engine-speed ratings are a poor indicator of



Dye-sub plus two modes of thermal-transfer printing make the SuperScript Color 3000M a versatile performer.

how long it *actually* takes to produce a printed page with the Color 3000M. Even with a Power Mac 8100/100 with 136 MB of RAM, we often encountered print times longer than half an hour when we printed a color page. Most of this time was for processing the data on the Mac. Text and QuickDraw-based vector graphics such as charts printed faster, but speed is definitely not this printer's forte. A direct-export plug-in that lets Photoshop communicate directly with the printer cuts times almost in half. But even so, printing a full-page 300-dpi color image from Photoshop through this plug-in took a little more than 25 minutes, 24 of which tied up our Mac with processing duties.

The Color 3000M gives you some control over halftones, but color matching was a chore. The print driver lets you adjust halftone settings for thermal-wax printing and control ink intensity and lightness for variable-dot and dye-sublimation. However, there's no way to tweak the built-in color-matching settings in the driver. Ironically, we obtained better screen-to-print color matching with variable-dot printing

than with dye-sublimation. We hope NEC will implement ColorSync color matching in a future version of the driver, since it would make color matching much simpler.

The Color 3000M can print on transparencies as well as on paper, but only in the thermal-wax and variable-dot modes. Even though using the variable-dot mode takes longer, transparencies created in it look much better than those printed in thermal-wax mode. Nonetheless, we were disappointed that you can't create dye-sublimation transparencies on the Color 3000M.

The documentation for the Color 3000M is adequate, but we would have liked it to include some discussion about which printing resolution works best with which technology. By trial and error, we determined that there's little reason to use any resolution higher than 200 dpi for variable-dot printing or any setting higher than 150 dpi for thermal-wax printing. Using the printer's highest resolution — 300 dpi — makes sense only for dye-sublimation printing.

The Bottom Line

For those who aren't in a hurry and don't need PostScript output, the Color 3000M will provide excellent color prints, and at a street price under \$750, it won't break the bank. It was easy to install and use, and it didn't have any nasty tendencies to jam or to misfeed paper. If it had more-sophisticated color-matching features, it would be even better. / Bruce Fraser

NEC SuperScript Color 3000M



Price: \$999 (list).

Pros: Inexpensive hardware. Uses any one of three color printing technologies. Easy to set up and use.

Cons: Slow. Relies on host Mac for processing. No PostScript support. Needs better color matching. Expensive consumables.

Company: NEC Technologies, Boxborough, MA; 800-632-4636 or 508-264-8000.

Reader Service: Circle #404.

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Nikon LS-1000 SuperCoolscan and Polaroid SprintScan 35 / Little slide scanners deliver big results.

FASTER AND LESS EXPENSIVE than their high-end counterparts, two compact slide scanners have recently been upgraded. The Nikon LS-1000 SuperCoolscan and the Polaroid SprintScan 35 each offer 2,700-dpi image quality and include color-correction tools. The \$2,695 Nikon scanner samples data at 12 bits per channel, and the \$1,995 Polaroid SprintScan 35 samples it at 10 bits. Both SCSI-2-compliant scanners are plug-and-play when it comes to setup, but getting the most out of each device will depend largely on your skill level and understanding of each scanner's software.

Nikon LS-1000 SuperCoolscan

The compact Nikon scanner weighs only 4 pounds and has a footprint small enough to fit within the borders of this page. If space is really limited, you can turn it over on its 2.5-inch side and still use it. The SuperCoolscan can handle mounted 35mm slides and unmounted 35mm positive and negative filmstrips.

Images captured by the Nikon scanner exhibited good detail in highlights and

shadows as well as smooth tonal reproduction. However, without color correction, the images looked flat, tending to be overly neutral and gray compared with the originals.

Scanning speed was highly dependent on the amount of RAM and the processor of the connected Mac. In our tests with a Power Mac 8100/110 with 76 MB of RAM, scans were fast — scans of color slides at 2,700 dpi took about 53 seconds each. However, scanning the same images with a Power Mac 6100/66 with 16 MB of RAM (10 MB of which was allocated to Photoshop) took longer — about 3.5 minutes for each slide.

Mirroring features available in software that accompanies more-expensive scanners, Nikon's plug-in software provides sophisticated tools for prescan color correction, exposure, and cropping. The real beauty of the software is that it presents all the tools you need in a single window.

But to take full advantage of the SuperCoolscan's software tools, you need some experience in dealing with color images. The on-screen interactive help isn't as comprehensive as we would have liked, and the

three-part manual is confusing at best — missing is any kind of helpful information on how to obtain better scans.

Polaroid SprintScan 35

The SprintScan 35 is bulkier than the Nikon scanner — it has about the same footprint, but it is more than twice the height and weighs 10 pounds. It's equipped with a fan, so it's also noisier. Like the SuperCoolscan, the SprintScan 35 can scan mounted 35mm slides and unmounted 35mm positive and negative filmstrips.

We found that images scanned with the SprintScan 35 showed greater contrast than those scanned with the Nikon scanner. Colors were richly saturated and color casts exaggerated. However, there was not as much detail in shadows as there was in images scanned with the Nikon scanner, although the Polaroid scanner's results were adequate for most needs.

The SprintScan 35's scanning speed was nearly equal to the Nikon scanner's when we were using the Power Mac 8100/110 with 76 MB of RAM. The SprintScan 35 took, on average, 57 seconds to scan a color slide at 2,700 dpi, compared to the Nikon scanner's 53 seconds. However, the SprintScan 35's plug-in module opened 4 seconds faster than the Nikon scanner's, making up for the difference in scan times.

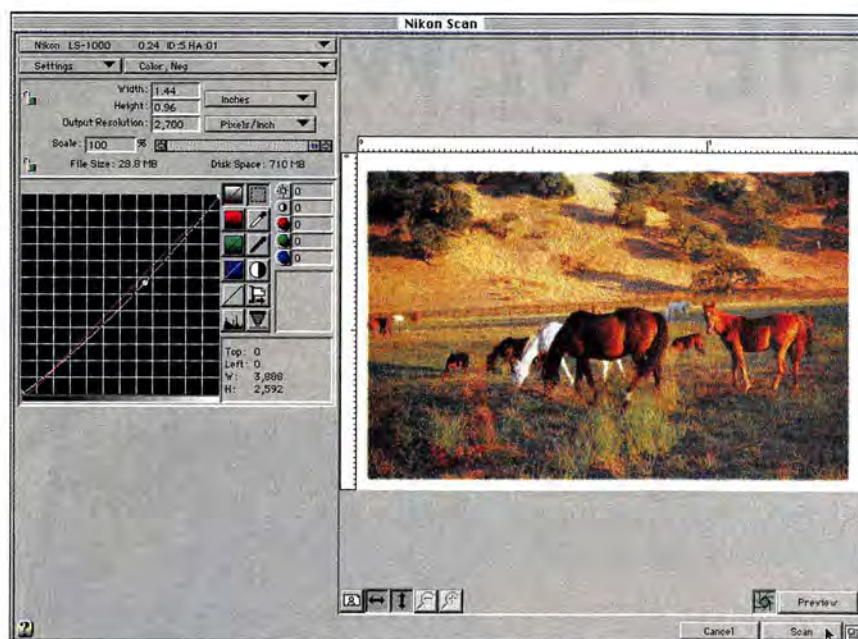
But the SprintScan 35 showed a speed advantage over the Nikon scanner when we used it with the less powerful Mac. With the Power Mac 6100/66 with 16 MB of RAM (with 10 MB allocated to Photoshop), the SprintScan 35 took about 2 minutes, compared to the Nikon scanner's 3.5 minutes to scan a color slide.

For novices and hurried users, Polaroid's plug-in software offers advantages over Nikon's. Preassigned settings help you obtain optimal scans quickly. You begin by selecting the appropriate film type — Ektachrome 200 or Fujicolor 100 — before you scan, and the software automatically assigns color correction to images based on preassigned lookup tables. You can use the same easy point-and-click method to control color cast, contrast/brightness, saturation, and sharpness. However, the effectiveness of the controls varies — the color cast and sharpness controls are helpful, but the contrast/brightness and saturation settings prove less effective.



Compact and lightweight, the Nikon LS-1000 SuperCoolscan slide scanner (right) boasts more-fully-featured software than its larger rival, the Polaroid SprintScan 35. But the SprintScan 35's software automates more tasks, making Polaroid's product a good choice for inexperienced users.

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One convenient window contains all the tools you need in order to preview and manage images scanned with the Nikon LS-1000 SuperCoolscan.

And unlike the single-window approach of the SuperCoolscan's software, the Polaroid software uses several windows to display scanner settings and previews. Each image-correction feature has a separate dialog box as well. Overall, we found that the multiple-window-and-dialog-box approach was somewhat awkward.

The SprintScan 35's manual, on the other hand, was much more helpful than the SuperCoolscan's — it did a good job of simplifying the hows and whys of scanning.

The Bottom Line

The Nikon LS-1000 SuperCoolscan and the Polaroid SprintScan 35 offer compact, affordable, and capable alternatives to bulky, high-priced scanners for those who don't require the highest-quality scans —

newspaper publishers are a prime target audience. Choosing the scanner that's right for you will depend on the system you have, your level of scanning experience, and your image-quality needs.

The Nikon scanner is pricier than Polaroid's offering, but it captures more image information, results in images that have more details in highlights and shadows, and comes with software that's more full-featured. The Polaroid scanner, on the other hand, has the overall speed advantage, particularly for those working with less powerful Macs, and its ease of use, automatic controls, and good documentation will be a boon to inexperienced users. One last caveat: Neither scanner comes close to its advertised speed with the recommended 16 MB of RAM. / Bob Steinberg

Nikon LS-1000 SuperCoolscan



Price: \$2,695 (list).

Pros: Good dynamic range in scanned images. Full-featured software.

Cons: Good scanning speed highly dependent on RAM. Poor documentation. Relatively pricey.

Company: Nikon Electronic Imaging Division, Melville, NY; 800-526-4566 or 516-547-4355.

Reader Service: Circle #405.

Polaroid SprintScan 35



Price: \$1,995 (list).

Pros: Fast scans with a wide range of Mac models. Good value. Helpful documentation. Software-automated scanning.

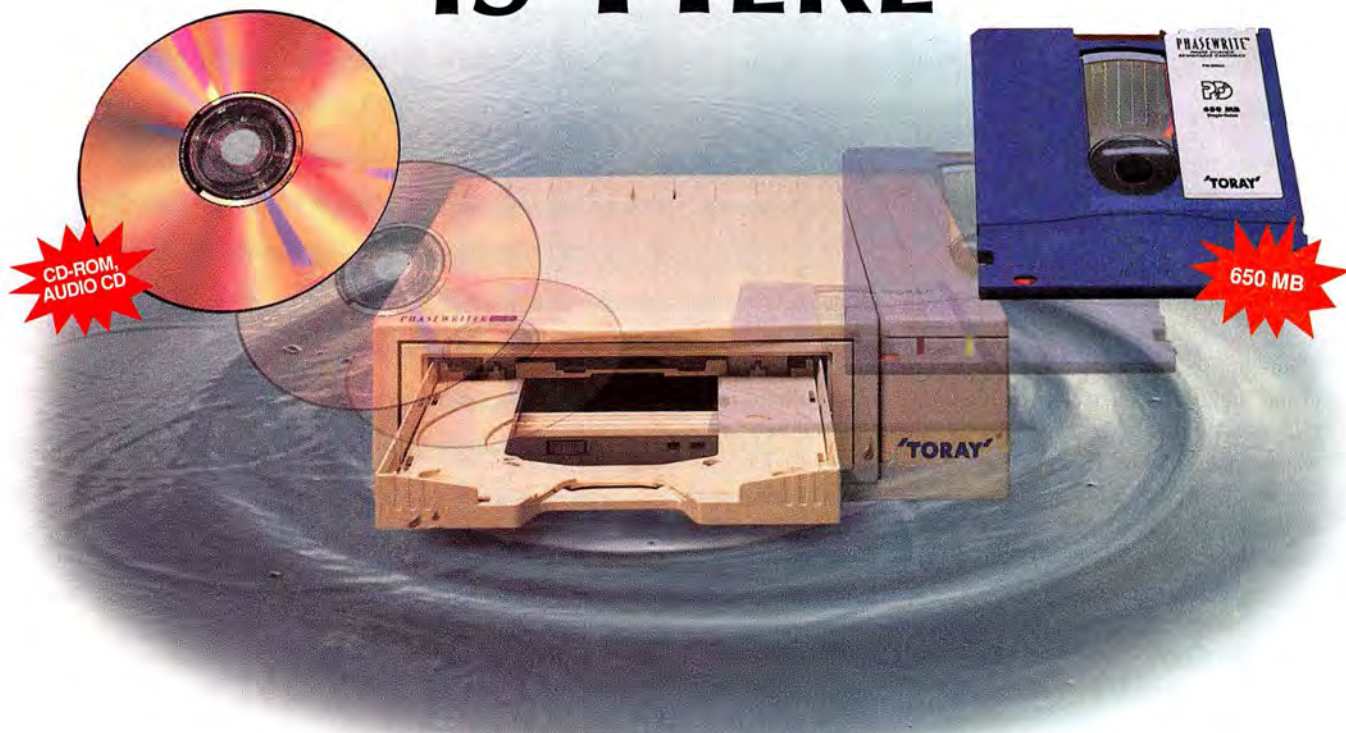
Cons: Images lack some detail in shadows. Relatively awkward software.

Company: Polaroid Electronic Imaging Systems Group, Cambridge, MA; 800-816-2611.

Reader Service: Circle #406.



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Astound 2.0 / New graphics effects and more interactivity options add drama to multimedia presentations.

BY COMBINING THE BEST features of traditional slide-show presentation programs with a timeline for each slide, Astound lets you create dazzling, complex multimedia presentations with a minimum of effort. Astound 2.0's bag of tricks is bigger and includes more graphics effects and design options than the previous version's. And if you have a Power Mac, you'll appreciate the speed boost, especially during playback, thanks to PowerPC-native code.

Timed Exposures

Like traditional slide-based presentation programs such as Microsoft PowerPoint and Adobe Persuasion, Astound has an outliner, slide sorter, charting features, and design templates. You can drop sounds,

background music throughout a presentation, you select the same sound file for adjoining slides. The music will then continue uninterrupted through all the slides.

With this version, you can set up markers in a slide timeline. That means you can return to a slide with a marker in its timeline and start playing your presentation back from a point you've selected rather than from the beginning. For instance, say you have a presentation that opens with four headings tumbling in, one by one, accompanied by a fanfare. Clicking on one of the headings branches you off into a subject. When you've finished exploring the subject, the presentation returns you to the introductory slide and you have to sit through the fanfare and tumbling headings again. You

can use Astound's slide markers to make specific transition effects appear only once. To do so in our example, you drop a marker into the opening slide's timeline, placing the marker right after the transition effects. You then direct Astound to play the slide from the marker on after the slide has been played the entire way through. You can also use the slide markers to create pauses in your presentation or loop part of your presentation between markers.

In version 2.0, Gold Disk has beefed up the variety of



Fill objects and backgrounds with textures as well as colors in Astound 2.0. The new floating tool bar puts features at your fingertips.

graphics, and movies into your presentations and output 35mm slides with Astound, just as you can with PowerPoint and Persuasion. However, with Astound, you also have a timeline that lets you precisely control when elements on your slides appear and disappear. Furthermore, Astound has a solid set of commands that let you cue actions when you interact with elements on-screen, so it's not only a terrific presentation program but also a good prototyping program for multimedia projects.

With the new Astound, you can have sounds span a series of slides. For seamless

ways users can interact with presentations. Clicking on buttons and objects can now hide and reveal other objects. You can also play and stop QuickTime movies and even launch other applications from within a presentation. And, as before, you can control the order of the slides or the sound volume by interacting with an object on a slide.

New features for manipulating graphics you create within Astound can give your presentation a more professional or dramatic look. The Extrude command lets you create 3-D shapes within the program. You pick any object you have created with

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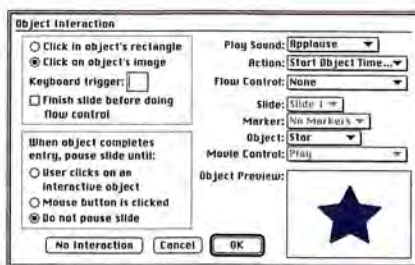
Astound's drawing tools and select the Extrude command. The dialog box that appears lets you adjust perspective, depth, and light-source direction; Astound then pulls the shape out to give it a 3-D form. However, you can extrude only shapes, not text, and you can't rotate the extruded objects. For 3-D text and other effects you can't get with Astound's Extrude command, you have to import 3-D text and objects from more full-featured modelers, such as Adobe Dimensions or Ray Dream's AddDepth.

You can make object surfaces and slide backgrounds even more interesting visually with Astound's new texture fills. You select either an object or the background and fill it with a texture, just as you'd fill it with a color via the Object Fill dialog box. You can choose one of 50 textures, including colorful fractal designs, wood grains, and cloud patterns, that come bundled with the program.

The Object Fill dialog box itself is still poorly designed. There is one large Preview window, and the five kinds of fills — patterns, gradients, textures, and foreground and background colors — each have their own preview window as well. This can become rather confusing. For instance, if you select a wood-grain texture as a fill, you'll see a preview of the wood grain in the Texture preview window as well as in the large Preview window. At the same time, you're looking at fills you considered earlier, such as a checkerboard pattern that remains visible in the Pattern preview window and a pink foreground color that remains visible in the Foreground Color preview window. Radio buttons for choosing which kind of fill you're using would probably work better than six preview windows.

The appropriately named Tween feature creates some fun effects. After you have selected any two objects created with Astound's shape drawing tool, the Tween effect will draw a series of intermediate shapes between them. You can show all the shapes at once, or you can display each intermediary shape one at a time, for an animated transformation effect.

On the more practical side, Astound now has a Document Colors palette, which gives you a choice of modifiable color schemes you can use throughout a slide or your presentation. However, unlike PowerPoint, Astound doesn't help you find colors that work well together.



Your presentation has even more interactive appeal with Astound 2.0's abilities to hide and reveal objects or launch another application when you click on an element.

A new panel lets you start, stop, fast-forward, rewind, and pause your presentation. This panel is convenient when you're addressing a lively group and is particularly useful as a previewing tool when you're setting up your presentation.

The new floating button palette is a great idea executed in a mediocre way. The palette changes according to which item you've selected and what you can do with the item, but several of the button icons are so small and poorly designed that it's difficult to figure out what the buttons do.

This feature-packed update gobbles up almost 8 MB of RAM. Astound 2.0 comes on a CD-ROM jammed with templates, clip art, QuickTime movies, and sounds. The program imports and exports all the major graphics, sound, animation, video, spreadsheet, and text formats, and you can create self-running presentations for Mac as well as Windows computers and distribute presentations with a run-time player.

The Bottom Line

With the latest release of Astound, Gold Disk has packed improvements into an already versatile and feature-rich program. Version 3.0 makes creating dramatic multimedia presentations even easier. / Shelley Cryan

Astound 2.0

Price: \$249.95 (list).

Pros: PowerPC-native. Sounds can span multiple slides. Slide markers. More interactivity features. More graphics options, including texture fills.

Cons: Poorly designed tool bar and Object Fill dialog box.

Company: Gold Disk, Santa Clara, CA; 408-982-0200.

Reader Service: Circle #407.

You're Already Thinking About Upgrading To Something More Powerful.



Adaptive Solutions PowerShop Accelerator card supercharges Photoshop.

YOU CAN NEVER be too thin or too rich, and you can never run Photoshop too fast, particularly if you're a prepress or publishing professional. Even for those lucky enough to own a top-of-the-line Power Mac 9500/132 loaded to the gills with RAM, using Photoshop can still be a huge time sink, especially if it's processing humongous image files.

Enter the Adaptive Solutions PowerShop, a Photoshop-accelerator card that is available for NuBus as well as PCI Macs. Billed as "The Power of 64," the PowerShop has four DSPs onboard, each of which has sixteen 25-MHz coprocessors. In our tests, the PowerShop delivered impressive results, making a variety of Photoshop functions as much as 13.5 times as fast. The card is street-priced at about \$2,000, and we think it will easily be worth the price to graphics pros who rely heavily on time-consuming Photoshop operations. An added plus is the PowerShop's ability to work with Kodak's high-end DCS series of digital cameras — the PowerShop speeds image acquisition from the cameras and allows users to capture more image data.

Power Up

Installing the PowerShop is as simple as with any other Mac PCI or NuBus card — either version takes up only one card slot. The software consists of a control panel and a PowerPC- or 68040-based Photoshop

plug-in. To find out what sort of speed gains users can expect from the PowerShop, we performed four Photoshop operations — Mode Conversion, Unsharp Mask, Arbitrary Rotate, and Resize — on a 50-MB file. We tested the PCI version of the PowerShop on a Power Mac 9500/132 and the NuBus version on a Quadra 950. Each machine had 256 MB of RAM and a Radius accelerated-graphics card — the Power Mac 9500 was equipped with a ThunderColor 30/1600 and the Quadra 950 with a Thunder IV GX (the DSP daughtercards on the Radius cards must be disabled when the PowerShop card is in use).

The PowerShop delivered the most dramatic speed gains to the Quadra 950. Overall speed results showed that Photoshop ran almost 8 times as fast as on a stock Quadra 950 and more than twice as fast as on a Quadra 950 equipped with a Radius Thunder IV GX. And with the PowerShop installed, the Quadra 950 was even able to outperform the Power Mac 9500 aided by the Radius ThunderColor 30/1600 in three out of four of our Photoshop test operations — Unsharp Mask, Arbitrary Rotate, and Resize.

Although the speed gains with the PowerShop running on the Power Mac 9500 were not as impressive as on the Quadra 950, they were significant enough to make investment in the card well worth it for users looking to squeeze every ounce of speed out of

Photoshop. With the PowerShop, the Power Mac 9500 was able to process operations more than 2.5 times as fast overall as without it. And compared to the speed of the Power Mac 9500 with the ThunderColor 30/1600, the PowerShop-equipped Power Mac 9500 was twice as fast overall.

The PowerShop does not accelerate mode conversions from RGB to CMYK on PCI Macs, although it does do so on NuBus Macs. In fact, in our tests with the PCI-based Power Mac 9500, we saw a slight *decrease* in speed for mode conversions when using the PowerShop. According to Adaptive Solutions, mode conversions are not accelerated on PCI Macs because the native handling of these functions is already quite fast and since the functions are slowed by the shuttling that occurs between the Mac's processor and the PowerShop. On the other hand, the Quadra 950 equipped with the PowerShop was more than 3 times as fast as a stock machine at processing the mode conversion. It's also important to note that, currently, the PowerShop does not accelerate third-party Photoshop plug-ins, although Adaptive Solutions says it plans to add plug-in support soon.

Picture Perfect

The PowerShop is also a plus for users of the Kodak DCS series of digital cameras. Included with the card is Adaptive Solutions' CNAPShot Photoshop plug-in. Replacing the Kodak software that comes with the camera with the CNAPShot plug-in gives you the option of acquiring images as 48-bit files, rather than as 24-bit files. That means you have more flexibility for making tonal adjustments with Photoshop in highlight and shadow areas than you do with a 24-bit file.

Teamed with the PowerShop, the CNAPShot plug-in also doubles the speed of image acquisition — in our tests, we were able to acquire an 18-MB image in about 11 seconds with CNAPShot, compared to about 22 seconds with the Kodak plug-in.

Once you've adjusted your image and converted it back to 24-bit format, you can use the other component of CNAPShot, the PhotoPerfect filter. Adaptive Solutions says this filter eliminates noise in images without requiring you to convert the images from RGB to Lab Color in Photoshop and fiddle with the channels. But in our tests, we



PHOTOSHOP ON STEROIDS / PowerShop makes fast work of processor-intensive operations

By beefing up your NuBus or PCI Mac with the addition of an Adaptive Solutions PowerShop card, you can slash the amount of time your system spends processing Photoshop files. But

don't plan to use the card for doing mode conversions on a PCI Mac — adding a PowerShop card can be counterproductive for this purpose, actually making your Mac slower.

	MODE CONVERSION	UNSHARP MASK	ARBITRARY ROTATE	RESIZE
Quadra 950 with Adaptive Solutions PowerShop	1:49 ■	0:45 ■	0:40 ■	0:28 ■
Quadra 950 with Radius ThunderColor IV GX	3:14 ■	1:48 ■	1:58 ■	1:35 ■
Quadra 950	6:32 ■	10:03 ■	4:37 ■	3:14 ■
Power Mac 9500 with Adaptive Solutions PowerShop	0:35 ■	0:23 ■	0:26 ■	0:12 ■
Power Mac 9500 with Radius ThunderColor 30/1600	0:53 ■	0:46 ■	0:53 ■	0:31 ■
Power Mac 9500	0:34 ■	1:16 ■	1:18 ■	0:48 ■
	MINUTES	MINUTES	MINUTES	MINUTES

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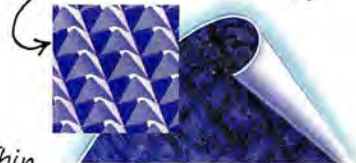
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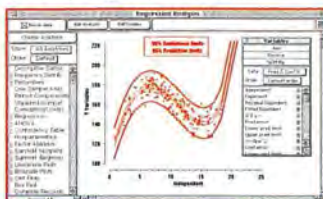
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MacUser

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APRIL

REMOVABLE STORAGE

Anyone who uses removable storage knows that all systems are not created equal. In the April issue, MacUser editors look closely at various technologies that power the different magnetic and optical media and drive mechanisms. What are their strengths, their weak-

nesses... and which of today's emerging technologies promise to be tomorrow's standards? Our editors also put magnetic and optical media to the test for media durability, speed and performance. You'll be getting the whole removable storage story, inside and out.

COLOR MANAGEMENT

Is frustration over color inconsistency between the screen image and the printed image making you see red (especially if you wanted to see green)? Color management promises to iron out color discrepancies, but does it? Find out in the April issue of MacUser. Our editors perform real-world tests using current top color management technology and tools. If you want to know how to get the best out of color management, this issue spells it all out in black and white.

**APRIL AD CLOSE:
TUESDAY,
JANUARY 23, 1996**

REVIEWS

found that the results we got with PhotoPerfect weren't as good as those we got with Photoshop's controls.

Press-Ready

Prepress pros will appreciate an added bonus available free to registered PowerShop users. ImageXpress' ScanPrepPro Photoshop plug-in (a \$695 value), teamed with the PowerShop, speeds the process of acquiring images from scanners. It improves the quality of your scans and automatically generates press-ready line art, halftones, and separations. You supply information on the source of your image (ScanPrepPro has a long list of scanner profiles) as well as on final output size and output device, and ScanPrepPro automatically processes the image and produces a press-ready file. In our tests, ScanPrepPro took less than 2 minutes to process a 50-MB file and only 50 seconds to process an 18-MB file - a fraction of the time it would take to process the files manually. The plug-in can also process any existing image that opens in Photoshop.

The Bottom Line

Overall, the Adaptive Solutions PowerShop accelerator card lives up to its billing. If you are looking for a way to speed up Photoshop operations but can't afford a new high-end PCI Power Mac, the PowerShop is a cost-effective alternative that will give you speed better than that of a stock Power Mac 9500/132 for running Photoshop. And you won't have to throw away the significant investment you've made in hard drives, RAM, and other accessories for your NuBus Mac. If you already own a top-of-the-line PCI Power Mac, the PowerShop can, cumulatively, shave off a significant amount of the time you spend every day manipulating images in Photoshop. / Rick Oldano

Adaptive Solutions PowerShop



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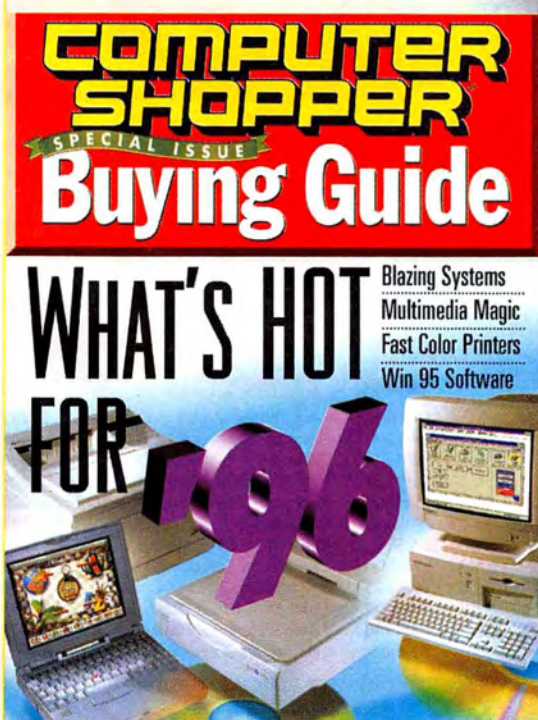
Cons: Current version doesn't accelerate all Photoshop operations. Lacks support for third-party filters.

Company: Adaptive Solutions, Beaverton, OR; 800-482-6277 or 503-690-1236.

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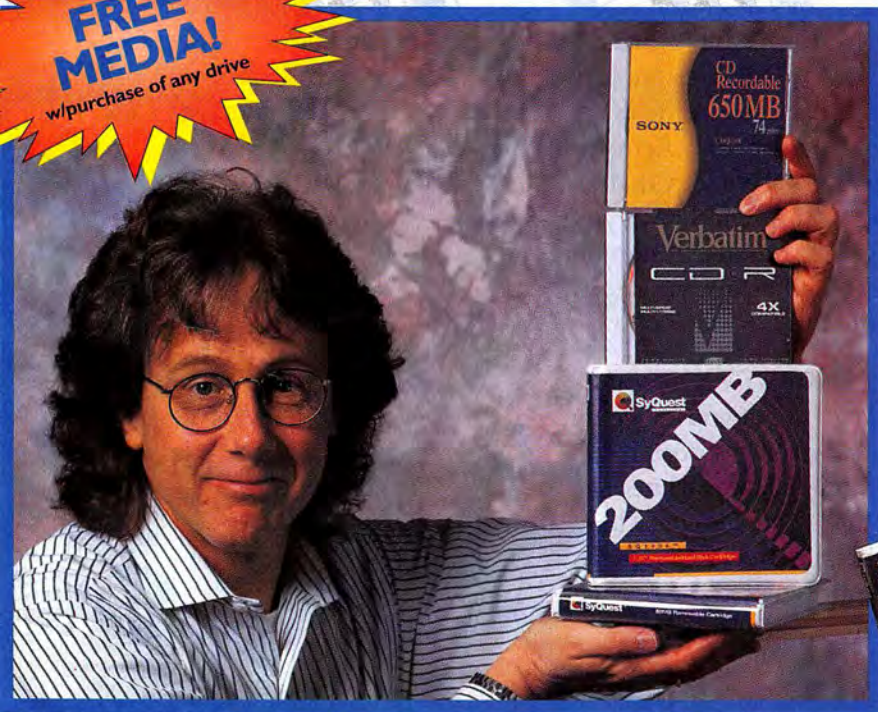
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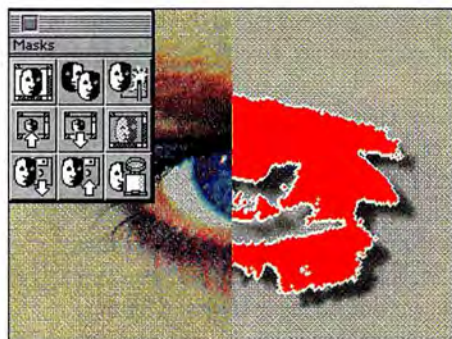
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Chagall / Surreally poor design

BILLED AS AN EASY-TO-USE painting and image-editing application that doesn't require a lot of RAM, Chagall is actually an awkward program that has little functionality as a creative tool.

You have access to most of Chagall's painting, masking, and special-effects tools in floating palettes. But the icons are confusing: The Lightener and Darkener tools (which work like the dodge and burn tools in Photoshop) look like brushes, and the Toner and Restorer tools look like pencils.



The drawing and painting tools are difficult to manage. Each pen and brush has modifiable settings for spacing as well as size and opacity. Spacing determines how fast you can draw. The lower the spacing, the slower — and theoretically, the more smoothly — the brush follows your strokes. But the results are inconsistent, and we frequently ended up with a series of dots instead of lines, even with a fairly low spacing setting. Some of the tools create anti-aliased lines, and some don't. You can't change the smoothness of lines after you draw them. Furthermore, drawing tools can have only an odd number of pixels.

Chagall can run with a minimum of 4 MB of RAM, as advertised, but it really needs much more. With 4 MB of RAM, there's no room for an undo buffer if you're working on a 2-MB image. In addition, the tools don't work efficiently and caused irregular movements and inaccurate strokes even when we ran the program on a Power Mac and allocated 30 MB of RAM to it.

Inelegant Undos. In fact, the unlimited undos Chagall boasts of are a misnomer. The Undo feature doesn't undo your last action; it makes your image revert to what it looked like the last time you issued the Update Undo command.

The texture that appears under the Chalk, Lightener, and Darkener tools gives you the illusion of working on real-life paper, but you're stuck with only one kind of paper and a very grainy one at that.

You can paint a mask onto your image and edit the mask within the image file or save it separately as its own editable, grayscale image file. However, you can't change the opacity of the mask overlay. You can edit or store only 1 mask channel with each image — a shame, considering that you can save images as Photoshop 2.5 files, which support up to 24 channels.

Chagall's documentation is sketchy and unbalanced. For instance, it describes in great detail how check boxes work but provides information on TIFF only, even though it has its own proprietary file format and supports five more.

There is nothing outstanding or unique about Chagall, and its counterintuitive interface and poor performance keep it from being competitive on any level. / David Biedny and Nathan Moody

Chagall 1.0 / Price: \$299 (list). Company: Technosystems USA, Radcliff, KY; 800-417-0108 or 502-351-0108. Reader Service: Circle #410.

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CIRCLE 40 ON READER SERVICE CARD

QX-Tools / XTension XPansion

SPORTING A SLICK, integrated interface patterned after the popular Now Utilities, QX-Tools, a set of ten XTensions for QuarkXPress, will streamline your desktop-publishing tasks.

Printing in QuarkXPress finally gets some perks with QX-Print. With it, you can print noncontiguous ranges of pages, specify that a document's spot colors be printed as process colors, and print a selected number of color plates in a color-plate job. Without QX-Print, you either have to print every color plate in a job or only one at a time.

With QX-Filters, you can apply Photoshop filters to images within a QuarkXPress document. You can create especially dramatic effects if you create a mask within QuarkXPress and mask out parts of an image to which you've applied a filter.

QX-Viewer gives you a thumbnail view of any page or spread in your QuarkXPress document. When you click on any area in the thumbnail view, your document window zooms in on that area — at up to 900-percent magnification, twice the maximum 400-percent magnification level you get in an XTension-less QuarkXPress.

The QX-Scaler extension provides a floating palette that lets you scale an object by dragging the item handles to resize it. You can select which elements of an object you want scaled, such as text or borders, and only those elements get resized.


Other nifty XTensions in the QX-Tools set include QX-Layers, which enables you to create layers in your QuarkXPress document

and shuffle, lock, hide, and delete them; QX-Tips & Tricks, which gives you a QuarkXPress tip when you open or quit QuarkXPress; and QX-Dingbats, which displays all the characters in a typeface. When you click on a character in the QX-Dingbats window, QX-Dingbats automatically places the character in your document. The XTension even comes with five dingbats typefaces.

Over-XTended. Two other XTensions are less impressive. QX-Bars lets you create customized floating tool bars and stuff them with icons for various QuarkXPress functions — the result may make QuarkXPress look as unattractive as Microsoft Word 6. If you drag one of these tool-bar palettes to the edge of your screen, it becomes a docked button bar.

QX-Styles adds character-level styles to QuarkXPress style sheets. However, like similar extensions from other companies, QX-Styles doesn't really create a character-based style sheet; it simply uses glorified shortcuts for applying character formatting. It updates your text formatting by using little more than high-speed search-and-replace for character attributes.

So you won't be bogged down with too many of these XTensions at once, QX-Manager lets you turn XTensions on or off and define XTension sets. Even if you end up using only two or three of the QX-Tools, this package would be a steal at twice the price. / Eric Taub

QX-Tools 1.0  / Price: \$99.95 (direct). Company: Extensis, Portland, OR; 800-796-9798 or 503-274-2020. Reader Service: Circle #411.



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CIRCLE 22 ON READER SERVICE CARD



SCSI PowerPlug II / Plug and play live

IF YOU FIND YOURSELF shutting down your Mac several times a day just to add, remove, or swap SCSI devices on your SCSI chain, the SCSI PowerPlug II can make your life a whole lot easier. The

PowerPlug II connector, with its digital active termination and software, lets you exchange SCSI devices while your computer is on. **Easy SCSI Swapping.** To add a device to your SCSI chain, you select any open SCSI ID in the PowerPlug control panel and click on the Add Device button. Then you move the data-throughput switch on the connector to the off position, attach the SCSI device (with a non-conflicting SCSI address), and turn the switch back on. The PowerPlug II uses its own driver during the mounting process, which prevents some of the driver-incompatibility problems that plagued the first PowerPlug. The PowerPlug II driver closes itself as soon as you unmount a device.

You might have trouble unmounting a SCSI device that wasn't mounted with the PowerPlug software. In such cases, the PowerPlug software tries to close the device's driver, but it warns you if it can't. If the software isn't able to close the driver, the driver will remain active and you may have problems mounting other SCSI devices, unless you shut off your Mac first.

With the PowerPlug II, you can save money by sharing one backup device and, most important, save time by not having to shut down constantly. / Jim Galbraith

HotWire SCSI PowerPlug II  / Price: \$119.95 (list). Company: HotWire Technology, Wilton, CT; 203-761-0651. Reader Service: Circle #412.

DOS Mounter 5.0 / Download DOS files fast


WHEN YOUR CLIENTS hand you DOS-based removable cartridges or floppy disks, you can mount them and download the information quickly and easily with the latest version of DOS Mounter.

Driven Driver. DOS Mounter 5.0 transfers files from DOS media to your Mac four to five times as fast as System 7.5's PC Exchange does. This speed increase is due to the MultiMounter SCSI driver, which DOS Mounter installs. Transfers are another 20 percent faster on PowerPC-based computers, since DOS Mounter 5.0 comes in a PowerPC-native version. MultiMounter is compatible with SCSI Manager 4.3, and it will give your Mac a speed boost when you're doing Finder copies as well as when you're accessing DOS media from within Mac applications.

The other key component of DOS Mounter is the improved MultiFormatter, which lets you use your Mac to format, partition, and test DOS-based SyQuest and magneto-optical cartridges. And now MultiFormatter lets you create Mac and DOS partitions on the same cartridge.

Windows and DOS users who want to access and format Mac media in the same way that Mac users access PC media with DOS Mounter can get DOS Mounter's PC counterpart, Software Architect's Here & Now.

In short, DOS Mounter 5.0 bridges the gap between PC and Mac data in the easiest and fastest way possible. / John Rizzo

DOS Mounter 5.0  / Price: \$89.95 (list). Company: Software Architects, Bothell, WA; 800-405-0002 or 206-487-0122. Reader Service: Circle #413.

PowerCADD™

Power Macintosh version of PowerDraw

300% faster than ever



File Size	PowerCADD 2.0	PowerDraw 6.0	PowerDraw 5.0
	(SCREEN REDRAW TIMES - SECONDS)*		
1.5 MB	2.27	8.5	28.85
6.4 MB	5.49	18.12	38.25
1.0 MB	1.68	3.87	7.87

* Test conducted on a Power Macintosh 8100/100AV for PowerCADD 2.0 and a Macintosh Quadra 630 for PowerDraw versions.



Macworld October 1995

"...PowerCADD's greatest benefit is speed..."

"PowerCADD does the best job of harnessing the Power Mac's capabilities I've seen."



MacUser October 1995

"...PowerCADD's programmability and extensibility may make PowerCADD a better choice than high-end CAD programs."



MacWEEK July 10, 1995

"...a 1.4 MB (PowerCADD) file on the Power Mac updated more than two times faster on the Power Macintosh (redraw speed of five seconds)."

InfoWorld July 24, 1995

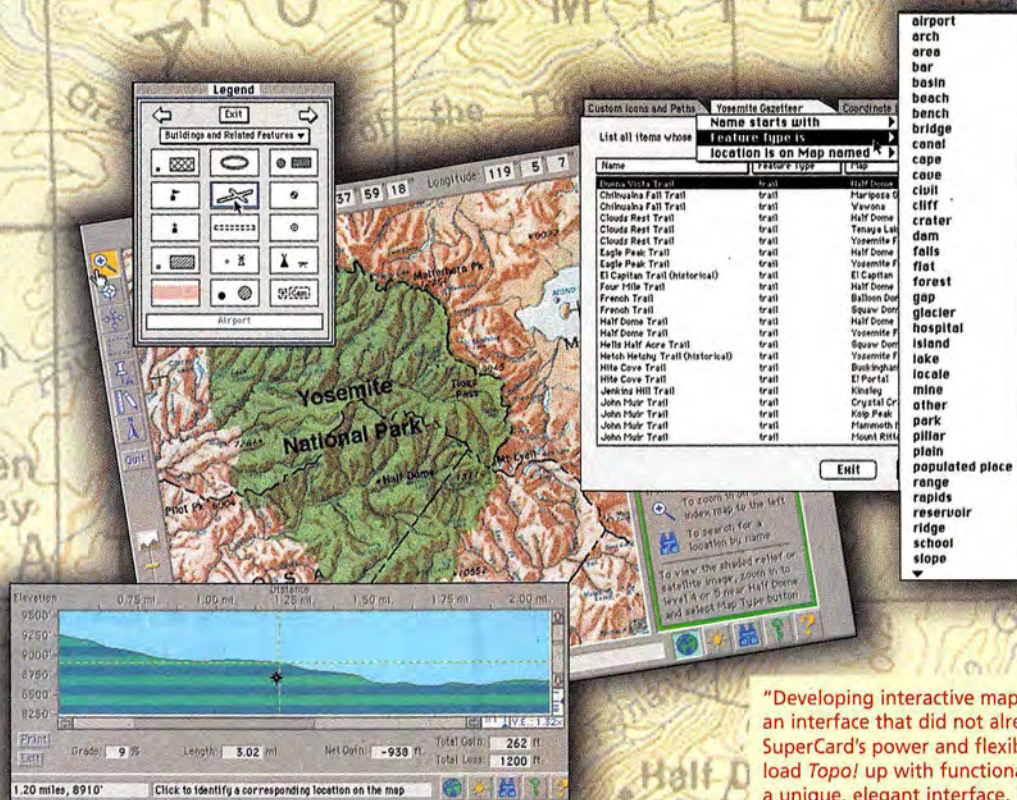
"PowerCADD 2.0 boasts faster redraw times, faster editing and processing speeds, improved layer controls, enhanced editing commands, and a redesigned interface."

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CIRCLE 73 ON READER SERVICE CARD

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— Paul Glauthier, Wildflower Productions



When Wildflower Productions wanted to build a groundbreaking interface to digital maps, they couldn't use just any authoring tool. They needed one that delivered real innovation, real fast.

That's why they chose SuperCard for their dazzling new *TOPO!* series of interactive topographical maps. Wildflower discovered what many top-notch developers already know:

SuperCard is the fastest, most flexible tool for delivering professional quality, cross-platform multimedia applications.

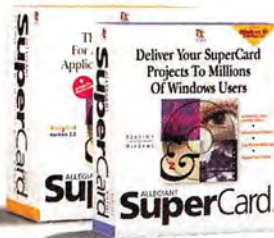
- Applications that stand out from the crowd with unique interface features, unparalleled user interactivity and complete platform support that the other tools just can't deliver.
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- Applications that leverage your time by letting you build your own custom authoring tools, accelerating your development to new levels.



SuperCard's simple scripting language, extensive media support and straightforward object-based approach make it easy to start your projects yet offer the depth required for even the most seasoned developers, such as Wildflower.

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So, when you're ready to blaze a new trail in multimedia, pick up a copy of SuperCard today...and start putting your work on the map.



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CIRCLE 68 ON READER SERVICE CARD

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MW ★★★★★




GrabNet 2.0 / Internet PIM

WORLD WIDE WEB BROWSERS don't give you a convenient way to save URLs (Uniform Resource Locators) or manage the mountain of information you can download. Using GrabNet, an information-gathering tool, in conjunction with a browser, you can use a command or drag-and-drop to save a URL, so you can return to a Web site by double-clicking on its URL or on an icon you create for it.

Granted, Netscape Navigator and other browsers can perform many of the same functions, although to a more limited extent. Netscape Navigator, for instance, lets you create URL bookmarks, but it doesn't let you keep notes with URLs and create icons for them, as GrabNet does. GrabNet also requires just a few mouse clicks to download and save all or part of a Web site.

Grab and Drop. GrabNet 2.0 has Finder-like hierarchical folders, Macintosh Drag and Drop URLs, and the ability to export Web pages to HTML. Drag and Drop is the most impressive of these new features. You can drag URLs onto the desktop or into any folder in the Finder. You can even drag Web-page elements into other applications that support Drag and Drop. For instance, you can drop a graphic from a Web page into a Microsoft Word or Adobe PageMaker document.

GrabNet 2.0 isn't a must-have item, but it does give Net surfers a better way to gather and organize information. / William Harrell

GrabNet 2.0  / Price: \$19.95 (list). Company: ForeFront Group, Houston, TX; 800-867-1101 or 713-961-1101; <http://www.ffg.com/>. Reader Service: Circle #414.


**CyberSound FX / QuickTime-audio postproduction**

YOU CAN ADD a subtle volume boost to the quieter portions of your audio track or create the sound of a robot gurgling under water in your QuickTime movies, with CyberSound FX. This new set of plug-in filters for Adobe Premiere lets you engineer your own postproduction-like sound effects directly within your videos.

The 15 plug-ins are a collection of controls for popular sound effects. Using the plug-ins, you can shift pitch, add reverb or flange, and equalize tones or balance volume levels in any portion of your sound track. In Premiere's construction timeline, you apply the sound effects as you would apply a filter to an audio clip and use the various slider controls — up to nine, as in the case of the multiple-delay plug-in — to create just the effect you want.

Learning by Ear. The plug-ins come with several descriptively named templates, such as Chipmunk Voice and Indoor Basketball Court, which are extremely helpful for guiding you through the daunting number of possible control settings and can give you a starting point. CyberSound FX's online help gives you descriptions of each slider and tips on using it.

Most important, the audio effects you create with these modules sound great. For the punch it packs in creating an awesome sound track, CyberSound FX is a terrific value. / Jeffy Milstead

CyberSound FX 1.0  / Price: \$129 (list). Company: InVision Interactive, Palo Alto, CA; 415-812-7380. Reader Service: Circle #415.

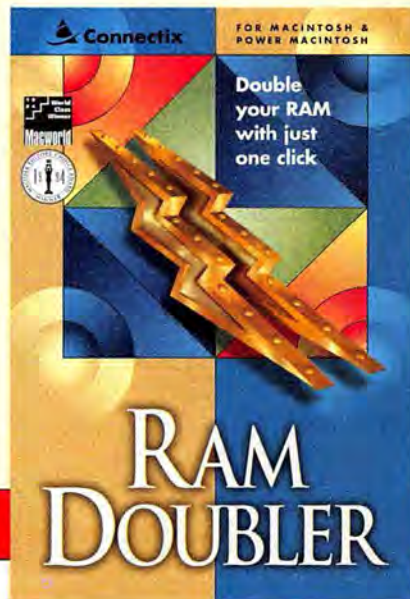
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System Requirements: Macintosh equipped with a 68030, 68040 or PowerPC microprocessor. System 6.05 or later, including all versions of system 7 • 4 MBs required (hard disk required for machines with 4 to 6 MBs) • Not compatible with Mac SE, original Mac Classic, original Mac LC or PowerBook 100 or Mac II without a 68851 PMMU or any accelerator that does not work with virtual memory.



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CIRCLE 62 ON READER SERVICE CARD

A black and white photograph of an elderly nun with glasses, wearing a traditional black and white habit. She is holding a silver Olympus Deltis CD-R2 recorder in front of her. The background is a large, colorful stained glass window with various designs, including a central circular medallion with a dove. The overall tone is traditional and venerable, contrasting with the modern technology she is holding.

YOU'RE OLD ENOUGH TO KNOW THE DIFFERENCE BETWEEN WRITE AND ROM.

If you still think CD is a read-only medium, it's time you discovered the error of your ways.

That's because Olympus has turned CD into something you can write to, as well. And while there are other CD writers out there, none holds a prayer to what the Deltis™ CD-R2 can do.

Not only is the CD-R2 double-speed, it's multi-session and multi-format, too. So you can record just about whatever you want, and start and stop recording wherever and whenever you choose. It's also designed to adapt to future formats, so it won't become obsolete overnight.

And while patience is a virtue, you won't have to wait to start writing with the CD-R2 because it comes complete with everything you need — including multimedia software that's so easy to use, anyone can record with it.

All of which make this CD recorder perfect for packing up to 650 MB of information or presentation materials, with audio and animation, onto a disk. As well as for making your own music, data or Photo CD.

So call 1-800-347-4027 and find out where you can get the Deltis CD-R2 today.

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The Deltis CD-R2 Recorder can be purchased through the following catalogs: MacWarehouse (1-800-255-6227), PC & Mac Connection (1-800-800-1111), MacZone (1-800-248-0800), and PrePress Direct (1-800-443-6600). Resellers, please call TechData (1-800-237-8931) or Ingram Micro (1-800-456-8000).

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CIRCLE 69 ON READER SERVICE CARD

BeyondPress / QuarkXPress yourself on the Web

WITH THE ATTENTION the World Wide Web has been getting recently, it's not surprising to see the development of authoring packages designed to help users generate HTML (HyperText Markup Language, the Web's language) quickly. One of the latest contenders in this field is Astrobyte's BeyondPress QuarkXPress XTension, which turns QuarkXPress layouts into Web pages.

Easy Translation. BeyondPress' major strength is that it lets you generate basic HTML code with minimal effort. With BeyondPress, you can integrate any or all of the elements in your QuarkXPress layout into a list of HTML elements and create a basic, modifiable Web page, which BeyondPress calls an article. You can preview your articles, using your favorite Web browser. HTML tags (such as for line breaks and horizontal rules) can be inserted into articles without having an effect on the original QuarkXPress layout; in fact, manipulating any HTML element doesn't alter the QuarkXPress layout. Type styles set in QuarkXPress translate into HTML automatically, and BeyondPress lets you map QuarkXPress style sheets to HTML styles. We did notice, however, that BeyondPress doesn't generate the cleanest, most efficient HTML code we've seen, which means you should expect to spend some time tweaking the output yourself for maximum efficiency.

Tinkering Required. BeyondPress is especially problematic with graphics. It sets up HTML code for graphics placement and linking, takes a graphic from QuarkXPress (in TIFF, PICT or EPS format),

and turns it into a JPEG or GIF file. The compression, transparency, and interlacing controls are adequate, if not as thorough as we'd like. All images are dithered to the 8-bit Mac color palette, whether you want that palette or not and regardless of the image's previous format and color depth.



Also lacking is support for some of the more colorful HTML 3.0 commands (such as those for creating customized backgrounds and color text). Designers will usually have to wind up reworking graphics outside BeyondPress by using image-translation and image-editing programs and relinking them to the

Web page. In addition, with the growing number of commercial HTML-authoring options, we think BeyondPress' \$595 price is too high.

BeyondPress is a solid program for using QuarkXPress as a template tool for generating basic HTML code, but it's almost impossible to use without resorting to a word processor to further refine the code. BeyondPress may provide a good start for creating well-designed, attractive Web sites, but it isn't a one-stop application.

/ David Biedny and Nathan Moody

BeyondPress ★★★ / Price: \$595 (list). Company: Astrobyte, Denver, CO; 303-534-6344; <http://www.astrobyte.com>. Reader Service: Circle #416.

ILLUSTRATION / JERRY VELASCO

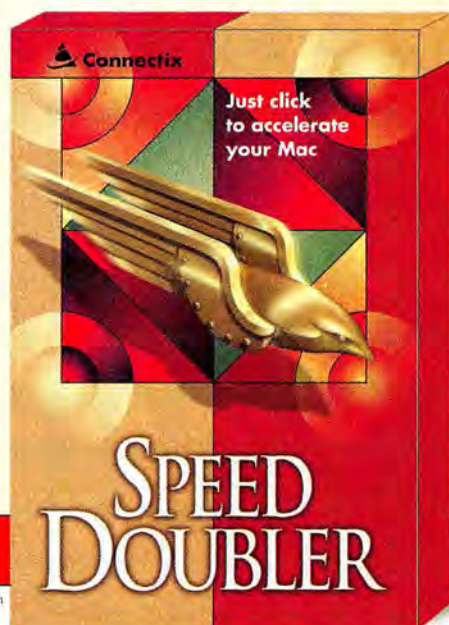
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spreadsheet with Speed Doubler in 6 seconds, without it...13 seconds. Run a summary calculation of 1500 FileMaker Pro records in 90 seconds instead of 3 minutes. It's not magic. It's Connectix Speed Doubler. And if you own a Power Mac, you gotta have it. Get Speed Doubler today wherever fine computer products are sold. Your satisfaction is guaranteed.

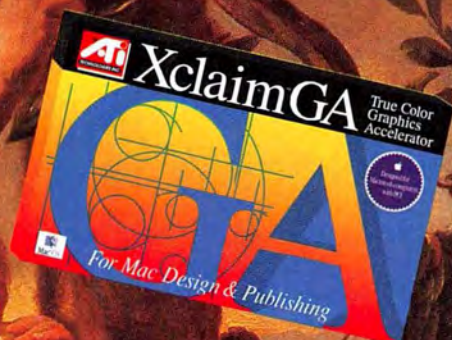
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Requirements: Macintosh equipped with a PowerPC, 68040, or 68030 microprocessor • System 7.0 or greater • 8 MB physical RAM or greater • Compatible with Connectix RAM Doubler • Not compatible with Mac Plus, Mac SE, original Mac Classic, original Mac LC or PowerBook 100

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In fact, it's based on the same graphics accelerator technology Apple chose for some of their new PCI Power Mac 9500 series. You'll enjoy Mac-specific features like AppleGuide on-line help, as well as unparalleled customer support and a tantalizing price – only \$449 for 2MB, \$649 for 4MB, and \$249 for a 2MB memory upgrade module.

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CIRCLE 43 ON READER SERVICE CARD



Quicken Family Lawyer / Legal software on the mark

MOVE OVER, NOLO PRESS — there's a new player in the legal-software arena. Intuit recently acquired Parsons Technology and its

It's Legal product. Now renamed Quicken Family

Lawyer, this product sports a brand-new, elegant interface and more online legal help than you can shake a gavel at.

Dozens of Documents. Quicken Family Lawyer can prepare 61 different documents that are automatically customized for each state (if necessary), and it includes state-specific notary forms. The documents are grouped according to category — Estate Planning, Powers of Attorney, Health & Medical, Family/Personal, Real Estate, Employment, Consumer Credit, Corporate, and Financial — and involve legal matters applicable to both home and business.

There are two ways to create a document: the interview method, where Family Lawyer asks you a question and you type the answer, and the fill-in-the-blank method. The interview provides an easy way for people with little legal knowledge to create a legal document; the fill-in-the-blank method is quicker and is suited to people familiar with law and the legal process. Each method will give you an accurate and legally binding document comparable to any prepared by an attorney. We compared a Power of Attorney document we created with Family Lawyer to one created for us by a practicing lawyer, and the documents were virtually identical.

Family Lawyer's new interface is clutter-free, simple, and elegant, and the help system is extensive and reassuring. When you create a

document, you get tips from hint panes to the left of every screen (similar to Quicken's Q Cards) and a Document Reference section, accessible from Apple Guide or the tool bar, that gives advice tailored to the current document. Apple Guide also contains an interactive tour and product support as well as the Legal Reference Help System, for explanations of legal terms and concepts. The program lets you know when you need to consult an attorney, such as when a legal matter is beyond the scope of a basic legal template.

Password protection is available on a document-by-document basis — we would have preferred passwords for each user. The built-in spelling checker contains 100,000 words, including legal terms, but lacks an Ignore All button.

Problematic Printing. Printing is Family Lawyer's weakest point: You can't edit the Print Preview, and the program doesn't currently support fractional widths. Family Lawyer has several print options, but you can't change a document's fonts or margins. However, you can export a finished file in RTF or text format and open it in a word processor to take advantage of its layout and printing options.

Quicken Family Lawyer offers a plethora of legal documents, a good interface, and an attractive list price of \$49 — enough to challenge any product in the Nolo Press line for the top spot in Mac legal software. / Ken Gruberman

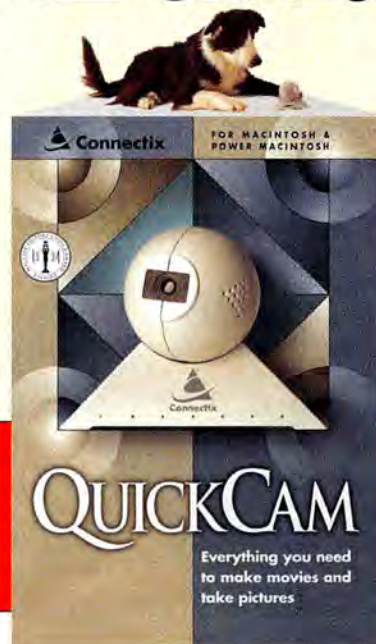
Quicken Family Lawyer 1.0 / Price: \$49 (list). Company: Parsons Technology (An Intuit Company), Hiawatha, IA; 800-223-6925 or 319-395-9626. Reader Service: Circle #417.

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BE CREATIVE

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The meeting's in an hour, the charts are in Windows, and you can't find the sticky with the client's address.



**Macintosh
System 7.5**

*It's powerful, it's easy to use—it's the new
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Let's talk System 7.5

Millions of Apple® Macintosh® users are finding that life at the office is a whole lot easier with Macintosh System 7.5—especially in a crunch.

It's better organized, so you can be too.

System 7.5 is full of new ways to help you be more efficient. Like 'WindowShade' to let you get at what's behind a window *without* closing or moving it: a double click on the title bar and the window disappears, but the bar stays. 'Find File' now has more search criteria so you get to the document you want, faster. And the Apple menu has new hierarchical sub-menus that take you straight to control panels and applications—no more clicking your way through layers of windows.

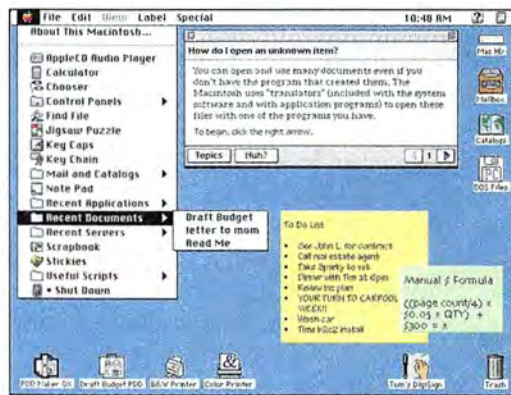
Putting it all together.

Integrating other people's work into yours is a snap with System 7.5. No matter what application or personal computer they used, System 7.5 treats their files just like Macintosh files. And now with a free copy of MacLinkPlus translators, it's even easier to share material with others.

A whole new level of on-line assistance.

System 7.5's new Apple Guide interactive help system walks you through functions step by step, pointing

out exactly what to do next. Now you can learn faster by 'doing', instead of just reading instructions.



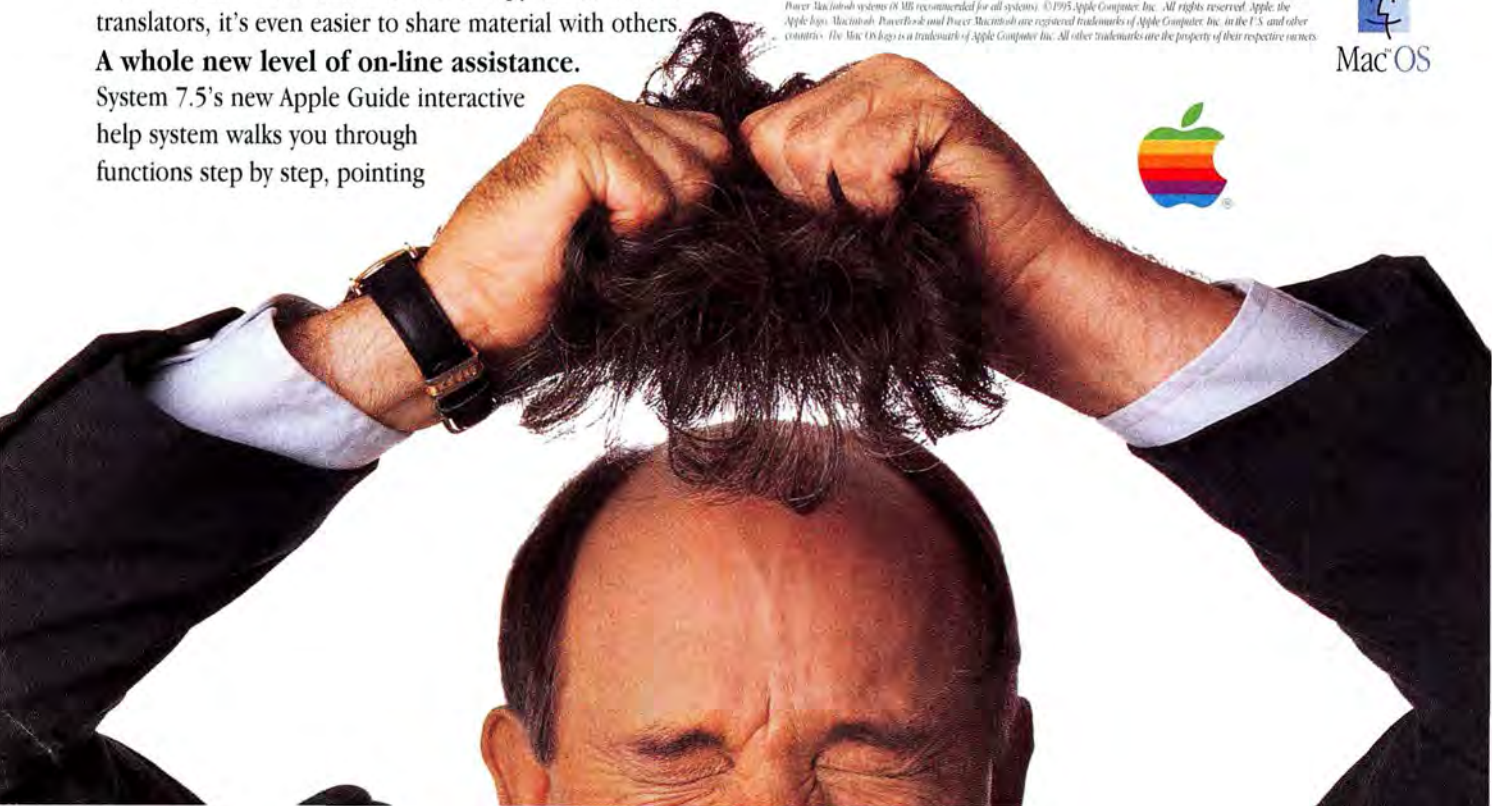
It's powerful, it's easy to use—it's the new operating system for your Macintosh.

Of course the best time to upgrade to System 7.5 is *before* the next crisis hits. So order today by calling 1-800-950-5382 ext. 785 (1-800-361-6075 ext.131 in Canada). Or call 1-800-538-9696 ext. 250 for the Apple reseller nearest you.

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Mac OS



CHOOSING THE RIGHT MAC

By Shelley Cryan

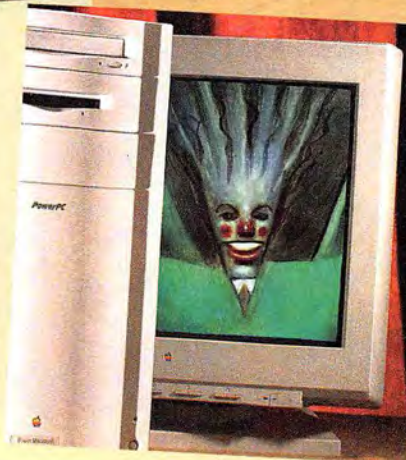
Buying a computer is a lot like purchasing stock. Pick the right one, at the right time and at the right price, and — Nirvana. It's tricky business, though, with thousands of dollars at stake. So how do you win? It boils down to a pair of Ws: When to buy and What to buy.

When is easy: now. Trouble is, it's *always* now.

Because computer prices drop and features improve over time, computers are cheaper and more powerful at any given moment than ever before. You're back to where you started.

But this time, "now" is an even better answer than usual: Apple's second-generation Power Macs, with dramatically faster PowerPC chips and PCI expansion slots, ushered in unprecedented Mac computing power — and forced down prices on their less endowed (but still formidable) first-generation cousins. The advent of the first Mac OS-compatible computers further fueled price cuts: Clone makers Power Computing, DayStar Digital, and Radius are all offering their own Mac OS systems, bringing the total number of currently shipping machines to roughly three dozen — all jockeying to be the best value.

That brings us back to the other *W* — *What* to buy — and that's where we come in. To help answer that question, we sat down and identified four major groups of Mac users: home-based users, academics, creatives, and businesspeople. We created a profile of an archetypal user within each group and identified an ideal machine for that user, basing our decision on features, specs, price, bundled software and hardware, and expansion and upgrade options. We



also profiled a handful of alternative users, whose needs (or budgets) vary one way or another from the "typical" user in each group. Finally, we scanned the ranks of the 100 or so discontinued Mac systems still available in the used-computer market and identified suitable systems in each category; these may appeal to you if you're willing to sacrifice some speed or features for a bargain price.

Your job is to find yourself in these pages. Family-finance managers, check out the Home section. Moviemakers and graphic artists, turn to the Creatives section. Academics and businesspeople, well, you get the idea. Among the handful of profiles in each section, we hope you'll find one that mirrors your situation.

In the fast-changing world of computers, we can't guarantee that the prices and specs on the following pages will be accurate by the time you read this article. But any changes will probably be in your favor: Your dream machine may have a higher-capacity hard drive, faster clock speed, and/or better price than what you see listed here. If only the stock market behaved that way, we'd all be rich.

Freelance writer Shelley Cryan has used Macs at work, school, and home and has assisted national consumer and fashion magazines in identifying the right Macs for their staffs.

CHOOSING THE RIGHT MAC

THE MAC AT HOME



Bill Payer, 38 / *hospital administrator, father of three*

WHY BUY? "I use a computer at work. My wife uses one at work. Two of our three kids use computers at school. Everything's going digital. It's inevitable."

"Besides, last week at the computer store, my kid whipped me in Glider. I need to sneak in some late-night practice."

PLANNED COMPUTER USES. Manage family finances. Occasionally pull up spreadsheets from work. Keep in touch with far-flung extended family via e-mail. Kids say they want to use it for homework. Bill knows they also want to play the latest multimedia CD-ROMs. Wife needs it for after-hours work and also wants to explore landscaping software.

PURCHASE CONSTRAINTS. Oldest daughter uses Macs in her eighth-grade class and is keen on researching projects online. Bill can afford a decent system but doesn't want to pay for extraneous features. And with yard work, soccer-coaching duties, and chauffeuring the kids around, who has time for setup hassles?

RECOMMENDED SYSTEM. Apple Performa 6205CD

WHY. The 6205CD sits smack in the middle of Apple's Performa line

— not as muscular as the pricier 6300CD but more advanced than the 60-MHz 68040-based 631CD. It'll give the Payers what they need, at a reasonable cost.

The high-capacity hard drive will help keep peace among the Payers, as there's plenty of room to accommodate everyone's files and programs. Multimedia games and reference titles will hum along nicely on the zippy CD-ROM drive — the fastest Apple offers. And Bill's planning to surprise the family, come holiday time, with the add-on Apple Video System, which will allow the family to convert their home videos to QuickTime.

The built-in 28.8-kbps fax modem differentiates the 6205CD from the less expensive 6200CD, whose modem operates at half that speed. The additional \$100 is well worth it, though, for surfing the Internet's World Wide Web.

Bundled software makes this machine a strong value: Seventeen programs come preinstalled, including ClarisWorks, for basic word-processing, spreadsheet and database tools; Quicken, for personal finance; and Macintosh PC Exchange, to let Bill work with files from his office Windows machine. The eight included CD-ROMs range from Grolier's Encyclopedia to a music-education game.

Bill had a tough time deciding between this machine and the Apple Performa 5215CD. The latter is essentially the same machine with a slower modem and a single case that contains both monitor and computer.

DRAWBACK. The biggest drawback of the 6205 is that its internal expansion options are limited: It has slots for Apple's proprietary video-capture and TV-tuner cards, but it does not accommodate the far more versatile (and popular) PDS, NuBus, or PCI expansion-card options for supporting larger monitors, hard-drive arrays, or network adapters.



RECOMMENDED SYSTEM

Apple Performa 6205CD

- 75-MHz PowerPC 603 processor
- 8 MB of RAM
- 1-GB hard drive
- 4x CD-ROM drive
- 15-inch Apple Multiple Scan Color Monitor
- 28.8-kbps internal fax modem

Price: \$2,099

ALTERNATIVE HOME-BASED MACS

The Home-Office Professional / *startup entrepreneur needs affordable versatility*

WHO. Bill's neighbor, Max, runs a successful consulting business out of his spare bedroom. He loves the tax write-off — and the 15-second commute. His daily challenge: making clients think his suburban high-ranch is a corporate high-rise. Max needs a system that can help him impress his clients.

RECOMMENDED SYSTEM. Power Computing Power 100

WHY. Max can crank out polished presentations and reports quickly,

thanks to the power of the 601 chip. Without an art staff, he relies on clip media he can access via the speedy CD-ROM drive, which also comes in handy for after-hours entertainment. A slower modem could save him some cash, but he'll need the added speed for research on the Internet's World Wide Web. The terrific home-office bundle jump-starts his software collection, with such titles as Quicken and Now Up-to-Date & Contact.



DRAWBACK. The Power 100 lacks PCI expansion slots and instead has NuBus slots, which don't allow data transfers as fast as PCI's.

RECOMMENDED SYSTEM

Power Computing Power 100

- 100-MHz PowerPC 601 processor
- 8 MB of RAM
- 540-MB hard drive
- 4x CD-ROM drive
- Keyboard

Price: \$2,029

RECOMMENDED ADD-ONS

- Personal laser printer
- 17-inch color monitor
- 28.8-kbps external fax modem

Estimated price of add-ons: \$1,500

Jostlin' Elders / *retirees in RV need affordable portability*



WHO. Bill's parents are retired, but they're busier than ever. Mom is most comfortable behind the wheel of their well-equipped RV; Dad's the chief navigator and gas

pumper. This month, it's Arizona — next month, who knows? The senior Payers plan to research destinations online and will keep in touch with friends and family via e-mail. A pair of fat pension checks each month, plus income from substantial investments, keeps them well in the black. They plan to maintain financial health by using personal-finance software.

RECOMMENDED SYSTEM. Apple PowerBook 190cs

WHY. About the size of a fat spiral notebook, this PowerBook tucks

nicely beside the passenger seat of the space-constrained RV. The color screen adds \$350 to the price, but since they don't have space for a desktop monitor, the senior Payers will appreciate a color image. The fax-modem card is critical — since friends and family can't reach them by phone too easily, the Payers will rely on their electronic mailbox as their cyber-answering machine. The 190cs is upgradable to PowerPC status.

DRAWBACKS. You pay a premium for portability — for the same

money, you can get a much speedier desktop model. The 190cs' passive-matrix screen is far less vivid than a desktop monitor.

RECOMMENDED SYSTEM

Apple PowerBook 190cs

- 33-MHz 68LC040 processor
- 8 MB of RAM
- 500-MB hard drive
- 10.4-inch backlit dual-scan color display (256 colors)

Price: \$2,199

RECOMMENDED ADD-ON

- 28.8-kbps fax-modem card

Estimated price of add-on: \$300

Jetsons' Aspirations, Waltons' Budget / *full features on a shoestring*

WHO. Bill's fellow youth-soccer coach, Ham String, is new to computers. He wants a Mac, but the

kids' braces, dance classes, and fancy high-tops leave his wallet thinner than a microchip. He and his wife have got a decent stash socked away, but that's for college.

RECOMMENDED SYSTEM. Apple Performa 631CD

WHY. There isn't a new, complete computer system with family-friendly features for less than you'll pay for a 631CD. It comes with nearly everything you need, including a CD-ROM drive, a monitor, a fax modem, and a passel of family-targeted software. When money pressures ease up, they can upgrade to PowerPC performance.

DRAWBACKS. Everything — the CD-ROM drive, the fax modem, and the processor — is relatively

slow. The monitor is on the small side. Although the 631CD is upgradable to PowerPC via the Macintosh Processor Upgrade

Card (about \$600), it will not be able to support Apple's advanced Copland operating system, likely to ship in early 1997.

Used-Mac Option

RECOMMENDED SYSTEM

Apple Performa 550CD

- 33-MHz 68030 processor
- 5 MB of RAM
- 160-MB hard drive
- 2x CD-ROM drive
- Built-in 15-inch color monitor
- Fax modem

Used price: \$700

WHY. The Performa 550CD combines the monitor and CPU in a single box, so it's unobtrusive in the den (and easily moved to the dining-room table when necessary). It's no speed demon, but it's perfect for pounding out the Great American Novel or the Mediocre Book Report.

DRAWBACKS. Sluggish processor and CD-ROM drive. Only enough RAM to run one, or perhaps two, applications at the same time. The hard disk will fill up fast.



RECOMMENDED SYSTEM

Apple Performa 631CD

- 33-MHz 68LC040 processor
- 8 MB of RAM
- 500-MB hard drive
- 2x CD-ROM drive
- 14-inch color monitor
- External 14.4-kbps fax modem

Price: \$1,399

CHOOSING THE RIGHT MAC

THE SCHOLARS



Belle Curve, 18 / college freshman, liberal-arts major

WHY BUY? "My uncle offered me his old electric typewriter to take to school. Yeah, right. Like I'm really going to sit there with my little bottle of white-out, blotting out typos page-by-page. Who do I look like, Wilma Flintstone? Get real. I've been using computers since seventh grade."

PLANNED COMPUTER USES. Write term papers, do research online and with reference CD-ROMs. Practice French lessons with CD-ROM-based tutor. Hook into campus mainframe. Exchange e-mail via the Internet with high-school buddies who are now at faraway colleges. Beg parents for money via e-mail.

PURCHASE CONSTRAINTS. Belle's got to keep her entire computer cost — CPU, monitor, printer, and software — under \$3,000. Her parents say this computer is the last one they'll buy her, so she needs it to have a decent life span.

RECOMMENDED SYSTEM. Apple Performa 5215CD

WHY. The 5215CD's all-in-one design is tailor-made for a cluttered dorm room. With the monitor built right into the chassis, Belle has minimal cable spaghetti to contend with. And moving the computer from dorm to home to apartment is no problem.

This computer's a champ on the inside too. It's speedy enough to handle Belle's assignments, and the onboard

geared for younger kids, she'll get good mileage from the included dictionary and atlas. Oh — the games may prove useful too.



RECOMMENDED SYSTEM

Apple Performa 5215CD

- 75-MHz PowerPC 603 processor
 - 8 MB of RAM
 - 1-GB hard drive
 - 4x CD-ROM drive
 - 15-inch color monitor
 - 14.4-kbps fax modem
- Price:** \$2,199

RECOMMENDED ADD-ONS

- Personal inkjet printer
- External speakers
- Apple TV/Video System

Estimated price of add-ons: \$600

PowerPC processor will be ready for Apple's forthcoming Copland operating system.

Since Belle, like most other college kids, can look forward to cramped living quarters, buying the listed add-ons can let the Mac take the place of several dorm *de rigueurs*. Unmodified, out of the box, the computer will double as an answering machine; add decent speakers, and the Mac becomes a fine audio-CD player. And with the Apple TV/Video System, Belle can watch Letterman — or *Masterpiece Theater*, Mom — right on the computer screen and even capture and edit video snippets for use in multimedia term papers.

Bundled software will help Belle stay within her budget: ClarisWorks is more than powerful enough to generate any college report, and although many of the 5215CD's programs are

For the best deal, Belle ought to purchase her computer from her campus computer store, which may be able to pass along special pricing and software bundles aimed at students (the price we show here is what she'd pay in a computer superstore or electronics store). If her school doesn't sell computers, she should call Apple's Campus Direct sales program (800-780-5006) and investigate the always changing, and often terrific, deals Apple offers students.

DRAWBACK. The relatively slow modem is OK for cruising commercial online services and for exchanging e-mail, but if Belle's dependent on the modem for Internet access, she'll definitely want to upgrade. Conversely, if her school offers a faster Internet connection via Ethernet, she may *still* have to buy a new modem, because the 5215's Ethernet card (\$149) displaces the built-in internal modem.

ACADEMIC ALTERNATIVES

Mac to School / *primary-grade computer lab*

WHO. Belle's aunt teaches fourth grade at a financially strapped elementary school and is on the purchasing committee for the school's small computer lab. She's in luck — Apple offers special discounts and hardware/software bundles to school districts.

RECOMMENDED SYSTEM. Apple Macintosh LC 580

WHY. The LC 580 is a solid performer at a low price, enabling schools on tight budgets to

introduce their students to computers. Its all-in-one design, with the monitor and CPU housed in a single case, is particularly convenient for computer labs. Teacher training and materials are available separately. If Belle's aunt wants to purchase a computer for home use, she should contact Apple's Educator Advantage (800-800-2775), where she'll find great deals for K–12 educators.

DRAWBACKS. The processor and



CD-ROM drive are slow, and the monitor is on the small side by today's standards.

RECOMMENDED SYSTEM

Apple Macintosh LC 580

- 33-MHz 68LC040 processor
- 8 MB of RAM
- 800-MB hard drive
- 2x CD-ROM drive
- 14-inch color monitor
- Keyboard

Price: \$1,349 (Apple offers bulk discounts)

Bundled with elementary reference software titles: \$1,549

Bundled with Early Language Connections software titles: \$1,999

Publish-or-Perish Portable / *prof on the move needs mobile power*

WHO. Belle's academic advisor, literature professor Dee Construct, needs a computer to do online research; track students' grades; argue with far-flung colleagues via e-mail; and, most important, work on her latest monograph. The computer must accompany Dee everywhere — office, library, home, and her favorite coffeehouse.

RECOMMENDED SYSTEM. Apple

PowerBook 190

WHY. The 190 lets Dee be ready whenever a flash of genius strikes. Now that she's got her latest manuscript on the PowerBook, her briefcase is considerably lighter. If only the computer could tackle that heap of paper in her office.

DRAWBACKS. Can't add an internal CD-ROM drive. Portability jacks up the price.



RECOMMENDED SYSTEM

Apple PowerBook 190

- 33-MHz 68LC040 processor
 - 8 MB of RAM
 - 500-MB hard drive
 - 10.4-inch backlit dual-scan grayscale display (16 grays)
- Price:** \$1,900

RECOMMENDED ADD-ONS

- 15-inch color monitor
 - 28.8-kbps fax-modem card
- Estimated price of add-ons:** \$700

The Brainy Boyfriend / *engineering tasks require flexible muscle*



RECOMMENDED SYSTEM

Power Computing PowerWave 604/120

- 120-MHz PowerPC 604 processor
- 16 MB of RAM
- 1-GB hard drive
- ATI graphics card with 2 MB of VRAM
- Keyboard

Price: \$3,150

RECOMMENDED ADD-ONS

- 15-inch color monitor
 - 28.8-kbps external fax modem
- Estimated price of add-ons:** \$750

WHO. Belle's first-semester beau, Dexter, is an engineering grad student who needs a computer to handle serious number analysis and complex scientific modeling. He also writes his own programs and wants to have enough horsepower to handle whatever he might throw at it. He's got a stash of grant money, so he can afford the computer he needs.

RECOMMENDED SYSTEM. Power Computing PowerWave 604/120

WHY. Many specialized, small-market data-acquisition cards, in fields such as medical imaging and gas chromatography, are available only as NuBus cards and are unlikely to appear in PCI versions. Yet investing in a NuBus-only machine closes off the promised speed boost and lower prices of PCI cards. The PowerWave offers NuBus as

well as PCI slots, so Dexter gets the best of both worlds, along with a blazingly fast CPU boosted by a Level 2 cache.

DRAWBACK. Power's Stargate technology, for combining NuBus and PCI slots on the same board, is brand-new and unproven.

Used-Mac Option

RECOMMENDED SYSTEM

Apple PowerBook 520

- 25-MHz 68LC040 processor
 - 4 MB of RAM
 - 240-MB hard drive
 - Grayscale screen
 - Built-in Global Village PowerPort
 - Platinum 19.2-kbps fax modem
- Used price:** \$1,350

WHY. Without any bells and whistles, the 520 offers zippy performance on all basic academic tasks, from calculating test grades to cranking out essays and poems. It's speedy, small, and light enough

to tote around campus in a backpack. Video-out capabilities mean you can hook the 520 up to a desktop monitor, and built-in Ethernet is set to connect to the college network. Finally, when you've saved enough pennies, you can upgrade the 520 to PowerPC.

DRAWBACKS. Theft is a very real risk with any portable computer, especially in a dorm. Buying a used PowerBook is inherently risky — you never know what these machines have been through. The passive-matrix screen is tough on the eyes over extended periods.

CHOOSING THE RIGHT MAC

THE CREATIVE MAC



RECOMMENDED SYSTEM

Apple Power Mac 9500/132

- 132-MHz PowerPC 604 processor
- 32 MB of RAM
- 2-GB hard drive
- 4x CD-ROM drive

Price: \$5,999

RECOMMENDED ADD-ONS

- Keyboard
- 21-inch color monitor
- 24-bit accelerated-graphics card
- Photoshop-accelerator card
- Fast-Ethernet adapter card
- Fast-and-Wide SCSI-2 adapter
- 64 MB of RAM (two 32-MB DIMMs)

Estimated price of add-ons: \$9,000

Art Deco, 29 / designer, Entertainment Life magazine

WHY BUY? "Six years ago, our magazine was among the first to toss out the waxers and pasteup boards and go digital with some then-blazing Macs — IIfx's and IIfi's. Now, my buddies at other magazines haze me about our prehistoric hardware. Sure, we've put in some upgrade cards and accelerators, but even those are now old. I hate waiting for complex spreads to open in QuarkXPress. I'm tired of slow redraws. I need a new Mac."

PLANNED COMPUTER USES. Page design, page design, and page design, all day long. Hopping among QuarkXPress, Adobe Illustrator, and Adobe Photoshop. Occasional forays into type-manipulation software to create fancy drop caps and funky-looking headlines. Exchanging files over fast Ethernet with rest of magazine staff.

PURCHASE CONSTRAINTS. Given the magazine's purchasing track record, this is the last new machine Art will see for some time. It's got to last, and Art's boss has finagled sufficient funds for the right machine.

RECOMMENDED SYSTEM. Apple Power Mac 9500/132

WHY. To handle complex manipulations on high-resolution images, Art needs the muscle of the Power Mac 9500's speedy, powerful 604 chip. And the Power Mac 9500's six expansion slots allow Art to install the add-on cards his networked, highly customized production machine needs — a fast-Ethernet card for network file transfers, a video card to drive his 21-inch monitor at a 24-bit color depth, a Photoshop accelerator, and a Fast-and-Wide SCSI-2 adapter for the external hard drive that serves as the magazine's image repository.

When next year's purchasing budget comes through, Art may request a tape drive or magneto-optical drive for installation in one of the 9500's two vacant 3.5-inch SCSI-device expansion bays.

DRAWBACKS. Can't use older NuBus expansion cards without purchase of an external card chassis. Physically difficult to add memory or PCI cards or to swap the processor daughtercard. Can't use SIMMs from older machines; requires purchase of DIMMs (or use of third-party SIMM adapters).

CREATIVE ALTERNATIVES

Image Magician / *prepress pro wants Photoshop to fly*

WHO. Art sends all his photo retouching work to Michelle, a one-woman service bureau who cleans up the large, four-color files, working almost exclusively in Adobe Photoshop.

RECOMMENDED SYSTEM. Power Computing PowerWave 604/150

WHY. The PowerWave 604/150 boasts the fastest shipping PowerPC chip, which will without a doubt be handy for processor-intensive Photoshop work. The 604 chip is on

a daughtercard, so when faster chips become available, it'll be easy just to pop one into the PowerWave.

Of more immediate value to Michelle is Power Computing's proprietary Stargate technology, which lets the PowerWave accommodate NuBus as well as PCI cards. That means Michelle can squeeze some extra mileage out of her aging NuBus graphics-accelerator and Photoshop-accelerator cards



until she can spring for newer, faster PCI cards.

DRAWBACK. Unproven Stargate technology.

RECOMMENDED SYSTEM

Power Computing PowerWave 604/150

- 150-MHz 604 PowerPC processor
 - 24 MB of RAM
 - 2-GB hard drive
 - 4x CD-ROM drive
 - ATI graphics card with 2 MB of VRAM
 - Two-NuBus/two-PCI-slot configuration
- Price: \$5,000

RECOMMENDED ADD-ONS

- 21-inch color monitor
 - 24-bit accelerated-graphics card
- Estimated price of add-ons: \$4,000

Multimedia Developer / *pixel pusher wants Mac with workstation power*

WHO. Art's design-school roommate, Sol, followed a different route after graduation: He's employed at a successful multimedia-development company. There he creates and edits video clips, 3-D graphics, and animations. He pulls up high-resolution photos and morphs them, recolors them, and rearranges their pixels. Until now, he wouldn't have been able to do this kind of CPU-intensive work on a Mac and his company would

have been taking out a bank loan to purchase an SGI workstation.

RECOMMENDED SYSTEM. DayStar Genesis MP

WHY. With not one, but four, PowerPC chips at its core, the Genesis MP has the potential to become the world's fastest Mac, at least at compute-intensive tasks such as 3-D rendering, blurs, and a variety of distortion effects — the sort of stuff Sol sometimes waits days to complete. The new Genesis



MP promises to reduce that downtime considerably.

DRAWBACK. Few programs can tap the Genesis MP's full power yet.

RECOMMENDED SYSTEM

DayStar Genesis MP

- Four 132-MHz PowerPC 604 processors
 - 32 MB of RAM
 - 2-GB hard drive
 - 4x CD-ROM drive
- Price: \$14,999

RECOMMENDED ADD-ONS

- Keyboard
 - 21-inch color monitor
 - Graphics-accelerator card
- Estimated price of add-ons: \$4,200

Presentation Producer / *taking control of sound, video*



RECOMMENDED SYSTEM

Apple Power Mac 8500

- 120-MHz PowerPC 604 processor
 - 16 MB of RAM
 - 2-GB hard drive
 - 4x CD-ROM drive
- Price: \$4,499

RECOMMENDED ADD-ONS

- Keyboard
 - 17-inch color monitor
- Estimated price of add-ons: \$850

WHO. Another of Art's college buddies took the corporate route after graduation. C. B. works for an in-house production department at a Fortune 500 company, where she's often called on to produce slick investor-relations presentations and corporate training materials. Output is often on videotape, but slides and on-screen presentations are also included.

RECOMMENDED SYSTEM. Apple Power Mac 8500

WHY. The AV subsystem on the 8500 is its claim to fame. Straight out of the box, it supports capture, display, editing, and output of full-motion, 24-bit video and CD-quality audio. The DAV 2 expansion slot lets you add third-party video-compression hardware. And the

processor is on a separate card, so upgrading to a faster chip is, literally, a snap.

DRAWBACKS. Physically difficult to access innards. Old SIMMs won't work in 8500.

Used-Mac Option

RECOMMENDED SYSTEM

Apple Quadra 840AV

- 33-MHz 68040 processor
 - 16 MB of RAM
 - 500-MB hard drive
 - CD-ROM drive
 - Keyboard
- Used price: \$1,875

RECOMMENDED ADD-ON

- 21-inch color monitor
- Estimated price of used add-on: \$2,000

WHY. The upshot of the waning days of NuBus is that older NuBus cards can be purchased cheaply, packed into a powerful 68040-

based Mac such as the Quadra 840AV, and used to create a formidable graphic-arts workstation. The Quadra 840AV's DSP (digital-signal processor) architecture accelerates a variety of Photoshop tasks and supports digital-audio and -video recording. Apple has announced it will offer an 8100/80AV logic-board upgrade for the 840AV (about \$1,200).

DRAWBACKS. Lack of PowerPC chip means slower performance on potent PowerPC-native applications. Low-capacity hard drive.

CHOOSING THE RIGHT MAC

DOWN TO BUSINESS



RECOMMENDED SYSTEM

Apple Power Mac 7500/100

- 100-MHz PowerPC 601 processor
- 16 MB of RAM
- 1-GB hard drive
- 4x CD-ROM drive

Price: \$2,999

RECOMMENDED ADD-ONS

- Keyboard
- 17-inch color monitor
- 28.8-kbps fax modem

Estimated price of add-ons: \$1,100

Ivana Profit, 42 / *product manager, Nifty Widget Co.*

WHY BUY? "Meetings with the marketing staff, strategic-planning sessions, ad-design consults, budget battles — I've got precious little time at my desk. Who has time to futz with a poky, underpowered computer? It's time to upgrade so my computer can keep up with me."

PLANNED COMPUTER USES. Number crunching, creating and playing back multimedia presentations, report writing, project scheduling. Ivana often likes to run several applications concurrently. And who knows what new uses may arise? Next week, Ivana may need to jump into teleconferencing.

PURCHASE CONSTRAINTS. It's a headache to navigate the capital-appropriations procedures for a new machine, so Ivana wants to make sure her new computer has plenty of room to grow. Her new Mac has to incorporate state-of-the-art technology and be easy to upgrade.

RECOMMENDED SYSTEM. Apple Power Mac 7500/100

WHY. Apple's Power Mac 7500 offers Ivana three things she prizes: speed, upgradability, and versatility. Her thousand-plus-cell spreadsheets recalc in an instant, and animated presentations run smoothly.

Three PCI slots put this machine on the technological cutting edge; the processor is what will become obsolete first, in a few years. She's covered there — the processor's on a daughtercard, so upgrading will mean a simple card swap. Furthermore, the 7500's newly designed chassis makes its logic board and other innards extremely accessible. If Ivana's calendar weren't so full, she could see for herself that installing an add-in card in a Power Mac 7500 is actually *enjoyable*.

Plenty of RAM lets Ivana keep several applications open at once, making it easy to refer to detailed spreadsheet data while she cranks out weekly financial-status reports. The roomy hard disk is far from filled, even after Ivana loads her varied applications. Built-in video-in ports let her transfer snippets of proposed TV commercials to use in computer-based presentations. And, with Apple's optional QuickTime Conferencing Kit (\$200), she'll be able to meet face-to-face with colleagues on other floors of her building — without taking the elevator.

DRAWBACKS. The biggest minus of the 7500 is the price tag: about \$1,000 above machines a tier lower. At press time, Apple was still tracking down printing bugs in the 7500's system software.

ALTERNATIVE BUSINESS MACS

No-Frills Efficiency / *administrative assistant gets basic speed*

WHO. Ivana's loyal and efficient assistant, Bob, keeps her organized; manages her schedule with a calendar program; types her letters; sends and receives faxes; and updates and distributes Ivana's presentations and project schedules, accessing them over the office's Ethernet network.

RECOMMENDED SYSTEM. Power Computing Power 100

WHY. If Bob's computer slows him down, Ivana can miss important,

timely information. That means Bob's computer must be speedy. But it doesn't need multimedia razzle-dazzle; as long as Bob can plug into the office network, he's all set. The Power 100 edges out its competition — the Apple 7200 models — by omitting a CD-ROM drive and delivering more processing power for less money.

DRAWBACKS. The Power 100 lacks PCI slots and instead packs older, slower NuBus expansion slots. The



processor is attached to the motherboard, making processor upgrades trickier than for the 7500, for example.

RECOMMENDED SYSTEM

Power Computing Power 100

- 100-MHz PowerPC 601 processor
 - 8 MB of RAM
 - 540-MB hard drive
 - Keyboard
- Price:** \$1,699

RECOMMENDED ADD-ONS

- 15-inch color monitor
 - Ethernet 10BASE-T connector
 - Fax modem
- Estimated price of add-ons:** \$775

Demanding Mucky-Muck / *a system for an exec who craves power*

WHO. Ivana's boss's boss, Napoleon, has assigned Ivana the dubious honor of recommending his next Mac. From what she knows about his job, she's certain he doesn't need the AV features of Apple's 7500 and she knows that a 120-MHz processor will satisfy even Napoleon's craving for power. She's left, then, to debate whether to be frugal and get a NuBus system or ride the cutting edge by suggesting a costlier PCI box.

RECOMMENDED SYSTEM. Power Computing PowerWave 604/120

WHY. Ivana feels that the PowerWave 120 is an ideal executive-class computer. Its main processor is on a daughtercard, for easy upgrades; it comes equipped with a performance-boosting Level 2 cache; and it ships with Microsoft Office. She also decides to save \$250 by forgoing the NuBus/PCI option and betting on PCI as solid, promising technology. When she



explains this to Napoleon, he praises her foresight.

DRAWBACK. The PCI/NuBus flexibility is untried technology.

RECOMMENDED SYSTEM

Power Computing PowerWave 604/120

- 120-MHz PowerPC 604 processor
 - 16 MB of RAM
 - 1-GB hard drive
 - ATI graphics card with 2 MB of VRAM
 - Keyboard
 - Three-PCI-slot configuration
- Price:** \$3,150

RECOMMENDED ADD-ON

- 17-inch color monitor
- Estimated price of add-on:** \$800

The Go-Between / *straddling the Mac/PC divide*



RECOMMENDED SYSTEM

Apple Power Mac 7200/90

- 90-MHz PowerPC 601 processor
 - 8 MB of RAM
 - 500-MB hard drive
- Price:** \$1,899

RECOMMENDED ADD-ONS

- Keyboard
 - 15-inch color monitor
 - Orange Micro 420-series PCI card
 - Level 2 cache card
- Estimated price of add-ons:** \$1,800

WHO. Ivana's financial-planning manager, Jason, provides up-to-date profit-and-loss statements for Ivana's product-management team. He's also in charge of providing his team's profit estimates to the parent corporation and must use a custom-built, DOS-based application to do so. He spends about 30 percent of his time in DOS.

RECOMMENDED SYSTEM. Apple Power Mac 7200/90

WHY. Jason's day-to-day duties, which focus on dollars and cents, don't require enormous processing power. What he *does* need is zippy DOS performance, so Jason opts for a hardware approach rather than software-based PC emulation. PCI-based cards are speedier than NuBus cards, so

Jason picks Orange Micro's 420 card, a PCI card sporting a 66-MHz 486 processor and 8 MB of RAM. Always the bean counter, he forgoes Apple's speediest PCI

machine and settles for a more economical business-class system.

DRAWBACK. Difficult to upgrade processor, since it's not on a daughtercard.

Used-Mac Option

RECOMMENDED SYSTEM

Apple Quadra 610

- 25-MHz 68040 processor
 - 8 MB of RAM
 - 230-MB hard drive
 - Keyboard
- Used price:** \$700

RECOMMENDED ADD-ON

- 15-inch color monitor
- Estimated price of used add-on:** \$150

WHY. The Quadra 610 is a workhorse. It's no match for a PowerPC-based machine, but it is more than adequate for many business tasks. Built-in Ethernet provides an easy fit into most offices, and in case PowerPC power becomes necessary, a now-discontinued 6100/60 logic-board upgrade is still available from dealers (about \$1,100).

DRAWBACKS. The processor is relatively slow. Room for just one expansion card (PDS or NuBus). Low-capacity hard drive.

ALTERNATIVE BUSINESS MACS, CONTINUED

Salesperson Unplugged / *making a case on the road*

WHO. Wanda, the top salesperson in Ivana's division, uses any available tool to convey her message to her clients, including multimedia presentations with jazzy sound and snazzy animated graphics. She's on the road constantly, so she also relies on her computer for more-mundane tasks such as faxing and e-mailing and keeping a customer database.

RECOMMENDED SYSTEM. Apple PowerBook 5300c

WHY. The 5300 is a snappy business-productivity computer, and presentations will look terrific on its active-matrix color screen. Wanda could have saved \$1,000 by opting for a dimmer passive-matrix screen, but she can't be sure every client will have a spare monitor impressive enough for her presentations. Many of her pitches are created in the Promotions Department, and — thanks to the 5300's infrared transceiver and a desktop



RECOMMENDED SYSTEM

Apple PowerBook 5300c

- 100-MHz PowerPC 603e processor
- 16 MB of RAM
- 750-MB hard drive
- Price: \$4,499

RECOMMENDED ADD-ON

- 28.8-kbps fax-modem card
- Estimated price of add-on: \$300

IR receiver — she can transfer them to her PowerBook easily.

DRAWBACKS. The active-matrix

screen hogs battery power; spare batteries are a must. Can't accommodate an internal CD-ROM drive.

Convenience Unleashed / *new business needs room to grow — without hassle*

WHO. Ivana's younger sister, Maura, is launching an upscale dog-grooming business. She's no computer whiz — she cares far more about bites than bytes — but she needs a Mac for maintaining a customer list, performing accounting, producing invoices, and perhaps producing handbills to pass out at dog shows. She'll consider her computer purchase a success if the computer works out of the box and she doesn't have to think about new computer hardware or software for at least the next few years.

RECOMMENDED SYSTEM. Apple Performa 6300CD

WHY. The Performa 6300 was designed for home users, but its powerful 100-MHz processor and generous software bundle make it a fine first Mac for business. Convenience is the concept here. Nearly everything Maura needs — hardware and software — comes in a single package. Heck, she could go to her local computer reseller on her way back from the kennel, purchase the system, set it up, and produce her first memo in less than an hour. The 6300CD — the most



RECOMMENDED SYSTEM

Apple Performa 6300CD

- 100-MHz PowerPC 603e processor
- 16 MB of RAM
- 1.2-GB hard drive
- 4x CD-ROM drive
- 15-inch color monitor
- 28.8-kbps internal fax modem
- Price: \$2,799

muscular Performa ever — is powerful enough to handle her fairly predictable computing needs. Plenty of RAM, hard-disk space, and speed ensure that she won't have to worry about the care and

feeding of her Mac for years to come.

DRAWBACK. The processor is attached directly to the motherboard, so upgrading will be difficult, if not impossible.

Quantitative Quality / *sophisticated number crunching demands processing muscle*

WHO. For assistance mapping out a strategic-marketing plan for her product, Ivana relies on her company's management-information

director, Mark, who analyzes sales records, industry statistics, demographic data, and economic indicators to uncover potential sales.



RECOMMENDED SYSTEM

Power Computing Power 120 minitower

- 120-MHz PowerPC 601 processor
- 16 MB of RAM
- 2-GB hard drive
- Internal Iomega Zip drive
- Keyboard
- Price: \$3,438

RECOMMENDED ADD-ONS

- Accelerated-graphics card
- 17-inch color monitor
- 10BASE-T Ethernet connector
- Estimated price of add-ons: \$2,500

RECOMMENDED SYSTEM. Power Computing Power 120 minitower

WHY. Serious number crunching needs serious power — and a 120-MHz 601 processor offers plenty. Its speed will help when Mark's trying to analyze multivariable relationships while three product managers wait — impatiently — for information. A Zip drive is

handy for archiving reports.

DRAWBACKS. No PCI. Minimal built-in color bit depth supported, although this shouldn't be a problem for data crunching.

Used-Mac Option

RECOMMENDED SYSTEM

Apple Power Mac 6100/60

- 60-MHz PowerPC 601 processor
- 8 MB of RAM
- 250-MB hard drive
- Keyboard
- Used price: \$950

RECOMMENDED ADD-ON

- 15-inch color monitor
- Estimated price of used add-on: \$150

WHY. Getting a used 6100/60, the original entry-level Power Mac, is a great, inexpensive way to hop on the PowerPC bandwagon. Newer, faster models put strong downward pressure on the price, making this a terrific bargain.

DRAWBACKS. Older NuBus slots instead of newer, faster PCI slots. Upgrade prospects appear poor. Low-capacity hard drive.

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Find your Mac

find the upgrade path

MAC MODEL	PATH
Any compact Mac	12
II	12
IIx	12
IIcx	1
IIci	1
IIfx	12
IIsi	1
IIvx	1, 2
IIvi	1, 2
LC	3
LC II	3
LC III	3
LC 475	3
LC 520	4
LC 550	4
LC 575	4
LC 580	4
LC 630	4, 10
MacTV	12
Performa 275	12
Performa 470 series	3
Performa 550	4
Performa 560	4
Performa 570 series	4
Performa 600	1
Performa 630 series	4, 10
Performa 5200 series	10
Performa 6100 series	12
Performa 6200 series	10
Centris 610	5
Centris 650	6
Centris 660AV	7
Quadra 605	3
Quadra 610	5
Quadra 630	4, 10
Quadra 650	6
Quadra 660AV	7
Quadra 700	8
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Quadra 900 series	8
Power Mac 5200	10
Power Mac 6100	12
Power Mac 6200	10
Power Mac 7100	12
Power Mac 7200	11
Power Mac 7500	13
Power Mac 8100 series	9
Power Mac 8500	13
Power Mac 9500 series	13

THE PATHS TO

Your 680x0 Mac is starting to show its age. It's served faithfully, but you're tired of watching friends' PowerPC-native applications blaze. And you suspect (justifiably) that Apple won't be supporting 680x0 machines in future system-software rollouts.

The time has come to upgrade to a PowerPC processor. But with all the upgrade cards, processor swaps, and motherboard replacements, which path do you take? Use these charts to find the upgrade options for your Mac. Find your Mac in the list on the left, and note the path number we've assigned it. Then find the box with the corresponding path number to see how you can upgrade your Mac.

A couple of caveats: Be aware that your older Mac may not perform as speedily as Power Macs with similar processors, owing to older data-bus architectures, slower hard drives and video cards, and so on. Also, know that although upgrade cards will let you use PowerPC-native software, they *won't* let you run Copland, Apple's upcoming PowerPC-only operating system, which will work only on Macs that have PowerPC chips *on the motherboard*.

Finally, be aware that Apple has dropped logic-board upgrades to Power Mac 6100, 7100, and 8100 status from its price list. There are still a few floating around at dealerships, but if you want one, find it fast and buy it.

PATH 1

PREREQUISITE: Upgrade to IIci.

POWERPC UPGRADE: DayStar 100-MHz Turbo 601 (\$1,299) or 66-MHz Turbo 601 (\$899).

TYPE: PDS card.

PROCESSOR: 100- or 66-MHz PowerPC 601.

NOTES: System 7.5 is required by, but not included with, these cards; it'll cost an extra \$98 to buy System 7.5 from Apple.

These cards are user-installable — just plug one into your Mac's PDS. Comes with a 256K cache. A supplied control panel lets you switch between the PowerPC processor and the motherboard's 68030 processor.

PATH 2

UPGRADE: Apple Power Mac 7100 motherboard (\$1,599).

TYPE: Motherboard replacement.

PROCESSOR: 80-MHz PowerPC 601.

NOTES: Requires dealer installation (about \$50). Once you get the 7100 motherboard, you'll probably want to add more RAM as well. Be sure to get the L2 cache — it's well worth the extra \$125 to \$260.

PATH 3

PREREQUISITE: Upgrade Performa- and LC-class Macs to Performa 475/LC 475.

POWERPC UPGRADE: Apple 50-MHz Processor Upgrade (\$659); DayStar 100-MHz PowerCard (\$999) or 50-MHz PowerCard 601 (\$649).

TYPE: Processor replacement.

PROCESSOR: 100- or 50-MHz PowerPC 601.

NOTES: These upgrade processors replace the 68040 chip on your system's motherboard. The Apple upgrade must be installed by a dealer (about \$50); it includes System 7.5 and ClarisWorks 3.0. The DayStar upgrade, which includes System 7.5, is sold as a do-it-yourself kit, with tools and instructions. But beware: Installation can be tricky.

UPGRADES

By Roman Loyola

PATH 4

PREREQUISITE: Upgrade Performa- and LC-class Macs to Performa 575/LC 575 or better.

POWERPC UPGRADE: Apple 66-MHz Processor Upgrade (\$659); DayStar 100-MHz PowerCard 601 (\$999) or 66-MHz PowerCard 601 (\$649).

TYPE: Processor replacement.

PROCESSOR: 100- or 66-MHz PowerPC 601.

NOTES: These upgrade processors replace the 68040 chip on your system's motherboard. The Apple upgrade must be installed by a dealer (about \$50); it includes System 7.5 and ClarisWorks 3.0. The DayStar upgrade, which includes System 7.5, is sold as a do-it-yourself kit, with tools and instructions. But beware: Installation can be tricky.

PATH 5

POWERPC UPGRADE: DayStar 100-MHz PowerPro 601 (\$1,299) or 40/50-MHz PowerPro 601 (\$529); Apple Power Mac 6100 motherboard (\$1,049).

TYPE: The DayStar upgrades are PDS cards. The Apple upgrade is a motherboard replacement.

PROCESSOR: The DayStar cards use a 100-, 50-, or 40-MHz PowerPC 601 processor. The 6100 motherboard contains a 66-MHz PowerPC 601.

NOTES: The 100-MHz DayStar card works at 80 MHz in the Centris 610. It requires System 7.5 (not included — \$98); a NuBus-card adapter (\$79) is also required. An included control panel lets you switch between the PowerPC processor and the motherboard's 68040 processor. The 6100 motherboard comes with 8 MB of soldered-on RAM and two 72-pin DRAM SIMM slots.

PATH 6

UPGRADE: DayStar 100-MHz PowerPro 601 (\$1,299); Apple 7100 motherboard (\$1,599).

TYPE: The DayStar upgrade is a PDS card. The 7100 motherboard comes with an 80-MHz PowerPC 601.

PROCESSOR: 100- or 80-MHz PowerPC 601

NOTES: The DayStar card is user-installable. It requires, but doesn't ship with, System 7.5 (\$98 from Apple). An included control panel lets you switch back and forth between the PowerPC processor and the motherboard's 68040 processor. The 7100 motherboard must be installed by a dealer (about \$50). Be sure to get the L2 cache — it's well worth the extra \$125 to \$260.

PATH 7

UPGRADE: Apple Power Mac 6100 motherboard (\$1,049).

TYPE: Motherboard replacement.

PROCESSOR: 66-MHz PowerPC 601.

NOTES: The 6100 motherboard uses a PowerPC 601 processor and comes with 8 MB of soldered-on RAM and two 72-pin DRAM SIMM slots.

PATH 8

UPGRADE: DayStar 100-MHz PowerPro 601 (\$1,299) or 50/66-MHz PowerPro 601 (\$529).

TYPE: PDS card.

PROCESSOR: 100-, 66-, or 50-MHz PowerPC 601.

NOTES: The DayStar cards are user-installable and require, but do not ship with, System 7.5 (\$98 from Apple). A control panel lets you switch between the PowerPC processor and the motherboard's 68040 processor.

PATH 9

UPGRADE: Apple Power Mac 8500 motherboard.

TYPE: Motherboard replacement.

PROCESSOR: 120-MHz PowerPC 604.

NOTES: The 8500 motherboard gets you a PowerPC 604 on a daughterboard, meaning that future processor upgrades should be as easy as swapping a board (and not necessarily from Apple). Quadra 800-series owners can take half a step up and upgrade to a Power Mac 8100, for \$1,999. Availability and price are yet to be determined.

PATH 10

UPGRADE: Apple Power Mac 5300/6300 motherboard (\$699 to \$799).

TYPE: Motherboard replacement.

PROCESSOR: 100-MHz PowerPC 603e.

NOTES: Comes with 1 MB of VRAM. Requires installation by dealer (about \$50). Performa 630 owners will need to buy more RAM. This upgrade won't be available until early 1996.

PATH 11

UPGRADE: Apple Power Mac 7500 motherboard.

TYPE: Motherboard replacement.

PROCESSOR: 100-MHz PowerPC 601.

NOTES: Requires dealer installation (about \$50). The 7500 motherboard has the processor on a daughterboard to make future processor upgrades simple. Availability and price are yet to be determined.

PATH 12

You're out of luck: There aren't any upgrade paths for these machines. Pony up for a new PowerPC-based system; to get extra speed, try Connectix's Speed Doubler (\$55); or add more RAM. For Power Mac models, you might also try adding a Level 2 cache (\$125 to \$260); using a clock accelerator from Newer or Alacritty (each about \$100 to \$300); or if you can find one, try a PowerPC 604-based Total Power application-accelerator card (about \$1,500, from Total Impact).

PATH 13

These machines are part of the current Macintosh line and are too current to have an upgrade path. Since their processors are on daughterboards, upgrading the processors will simply involve a daughterboard swap. And instead of having only one source (Apple) for getting new processors, you can expect third-party vendors to offer solutions. If you need extra speed now, you can use Connectix's Speed Doubler (\$55) or any of the clock accelerators from various vendors or you can add more RAM.

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THE SMART SHOPPER



YOU'VE DONE THE RESEARCH. YOU'VE GOT THE MONEY.
YOU'RE FINALLY READY TO BUY A COMPUTER . . . OR
ARE YOU? **By Nikki Echler**

Believe it or not, figuring out *where* to buy your Mac may be just as important — and just as difficult — as deciding which one to buy. Should you go to the superstore downtown that seems to have *everything*, or should you drive directly to your local dealer? Depending on your needs, you may not even need to leave the comfort of your home.

Mac compatibles from DayStar Digital, Power Computing, and Radius are sold at only a few types of outlets, making your decision on where to buy such systems fairly easy. But Apple's Macs are sold in an ever-increasing variety of places nationwide. To help you sort through this array of outlets, we've grouped stores into seven kinds — local dealers, superstores, value-added resellers, mail-order companies, campus stores, refurbishers, and online stores — based on characteristics they have in common. We'll tell you what to expect and what *not* to expect from each type of store, in terms of service, pricing, and selection. In the end, you'll know where to shop, based on your particular needs, and how to get the best deal.

CHOOSING THE RIGHT MAC

WHAT IT MEANS TO BE APPLE-AUTHORIZED

In order to sell Macs, a store must be *authorized* by Apple. In other words, it must comply with a host of restrictions and regulations. But different types of stores apply those rules in different ways. For example, although all Apple-authorized resellers must offer customer service, the level of service varies — from simply sending Macs under warranty back to Apple for repair to providing on-site installation and troubleshooting. (*Reseller* is a general term used to describe any vendor that sells Macs.)

In order to become Apple-authorized, a reseller must purchase at least \$500,000 worth of Apple products per year. Most resellers can choose to buy directly from Apple or through distributors. The price difference to the reseller is minimal, however, unless it sells \$5 million worth of Apple products a year. Mass merchandisers (generally large national chains such as CompUSA) that deal in such volume pay Apple's B-level prices, which are discounted 3 to 5 percent by Apple. They then pass these savings on to consumers. Everyone else either pays A-level prices or buys from a

distributor that offers a price point somewhere between the A- and B-level ranges.

Resellers must also abide by Apple's minimum-advertised-pricing policy. This means that if a store advertises a sale price below Apple's established price for a specific product, the store forfeits the co-op fund that Apple rebates it for that product. The co-op fund is a percentage of each store's sales of each product and can be a significant chunk of change — one that can be quite painful to lose.

Stores have figured out how to get around this policy, however. Most *sell* below the Apple price, even if they don't *advertise* below the set rate. (However, don't expect to get any great deals on hot new models, such as the Power Mac 7500 and 8500, that resellers can't even keep in stock.) Other stores bundle various non-Apple-brand products, such as a monitor and a scanner, with the Mac and then advertise "unbeatable" prices on the whole bundle. Although this scheme prevents Apple from figuring out where the price cuts are coming from, it doesn't always work. If Apple suspects that a store is breaking the rules, it can take away the store's co-op fund, without warning or without explaining why.

SMALL AND FRIENDLY: LOCAL DEALERS

Long ago, before computers became big business, you pretty much had only one option of where to go to buy a Mac — a local dealer. These small, independent stores still

exist, although there are fewer of them now than there were several years ago. Like small-town doctors, local dealers are there to hold your hand, to see you through your time of need. In effect, they care.

Generally knowledgeable and enthusiastic about the Mac, local dealers often sell products that the store owner or manager personally likes and recommends. And although the salespeople at these stores aren't required to take any Apple-sponsored training classes, local dealers breed informed salespeople almost by default. You are, after all, what you sell.

Many local dealers also double as complete authorized service centers — a real boon if you have any problems with your Mac once you get it home. All new Apple products are covered by a one-year warranty, but for *immediate* repairs, you have to take your computer to an authorized service center. Otherwise, you must either send your Mac back to Apple or, if you're covered by an on-site service warranty such as the one included with Performas, wait for Apple to come to you.

But although local dealers generally offer excellent service, you won't get rock-bottom prices from these stores. That's because most local dealers do not move large amounts of inventory and therefore do not receive Apple's top discounts. In our experience, however, local dealers can often come close to matching the prices offered by superstores.

BUYING FROM BOZOS / 10 stupid things our salesman said

YOU'D BE SAFER buying a Mac from a monkey than from several of the salespeople we met. We could hardly believe our ears in some cases. Here are some of the more entertaining statements we heard while shopping for a Mac:

1. "How long would we have to wait to take this machine home?"

"You can take it home today, if we have it in stock."

"Well, do you have it in stock?"

"Um, no."

2. "This machine has a multimedia. It is so popular that pretty soon it will probably be impossible to buy a computer without it."

"What is a multimedia?"

"Well, a multimedia plays audio CDs and answers your telephone."

3. [Our salesman as he ran his finger down a feature list]
"This Performa has eight em-bees."

"What's an 'em-bee?"

"Just a second. Let me look it up."

4. "Why is this color printer the same price as the monochrome printer?"

"Because it's been discontinued, and HP shipped us a lot of them."

"Discontinued? Could we still get tech support for it?"

"Of course. It's not officially discontinued. Besides, there are a lot of them out there."

BIG BUT BUSY: SUPERSTORES

Walk down the wide, impersonal aisles of Circuit City or CompUSA. Wind through the dizzying forest of bedspreads and fitted sheets at Sears. Keep going . . . Keep going . . . Eventually you will find the Macs squeezed in between the PCs and the portable phones.

Superstores are broadly defined to include large electronics stores such as Circuit City, mass merchandisers such as Sears, computer superstores such as CompUSA, and warehouse stores such as Costco. You can expect low prices from these Goliaths, but you won't find the same Mac-savvy salespeople that you do at local dealers. Nor will you always find the entire line of Macs. For example, Sears, the Wiz, and Staples carry Performas only.

What makes the superstores most appealing, however, is their convenience. Many towns are not large enough to support a local dealer. Superstores, however, are usually a mere car ride away from Anywhere, USA. These ubiquitous stores also tend to stock a large supply of Macs; you can frequently take the product of your choice home the same day. And many superstores offer extended shopping hours as well as store credit lines, making shopping even more accessible and affordable.

If a local dealer does exist in your area, however, your best bet is to use the superstores for pricing leverage: The hassle involved in getting reliable, quick service at a

superstore isn't worth the minimal savings. Salespeople at superstores must remember the basic selling points for a huge selection of products for Macs and for PCs, and they frequently must help several customers simultaneously.

TARGETING NICHE MARKETS: VARs

Value-added resellers (VARs, for those in the know) sell high-end, custom-configured Macs to specific types of users, such as graphics professionals and small-business owners. Although many VARs operate like regular stores — you can go in on any day and purchase any of the products for sale — they also act as personal consultants, helping you configure your system. Apple also requires VARs to provide installation and ongoing support for the systems they design for you. So, for example, a VAR that specializes in graphic design should be able to recommend, set up, and troubleshoot a system that suits the hefty-RAM, high-speed, and big-screen needs of most graphics professionals. It should also be able to offer useful advice on, say, color-management systems or prepress software and hardware.

Unlike other authorized resellers, VARs must purchase only \$25,000 worth of Apple products per year and they must purchase those products from distributors such as Merisel; Americas, Inc.; and Ingram Micro rather than from Apple itself. And Apple does not allow VARs, unlike other resellers, to sell Performas. But one of the biggest

differences between VARs and other resellers is that VARs are usually not willing to budge on price, even by a nickel.

INEXPENSIVE AND EASY: MAIL-ORDER COMPANIES

If you want rock-bottom prices, then you should start flipping through mail-order catalogs. Mail-order companies can sell Macs for very low prices, because they deal in huge quantities and don't incur the high overhead that storefront sellers do. Also, buying from mail-order companies can often allow you to bypass state sales taxes — money that can score you a modem or a set of stereo speakers.

Although you are legally required to pay your state's sales tax on any product you purchase from an out-of-state mail-order company, most people don't bother coughing up the dough when buying a system for personal use, and no harm ever comes to them. However, because some states are starting to demand their share of the wealth, some mail-order companies are required to collect state sales tax from you. Before choosing a mail-order company, be sure to read the fine print on your order form that tells you whether or not you have to pay state sales tax.

Be forewarned, however, that mail-order companies provide very little assistance in choosing a system. They are even less help if you have installation or repair problems. If you call up a mail-order company to ask a

5. "What's the difference among these three systems?"

"One of them doesn't have a monitor.

[five-second pause]

Actually, it does. It must be something else."

6. "Does this one have sixteen megabytes?"

"Yes."

"Are you sure? It says eight."

"Well, it has RAM Doubler."

7. "What is a CD-ROM?"

"A CD-ROM is something that holds ten hard drives' worth of information."

"What?"

"Uh-huh, but make sure you back your memory up on a floppy."

8. "Which machine do you recommend?"

"The basic model."

"What is the basic model?"

"I don't know. But I can tell you about the 6250."

9.

"Apple isn't going to give us any new machines until we sell the old ones."

"Really?"

"Sure. That is, unless they get desperate."

10.

"You know, to tell you the truth, I don't know much about selling computers."

"Oh, really?"

"Yeah. But my boss . . . now, he's a computer whiz."

/ Rebecca Olson

CHOOSING THE RIGHT MAC

technical question, the representative will most likely forward you to Apple's help line. Also, be aware that although some mail-order companies offer 30-day money-back guarantees, these might not apply to Apple products.

Apple began authorizing companies to sell Macs through the mail only about a year

ago, but many of these mail-order companies — such as MacMall, MacWarehouse, and The Mac Zone — have been in business for years, selling software, hardware, and accessories, and have built up solid reputations. Still, if you purchase a computer from a mail-order company, you should be sure to pay with a credit card so that you'll have some form of recourse if you don't get what you want or if it doesn't make it to your door. We've heard horror stories from people who paid less reputable companies by check and never got their merchandise or who got the wrong product but never got their money back.

FOR COLLEGES ONLY: CAMPUS STORES

Apple offers a special educational discount to college students, staff, and professors that can often save you more money than if you bought from a mail-order catalog. Apple allows each university to have one authorized reseller on its campus that offers the discount. The more Macs a school sells, the higher the discount from Apple and the lower the cost of Macs for students. Savings are always quite good, no matter what the sales levels are, however. You can usually find hardware and software for at least 10 to 20 percent less than you can at any of the other outlets.

TRUE-LIFE TALES / a Silicon Valley shopping extravaganza

CONFUSED BY CONSTANTLY changing computer features? Don't know which Mac to buy? You aren't alone. Chances are, your local computer salesperson is equally befuddled.

That's what we found when we sent two of our editors on a quest to buy a new Mac. Our editors shopped at five types of stores — a local dealer, a consumer-electronics retailer, a computer superstore, a mass merchandiser, and a mail-order house — using the same guise: novice users who wanted to buy a home system after getting jobs in an office that uses Macs. We noted how each type of store fared when it came to ambiance, service, recommendations, postsale support (other than honoring Apple's warranty), pricing, and selection. By comparing the experiences we had in dealing with each type of store, you'll gain valuable insight into the great gamble that is computer shopping.

LOCAL DEALER: COMPUTERWARE

AMBIANCE: Clean and well organized. Packed with Mac products, from computers to Escher mouse pads. Neil Young played on the stereo.

SERVICE: Wandered around for two minutes before a smart, well-informed salesman named "Jeff" came over. Jeff listened to our system criteria and then asked a few detailed questions. Based on our answers, he suggested an appropriate Mac. He also clearly explained the pros and cons of a few alternative systems.

RECOMMENDATIONS: A Performa 631CD. Jeff told us that this all-in-one Mac had everything we needed and was relatively inexpensive. Jeff also mentioned a Power Mac 6100 but said that although it was faster, it might be excessive since we wouldn't be working with graphics. For a printer, he suggested "any lower-priced model from Apple or HP." Jeff suggested that we invest in a set of inexpensive computer speakers too.

POSTSALE SUPPORT: Sure, Jeff would help out, but maybe we should think about buying an extended three-year warranty from General Electric, which covered on-site service (parts and labor) for hardware problems.

PRICING: Performa 631CD, \$1,499; Power Mac 6100, \$1,849; Altec Lansing ACS53 computer speakers, \$79; GE warranty, \$159 to \$179 — depending on the price of the system. Total: \$1,737 to \$2,107.

SELECTION: A well-chosen variety of peripherals, software, and gadgets. The clear omission was a pleasant one: nothing PC-related.

CONSUMER-ELECTRONICS RETAILER: FRY'S

AMBIANCE: Wild West motif carried throughout the store, poorly masking the gray industrial building. Computers were conveniently displayed on a shorn-off, simulated covered wagon. The illusion of a train track was created on the floor by alternating patterns of linoleum. Pop music blared.

SERVICE: Waited five minutes before the chatting group of salesmen disbanded and "Sid" approached us. Sid was willing to help but had to consult a specifications binder every time we asked a question. Eventually, Sid suggested a Performa 6116CD (the system we were physically closest to), but by then he had lost all credibility due to his lack of knowledge and his apparent confusion. "John," his supervisor, overheard and quickly took over. John's knowledge wasn't much better.

RECOMMENDATIONS: To meet our needs, the minimum system we should get would be a PowerPC-based Mac. For economy, our best bet would be a Performa 6200CD. A good printer for our purposes would be either the Apple StyleWriter 1200 or the Hewlett-Packard DeskWriter 660C.



POSTSALE SUPPORT: We could try calling, but that was not their strength.

PRICING: Performa 6116CD, \$1,847; Performa 6200CD, \$2,297; Apple StyleWriter 1200, \$280; HP DeskWriter 660C, \$227. Total: \$2,074 to \$2,577.

SELECTION: Several different systems, both Mac and PC, were displayed. Software selection was extensive as well.

That's the good news. The bad news is that schools are the lowest sellers on Apple's food chain, and when hot items are in short supply, many students are often left waiting for weeks. Even products that are in stock usually require a delivery period. Also, some campus stores offer only a few Macs, leaving you to choose from an anemic price list.

In addition to discount prices for students, Apple also offers loans. Its popular student-loan program dished out \$217 million in 1994. Students can get their hands on money for a Mac in about three days if they meet the requirements for loan approval. A

solid credit line and a \$15,000 annual income are prerequisites for borrowing a minimum of \$1,000 and a maximum of \$10,000. Although the loan requirements may seem steep, students who don't meet them can enlist the aid of a cosigner.

Loan recipients have eight years to repay the loan, at an annual percentage rate of about 13.6 percent. As with most other student loans, students have to pay only the monthly interest while they're taking classes, which comes to about \$11 per month for every \$1,000 borrowed. For more information on the Apple Loan Program, call 800-277-5356.

NEARLY NEW PRODUCTS: REFURBISHERS

If you belong to an Apple-authorized user group, you can take advantage of the User Group Store, a cataloger based in Soquel, California, that sells refurbished and discontinued hardware as well as new Mac software. In the case of Apple products, Apple refurbishes hardware that is flawed or that has been removed from the original packaging (say, for use as a demo machine or as a loan to a developer). Apple then sells these products to the User Group Store.

Originally part of Apple (and known as the User Group Connection), the User



COMPUTER SUPERSTORE: COMPUSA

AMBIANCE: Bright lights, bare rafters, and wide aisles. Packed with people, even on a Saturday evening. Young kids hovered around the Macs, playing games and preventing us from getting close to the displays. Early-'80s pop music was piped in. There were about 3 computer salespeople for every 45 customers.

SERVICE: "Bryan" acknowledged us right away,

but 12 minutes elapsed before he was available to help us. Bryan was knowledgeable and opinionated but also spread way too thin. He helped 4 customers simultaneously, turning his attention only long enough to answer each rapid-fire question. It turned out that this was his hobby — his other gig was teaching computer science.

RECOMMENDATIONS: Don't buy a Power Mac if you're an economically rational person (unless you're planning to do graphics). He compared the Power Mac to a Porsche — excessive if you aren't on the autobahn. Instead, he recommended the Performa 631CD or 638CD. For a printer, he suggested either the HP DeskWriter 660C or the Apple StyleWriter 1200, although he said that the DeskWriter 660C "handled paper" better.

POSTSALE SUPPORT: Bryan would be glad to answer questions, but he worked only two days a week.

PRICING: Performa 631CD, \$1,499; Performa 638CD, \$1,599; HP DeskWriter 660C, \$389; Apple StyleWriter 1200, \$250. Total: \$1,749 to \$1,988.

SELECTION: An extensive selection of peripherals and software for Macs as well as PCs. Boxes full of the displayed peripherals lined the store walls.

MASS MERCHANDISER: SEARS

AMBIANCE: Cavernous and eerily empty of shoppers. No music. Wandered around for five minutes before finding the pea-sized computer section sandwiched between TVs and washing machines. The lone Mac, a Performa, sat on a knee-high table.

SERVICE: Waited ten minutes and then asked a passing employee to find us some help. Our salesman, "Roger," was unfamiliar with even the

most basic computer concepts (see item No. 7 in the "Buying from Bozos" sidebar). When asked how he knew so much about computers, he highlighted Sears' extensive two-week training course.

RECOMMENDATIONS: Ultimately, Roger tried to sell us the only Mac in stock, the Performa 6250. For a printer, he said we had various options but suggested that we call back after he'd looked up information on them.

POSTSALE SUPPORT: Roger strongly encouraged us to buy the costly Sears service guarantee (although he didn't know what it covered).

PRICING: Performa 6250, \$3,000; Sears Service Guarantee, \$300 to \$400 (Roger wasn't sure of the exact price). Total: \$3,300 to \$3,400.

SELECTION: Minimal. One Performa, one PC. Barren of software and peripherals as well.

MAIL-ORDER HOUSE: MACWAREHOUSE

AMBIANCE: None.

SERVICE: Waited on the phone for less than two minutes. "Adam," our salesman, was calm, knowledgeable, and friendly. He gave us some good suggestions on which system to buy. However, we were fortunate — MacWarehouse does not guarantee that its sales staff can help with product recommendations.

RECOMMENDATIONS: The Performa 631CD, which comes with all the basics, except a printer. For a printer, Adam suggested a refurbished HP DeskWriter 560C.

POSTSALE SUPPORT: Toll-free tech-support number.

PRICING: Performa 631CD, \$1,499; HP DeskWriter 560C, \$249. Total: \$1,748.

SELECTION: Wide. MacWarehouse distributes a thick catalog of various computer goods. It's best to call and request a catalog before placing an order. / Rebecca Olson

CHOOSING THE RIGHT MAC

Group Store is now contracted by Apple to sell refurbished hardware. Although the company earns no special discounts from its founder, refurbished goods and discontinued products generally cost much less than equivalent new Macs or peripherals. Buying refurbished can save you anywhere from 30 to 50 percent over what you'd pay for a model that's hot off the assembly line. Shoppers are limited to taking home only two of any product per person, however.

Product selection is based on the recommendations of a council composed of 30 user-group leaders from around the country. If you aren't satisfied with your purchase, you have 30 days to return it and get your money back. Of course, the disadvantage of the User Group Store is that product selection varies quite drastically from

month to month and can sometimes be meager. To find an authorized user group in your area, call Apple at 800-538-9696.

CUTTING-EDGE CONVENIENCE: ONLINE STORES

With the exploding popularity of the Internet, "cyberstores" are appearing on the scene like earthworms after a heavy rain. Unfortunately, Apple has not yet authorized stores to sell new hardware over the Internet. Mail-order companies — such as MacWarehouse — that set up Web sites can advertise new Apple products, but to order them, you still need to pick up the phone and call the company. Cyberstores can, however, sell discontinued Apple products.

Thus, when buying a new Mac, the Internet is more useful as a research tool than as a shopping mall. Browsing through various Mac Web sites can give you a good idea of product prices and of the availability of new as well as used Macs. You can also check up on reseller locations and reputations or tap into a Mac user-group directory, simply by cruising the Net.

WHERE TO FIND THE CLONES

Anyone who's spent an hour on the phone waiting to speak to someone at Apple has gotten the feeling that the company purposely avoids direct human contact. This is definitely the case if you're buying a Mac — Apple does not sell direct. Neither does Radius, which sells its computers through local dealers, VARs, and CompUSA.

Apple's other protégés do deal with the public. DayStar and Power Computing both sell direct. DayStar, however, primarily sells its high-end systems through VARs, which can devote a lot of attention to helping users get their systems running. Power Computing also sells its systems through local dealers, Computer City, and MacMall.

Wherever you do business, you should be sure to do your homework first. The more you know about what you want and where to get it, the more likely you are to leave with a system you'll love. And at a price you can afford. ☞

Nikki Echler is a *MacUser* assistant editor. Research assistant Rebecca Olson also contributed to this article.

THE MAC-BUYING JUNGLE / how not to get ripped off

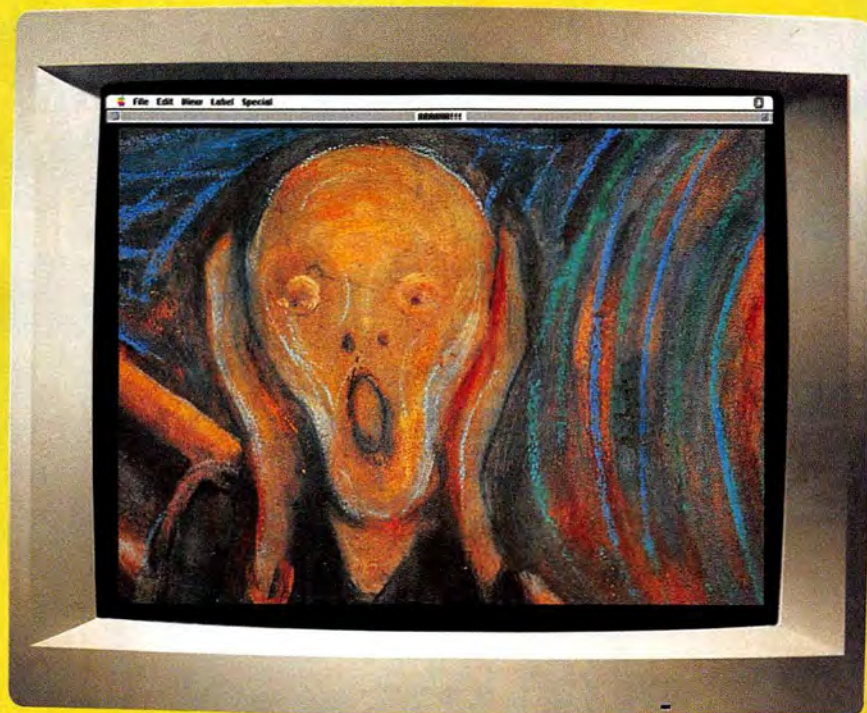
BE PREPARED — that's advice you should take to heart when shopping for a Mac. Many salespeople are honest, upstanding individuals who are just trying to hook you up with the Mac of your dreams. Some, however, may try to take advantage of you, pressure you into buying more than you need, or trick you into purchasing an extended warranty. Here are our top tips for making sure you're treated fairly:

- **DO YOUR RESEARCH.** Know what you want and what it's worth. Check newspaper ads and mail-order catalogs to determine the going rate for the Mac you want — this way you won't be bargaining blindly. Many salespeople will match their competitor's prices rather than lose a sale, so have the ads handy when you're ready to negotiate.
- **BRING A BUDDY.** If you don't feel comfortable confronting a salesperson alone, take along a computer-savvy friend. A friend can help prevent misunderstandings, whether they be on your part or the salesperson's. Besides, it doesn't hurt to have someone along to help carry the boxes to the car.
- **JOIN A USER GROUP.** If you're running short on computer-literate pals, join or consult a local Macintosh user group. More than 2,000 user groups, with over 600,000 members nationwide, meet regularly to discuss the concerns of the Mac community. People this passionate about their computers are generally knowledgeable enough to give you the straight dirt on which Mac to buy and where to buy it.
- **PLAY NICE.** In many stores, the salesperson has the authority to negotiate with customers on a case-by-case basis — so it can literally pay to be pleasant. However, doormats don't get deals. Know what you want, but if

the salesperson asks questions designed to better help you, be cooperative. For example, providing a complete answer if the salesperson asks you how much you plan to spend or what you plan to do with your Mac can get you pointed in the appropriate direction.

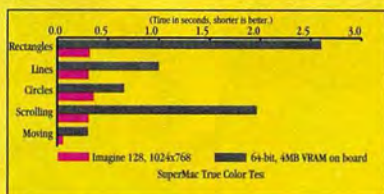
- **DON'T BE AFRAID TO KISS UP EITHER.** An experienced salesperson gave us a line to use that anyone in sales likes to hear, "I found that product X is less expensive at store X, but I really feel comfortable with *you* and would like to work something out with *you* if possible."
- **CHECK OUT A STORE'S REPUTATION.** Consult with friends, colleagues, or local user groups to verify a store's reputation before trusting it with your money. Some stores may advertise low prices, but their salespeople might stick you with inferior parts or poor postsale support. For example, if you request a faster hard drive, a salesperson at a disreputable store might slip you a low-quality drive instead — and you might never know.
- **UNDERSTAND THAT DELIVERY DATES MIGHT SLIP.** If you absolutely, positively must have your new computer by a certain date, you should try to find one in stock. At the very least, you should get a promised delivery date that is earlier than the date you really need the computer — that way, you still have some time to think of an alternative solution if the computer doesn't materialize on time.
- **DON'T BE PRESSURED INTO PURCHASING AN EXTENDED WARRANTY.** Apple's one-year warranty is generally long enough to cover any major problems your Mac may have. About the only reason to purchase an extended warranty is if it offers something else you find valuable — on-site service or delivery and installation, for example. / Nikki Echler

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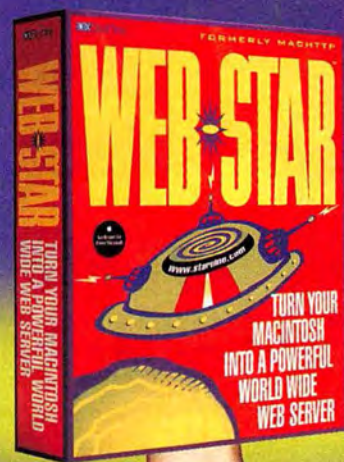
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THE YEAR OF THE CLONES

IT'S BEEN OVER A YEAR SINCE APPLE ANNOUNCED THAT IT WOULD LICENSE THE MAC OS. HERE'S WHAT CLONES HAVE — AND HAVEN'T — DONE FOR US SINCE THEN.

Over the last year, the product plans of DayStar Digital, Power Computing, and Radius — the first three Mac OS licensees — have begun to take shape. But back in November 1994, when Apple first announced that it would license the Mac OS to other computer manufacturers, no one foresaw what today's clone market would look like. Everyone agreed that Apple should have played its clone card years earlier. And everyone pointed out that clones would cost less than Macs. But stating the obvious was easy. Predicting how clones would affect the Mac market was a more difficult task.

Some folks claimed that by the end of 1995, there would be as many as a dozen Mac-clone makers — including PC giants such as Compaq, Dell, Gateway, and IBM — and that all these contenders would cannibalize Apple's market. Still others foretold a compatibility nightmare, warning that Mac clones would flop. And we were cautioned to expect neither any performance edge nor any technical innovation from clone vendors, because they would likely settle for churning out less expensive copies of Apple's Mac designs.

It hasn't turned out quite that way.

By Henry Bortman

CHOOSING THE RIGHT MAC

THE TECHNICAL EDGE

The biggest surprise has been that clone vendors have not simply followed in Apple's footsteps. DayStar and Power Computing have both shipped systems that are more powerful than Apple's fastest Mac, the Power Mac 9500/132. And both have pushed Macintosh technology beyond the boundaries established by Apple.

DayStar, with its Genesis MP systems, is perhaps the best example of a clone vendor that is leapfrogging Apple in certain areas. DayStar offers three systems, based on Apple's Power Mac 7500, 8500, and 9500 motherboards. One of the features both DayStar's and Apple's systems have in common is that each machine's processors are on a daughtercard that plugs into a special processor slot on the motherboard. Apple puts a single processor on the daughtercard — a PowerPC 601 on the Power Mac 7500 and a PowerPC 604 on the Power Mac 8500 and 9500. A Genesis MP system, however, has *four* 604 processors on its daughtercard.

These extra processors make DayStar's

systems roughly 2.5 times as fast as comparable Apple single-processor systems — in some cases, that is. Software must be updated to recognize and use all four processors simultaneously. As we went to press, only one application — Adobe Photoshop — could take advantage of this multiprocessing capability. But others are on the way (see the "Multiprocessing" sidebar).

Why DayStar? Why didn't Apple create a multiple-processor card? Actually, Apple probably will sell multiprocessing systems at some point. But Apple is no longer the company it was when it was in Steve Jobs' parents' garage. For one of its systems to be profitable, Apple has to sell tens of thousands of units — a goal that's currently unattainable for very high-end, specialized systems such as the Genesis MP.

Also, to remain competitive with Wintel-system vendors, Apple must keep the price of even its high-end systems down. Have you ever noticed that although Macs keep getting more and more powerful, each new high-end system always starts at around \$5,500? When Apple can produce a multiprocessing system at this price, it will. And that system will become the new high end of its line. But until then, Apple is better off letting — even helping — some other vendor take the lead.

DayStar is that other vendor. A much smaller enterprise, it isn't under the same

constraints as Apple. It can run a very profitable business marketing a relatively expensive, high-profit-margin machine to an admittedly limited audience. In the process, DayStar is helping Apple evangelize multiprocessing, build a stable of software that takes advantage of multiple processors, work out the technical snafus, and bring down the cost, thus paving the way for Apple to adopt this technology.

But DayStar isn't the only clone vendor to provide innovative technology. Power Computing, with its PowerWave systems, is also filling a niche that Apple can't or doesn't want to fill. Apple, with its second generation of Power Macs (the Power Macintosh 7200, 7500, 8500, and 9500), abandoned the NuBus system-expansion bus in favor of the PC-industry-standard bus, PCI. In the long run, this shift will benefit Macintosh users by enabling them to purchase higher-performance add-in cards at lower cost.

But many users have NuBus cards that are critical to their work. In some cases, PCI versions of these cards aren't available; in others, users simply don't want to plunk down money for PCI cards that duplicate the functions of NuBus cards they already own. And although Second Wave offers external multislot NuBus expansion chassis that attach to a PCI slot, some users may not want to have yet another box sitting on their desks. In any case, Apple itself has no analogous product for these users.

Power Computing does, though. The expansion slots in its PowerWave systems reside on a riser card, not on the motherboard. A PowerWave system can hold either a riser card containing three PCI slots or one containing two NuBus slots and two PCI slots. The latter \$249 option allows users to continue using their NuBus cards while gaining the speed advantage of a fast, 604 processor. Although no six-slot PowerWave system is available — Apple's Power Macintosh 9500 has six PCI slots — many users will find a PowerWave system's dual-bus option compelling. Apple has indicated that it

TO BUY OR NOT TO BUY / who should consider a clone

YOU'RE IN THE MARKET for a new Mac. Should you consider purchasing a clone? In all likelihood, the answer is, Yes.

If you're a graphics or multimedia professional who works with one or more of the applications slated for multiprocessing support in the near future — Photoshop already supports multiprocessing — take a close look at DayStar's Genesis MP systems. At \$10,000 and up, they're expensive, but their speed may be worth the cost.

An alternative is the one-stop-shopping hardware-and-software bundles Radius offers to artists, designers, and multimedia authors. If you intend to purchase a Thunder or ThunderColor accelerated-graphics card and a PressView

monitor with your system, you may be able to achieve substantial savings by purchasing the whole kit and caboodle from Radius.

For graphics-processing power on a budget, consider the PowerWave 604/150, from Power Computing. PowerWave systems are also the clear choice if you're looking for PowerPC 604 speed but are hampered by legacy NuBus cards you simply can't do without — or can't afford to replace. Take a close look at Power's software-bundling options too. If the Microsoft and Adobe products the company offers are ones you plan to buy, you may be able to save significant amounts of money.

But for rock-bottom prices on lower-end systems, Apple has the

advantage, with its bargain-priced Performas and Power Mac 7200. And for those who need more than three PCI expansion slots but don't have any need for the DayStar systems' multiprocessing capability (or simply can't afford it), Apple's Power Mac 9500 systems are still the way to go. The built-in digital-video capability of Apple's Power Mac 7500 and 8500 is also unmatched by any of the systems.

Although the clones have increased your buying options, they have also increased the difficulty of making a purchasing decision. Know exactly what you want before you buy. That way, you can weigh in the value of bundles or higher-end configurations before making a final decision.



MULTIPROCESSING / it's in your future

DAYSTAR DIGITAL made Mac history recently by shipping the first Mac OS computer system to support multiprocessing. Others have attempted to use multiple processors in a variety of ways in the past. What makes DayStar's effort different is that the company has Apple's full cooperation. DayStar implements multiprocessing via a shared library (a special type of system extension) called DayStar MPLibrary. Early next year, DayStar will give a version of the shared library to Apple that will officially become part of the Mac OS.

From today's vantage point, it might look as though multiprocessing is of interest only to a limited market. After all, when DayStar's Genesis MP systems began shipping, in November 1995, only Adobe Photoshop 3.0.4 could take advantage of multiprocessing. On

several compute-intensive Photoshop tasks, the Genesis MP was an average of 2.5 times as fast as a stock Power Mac 9500/132.

However, the list of developers who are actively working on multiprocessing-capable software reads like a *Who's Who* of the graphics and multimedia industry. Adobe is considering multiprocessing support for Premiere and After Effects; Specular, Strata, and Ray Dream are considering it for their 3-D products; and Crossfield is looking at it for its Celix 2000 Imagesetter. Elastic Reality, Kodak, Live Picture, Macromedia, and many others are also actively working to support multiprocessing. Even Apple is rumored to be working on multiprocessing-enabled versions of QuickTime and QuickDraw 3D.

This trend will accelerate by

February 1996, when Apple begins distributing the multiprocessing shared library. Look for dual-601 or -604 systems, possibly even dual-603 systems, from Power Computing. Radius is more likely to compete directly with DayStar at the high end, offering quad-604 systems. And don't be surprised to see Apple ship multiprocessing systems in 1996 as well.

Multiprocessing also offers hot prospects for upgrades. Apple's Power Macintosh 7500, 8500, and 9500 each contain a processor-card slot capable of supporting a dual-processor card. Power Computing's PowerWave systems and forthcoming systems from Radius will also contain such a slot.

Late in 1996, we'll begin to see the first CHRP-based systems. CHRP, by allowing system vendors to customize their hardware to a

greater extent than is possible with current Mac motherboard designs, will fuel the creation of multiprocessing systems. Rumor has it that DayStar is already at work on a CHRP system.

At the same time, the Copland operating system will ship — we hope. It too will support multiprocessing. (Don't worry: Copland's multiprocessing implementation will support the current form.)

So although it might look as if multiprocessing is limited in use, it won't stay that way for long. Ten years from now, as we work at our 4-, 16-, or 64-processor systems, we'll look back at today's single-processor systems much as we now look back at the original 128K Mac, with its single 400K floppy-disk drive and 9-inch black-and-white monitor, and ask, How did we ever get any work done?



won't ship a system such as this.

With the announcement of its PowerWave 604/150, Power Computing has also taken a temporary performance lead over Apple. The PowerWave 604/150 sports a 150-MHz PowerPC 604 processor, which is clocked some 14 percent faster than the 132-MHz PowerPC 604 in Apple's top-of-the-line machine, the Power Mac 9500/132. If Apple sticks to tradition, it will "speed-bump" its current Power Mac lineup sometime in the first half of 1996. All current models will get faster processors; there's a good chance the 9500/132 will bump up to a 9500/150. But clone vendors have clearly gotten the jump on Apple with this higher-speed chip. By the time you read this, DayStar will also be shipping a system with four 150-MHz 604 processors.

THE ISSUE OF PRICE

These innovations, however, have come only recently. DayStar didn't even begin shipping Genesis MP systems until November 1995. And Power Computing's and

Radius' designs, for most of the first year of the clone era, were essentially cost-reduced remakes of Apple systems. Not to belittle the importance of cost reduction. Even before the advent of clones, Apple had begun to lower its prices to bring the cost of Macs more in line with those of Wintel systems. The competition from clone vendors — Power Computing's systems have sold for some 15 percent less than equivalent Macs — has made Apple feel this pressure even more. For example, Apple's new 7200/75 can be had for as little as \$1,699.

Has price competition hurt Apple's sales? Not really. The total combined Power Computing and Radius unit sales in the first year were in the tens of thousands, a drop in the bucket compared to Apple's multimillion-unit annual Macintosh sales. Apple, plagued by chronic underpredictions of user demand and consequent product shortages of its most popular models, has done a far better job than its licensees could ever hope to of eating away at its own market. Rather than undercutting Apple, clone

vendors, by providing systems when Apple couldn't, may have prevented frustrated Macintosh customers from moving to more-plentiful Wintel systems.

A QUESTION OF CUSTOMIZATION

Innovation, speed, and pricing are perhaps the most tangible benefits of clones. But there is another advantage clone vendors have brought to the Mac market: flexibility. Apple typically ships Macs in a limited set of configurations. It seems, though, that none of the combinations Apple chooses are ever quite what you're looking for. And although resellers offer a wider array of configurations than the handful on Apple's price list, these alternative packages are often driven by what kind of margins dealers can get on individual components.

Power Computing, in contrast, has made configuration flexibility a corporate hallmark. When you order a system from Power Computing, you specify what you want: the processor speed, the amount of RAM, and the hard-drive capacity — as well as several

Drive a High-Res, full page Photoshop image.



"Genesis MP is an incredible time saver. It makes Photoshop fun again!"

John Lund, Digital Photographer

Real-time. Anytime with Genesis MP.



colina Design

You know the tracks are there even if they're covered under seven feet of snow. You know how to get the job done. You just need more time... or more power. **Power counts.** Especially when you have to produce an image in time to make the last courier. **The less time spent waiting on Photoshop, the more time you have to be creative and still make it under the wire.**

The revolutionary Genesis MP is a powerful new Mac OS system using four of the fastest PowerPC 604 processors available. Now you can drive huge files in real time rather than just pushing pixels.

With a Genesis MP from DayStar you can run Photoshop seven times faster than your current Mac. It's four times faster than Apple's new PowerMac 9500. Even an SGI workstation costing three times as much runs at a fraction of the speed. **Nobody does it faster than a Genesis MP.**

In addition to Adobe's Photoshop, Premiere and After Effects, and Strata's Studio Pro, **over 200 Mac software titles for publishing are being boosted to multiprocessing performance.**

Genesis MP was envisioned from the beginning to be the most powerful, yet user-friendly workstation ever created. Not only does it use the Mac OS, the most intuitive operating system in the world, but adding a card or memory, or even extra hard drives is a simple two step procedure. Just open the side panel and pop in the upgrade. It's that simple.



So, it's time to make tracks. Get a Genesis MP.

Look us up on the web at <http://www.daystar.com>, or call us at 800.984.4510 for some hard data on the new line of Genesis MP computers.

Genesis MP: A new beginning in Mac workstation performance.



CHOOSING THE RIGHT MAC

other system details. You can, for example, order a Power Computing system with 72 MB of RAM and a 4-GB hard drive. The most stuffed system Apple offers is one with 16 MB of RAM and a 2-GB hard drive.

Power Computing also offers options that are difficult, or impossible, to come by in an Apple Mac: You can order a Power Computing system with an internal Iomega Zip drive, for example. And if you want to price

a particular configuration before you buy? Simple: Log onto the online configurator on Power Computing's Web site (the URL is <http://www.powercc.com/BYOB/index.html>). The configurator will walk you through all the available options, letting you specify the system of your dreams, and will tell you exactly how much it will cost. If you don't have access to the Web, you can get the same information by calling Power Computing (512-258-1350) or you can obtain a complete price list from the company's fax-back number (800-788-3783).

ONE-STOP SHOPPING

And then there are bundles — with the exception of Performas, bundles are not an area in which Apple has excelled. When you

buy a non-Performa Mac, you get a Mac, plus system software and a mouse. That's it. Not even a keyboard. Sometimes you luck out and get a microphone. For a brief period, Apple was pushing CD-ROM drives, so it bundled a few underwhelming CD-ROM titles with CD-ROM-equipped systems. And with Power Mac 7500s and 8500s, it currently includes some telephony and video-editing software. Not the kind of stuff to write home about.

Some clone vendors have moved in to fill the gap. Power Computing provides the most-extensive software bundles with its computers. The list currently includes half a dozen utility and productivity applications as well as a CD-ROM containing 250 fonts. The total value of Power Computing's

COMPARING CURRENT SYSTEMS / what the clones and the Macs offer

WITH THE INTRODUCTION of the clones, choosing a Mac OS-compatible computer has gotten tougher. You'll find that all the current systems, including Apple's, have a few things in common: They each ship with System 7.5 or later, they each include a mouse, they each have a quad-

speed CD-ROM drive, and they each have an AAUI Ethernet port. Beyond that, however, they vary widely. Power Computing bundles a vast array of software and lets you custom-configure systems with, say, the exact amount of RAM and storage space you need. DayStar's Genesis MP

systems cost two to three times as much as Apple's top-of-the-line Power Macintosh 9500/132, but each has four PowerPC 604 processors that can work simultaneously when used with special versions of current software. Radius, with its System 100, offers one-stop shopping

	APPLE						DAYSTAR DIGITAL			POWER COMPUTING		
	Power Mac 7200/75	Power Mac 7200/90	Power Mac 7500/100	Power Mac 8500/120	Power Mac 9500/120	Power Mac 9500/132	Genesis MP (3-slot)	Genesis MP (6-slot)	Genesis MP (6-slot)	Power 100	Power 120	PowerWave 604/120
Estimated street price	\$1,699	\$1,899	\$2,700	\$3,999	\$4,699	\$5,200	\$10,000	\$13,000	\$15,000	\$2,319 (direct)	\$2,619 (direct)	\$3,504 (direct)
PowerPC processor	601	601	601	604	604	604	4 x 604	4 x 604	4 x 604	601	601	604
Clock speed	75 MHz	90 MHz	100 MHz	120 MHz	120 MHz	132 MHz	120 MHz	132 MHz	150 MHz	100 MHz	120 MHz	120 MHz
RAM	8 MB	8 MB	16 MB	16 MB	16 MB	16 MB	16 MB	16 MB	16 MB	8 MB	8 MB	16 MB
Maximum RAM	256 MB	256 MB	1 GB	1 GB	1.5 GB	1.5 GB	1 GB	1.5 GB	1.5 GB	200 MB	200 MB	512 MB
RAM slots	4 DIMM	4 DIMM	8 DIMM	8 DIMM	12 DIMM	12 DIMM	8 DIMM	12 DIMM	12 DIMM	8 SIMM	8 SIMM	8 DIMM
Hard-drive capacity	500 MB	500 MB	500 MB*	1 GB†	1 GB	2 GB	500 MB***	1 GB	1 GB	540 MB	540 MB	1 GB
Expansion-bus slots	3 PCI	3 PCI	3 PCI	3 PCI	6 PCI	6 PCI	3 PCI	6 PCI	6 PCI	3 NuBus	3 NuBus	3 PCI†
L2 cache	none	none	none	256K	512K	512K	512K	512K	512K	256K	256K	256K
Maximum L2 cache	512K	512K	512K	1 MB	NA	NA	4 MB	NA	NA	512K	512K	1 MB
Built-in VRAM	1 MB	1 MB	2 MB	2 MB	2 MB**	none	2 MB	none	none	2 MB††	2 MB††	2 MB**
Maximum VRAM	4 MB	4 MB	4 MB	4 MB	4 MB	NA	4 MB	NA	NA	4 MB	4 MB	4 MB
Accelerated-graphics card												
10BASE-T port	•	•	•	•	•	•	•	•	•			•
Video-in			•	•			•			• [∞]	• [∞]	
Video-out				•			***			• [∞]	• [∞]	
Keyboard							•	•	•	•	•	•
Microphone			•	•								
Bundled software	A	A	B	B	none	none	F	F	F	C	C	C
Warranty	1 year	1 year	1 year	1 year	1 year	1 year	1 year	1 year	1 year	1 year	1 year	1 year

*For an extra \$350, you can get a model with a 1-GB hard drive.

†For an extra \$500, you can get a model with a 2-GB hard drive.

‡Also includes an FWB JackHammer Fast-and-Wide SCSI-2 card and a fast 2-GB external hard drive.

§For an extra \$249, you can get two NuBus and two PCI slots instead.

**Via an ATI Xclaim GA accelerated-graphics adapter.

††Includes a DRAM graphics port.

∞Via a Thunder IV GX-1600 accelerated-graphics adapter.

∞Optional.

***For an additional \$1,000, you can get a model with a 1-GB hard drive and video-out.

BUNDLED SOFTWARE

A. Cypress Research's MegaPhone, Adobe Acrobat (reader)

B. Apple Media Conference, Cypress Research's MegaPhone, Avid VideoShop, Adobe Acrobat (reader)

C. ClarisWorks; Intuit's Quicken; Now Software's Now Utilities, Now Contact, and Now Up-to-Date; FWB's Hard Disk ToolKit and CD-ROM ToolKit; 250 Bitstream Type 1 and TrueType fonts; America Online; Nisus Compact; Grolier's Multimedia Encyclopedia

D. Adobe Photoshop, ATM, and Acrobat (reader); FWB's Hard Disk ToolKit and CD-ROM ToolKit

E. FWB's Hard Disk ToolKit and CD-ROM ToolKit

F. Multiprocessor Accelerator plug-in for Photoshop, FWB's Hard Disk ToolKit and CD-ROM ToolKit

standard bundle is in the hundreds of dollars, although calculating its actual value to users is more difficult. If you happen to need the software in the bundle, you're in luck. Problem is, though, that Power Computing provides the same bundle with every system, regardless of how it's configured or what it's likely to be used for. Not everyone needs ClarisWorks and Nisus Compact.

As we went to press, however, Power Computing was putting the final touches on a new software-bundling program. It will soon offer customers the option of purchasing, at substantial discounts, Microsoft Office and many of Adobe's most popular applications (such as Photoshop, Illustrator, Premiere, PageMaker, and Persuasion). Other deals were also in the works. This is

cool. But there is a catch: To get the discount, you have to purchase the software at the same time as you purchase the computer. How much of a discount? Stay tuned. Final pricing was not set in time for this article.

Radius is also talking bundles, but more-targeted ones. Its System 100 is pre-configured specifically for heavy-duty Photoshop users. (The Radius 81/110, however, is simply a remake of Apple's now discontinued Power Mac 8100/110.) The System 100 includes 72 MB of RAM; a Thunder IV GX-1600 accelerated-graphics adapter with a DSP-based Photoshop-acceleration daughtercard; FWB's JackHammer Fast-and-Wide SCSI-2 card and a high-speed, 2-GB drive; and Photoshop. One particularly nice touch is that not only does Photoshop come preinstalled on the hard drive but both the system software and Photoshop are also pretweaked for maximum Photoshop performance. And the installation CD-ROM Radius includes can restore all the custom system and application settings. If you've ever spent hours (or days) tuning your system, only to have your Mac crash, requiring you to fully reinstall your system software, you'll appreciate this benefit.

Radius plans to go further with bundles. Through deals with its distributor, Ingram Micro, the company will offer targeted bundles for desktop-publishing specialists, multimedia authors, and Web authors. Details on what will be in these bundles and what they will cost weren't available at press time. Radius also plans to offer discounts on its accelerated-graphics cards and high-performance monitors to customers who purchase its computer systems.

WHERE THE CLONES STAND

So that was the state of clonedom as 1995 drew to a close. Despite predictions, clone vendors haven't cannibalized Apple's sales, the systems haven't had compatibility problems, and the systems certainly haven't flopped. Quite the contrary, in fact.

Clone vendors have clearly aided the Macintosh market. They've helped bring Mac prices down. They've taken the lead in the performance race, forcing Apple to play catch-up. They've developed new technologies that might have taken Apple another year or two to come out with. They've expanded users' configuration options. And

they've put together hardware and software bundles that are attractive alternatives to Apple's offerings for many users. All that, and there wasn't even a big PC vendor among them. Not a bad list of achievements for Year 1.

But there's plenty left to do. First, there are the things someone ought to have done already. For example, none of the clone vendors offers a DOS compatibility card. None — even Power Computing, with its penchant for configurability — offers a modem as an option. In the era of the information superhighway, that's pitiful. Not to mention the fact that no one bundles a Web browser. Get with the program! Of course, users can always go out and buy these additions to their systems on their own. But why should they have to?

Then there are the things that are just on the horizon. QuickDraw 3D acceleration. MPEG support. High-speed network adapters. Digital-video capture. Integrated telephony. To maintain a compelling advantage over Apple — and in some cases, to catch up — clone vendors will need to implement these technologies quickly.

Finally, there are three technologies that are definitely on the timeline for late 1996: **CHRP (Common Hardware Reference Platform)**. CHRP will enable a much broader group of computer manufacturers to produce systems that run the Mac OS, because it will reduce these vendors' dependency on Apple's custom ASICs and thus their dependency on support from the already strained Apple engineers.

PowerPC 615. Although IBM won't confirm its existence, this split-personality chip, capable of executing PowerPC-native and Intel x86-native instructions, will make possible low-cost systems that run Macintosh and Windows applications with reasonable performance.

Multiprocessing. Already adopted as the centerpiece of DayStar's Genesis MP systems, multiprocessing will become more pervasive in 1996.

Stay tuned to the pages of *MacUser*. The clone market is nothing if not fast-moving, and the pace will only increase in 1996. We promise to keep you up-to-date. ☛

Henry Bortman is *MacUser's* technical director. Senior Project Leader Jeffrey Milstead managed the testing for this article.

for publishing professionals who want to equip their systems with high-speed RAID systems and Radius' high-end accelerated-graphics adapters and calibrated monitor systems.

We've listed the specifications for currently shipping systems here.

		RADIUS	
PowerWave 604/132	PowerWave 604/150	Radius 81/110	Radius System 100
\$3,954 (direct)	\$4,499 (direct)	\$3,000	\$8,400
604	604	601+	601+
132 MHz	150 MHz	110 MHz	110 MHz
16 MB	16 MB	16 MB	72 MB
512 MB	512 MB	264 MB	264 MB
8 DIMM	8 DIMM	8 SIMM	8 SIMM
1 GB	1 GB	730 MB	540 MB ^b
3 PCI ^c	3 PCI ^c	3 NuBus	3 NuBus
256K	512K	256K	256K
1 MB	1 MB	1 MB	1 MB
2 MB**	2 MB**	none	6 MB ^{aa}
4 MB	4 MB	4 MB	6 MB
●	●		●
●	●		
●	●	●	●
C	C	E	D
1 year	1 year	1 year on-site	1 year on-site



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HOW WE TEST



AND WHY

HERE'S HOW YOU CAN
BENEFIT FROM THE
UPDATED VERSION OF
MACBENCH, OUR
INDUSTRY-STANDARD
BENCHMARK-
TEST SUITE.

By Henry Bortman

You're about to buy a Power Mac 9500/132, but it doesn't come with a graphics-display card. Which card should you get? Or you're wondering if a system from Power Computing can outrun a Mac. Or maybe you're planning to outfit everyone in your office with Power Mac 7500/100s, and the Mac expert in the department says you'll get better performance if you spring for the optional L2 cache. But how much better?

Wouldn't it be great if there were a single tool that could answer such a broad array of questions? A tool you could rely on for evaluating your alternatives? A tool that doesn't cost you anything? There is. It's called MacBench, and version 3.0 is coming soon to a computer near you.

Since its release in 1993, MacBench has steadily grown in popularity and has come to be recognized within the Mac industry as *the* standard set of benchmark tests for measuring the performance of Mac OS systems and peripherals. Last year, ZDBOp (Ziff-Davis Benchmark Operation), the creator of MacBench, distributed over 200,000 copies of version 2.0 of the program. With the release of version 3.0, many major vendors of computer systems and peripherals will begin bundling MacBench with their products.

HOW MACBENCH 3.0 WORKS

MacBench works by isolating and measuring the main subsystems that make up your Mac: processor, floating-point unit, disk, graphics, and CD-ROM. MacBench Disk and Graphics Mix tests are based on profiling lengthy series of tasks that people commonly perform with the 13 best-selling Mac applications: Microsoft Word, Excel, PowerPoint, and Works; Adobe Photoshop, PageMaker, and Illustrator; Novell's WordPerfect; Claris' FileMaker Pro and ClarisWorks; Intuit's Quicken; Quark's QuarkXPress; and Macromedia FreeHand. Version 3.0 also adds Publishing Disk and Graphics Mix tests, based on profiling high-end work in Photoshop and QuarkXPress. Here's the scoop on the tests:

Processor. The processor subsystem includes the microprocessor; the system memory (RAM); and the L2 cache, if present. ZDBOp worked closely with Apple and Motorola to ensure that the mix of processor instructions the test performs closely matches the instructions the processor in your Mac executes as you go about your usual tasks. As expected, this test shows a performance difference between 68040 and PowerPC processors. For a given processor, this test also shows a steady performance progression as clock speed increases.

In particular, the Processor scores for DayStar Digital's Genesis MP systems attracted our attention. Although these systems sport four PowerPC 604 processors apiece, their Processor scores are lower than those of models from Apple and Power Computing that contain only one PowerPC 604 processor each. DayStar's Genesis MP processor card contains circuitry that acts as a traffic cop, sending data to the correct processor. Even if only one processor is being used

CHOOSING THE RIGHT MAC

by the application software, the circuitry is still active, thus causing a slight delay in data processing. When we installed a 132-MHz 604 single-processor card from a Power Mac 9500/132 in a Genesis MP, DayStar's system yielded results nearly identical to those of a Power Mac 9500/132.

Floating Point. MacBench's Floating Point test measures the speed at which a Mac can perform floating-point calculations, which are used extensively in such tasks as 3-D rendering and solving scientific equations.

Disk Mix and Publishing Disk Mix. These two tests measure the speed of a Mac's hard-disk subsystem, which includes the drive or array specified for testing; the software driver; the Mac's SCSI controller (or, if present, a high-speed SCSI adapter card); SCSI Manager and File Manager software; and to some extent, the Mac's processor.

The Disk Mix and Publishing Disk Mix tests can be used to examine the effect of changes in any of these disk-subsystem components. For example, you can use the tests to compare the speed of hard drives from different vendors. Or to see the effect of formatting a disk with, say, FWB's Hard Disk ToolKit instead of with Apple's driver.

Why two Disk Mix tests? Because we found that different types of applications stress a hard drive in different ways. The "standard" Disk Mix test is based on profiles of lengthy sequences of typical user tasks in our suite of 13 popular applications. When you run the Disk Mix test, MacBench plays back the sequences of disk-subsystem calls that occurred while the profiled tasks were performed. The results are then weighted according to each application's market share. Thus, applications such as Microsoft Word and Excel and ClarisWorks weigh heavily in the overall Disk Mix score.

But the applications used by publishing professionals interact with drives differently than do business applications. Business applications tend to read and write lots of very small blocks of data, whereas high-end publishing applications read and write data in larger blocks. That's why, this year,

we added the Publishing Disk Mix test. Its score is based on profiles of Adobe Photoshop and QuarkXPress. Although we also profiled these applications in the standard Disk Mix test, because their market share relative to top-selling business programs such as Word and Excel is relatively small, their influence on the standard Disk Mix score is minimal. Also, we used much larger files and did more-complex tasks when we profiled these two applications for the Publishing Disk Mix test than we did for the standard Disk Mix test.

What's the value to you? Here's an example. We first tested the internal 2-GB drive on a Power Mac 9500/132. We then installed ATTO's ExpressPCI-MC Fast-and-Wide SCSI adapter in the same machine and attached a pair of ultrafast Seagate drives

configured as a 3.5-GB RAID Level 0 array. Although the high-speed array outran the internal drive by nearly 60 percent in the Publishing Disk Mix test, it was only 10 percent faster in the standard Disk Mix test. Our results held up under even closer scrutiny: When we examined the individual disk subtests MacBench can perform, we found that the Disk Mix test correlates closely with MacBench's smaller-buffer-size tests and that the Publishing Disk Mix test correlates closely with larger-buffer-size ones.

Graphics Mix and Publishing Graphics Mix.

These tests measure the speed of a computer's graphics subsystem, which includes built-in VRAM or an accelerated-graphics adapter; the expansion bus; QuickDraw software; and to some extent, the processor. The standard Graphics Mix test is based on



SIZING UP THE COMPETITION / find out how

APPLE'S FINALLY GOT COMPETITION. To help you compare Mac OS systems, we've assigned mouse ratings to currently shipping machines. We considered each computer's features; price; and, of course, its speed in MacBench 3.0 tests.

We've listed the key configuration details that affect MacBench results. We tested PCI-based systems and the PowerBooks with System 7.5.2 and all other systems with System 7.5.1. We set the disk-cache size to 96K. Except as noted, for

		PROCESSOR/CLOCK SPEED (MHZ)	RAM	HARD-DRIVE CAPACITY	CD-ROM- DRIVE SPEED	L2 CACHE SIZE	GRAPHICS HARDWARE
APPLE COMPUTER SYSTEMS							
★★★★	Performa 640CD DOS Compatible	68040/33	16 MB	500 MB ¹	2x	none	DRAM
★★★★	Performa 5215CD	603/75	16 MB	1 GB ¹	4x	256K	DRAM
★★★★	Performa 6230CD	603/75	16 MB	1 GB ¹	4x	256K	DRAM
★★★★	PowerBook 190/66	68040/33	12 MB	500 MB ¹	NA	none	VRAM
★★★★	PowerBook 190cs/66	68040/33	8 MB	500 MB ¹	NA	none	VRAM
★★★★	PowerBook Duo 2300c/100	603e/100	16 MB	750 MB ¹	NA	none	VRAM
★★★★	PowerBook 5300cs/100	603e/100	16 MB	500 MB ¹	NA	none	VRAM
★★★★	PowerBook 5300c/100	603e/100	16 MB	750 MB	NA	none	VRAM
★★★★	Power Mac 7200/75	601/75	16 MB	500 MB	4x	none	VRAM
★★★★	Power Mac 7200/90	601/90	16 MB	500 MB	4x	none	VRAM
★★★★	Power Mac 7500/100	601/100	16 MB	1 GB	4x	none	VRAM
★★★★	Power Mac 8500/120	604/120	16 MB	1 GB	4x	256K	VRAM
★★★★	Power Mac 9500/120	604/120	16 MB	1 GB	4x	512K	[§]
★★★★	Power Mac 9500/132	604/132	16 MB	2 GB	4x	512K	[§]
DAYSTAR DIGITAL SYSTEMS							
★★★★	Genesis MP (132 MHz)	604/132	16 MB	1 GB	4x	512K	[§]
★★★★	Genesis MP (150 MHz)	604/150	16 MB	1 GB	4x	512K	[§]
POWER COMPUTING SYSTEMS							
★★★★	Power 100	601/100	16 MB	700 MB	4x	256K	VRAM
★★★★	Power 120	601/120	16 MB	1 GB	4x	256K	VRAM
★★★★	PowerWave 604/120	604/120	16 MB	1 GB	4x	256K	[§]
★★★★	PowerWave 604/132	604/132	16 MB	1 GB	4x	512K	[§]
★★★★	PowerWave 604/150	604/150	16 MB	2 GB	4x	512K	[§]
RADIUS SYSTEMS							
★★★★	Radius 81/110	601/110	16 MB	730 MB	4x	256K	VRAM
REFERENCE SYSTEMS							
NA	Power Mac 8100/100	601/100	16 MB	1 GB	2x	256K	VRAM
NA	Power Mac 6100/60	601/60	16 MB	250 MB	2x	none	DRAM

¹At 640 x 480 pixels, the Performas and the PowerBook Duo 2300c/100 and 5300c/100 have a maximum bit depth of 16 bits, the PowerBook 190cs/66 and 5300cs/100 have a maximum bit depth of 8 bits, and the PowerBook 190/66 has a maximum bit depth of 4 bits.

[§]Uses an IDE drive.

[§]ATI Xclaim GA card.

profiles of all the QuickDraw calls generated while performing typical tasks in our suite of 13 programs, and the Publishing Graphics Mix test uses profiles based on high-end tasks in Photoshop and QuarkXPress.

Like the Disk Mix tests, the Graphics Mix and Publishing Graphics Mix tests highlight the effect of changing graphics-subsystem elements. And, again, we found that specific components do not necessarily provide equal benefit to users of varying applications. For example, we installed ATI's Xclaim GA accelerated-graphics adapter in a Power Mac 8500/120 and compared the adapter's speed with that of the Mac's built-in VRAM. Although the ATI card was faster in the Graphics Mix and Publishing Graphics Mix tests, it offered far greater benefit in the Graphics Mix test, which is weighted

heavily toward business applications.

CD-ROM Mix. CD-ROM speed is affected by both the mechanism and the driver software. For example, although both Apple and Power Computing ship quad-speed CD-ROM drives in most of their systems, Power Computing uses FWB's CD-ROM ToolKit, a caching driver, whereas Apple uses its own, noncaching driver. The speed difference is dramatic: The CD-ROM Mix scores of Power Computing's machines average more than twice those of Apple's systems. To develop MacBench 3.0's CD-ROM Mix test, ZDBOp profiled typical use of five popular CD-ROM titles: Apple's System 7.5 installation disc, Corel's World's Best Photos, Brøderbund's Myst, Against All Odds' Passage to Vietnam, and Microsoft's Encarta.

As in past years, we are using the release

of a new version of MacBench to take stock of current Mac OS-system offerings. This year, we tested not only Apple Power Mac, Performa, and PowerBook systems but also Mac OS-compatibles from DayStar, Power Computing, and Radius. This is the most comprehensive roundup of Mac OS-system performance available from any source.

In the coming year, we'll use MacBench 3.0 to answer your most pressing questions. Alternatively, you can perform your own testing with MacBench. As of January 8, you'll be able to download it from ZD Net/Mac or MacUser's Web page, or you can fax a request to ZDBOp, at 919-380-2879. ☐

Henry Bortman is MacUser's technical director. Senior Project Leader Jeffrey Milstead managed the testing. Thanks also to Scott Lane and the MacBench team at ZDBOp.

Macs and compatibles compare to one another

the Graphics Mix test, we used monitor settings of 640 x 480 pixels at 8-bit color and, for the Publishing Graphics Mix test, we used monitor settings of 640 x 480 pixels at 24-bit color. (All scores for the Power Mac 6100/60 reference

system were generated with monitor settings of 640 x 480 pixels at 8-bit color.) Hard disks in Apple systems were formatted with Apple's driver; disks in other vendors' systems were formatted with FWB's Hard Disk ToolKit. Apple and

DayStar systems used Apple's CD-ROM driver; Power Computing and Radius systems used FWB's CD-ROM ToolKit. All MacBench 3.0 scores are relative to those of the Power Mac 6100/60, which is assigned a score of 10.0 in each test.

MACBENCH 3.0 SCORES

PROCESSOR	FLOATING POINT	DISK MIX	PUBLISHING DISK MIX	GRAPHICS MIX*	PUBLISHING GRAPHICS MIX*	CD-ROM MIX
4.7 <div></div>	0.1 <div></div>	14.3 <div></div>	8.8 <div></div>	10.0 <div></div>	6.7 <div></div>	10.1 <div></div>
10.0 <div></div>	10.5 <div></div>	13.8 <div></div>	11.4 <div></div>	9.0 <div></div>	7.4 <div></div>	13.2 <div></div>
10.0 <div></div>	10.3 <div></div>	13.7 <div></div>	11.3 <div></div>	9.0 <div></div>	7.2 <div></div>	13.4 <div></div>
5.0 <div></div>	0.1 <div></div>	12.5 <div></div>	8.9 <div></div>	6.6 <div></div>	6.3 <div></div>	NA
5.0 <div></div>	0.1 <div></div>	12.3 <div></div>	8.5 <div></div>	4.5 <div></div>	4.9 <div></div>	NA
11.2 <div></div>	11.8 <div></div>	9.3 <div></div>	7.9 <div></div>	4.4 <div></div>	5.9 <div></div>	NA
11.9 <div></div>	14.5 <div></div>	9.6 <div></div>	8.0 <div></div>	7.6 <div></div>	9.2 <div></div>	NA
11.9 <div></div>	14.5 <div></div>	9.8 <div></div>	8.0 <div></div>	5.8 <div></div>	9.2 <div></div>	NA
11.1 <div></div>	12.0 <div></div>	10.1 <div></div>	8.9 <div></div>	14.9 <div></div>	11.9 <div></div>	12.4 <div></div>
12.8 <div></div>	14.2 <div></div>	10.3 <div></div>	8.9 <div></div>	14.7 <div></div>	13.1 <div></div>	13.0 <div></div>
17.5 <div></div>	16.5 <div></div>	15.8 <div></div>	15.2 <div></div>	16.7 <div></div>	17.3 <div></div>	13.0 <div></div>
23.7 <div></div>	24.2 <div></div>	17.2 <div></div>	15.9 <div></div>	21.0 <div></div>	22.8 <div></div>	12.7 <div></div>
24.7 <div></div>	23.9 <div></div>	17.2 <div></div>	15.9 <div></div>	40.3 <div></div>	28.6 <div></div>	13.1 <div></div>
25.8 <div></div>	26.5 <div></div>	18.7 <div></div>	16.9 <div></div>	41.8 <div></div>	29.1 <div></div>	13.2 <div></div>
23.2 <div></div>	25.0 <div></div>	19.0 <div></div>	15.3 <div></div>	34.9 <div></div>	28.8 <div></div>	13.7 <div></div>
25.4 <div></div>	28.5 <div></div>	19.2 <div></div>	14.6 <div></div>	38.5 <div></div>	29.7 <div></div>	13.6 <div></div>
18.1 <div></div>	17.7 <div></div>	14.5 <div></div>	12.9 <div></div>	23.0 <div></div>	26.5 <div></div>	29.0 <div></div>
19.7 <div></div>	20.9 <div></div>	16.9 <div></div>	15.6 <div></div>	23.1 <div></div>	26.8 <div></div>	32.0 <div></div>
23.6 <div></div>	23.5 <div></div>	17.7 <div></div>	15.9 <div></div>	33.5 <div></div>	27.8 <div></div>	22.7 <div></div>
27.1 <div></div>	26.5 <div></div>	19.8 <div></div>	17.4 <div></div>	36.6 <div></div>	29.9 <div></div>	32.4 <div></div>
30.5 <div></div>	30.2 <div></div>	14.9 <div></div>	17.8 <div></div>	40.6 <div></div>	32.9 <div></div>	30.7 <div></div>
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SCORE <div>BETTER</div>	SCORE <div>BETTER</div>	SCORE <div>BETTER</div>	SCORE <div>BETTER</div>	SCORE <div>BETTER</div>	SCORE <div>BETTER</div>	SCORE <div>BETTER</div>
BEST PERFORMER IN EACH TEST						

■ BEST PERFORMER IN EACH TEST

QUICK LABS

• An Adequate Workgroup Printer • Four Workmanlike Hard Drives • A Sextet of Sufficient Monitors

In the Quick Labs game, it sometimes feels like feast or famine. One month we get more products than we can hope to test; another month, it feels as though vendors are hibernating and new products are frightfully scarce. And it's not just product availability that leads to a boom-or-bust sensation: Sometimes it's overall product *impressiveness*.

Most months, there's at least one product in one of our testing categories that emerges as a real star. It could be a printer that raises the output-quality bar, a hard drive that sets new price-per-megabyte records, or a gorgeous monitor with easy-as-pie controls. Almost as often, one of the products we test stands out as a real loser — a bona fide dud you wouldn't wish on your worst enemy.

(It's almost as much fun to warn you of the lemons as it is to trumpet the stars.)

But as this month's batch of products attests, there are times when all the products are solid and workmanlike but nothing to do cartwheels over. Across all the categories, this month's crop performed solidly on our tests, and all the products were acceptably easy to set up and use. No horror stories, but no jubilation either — although the products do the jobs they set out to do, which is certainly cause for quiet celebration.

Next month, we'll be announcing some changes to Quick Labs that will help us better address product-availability fluctuations and ensure that we continue to furnish the most up-to-date, useful product information. Stay tuned.



ONE NEW WORKGROUP LASER PRINTER

With the Lexmark Optra R+, we were tempted to take the easy route — simply cutting the review of Lexmark's Optra Lx+ from our last Quick Labs and pasting it here. Except for the RAM configuration and the paper tray, there's not much difference between the two printers: The Optra Lx+ comes standard with 4 MB of RAM and a 500-sheet paper tray; the Optra R+ comes with 2 MB of RAM and a 200-sheet paper tray (you can also hand-feed it legal-sized sheets).

But it's a good thing we tested the \$1,700

Optra R+, because we learned a few things in the process. Our first lesson: Most users should purchase extra RAM for the Optra R+ right away — its standard 2 MB proved insufficient to print our graphics-laden, PageMaker test file. Lexmark suggests having at least 8 MB if you plan to print complex PostScript files, but we were able to print our PageMaker file after installing just 2 MB of additional RAM (\$169). The Optra R+ can handle a maximum of 64 MB and uses standard 72-pin SIMMs.

Once we'd added the extra RAM, the Optra

R+ performed admirably: Line art and text were crisp and clean at 1,200 dpi. It printed grayscale photos and art with excellent detail and consistency and at a respectable speed. As you'd expect, pages print about twice as fast at 600 dpi as they do at 1,200 dpi.

The Optra R+ also comes with MarkVision, Lexmark's network-printer-management utility. It lets network administrators adjust printer settings and get progress reports on print jobs from anywhere on the network.

REVIEWER / ROMAN LOYOLA TESTING / JIM GALBRAITH

+ / OUTSTANDING ● / ACCEPTABLE - / POOR		ESTIMATED STREET PRICE	RESOLUTION	WARRANTY	TEXT QUALITY	GRAPHICS QUALITY	PAPER HANDLING	SUPPORT	COMMENTS	PAGES PER MINUTE
Lexmark Optra R+		\$1,700*	1,200 dpi	1 year	+	+	●	●	Some files require more than the standard 2 MB of RAM.	0 2 4

*With 2 MB of RAM.



FOUR NEW HARD DRIVES

This month's quartet of hard drives collectively offer an interesting range of features and price/performance. All ship with straightforward manuals and simple, versatile software, yet none stands out as a star.

The Microtech BLUE Storm 2000 (pictured) is the most sophisticated — and expensive — drive in the batch. Its SCSI-2 connectors attach directly to the logic board (without cables) in order to minimize signal noise, and an LCD supplies drive-status information. Although

impressive, this wizardry is worth the extra cost only for the most-demanding situations, such as digital-video playback.

The MacProducts Magic Quantum Lightning 730 MB, an appealing buy at \$269, ships with a handy active external terminator. The 700-MB capacity, once seemingly vast, is now rather meager, however. The Mac Zone Performantz 1GB External Hard Drive offers a more practical capacity and a slightly better price per megabyte, but it lacks an active terminator and

offers a measly one-year warranty.

Large and boxy, the MacProducts Magic Quantum Grand Prix 4.2 GB drive offers this month's best price per megabyte. It has twice the capacity of the Microtech drive, at a lower price, but lacks active termination.

We tested drive speed by using MacBench 2.0's Disk Mix test. The results are relative to that of a 250-MB Quantum IDE drive in a Quadra 630, which has a score of 10.

REVIEWER / JIM SHATZ-AKIN TESTING / MARTIN WONG

+ / OUTSTANDING ● / ACCEPTABLE - / POOR										MacBench 2.0 Disk Mix Score	
		ESTIMATED STREET PRICE	FORMATTED CAPACITY	PRICE PER MEGABYTE	WARRANTY	CASE	SOFTWARE/MANUALS	SUPPORT	COMMENTS	BETTER	
★★★★	MacProducts Magic Quantum 4.2 GB	\$1,198*	4,103.1 MB	\$.29	5 years	●	●	+	Fast. Great price/megabyte. Big. No active terminator.	8.5	
★★★★	Mac Zone Performantz 1GB	\$379.98*	1,027.8 MB	\$.37	1 year	●	●	●	Good general-purpose-drive value. Skippy warranty.	5.5	
★★★★	MacProducts Magic Quantum 730 MB	\$269*	696.9 MB	\$.39	2 years	●	●	●	Attractively priced, but bigger would be better.	7.5	
★★★★	Microtech BLUE Storm 2000	\$1,400	2,045.5 MB	\$.68	5 years	+	●	+	Business users won't appreciate advanced, costly design.	6.5	

*Direct price.

LISTING IS ALPHABETICAL WITHIN GROUPS OF EQUAL MOUSE RATINGS.



SIX NEW MONITORS

With this month's crop of monitors, strengths and weaknesses conspired to cancel each other out, resulting in a lackluster field. Top image-quality honors, for example, go to two PowerMax displays — the 17-inch PM17T and the 20-inch PM20T — but clumsy push-button controls detract from their great looks.

The 20-inch IBM P201 (pictured) has a similar story — excellent focus and color image quality good enough for demanding desktop publishers, but adjusting its push-

button controls, which lack numerical indexes for color and geometry settings, is tough.

In theory, on-screen-menu controls, such as those on the Princeton EO15, the Samsung SyncMaster 6Ne, and the Smile CA2111, are far easier to use than the older-style, push-button ones. But you still have to use buttons to invoke the menus, and the Princeton monitor's buttons are so tiny that they may be awkward for the large-fingered. And alas, with the exception of the Samsung SyncMaster 6Ne, the

monitors boasting on-screen menus yielded image-quality results that were just better than acceptable in our tests.

The image-quality scores reflect the results of our tests for image sharpness, focus, brightness, uniformity, pincushioning, color range and accuracy, and vibrancy. Keeping focus and sharpness on larger monitors is harder, so they tend to score lower than smaller ones. 1.0 is considered acceptable.

REVIEWER / ROMAN LOYOLA TESTING / BRIAN FIKES

+ / OUTSTANDING ● / ACCEPTABLE - / POOR										IMAGE-QUALITY SCORE	
		ESTIMATED STREET PRICE	SCREEN SIZE	MAXIMUM RESOLUTION	WARRANTY	MANUALS	SUPPORT	CONTROLS	COMMENTS	BETTER	
★★★★	Samsung SyncMaster 6Ne	\$699	17 in.	1,024 x 768 pixels	3 years	●	●	+	Great combination of good image quality and controls.	1.2	
★★★★	IBM P201	\$2,675	20 in.	1,600 x 1,280 pixels	3 years	●	+	●	Good monitor for desktop publishers, but expensive.	1.1	
★★★★	PowerMax PM17T	\$839	17 in.	1,280 x 1,024 pixels	3 years	-	+	●	Great image quality, but controls lack elegance.	1.0	
★★★★	PowerMax PM20T	\$1,849	20 in.	1,600 x 1,280 pixels	3 years	-	+	●	Almost the same as the PM17T, with similar image quality.	1.0	
★★★★	Princeton EO15	\$400	15 in.	1,280 x 1,024 pixels	1 year	●	●	+	Average image quality but great controls.	0.8	
★★★★	Smile CA2111	\$795	21 in.	1,600 x 1,280 pixels	1 year	●	-	+	Very inexpensive, but lackluster image quality.	0.7	

LISTING IS ALPHABETICAL WITHIN GROUPS OF EQUAL MOUSE RATINGS.

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Presenting The Next Upgrade To Microsoft Word

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What Nisus Writer squeezes out of a little bit of memory is nothing short of remarkable. For starters, you get all the text, formatting, document and graphics features you'd expect from the most powerful word processors. But with Nisus Writer 4.1, that's just the beginning.

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SCANNERS /

Imacon Flexes Scanning Muscle

Scanner boasts several new scanning technologies.

BREAKING THE scanner mold, Copenhagen-based Imacon is ready to offer the FlexTight, which looks stylish outside and has innovative electronics inside. According to Imacon, this new technology makes the \$16,995 scanner the equal of drum and CCD scanners that cost three to four times as much.

The technology inside is unlike that of any other scanner, combining the basic features of drum scanners and flatbeds into one unit. Like a drum scanner, the FlexTight bends the original in front of the scanning unit, and like a typical flatbed

scanner, it uses a CCD to capture the RGB data in a single pass.

Unlike a drum scanner, however, the FlexTight has a unique flexible, magnetic mounting system that holds the original completely flat as it is passed by the scanning elements. This eliminates the need for adhesives, speeds the scanning process, and keeps the original in focus.

The FlexTight also contains electronics that minimize the introduction of noise into the scanned data and that are capable of capturing 13 bits of data in each channel. The

combination of the scanning mechanism and the electronics allows the FlexTight to capture more than 8,000 levels of color per channel.

Resolution shouldn't be an issue either. The FlexTight can scan A4-sized originals at up to 7,800 dpi and 35-mm slides at up to 4,800 dpi. Imacon claims that the FlexTight has a density range of 3.9 — quite good for a CCD-based device.

The scanner ships with a SCSI-2 interface and proprietary scanning software. A U.S. distributor had not been decided on at press time. Imacon can be reached by phone at 45-



3-888-4050, by fax at 45-3-888-4052, and on the World Wide Web at <http://www.imacon.dk>.

/ Sean J. Safreed

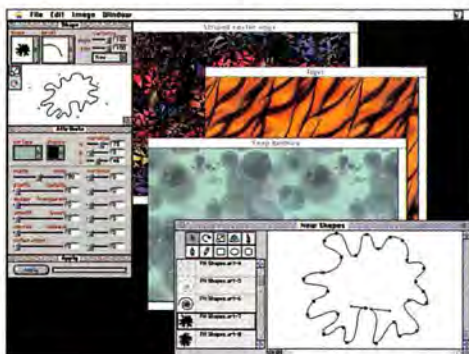
GRAPHICS UTILITIES /

Specular Enhances Apps

HOT ON THE HEELS of Specular's recent update to Infini-D 3.1 comes version 2.0 of TextureScape and LogoMotion. TextureScape offers a raft of new controls, in a revamped interface that can produce a greater variety of textures. LogoMotion's interface, which has also been enhanced, should appeal to novices, with drag-and-drop features to make setting up logo animation easier.

TextureScape 2.0. The big addition to TextureScape is a new dialog box containing Adobe Illustrator-like controls for creating and editing Bézier shapes used to create textures. As with the previous version, you can import EPS graphics from Illustrator and Macromedia FreeHand, but the new drawing tools should simplify the creation of basic shapes.

Shape editing is just the first step in creating textures. TextureScape 2.0 offers new controls for randomizing almost any attribute, making it possible to employ a single layer for effects that used to take multiple



AOL Users Find Home on the Web

EVERYONE CAN BE A WEB PUBLISHER, now that users of America Online can create Web pages and put them online, courtesy of AOL's new My Home Page service.

Each account is given a quota of 2 MB of disk space per screen name, meaning that an account with five screen names can offer 10 MB of data on a set of interlinked Web pages. You can upload files via FTP from within AOL by connecting to users.aol.com. You can find AOL users' pages by connecting to [http://users.aol.com/\[screen name\]](http://users.aol.com/[screen name]). 800-827-6364. / Jason Snell

shapes and layers. For interesting animated effects, random features can be applied to textures over time. \$199; upgrade, \$59.

LogoMotion 2.0. A new button bar combines the rich controls of LogoMotion into a drag-and-drop interface. This includes the ability to

drag textures or bevel styles onto objects. You can also drag stagehands — premade animations — directly into a scene or create your own stagehands to share with other LogoMotion users.

Rendering is also improved in version 2.0. The Phong renderer makes it possible to have shadows as well as objects with applied textures, such as sphere with a map of the earth on it, for extra realism. \$199; upgrade, \$59. 800-433-7732 or 413-253-3100. / SJS



GRAPHICS CLOSE-UP / BY BEN LONG

Layered Layouts

Compositing images in Adobe Photoshop is a common task. For those with page-layout skills, there is an easier way. Meet Collage.

THE WORD COLLAGE may imply creating images by cutting and pasting pictures from magazines or photos. But with powerful digital-compositing software, making collages on your Mac can become anything from the

simple combination of several images to sophisticated special-effects work.

That's where Collage 2.01 (\$279), from Specular (413-253-3100), comes in. Collage is a compositing application designed to complement paint and image-editing programs such as Fractal Design Painter and Adobe Photoshop. Using Collage's page-design metaphor, you can quickly and easily create compositions of several images. Collage has two main benefits over an image-editing program: speed and lower RAM requirements. Let's take a closer look at Collage to see how it fits in with your work flow.

Editing by Proxy

Collage does not include any tools for retouching or painting, but placing, moving, rotating, and blending images is Collage's forte. It can perform these operations much faster than a program such as Photoshop or Painter, even though these programs also

have image-layering capabilities.

To speed up compositing, Collage makes a proxy of each of the large files in your composition. Typical bitmap-editing programs give you control of each and every pixel in your image, which makes them great for creating artwork. But editing large, high-resolution images can tax even the fastest Macintosh.

Collage eases this processing burden by creating screen-resolution (72 dpi) proxy files of all your images. When you import a file into Collage, a proxy is saved to disk on-the-fly. Instead of working with, say, a 300-dpi file, you're working with a 72-dpi file, which has enough detail for most compositing work. When you've finished creating your composition, Collage returns to the original full-resolution files to render a completed image at the size and resolution you specify.

In addition to speeding up editing with

its proxy approach, Collage eases the compositing process by keeping each image in its own layer. The obvious question is, Photoshop 3 also provides layering controls, so why use Collage? Aside from having superior speed (particularly when working with many high-resolution layers), Collage offers a true object-oriented approach to layering. Working with layers in Collage is more akin to working in a draw program such as Adobe Illustrator than it is to working with Photoshop's layering features.

In Collage, each layer has a set of properties that can be changed at any time. Photoshop applies filters one at a time to each pixel, and once the image or layer is changed it cannot be undone. Collage applies the filter to the proxy but leaves the actual filter processing to the final rendering phase, meaning you can undo any property applied to any layer. This approach means that rapid changes are much easier to execute than in Photoshop and that you can undo any operation quickly.

RAM Tough

For users with limited RAM (24 MB or less), Collage can be most useful simply for getting multiple images into one document. If



figure 1 / For this CD cover, the author created a Collage document and imported two high-resolution scans and a 3-D rendering. Collage made easy work of combining and scaling the images.

you add several large, 300-dpi images to a Photoshop document, you will find that Photoshop wants lots of RAM simply to position them, never mind performing more-complicated operations such as rotating and scaling. If Photoshop runs out of RAM, it creates the necessary space — called virtual memory — on your hard disk. Because data access is slower with hard drives than with RAM, even a speedy Power Mac seems to crawl.

Using Collage is the perfect solution to this problem. No matter how large your images, you'll be able to easily place and move them in Collage, with as little as 8 MB of RAM.

You'll also find advantages to Collage's pasteboard. Like Adobe PageMaker and Illustrator documents, Collage documents sit on a large canvas. This pasteboard makes it possible to deal with elements that are much larger than your document. A large image can be brought in and easily scaled down to the desired size or made to bleed off the edge of the page. To do the same thing in Photoshop, you must create a document big enough to contain the largest images in your composition, but doing so often requires more memory than you have.

With your images in place, Collage can render your document as one large image or as a Photoshop 3.0 file with all layering information intact.

Who Was That Masked Program?

Good compositing depends on the ability to create masks — often called alpha channels — which define how separate layers blend together. Masks are akin to stencils in the real world but with the added benefit of being partially transparent. An alpha-channel mask fades two images smoothly together by using the mask image to specify which areas are clearly visible and which are completely transparent.

Masks are necessary for combining just the parts of an image you want in your composition, but unlike Photoshop or Painter, which have a complete selection of tools for creating masks, Collage has no such built-in masking features. Collage does, however, provide the necessary tools — including transfer modes for adding special effects and filters such as Add Noise and Unsharp Mask — for combining images by

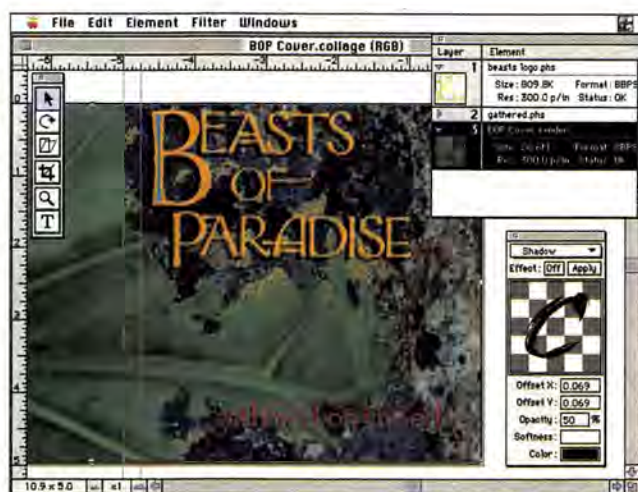


Figure 2 / Collage emphasizes page design. Notice the page borders and guides that aid in positioning images. The drop shadows behind the text were a snap to create with the Effects palette.

employing alpha-channel information.

If your masking needs are simple — removing a background or creating a dissolve from one side of an image to another, for example — you can probably create all of your masks ahead of time in an image-editing program. Collage provides controls for changing the transparency of an element, so you don't need to create masks for this simple effect. With your masks created, launch Collage, import your images, and turn their masks on — and you're ready to start compositing.

There are times when you won't know what type of masks you need until you begin placing your images together. You may not realize, for example, that one part of an image needs to be masked until you start creating your collage. You can approach the composition in one of two ways, depending on the amount of RAM in your machine.

If you have enough RAM, give Photoshop and Collage a partition of 10 to 15 MB each and launch them both. Place your images in Collage, and then move back to Photoshop to create masks, using any of Photoshop's masking and selection tools. Collage automatically updates placed images when the original files change, which has the benefit of making the editing process interactive. This is the faster method, provided all the images you are working on are small, about 3 to 5 megabytes.

Users with less RAM may want to position all their images in Collage (as described above) and then render the images as layered Photoshop 3.0 files. The resulting documents can be opened in Photoshop, and masks can be created by using Photoshop's Layer Mask feature. Even if your

machine doesn't have enough RAM for moving or placing large images, it probably has enough for editing masks.

Day of Rendering

With your image complete, you're ready to render, a time-consuming process when you're outputting a high-resolution image. Rendering a 10-x-5-inch image in Collage at 300 dpi on our Power Mac 7100/66 took 48 minutes. Nevertheless, the time we saved during the composition process was more than worth the time it took to render the final image.

Even after rendering, you'll probably find a few uses for your image editor. No matter how carefully you select and mix your images or how meticulously you create your masks, there will still probably be rough spots in your final image, areas you'll want to retouch in Photoshop.

Because Collage doesn't offer any color-correction tools, you may want to use your image editor to adjust the colors of your final image. Because Collage supports Photoshop layers, it's as easy to do this on a layer-by-layer basis as on the final image.

As users' needs become more complicated and software becomes more specialized, using several applications in tandem can overcome processing and storage limitations. Although other applications — most notably HSC Software's Live Picture — exist for putting together sophisticated compositions, Photoshop users will find using Specular's Collage to be a natural extension of their normal work process. □

Ben Long is a San Francisco-based writer who creates collage artwork, both analog and digital, and likes clarinets.

GRAPHICS HOW-TO / BY JANET ASHFORD

Spic-and-Span Scans

Photoshop provides the right tools for turning old art into sharp illustrations.

CAPTURING COPYRIGHT-FREE vintage artwork with a scanner can be a great way to start an illustration. Scans, however, require some preparation before you can turn them into a final piece of PostScript art, especially if you plan to add color to various parts of the illustration. You will need to break the image up into separate shapes in Photoshop *before* autotracing in Adobe Streamline or another tracing program, to make the final illustration in Adobe Illustrator or Macromedia FreeHand easier to edit and print. Most old engravings and woodcuts contain problem areas — small black or white spots, clogged areas, or superfine lines — that require a bit of pixel editing. This example shows you simple techniques for cleaning up these scans so your final illustration can look its best.

Janet Ashford is the coauthor, with John Odam, of *Start with a Scan: A Guide to Transforming Scanned Photos, Drawings and Objects into High-Quality Art* (forthcoming from Peachpit Press).



1. Scanning the original. The first step is to scan your image in Photoshop, at a resolution that's high enough to give you the detail you want without taxing your system or hindering Adobe Streamline during the tracing process. I scanned — at 400 dpi — a picture of a pianist from the copyright-free source *Music: A Pictorial Archive of Woodcuts & Engravings* (Dover, 1980).



2. Cleaning things up. To simplify the image, I circled the background shapes and filled them with a white background color by pressing the Delete key. I then used the brush tool, with either black or white paint, to brush out small dots and spots, such as those in the hands of the pianist, and to open up areas that were clogged, such as the areas of white in the dress.

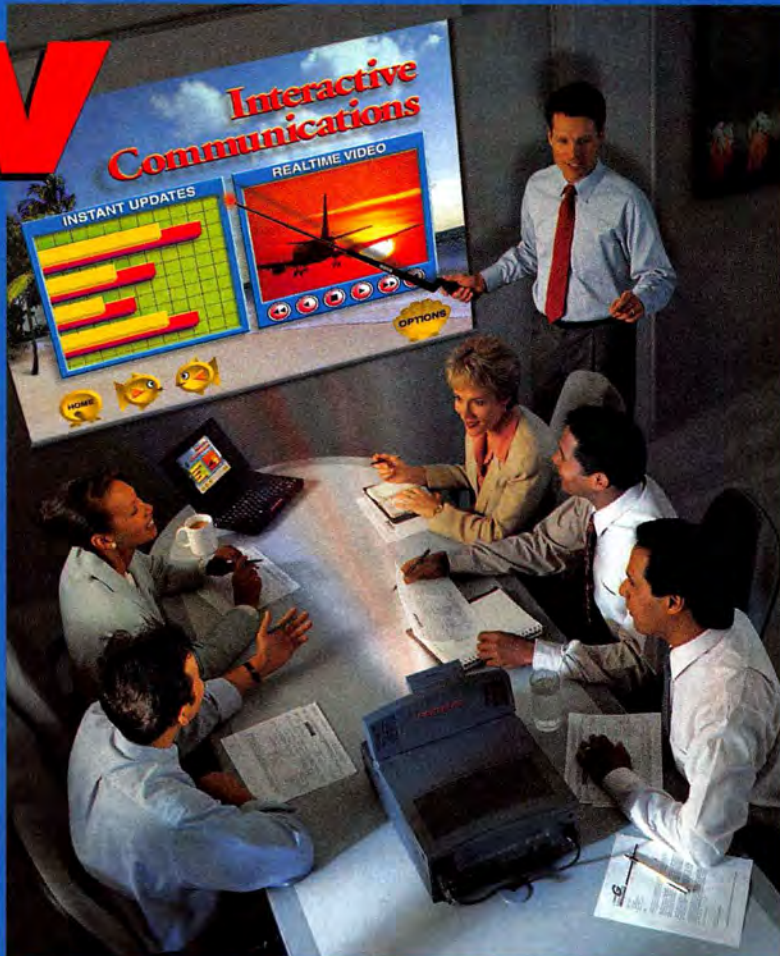


3. Breaking up the shapes. I knew I wanted the dress and the piano to be different colors in the final PostScript art, so to lay the groundwork for this, I converted the scan to RGB mode (Mode: RGB) and filled the dress areas with red, using the paint-bucket tool. Then I could see where breaks between shapes should occur. To separate black areas from each other, I drew breaks between the shapes, using the airbrush tool and a white color.



4. Separate with color. To check my progress, I dumped different colors into black areas until there was no unwanted filling of adjacent shapes. Painting white breaks meant that solid-black borders could not be maintained around white shapes, such as the face, that should remain separate. I dealt with these areas by later drawing the shapes in Illustrator. Before autotracing, I converted the image back to black-and-white, by using the Replace Color command (Image: Adjust: Replace Color) to reduce the saturation of the colored areas to zero.

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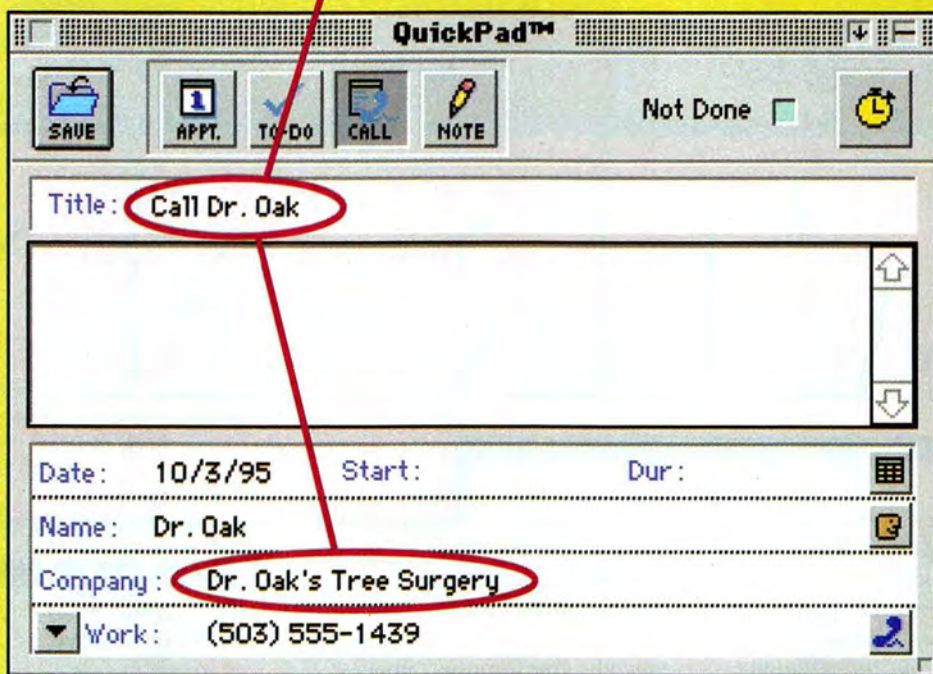
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EXPERT TIPS / BY BOB SCHAFFEL AND CHUCK WEGER



Data, Data Everywhere

Publishing in the digital world means creating and storing lots of data. Making use of all those bits requires smart data-management tools.

WE'RE DROWNING in a sea of data, and we need life preservers to keep us from going under. In the publishing environment, that's what database and work-flow managers are for. But what's available today is a cross

between a bit bucket into which we haphazardly throw data and an electronic version of the magnetic whiteboard on which we scrawl to-do lists. This approach may be acceptable for the near term, but as work-flow management in a digital-publishing environment evolves, it will lead to more rounds of reconfiguring our databases — throwing out the data babies with the digital bathwater. As we publishers amass more data, we need to find better ways to make more-productive use of and add some much needed longevity to it.

For example, look at how we store content with an eye toward repurposing it for other media. With most image databases, you first decide what an image looks like and then you assign it a corresponding key-word or two. Next, you store it in the database by file type. Now you can find it again and reuse it. This method of image management is great as long as the format works in an evolving publishing environment and as long as you don't mind using the same images again.

Some image-database vendors have put on their X-ray specs and are talking about the data bits rather than the file types. In this scenario, it doesn't matter whether or not the database manager recognizes the file type — the bits just get passed through the publishing process intact.

However, even this approach doesn't go far enough if the data is to feel fresh. What's required is a way to create "molecules" of data — subcomponents that can


be recombined in innovative ways. Without recombination, images are destined to become stale faster than they might otherwise. Think of the process as the content equivalent of using a raster-image processor (RIP). RIPping works for output because PostScript turns content — text, graphics, and images — into the common language of math. The RIP turns the math into marks on paper without regard to what created those content elements in the first place. What we need is a content processor to make it easy for publishers to reuse content.


Keeping afloat in this sea of data also requires that work-flow management go far beyond scheduling. For example, people who are good at making choices when the proper decision points are presented to them are often not as well versed in deciding what the proper decision points should be. If databases could store more than just content, we could, for example, include decision trees — work-flow decision templates, to be exact — in our databases. When a job was entered into the work-flow manager, not only could appropriate decisions be presented to production personnel but some decisions could be automatically initiated from the work-flow manager's database. For example, an image would not

just be retrieved but would also be automatically resampled and resized before it was presented for page placement.

Here's the real point: Instead of using databases as passive collection entities, we can make them active partners in the production process. Customer-service representatives could define the work flows that drive the production decisions, which in turn would be automated by work-flow-management modules. Designers could pay more attention to design than production. The entire production process would be optimized.

While you're waiting for this change to occur, is there anything you can do? Start thinking about your data as subparts. For example, instead of thinking of a digital image as a bitmap, think of the elements and operations that went into creating it — masks, layers, and other image components. Then think about how you can reuse these image elements. And start banging the drum with software developers. After all, they build what they think you will buy.

Such smart database- and work-flow-management tools may sound far-fetched, but they're not. The concepts aren't really new, but desktop computer systems are finally powerful and cheap enough to implement these ideas. It behooves us to stop asking developers to create stopgap database life preservers for us when what we really want is to learn to swim. 

Such smart database- and work-flow-management tools may sound far-fetched, but they're not. The concepts aren't really new, but desktop computer systems are finally powerful and cheap enough to implement these ideas. It behooves us to stop asking developers to create stopgap database life preservers for us when what we really want is to learn to swim. 

Bob Schaffel is emerging-technologies consultant for R. R. Donnelley & Sons. Chuck Weger is a consultant and conference chair for CONCEPTS 96.



Created on a Macintosh with
64MB of Kingston memory.

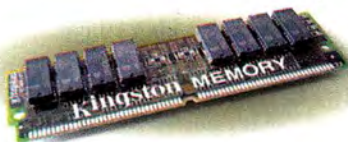
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NETWORKING

WIRELESS NETWORKING /

PC Card Lets You E-Mail on the Go

CONVENIENT, LIGHTWEIGHT WIRELESS communication is the traveling computer user's Holy Grail — and the goal of a new PC Card from Megahertz (800-527-8677 or 801-320-7000) that connects to messaging services in order to bring wireless e-mail, fax, and file transfer to PowerBook and Newton users.

The Megahertz AllPoints Wireless PC Card carries its own battery and antenna in a PCMCIA Type II card. The \$499 price includes WyndMAIL and RadioMail software, each of which runs on Macs, PCs, and Newtons as well as other PDAs. With either the WyndMAIL or the RadioMail service, which is charged on a per-message basis, the package allows e-mail, fax, and data communication via the radio-based RAM Mobile Data Network, available throughout the U.S. and several foreign countries.

Megahertz is not the first to bring

wireless communication to the Mac, but the AllPoints card is notable for providing all you need in a compact form. Other schemes require brick-sized radio modems for connection to wireless networks.

The WyndMAIL and RadioMail services provide users with an Internet e-mail account that can forward messages either directly to the AllPoints card or to any designated e-mail address. Users can send and receive e-mail with the card or can simply receive notification of waiting messages. The software can also filter messages.

The WyndMAIL service (800-549-6000 or 805-547-6460) costs \$49 to activate and \$49 per month, with 50 free 1,000-character messages included in the monthly fee. Additional messages cost 29 cents each, and dial-in mail retrieval costs 19 cents per 1,000-character message. The RadioMail service (800-597-6245 or 415-286-7800) costs \$99 to activate (fee waived with a two-year contract) and \$39 per month with 100,000 characters' worth of messages included in the monthly fee; additional messages cost 32 cents each. News and stock quotes are also available from RadioMail. Both services can send faxes via the wireless network. / Nathan Garcia



NETWORKING SOFTWARE /

Timbuktu Adds Features, Integration

NEW COLLABORATION FEATURES and a new look highlight version 2.0 of the Timbuktu Pro screen-sharing software, from Farallon (510-814-5100). Road warriors will also find dialing up their desktop Macs a bit easier.

Timbuktu Pro for Networks, Macintosh Edition, as the product is now dubbed, looks a lot more like a Microsoft Windows application than past versions. That's no accident, since Farallon hopes to expand Timbuktu's reach into the cross-platform world. Mac and Windows versions of Timbuktu (the company released a new Windows version last July) now support connections over IPX, in addition to connections over AppleTalk and TCP/IP, which have been available in previous versions. Version 2.0 of the Mac product also supports Apple's Open Transport.

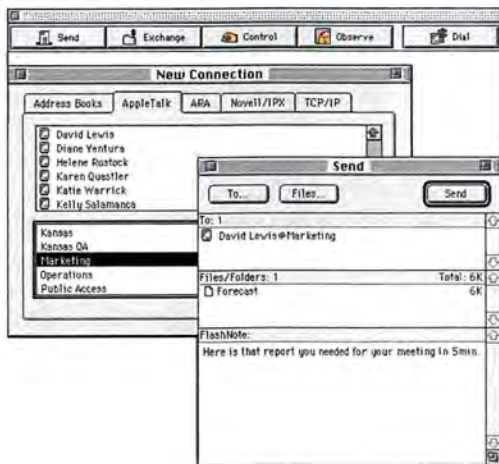
Taking note of Timbuktu's usefulness to PowerBook and remote-office users, Farallon has licensed ARA (Apple Remote Access) client software from Apple and includes it with version 2.0. As with previous versions, ARA users are able to open connections to a Mac network automatically through Timbuktu documents, if they have ARA installed.

Timbuktu's file-transfer features are significantly enhanced in the new version. The software supports drag-and-drop transfers between machines that are being controlled remotely. In addition, users can send files to multiple

people — rather than to one user at a time, as with previous versions — whether the recipients are using the Mac or the Windows version of Timbuktu. A messaging system called FlashNotes allows users to add a note to a file being transferred.

The simplicity of group file transfers owes much to Timbuktu's new user interface, which includes an address book and other features designed to help users find others on a large AppleTalk or IPX network. Users can save names and groups in the address book and search both the address book and the network for other users.

Prices for Timbuktu range from \$42 per user (\$4,199 for a 100-pack) to \$100 per user (\$199 for a twin-pack) — slightly higher prices than the firm charges for the Windows version. / Shelly Brisbin



NET BYTES

Hello Out There

FREE CONNECTIVITY for PowerTalk users is now available from **Apple**, which is distributing gateways that provide a bridge between the messaging software and other mail-system software. Apple will distribute the **Mail*Link** gateways, which it acquired from StarNine Technologies, via the World Wide Web (at <http://www.info.apple.com/dev/evangelism/powertalk/gateways.html>) and as part of future system-software releases. With the gateways, PowerTalk users can receive mail from the Internet, StarNine Mail (formerly Microsoft Mail for AppleTalk), and CE Software's QuickMail. * If free mail gateways can't tempt you to use PowerTalk, how about an all-purpose communications application? **JABRA** (800-327-2230 or 619-622-0764) has released **DOC•TEL**, an e-mail, fax, and telephony package that manages messages and documents and — with a GeoPort and the JABRA Ear PHONE — lets you use the Mac as a hands-free telephone. DOC•TEL Personal sells for \$99 or for \$49 if you upgrade the Lite version that comes with the Ear PHONE. A multiuser version is planned for early 1996. / SB

MAC TO PC / BY JOHN RIZZO



Making the Standard Pitch

Apple is once again striving to create a cross-platform standard. Will OpenDoc be another QuickTime or a boondoggle?

IT SEEMED LIKE MAGIC at the time. I stood at a trade-show booth in 1987, staring in disbelief. The application that was then the *raison d'être* for the Mac — PageMaker — was running smoothly under the clunky

new Microsoft Windows 1.03. PageMaker was one of the first Mac applications to make its way to the other side of the fence. The Windows port gained Aldus new customers, but it also helped the company keep its Mac customers, by establishing the product as a cross-platform standard.

The importance of standards for the success of the Mac has only grown with time. Some of Apple's cross-platform products, notably QuickTime, have captured the market, whereas others have failed. In the afterglow of the Windows 95 hoopla, OpenDoc presents an important opportunity to bring a Mac standard to the industry — if Apple can show that it has learned from its past successes and failures.

Multimedia Savvy

Realizing that its QuickTime technology would be a welcome addition to the PC environment, Apple was quick to port the multimedia software to Windows. QuickTime for Windows 1.0 enabled PCs to run multimedia software without the costly add-in boards and additional RAM required by Intel-promoted technologies. But Microsoft soon picked up on the idea and released Video for Windows, which instantly became a major competitor. Apple fought back with QuickTime for Windows 2.0. QuickTime is faster than Video for Windows, is easier to develop for, and yields better-quality video.

Yet QuickTime couldn't succeed with superior technology alone. It needed the endorsements of major PC companies, and

it got them. Last year Apple agreed to include Intel's video-compression algorithm, Indeo, in QuickTime for Windows and the Mac. A few months later, Netscape agreed to incorporate QuickTime and QuickTime VR into future releases of Netscape Navigator for the Mac and Windows, to enable people to use multimedia over the Internet.

QuickTime for Windows has prevailed, because Apple stayed ahead of the technological curve and because it made crucial licensing deals. QuickTime for Windows is widely used in PC multimedia products, gets good reviews in the PC press, and lets the Mac remain an important platform in the production of CD-ROMs and multimedia titles for Macs as well as for PCs.

Windows Vaporware

Apple has not always taken the lessons of QuickTime to heart. The company's GeoPort was supposed to become a general-purpose, low-cost communications standard for analog and digital lines. IBM and AT&T announced support for the GeoPort standard but have never produced a product that implemented it. In fact, Apple itself underutilizes the GeoPort, which has the capability to transmit ISDN but can currently operate only at 14.4 kbps on the Mac. With 28.8-kbps modems available for \$200, there's little reason for a Mac user, let alone a PC vendor, to adopt the GeoPort.

Another of Apple's failed cross-platform standards is DAL (Data Access Language), client/server database middleware. DAL actually made it to a PC version. In fact, you can still buy DAL Client for DOS/Windows (\$149) and DAL server software for UNIX machines, from AGE Logic (508-898-3300). However, DAL failed to become anything like a standard in the face of Microsoft's ability to sign up developers and create a de facto standard with its own ODBC. Apple eventually made the Mac and PC

DAL client software compatible with Microsoft's ODBC APIs, but this tactic didn't work. Apple surrendered the battle, stopped shipping DAL with the Mac OS, and sold DAL to Independence Technologies (800-605-9010 or 510-438-2034).

Apple has occasionally attempted to enter the cross-platform world by bringing others' technology to the Mac. NetWare for PowerPC, a joint project with Novell, was possibly Apple's biggest cross-platform mistake ever. As I described in my December '95 column (page 143), Apple was planning to bundle a PowerPC port of the NetWare network operating system with an Apple Workgroup Server. The decision to kill the project was an expensive one. NetWare for PowerPC was already in beta and was scheduled to ship in February 1996.

Why did Apple and Novell kill NetWare for PowerPC? Apple told me that customers didn't really want NetWare for PowerPC after all and that it had decided to focus on AppleShare software. Unfortunately, the company took too long to come to this conclusion, which cost it money and produced an embarrassing retreat from what would



have been a high-profile product.

Sticking to AppleShare does make some sense, now that Apple Workgroup Servers include AppleShare Client for Windows at no extra charge. (It's also available separately for \$199 for an unlimited number of networked PCs.) Although it's not intended to compete with NetWare or Microsoft Windows NT Server, AppleShare Client for Windows makes Workgroup Servers viable solutions for Mac-centric networks that have a few PCs.


OpenDoc: Another QuickTime?

Despite a string of failures, Apple does have a chance of repeating QuickTime's success. OpenDoc technology will let users link and customize their applications (see Mac to PC, March '95, page 119). Just as QuickTime brought multimedia to PCs, without requiring a lot of extra hardware, OpenDoc promises to bring powerful applications to users' machines, without the need for massive amounts of hard-disk space and RAM. OpenDoc makes features of applications available as small pieces of software, called *parts*, that you can choose to install and mix and match at your own whim. OpenDoc may ultimately allow you to simply remove the features you don't need from OpenDoc-based applications, although early versions are unlikely to include this capability.

Like QuickTime, OpenDoc is technically superior to Microsoft's alternative, OLE (Object Linking and Embedding), which still relies on huge, monolithic applications. OpenDoc is easier to use than OLE, easier to develop for, and more flexible. Apple has also been able to articulate these advantages to cross-platform developers and to get them interested — something it succeeded in doing for QuickTime but failed to do with DAL and NetWare for PowerPC. Apple created an industry alliance, Component Integration Labs, to foster OpenDoc development. CI Labs now controls Apple's OpenDoc technology and boasts members that include IBM, Novell, and Adobe.

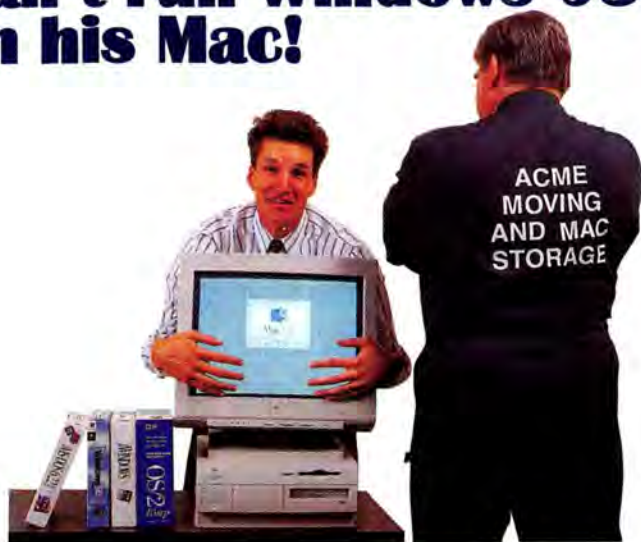
Unfortunately for OpenDoc proponents, OLE is already shipping, with OpenDoc expected to become available to developers only this quarter. The OpenDoc alliance will need a massive marketing effort to overcome OLE's lead. Fortunately, the alliance has more resources for this effort than Apple would have by itself.

With OpenDoc, Apple seems to have the right technology and the right alliances. OpenDoc will be a central part of Apple's Copland operating system, and IBM — whose new ownership of Lotus Development makes it a very important software vendor — has stated its intention to use OpenDoc widely. Novell's commitment at this point is less clear.

One thing is certain: The cross-platform success of OpenDoc is crucial for Apple. The company can no longer afford to create great Mac-only technology. By propagating innovative cross-platform technology, Apple can help the Mac remain relevant in a Windows-dominated world. 

Contributing editor John Rizzo is the author of several books, including How Macs Work.

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CIRCLE 130 ON READER SERVICE CARD

HANDS ON

PRINT *Like a Pro*

Apple's latest printing software brings new power to the Mac masses, but it demands some new troubleshooting techniques.

BY TED LANDAU

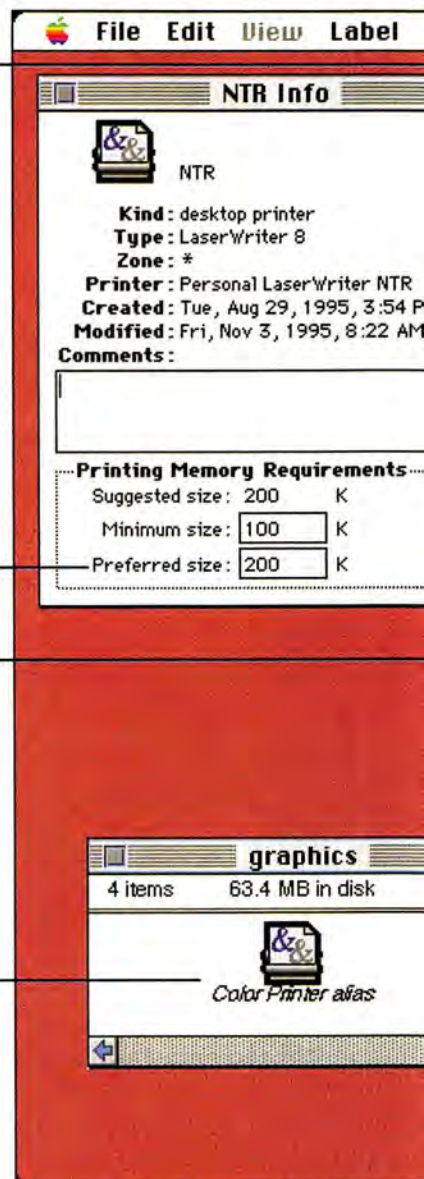
NOW, ALMOST ANY MAC user can take advantage of printing features that used to be available only to those who braved QuickDraw GX. The main attraction? *Desktop printers*, icons that sit on your Mac's desktop and enable drag-and-drop printing. It's easy enough to get desktop printers onto your own Mac; the printing software is available on all the major online services (see the "Icon Class" sidebar for information on obtaining the software). The problem is that you're likely to get documentation that's skimpy at best. Here's a catch-up on the basic features, insider tips, and troubleshooting aids to help you reap the benefits of desktop printers.

To delay printing of all your files, use the Stop Print Queue command.

If you get out-of-memory messages, you probably need to allocate more memory to a desktop printer or the Desktop PrintMonitor extension.

Even though desktop-printer folders appear in the Save dialog box, don't save files to them.

Use aliases to print from within folders.

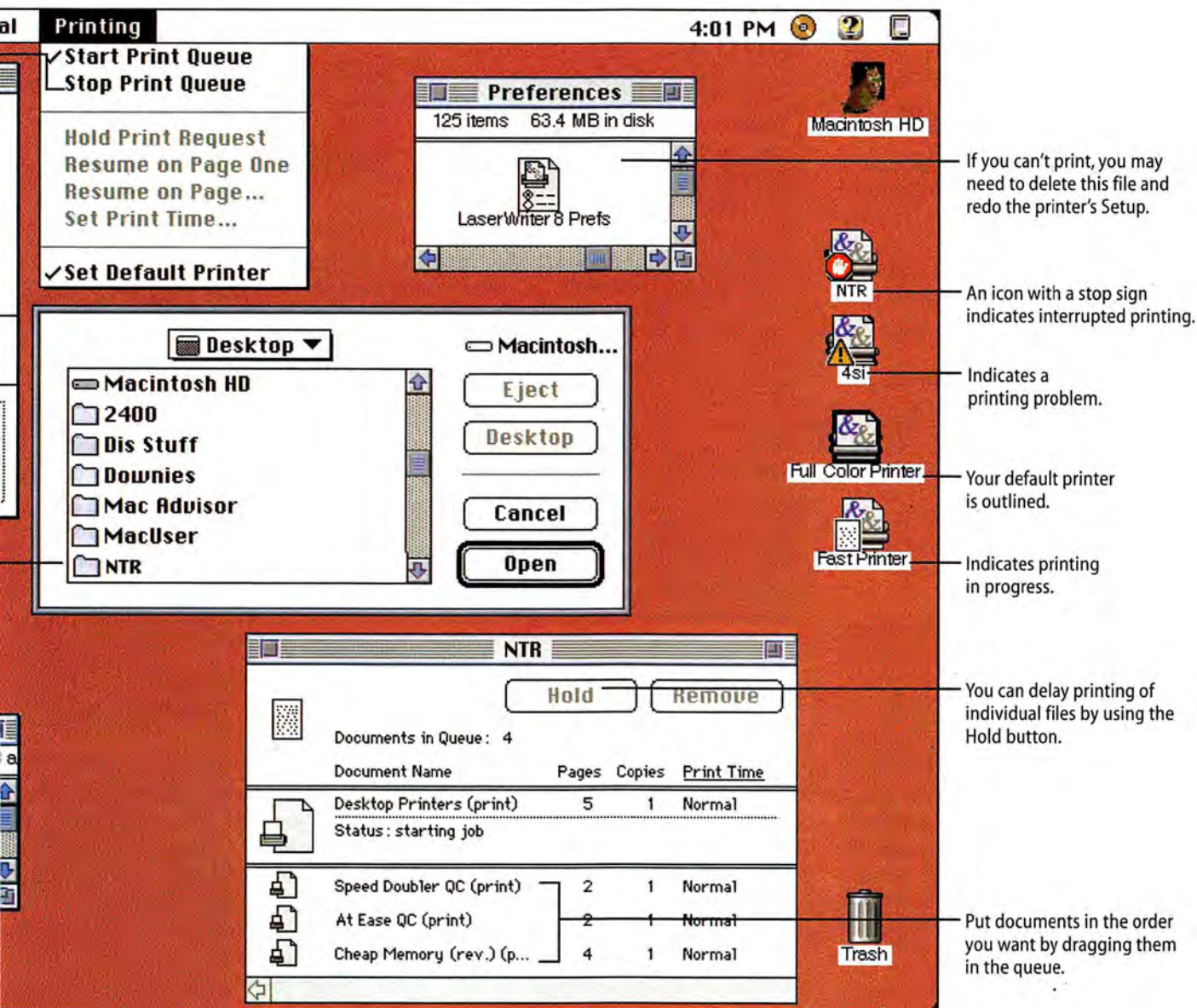


What You Get

Using desktop-printer software is easier than the old printing method, because it saves you steps and gives you more control.

Step Saver. You can still print the old-fashioned way, by selecting Print from an application's File menu, but desktop printers give you another choice: Just drag and drop a document's icon onto a desktop-printer icon. This opens the document and the Print dialog box, saving you a step. Drag-and-drop printing really comes in handy when you need to print several documents or want to print to more than one printer. Simply drag your documents to your selection of printers, and the desktop-printer software sorts everything out. No more need to go to the Chooser to switch printers.

The Signs of Change. Checking the progress of a print job is also easier with the new printing software. With the old software, you had to open PrintMonitor. Now, all you have to do is glance at the desktop-printer icon you're using. Whenever a print job is in progress, the icon changes to include a piece of paper. If any trouble occurs, a triangular yellow alert symbol appears (along with an error message



in the Finder). If you halt the queue, you'll see a stop sign on the icon.

A Clean Window. One of the most important changes you get with this new software is more control over background printing. Unlike previous printer software, desktop-printer software lets you rearrange the order of documents in the print queue without having to delete any print jobs, and you can delay the printing of one job while allowing the others to continue on their march to the printer.

To assert this control, start by double-clicking on a desktop printer. That opens a window containing a list of current jobs in the printer's queue. To delay printing of only one document, select its name and click on Hold. Rearranging the order in which documents print is also simple — just drag a document's name up or down in the queue (or even out of the window if you want to delay its printing until you move it back).

Cease All Activity. If you want to halt *all* your print jobs for a given printer, you need to access the desktop printer's menu rather than the print queue. Click on a desktop printer to make a new menu — Printing — appear in the Finder's menu bar. Then select Stop Print

Queue. This not only stops current print jobs but also stacks up subsequent jobs you send to the printer. When you want to start printing again, select Start Print Queue.

One caution about delaying printing: Don't do it needlessly if you're tight on memory. Whenever you leave documents in the queue, the desktop-printer software soaks up an additional 160K of RAM.

The Bold Ones. A bold line around a desktop printer means it's the default — the one your documents print to if you print from within an application rather than using drag-and-drop. To select a different printer as the default, highlight it and choose Set Default Printer from the Printing menu.

What's Missing

You may find desktop printers are missing some important features. Here are a couple you can add yourself:

Alert Handling. Since the desktop-printer software handles background printing, the old PrintMonitor doesn't show up anymore.

However, the old PrintMonitor had at least one useful feature that desktop printers don't have: the option to disable manual-feed alerts (so that you don't get an alert that holds up printing to tell you what you already know — you need to insert paper into the printer's manual-feed tray). All you have to do to get the old PrintMonitor is disable the desktop-printer extensions. You can do this either by restarting with extensions off (by holding down the Shift key during startup) or by using a utility such as Apple's Extensions Manager.

Mobile Icons. One other potential frustration is that desktop printers won't budge from the desktop, but don't let that limit you. Although you can't move a desktop-printer icon into the folder of your choice, you can create an alias and put it wherever you want. An alias works just like the original.

Fix What's Wrong

Desktop printers are reliable, but problems can and do arise. Here's a sampler of what to watch out for:

Lost in Desktop Space. A desktop printer is actually a folder, which means it shows up in the list of folders and files in the Save dialog boxes. The problem is that if you save a document to a desktop printer, that document will disappear from the Finder and you won't be able to access it from the desktop anymore. To retrieve the file, start up with extensions off and drag the file out of the desktop-printer folder.

XXX. If your desktop-printer icons have Xs over them, it means the printing extensions are disabled (typically because you started up with the Shift key held down). You can still print, but you don't have access to any of the special features of desktop printers. Restart with extensions back on, and all will return to normal.

Memory Lapse. Memory management is improved in this latest incarnation of Apple's printing software, but that doesn't mean your Mac is immune to low-memory alerts. If you're getting them, the cause is likely to be one of the following problems:

- You haven't allocated enough memory to the Desktop PrintMonitor. This is the likely problem if you have more than four desktop printers on a Power Mac or more than eight on a non-Power Mac. To allocate more memory, highlight Desktop PrintMonitor (in the Extensions folder) and increase the

ICON CLASS / creating a desktop printer

PUTTING DESKTOP-PRINTER SOFTWARE on your Mac is basically a four-step process:

1. Download the software.

The parts you need are included in the LaserWriter 8.3 print driver or the latest versions of the StyleWriter printer software. These files are available from the Apple-support area of all major online services.

2. Install the software.

Since the software you download is probably in the form of a disk image, you'll need the help of a utility to prepare the software for installation. One option is to copy the disk images to floppy disks, using Apple's DiskCopy utility, and then install from the floppies. Some utilities, such as the shareware program ShrinkWrap, let you mount the disk images on your desktop without copying to floppy. Both DiskCopy and ShrinkWrap are available online. After installing the software, restart your Mac.

3. Select a printer.

To do so, open the Chooser and select a print driver. Typically, a Setup button will appear. Click on it. The printer may have to be turned on for this button to work.

4. Finally, check your settings.

Make sure all the other settings in the Chooser are as you want them. For instance, do you want AppleTalk to be active or not? Quit the Chooser.

That's it. The printer icon will now be waiting for you on the desktop. To make the best use of desktop printers, you should use System 7.5.

preferred memory size in its Get Info window. You don't need more than a small increase. If you have a Power Mac, increase the memory 10K for every printer beyond four. For instance, if you have six printers, increase the memory by 20K. For non-Power Macs, increase memory 10K for each printer beyond eight.

- A specific desktop printer doesn't have enough memory allocated to it. Suspect this problem when the message asks if you want to temporarily adjust the memory size of the desktop printer in use. The fix? Increase that specific desktop printer's memory (as opposed to the Desktop PrintMonitor's memory) by 100K to 200K.

Crash and Crash Again. Occasionally a printing problem may cause the Mac to crash, forcing you to restart. If so, the Mac may crash again near the end of the startup, as it automatically tries to print the problem file again. Stop this nonsense by first restarting with extensions off. Then double-click on the desktop printer, even though it has an X over it. It will open like a folder, with the waiting print jobs inside visible as ordinary-looking documents. Drag the document icons to the Trash, and restart.


Crashes on PCI Macs. If you have a PCI Power Mac and are experiencing problems such as freezes and crashes, make sure that you have the latest version of the desktop-printer

extensions and that you install the 7.5.2 Printing Fix extension. These files are all available online from Apple.

Printing Paralysis. If you can't get a print job to finish — say, for instance, you get a message that says you can't use a particular printer — go to the Preferences folder and delete that printer's Preferences file (for a printer using the LaserWriter 8 print driver, look for LaserWriter 8 Prefs). Then go back to the Chooser, and redo the setup for the printer. Restart the Macintosh, and try again.

No Signs of Life. It's unlikely, but it can happen — you drag a document to a desktop printer, and you get no response, not even an alert message. This means the application you're printing from is probably incompatible with the drag-and-drop feature. Unfortunately, there's nothing you can do but hope that the next update of the application is compatible.

Print Job Complete

Desktop printers make managing your printing easier and more convenient, especially if you use more than one printer. Now that they're available to QuickDraw GX as well as non-GX users, what are you waiting for? 

Ted Landau is a MacUser contributing editor and author of books on Macintosh troubleshooting.

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NET TRAVELER / BY MICHAEL SWAINE



Point and Shop

A world of products awaits you in the Internet's virtual stores, but watch out: Your credit-card number and your privacy may be at risk.

ELECTRONIC OPERATORS ARE standing by, even now, to take your orders at thousands of online stores. You can throw yourself a Tupperware party at <http://mall.turnpike.net/R/rgs/tupper.htm> or shop till you

drop at a virtual mall. Finding the store you want can be a chore, however. One way is to visit malls such as Shopping 2000 (<http://www.shopping2000.com/>) and the Internet Mall (<http://www.mecklerweb.com/imall/>), which has 4,500 cybershops. Or you can search for a specific store at Yahoo (<http://www.yahoo.com>). Wherever you decide to do your virtual shopping, you'll find that it's surprisingly similar to the real thing — but with dangers more sinister than sticky-fingered pickpockets.

Wrap It Up. At many shops, the first thing you do is grab a cart. It may be called a shopping bag or a shopping list. Netscape's General Store, at <http://merchant.netscape.com/netstore/index.html>, calls it a basket. Book Stacks Unlimited (<http://www.books.com/>), which has 300,000 titles on its virtual shelves, calls it a BookBag. Whatever it's called, the idea is the same: You click on items to put them in your cart, and when you're ready to check out, the store tallies up the prices of the items in your cart and presents you with a bill.

Is It Safe? The first stores to take orders over the Net experimented with various payment schemes, including asking you to send your credit-card number via e-mail, over unsecured connections. Many sites now use software that keeps your credit-card number or your entire transaction private, via public-key encryption. Although this technology itself is very secure, not all implementations are created equal. Last fall, Netscape discovered that its public-key encryption scheme

was flawed, taking advantage of only a fraction of the security the technology offered. That problem has been fixed, but questions still remain about the security and privacy of Internet transactions.

Even if the details of your transaction are protected, other information — the fact that you're shopping at a certain store, for instance, or your preferences for certain types of products — might not be. Online shopping makes it easy for a merchant to create a profile of your shopping habits, which can be used to advertise more merchandise or be sold to other companies, without your permission.

Trust in a merchant's staying power and service may suffer when buying is done electronically. The relatively low cost of setting up a Net business opens the door to more firms that may abscond with people's money or go bankrupt. And even if you're pretty sure that BigStore isn't going to skip town, how sure are you that it's really the BigStore Web site and not an imitator you've linked to? The record so far is that shopping on the Net is as safe as shopping anywhere else. But you should know the risks.

Ecash Is Here. You may soon see online shopping sites sporting a "we accept ecash" sign. Ecash is something quite new: real digital money. Cash has benefits credit cards lack, one of the most interesting being that paying cash preserves your anonymity. Ecash has these same benefits. You get it from a bank by using your computer as an ATM. It's

stored as "digital coins" (encrypted files) on your hard disk. You spend it by transferring the coins when you make a purchase. The Mark Twain Bank (<http://www.marktwain.com/>) recently became the first bank to offer ecash accounts, and vendors may be accepting digital money by the time you read this. You can get more information on ecash in general from the DigiCash page, at <http://www.digicash.com/>.



Tip of the Month

Some say the greatest strength of the Internet is its ability to connect people to one another and that it may be able to rebuild what the automobile destroyed: community. As in small towns of yesteryear, there are lots of places to barter online: BarterNet (<http://www.teleport.com/~dtpdx/bnhome.htm>), NetTrader (<http://www.sentex.net/nettrader/>), and Web-Barter (<http://www.ultranet.com/~bellvill/webbarter.html>) are just a few of them.

Don't Know Ecash from Cache?

MacUser maintains a list of frequently asked questions (FAQs) about the Internet, MacUser itself, and this column specifically. Send mail to faq@macuser.com. MacUser's address on the World Wide Web is <http://www.zdnet.com/~macuser/>. You can reach me at traveler@macuser.com.

A MESSAGE TO THOSE WHO'VE BEEN

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CIRCLE 138 ON READER SERVICE CARD

BY CHRISTOPHER BREEN AND BOB LEVITUS



Help Folder

Why PowerPC upgrades may be a waste of money, how to make sure you don't miss system updates, and ways to speed up backups.

Stepping on the Accelerator

Q. I'd like to upgrade my Performa 637CD to a PowerPC. Unfortunately, the only upgrade I've seen for it is the PowerCard 601, from DayStar, which runs at 66 MHz. I'd like faster speed.

Should I purchase the 601 or wait and see if DayStar comes out with a 604-based upgrade?

Brandon A. Duhamel
Woodside, NY

CHRIS: At around \$650, the PowerCard 601 is tempting — you get low-end Power Mac performance for half the price of the real thing. Or for about \$100 more, you can go with the faster upgrade Apple predicted would be out at the beginning of '96 — the 100-MHz 5300/6300 Logic Board Upgrade. It uses a 603e chip. Or wait for a 604-based upgrade (no word on when one may be available, if ever). I'm going to suggest another and — oddly enough for me — more expensive alternative: Buy a new Mac.

Even though I was a happy DayStar customer in my 680x0 days, I wouldn't dream of jumping a 680x0 Mac to a Power Mac through acceleration now, unless:

1. I had a decorative lunch box full of money invested in RAM for my current machine that I couldn't reuse in a Power Mac.
2. I owned a slew of NuBus cards that

weren't supported by the new Power Macs.

3. I absolutely needed a Power Mac to play *Marathon 2: Durandal* and was so short of funds that I couldn't justify the expense of a new machine.

I'm not knocking DayStar. The company goes to the ends of the earth to make its accelerators compatible with current software and hardware. But there are just too many cool things on current Power Macs that an accelerator doesn't provide — GeoPort, Fast SCSI-2, and PCI, for instance. And although DayStar has a generous upgrade policy, the daughterboards in some of the latest Power Macs will make upgrading significantly easier — and presumably less expensive — than in the past.

Recycling Floppies

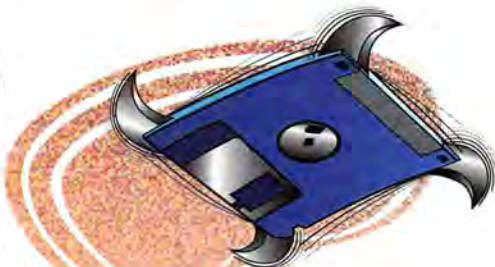
Q. The fate of the planet is in our hands. Please tell me where I can send my floppies for recycling.

Jim Hoffman
Herndon, KS

BOB: If the floppies aren't damaged, donate them to your favorite user groups, which are always in need of disks for their libraries and BBSs (bulletin-board systems). You can get a list of user groups from Apple (800-538-9696, ext. 500). Or donate them to any place that uses floppies, such as a school, copy shop, or computer-rental store.

However, if you've thrown those floppies into boxes because they've failed at one time or another, donating them to charity may be more cruel than kind. They're bound to fail again soon. Instead, drop the floppies off at a recyclery — you know, where you take glass bottles and soda cans. I found several in the Yellow Pages that accept floppy disks.

CHRIS: Wait. Before you let a recyclery have at them, think about all the handy uses for floppies around the home. For instance,



they make great coasters, can be used in lieu of matchbooks to prop up uneven table legs, and look just dandy when arrayed on a mobile. Perhaps the best use is to tack sharp pieces of tin to the corners and use them as Ninja death stars.

Get with the System Updates

Q. Software publishers always tell you when a software upgrade becomes available. Why doesn't Apple? I hear that the System 7.5.1 upgrade, with its bug fixes and enhancements, has been out for a while now. Where do I get it, and how can I make sure I don't miss out on future upgrades?

Dirk Mockingbird
Carmel, CA

BOB: Apple will be happy to notify you of software upgrades and updates as long as you have an e-mail address. All you have to do is subscribe to the Apple Software Updates mailing list, by sending an e-mail message to swupdates@thing2.info.apple.com. In the body of the message, type **subscribe** and your name; for example, I'd type **subscribe Bob Levitus**. You know you've been added to the list when you receive an automated reply. From then on, whenever Apple issues an update or an upgrade, you can expect to receive a cheerful little e-mail message telling you so. If you don't have e-mail, you can call Apple (800-769-2775) to get the software on disk

WRITE TO HELP FOLDER/TIPS

c/o MacUser
950 Tower Lane
18th Floor
Foster City, CA 94404

Don't want to wait for an answer? Post your question on ZD Net/Mac, MacUser's online service, or send e-mail to helpfolder@macuser.com or tips@macuser.com. We pay \$25 to \$100 for any undocumented tips we publish.

for only the cost of shipping — about \$10. **CHRIS:** Of course, because we're typing these words some months before they actually appear in print, an update to this update may now be available. That's why it's important to get on the updates mailing list.

Speaking of helpful mailing lists, Apple produces a ton of them — by subscribing, you can get items ranging from press releases to the fact-packed Information Alley (a newsletter of Mac tips). In order to get the Apple Mailing Lists list, send e-mail to info@thing2.info.apple.com and type **listinfo** in the subject of the message.

Breakneck Backups

Q. To my surprise and complete joy, when I got a SyQuest 88 last spring I also got a new feature called Smart Replace. I don't know where it came from, but it made backing up much faster by copying only files that I had modified since my last backup.

Unfortunately, since installing System 7.5, I've lost that feature. Where did it go, and how do I get it back?

Kenneth R. Anderson
Hilton Head Island, SC

BOB: I'm not sure where it went, but I know how you can get back that capability. This type of feature is available in components of at least two commercial products. For instance, you'll find it in the Speed Copy component of Connectix's Speed Doubler; it's called Speed Replace. The CopyDoubler component of Symantec's Norton Disk Doubler Pro has something similar, but it's called Fast Replace (see figure 1).

Both Fast Replace and Speed Replace do just what you've been missing — selective backups, copying only those files you've modified. But if I were forced to choose between one and the other, I'd go with CopyDoubler, because it has a feature I couldn't do without — it backs up folders automatically several times a day. I would not discount Speed Doubler, however, if your highest priority were speeding up a

PowerPC machine. (Disclaimer: I installed it only a couple weeks ago, but so far so good.)

CHRIS: I also think Speed Doubler is the bee's knees for goosing my PowerPC speed, but for copying, I would go with CopyDoubler or take a look at Desktop SpeedBoost, a component of Aladdin's Desktop Tools. Desktop SpeedBoost doesn't perform scheduled copies, as CopyDoubler does, but in most other ways, the two products are comparable. Plus Desktop SpeedBoost comes with Desktop Viewer, an intensely swingin' utility that allows you to view — and sometimes edit — a variety of files. Why endure Photoshop's long startup process when you just want to peek at a TIFF file?

Virtual Receptionist

Q. Is there a way of setting up a Performa 475 or a Power Mac 6100 to receive faxes and modem communications, unsupervised, over the same telephone line? I can set my Global Village TelePort Gold fax modem to receive either faxes or modem communications, but not both.

Howard Smithline
Somers, CT

BOB: It is possible to get fax and modem transmissions on the same line, but not with the modem you're using. The only way to get what you're asking for is to shell out some dough on new hardware. For instance, you can buy a Global Village TelePort Platinum modem, which comes with software that can discriminate between voice and fax and between fax and ARA.

Another option is to get a ComShare 750 (available from APS for around \$120). It automatically routes not only fax and modem calls to the proper devices but also forwards calls to an answering machine and lets you use your phone, all on the same line. Unfortunately, this device requires that your phone, answering machine, fax, and modem be separate devices,



figure 2 / **Limited to one phone line** but still need to receive faxes, modem communications, and phone calls? The ComShare 750 can reroute those calls to the proper devices as long as they're separate devices.

which you plug into jacks on the ComShare 750 (see figure 2).

CHRIS: My suggestions also involve spending some money:

You've got two computers? Buy another modem for the computer lacking same, install another phone line, and use one number for a dedicated fax line and the other for data.

Or pick up an Apple GeoPort Telecom Adapter (estimated street price, \$130), and attach it to your Power Mac. The GeoPort adapter supports a feature called *intelligent answering* — the software attempts to detect the kind of call coming in (voice, fax, or data) and route it to the proper application. Your TelePort Gold supports only the "moron answering standard," which requires that you choose in advance which type of calls your modem will accept.

If the GeoPort software can make out a fax or data tone, it routes the call to an appropriate application (one you've set to auto-answer). If the software can't identify the call, it routes it to the type of application you've set for unidentified calls — a telephony application such as Cypress Research's MegaPhone, for example, which is bundled with the GeoPort adapter.

Captured by QuickTime

Q. I've heard that the best full-screen capture rates you can get when you copy a movie from videotape to your Mac are around 15 to 20 frames per second (as opposed to 30 fps when you play a videotape on a VCR).

If that's true, then how are the makers of movies such as *Addams Family Values* using Macs to create special effects? Obviously they've found a way to get the full 30 fps into

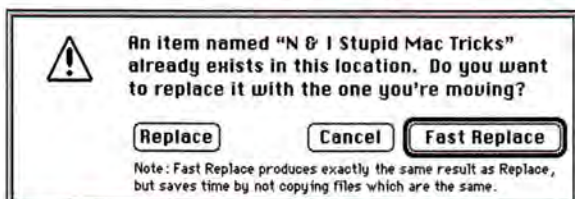


figure 1 / **Copying files faster** is part of the purpose of such utilities as Norton Disk Doubler Pro, which features Fast Replace.

TIPS / Monitors

PLUG AND PRAY

Expect trouble if your monitor ever gets separated from the adapter cable or *dongle* (an adapter that goes on the end of a standard PC cable) it came with. Without an appropriate adapter, you can inadvertently set your graphics card to a resolution the monitor can't support, which can wreak havoc with your hardware. That's what happened during graphics-card testing in MacUser Labs. We ended up with a blank screen that took two knowledgeable technicians over an hour to fix.

Mac users wouldn't run into this problem if it weren't for the fact that most monitors cater to PC users and don't come with the capability to interpret Apple's *sense codes* (a scheme that enables a monitor to communicate to a Mac at startup which resolutions it can support). But there are fixes if you get in the same bind we did. The one to use depends on whether you have a NuBus Mac or a PCI Mac.

On NuBus Macs, you can easily clear out the invalid choice by restarting your Mac and holding down Shift-Option-P-R to "zap" the parameter RAM (PRAM). Moving your graphics card to a different NuBus slot also lets the Mac "forget" the invalid setting.

Not so on PCI Power Macs. System 7.5.2, which ships with the new models, stores information about graphics-card settings in the Display Preferences file, in the system's Preferences folder. Moving a card to a different PCI slot doesn't help — the Display Preferences file can track the card wherever it moves. Nor does zapping PRAM do the trick until you delete Display Preferences. Here's how to do it:

If you have a 7200, 7500, or 8500, you can plug your monitor into its built-in graphics port (so you can see your screen), restart, delete the Display Preferences file, and reconnect the monitor to your graphics card. Restart again, zapping the PRAM this time.

The 9500 requires a different tack. Since it has no built-in graphics port, you have to zap the PRAM while restarting your Mac from your System Install CD or Disk Tools floppy disk — neither of which contains the offending Display Preferences file. Then you can delete the Display Preferences file from the System Folder of your startup hard disk and restart again, this time from your hard disk.

Henry Bortman
MacUser Technical Director

the Mac. What's their secret? What kind of hardware, software, and processor would I need?

Chris McSorley
Converse, TX

BOB: This subject could fill an entire bookshelf. Here's the short answer: You need at least \$20,000 worth of software and hardware to get broadcast-quality Mac video. For hardware, you need a Quadra 800 or a faster machine; at least 32 MB of RAM; several gigabytes of hard-disk space; and a high-end video-digitizing system, such as one from Truevision, Radius, or Data Translation. State-of-the-art equipment lets you import and export video at rates of up to 30 fps.

The lower numbers you've been hearing — 15 to 20 fps (and that's not full-screen, by the way) — are what you get by using an Apple AV card or a low-priced video digitizer such as the Radius Spigot 2 Tape (estimated street price, \$600) and a midrange Mac — say, a Quadra 630.

CHRIS: No one is suggesting, of course, that you buy this equipment yourself. We're in the multimedia age now, and video service bureaus are starting to pop up across the land like mushrooms on a cow pie.

If you intend to go the service-bureau route — and yes, it is expensive (to the tune of \$70 to \$100 per minute of video) — simply edit your QuickTime movies at home by using a program such as Adobe Premiere, generate an Edit Decision List (this EDL contains a list of all the cuts and transitions

in your movie), and pass the whole mess off to the pros.

In a matter of days, you'll have not only a beautiful movie that plays just as fast as your Mac will allow but also a substantial hole in your bank account.

Your Saving Grace

Q. With alarming frequency, I continue to make the same mistake — I modify a document and then inadvertently hit Command-S when what I meant to do was a Save As. Naturally this wipes out my original document. Is there any way I can recover the original?

Bob Ralston
Granada Hills, CA

CHRIS: I've done the same thing more often than I care to admit, so I can well imagine the muttered expletives wafting across your work space. For your benefit and mine, I've searched high and low for a utility that creates a recoverable buffer file for old documents, and I've come up with zilch. (But gee, what a swell idea for some enterprising shareware author.) Therefore, we must move from recovery to prophylaxis.

The first and easier solution is to save your documents as stationery files whenever you close them. When you open them, a copy of the file appears, ready for work, while your original remains tucked safely

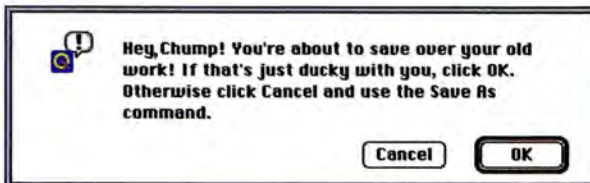


figure 3 / **This annoying message**, generated by a custom QuickKey, will either help you, by making sure you don't lose your originals, or cure you of the habit of saving over files you need, by driving you mad.

away. Of course, not all applications support stationery files, which is why I've devised a dual-purpose QuickKey: (1) It offers you a chance to back out of hasty decisions, and (2) it's so annoying that after a week of use, you'll never make the mistake again. If you install this QuickKey, whenever you press Command-S, a pesky dialog box will pop up and warn you that you may be doing a bad thing (see figure 3).

BOB: I'd just use Copy Doubler's automatic copy feature to back up important folders every few hours.

CHRIS: I've tossed a copy of the QuickKey — Safety Net — onto ZD Net/Mac (see end of article) and MacUser's Web site (<http://www.zdnet.com/~macuser/>). ☺

Bob LeVitus is the author of more than a dozen computer books. He's currently director of evangelism for Power Computing. Christopher Breen recently coauthored The Macintosh Bible Guide to Games, published by Peachpit Press.



You can find the QuickKey referenced in this article in the MacUser and ZD Net/Mac areas on CompuServe and eWorld. See How to Reach Us for instructions on accessing ZD Net/Mac.

Until now, the on-ramps to the Internet have been under construction.



Introducing the Apple Internet Connection Kit.

Getting hooked up to the Internet can be a messy process. That is unless you've got exactly the right tools. Presenting the Apple® Internet Connection Kit. It's everything you need to get on and get around the Internet quickly, easily and with a minimum of frustration. Here's what you receive: Netscape Navigator™, Claris EMail™ Lite, Progressive Networks RealAudio, NewsWatcher, Fetch, the Apple Internet Dialer, QuickTime® VR Player and more. Plus, if you come across anything you don't understand, Apple Guide on-line help is there to assist you right away.

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Uncork Your Mac

A glass of wine, a CD-ROM, and an Internet connection — that's all you need to educate your palate without leaving your Mac.

BY PAMELA PFIFFNER

I'M NO WINE SNOB, but I must admit I've developed a taste for finer vintages since graduating from the screw-top jugs of my college years. Yet when my boss invited my husband and me to a comparative wine tasting of California Cabernet Sauvignons and French Bordeaux, I panicked. Living in San Francisco allows me frequent access to California's wine country, so choosing a Cabernet

Silicon Sommelier

Wine tasting is a perfect subject for interactive CD-ROMs. If you forget a technique (Is it swirl, sniff, sip, spit?), just fire up the disc and check. And instead of quaffing several bottles to find the right match for pasta puttanesca, you can ask your silicon sommelier for an expert opinion. That way, the disc is loaded instead of you.

All wine-appreciation CD-ROMs seem to include the same basic ingredients: a video lesson in wine tasting, information about particular grape varieties and growing regions, advice on matching wine with food, and an encyclopedia with tasting notes on wines from around the world. Each of the three discs I sampled also has a designated expert to guide you.

I started out with **Food & Wine's Wine Tasting** (444; \$30), from Times Mirror Multimedia (201-307-8866). This disc aims to educate your palate, not list thousands of wines. Filling out a tasting questionnaire evaluates your personal wine style — it accurately assessed my preference for big, full-bodied reds. The wine-tasting component consists of only 48 wines, but with each wine is a detailed list of descriptive phrases pertaining to its appearance, bouquet, and palate — including such evocative comparisons as *acacia blossoms* and *wet dog*. After stepping through your own tasting, you can elect to see the notes of this disc's wine expert, Steve Olson. I tired of this disc's inconsistent graphics and text-heavy screens —

wasn't going to be a problem. But I'm baffled by Bordeaux.

Off I ran to my local wine store and begged for advice. The merchant steered me toward the right section of the store and I bought some wine, wishing I knew a better way to handle such situations. Then I discovered the wealth of wine information available on CD-ROMs, online services, and the Internet.

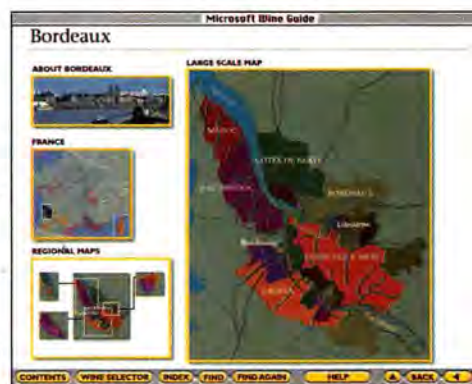
multimedia, chaps! — but I had fun using it. But like a late harvest Riesling, it's not something I'd open often.

I'd more often turn to the information-packed **Wines of the World 2.0** (444; \$50), from Multicom Publishing (800-850-7272 or 206-622-5530); for an extra ten bucks, you can get it bundled with a hardcover copy of Kevin Zraly's *Windows on the World Complete Wine Course*. An exhaustive hodgepodge of text, graphics, videos, and maps (taken from widely and wildly varying sources), the disc consists of three tutorial sections encompassing the three Vs — viticulture, vinification, and vinosity. Its strengths include explorations of such far-flung growing regions as China as well as information on how to judge wine color and read bottle labels. But the interface is clunky, and navigation is hampered by the vanishing of the button bar after each selection.

At the heart of *Wines of the World* is the Wine Browser, which lets you search through 28,000 wines culled from *The Wine Connoisseur's Companion* and the *Restaurant Wines* newsletter by Ronn Wiegand, literally the disc's talking head (although his absence from the wine-tasting video clip undercuts his authority). You can also add wines from your personal cellar. Search criteria include

country; vintner; varietal; vintage; price; overall value; and rating, which is the wine's average score based on published evaluations. Searching through such a large database on CD-ROM is slow, however, and tasting notes often refuse to display.

Stomping the competition is the **Microsoft Wine Guide** (444; \$35), from the Ernest & Julio Gallo of the software market — Microsoft (800-426-9400 or 206-882-8080). This well-thought-out disc has an elegant, easy-to-navigate interface and a long finish. If the other discs are a bit thin on video clips, the Microsoft Wine Guide more than makes up for it. Videos of wine expert Oz Clarke, an Australian given to breathless hyperbole and enthusiastic spitting, pop up everywhere. Clarke tastes 18 varietals, telling you what to look for and what to avoid. A grab-bag section called All About Wine



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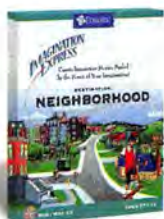
Thinkin' Things
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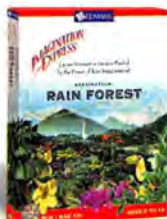
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unearths tidbits about wine folklore, history, and personalities and provides useful how-to information on storing wines and starting a wine cellar. The Wine Guide's maps are superior, letting you zoom in to a level of detail not possible with the other discs.

This guide's encyclopedia has 6,000 wines tasted by Clarke. You can search on matches to specific foods, to solve such perennial problems as what to drink with haggis. Each wine is linked to a glossary that contains detailed information about its region, the grapes used, pronunciation of relevant terms, and more. After hours of playing with the Microsoft Wine Guide, I still found more to explore. This one has legs.

A Virtual Tasting Room

The problem with CD-ROMs is that they don't age well. If you want information that's more up-to-the-minute, head for the cybervineyard. On the Internet and commercial online services, you'll find scores of places where wine is discussed and, in many cases, sold.

I'd start with **Cyber Wine** (<http://www.winebiz.com/wines/index.htm>) and its One-Stop Mother of All Wine Links. This wine-related Web site lists all other wine-related Web sites — and rates them too.

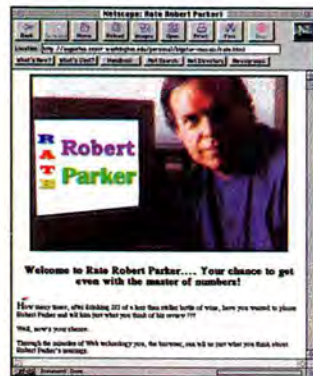
Commercial Web sites from individual wineries are sprouting like grafted rootstock in spring. They provide an easy way to find out about smaller wineries around the world. If your interest is focused on Napa Valley wines, check out the attractive **Napa Valley Virtual Visit** (<http://www.napavalley.com/>). It has news about Napa Valley wineries, restaurants, and sights; during the 1995 harvest, for example, the Rutherford Hill winery posted daily reports on the grape crush. And then there are sites, such



as **The Grapevine** (<http://winery.com/>) and **Virtual Vineyards** (<http://www.virtualvin.com/>), that serve as wine shops that let you buy represented wines over the Net.

The Internet also serves as the people's tasting room, a place where you can find notes from kindred souls such as the reviewers of **Wine Net News** (<http://http.cs.berkeley.edu/~seth/Wine/>). Wine Net News gives you an exhaustive list of reviews contributed from around the world and arranged according to country, varietal, and winery. **The Wine Page** (<http://augustus.cssc.washington.edu/personal/bigstar-mosaic/wine.html>) not only has plenty of ratings for wines from Washington state and the world but also has links to The Croatian Wine Page and other sites. Lest you think oenophiles lack humor, check out this site's Rate Robert Parker! feature ▼, in which the rest of us can get back at America's foremost wine critic. **The Bargain Wine Page** (<http://www.iglou.com/why/wine.html>) specializes in inexpensive wines — all tasted by Robin Garr, a Louisville wine columnist. Garr conveniently includes notes on such topics as matching wines with vegetarian and ethnic dishes.

Garr is also associate sysop of CompuServe's **Bacchus Wine Forum** (GO WINE), one of many wine forums on commercial online services. The Bacchanalians conduct a monthly real-time event, in which agreed-upon wines are sampled and notes compared online. Had I logged onto Bacchus the night of my boss's dinner party, I would have found just what I needed: a thread pertaining to California Cabernets versus French Bordeaux. Next time, I'll be smart and use the Mac to meet my grape expectations. ☞



The Two Dads

BY RIK MYSLEWSKI AND JIM SHATZ-AKIN

JIM: You got me with last month's geography quiz, so now let's test your body of knowledge: Where are the islets of Langerhans?

RIK: Sounds Scottish — near the Orkneys?

JIM: Sorry, bud. Try your pancreas.

RIK: Ouch. So you're really testing my knowledge of body?

JIM: Yep. Our topic is anatomy software, and there's quite a corpus...

RIK: Plus a few stiffies. I had hopes for Microsoft's **The Magic School Bus Explores the Human Body**, but it's more toy than teacher.

JIM: Still, at least it's fun to play, which makes it a far better ride than you'll find at Virtual Entertainment's cutesy-poo **Body Park**.

RIK: Or at IVI Publishing's **Welcome to Bodyland** theme-park game. It's less cloying than Body Park but only slightly more informative.

JIM: IVI did far better with its interactive storybook **What Is a Bellybutton?**

RIK: Well, it may be OK for prereaders, but I'd rather see a pumping heart animated than dancing juice glasses.

JIM: You prefer a bare-bones approach?

RIK: Sure, such as A.D.A.M. Software's **A.D.A.M. The Inside Story** ▲.

You peel layers from skin to skeleton and see everything in between.

JIM: I like Eve and Adam's humorous explanations too. Still, for gutsy comedy, StarPress' **Dr. Health'nstein's Body Fun** takes the prize.

Dr. H. uses a light touch but still provides lots of preventive-health and anatomy info, plus — my favorite — a game called Bag O' Guts.

RIK: No guts, no glory!



A.D.A.M. The Inside Story

Ages: 10 – adult.
Price: CD-ROM, \$49.95 (list).
Sliders peel layers from skin to bone, with structures identified. Dictionary and animations seem decoupled from main anatomy presentation.
Company: A.D.A.M. Software, Atlanta, GA; 800-408-2326 or 619-490-8055.
Reader Service: Circle #418.

Body Park

Ages: 4 – 10.
Price: CD-ROM, \$49.95 (list).
Dull, shallow amusement park offers repetitive games, "experiments," and meager facts on health and nutrition.
Company: Virtual Entertainment, Needham, MA; 617-449-7567.
Reader Service: Circle #419.

Dr. Health'nstein's Body Fun

Ages: 8 – adult.
Price: CD-ROM, \$24.95 (list).
Humorous, visually appealing game balances fun with info on preventive health, diet, and body functions.
Company: StarPress, San Francisco, CA; 800-782-7944 or 415-778-3100.
Reader Service: Circle #420.

The Magic School Bus Explores the Human Body

Ages: 6 – 10.
Price: CD-ROM, \$44.95 (list).
Shrunken school bus explores schoolboy's innards — very, very slowly. Fun but information-light.
Company: Microsoft, Redmond, WA; 800-426-9400 or 206-882-8080.
Reader Service: Circle #421.

Welcome to Bodyland

Ages: 5 – 11.
Price: CD-ROM, \$29.95 (list).
Better of two theme-park-related games features fun, original music, and a good self-hinting quiz.
Company: IVI Publishing, Minneapolis, MN; 800-432-1332 or 612-996-6000.
Reader Service: Circle #422.

What Is a Bellybutton?

Ages: 3 – 8.
Price: CD-ROM, \$29.95 (list).
Gentle, fun interactive storybook squanders animation that could have illustrated physiology. Weak games.
Company: IVI Publishing, Minneapolis, MN; 800-432-1332 or 612-996-6000.
Reader Service: Circle #423.

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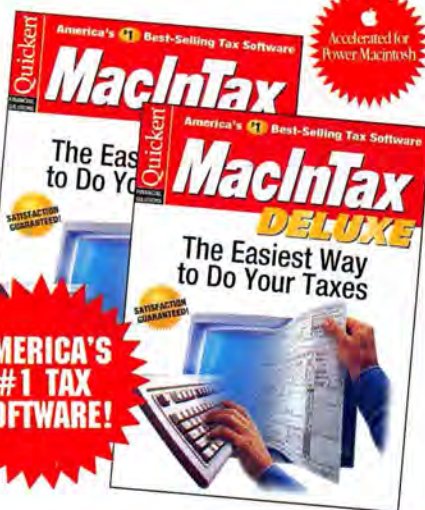
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The Game Room

BY BOB LEVITUS

WE TAKE TO THE SKY this month, with three challenging flight simulators. Out of the Sun lets you fly vintage aircraft in three famous WWII battles. F/A-18 Hornet puts you behind the yoke of a modern-day F-18 jet fighter in the Middle East. And A-10 Attack! has you looking for trouble over Germany in an A-10 Warthog, the world's toughest and ugliest airborne assault vehicle.

Out of the Sun

Rosie Would Be Riveted

FLIGHT SIMS ARE DIFFICULT to learn, with their myriad instruments to control and maps to navigate. Out of the Sun, like all other flight sims, is challenging, but it has features that simplify simulated flying.

First of all, the flight controls of this game have a slow response. (Domark, maker of Out of the Sun, claims that the slow response is intended to mimic the feel of WWII aircraft.) Thus, the controls are more

forgiving than those of most other sims — once you've tamed your tendency to overcompensate.

You'll also find that there isn't an overwhelming number of controls. It's old-time open-cockpit flying — you hunt down an enemy by using only a map, a compass, and your wits and eyeballs.

The controls may be simplified, but there's plenty of variety in the game. You can choose from 17 U.S. and foreign aircraft. You also have three historically accurate WWII battles to try out, and you can opt to fly in the "arena" mode, in which you fight your choice of enemy aircraft. You can fight your battles in any of four skill levels. This combination of features makes each battle unique. It's an excellent introduction to the art and craft of flight simulation (as long as you have a Quadra or a faster Mac; it won't run on anything else).



sims in this review.

If you're willing to scale its steep learning curve, your reward is hours of intriguing play in one of the best Mac flight sims yet.

A-10 Attack!

It Soars Above the Rest

IF F/A-18 ISN'T the best flight sim around, A-10 Attack! is. Although the locations of their missions are different (A-10 takes you to the skies over Germany in one version and to Guantanamo Bay in another), the two games have many similarities. They're both challenging and realistic; you must use almost every key on the keyboard; they provide training missions, adjustable difficulty levels, and quick-reference cards to make the learning curve more manageable; both offer multiple views of the action; and, finally, they support up to three monitors at once.

However, A-10 has an edge in the weaponry department, stocking a greater number and diversity of weapons systems. The weapons range from bombs, for air-to-ground destruction, to a brutal cannon capable of firing 67 depleted-uranium shells per second, for air-to-air annihilation.

Additionally, A-10 gives you more control over your battles, by letting



Cheat Sheet

BY ROMAN LOYOLA

Out of the Sun

• Concentrate on your target.

When you're in air-to-air combat, it's important to concentrate on taking your shot rather than worrying about keeping your plane perfectly level. Let your plane float to your target. If you're always trying to correct your heading, you'll never have enough time to take a shot.

• To shoot an enemy

out of the sky, sometimes you need to reduce your speed quickly. To do so, cut the engine power to 50 percent and lower your landing gear. If the aircraft doesn't have retractable gear, lower your flaps instead of the landing gear. For an even quicker speed drop, engage your dive brakes too.

• Watch your altitude, or you'll probably crash.

You should be safe above 1,000 feet. However, when you need to drop a torpedo, you have to fly between 100 and 500 feet — easier said than done. One way to avoid crashing while maintaining a low altitude is to keep your crosshairs above the horizon. It's not a crash-proof method, but at least you're heading away from the ground.

• If you lose sight of the horizon and all you see is blue, remember to use the artificial-horizon indicator.

Checking the indicator is less confusing than peering out of your cockpit.

Thanks to Domark Software game guru Jason M. Ridge for his contributions to these tips.

you tweak the flight paths of all friendly aircraft.

Its biggest downfall is that its documentation is the weakest of the three flight sims in this review. As a result, I found this one the most difficult to master. ☹

Bob LeVitus is a MacUser contributing editor and Power Computing's director of evangelism.

GAME POINT

I thoroughly enjoyed all three flight sims. Out of the Sun is the least intimidating, with its manageable number of flight controls and its slow response. The other two take more time to learn and will challenge even the most seasoned sim pilot.

Out of the Sun ★★☆☆

Price: \$45 (estimated street).
Company: Domark Software,
San Mateo, CA; 800-695-4263 or
415-513-8929.
Reader Service: Circle #424.

F/A-18 Hornet 2.0 ★★☆☆

Price: \$50 (estimated street).
Company: Graphic Simulations, Dallas,
TX; 800-580-4723 or 214-386-7575.
Reader Service: Circle #425.

A-10 Attack! ★★☆☆

Price: \$50 (estimated street).
Company: ParSoft International,
Richardson, TX; 214-479-1340.
Reader Service: Circle #426.

F/A-18 Hornet

Stimulating Simulator

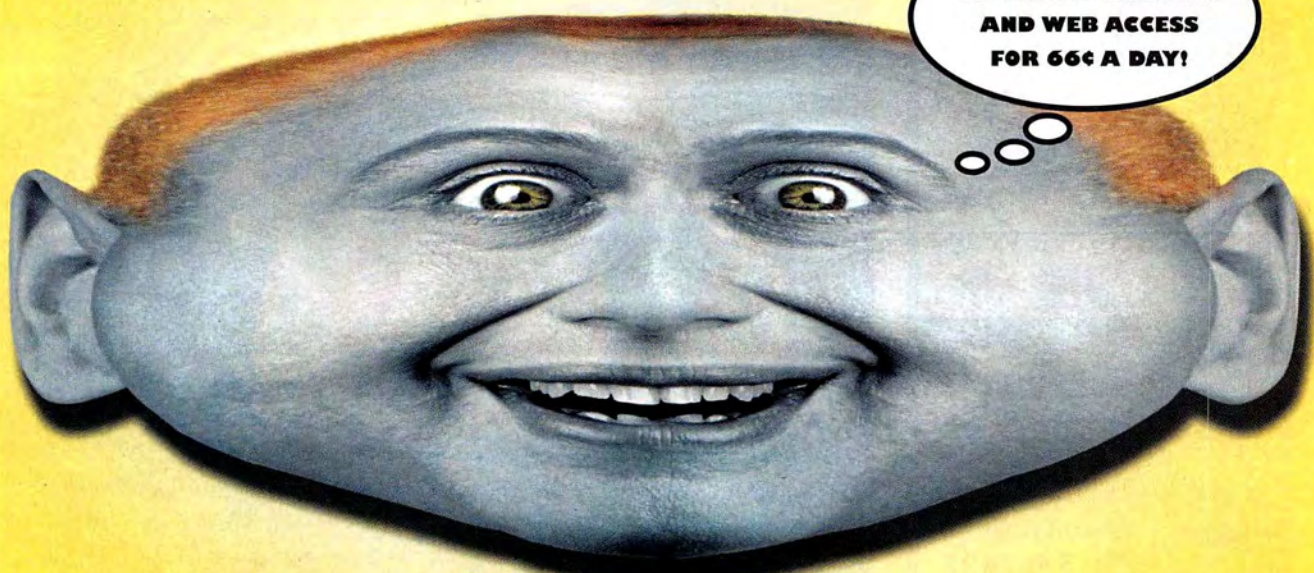
HERE'S A "KILLER" SIM that takes you to battle in the Middle East. Fast and fluid on most modern Macs (all you need is a Mac with a 68020 processor or better), it is, in a word, a blast.

F/A-18's instrumentation is realistic in almost every detail. Like it or not, you oversee dozens of controls and a good variety of weapons and guidance systems, including heat-seeking, radar-guided, and TV-guided missiles. Given such complexity, you'll be grateful for its helpful command-reference card.

With F/A-18, you're guaranteed variety. It has six training missions, difficulty settings that are almost infinitely adjustable, optional tutorial voice commands, and the most-comprehensive documentation of the three flight

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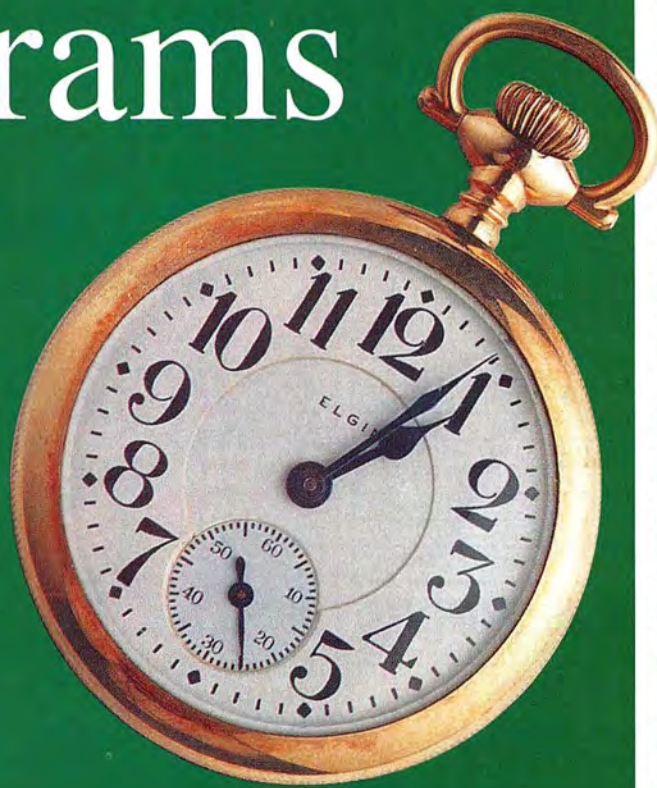
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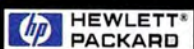
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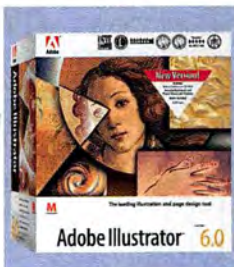
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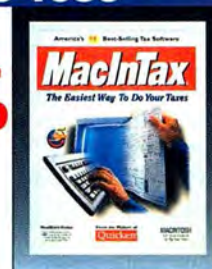
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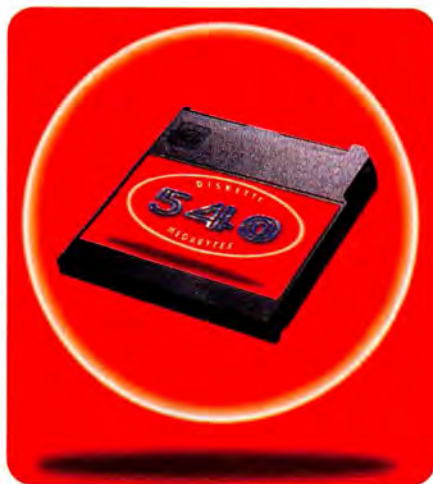
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93748	TelePort Gold II	\$103.98
01155	TelePort Platinum V34 for Desktop Macs	\$193.98
Performantz		
90624	28.8 V34 Fast Mac FaxModem	\$135.98
90600	MacClass MC28812-EZ PCMCIA	\$328.98
92951	MacClass MC288MT II v34	\$209.98

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Supra		
93719	FAXNetwork Software Server	\$69.98
93721	FAXNetwork Software 10 User	\$189.98
93736	Supra Express 144 Plus	\$399.98
93738	Supra FaxModem 144LC Ext - Mac	\$128.98
06865	Supra FaxModem 144PB Int - PowerBook	\$155.98
96582	Supra FaxModem 288 Ext - Mac	\$206.98
90212	Supra FaxModem 288 V34 Int for PB	\$239.00
89309	Supra Express 288 V34 FaxModem	\$169.00
00413	Supra FaxModem V32BIS (MC) w/ST Cable	\$173.98
TDK		
91807	TDK 28.8 PCMCIA FaxModem for Apple	\$279.98
US Robotics		
93701	Mac & Fax Sportster 14.4	\$111.98
92953	Mac & Fax Sportster 28.8 V34	\$199.98

STORAGE DEVICES

Apple Hard Drives		
89873	2150MB Ext HD	\$839.98
93568	1080MB Ext HD	\$489.98
95338	540MB Ext HD	\$369.98
Fujitsu		
01180	DynaMD 230MB Optical Drive	\$478.98
FWB		
06271	CD-ROM Toolkit	\$47.98
00555	Hard Disk Toolkit	\$119.98
05476	Hard Disk Toolkit - Personal Ed.	\$46.98
94121	SCSI Jackhammer	\$449.00
90124	PCI SCSI Jackhammer	\$389.00
Imagem		
93320	Imagem MacTransportable 230	\$452.98
96810	Imagem MacTransportable 30 Pro	\$431.98
96811	Imagem MacTransportable Multidisk 150	\$429.98
91825	Zip Drive	\$198.00
LaCie		
03649	Q Drive External 1080MB	\$459.00
03698	Q Drive External 540MB	\$339.00
Microtech International		
89609	Polaris 500MB Ext	\$294.98
89611	Polaris 1.0GB Ext	\$449.98
89612	Polaris 2.0GB Ext	\$939.98
Olympus		
89942	Deltis Power 3.5" MD 230MB	\$579.98
89934	Deltis 5.25" 1300 MD	\$1,649.00
89935	Deltis 2x Recordable CD	\$1,279.00
Performantz		
89160	730MB Mini HD	\$279.98
90454	1.0GB Mini HD	\$329.98
89163	Quantum 840MB	\$379.98
91911	Barracuda 2.0GB Mini HD	\$1,049.00
Pinnacle Micro		
92403	RCD 1000 Recordable CD-Rom	\$1,439.00
93302	Sierra 1.3GB Optical	\$1,769.00
93301	Tahoe 230MB Optical	\$749.00
SyQuest		
24935	EZ135 SCSI Drive & Cart	\$223.98
01142	Performantz 200MB w/ro cartridge	\$409.98
97989	Performantz 270MB w/ro cartridge	\$399.98
06538	Performantz 44-88MB w/ro cartridge	\$312.98

MEDIA

Fuji		
90883	3.5" Optical Disk 230MB Mac Format	\$34.98
91906	74mm CD-R 3-Pack (\$10 Rebate)	\$26.35
05717	DG90M 4mm Data Grade 1 95GB	\$7.95
Imagem		
96824	Bernoulli Multidisk 90MB Cart	\$87.98
97291	Bernoulli Multidisk 150MB Cart	\$89.98
22336	Imagem Zip 100MB Cart	\$18.49
91161	Imagem Zip 100MB Cart 10-Pack	\$139.98
91160	Imagem Zip 100MB Cart 3-Pack	\$47.98
Sony		
90458	CD-R 4x 650MB (74 Min) 10-Pack	\$69.98
SyQuest		
24998	EZ135 Cart (Single)	\$20.98
24909	EZ135 Cart 5-Pack	\$94.98
24910	EZ135 Cart 10-Pack	\$179.98
99922	SyQuest 105MB Cart	\$57.98
00278	SyQuest 200MB Cart	\$75.98
97992	SyQuest 270MB Cart	\$61.98

02183	SyQuest 44MB Cart	\$40.00
00183	SyQuest 88MB Cart	\$45.98
Verbatim		
21922	CD-R 4x 74min	\$8.98

CD-ROM/MULTIMEDIA

NEC		
94885	NEC 6XE CD-ROM	\$547.55
01124	Performantz 4x Dual CD-ROM	\$195.98
89936	Performantz 4x Multimedia Kit	\$298.98
Sony		
91947	4X Speed CD-Rom CSD-7611	\$312.72
01172	Computer Speaker System CSS-B100	\$64.98
91982	Spressa CD-Recorder CD CSP-9211S	\$1,589.00
13166	SRS-D2K Speakers w/ Subwoofer	\$134.98
91944	SRS-D4K Speakers w/ Subwoofer	\$199.98

SCANNERS

Agfa		
02135	Arcus II	\$1,979.00
02102	StudioScan	\$599.98
89851	StudioScan IISI	\$889.00
92604	Vision 35 Slide Scanner	\$3,399.00
Epson		
02176	AcionScanning System II	\$474.98
91939	ES-1000C	\$737.00
02133	ES-1200C	\$949.98
Hewlett-Packard		
87989	ScanJet 4C	\$949.98
Microtek		
91941	ScanMaker II	\$379.98
91942	ScanMaker IIS	\$476.98
89941	ScanMaker IISR	\$588.98
01122	ScanMaker III	\$2,486.00
06903	35T Slide Scanner	\$671.98
Nikon		
06926	Coolscan	\$1,289.00
89921	Super Coolscan LS-1000	\$1,953.00
01174	Scanouch Flatbed Scanner	\$1,117.00
Polaroid		
01192	SprintScan 35mm FilmScanner	\$1,499.00
Umax		
01193	Vista SB Pro 2	\$649.00
91968	Vista SB Pro 2	\$773.98
01189	Powerlook Pro 2 w/TMA	\$1,390.00
89198	Gemini D-16 Scanner LE	\$1,475.00
87953	Gemini D-16 Scanner Pro	\$1,575.00

INPUT DEVICES

Adesso		
91099	Tri-form Extended Keyboard w/Pointer	\$99.98
Alps		
92698	Alps Glidepoint for Mac	\$56.98
Calcomp		
91862	Drawing Slate II 12x12 w/Pressure Pen	\$224.00
91870	Drawing Slate II 6x9 w/Fractal Painter 3.0	\$419.98
91864	Drawing Slate II 6x9 w/Pressure Pen	\$194.00
Kensington		
93628	Thinking Mouse ADB	\$84.98
05176	TurboMouse 4.0 Trackball w/4.1 Software	\$99.98
Wacom		
90643	ArtPad II (ADB) w/Erasing UltraPen	\$119.98
90644	ArtPad II (ADB) w/ Dabblor Bundle	\$149.98
90646	Artz II 12x12 (Serial) w/Erasing UltraPen	\$399.98
90645	Artz II 6x9 (ADB) w/Erasing UltraPen	\$297.98
98645	UD-1212RM Tablet w/UltraPen	\$189.98

PRINTERS

Accessories		
05765	Macintosh DIN 8 Printer Cable	\$6.48
97855	Port Juggler	\$84.00
90400	VersaLink 2 Serial Port NuBus Card	\$169.98
CoStar		
95505	LabelWriter XL	\$148.98
95506	LabelWriter XL Plus	\$236.98
Epson		
20670	Stylus Color II Ink Jet	\$448.98
89901	Stylus Color Pro Ink Jet	\$789.00
87980	Stylus Pro XL Ink Jet	\$1,778.00
Fargo		
92705	PrimaPro	\$1,379.98
Hewlett-Packard		
95527	HP ColorKit for 540/320 Printers	\$35.98
88902	HP DeskJet 6000	\$298.98
21159	HP LaserJet 4MV	\$2,835.00
23786	HP LaserJet 5MP	\$1,044.00
Texas Instruments		
19899	MicroLaser Power Pro	\$1,593.00
14319	MicroLaser Pro 600 PS23	\$1,196.98
93692	MicroLaser Pro E	\$1,369.00
Troxonix		
92531	Troxonix Phaser 140	\$1,195.00
90628	Troxonix Supply Start-up Kit	\$179.98

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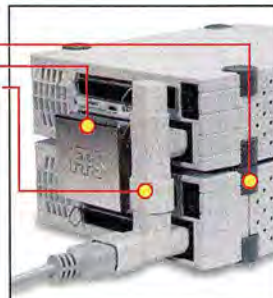


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SCSI Conduit
4-stacking feet
SCSI "C" Connector
2-PowerT Connectors
only **\$29⁹⁵**



BEST VALUES!

APS Q 840 Quantum®

- ✓ Great for multimedia applications
- ✓ Over 800MB to store your files
- ✓ 3-year warranty

Internal configuration
\$219⁹⁵

APS Q 1080 Quantum®

- ✓ PRML technology delivers more storage to powerful CPUs
- ✓ Well suited for home and office use
- ✓ Embedded servo, great for AV and non-AV applications
- ✓ 3-year warranty

Internal configuration
\$269⁹⁵

APS Q 2210 Quantum®

- ✓ Perfect for AV and non-AV applications
- ✓ Ideal choice for desktop publishing systems
- ✓ Over 2GB of formatted capacity
- ✓ 5-year warranty

Internal configuration
\$629⁹⁵

APS ST 4200 Seagate®

- ✓ Excellent combination of capacity, reliability and value
- ✓ Terrific with page layout and graphics files
- ✓ Over 4GB of formatted capacity
- ✓ 5-year warranty

Internal configuration
\$949⁹⁵

APS DESKTOP DRIVES

Model	Capacity	Awards	Internal	SR2000
APS Q 540 ³ Quantum 540 Fireball	516MB	★★★★	\$179 ⁹⁵	\$249 ⁹⁵
APS Q 840 ³ Quantum 840 Trailblazer	811MB	★★★★	219 ⁹⁵	319 ⁹⁵
APS Q 1080 ³ Quantum 1080 Fireball	1042MB	★★★★ MacWeek	269 ⁹⁵	349 ⁹⁵
APS ST 1080 ³ Seagate ST15080N	1042MB	★★★★	279 ⁹⁵	379 ⁹⁵
APS Q 2210 ⁵ Quantum Capella VP32210	2100MB	★★★★	629 ⁹⁵	729 ⁹⁵
APS ST 4200 ⁵ Seagate ST 15230N	4094MB	★★★★	949 ⁹⁵	1049 ⁹⁵

BETTER-PERFORMANCE

APS HIGH-PERFORMANCE DRIVES

Model	Capacity	Awards	Internal	SR2000
APS MS 2.0 ⁵ Micropolis 4221	1955MB	★★★★	\$699 ⁹⁵	\$799 ⁹⁵
APS Q 2.0 ⁵ Quantum Atlas XP32150	2050MB	★★★★	799 ⁹⁵	899 ⁹⁵
APS ST 2.0 ⁵ Seagate ST 32550N Barracuda	2047MB	★★★★	849 ⁹⁵	949 ⁹⁵
APS MS 2.0Av ⁵ Micropolis 4221AV	1955MB	★★★★	799 ⁹⁵	899 ⁹⁵
APS MS 4.0 ⁵ Micropolis 3243	4064MB	★★★★	1099 ⁹⁵	1199 ⁹⁵
APS MS 4.0Av ⁵ Micropolis 3243AV	4064MB	★★★★	1199 ⁹⁵	1299 ⁹⁵
APS ST 4.0 ⁵ Seagate ST 15150N	4094MB	★★★★	1299 ⁹⁵	1399 ⁹⁵
APS Q 4.0 ⁵ Quantum Atlas XP34300	4101MB	★★★★ MacWeek	1299 ⁹⁵	1399 ⁹⁵
APS MS 9.0 ⁵ Micropolis 1991	8669MB	★★★★	2199 ⁹⁵	2399 ⁹⁵
APS MS 9.0Av ⁵ Micropolis 1991AV	8669MB	★★★★	2299 ⁹⁵	2499 ⁹⁵
APS ST 9.0 ⁵ Seagate ST410800N	8669MB	★★★★	2199 ⁹⁵	2399 ⁹⁵

¹Denotes length of manufacturer's warranty in years.
Internal drives for Quadra 800 and Centris 610 available.
Patented DaTern™ Digital Active Termination™ technology.
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²External case is Full Height only.
Listed capacities are formatted.
³IBM's formatting capacity.

APS Q 2.0 Quantum®

- ✓ Optimized for workstations and servers
- ✓ Embedded servo eliminates need for thermal recalibration – great for AV and non-AV applications
- ✓ 5-year warranty

Internal configuration
\$799⁹⁵

APS MS 4.0 MICROPOLIS

- ✓ Great drive for disk-intensive applications
- ✓ Utilizes read & write caching for outstanding performance
- ✓ 5-year warranty

Internal configuration
\$1099⁹⁵

APS MS 9.0 MICROPOLIS

- ✓ Perfect as an image library
- ✓ Best performance and value in 9GB drives
- ✓ 5-year warranty

Internal configuration
\$2199⁹⁵

BEST-PERFORMANCE

You need a Fast/Wide drive from APS...

to get the best possible performance from all of your applications. APS Fast/Wide drives improve throughput to new levels, accelerating your Photoshop functions, database searches and server speed. They are the best time-saving investment you can make for your Macintosh system today.

APS MS 4.0W MICROPOLIS

- ✓ Overall highest-performance hard drive
- ✓ Perfect match for Photoshop & other powerful applications

Internal configuration
\$1199⁹⁵

APS FAST/WIDE DRIVES

Model	Capacity	Awards	Internal	SR2000
APS MS 2.0W ⁵ Micropolis 4221W	1955MB	★★★★	\$799 ⁹⁵	\$899 ⁹⁵
APS Q 2.0W ⁵ Quantum Atlas XP32150W	2050MB	★★★★	899 ⁹⁵	999 ⁹⁵
APS ST 2.0W ⁵ Seagate ST 32550W Barracuda	2047MB	★★★★	949 ⁹⁵	1049 ⁹⁵
APS MS 4.0W ⁵ Micropolis 3243W	4064MB	★★★★	1199 ⁹⁵	1299 ⁹⁵
APS Q 4.0W ⁵ Quantum Atlas XP34300W	4101MB	★★★★	1399 ⁹⁵	1499 ⁹⁵
APS ST 4.0W ⁵ Seagate ST 15150W	4094MB	★★★★	1399 ⁹⁵	1499 ⁹⁵

ADAPTER & ACCELERATOR CARDS

Model	External SCSI Connection	Internal
QLogic Fast!SCSI Mac PCI-N	HD 50-pin	\$299 ⁹⁵
Increases the SCSI performance of your PCI Power Mac		
QLogic Fast!SCSI Mac PCI-W	HD 68-pin	379 ⁹⁵
Adapter for Fast/Wide drives		
Silicon Express II	DB25 connection	499 ⁹⁵
For NuBus Quadras & Power Macs only. Fast SCSI-2 Accelerator.		
Silicon Express IV	HD 68-pin	849 ⁹⁵
For NuBus Quadras & Power Macs only. Fast/Wide adapter card.		

APS POWERBOOK DRIVES

Model	Capacity/Features	Drive Type	Internal
APS Q 1.08 ¹ Quantum Europa	1037MB 3800 rpm	Fast ATA2	\$499 ⁹⁵
APS J 1.2 ¹ IBM Travel Star	1215MB* 4900 rpm	SCSI drive	699 ⁹⁵

DIGITAL ACTIVE TERMINATOR & SCSI MONITORING DEVICE

SCSI Sentry®

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*when all was said and done, SCSI Sentry did its stuff. All the problems I have experienced became history... -Macworld Magazine

Don't be confused by inferior knock-offs, only APS SCSI Sentry has patented Digital Active Termination
\$39⁹⁵

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Don't settle for imitations. There's only one Digital Active Termination, and it's only available from APS. Our award-winning SR 2000 enclosure uses our patented DATerm and its unique stacking design to make it the best drive enclosure in the industry. When you use the SR 2000 in conjunction with our SCSI Conduit® line of drive stacking devices, you'll have the best complete storage solution available today.

THE ONLY WAY TO STACK YOUR DRIVES!

WOW!...2GB ONLY \$629⁹⁵

APS Q 2210

- ✓ Perfect for AV and non-AV applications
- ✓ Ideal choice for desktop publishing systems
- ✓ Over 2GB of formatted capacity
- ✓ 5-year warranty

Quantum®



NEW LOWER PRICE

APS REMOVABLE DRIVES

APS CD-ROM DRIVES

Model	Awards	Internal	SR2000
APS T 3701 ¹ 6.7X-speed CD-ROM		\$399 ⁹⁵	\$449 ⁹⁵
APS PD4 ¹ multi-purpose drive		N/A	599 ⁹⁵
APS CD-R ¹ CD-ROM recordable drive		N/A	1299 ⁹⁵

INTRODUCING... THE APS T 3701

- ✓ Super-fast 6.7X speed gives smoother video and animation output
- ✓ Sustained data transfer rates up to 1000KB per second for optimal performance

\$449⁹⁵

THE APS CD-R

- ✓ Keep your important data safe and secure on CD media with a 100-year shelf life
- ✓ Fast retrieval of your critical information
- ✓ Includes a **FREE** copy of TOAST CD-ROM Pro CD recording software - a \$500 value

\$1299⁹⁵

APS SYQUEST DRIVES

Model	Capacity	Awards	Internal	SR2000
APS SQ 3270 ¹	255MB	★★★★	\$349 ⁹⁵	\$399 ⁹⁵
APS SQ 5200 ¹	194MB	★★★★½	339 ⁹⁵	389 ⁹⁵

APS SQ 5200 Special Offer**

- ✓ Perfect for prepress and desktop publishing files
- ✓ Gives you up to 194MB of formatted, interchangeable online storage
- ✓ Uses 44, 88 and 200MB cartridges for greater storage flexibility

\$349⁹⁵*

*When you purchase 5 - SQ2000 cartridges from APS

APS MO DRIVES

Model	Awards	SR2000
APS 230MB MO ²	★★★★	\$499 ⁹⁵
APS 1.3GB MO ¹ 4MB Cache		1699 ⁹⁵

1-5 Denotes length of manufacturer's warranty in years
**Offer consists of SQ 5200 drive & 5 - SQ2000 cartridges for a total of \$789.95. Order number 105239 - limited offer, call today!

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APS TAPE DRIVES

APS DLT40

- ✓ Excellent for server and workstation backups
- ✓ Holds up to 40GB on a single tape†
- ✓ 2-year warranty



External configuration

APS DATLoader600

- ✓ Ideal for unattended large network backups - automates your entire data management process
- ✓ Includes a 6-tape magazine with 6-120m tapes
- ✓ 2-year warranty

External configuration

APS HyperDAT

- ✓ Up to 8GB of storage on one 120m DAT tape†
- ✓ Perfect for workstations or servers with large amounts of compressible data
- ✓ 2-year warranty

External configuration

APS TAPE DRIVES

Model	Capacity*	Awards	Internal	SR2000
APS HyperQIC ² QIC 3080 Mechanism	2GB*	★★★★ MacUser	N/A	\$499 ⁹⁵
APS DAT-DC ² DDS-1 Compression Mechanism	4GB†		\$749 ⁹⁵	799 ⁹⁵
APS ProDAT ² DDS-2 Non-Compression Mechanism	4GB*		849 ⁹⁵	899 ⁹⁵
APS HyperDAT ² DDS-2 Compression Mechanism	8GB†		949 ⁹⁵	999 ⁹⁵
APS DAT Loader600 ² 48GB††			N/A	*2299 ⁹⁵
APS DLT30 ² Digital Linear Tape Mechanism	30GB†		N/A	*4499 ⁹⁵
APS DLT40 ² Digital Linear Tape Mechanism	40GB†		N/A	*5999 ⁹⁵

*Actual data compression and tape capacity vary greatly depending on the type of data recorded, other system parameters and environment. † 2:1 Hardware data compression. †† Using six 120m DAT tapes. *Native capacity without data compression. *External case is special Full Height only. All APS DAT, DLT & HyperQIC drives include Retrospect by Dantz.

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APS
Technologies

\$189

Quantum

LIGHTNING

11ms Access Time
4500RPM

BEST BUY

730MB

Internal Lightning
C109 1154

30 DAY WARRANTY

\$269

Quantum

FIREBALL

12ms Access Time
5400RPM

1GB

Internal Fireball
C109 1202

30 DAY WARRANTY

\$999

Quantum

GRANDPRIX

4.3GB

7200 RPM

Internal Grand Prix
C109 1159

30 DAY WARRANTY

MacUser
October 1995

\$379

ClubMac 200MB Removable

200MB

Shipping with Active Technology

C109 1222

30 DAY WARRANTY

\$234⁹⁵

SyQuest® EZ135 Drive

EZ135 Drive

Features:
SCSI Interface
13.5ms Access Time
One Free Cartridge
Two Year Warranty

135MB

S198 2001

IN STOCK

30 DAY WARRANTY

\$339

NEC

MultiSpin 4Xc

7 Disc Changer

Load 7 Discs at a time!

N024 1070

30 DAY WARRANTY

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Source Code
68025

CLUBMAC HARD DRIVES

Quantum

Internal/External

420MB TrailBlazer	C109 1204/C109 1205	\$179/\$239
730MB Lightning	C109 1154/C109 1102	\$189/\$249
850MB TrailBlazer	C109 1206/C109 1207	\$229/\$289
1080MB Fireball	C109 1202/C109 1203	\$269/\$329
2200MB Capella	C109 1213/C109 1212	\$689/\$749
4300MB Grand Prix	C109 1159/C109 1108	\$999/\$1059

2.5" Hard Drive

341MB Daytona	Q030 1041/C109 1119	\$199/\$319
514MB Daytona	Q030 1002/C109 1109	\$299/\$419

Seagate

Internal/External

2.4GB Hawk 2 LP	S132430N C109 2211/C109 2112	\$739/\$799
4.3GB Hawk 4	S151530N C109 2212/C109 2113	\$999/\$1059
2.5GB Barracuda 2 LP	S132550N C109 2203/C109 2109	\$889/\$949
4.3GB Barracuda 4	S1515150N C109 2207/C109 2106	\$1329/\$1389

5.25" Full Height

9.1GB Elite-9	S1410800N S020 1014/C109 2110	\$2299/\$2399
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MICROPOLIS

Internal/External

2.0GB Taurus-2 4221AV	C109 1228/C109 1231	\$859/\$919
4.3GB Capricorn-4 3243AV	C109 1229/C109 1232	\$1239/\$1299
9.1GB Scorpio 9 1991AV	C109 1230/C109 1233	\$2239/\$2299

IBM

Internal/External

1080MB Deskstar XP	C109 1237/C109 1238	\$269/\$329
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hp HEWLETT PACKARD

Internal/External

2.0GB SureStore 2000LP	C109 1210/C109 1211	\$749/\$809
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ClubMac Fast and Wide Drives

Seagate

Internal/External

2.1GB Barracuda 2LP	S132150W C109 2214/C109 2215	\$959/\$1059
4.3GB Barracuda 4	S1515150W C109 2206/C109 2208	\$1399/\$1499
9.1GB Elite 9	S1410800W C109 2220/C109 2222	\$2379/\$2499

Quantum

Internal/External

2.2GB Capella VP322105W	C109 2219/C109 2217	\$799/\$899
4.3GB Grand Prix	VP343015W C109 2216/C109 2218	\$1069/\$1169

MICROPOLIS

Internal/External

2.0GB Taurus-2 4221W	C109 2223/C109 2226	\$849/\$949
4.3GB Capricorn-4 3243W	C109 2224/C109 2227	\$1269/\$1369
9.1GB Scorpio 9 1991W	C109 2225/C109 2228	\$2289/\$2409

CD-ROM READERS

NEC

	Access Time	Trans Rate	
N024 1062 MultiSpin 6Xe CD-ROM Reader	150ms	900K/sec.	\$545
N024 1070 MultiSpin 4Xc 7 Disc Changer	350ms	600K/sec.	\$339
N024 1011 MultiSpin 3Xp plus CD-ROM Reader	240ms	500K/sec.	\$379

ClubMac

	Access Time	Trans Rate	
C109 9546 ClubMac Quad-Speed CD-ROM Drive	140ms	600K/sec.	\$199
C109 9543 ClubMac Classic 2X CD-ROM Drive	320ms	300K/sec.	\$129
C109 9550 ClubMac Dual-Speed CD-ROM Drive	350ms	300K/sec.	\$88 ⁸⁸

7 Hammond, Irvine CA 92718

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• ClubMac hard drives include all cables, cards, leads, and brackets necessary for use with the Macintosh you specify. ClubMac formats all hard drives and installs Apple System 7.1 software, SCSI Director, and PowerMerge LE.

• External drives include a Double Shielded, twisted pair 25-50 SCSI cable.

• ClubMac honors all original equipment manufacturer warranties. ClubMac will repair or replace drives at its discretion. Drives returned within first 30 days of purchase are replaced with a new unit.

• All ClubMac hard drives include a 30 day money back guarantee. Your risk is the cost of shipping.

REMOVABLE DRIVES

ClubMac

C109 1222 ClubMac 200MB 5.25" Removable*	\$379
C109 1221 ClubMac 88MB 5.25" Removable*	\$199
C109 1224 ClubMac 270MB 3.5" Removable*	\$375
C109 1005 ClubMac 105MB 3.5" Removable	\$189
S198 2001 SyQuest EZ135 135MB 3.5" Removable	\$234 ⁹⁵

*Cartridge not included

SyQuest Media

Media	Qty 1	Qty 10	Qty 20
S198 1010 44MB	\$42ea	\$41ea	\$40ea
S198 1011 88MB	\$47ea	\$46ea	\$45ea
S198 1012 200MB	\$75ea	\$73ea	\$71ea
S198 1013 105MB	\$35ea	\$34 ⁵⁰ ea	\$34ea
S198 1014 270MB	\$60ea	\$59ea	\$58ea
S198 2010 EZ135 Cartridge (135MB)			\$19 ⁹⁹

Omega

J040 1014 Jaz drive with one 1.0GB cartridge	\$599 ⁹⁹
J040 1015 Jaz Cartridge (1.0GB)	\$119 ⁹⁹
J040 1016 Jaz Cartridge (540MB)	\$69 ⁹⁵
J044 1010 Zip drive with One 100MB cartridge	\$199 ⁹⁹
J040 1006 Zip Cartridge (100MB)	\$19 ⁹⁹
J040 1011 Zip Cartridge (3 pack)	\$49 ⁹⁵

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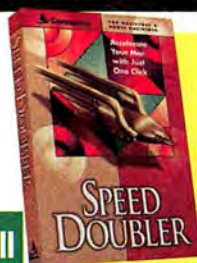
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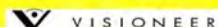
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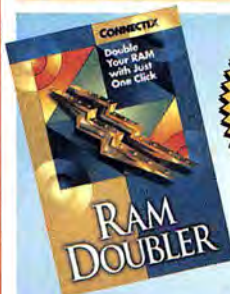
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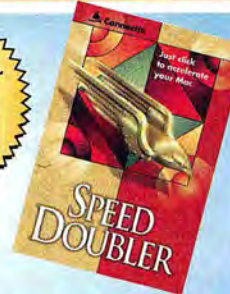
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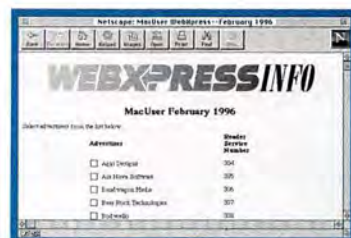
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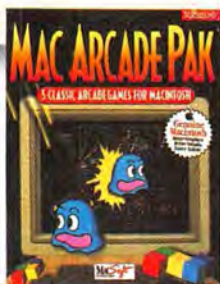
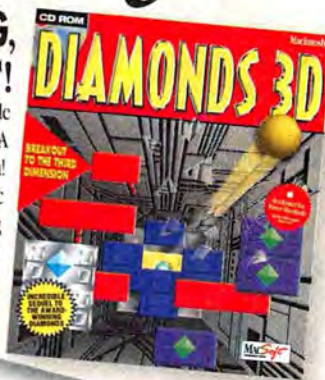
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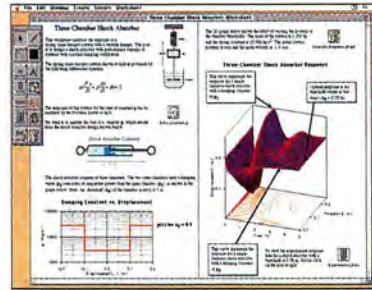
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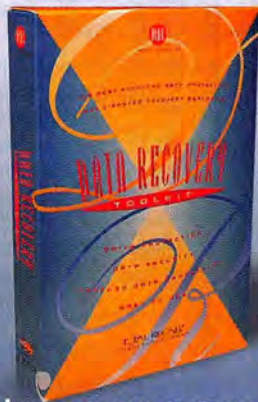
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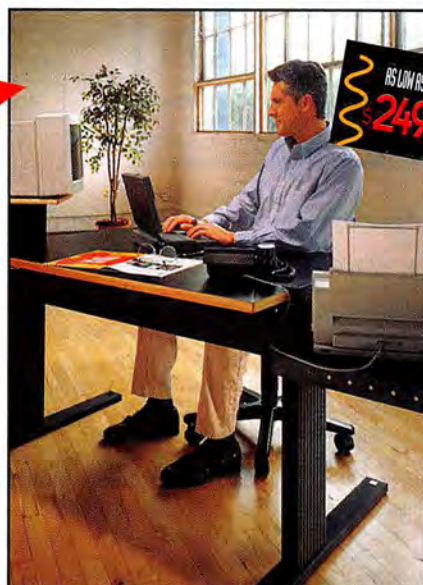
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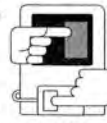


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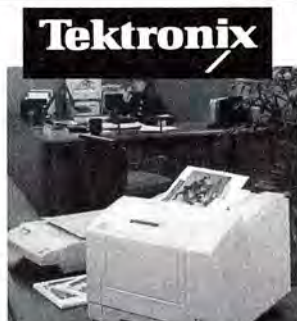
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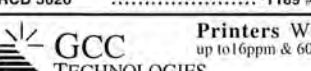
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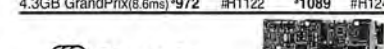
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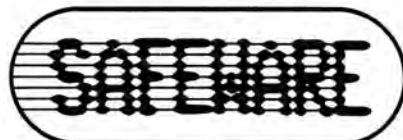
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The World's Best Software

"SO WHAT'S THE BEST SOFTWARE IN THE world?" That's the kind of question people like me (overweight, fond of Jerry Lewis LPs)

get hit with all the time, and after swallowing my mouthful of dinner, I don't need to fumble for an answer. "Oh, Apple's MacsBug debugger, definitely."

After all, in the American office, you have but one goal: to look like a Big Shot at your coworkers' expense. That's why you bought a computer in the first place. But unfortunately, thanks to the Mac, there are now many best-selling word processors that can be (and are) operated by specially bred terriers. Getting a friendly and accessible computer to do what you expect is about as impressive as landing a 757 safely. No, to score real Mac Jedi fear-and-loathing points against your competition, you gotta show you can land that monster with three engines on fire and eight women giving birth simultaneously. And that's where MacsBug — free for the downloading from any of Apple's online tendrils — shines. It is indeed The Best Software in the World:

It makes even the slightest system error look like Offgassing Day at Three Mile Island. One of the few drawbacks of the Mac OS is the way it can put a happy face on anything... even a fatal system error. After all, what sort of Mac Jedi are you if you just happily click on the Restart button as directed? No, with the low-level debugger installed, your entire screen blanks at the first sign of trouble and fills with inscrutable hexadecimal digits and mnemonics. The faces of your coworkers will ashen audibly at the sight, particularly if one of your apps decides to quit seconds before deadline. Oh, sure, the project's just as dead as it would have been without MacsBug installed, but nothing screams, "Honest, sir... it wasn't my fault," like a screen full of OA DF DF DF OA FF FF FF OA EA EA EA MOV #A and the like.

It features an inscrutable text-based user interface, but some of its cryptic commands are nonetheless easy to master. Topping all of this off is the fact that there is *nothing* to tip the observer off about how the program works. When one of your competitors clucks that your watch-cursor hasn't moved for 20 minutes, your mouse is frozen, and — oh, dear — it looks like you're going to have to do a manual reset and lose *alllll* of your data in *alllll* of your open applications, you can merely bark in a scornful fashion. Hit the programmers' switch, and give MacsBug the handy, straightforward command ES, which signifies, "Drop whatever you're doing, and return to the Finder." Your craven competitors will then see you calmly saving all of your work, quitting your apps, and restarting manually, and they will be left with balloonlike question marks hovering overhead, just like in the cartoons.

Sometimes, just sometimes, it helps you pull off an utter miracle. You want to become feared and respected as a total Mac Jedi? Some sort of god? Picture this: There is a scream from next door, and Ed begs you over to his cubicle. "DiscoWriter up and quit on me before I had the chance to save the two-page finale of my quarterly report," he sputters, "and I don't have time to rewrite it!"

With the facial expression of a James Bond who knows that the gun-wielding henchman guarding him has finally strolled into the range of his A-9 Tactical Field Cumberbund, you pull Ed's keyboard closer. "Aw, it's probably still floating around in memory somewhere. Give me a few tics." And assuming that you had secretly installed MacsBug

on his machine a while back, you would hit the programmers' switch. Type `log EddiesText` so that MacsBug will copy all of your efforts to a text file as you go along. "You were writing about LambadaWare's market share, right?" you ask, as you type `F0 FFFFFFFF "LambadaWare"`. If the text is still in memory, MacsBug will respond with an eight-digit memory address followed by a dump of its contents. Type `DM [address]`, and the text will come spooling out in a narrow column.

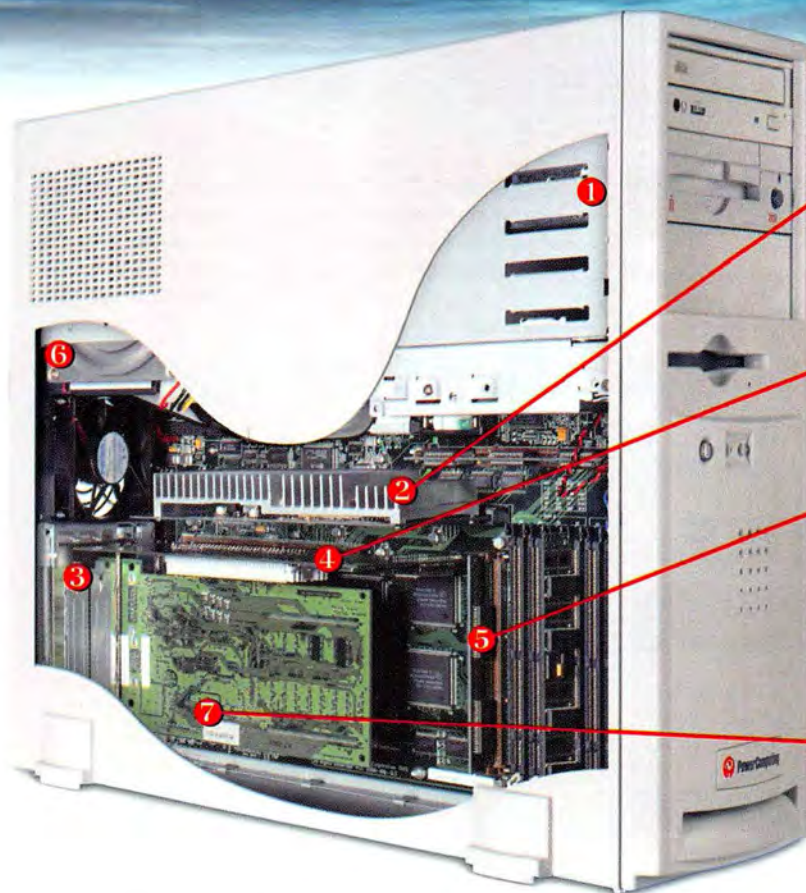


The grin of cata-tonic delight upon Ed's face is rapidly going to be replaced by a look of utter penitence. "[readername], as you know, our office has no volcano and precious few

virgins," he'll stammer, plucking a brightly colored object off a nearby shelf. "But I hope you'll accept this Batman PEZ dispenser and the big document shredder on the third floor as a proper demonstration of my cowering fealty to you, my new and powerful god." Which brings us to my last reason why MacsBug has won such a special place in my heart:

Its complexity is multilayered. Because if Ed proceeds to read this column and decides he can become every bit the Big Shot you are, you'll still have your trump card. "Very nice," you allow, after Ed finishes his little MacsBug demo. "Hey, take a screen shot of that for me, will you? I'd like a hard copy." And as you stroll off, watch the airspace above his cubicle for wisps of yellow smoke coming out of his ears. Being a Mac Jedi is like being a member of a popular fraternity: Half of the work and the fun is in keeping other people from joining. ☞

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MacUser - AUG. '95



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