

THE FASTEST MAC YET! POWER'S 180-MHZ CLONE...PAGE 27

MAY 1996 / \$3.95






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Mac

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User

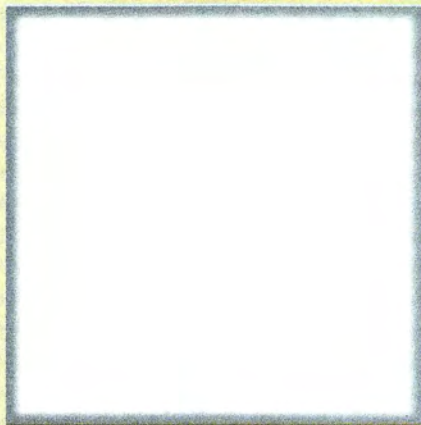
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**Apple's Bold Plan to
Save the Mac...page 78**

What's Cool in Netscape Navigator 2.0?



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In here

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Your Power Mac™

And Microsoft® Office

Become one.

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You assemble your thoughts

Effortlessly.

You drag

Words tables

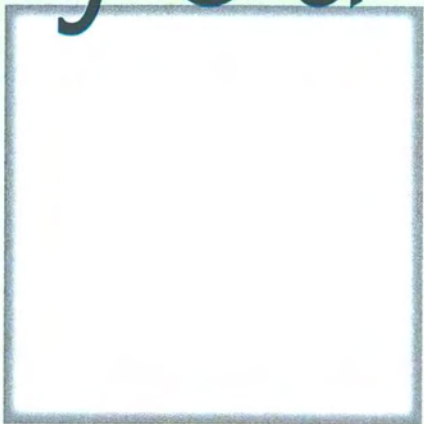
Charts graphics

From one program

And drop them

Into another

Instantly.

in
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work
miracles



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You run

Microsoft Excel calculations

In your Word document.

You turn your Word document

Into a PowerPoint® presentation.

You see everything

Come together.

Seamlessly.

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Make something.

Make anything.

This is you.

Working.



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WHERE DO YOU WANT TO GO TODAY?™

in
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mistakes
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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.
A Your fingers
J Are racing
O To keep up
B With your thoughts.
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D
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Y You begin
O A new sentence
U With
W A lowercase letter.
R This mistake is corrected
I Automatically.
T
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O 100 levels
U Of Undo.
R And 100 levels
E Of Redo.
V Just in case.
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O Sentence with
U An abbreviation
W You created.
R It becomes
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O You click AutoFormat.

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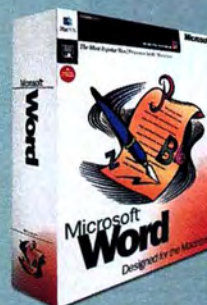
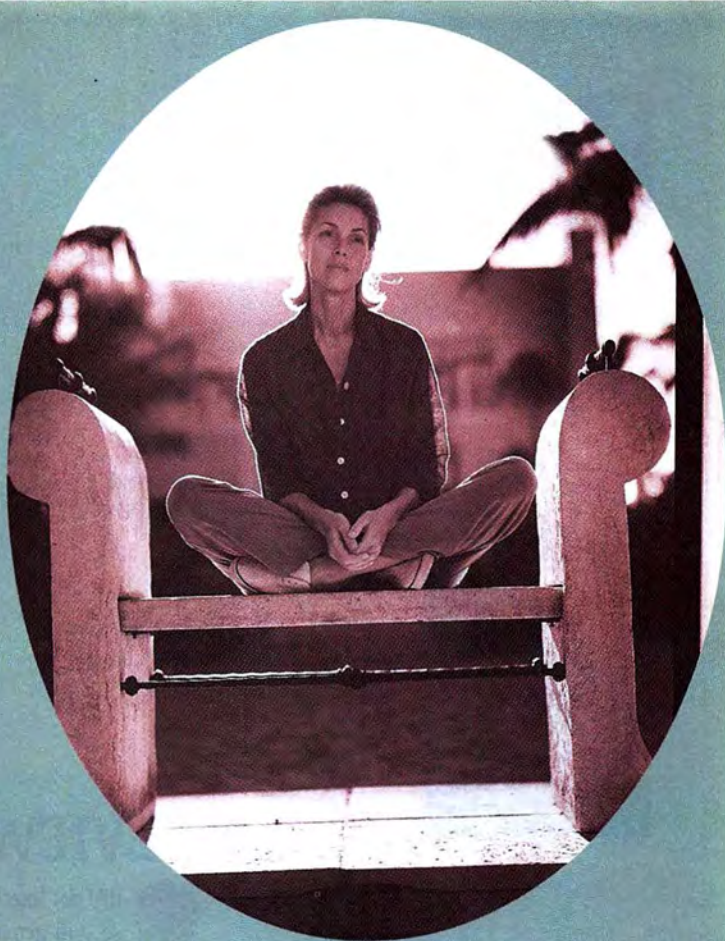
W A letter.

R A proposal.

I A story.

T Automatically.

E You write. Because you can.



Microsoft

WHERE DO YOU WANT TO GO TODAY?™

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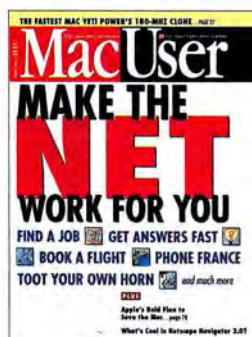
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Net Success

How many hours have you spent on the Net with nothing to show for it?



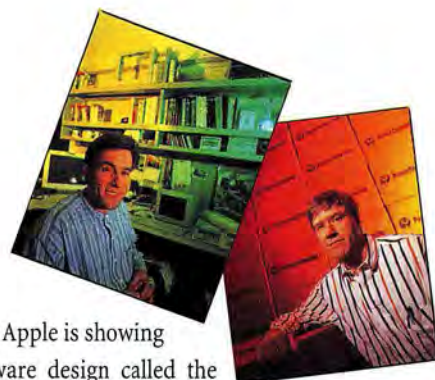
Sure, surfin' where the spirit takes you is the coolest, but what about a practical payoff? The Net can save you time, money, even frustration — or be the biggest time waster since the O. J. trial. Here are 10 ways to make your online time quality time.

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No doubt about it. A color printer is a smart business investment — color charts and presentations are better-looking and more persuasive than simple black-and-white ones. But which color printer should you buy? We torture-test 15 workgroup-based color printers for speed, output quality, price, and support. By Roman Loyola / 84

Quick Labs



Problem: We just can't keep up with all the great products introduced each month. Solution: Quick Labs, a monthly bulletin of lab results on the latest printers, monitors, and storage systems. / 92

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MacUser (ISSN 0884-0997) is published monthly by Ziff-Davis Publishing Company, L.P., One Park Avenue, New York, NY 10016. Editorial Offices: 950 Tower Lane, 18th Floor, Foster City, CA 94404. Telephone: 415-378-5600. U.S. subscription rates are \$27 for 12 issues, \$45 for 24 issues, and \$62 for 36 issues. Additional postage for Canada: Add \$16 per year to the U.S. rates for surface mail. Single-copy price is \$3.95. Canadian GST registration #R-140496720. Canada Post International Publications Mail Product (Canadian Distribution) Sales Agreement No. 278521. POSTMASTER: Send address changes to *MacUser*, P.O. Box 56986, Boulder, CO 80322-6986. Second-class postage paid at New York, NY 10016, and at other mailing offices. Printed in the USA.

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(SCREEN REDRAW TIMES - SECONDS)*

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



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MacUser October 1995

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MacWEEK July 10, 1995

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In memory of John J. Anderson 1956 - 1989

and Derek Van Alstyne 1967 - 1989



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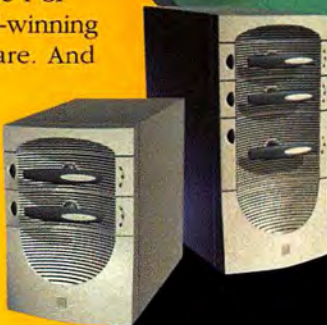
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You are on

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.

3

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

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You enter numbers.
You click AutoFilter
And the data you want to see
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LETTERS



Choose Wisely

"CHOOSING THE RIGHT MAC" (February '96, page 67) was quite interesting and very timely. However, I noticed you recommended many 680x0-based Macs. I wouldn't recommend that *anyone* buy a 680x0-based Mac. The future is Power Macintosh. If you want your Mac to live into the next millennium, buying a 680x0-based machine will short-change your future.

Maybe I just live too close to the edge, but getting even a low-end Power Mac seems more prudent to me at this time.

Duane Murphy
murphy@community.net

I WAS DISAPPOINTED by your lack of support for the Power Computing line. Power Computing is offering the feature set — especially the PowerPC 604 processor instead of the PowerPC 601+ — that Apple *should* have put into the 7200 and 7500 series. The mediocre telephony and strictly low-rent, amateur-level AV features Apple put into its new releases are a waste of money. We don't need 'em, don't want 'em, and don't want to pay for them. And compared to Apple's miserable efforts, Power Computing's customer relations and support are great!

Earl M. Britt
promo@wcnnet.org

YOU HAVE CHRONIC RAM delusions. My colleagues and I aren't buying any new Macs that have less than 16 MB, and we get 20 MB of RAM even for Performas running Microsoft Excel and Word. Lack of RAM makes for unhappy computer users — they get "out of memory" warnings on new computers and feel cheated with their new purchases. Even the king of understatements, Microsoft,

recommends that you have 16 MB of RAM for Microsoft Office!

Caleb J. Clark
via the Internet

BELLE CURVE, the liberal-arts major? And boyfriend Dexter, the brainy engineering grad student? Puh-leeze! This is tired, tired stereotyping. Next time, let's see Bob Buns and his girlfriend Athena, the Nobel laureate in physics!

Margretta Diemer
via the Internet

Making the Upgrade

I WAS SURPRISED to see you recommend a Power Mac 7100 motherboard as an upgrade path for a Centris 650 ("The Paths to Upgrades," February '96, page 78). You can actually buy a whole Power Mac 7100/80 — with 8 MB of RAM, a 700-MB hard drive, and a CD-ROM drive — for less than the \$1,599 price of the logic board. Not only would you get the larger hard drive but you could also sell the Centris.

Michael Lassner
lassner@calgene.com

If a model has an upgrade path to a Power Mac, we listed the upgrade, regardless of its overall value. Obviously, buying a new machine is a better alternative than upgrading many of the machines listed. / RL

ARE MY EYES deceiving me? Did I just see MacUser make a blanket recommendation for clock accelerators? You say that "if you need extra speed now, you can use . . . any of the clock accelerators from various vendors." Although it's true that you can sometimes push

OPEN FOLDER

We take it all back. Every last bit of it. Everything you read in the February '96 Open Folder was actually written by a team of poorly trained monkeys filling in for the Open Folder staff, which was vacationing in sunny Mexico at the time. That's our story, and we're sticking to it.

Bang! That was the sound of our heads hitting our desks when we realized we had written that Alfred Nobel was "the man who invented gunpowder." Oh, how the e-mail poured in. "Let me be the 276,794th person to point out that Nobel invented dynamite, not gunpowder," wrote Luke Jaeger. "As nearly as anyone can tell, gunpowder was developed by Chinese scientists approximately 700 years ago." Luke was smart enough to realize that he wasn't the only one who would spot our obvious gaffe. Or as reader Julian Smith explained it to us, "I know they both blow up, but Windows 95 is 'just like a Mac' too." Touché.

Would you believe us if we told you that Microsoft programmers have a sense of humor? (Sorry, Microsoft Bob is proof that Microsoft executives have a sense of humor.) We base our theory on information we received from Denis Chabot: "Recently, I got this 'tip of the day' upon opening Word 6: 'Things that go away by themselves can come back by themselves.'" It's good to know that even if Word fails you as a word processor, it can still be a full-service generator of Zen koans. Now if we can only get Microsoft engineers to create a Haiku Wizard . . .

We're only human, and all of us make mistakes — even the mighty Andy Ihnatko. Witness the letter we got from Bill Melton: "Andy suggests that the likelihood of mere mortals using MacsBug successfully is similar to that of landing a 757 with three engines on fire . . . but the 757 has only two engines." Of course, Andy was cleverly explaining just how difficult MacsBug really is. Yeah, that's it. And by the way, did you know that the whale is not actually a mammal but is, in fact, a fish? True, true. We'd stake what's left of our reputation on it.

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CIRCLE 31 ON READER SERVICE CARD

a CPU past its rated clock speed, it's also true that doing so can introduce random errors. I can't believe that you would print such a potentially misleading statement.

T. R. Smith
kaimiike@hinahina.eng.hawaii.edu

/ Clock accelerators do work, but only up to a maximum speed that's unique to every system and environmental temperature. Mileage will vary. Because finding the perfect speed at which random crashes don't occur can require a lot of time and effort, clock accelerators are not for everyone. Having higher clock speeds will void your warranty and may reduce the life of your motherboard. However, there are some people for whom these low-cost, short-term gains can prove invaluable. Like race-car drivers, media publishers stand to gain a lot from increasing their production runs, even if the eventual cost could be the replacement of a motherboard. / JP

I REALLY LIKED "The Paths to Upgrades" article. It was a very concise and effective way of supplying upgrade information. Unfortunately, when I called my Apple dealer and asked about a logic-board upgrade for my Quadra 800, he told me "it isn't going to happen."

Do you have information that the Apple dealer(s) do not yet have, or have my hopes been raised only to be slapped down again?

Charles Shelor
cfshelor@acm.org

/ Before you can upgrade a Quadra 800 to a Power Mac 8500, you must first upgrade it to a Quadra 840AV — if you can find such an upgrade (they're in short supply). Furthermore, when Apple first announced the Power Mac 8500, it also announced that users would be able to upgrade a Quadra 840AV to a Power Mac 8500. However, Apple has yet to make that upgrade available — and it hasn't made any further announcements regarding it. / RL

ONE AREA YOU didn't cover in "The Paths to Upgrades" is the extreme difficulty of convincing anyone that such paths exist. When the logic board on my 660AV died, the price to replace it was quoted at \$900. When I inquired about the logic-board upgrade to the Power Mac 6100/60AV, my Apple dealer didn't know about the upgrade or what it might cost. Nothing happened until I found the board's part number on Apple's Web site. But the only price I was quoted was \$2,200, well above the \$1,049 quoted in your article.

Steven Maleski
smalesk@cello.gina.calstate.edu

Sold!

HERE'S ANOTHER ONE to add to the list of stupid things salespeople said ("The Smart Shopper," February '96, page 81):

Customer: "Do you have any Mac disk drives that are Fast-and-Wide SCSI-2?"

Salesman: "All our Mac software is on those shelves over there."

Joel Williams
jwilliams@ids2.idsonline.com

HERE'S MY FAVORITE:

Customer: "What does Energy Star-compliant mean?"

Salesman: "That means when you throw it away, it's good for the environment."

Mark A. Clark
clarkm@misslink.net

YOUR LIST OF TEN stupid things salespeople said was hilarious. Being a former computer salesperson, I couldn't stop laughing. I sure hope these folks aren't commissioned salespeople — otherwise they're going to have a very poor paycheck.

With computer retail prices dropping, the commissions of salespeople have also dropped. Since the good ones can't make a living, they leave. The biggest losers here are the would-be users, who have no idea about what they're buying and walk away even more confused.

Ed Berlot
edber@hookup.net

ALTHOUGH YOUR EXPERIENCES with CompUSA may have been acceptable, I have never found its personnel to be either knowledgeable or helpful when dealing with Mac products.

As a result, I always find it better to use information provided by your magazine or by friends before purchasing from a catalog. Although there is little or no ambiance, it sure beats the rudeness I always seem to encounter at CompUSA.

Ken Marcus
via the Internet

I FOUND YOUR ARTICLE very interesting and informative, but I must point out some inaccurate statements about Circuit City. I work at a Circuit City store, and our computer-department sales staff is highly qualified and knowledgeable about the systems the store sells.

As for myself, I am the president of the Tucson Macintosh Users Group, own four Macs, regularly do hardware upgrades, and help Mac owners fix their machines when they do have problems.

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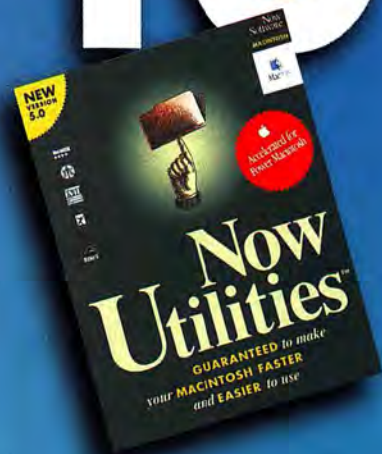


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CIRCLE 112 ON READER SERVICE CARD

How to make 7.5 a 10



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CIRCLE 82 ON READER SERVICE CARD

LETTERS

Statements like yours can give the impression that we don't know what we're talking about. This perception couldn't be further from the truth. Because of Circuit City's 30-day return policy, if I sell people a system that they aren't happy with, they bring it back and I lose any commission I made on the sale. So it's in my best interest to make sure that I sell customers systems that meet their immediate needs and that offer some room for growth.

Wherever you shop for a new Mac, ask a few questions of the salespeople to make sure that they're qualified. And yes, you can find such people at large consumer-electronics stores.

Matthew P. Caswell
mattcaz@primenet.com

Cloning Around

HENRY BORTMAN'S "The Year of the Clones" (February '96, page 89) was fascinating. However, it did not address the PowerBook question! When will the clone makers start manufacturing and marketing Mac OS portables? Inquiring minds want to know!

Freddie Patterson
phastman@pipeline.com

/ Power Computing has stated its intention to manufacture and sell a portable clone. But don't expect it real soon. / HB

Use the Force

ANDY IHNATKO'S "The World's Best Software" (February '96, page 202) might be a brilliant bit of Journalism, but I am not one bit wiser about how to use MacsBug. Instead of showing off his wisdom, he could have helped us by giving a URL that tells where the software is documented.

Michel Eytan
eytan@dpt-info.u-strasbg.fr

ANDY PROVIDED a brief but interesting introduction to MacsBug. Unfortunately, he left no clue about where MacsBug might be obtained. Worse, he provided no instructions for its installation.

If Andy was attempting to follow in Yoda's footsteps, he failed miserably.

Scot Marburger
via the Internet

/ MacsBug can be found at ftp://ftp.support.apple.com/pub/apple_sw_updates/US/Macintosh/Utilities. To install it, drop it into your System Folder. You can find more information on how to use MacsBug in Apple's The MacsBug Reference and Debugging Guide. / JS

IT'S NICE TO see MacsBug finally get the respect it's due. As a developer and all-around cool guy, I couldn't impress the chicks if I didn't have MacsBug. (It also tends to be invaluable in my work.)

David Shayer
dshayer@netcom.com

/ I have no proof to back this up, but I have it on good authority that MacsBug is what David Copperfield used for snagging Claudia Schiffer. / AI

IS ANDY IHNATKO an alias for Dave Barry?

Jon Marcus
jon20762@aol.com

/ No. Mr. Barry has better hair and far less trouble getting Frank "The Riddler" Gorshin to return his phone calls, I reckon. / AI

Where's Dvorak?

DID I MISS a staff meeting or something? Why is there no John C. Dvorak column on the last page of my MacUser? I know John has a way of irritating us die-hard Macphiles, but his iconoclastic nature is the slap we need from time to time. After all, don't you just hate it when he's right?

Russ Reabold
102110.540@compuserve.com

Fight Sims

I WAS DISAPPOINTED that all three of the flight simulators you reviewed (The Game Room, February '96, page 130) were designed for fighting rather than actual flying. One of the main reasons I still like Microsoft's Flight Simulator 4 is that it makes me feel like I'm actually piloting an aircraft. I want to fly the airplane, not use it for violence.

Jon Calon
via the Internet

/ We'd love to review such a flight simulator, and we will as soon as Looking Glass Technologies ships its promising new game, Flight Unlimited. The Microsoft product, however, is too out-of-date to review. / NP

Prints Valiant

AFTER EXPLAINING how complicated drag-and-drop printing can be ("Print Like a Pro," February '96, page 114), it's unfortunate you didn't point out how simple it can be. Kerry Clendinning's shareware Print Choice has been around longer than QuickDraw GX and probably still does the job better for most people.

The feature I like the best is the ability to quickly change printers from within any

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LETTERS

application (not just the Finder) by selecting a printer from the Print Choice icon on the menu bar.

John Macdonald
via the Internet

/ Print Choice (\$14 shareware) can be found on just about every online service, including in the info-mac software archives at <ftp://mirrors.aol.com/pub/info-mac/gui/print-choice-14.hqx>. / JS

Macromedia Service

I'D LIKE TO RESPOND to the comment Ward Larkin made in Open Folder (February '96, page 11) regarding his dealings with Macromedia's customer-service department.

After he wrote his letter to *MacUser* but before it appeared in print, we were able to satisfy Mr. Larkin.

Macromedia is dedicated to providing the highest-quality products and service in the software industry. In customer service, we are committed to providing the best-possible service to every customer. We always try to do what is right and understand that even though the customer may not always be right, the customer is always the customer.

Dan Koehn, Manager
Macromedia Customer Service

Fine Whine

PAMELA PFIFFNER'S "Uncork Your Mac" (February '96, page 125) was very good. However, the URL for The Wine Page has changed to <http://www.speakeasy.org/~winepage/wine.html>.

And I am very sad to see that Pfiffner forgot the first real Mac wine e-zine, MacVine, which can be found on eWorld and AOL and through The Wine Page.

Marc Aubin
via the Internet

MAYBE HIS NAME confused you, but wine writer Oz Clarke is going to be mighty surprised to find out that he's an Australian. He's as English as Yorkshire pudding. Trust me. I've been writing a wine column for 25 years. (It's now on the Net, at <http://www.millennia.net/bcwine>.)

Jarvis Whitney
via the Internet

/ There are lots of great wine sites on the Net, but the ones I mentioned were the most appealing to my palate. As for Oz not being from Oz, I apologize for the mistake. For some Brits, there's no greater insult than being mistaken for an Australian, but this was not intended to be a slight. Sorry, old chap! / PP

Online Applause

I wanted to let you know how valuable I find your free *MacUser* utilities, especially Find Pro and the Mac Catalog Database. Thank you very much for making these available!

Lew Nelson
via the Internet

/ You're welcome. MacUser readers can always download the latest exclusive MacUser utilities from our Web site, located at <http://www.zdnet.com/macuser/>. / JS

THANKS FOR THE opportunity to participate in your MacUserWeb mailing list. I'm glad I subscribed. The information is timely and interesting. Looking forward to your next misadventure and to the next issue!

Hal Portner
hportner@mail.trincoll.edu

/ Thanks for the compliment! Anyone wanting to receive a notification mailing when new material is posted to MacUser's Web site can do so by sending an e-mail message to macuserweb@macuser.com, with a subject of "subscribe" (no quotes). / JS

The Convert

I ABSOLUTELY ADORE the Macintosh and its OS. I swore off Apple after I had an Apple II, and I thought nothing would ever beat the Wintel platform, which my father sells for a living.

Now that I am a freshman at Drexel University, in Philadelphia, the first school to require personal access to computers by students (and a 100-percent Macintosh school), I was required to buy one. Soon after getting my Power Mac 8100/80, I mastered the Mac OS. I will never go back to the Wintel world. Never again will I deal with IRQs and DMAs.

Your magazine is excellent! Keep up the good work.

Alex Charyna
via the Internet

CORRECTIONS

The phone number for Ricoh (News, March '96, page 25) was incorrect. For more information about the RDC-1 digital camera, call 800-225-1899.

Power Computing's PowerCurve 601/120 system (News, March '96, page 27) changed after our issue went to press. The baseline system has neither a 256K L2 cache nor a CD-ROM drive, and its initial pricing was higher than we reported.

The phone number for Storm Software ("Fast 'n' Easy Photo Fixes," February '96, page 28) should have been listed as 415-691-6600.

The phone number for Reality Bytes ("The Name of the Game," January '96, page 80) should have been listed as 617-621-2500.

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Mark Hall
Editor in Chief
Macweek
July 24, 1995

"Canvas 5 sports a sleek interface that packs the power of numerous programs without confusing the user...Canvas equals Adobe Illustrator and Macromedia FreeHand... Although it doesn't offer all the bells and whistles of Adobe Photoshop, it does support a fairly complete array of tools for image editing, including masking."

Sean J. Safran
Senior Graphics Editor
MacUser Magazine
October, 1995

"Canvas 5, what a product! Image editing, page layout, presentation and tech illustration wrapped into one easy to use interface. This is the true Swiss Army knife of any graphics applications out there. Deneba has done everything the graphics community has asked for."

Keith Boncek
Director of Computing
Cornell University
August, 1995

THE OFFER Time's running out. The instant Canvas 5 starts shipping, this offer will be history, and you'll either be feeling very smug or very foolish. Right now, you can buy the most complete all-around graphics program (Canvas 3.5) for as little as \$149* and get a free upgrade to an even better one (Canvas 5) when it ships this spring.

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THE TEST I'm so smart I...
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2. Recognized that Picasso in the garage sale for \$100 (it was last auctioned at \$50 million).
3. Bought Canvas at \$149 and got a free upgrade (saved thousands). Well, it's too bad about 1 & 2, but it's not too late for 3.

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MacBench 3.0 publishing graphics mix test performed on Power Mac 9500/132 with 40MB of RAM @ 1152 x 870 in 16.7 million colors with Matrox Millennium for PCI Power Mac, Number Nine Imagine 128, IMS Twin Turbo 128 and Radius Thunder 3D/1600.



PAMELA PEIFFNER

Internet Agonistes

APPLE'S NEW CEO and chairman, Gil Amelio, has targeted the Internet as a key strategic focus for Apple. Well, knock me over with a feather. Mac users know they have the easiest on-ramp to the Infobahn, and I'm glad that Apple intends to capitalize on it. But really, did anyone seriously think Apple *wouldn't* embrace the Internet? I mean, who hasn't? You can't turn around these days without getting entangled in the Web. It's everywhere and nowhere, a valuable resource that's reached superhype status even though we're still very much in the process of figuring out what the heck it's good for.

Funnily enough, the qualities that make the Internet so appealing — that it's an unrestricted international community of free-thinkers with access to a limitless bit stream — are exactly what give me the most concern about its future. Let's face it: It's chaos out there. The Internet is like a gangly adolescent who can't decide if he wants to hang out with friends or do his accounting homework, and the peer pressure is enormous. What's it gonna be, kid: Utopian playground or commercial gold rush? To help the Net outgrow this awkward stage, we need to start being role models. How? Here are a few ideas.

Don't Brag About Your Accomplishments. Wacky Web pages are part of the Net's home-spun allure, but the wackiness is out of control. Thanks to the expansiveness and accessibility of the Internet, A. J. Liebling's old saw about the power of the press belonging to those who own one has taken on new meaning. Everybody and their sibling are creating home pages about everything from Drew Barrymore's tattoos to the latest Elvis sightings. Enough already. Stumbling across a personal home page is like reading a diary entry or a high-school-yearbook inscription. Although amusing, such pages tend to clog up the works, making for longer searches on those rare occasions when you're actually trying to find some real information.

Internet search services that feature

classification trees are part of the answer — Yahoo! is a particularly good example — but what's really needed is a way for page creators to take some responsibility themselves for the classification. I'd like to see a classification tag that Web authors could add to their documents; that way, if it's a personal home page, I'll know before I click there.

Remember That Good Grooming Is Essential. I can't wait until the Internet has the infrastructure to support really great-looking design. Today's home pages aren't prone to the ransom-note typography that plagued early desktop-publishing efforts — although I'd be willing to live with typographic eyesores if it meant you could use more fonts. And as much as I like groovy graphics, I grow weary when waiting for large graphics files to download. If I want eye-candy, I'll open a magazine — at least for now. Ask me again when multimedia-rich home pages created with Sun's Java and Macromedia's Shockwave become common and my cable modem is humming along.

Until then, remember that many of the same design principles that apply to print publishing — such as contrast and consistency — pertain to online publishing too. It will be interesting to see if widespread use of products such as Adobe PageMill actually results in better-looking pages.

Don't Succumb to URLish Behavior. It seems every product now has a URL attached to it. On my way to work each day, I pass a billboard with nothing but the name of a bank and its URL. Is there anything wrong with that? Nope. After all, *MacUser* now prints its URL on the cover. But publicizing your URL is meaningless if you don't have strong content on your home page. It really irks me to go to a Web page and find an Under Construction sign. If you're going to advertise your URL, have something to say. Give me solid information, and I'll come back again and again.

Do Your Civics Homework. Every time I tell someone that the Internet community needs to come up with ways to regulate the World Wide Web, I'm regarded as Big Brother incarnate. These people think that the Internet is inherently uncontrollable.

But as we've seen in the recent passage of the Telecommunications Reform Act, someone forgot to tell the real Big Brother — the federal government — that it shouldn't interfere with the Internet. Our government is already busy imposing limitations, and I question whether the distributed anarchy that



is the Internet can launch an effective counterattack. Somehow I'm not confident that sitting down in the middle of the information superhighway while holding hands and singing "Give Geeks a Chance" will do it.

Sure, blue ribbons and black home pages send a message to other Internet users, but it's really only preaching to the choir. If we want our rights respected, we must continue protesting loudly and vehemently outside the electronic confines of the Net itself.

And why does everything have to be grassroots anyway? How about some big-time lobbying from some of the companies that stand to profit from the Net's explosive growth? Are you listening, Time Warner, Starwave, Yahoo!, and Microsoft? And you, Mr. Amelio? Perhaps it's time to articulate what Apple is going to do for the Internet. ☐



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Naturally, the MultiSync M Series is backed by a 3-year limited warranty. More importantly, both monitors are backed by NEC's reputation for building the finest monitors in the world.



The MultiSync M Series monitors from NEC. Think of them less as new monitors, more as the standard by which all others will be judged. To learn more about either the MultiSync M500 or M700 monitors, call 1-800-NEC-INFO. To have the information sent to you by fax, simply call 1-800-366-0476 and request document #157201. Or contact us on the Internet at <http://www.nec.com>.

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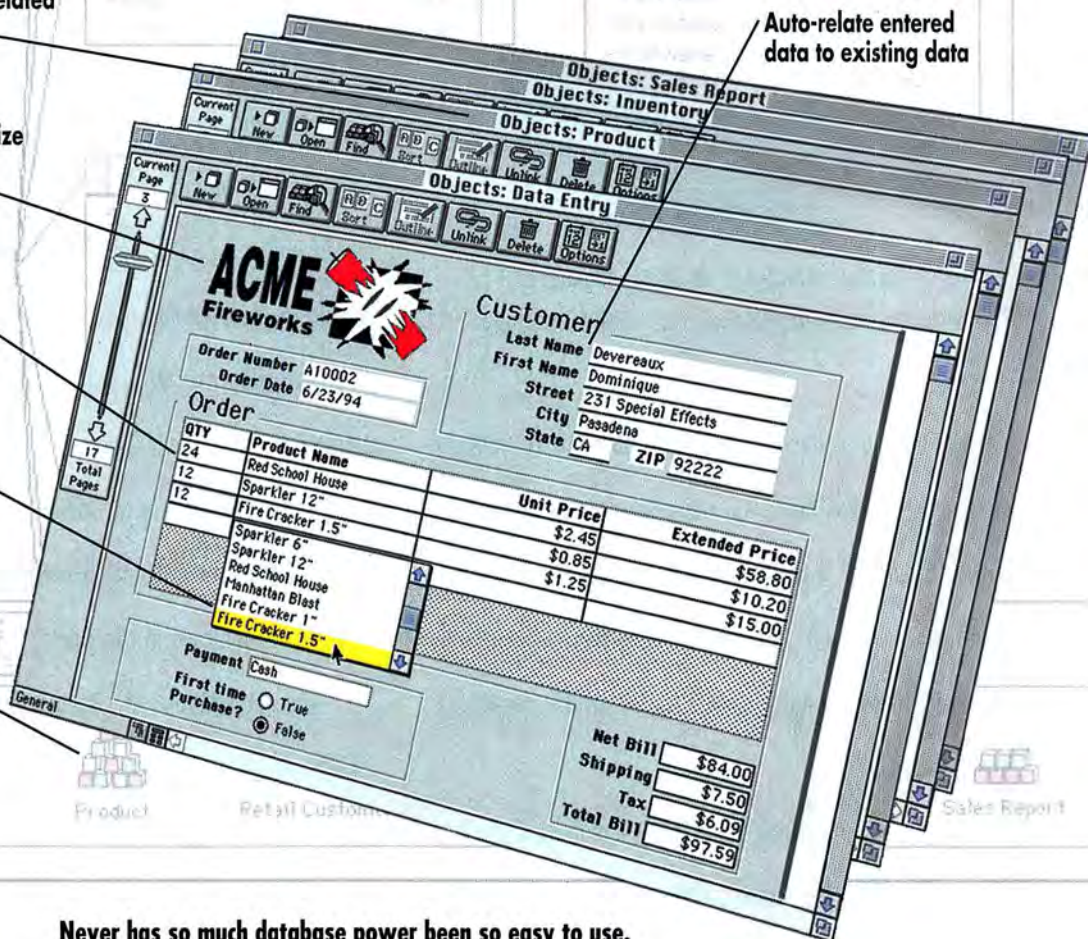
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CIRCLE 140 ON READER SERVICE CARD

NEWS

New OS Update to the Rescue

System 7.5.3 repairs bugs, improves performance, simplifies maintenance, and runs on all Macs.

IF YOU'RE RUNNING System 7.5.whatever on a Mac or a clone, upgrade to System 7.5.3, with Apple's System Update 2.0. You'll be better off. Much better off.

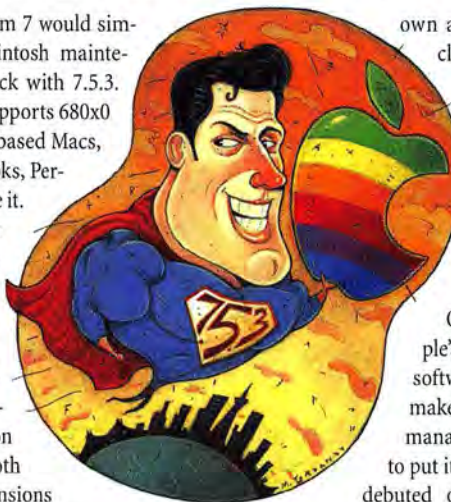
SYSTEM STABILITY. If you're cursed with frequent visitations of dreaded Type 11 system-crash messages, redemption is at hand. System 7.5.3 exorcises those demons along with out-of-memory errors, printing problems on PCI-based Macs, and a few other pesky gremlins.

SPEED ENHANCEMENTS. System 7.5.3 speeds up your Mac in several ways: First, the Finder has been improved for faster file copying, especially when you're moving lots of small files. Second, the scheme that is used to page code between memory and disk has been improved, so launching Excel on a PCI-based Power Mac with virtual memory on is no longer a good opportunity to take a lunch break. Finally, the Resource Manager and SCSI Manager are now fully native for all PowerPC-based Macs. (These portions of the OS were formerly native only in System 7.5.2, which ran only on PCI-based Power Macs.)

UNIFIED SYSTEM. Apple strayed away from its

original promise that System 7 would simplify multiple-model Macintosh maintenance, but it's back on track with 7.5.3. This new system version supports 680x0 Macs, Power Macs, NuBus-based Macs, PCI-based Macs, PowerBooks, Performas, clones — you name it. There are still two different system enablers — one for PCI-based Macs and another for all other Macs. Using a System 7.5 Installer CD-ROM and System Update 2.0, you can create a single, universal version of the OS that contains both enablers and all the extensions and control panels necessary to boot any Mac — from a Plus to a Power Mac 9500/132. (System 7.5 on a Mac Plus? Hey, we said it's possible, not that it's a good idea.)

One caveat for clone users: The Apple CD-ROM extension in System 7.5.3, like its predecessors, doesn't support non-Apple CD-ROM drives. If you



own a CD-ROM-equipped clone or a third-party CD-ROM drive, you'll need a third-party CD-ROM driver or you won't be able to mount and use CD-ROMs.

OPEN TRANSPORT. Even though

Open Transport, Apple's new networking software, was designed to make networking easier to manage on the Mac, it was, to put it kindly, a flop when it debuted on PCI-based Power

Macs. Its worst offense was that it hobbled Fast Ethernet and ATM network connections so severely that they offered little or no speed boost over standard Ethernet. That's fixed in version 1.1, which is installed by System Update 2.0. Open Transport also lets users switch among TCP/IP configurations (for example, between a LAN connection used in the office and a dial-in connection used from home) without requiring a restart.

Previously Open Transport ran only on PCI-based Macs. With System 7.5.3, it's available on all Macs that have 68030 processors or better. Those with 68000s and 68020s still can't run Open Transport; they'll continue to rely on classic AppleTalk protocols. On 68030- and 68040-based Macs, and on the first Power Macs, users can switch between Open Transport and classic AppleTalk. PCI-based Macs can run only Open Transport.

Is System 7.5.3 for you? In a word: yes. If you're running System 7.5, you'll want to install this upgrade. If we haven't convinced you of its value yet, here's one more feature to consider: With System 7.5.3, you no longer lose all your Get Info comments when you rebuild your desktop.

System Update 2.0 is available for free from Apple FTP and Web sites, America Online, CompuServe, and — for both of you who use it — eWorld. (You'll have to pay for connect time, of course.) It's also available from user groups and, for a \$13 shipping-and-handling charge, directly from Apple (800-293-6617). / HENRY BORTMAN

FUTURE TECH

Your Next Monitor May Run on Gas

MONITORS ARE TOO BULKY because they're built around a big bottle of air called a CRT. LCD technology solves the bulk problem, but active-matrix LCD panels the size of a typical monitor are prohibitively expensive for anyone except the Department of Defense. The ideal monitor would be as flat and light as an LCD panel yet as big and bright as a CRT — attributes that describe the PDPs (plasma display panels) currently being developed by Sony, NEC, Mitsubishi, and others.

PDPs, like CRTs and LCDs before them, will likely first see limited commercial use, then wide distribution in consumer products such as televisions, and then finally migration to the desktop. Sony's 25-inch Plasmatron system, planned for a late-1996 introduction, is an HDTV (high-definition television) display based on PALC (plasma-addressed liquid crystal) technology, in which gas-

plasma channels perform much the same pixel-triggering duties as do the thin-film transistors in active-matrix LCD panels; standard LCD-style backlighting provides the illumination.

In NEC's PDP technology, gas plasma is made to emit ultraviolet rays that in turn stimulate fluorescent materials in each pixel. No backlighting is needed — or possible — and a much improved viewing angle is achieved. A 33-inch NEC analog display will appear later this year in the \$10,000 price range; prices should soon drop to \$6,000 or \$7,000.

Mitsubishi declined to reveal which technology it will use in the 20-inch 640-x-480-pixel computer-display PDP it plans to release in late 1996 or early 1997, but it did say that the PDP should be available for less than \$10,000.

/ RIK MYSLIEWSKI

Apple Revamps Scanner and Consumer Printers

New Color OneScanner and Color StyleWriters have improved performance but remain inexpensive.

ADD A RAINBOW of color to your spring images, with Apple's revamped line of imaging products for the home, small-business, and education markets.

Leading the pack is the \$599 Color OneScanner 600/27. This new version of Apple's flatbed scanner can scan images as large as 8.5 x 11 inches in resolutions of up to 300 x 600 dpi at a 27-bit color depth. The best enhancement, however, is the scanner's Dispatch software, which takes its cue from the drag-and-drop simplicity of Visioneer's popular but finicky PaperPort Vx. With one click of a button, you can copy, edit, or archive a document as it's being scanned. You can also drop a scanned image file onto icons to print or fax or to launch a linked application, such as Xerox's TextBridge OCR program, which is bundled with the Color OneScanner. And best of all, quashing a major disappointment of the old version, the new Color OneScanner can be at your disposal with a plug-in from inside Adobe Photoshop.

Apple's latest Color StyleWriters also benefit from new software, namely bundled consumer titles such as Mindscape's CardShop Plus and Calendars and More. The Color StyleWriter 2500, which can print color as well as black-and-white images at 720 x 360 dpi, replaces the Color StyleWriter 2400. The Color StyleWriter 1500 uses

the same black-and-white cartridges as the StyleWriter 1200 it replaces but also accepts three-color cartridges for 360-x-360-dpi color prints.

Both of these new QuickDraw printers have done away with adjustable paper-sizing sliders, which Apple says broke frequently in school settings. The Color StyleWriter 2500 has a \$399 estimated street price; its color and black-and-white cartridges cost \$20 and \$8, respectively. The Color StyleWriter 1500 has a \$289 estimated street price; its color and black-and-white cartridges cost \$29.95 and \$23, respectively.

If you want Ethernet speed and networkability with your new StyleWriter — or, for that matter, with an older StyleWriter — you can get them with



The Color StyleWriter 2500 (top) offers higher resolution than the 2400, which it replaces. The Color StyleWriter 1500, which also has color capability, replaces the StyleWriter 1200.

the new StyleWriter EtherTalk adapter (\$189), due out this spring. 800-538-9696 or 408-996-1010; <http://www.apple.com>. / CAROLYN BICKFORD

New Directions for Director 5.0

MULTIMEDIA MAVENS who are looking for a better interface and cross-platform support will approve of Macromedia's plans for Director 5.0. Changes include 32-bit support for Windows 95 and Windows NT (and, of course, for the Macintosh OS); cross-platform Lingo Xtras; Shockwave, for animated Internet content; and an improved user interface.

Developers who plan to deploy their applications across multiple platforms will be happy to learn that Director 5.0 works with the Mac OS, Windows 95, and Windows NT for both authoring and playback — including, for the first time, cross-platform 24-bit-color support. Director 5.0 accommodates Lingo Xtras, a new type of Xtra that offers the same utility as XObjects but works across multiple platforms.

Of course, the ultimate "platform" is the World Wide Web. Macromedia is including a Shockwave for Director utility that converts titles to run over the Internet, for users who have the appropriate plug-in for Netscape Navigator 2.0 running on either a Mac or a PC.

Even experienced Director jockeys will appreciate the new user interface, which offers a tool bar à la Microsoft Office for accessing frequently used commands, such as Save and Print, and editing tools, such as Cut and Paste.

Director 5.0 additionally has a bevy of smaller improvements for making titles look better and work more efficiently. The new text-management



The new tool bar and redesigned palettes update Director's look, and the Lingo debugger is a welcome addition.

features, with controls for anti-aliasing text elements and support for importing RTF (Rich Text Format) files, are particularly welcome to developers who are frustrated by Director 4.0's limited text-handling capabilities. A new Lingo debugger within Director lets you step through a project and set break points to make finding bugs easier. Other important additions include support for applying Photoshop filters to bitmapped objects within Director and direct links to SoundEdit 16. The price for Director 5.0 is \$1,199; an upgrade from any previous version is \$399. Director 5.0 is also available as part of the \$1,999 Director Multimedia Studio, which includes Extreme 3D, xRes 2.0, SoundEdit 16, and Deck II 2.5. 415-252-2000; <http://www.macromedia.com>. / SEAN J. SAFREED

MACUSER UTILITY OF THE MONTH

An Icon for Every Mac

IF YOU THINK Apple's standard-issue hard-disk icon is a tad too standard, we have just what you're looking for: Custom Icon Pack III, a collection of icon-sized images of each and every Mac or Mac-compatible from Apple, Power Computing, DayStar Digital, and Radius — er, UMAX. You can replace your spartan hard-disk icon with one of the Custom Icon Pack icons by performing a simple copy-and-paste in the Get Info box. Created by Mark Simmons, the utility is available exclusively from the ZD Net/Mac service on CompuServe (GO ZMC:MACUSER), from the ZD Net/Mac services on eWorld (Shortcut: shareware), and on the Web at <http://www.zdnet.com/macuser>. Custom Icon Pack III is available beginning March 15. / MARK SIMMONS



CLONE WATCH

Motorola Joins, Power Speeds

Motorola signs unique licensing deal; Power Computing promises fastest systems ever.

FASTER, MORE AFFORDABLE clones are in your future, say Apple, Motorola, and sources close to Power Computing: Motorola has become the latest Mac OS licensee and the first to be allowed by Apple to itself license the Mac OS, with motherboards and subsystems, to other manufacturers; Power Computing will be the first clone vendor to offer systems based on 166-MHz and 180-MHz PowerPC 604s — thus rocketing past Apple, which has yet to offer even a 150-MHz desktop system.

Despite the licensing agreement, you won't find Motorola-brand desktop systems at your local computer store: Motorola plans to concentrate instead on its own "enterprise systems," offered directly to major corporate customers. And although Motorola hasn't ruled out models based on current Mac systems, expect it to focus on the upcoming multi-OS-capable PowerPC Platform.

However, your next Mac just might come with

a "Motorola Inside" sticker: Motorola plans to provide components as well as full systems to third-party vendors, who can configure them as they wish and offer them for sale under their own brands — but only after certification from Apple.

Whoever those vendors are — rumors abound about big-name possibilities — they'll have to contend with the fact that Power will have a big jump on them, especially when its 166- and 180-MHz systems appear this spring. These speedsters won't be based on Power's high-end PowerWave systems but on its lower-end PowerCurve models, because the maximum clock speed of the processor bus on the PowerWave motherboard, which is based on the same Tsunami architecture as Apple's 9500 motherboard, is 50 MHz. Today's PowerPC 604 chips cannot run faster than three times the bus speed — in this case, 150 MHz. Later this year, the new 604ev processor, which can run at four

times the speed of the bus to which it's connected, will be released; Apple will then be able to push the 9500 to 200 MHz.

PowerCurve systems, on the other hand, are based on Apple's Catalyst architecture, which Apple uses in the 7200. Unlike in the Tsunami/9500/PowerWave design, the processor bus on a Catalyst/7200/PowerCurve system can be pushed to 66 MHz, enabling the system to support 166- and 180-MHz microprocessors.

Power Computing declined to comment.

/SHELLY BRISBIN

Beefy Servers Target Publishing

THE MOST-POWERFUL servers ever to carry the Apple logo don't even run the Mac OS. The new Apple Network Servers 500 and 700 (700 shown here), which instead borrow IBM's UNIX operating system, AIX, are aimed squarely at one of Apple's most important market niches: publishing. In addition to these two workhorses, Apple has introduced a new line of Mac OS Workgroup Servers based on current desktop systems.

Apple claims that the Network Servers 500 and 700 will offer Mac clients better support and more robust hardware than the UNIX vendors' "pizza box" offerings. At prices of \$11,000 and \$15,000, Apple Network Servers are priced competitively with UNIX systems as well as well-configured Pentium-based servers. Like other server vendors, Apple will sell its servers primarily through VARs (value-added resellers) who specialize in turnkey publishing and prepress systems.

The new Network Servers were designed from the ground up as high-performance servers, with two Fast-and-Wide-SCSI-2 channels, hot-swappable RAID systems and power supplies, and support for multiple Ethernet interfaces. Each server can support up to 85 SCSI devices. The Network Server 500/132

has a 132-MHz PowerPC 604 processor; its sibling, the Network Server 700/150, has a 150-MHz PowerPC 604 processor and a larger power supply. Each processor is upgradable via a daughter-card. The Network Server 500 ships with a minimum of 32 MB of RAM; the 700 has 48 MB. Each can be upgraded to 512 MB. The servers each contain six PCI slots, arranged on a dual PCI bus.

Apple has optimized AIX — the version of UNIX IBM includes with its RS/6000 workstations and servers — to speed up AppleTalk and TCP/IP communication. The OS is also Apple-event-aware, allowing administrators to use a suite of included utilities to perform basic management tasks from a Mac. AIX is not bundled with the servers; it costs an additional \$1,600.

Server buyers who don't need the horsepower — or the AIX headaches — of a Network Server have two new midrange choices. The Workgroup Server 7250 (\$3,000 to \$3,900) and 8550 (\$6,500 to \$8,000) are based on the 120-MHz PowerPC 604-based Power Mac 7200 and the 132-MHz PowerPC 604-based Power Mac 8500, respectively. Each includes AppleShare 4.2.1 or one of two application bundles.

/SHELLY BRISBIN



Polaroid Takes On Sony

THE BIG BOYS are entering the rapidly growing field of digital photography. Polaroid, the top name in instant photography, and Sony, the giant of consumer electronics, are going head-to-head with new stylish, easy-to-use cameras.

POLAROID PDC-2000. ▼ Polaroid's first digital camera, the PDC-2000, promises the point-and-shoot convenience of a film camera. It offers autofocus, auto-exposure, and automatic flash, with manual controls to compensate for back-light and for incandescent or fluorescent lighting.

The PDC-2000 captures 24-bit-color images at a resolution of 1,600 x 600 pixels and stores the images uncompressed. Users can download images from the camera at either 800 x 600 pixels or 1,600 x 1,200 pixels.

Polaroid offers the camera in three models: two point-and-shoot models that store 40 or 60 images, respectively, and a studio version that downloads images directly to your Mac. Prices range from \$2,995 to \$4,995. 800-225-1618.

SONY DKC-ID1. ▼ Sony's new entry-level camera holds electronics that replace the traditional shutter and viewfinder. The camera captures 24-bit-color images at 768 x 576 pixels. Users view the images through a small color LCD.

The DKC-ID1 stores images on Type II PC Cards. Users can choose either Fine or Normal settings, which store 40 or 140 images, respectively, on a 10-MB PC Card. An included SCSI-2 interface allows direct connection to a Mac. The DKC-ID1 is expected to be priced under \$2,000 when it ships this summer. 800-635-7669 or 201-930-1000. /SEAN J. SAFREED



NEC Reinvents the Monitor

New multimedia monitors provide a new look, new on-screen controls, and a new technology.

WEIRD OR wonderful — it's up to you to decide how you feel about the radical styling of NEC's new MultiSync M monitors. But don't let the new look fool you into thinking that NEC has merely given its boxy-but-brilliant old line of Macintosh monitors a trendy face-lift — this is a makeover that goes all the way to the bone.



Inside the futuristic shells of the new 15-inch MultiSync M500 (\$599) and 17-inch MultiSync M700 (\$899) is NEC's new CromaClear CRT. With CromaClear, NEC is introducing a third type of CRT technology, which is already popular in quality televisions, to the desktop computer. Combining features of current shadow-mask and aperture-grille CRTs, CromaClear's *slot-mask* scheme employs a stable, rigid Invar shadow mask (as do high-quality shadow-mask CRTs). However, instead of the traditional shadow-mask trios of red,

green, and blue dots, CromaClear's mask has elliptical slots. These trios of slots are characterized by a vertical orientation that's much like that of the aperture grille that is used in Sony Trinitron and Mitsubishi Diamond-Tron CRTs.

NEC claims that this slot-mask design, which has migrated from the video industry and is combined with NEC's new ELA (*expanded large aperture*) electron gun, will improve image quality for multimedia applications by improving focus, contrast, and color saturation.

In addition, both the MultiSync M500 and the MultiSync M700 include Video Boost, a feature you can switch on when viewing video or animation, to approximate the contrast and brightness of a television set.

Being multimedia monitors, the M500 and the M700 are equipped with the requisite midrange stereo speakers. NEC goes further than most of its competitors, however, by including adjustable surround-sound circuitry as well as an integrated omnidirectional microphone. Also included is a new version of NEC's OSM (*on-screen manager*) technology, which now allows adjustments to various aspects of screen geometry and color temperature, in six languages, as well as periodic fitness tips on how to avoid eyestrain and repetitive-stress injuries. Not only does NEC want you to feel good about its new monitors — it also wants you to feel good, period. 800-632-4636 or 506-264-8000; <http://www.nec.com>. / RIK MYSLAWSKI

NET.CETERA

Just Plugging Along

DOES NETSCAPE CARE about the Mac? That's what Net surfers asked themselves after the Mac version 2.0 of the popular Netscape Navigator Web browser was released without the multimedia capabilities that are available in Navigator for Windows and for UNIX. Worst of all, Mac Navigator 2.0 doesn't support Sun's Java, the much hyped language that lets Web authors transmit and run small applications on any platform.

Mac offerings that do take advantage of Navigator's plug-in architecture are still few and far between. When Navigator 2.0 was released in early February, Mac users were limited to Tumbleweed Software's Envoy; Infinet Op's LightningStrike, which displays highly compressed images; Progressive Networks' RealAudio; and a developer version of Macromedia's Shockwave for Director.

But developers won't give up on the Mac, because for a file format to become the Web's next standard, it must be viewable by just about everyone — and Macs are proportionally much more common on the Internet than in the world at large.

The plug-ins are coming, even though developers got off to a slow start when Navigator's Mac plug-in architecture was less stable than the UNIX and Windows versions. Now that Navigator 2.0 has shipped, expect to see more Mac plug-ins appear soon, including Macromedia's Shockwave for FreeHand; FutureWave's Splash; Adobe's Acrobat Amber; and Inso's WordViewer, for displaying



The Shockwave for Director plug-in allows Netscape Navigator 2.0 pages to include animation, sound, hyperlinks, and scrolling-text boxes.

Microsoft Word documents. And a public beta version of Navigator 2.1 will soon include Java compatibility for the Mac — finally.

But although Navigator plug-ins are hot, let's not crown Netscape King of the Internet just yet: Microsoft has joined the battle. Microsoft Internet Explorer 2.0 for Macintosh, written by a team of veteran Mac programmers, will hit Navigator hard. Internet Explorer already supports Mac-only Internet features that Navigator doesn't, such as the Internet Config system. And sometime this year, you'll see a version of Internet Explorer that supports Navigator plug-ins and Java applets. Microsoft probably won't beat Netscape to the Java punch, but it won't be very far behind. / JASON SNELL

Blackbird, Fly

THE FIRST PowerPC upgrade cards for 500-series PowerBooks have finally arrived — but not from Apple. Newer Technology's NUpowr PowerPC upgrade cards have an energy-efficient 117-MHz PowerPC 603e processor like that found in the PowerBook 5300 and replace the 25- or 33-MHz 680LC40 processor card that comes in 500-series PowerBooks (formerly code-named Blackbirds).

Estimated street prices for the NUpowr cards — which are bundled with Connectix's popular Speed Doubler — are: with no RAM, \$590; with 4 MB of RAM, \$795; with 8 MB of RAM, \$999. Newer Technology offers an \$80 rebate for the 500-series PowerBooks' factory-issue 680LC40 cards.

One Apple-induced wrinkle: Although you'll need System 7.5.3 (or System Update 2.0) to run the NUpowr, Apple, at press time, was refusing to let Newer bundle it; you'll need to find a copy yourself. Perhaps this is because Apple is preparing its own long-awaited upgrade card, with a 100-MHz PowerPC 603e and 8 MB of RAM, for release this spring, at an expected street price of around \$700. Newer Technology, 800-678-3726 or 316-685-4904; <http://www.newertech.com>. / CAROLYN BICKFORD

More Than a Mac, More Than a TV

Intelligent TV is no oxymoron when your Mac gets a TV tuner.

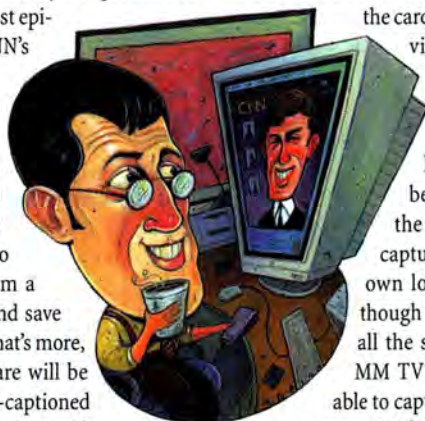
HOOK A TV tuner up to your Power Mac's PCI slot, and you won't have to abandon your spreadsheet or Web browser for the latest episode of *The X-Files* or CNN's latest report.

ATI's Xclaim MM TV tuner and Diamond Multimedia's Javelin AV/TV will transform your PCI-based Mac into a cable-ready TV. They'll also capture a video signal — or a signal from a camcorder or a VCR — and save it in QuickTime format. What's more, ATI's sophisticated software will be able to monitor the closed-captioned text stream that's broadcast along with most TV shows. When it encounters a word for which you've instructed it to search, it will notify you, pop up a viewing window, or begin to save the closed-captioned text. The ATI tuner and software, projected to cost around \$150, will be available only as an external add-on to the company's Xclaim MM video-accelerator card, which can be found for around \$300. ATI, 905-882-2600.

Diamond Multimedia's Javelin AV/TV card, for

PCI-based Macs, will deliver up to 125 TV channels as well as VCR video to your Mac screen via the card's S-video and composite-video input connections. If you have video-editing software (which may be bundled) and a lot of hard-disk space, you will be able to take advantage of the card's audio- and video-capture capabilities to roll your own low-end sci-fi movies. Although its software doesn't have all the smarts of the ATI Xclaim MM TV tuner package, it will be able to capture closed-captioned text streams. With its \$169 price tag, the Javelin AV/TV might be a better bargain than a new TV set. Diamond Multimedia, 800-468-5846 or 408-325-7070; <http://www.diamondmm.com>.

The Xclaim MM TV tuner add-on and the Javelin AV/TV are both expected to ship this spring. If you'd like a full home-entertainment system, you may want to wait for news of Apple's TV and FM-radio tuner, which was reportedly in the works at press time. / CAROLYN BICKFORD



ISDN Made Easy

PLEASEING MAC USERS hasn't been a high priority for most ISDN-equipment vendors. Farallon and U.S. Robotics, however, are bucking that trend with a pair of new ISDN modems that are bundled with Internet Valet, a software package that's a veritable *Who's Who* of Mac-to-Internet utilities: Enhanced Mosaic, Eudora, NewsWatcher, Fetch, TurboGopher, and MicroPhone Telnet.



Farallon's Netopia (bottom) and U.S. Robotics' Courier-I simplify connecting to ISDN.

Farallon's Netopia ISDN Modem includes an ISDN terminal adapter and an NT-1 (network terminator) — the two essential components for an ISDN connection — as well as a Mac serial cable and an RJ-11 port for voice, fax, and analog modem connections. The Netopia supports Multilink PPP, allowing users to bond two 64-kbps ISDN channels for a single 128-kbps connection.

The Netopia's list price is \$549, but you should be able to find the product on the street for about \$399. For an additional \$99, Farallon will provide support for connecting to ISDN, including help in working with local telephone companies and Internet service providers. 510-814-5000.

If you plan to use an analog modem along with your new ISDN connection, look into a U.S. Robotics Courier-I. In addition to being an ISDN terminal adapter and an NT-1, the Courier-I (\$895) includes all the functionality of U.S. Robotics' 1995 *MacUser* Eddy Award finalist, the Courier V. Everything with V.34 analog modem. Smith Micro's MacComCenter data/fax software is bundled with the modem, along with an ISDN-configuration application. 800-877-2677 or 708-966-0498. / SHELLY BRISBIN

CD-ROMS

Sex and the Stars

IF YOU WANT to put a little more science into your sex life — or vice versa — two women scientists offer new discs with both spice and space.

INVISIBLE UNIVERSE. Who has the brain of Stephen Hawking, the bearing of Zsa Zsa Gabor, and a voice straight out of a Fellini flick? Meet Dr. Fiorella Terenzi, brilliant astrophysicist and blonde bombshell. Learning about nebulae has never been so fun, especially when Dr. Terenzi is draped across Andromeda, caressing the center of the galaxy like a satin sheet. When you tire of her — if you do — there's still a lot to learn about and enjoy, from gamma rays to poems and even music created from the radio signals of distant galaxies. The Voyager Company. \$40. 800-446-2001 or 212-431-5199.

ANNE HOOPER'S ULTIMATE SEX GUIDE. ▼ You don't know *everything* about sex. Forget about



turning on your partner — turn on your Mac, and check out Anne Hooper's Ultimate Sex Guide CD-ROM. Hooper, the Dr. Ruth of England, provides sexual strategies from flirting to touching to . . .

She gives advice based on your answers to her comprehensive questionnaire. Case studies and extremely helpful (and only mildly revealing) photos and QuickTime videos help turn romantic rookies into sexual — and sensual! — maestros. DK Multimedia. \$40. 800-356-6575. / REBECCA OLSON

THE OFF BEAT

Doggone Cute

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NEW & NOTABLE

HARDWARE

▼ **Microtech Digital PhotoAlbum.p.** This plug-and-play PC Card reader is compact and portable. Its single-slot SCSI design accepts Type I, II, and III storage cards and is compatible with all Macs and all ATA-standard PC Card accessories. \$385. 800-222-9488 or 203-468-6223.



ATTO SiliconDisk II Solid-State Drive and UltraSCSI Accelerators. Pull those megasized images from storage at 80 MB per second with this Ultra SCSI RAM drive — with a mind-bending access time of .02 millisecond — and its attendant dual-port Fast-and-Wide Ultra SCSI accelerator card. Starting price for the SiliconDisk II, \$10,000; dual-port PCI-based accelerator card, \$945; single-port card, \$445. 716-691-1999.

QMS 2425 Print System. High-speed, high-quality, high-convenience printing — that's the promise of this surprisingly affordable 24-ppm monochrome printer. You can configure the basic 600-dpi unit with a wide array of options, from a 1,200-dpi upgrade to a 2,000-sheet stacker-stapler. \$5,499 (base model). 800-523-2696 or 334-633-4300.

Xerox DocuPrint 4517. A black-and-white network laser printer with a convenient confidential mailbox/collator feature, the 4517 prints 17 ppm at a true resolution of 600 x 600 dpi and has 2 MB of RAM standard. Proprietary Xerox Quad Dot technology promises improved grayscale image quality. \$1,850. 800-349-3769 or 716-425-5230.

Agfa Horizon Ultra. With an optical resolution of 2,000 x 1,200 ppi for color images and 2,540 x 1,200 ppi for line art and grayscale images, this high-end flatbed scanner is almost twice as fast as its predecessor, the Horizon Plus. \$20,000. 508-658-5600.

MicroNet DataDock Express. The latest addition to MicroNet's line of DataDock storage devices, this portable, single-bay enclosure accommodates MicroNet's 3.5 DataDock modules, which include hard drives, magneto-optical drives, DAT drives, and SyQuest drives — and it's small enough to fit in a briefcase or backpack. \$189. 714-453-6000.

ViewSonic 29GA PerfectSound.

Ideal for business presentations, this large-screen multimedia monitor has dual 5-watt speakers, a wireless remote, a microhole speaker grille, front-panel controls, and multiple AV and computer inputs. \$3,995. 800-888-8583 or 909-869-7976.



Optical Access CD/Maxtel Series. These high-performance CD-ROM towers have SCSI ID-splicing technology that allows up to 56 drives on the same SCSI channel. Models include the 800, 1400, 1600, and 3500 and come with 8, 14, 16, or 35 drives, respectively. \$5,380 to \$19,480. 800-433-5133 or 617-937-7310.

SOFTWARE

Discover Programming for Macintosh. This inexpensive and thorough programming package for beginners includes not only CodeWarrior C/C++ and Object Pascal tools but also two reference works and four complete programming-instruction books. An Apple Guide file directs you to programming resources on the Web. \$79. Metrowerks. 800-377-5416 or 512-305-0401.

Attainment Literacy CD-ROMs. A series of five instructional CD-ROMs for people who have developmental disabilities, these discs make everyday life somewhat easier to negotiate. Titles such as Dollars & Cents, a disc designed to teach about basic money issues, and Picture Cue Dictionary, which provides visual aids for language comprehension, reveal a socially productive trend in multimedia publishing. \$49 to \$99. Attainment. 800-327-4269 or 608-845-7880.

Marionet. This scripting software simplifies the task of building Internet tools and browsers with a scripting language that's appropriate for novices. Create customized tools, and build Internet access into your standard business-productivity programs or your own multimedia CD-ROMs. Supports the World Wide Web, e-mail, and newsgroups, among other Internet standards. \$219. Allegiant. 619-587-0500.

Mathematica Link for Microsoft Word. Creating live numeric and symbolic calculations from within Microsoft Word documents has just gotten a heck of a lot easier with this program link to the powerful capabilities of Mathematica. Within Word, Mathematica automatically resolves equations, imports existing notebooks for use as live documents, and builds an index for your technical documents. \$129. Wolfram Research. 800-441-6284 or 217-398-0700.

◀ **Angel Devoid: Face of the Enemy.** Slipping through the 3-D world of NeoCity, you are the villainous prey of society at large. The thing is, you aren't even a villain; a freak accident has marked you with the face of a criminal on the lam, and death haunts your every move. The Attitude control panel and live-action video using over 20 actors give this adult (17+) game a realistic edge. \$50. Mindscape. 800-234-3088 or 415-897-9900. / REBECCA OLSON

MACINTOSH PRICE INDEX

THE UNITED COMPUTER EXCHANGE index reflects average sales prices of new and used Macs as of February 6, 1996. Prices (other than 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)	•	\$350
Performa 5215CD (8/1GB)	\$1,899	\$1,500
Performa 6220CD (16/1GB)	\$1,899	\$1,600
IIx (5/80)	•	\$300
IIcx (4/80)	•	\$450
IIfx (4/80)	•	\$500
Quadra 605 (4/80)	•	\$425
Quadra 610 (8/160)	•	\$550
Quadra 630 (4/250)	•	\$600
Quadra 650 (8/230)	•	\$1,125
Quadra 660AV (8/230/CD)	•	\$950
Quadra 700 (8/230)	•	\$850
Quadra 800 (8/230)	•	\$1,200
Quadra 840AV (8/230/CD)	•	\$1,575
Quadra 900 (8/230)	•	\$1,100
Quadra 950 (8/230)	•	\$1,375
Power Mac 6100/66 (8/350/CD)	•	\$1,050
Power Mac 7100/80 (8/700/CD)	•	\$1,300
Power Mac 7200/90 (8/500/CD)	\$1,699	\$1,400
Power Mac 7500/100 (16/1GB/CD)	\$2,999	\$2,350
Power Mac 8100/100 (16/1GB/CD)	•	\$2,250
Power Mac 8100/110 (16/2GB/CD)	•	\$2,500
Power Mac 8500/120 (16/2GB/CD)	\$4,499	\$3,700
Power Mac 9500/132 (16/2GB/CD)	\$4,699	\$4,000
PowerBook 145B (4/80)	•	\$700
PowerBook 150 (4/120)	•	\$750
PowerBook 165 (4/80)	•	\$900
PowerBook 165c (4/80)	•	\$1,100
PowerBook 170 (4/80)	•	\$875
PowerBook 180 (4/80)	•	\$1,250
PowerBook 190cs (8/500)	\$2,199	\$1,700
PowerBook 520 (4/160)	•	\$1,150
PowerBook 520c (4/160)	•	\$1,400
PowerBook 540 (4/240)	•	\$1,400
PowerBook 540c (4/320)	•	\$2,200
PowerBook 5300cs (8/500)	\$2,499	\$2,000
Duo 250 (4/200)	•	\$1,100
Duo 280 (12/240)	•	\$1,900
Duo 280c (4/320)	•	\$1,700
Duo 2300c (8/750)	\$3,499	\$3,000

• = discontinued model

For more pricing information on these and other models, call 800-755-3033 or 770-955-0569 or visit <http://www.uce.com>. And find it on ZD Net/Mac, in Library 1 (Special Reports) of the MacUser Forum (GO ZMC:MACUSER). On eWorld, go to shortcut MACUSER, in MacUser Software Library:MacUser Special Files.



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CIRCLE 14 ON READER SERVICE CARD

MERISE L.

MacWEEK **REPORT**

MacUser's Inside Track to Macintosh News

Thumbs up for Apple's new CEO

By Jon Swartz

Turnaround specialist Gilbert Amelio worked his managerial magic at National Semiconductor Corp. and Rockwell International Corp., but can he use those same skills to help Apple?



Industry observers recently gave an emphatic thumbs up for Amelio, Apple's new CEO and chairman, and said they believe he is the person who can return the company to profitability and drive up its stock price to make any possible acquisition of Apple more attractive to stockholders.

However, Apple has issued a statement refuting a new wave of published reports that it is in merger discussions "with any party." The company, which routinely refuses to comment on merger rumors, also said it expects to report a second-quarter loss that some analysts said could top \$150 million.

With Apple facing its most serious crisis in years, Mac insiders offered Amelio their suggestions on how to repair Apple's tattered reputation.

"[Amelio's] primary challenge is to fix this thing and get the stock up for another possible merger," said Ted Helvey, president of Big Software Inc., a Los Altos, Calif., Macintosh developer. "I think he will make major changes in one fell swoop and do it decisively."

If Apple observers have their druthers, changes will include continued product innovation, more-aggressive courting of clone partners, improving product forecasting, patching up developer relations and simplifying product lines.

Ford Goodman, CEO of CE Software Inc. of West Des Moines, Iowa, was blunt: "Don't kill your business partners and change the culture. You can't run a \$12 billion business by committee."

See Amelio, next page

Apple to play in toy biz

By Jon Swartz

After years of being derisively labeled the "toy maker" among personal computer vendors, Apple is taking the plunge into the toy market. The company recently said it has licensed Toy Biz Inc. to create the new "Apple for Kids" line of "electronic learning aids." The so-called ELAs will be designed, built and marketed by Toy Biz, a New York-based company that has similar deals with Marvel Entertainment Group, Gerber Products Co. and Jim Henson Productions. The first crop of toys, due next summer for 2- to 6-year-old children, will cost less than \$100 each.

Although Apple won't invest any money and will have no role in creating the toys — other than exercising veto power to make sure they meet its quality standards — Apple

will receive a payment for every toy sold.

"[The deal] is an extension of Apple's R&D and distribution," said Jon Holtzman, Apple director of entertainment marketing. "We get paid good royalties while gaining expertise in a business we don't know much about."

Toy Biz Creative Director Avi Arad said Apple's prowess in the K-12 and home markets makes it the premier brand name for Toy Biz's initial foray in the burgeoning ELA category.

"Our strength is to take well-known brands and build them into multimillion-dollar, category-specific toy lines," Arad said. "The Apple license offers us an opportunity to build an important brand of learning products and bring the Apple franchise into the youth markets." □

Macintosh OS hitches ride on PPCP box

By Andrew Gore

Palm Springs, Calif. — Apple came up with a show-stopper at January's Demo 96: the first public showing of the Mac OS running on a PowerPC Platform box.

At the industry conference, Apple described the computer hardware as a 3-week-old "proof of concept" machine built by IBM Corp., complete with a set of Intel-standard PC I/O ports. After start-up, the PowerPC Platform, or PPCP, machine displayed the Open Firmware boot ROM interface — a command line intended for programmers.

"The user won't see the text-based interface," said Mike Bell, Apple engineering manager for PPCP. "There will be a Mac-like interface to switch to other OSes that will be part of Apple's value-add [on PPCP]. This is just to show it's a real [PPCP] machine."

Bell demonstrated Adobe Photoshop 3.05 and Microsoft Excel 5.0. Audience members later commented that both ran "very fast." Bell said final hardware will be considerably faster than the 132-MHz PowerPC 604-based prototype: "We've done a substantial rewrite [of the Mac OS], rewritten a lot of the low-level architecture. That's why it's so fast."

According to Bell, the Mac OS for PPCP should be ready for seeding to licensees this spring. The first version of the OS will be based on the as-yet-unannounced System 7.5.3; the demo system used a Mac OS ROM, although Bell said it has not been decided if the final release will require a ROM.

Representatives from clone-maker Power Computing Corp. of Round Rock, Texas, said they were impressed by the demo. "Apple has delivered what they promised: the first major milestone of the PowerPC Platform," said Mike Rosenfelt, director of marketing for Power. "With today's demo, the PC industry got its first taste of what PPCP is about."

Bell acknowledged that the lack of a common hardware platform has held back Apple licensing efforts. But, with the Mac OS up on PPCP, the job of cloning has become much simpler. "That's what [PPCP] addresses — it makes it easy to build a Mac," Bell said. □

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CIRCLE 90 ON READER SERVICE CARD

Amelio

From previous page

Bud Colligan, CEO of San Francisco-based Macromedia Inc., said he would like Amelio to bring in outside senior managers capable of correcting problems in forecasting, sales and marketing. "It's a \$12 billion company, and they need \$12 billion managers."

Decisiveness is key, observers said. "Apple ought to step up to the plate and swing hard," said Alan Lefkof, CEO of Alameda, Calif.-based Farallon Computing Inc. "Whatever decisions Apple needs to make, they should make them and then move on."

At the same time, industry observers said the departure of former Apple CEO Michael Spindler was long overdue. "When you have your company logo on the cover of *BusinessWeek* over a headline that says, 'The fall of an American icon,' it's time to go," said Lou Doctor, CEO of Truevision Inc. of Santa Clara, Calif. "Apple may have a good technology and strategy, but you don't want an introvert for a CEO conveying its message."

Users agreed. David Pensak, senior research fellow at DuPont Central Science and Engineering in Wilmington, Del., said: "There absolutely had to be a change at the top. Confidence was eroding and nothing existing management could have done would have fixed it. There is nothing fundamentally wrong with Apple. The doom and gloom stuff doesn't scare me off."

In fact, observers said the infrastructure at Apple is good; all it requires is strong management and a focused plan. "Despite management changes, the underlying fundamentals at Apple in terms of unit growth, revenue growth and worldwide demand remain very strong," said Stephen Kahng, CEO of Power Computing Corp. of Round Rock, Texas.

Meanwhile, Spindler and company Vice Chairman A.C. Mike Markkula churned out more internal memos on Apple's tumultuous month. Markkula, the former Apple board chairman, admitted in a Feb. 4 message to employees that Apple made a major miscalculation in its "expectations about margins ... so we have to change our business model again."

"The press has created the perception that Apple is in a 'going out of business' mode. Bull -! With Gil's help and leadership, we can get going on that issue immediately," Markkula wrote.

In his Feb. 2 farewell memo to employees, Spindler said it was the Apple board's decision to "make a change in management moving the company forward — that's the fact. So it's time for me to go! Mistakes or misjudgments made? Oh yes — even plenty."

"I take personal responsibility for things that didn't work and should have worked," he wrote. □

VRML battle heats up

By Kelly Ryer and James Staten

Netscape Communications Corp. and Silicon Graphics Inc. recently proposed bringing 3-D motion to the Internet in a way that could leave Apple and Microsoft out in the cold.

The proposal, "Moving Worlds," was presented to the VRML Architecture Group (VAG) last month. The plan, which details processes for animating Virtual Reality Modeling Language (VRML) static models, is supported by more than 50 companies, including Adobe Systems Inc., Macromedia Inc. and Sony Corp.

The move by Netscape and SGI, both of Mountain View, Calif., has been lauded by the VRML community, including some members of the VAG standards board. However, the list of supporters does not include Apple and Microsoft, which have issued their own proposals.

Microsoft's ActiveVRML proposal received a chilly reception from the VRML community last December. Developers said it does not follow community principles for making VRML an open standard.

Apple's plan, submitted in January, proposed incorporating its 3DMF (3-D metafile format) into VRML 2.0. Although initially praised, it has since lost supporters in the wake of Netscape's and SGI's proposal.

Despite Apple's and Microsoft's efforts, many said they feel that Moving Worlds' dominance may be inevitable. But for Apple and Microsoft to give in at this point would confirm fears that the Moving Worlds specification has sidestepped VAG's standardization process, observers said. VAG is expected to issue a draft of VRML 2.0 in late March, with the final version due this summer.

Netscape and SGI are already distributing the Moving Worlds specification and will soon release browsers supporting it. Thus, Moving Worlds could become a de facto standard well before VAG can act. Netscape said it will play VAG's game but feels pressure to keep the market moving forward.

Grant Munsey, CEO of Cognicon Inc. of San Jose, Calif., said, "If [Moving Worlds] is included in Netscape's browser, that alone will pretty much give it 'standard' status due to sheer volume."

But some observers say that Microsoft and Apple may still find a place at the VRML dinner party, even if it's only serving a side dish.

"Both Microsoft's and Apple's proposals seem to have some decent stuff in them," said Mike Hilgenberg, vice president of Integrated Data Systems Inc. of Savannah, Ga. "I like the time-based model in ActiveVRML. It keys everything by timing."

According to Alex Edelstein, senior product manager for Netscape Navigator, there may be some room for compromise. "[The Microsoft proposal] will get plumbed for its insight on time."

"I wouldn't write Apple off," he added. "We may end up with some synthetic mechanism with Moving Worlds, Apple's [file] format and Microsoft's time thing."

Ken Gaebler, vice president of sales and marketing at VREAM Inc., a VR developer in Chicago, noted that creation of standards is always a political process. "I think it's an effort to influence rather than go around the standards process," he said. "[Netscape] won this round." □

Joanna Pearlstein contributed to this report.

CyberCash ushers in new era

By James Staten

Mac users can now breathe easier when purchasing products through the Internet. CyberCash Inc. recently released a free electronic commerce utility for the Mac.

CyberCash Mac Wallet conducts credit card transactions over the Internet via an encrypted connection. The tool can be used only with merchants running the CyberCash server; support for electronic-cash transactions will be provided in the second half of 1996.

The utility provides a walletlike interface, where users can store their Visa, MasterCard,



Discover or American Express card information. All data is protected by a password. When visiting a Web site running the CyberCash server, the user simply hits the "Pay" button and the CyberCash Mac Wallet automatically launches and takes over the payment process, the company said.

Macintosh and Power Mac versions are available at <http://ftp.cybercash.com/cgi-bin/download>.

CyberCash Inc. of Redwood Shores, Calif., can be reached at (415) 594-0800 or (800) 929-2371; fax (415) 594-0899; info@cybercash.com; <http://www.cybercash.com>. □



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CIRCLE 66 ON READER SERVICE CARD



REVIEWS

HP Color LaserJet 5M



Color technology advances but still needs improvement.

DELIVERING ON PROMISES is often the role of second-generation products; they frequently offer features or functions that never quite jelled in their always ambitious version 1.0 forebears. So it was with considerable excitement that we looked forward to Hewlett-Packard's second-generation color laser printer for the Mac, the Color LaserJet 5M.

HP's debut color laser printer, the Color LaserJet, was decidedly underwhelming, particularly in its handling of color photographic images, which suffered from unnatural colors and from graininess caused by obtrusive dot patterns. The 5M is an improvement, but it still has a way to go before it makes high-quality color graphics and photo images a worry-free part of everyday business printing. (The 5M shipped too late for inclusion in "Color Goes to Work," this issue's color-printer roundup, but we used the same test documents, in order to compare output quality and speed.)

Familiar, Yet Different

Superficially, the 5M is identical to its predecessor: It has the same bulky case design and the same 300-dpi Konica print engine. Beneath the surface, however, the 5M differs from the original Color LaserJet in many ways.

Perhaps the most important change is that HP has abandoned the traditional technique of *dithering* the printer's four toner colors (cyan, magenta, yellow, and black — or C, M, Y, and K) to represent the full range of colors. Dithering is the placement of tiny dots of two or more toner colors adjacent to each other in order to create the impression of a third color. Yellow and cyan, for example, can be dithered



to trick the eye into seeing green.

Instead of dithering, the 5M layers dots of the four toner colors on top of each other in varying amounts so that when they are fused and bonded to the page, the dots physically blend to create another color. Thus, in a photo of a tree, the leaves are made up of differently shaded green dots rather than varying quantities of yellow and cyan dots. HP calls this technique Resolution Enhancement technology 1200 and claims that it makes the 300-dpi 5M's color images equivalent to 1,200-dpi output. We wouldn't go that far, but photo images are far smoother than those printed by first-generation color laser printers. Solid-color ramps are somewhat smoother as well, although we still saw some stepwise banding as colors faded from dark to light. As in first-generation color laser printers, black text and line art looked fine but they were inferior to those generated by most workgroup-class monochrome laser printers, which have 600-dpi resolution.

Improved smoothness boosts the quality of color images, but it will mean little unless the colors that appear on the page are the colors you *want* on the page — and this is where the 5M falls woefully short. Colors were generally far too

intense, with a tendency toward a "neon" look. This wasn't so grievous with saturated solid colors, such as in block type or presentation-slide backgrounds, but it severely degraded the appearance of photographic output. A test page that included a photo image of fresh produce yielded a printout in which red peppers and Bermuda onions were so oversaturated that they looked irradiated. Other portions of the image were also overblown — with excessive contrast and a loss of subtle shadows visible in the image on the monitor screen. We tried to remedy this situation by using the driver software but had no luck.

Management Void

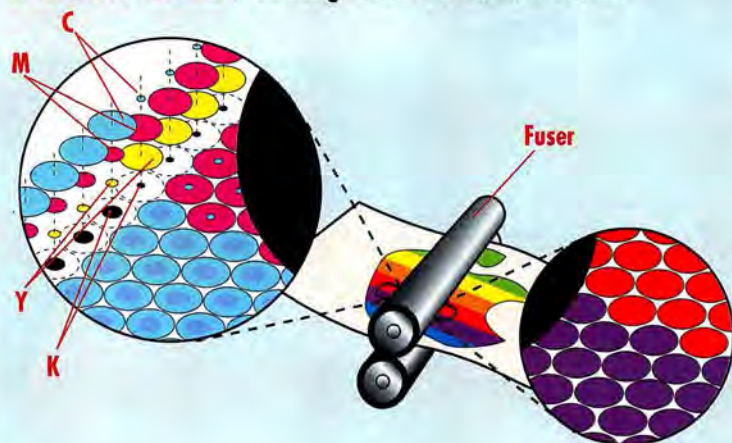
The disparity between the on-screen image and the output suggests a need for color-management software, and HP has taken a first step in that direction with the introduction of its ColorSmart technology for color laser printers. ColorSmart, which has been available for HP color inkjet printers for a

couple of years now, recognizes text, graphics (solid-color elements), and images (photographs or other bitmaps) in a document and attempts to adjust color intensity and toner-dot patterns in order to optimize each page's appearance.

REVIEWS RATING KEY

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

A SMOOTH BLEND / mixing toner for subtler colors



Unlike older color laser printers, which place dots of cyan, magenta, yellow, and black (or C,M,Y, and K) toner next to one another to create the illusion of color, the HP Color LaserJet 5M's engine layers variable amounts of the four toner colors directly on top of each other (left). Depending on the quantities of C,M,Y, and K used, the toner in each dot blends together as the page goes through the printer's fuser, to form a dot in one of thousands of distinct colors (right).

changing them is pretty straightforward. The manual is thorough, but a few of the how-to illustrations are confusing.

How Fast Do the Colors Run?

For plain paper, the 5M boasts a rated engine speed of 10 ppm for monochrome text and 2 ppm for color. To see how real-world speeds stack up against these theoretical numbers, we printed a variety of

(Dissatisfied with ColorSmart's choices, we overrode its settings but couldn't improve the output significantly.) A more sophisticated color-management scheme, such as Apple's ColorSync 2.0, may produce better results than ColorSmart, but the 5M doesn't support ColorSync. It *does*, however, use a new version of Adobe's LaserWriter driver (version 8.3), which allows for third-party driver extensions. ColorSmart is provided through one such extension, and it's reasonable to expect that ColorSync will eventually be available that way as well. We hope it happens soon.

A final complaint about the 5M's output quality: Color display type on a solid-color background exhibited a halo effect that looked like poor registration. This came as a surprise, since HP's literature touts the registration accuracy inherent in the printer's direct-to-drum toner-application method. (Other color laser printers apply C, M, Y, and K toner, one color at a time, to a transfer belt that deposits each color in turn onto a transfer drum; once all four colors have been accumulated on the drum, the full-color image is rolled onto the page. The 5M applies all four toner colors to the transfer drum directly, in one pass.)

Beefed-Up Hardware

On a more upbeat note, the 5M sports considerably more raw muscle under the hood than its predecessor: The base configuration comes standard with 36 MB of RAM — enough memory to handle full-page color images — compared with the practically unusable 8 MB provided in the first Color LaserJet. The maximum RAM capacity is higher too — 84 MB, up from 72 MB. What's more, its 40-MHz AMD PostScript processor is speedier

than the 20-MHz chip in the Color LaserJet. And the JetDirect Ethernet card, which previously cost extra, comes as standard equipment. The 5M accepts print jobs in either PostScript or the PC-standard PCL page-description language, and like its predecessor, it ships with a 250-sheet paper tray.

Even with all these welcome hardware improvements, the 5M costs about \$800 less than an original Color LaserJet outfitted with PostScript and Ethernet connectivity.

Cost-Conscious Consumables

All of the 5M's replaceable components are remarkably easy to change, and all are completely separate rather than integrated into cartridges such as those used in monochrome laser printers (and some competing color laser ones). This approach saves you money: Because you replace only the items that are worn out, you avoid the waste inherent in tossing a cartridge that, for example, is out of magenta toner but still has developer. HP claims that when these savings are taken into account, it costs less to print a color page with 50-percent coverage on the 5M than it does to print a gray-scale version on a monochrome laser printer.

Although the use of separate consumables brings savings, it also adds complexity. You have 11 components — from a black toner cartridge (\$8.95) that lasts for about 2,200 pages to a color-developer cartridge (\$599) that lasts for about 40,000 pages — to replace at regular intervals. There's also a handful of quick but important cleaning procedures you should perform every 2,000 pages or so. Fortunately, a front-panel display informs you when consumables need replacing, and

documents in Microsoft Word and PowerPoint and QuarkXPress. Print times for individual documents were surprisingly inconsistent, perhaps because of the printer's automatic energy-conservation mode. Even the shortest print times, however — for a 20-page Word 6.0.1 file containing only black text — ranged from 2.75 to 3 minutes, or an average of 7 ppm. Our most demanding test document, a single QuarkXPress page with embedded line art, a photo, and color ramps, took 4.5 to 6.5 minutes to print, yielding printing rates of well below .25 ppm. Although the 5M's output speed was well below the rated engine speed, it fell within the general range of the color laser printers we tested for this month's color-printer roundup.

The Bottom Line

HP's Color LaserJet 5M takes a step in the right direction in value, offering a hefty 36 MB of RAM, a speedy 40-MHz Adobe PostScript Level 2 processor, and full Ethernet connectivity — all in a base configuration that's less expensive than last year's far more meagerly equipped first-generation color laser printers. Its text and solid-color output are suitable for most business-graphics uses; although colors on the page can vary significantly from those viewed on a monitor screen. Photographic images, however, leave much to be desired. The 5M still has a way to go to become the ideal color laser printer, one that makes automatic, high-quality color an option for every business document. / Jim Shatz-Akin

HP Color LaserJet 5M, \$7,625 (list). **Company:** Hewlett-Packard, Santa Clara, CA; 800-752-0900 or 415-857-1501; <http://www.hp.com>. **Reader Service:** Circle #401.

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Netscape Navigator 2.0

333

Upgrade secures Net browser's dominance — for now.

IT'S NO FLUKE that Netscape Navigator has a whopping 70 percent of the market share for Internet browsers: It's speedy, attractive, and better than any other application at displaying pages designed in HTML (HyperText Markup Language), the cross-platform language of the Internet's multimedia-rich World Wide Web. With version 2.0, Netscape has improved Navigator's speed and ease of use and is seeking to further its role in pioneering Web standards, with the introduction of a plug-in architecture that simplifies third-party add-ons. Despite Netscape's admirable ambition, however, Navigator 2.0 has signifi-

cant limitations and is seriously lacking compared to its Windows and UNIX counterparts. One reason for Navigator 1.x's popularity was Netscape's tradition of advancing HTML by introducing new formatting standards, or tags, to the language. These let Web authors spruce up their pages with nifty effects — and they gave Navigator, the only browser initially able to tap those effects, a competitive edge. Tags introduced with the first version of Netscape are starting to be supported by other browsers, so Netscape has upped the ante by introducing several new tags with Navigator 2.0. Most notable of these are the Frames tags,

Plugging In

which let authors split Navigator's window into independent panes. But unlike Netscape's earlier innovations, frames aren't particularly compelling or useful: They're difficult for authors to create and even more difficult for users to navigate. Each frame is an independent Navigator window-within-the-main-window, which creates confusion about master navigational controls. We found ourselves reflexively clicking on the Back button to retrace links in a frame, only to watch in frustration as the entire main window disappeared.

One big addition in Navigator 2.0 is the Plug-Ins folder. Navigator can use third-party plug-ins to display data types the browser itself doesn't support. Vendors have promised plug-ins supporting such formats as QuickTime, RealAudio, Macromedia Director, and Acrobat PDF, but only a few were shipping at press time. Still, early versions of Macromedia's Shockwave plug-in show the potential: A file created in Director can be downloaded and displayed in the Navigator window as if it were an in-line GIF image. Sounds and animations can play, and mouse clicks can be treated as links in the Director file or as hyperlinks to other Web pages. Seamless support for formats other than HTML, GIF, and JPEG is long overdue, but it does come at a cost: Netscape plug-ins can eat up a lot of RAM.

Netscape's commitment to plug-ins signifies a turn away from helper applications, its old method for handling new or alien file formats. (Apple's MoviePlayer, for example, could be set up as a helper application for Navigator, so that if you ran into a Web page containing a QuickTime movie, the player would launch and show the movie to you in a separate window.) Adding helper apps to Netscape 1.x was always difficult, because of an arcane dialog box, and that poor implementation is essentially unchanged in Navigator 2.0. With luck, a growing acceptance of plug-ins will soon make this deficiency moot.

Navigator 1.1's Bookmarks feature — intended to help you keep track of your favorite sites on the Net — really didn't simplify things much. Bookmarks just piled up willy-nilly in a drop-down menu, unless you took pains to arrange them, using a complex dialog box. Navigator 2.0 thankfully organizes your favorite sites in a Finder-style list that lets you drag and drop bookmarks into nested folders and display them in a hierarchical menu list.

Not content to let Navigator be just a Web

browser, Netscape has turned Navigator 2.0 into a POP/SMTP e-mail reader as well. From within a three-paned window, users can send, receive, and file e-mail messages. However, this interface makes using Navigator for e-mail extremely difficult on small monitors. You'd be better off with Qualcomm's free Eudora Light e-mail software than with the cramped Netscape system. Likewise hindered by a three-paned window is Navigator's new ability to read Internet newsgroups.

A Jones for Java

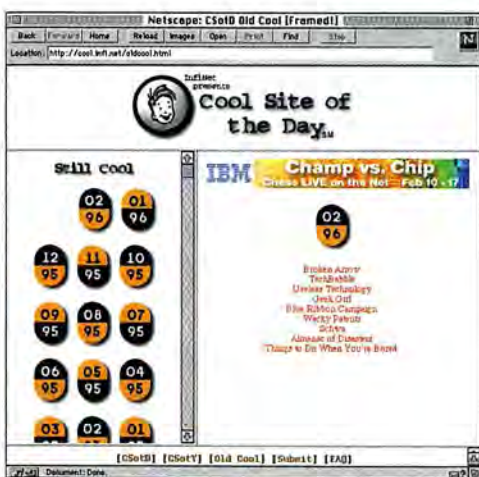
The chief disappointment with the Mac version of Navigator 2.0 is its lack of support for Java, Sun Microsystems' cross-platform programming language, which allows Web authors to embed executable programs (or applets) into their pages. Java is one of the hottest things on the Internet, and both the UNIX and the Windows versions of Navigator 2.0 support it. Netscape promises Java support in a future Mac release, but Navigator 2.0's lack of support for Java and the thousands of Java applets threatens to make the Mac a second-class Internet citizen. (Navigator 2.0 does support JavaScript, a less powerful scripting language based on Java.)

One other drawback to Navigator 2.0 is instability — it has a tendency to crash (and freeze up your Mac in the process) more often than most standard Mac applications. And users of PCI-based Power Macs should note that Netscape advises against using versions of Open Transport earlier than 1.1, even though that version was still just a beta release at press time.

The Bottom Line

Right now, Netscape Navigator is the only product in its class. It's clearly the best Mac Web browser available, and its new plug-in architecture will transform the Web into a much richer multimedia environment. However, Navigator is RAM-hungry (especially with plug-ins), its e-mail and news readers seem mere afterthoughts, and it crashes more often than it should. With Microsoft's free Internet Explorer 2.0 on the horizon (and looking impressive in its beta release), Navigator 2.0 may soon face a challenge for Web supremacy. But for now, using Navigator 2.0 really is the only way to surf. / Jason Snell

Netscape Navigator 2.0, \$49 (list). **Company:** Netscape Communications, Mountain View, CA; 415-528-3777; info@netscape.com. **Reader Service:** Circle #402.



The Frames tags for HTML, new in Netscape 2.0, allow Web authors to embed multiple active windows in their pages.

cant limitations and is seriously lacking compared to its Windows and UNIX counterparts.

One reason for Navigator 1.x's popularity was Netscape's tradition of advancing HTML by introducing new formatting standards, or tags, to the language. These let Web authors spruce up their pages with nifty effects — and they gave Navigator, the only browser initially able to tap those effects, a competitive edge. Tags introduced with the first version of Netscape are starting to be supported by other browsers, so Netscape has upped the ante by introducing several new tags with Navigator 2.0. Most notable of these are the Frames tags,


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HISTORICALLY, DIGITAL CAMERAS have been either too complex and expensive for non-professional photographers or have yielded low-quality images that were fine for viewing on-screen but not good enough for catalogs, brochures, or family photo albums. With the DC50 Zoom, Kodak raises the image-quality bar and provides ease of use and flexibility with a 3x zoom lens and support for Type I and II PC Card storage, which gives the camera the capacity to store as many as 1,000 photos. Priced at just under \$1,000, however, the DC50 isn't about to replace the pocket camera: Its image quality is inferior to that of a film camera, and getting photos out of the DC50 is harder than it ought to be.

The DC50 is about the size of a pair of binoculars, with an adjustable hand strap on the right side of the body. Shutter-release and zoom-control buttons are on top, toward the camera's right side. An LCD to the right of the viewfinder reports camera status, how many photos are stored, how many more can be taken, and the remaining life in the camera's 4 AA batteries. A button on the back panel lets you step through command options on the LCD to adjust focal distance (macro, for close-ups at a fixed distance of 17 centimeters, and telephoto, which frees the zoom controls) and image quality (Good, Better, and Best settings, which differ in the amount of compression applied to the image). You can also choose from five exposure settings, override the automatic built-in flash, and set a timer for automatic photos. Settings can also be changed through software when the camera is connected to your Mac.

Taking pictures with the DC50 feels perfectly natural if you've ever used a 35mm zoom

camera. The motorized zoom is smooth and precise, making it easy to frame a shot of your boss for the company newsletter or a house for a real-estate flyer.

Storage Add-On Option

The camera's built-in memory stores only 7 photos at the Best setting, 11 at the Better one, and 24 at the Good setting. When the camera is full, you must either download your images to the Mac via the provided serial cable, add memory in the form of a PC Card, or erase every photo by using a back-panel button. We found ourselves frustrated several times by the all-or-nothing erase option, when we knew we'd blown a shot and couldn't undo it without trashing all of our stored images.

Adding PC Card memory is simpler than loading film in a conventional camera: You slide the card into its slot, and the camera tells you how many more photos you can take. A 5-MB card Kodak provided for us had room

for 45 Best-quality images. If you need room for more photos, you can swap in new cards quickly and easily or use one higher-capacity card. (The camera is able to store a maximum of 1,000 images.) The only disadvantage of the PC Card scheme is cost: The DC50 doesn't currently support a card

that has a capacity of less than 5 MB, and at a price of around \$200, that's a hefty add-on.

Burdensome Wait

Downloading photos to your Mac is straightforward but tedious. When you connect the camera and the Mac, using the serial cable, and launch the supplied PictureWorks PhotoEnhancer software, the Mac recognizes the camera. You have the option of working with images stored either in the camera's memory or in the PC Card's but, frustratingly, not with both simultaneously. You can download your photos in a batch or preview them on-screen before saving them to disk. Whichever you choose, be prepared to wait — and to give up control of your Mac. Downloads of Best-quality images took nearly a minute each on a Power Mac 7500/100 (with AppleTalk turned off), and each image took up about 132K of

disk space, so we recommend previewing the batch and saving only the photos you want. This process is annoyingly difficult, however, because you cannot download groups of photos that weren't taken sequentially: You can designate shots 1 through 5 in one download session, for example, but saving shots 1, 3, and 5 requires three separate sessions.

Once the photos are on your Mac, you can use PhotoEnhancer to retouch them. You can apply global corrections to lighten, darken, sharpen, or soften an image; use the floating tool palette to change to selected regions; or use the nifty SmartPix option to automatically correct for a variety of common poor-photo conditions, such as fluorescent lighting or dim light. Finally, there's a slick option that lets you apply corrections by example: You preview your image with a variety of corrections applied and select the one that looks the best, until you get the appearance you want.

It's a good thing PhotoEnhancer gives you so many image-correction options, because chances are you'll need them often. Nearly every indoor photo we took using the DC50's default settings was suitably bright at the center but overly dark at the edges. (Lowering the camera exposure setting a notch alleviated this problem, but the setting reverts to normal every time you turn the camera off, and resetting it for each shot is a nuisance.) Outdoor shots were better exposed, but distant objects (such as buildings) were sometimes fuzzy. Color tone in the photos was quite good, however — even skin tones, which are notoriously difficult to replicate. When we printed the images on a high-quality dye-sublimation printer, the quality was only slightly inferior to that of a snapshot — adequate for use in brochures, catalogs, or flyers and outstanding for publication on Web pages or CD-ROMs.

The Bottom Line

For those who are willing to tweak photos for publication and can put up with a slow and unwieldy image-download process, the Kodak DC50's versatility and focus-and-shoot ease of use can make it an asset for many small businesses. But with a price of nearly \$1,000, it's a steep investment, and many users may ultimately be better off sticking with film and processing. / Jim Shatz-Akin

Kodak Digital Science DC50 Zoom, \$979 (estimated street). **Company:** Eastman Kodak, Rochester, NY; 800-235-6325 or 716-724-4000; <http://www.kodak.com>. **Reader Service:** Circle #403.



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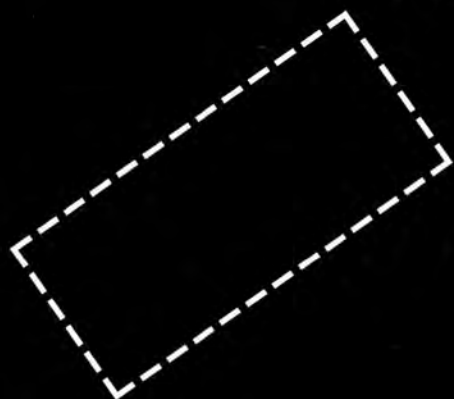
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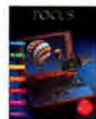
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FileMaker Pro 3.0



Save time, space, and sanity with this relational-database program.

CLARIS TOOK ITS TIME with this update of FileMaker Pro, but it has artfully addressed almost every shortcoming of its popular and powerful database application. Although FileMaker still isn't as powerful as fully scriptable database programs such as ACI US' 4D, every FileMaker Pro user can benefit from this excellent upgrade.

Rich Relations

The most ballyhooed change in version 3.0 — and the most important — is FileMaker Pro's relational capabilities. These allow one FileMaker Pro database to link dynamically to another. One benefit of this is the ability to see data stored in the second file through a window (or "portal") in the first. This allows greater flexibility and accuracy in data entry and storage without removing the ability to manipulate it. A customer-list database including each customer's ordering history, for example, might have a relational link to a separate product-order database. If your sales rep entered a new sale to Jane Jones in the order database while you were viewing Jones' entry in the related customer database, you'd immediately see the sale appear in the related fields.

This may sound similar to an approach FileMaker users have taken for years: linking

database fields through lookups. Lookups automatically copy the contents of fields in one database into corresponding fields in another, but they don't create dynamic links between the files, as relational fields do. The lookup approach has several drawbacks: The duplication of data can waste a lot of hard-disk space; the process can be painfully slow; and most important, data accuracy can be compromised, because changes in source files don't show up in linked fields unless the linked fields are updated manually (via the Relookup command). Relationally shared data is always identical in all files it appears in, so updates appear instantly in every linked file.

Still Simple

Creating a database file with FileMaker is much like simply designing a form. When you create a new file, a dialog box prompts you to set up your fields, which can be of nearly any type, including text, number, date, calculation, or summary. With the Options button, you can make a field a pop-up menu that gives users a choice of items or you can create a lookup field that pulls data in from another file.

To create a relational link between FileMaker files, you double-click on a field in your database layout. First, you have to set up a match field — a field that keeps identical information, such as a record number, in each related file, so you can match information in one related file with that in another. Then using a related field is as simple as dragging it into a layout — when you add a field from a related file to any layout, a simple dialog box appears, letting you choose the file and which

of its fields you want to add.

Perhaps the handiest of several features aimed at streamlining the field-relating process is FileMaker Pro 3.0's ability to create pop-up fields that list the contents of related files. For instance, an order form linked to a products database could contain a pop-up field that displays all the items in the products file.

There are a few minor blemishes in FileMaker



LARGE-FORMAT FLATBED SCANNERS

If you're in the production environment, or a desktop publishing pro, you want a high-quality scanner without paying a high-end price. This July, MacUser editors review and mouse-rate the leading large-format flatbed scanners in the 7K-30K price range. With an 11"x17" scanning area, these scanners have more color management and control than ever before. Find out how they compare to high-end drum scanners. This in-depth review is sure to improve your image without wiping out your wallet.

VIDEO CONFERENCING

MacUser editors put video conferencing on the agenda in the July issue of MacUser. What technologies are currently available and how are businesses using it? When does it make sense to video conference? And when is it just not worth it? Our editors answer these questions and more when they look at low- to high-end video conferencing systems. Shouldn't this issue be on your agenda?

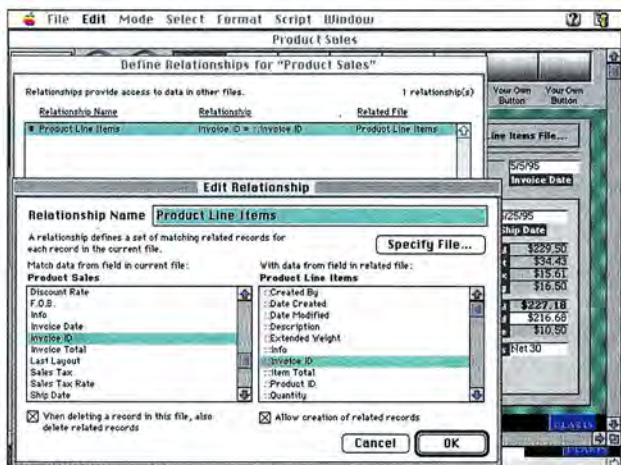
THE COUCH POTATO MAC

Put down your remote and pick-up the July issue of MacUser. We've got a great lineup of products for TV and movie lovers in the Personal Mac section. For those times when you'd rather be Net-surfing than channel-surfing, we have listings for TV- and movie-related web sites. Stay tuned!

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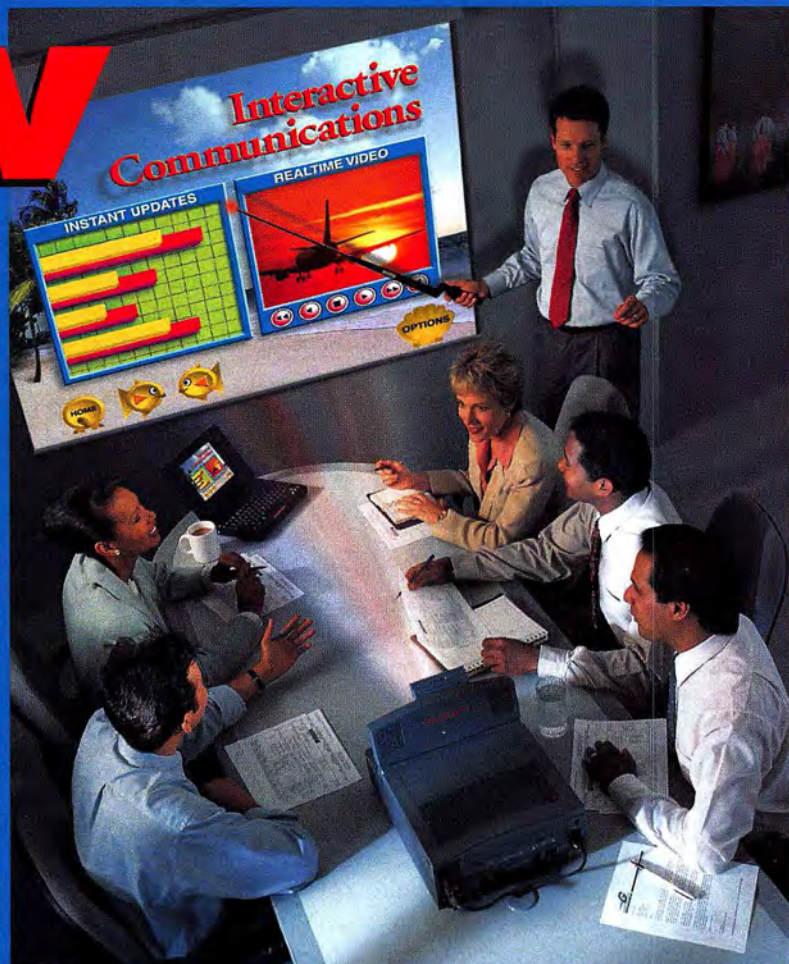
TUESDAY

APRIL 23, 1996



The new relational database features available in FileMaker Pro 3.0 let you define a relationship between fields in related databases, so whatever information is entered in one file will automatically be reflected in the other.

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REVIEWS

Pro's relational-database engine. For instance, records in a portal always appear in the order they were originally entered: You can't sort them (as you can in 4D). You can do a search on fields from a related file, but version 3.0 choked on one complicated search we tried, requiring a workaround that broke the process into two separate searches.

Substance and Style

FileMaker Pro now has merge fields — the lack of which was a recurring irritation in previous versions. These let you create mail-merge letters and customize boilerplate text easily without making you worry about obvious blank spaces around fields within text blocks or having to create cumbersome calculated fields as a workaround.

FileMaker Pro now also lets you format text within a field. Earlier versions required you to set a single style for all the text in a field. Now you can apply standard styles, such as bold or italic, to individual words. FileMaker also now supports tabs, especially useful for fields with long notes or letters.

Calculated fields can update themselves only when a record is viewed or printed. Furthermore, 45 functions have been added or updated in FileMaker Pro. The new functions include Case, for specifying particular conditions, and Word Count. And 32 status functions furnish information about the system a file is running on — such as operating system, platform, and screen size — and about the file itself, such as current layout and the number of records it contains.

FileMaker Pro's easy-to-use scripting functions now include conditions (IF, THEN, ELSE) and looping, although you still can't use variables and you can't automatically record actions as a script, as you can with FileMaker Pro's rival Panorama, from ProVUE.

Several minor changes, such as the ability to import and export in more file formats and support for Macintosh Drag and Drop within files and between FileMaker and other applications, round out the improvements in this new version.

The Bottom Line

By giving FileMaker Pro relational capabilities and fixing its major flaws, Claris has delivered a masterful reinterpretation of an acclaimed classic. / Kristi Wachter

FileMaker Pro 3.0, \$199 (list). **Company:** Claris, Santa Clara, CA; 800-544-8554 or 408-727-8227; <http://www.claris.com>. **Reader Service:** Circle #404.

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Linotype-Hell Saphir

★★★★★

Midrange scanner delivers high-end prepress features.

LINOTYPE-HELL IS WELL KNOWN for heavy-duty prepress scanners, but the \$3,999 Saphir marks the company's first foray into the world of desktop flatbed scanners and it's a very impressive debut. The scanner itself is a version of UMAX's 8.5-x-11-inch PowerLook, with some internal-programming changes — a solid, high-end desktop scanner, but certainly not without peer. It's the accompanying software that really sets the Saphir apart, making it a prepress powerhouse with features normally associated with much more expensive scanners.

The Saphir is a one-pass color flatbed scanner with a built-in transparency adapter in the lid. It has an optical resolution of 600 x 1,200 dpi, with interpolated resolutions up to 2,400 dpi, and it captures 30 bits per pixel.

The scanner comes with an impressive array of software, including the Deluxe CD-ROM version of Adobe Photoshop 3.0 and Xerox's TextBridge OCR program, but what really differentiates the Saphir from other scanners in this price range is the inclusion of Linotype's ScanOpen Lite scanner-calibration software and LinoColor Lite prepress scanning and color-separation application.

PowerPC Preferred

The bad news is that LinoColor Lite demands a Power Mac. For 680x0-Mac users, a Photo-shop plug-in called ScanLite is included in the package, but its capabilities are fairly limited. As a result, we don't recommend the Saphir for non-Power Mac users — not because it's bad, but because you'd be paying for features you couldn't use.

LinoColor is the first application we've seen that makes full use of Apple's ColorSync 2.0 color-management system — not surprising, since the technology underlying ColorSync came from Linotype-Hell. It uses ColorSync monitor profiles to display color accurately on-screen and ColorSync output profiles to deliver accurate CMYK separations straight from the scanner. The Saphir ships with ColorSync profiles for a wide variety of output devices, and you can also use the Saphir with any output device that accepts International Color Consortium (ICC)-compliant device profiles.

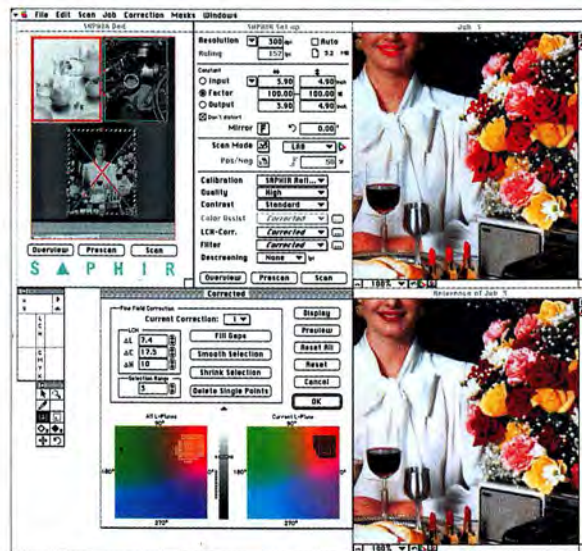
Input calibration is handled by the ScanOpen Lite application. The calibration process is simple: You scan the Kodak IT8 target included in the package; open the scan in ScanOpen, along with the target data file associated with the IT8 target; and have ScanOpen calculate a scanner profile.

Once you've calibrated the scanner and designated monitor and output profiles, you're ready to use LinoColor Lite. This complete batch-scanning, color-correction, and color-separation package is a scaled-down version of the software that Linotype uses to drive its high-end drum scanners, lacking only the distributed-processing and job-

queuing features of the full-blown LinoColor.

You start by placing one or more originals on the bed of the scanner and performing an overview scan, which gives you a quick grayscale scan of the entire scanner bed. You can then set cropping rectangles for each original on the bed. Each crop you set becomes a scanning job, so you can scan multiple originals, scan different areas of the same original, or do both.

Once you've performed the prescan, you can set the resolution and scaling factor



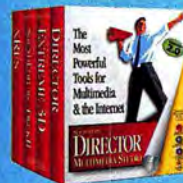
The Saphir's LinoColor Lite software offers fine-field color correction, used here to alter the shade of the roses and lipstick.



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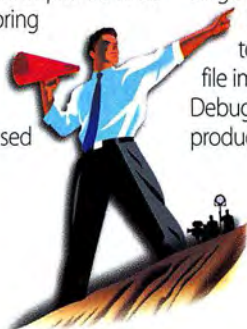
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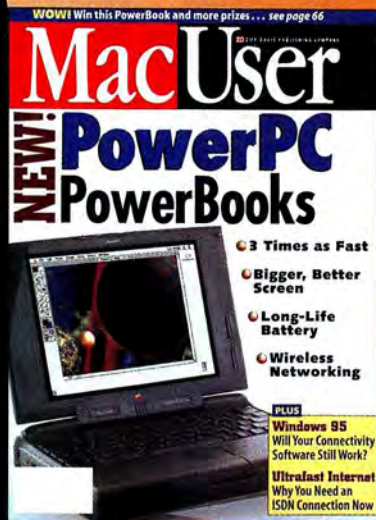
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of the scan and apply a variety of tone or color corrections. The Color Assist feature is an "expert assistant" that automatically analyzes the scan and makes automatic corrections for tone and color. It contains effective preset corrections for a variety of images. Among the presets are landscapes, skin tones, jewelry, and under- or overexposed originals.

For more-demanding color correction, you can use LinoColor's LCH Correction. This is a very powerful set of tools, but be prepared for a learning curve, because it's probably quite unlike any other color-correction software you've ever used. It uses an LCH (luminance, chroma, hue) model for all corrections. This takes a little getting used to, but the degree of fine control it offers goes beyond anything else we've seen in a desktop flatbed scanner. You can make global adjustments to the dynamic range, contrast, and saturation, and you can also make selective color corrections to the six primary hues (cyan, magenta, yellow, red, green, and blue).

The Filter feature lets you apply sharpening, smoothing, or a combination of both to the image. It comes with presets for various image resolutions, but you also have full manual control.

The scanner is fast — a full-resolution, full-area scan takes just over a minute — but the ability to deliver sharpened, color-corrected CMYK separations makes it not just fast but also productive.

The Saphir's feature set is very much skewed toward prepress applications, so if your primary scanning focus is for on-screen or online use, it's probably overkill. It doesn't have the dynamic range to handle transparencies that have too much contrast, nor does it allow sufficient enlargement to do much beyond FPO (for position only) scans from 35mm originals, but busy prepress shops will find the Saphir a great productivity enhancer for a vast majority of jobs.

The Bottom Line

If you're a prepress pro with a PowerPC-based system and are willing to spend some time learning to use the Saphir's powerful but complex software, you'll find the scanner to be an excellent, highly productive midrange scanner, at a price normally associated with FPO scanners. / Bruce Fraser

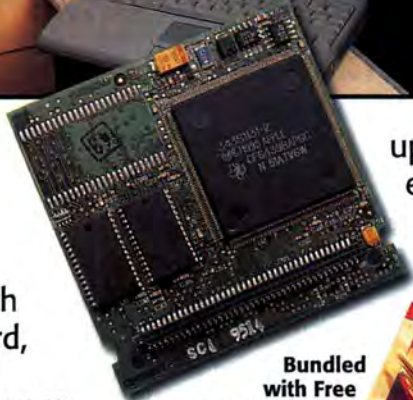
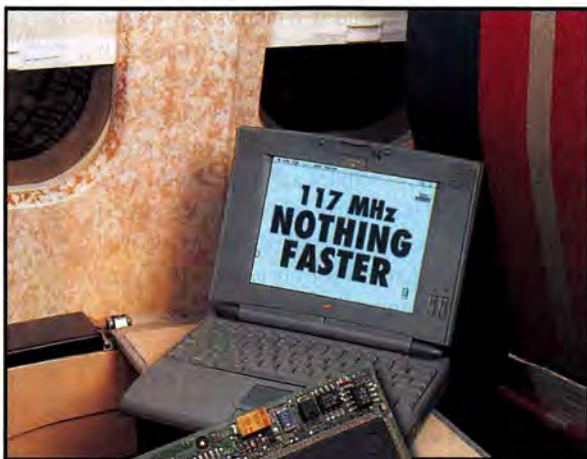
Linotype-Hell Saphir, \$3,999. **Company:** Linotype-Hell, Hauppauge, NY; 800-842-9721 or 516-434-2000; <http://www.linotype-hell.com>. **Reader Service:** Circle #405.



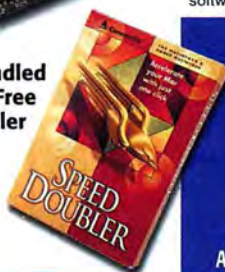
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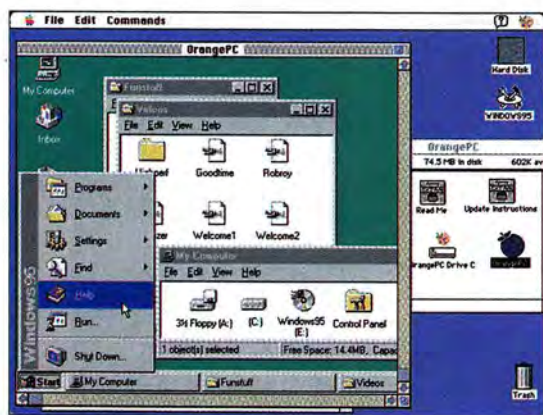
OrangePC Model 290 version 3.8



Go ahead and run Windows 95 on your Mac (if you must).

"WINDOWS 95 EQUALS MAC '89" is truer than ever, now that you can run the former on the latter: Orange Micro's OrangePC 486 coprocessor card, the most advanced Wintel-compatible card currently available, brings Windows 95 to the Mac desktop. We looked at the top of the product line, the OrangePC Model 290, and found that it ran Windows 95 flawlessly and at a good speed.

And you truly can run it on a 1989-vintage Mac: When we installed the card in a Mac IIci with 8 MB of RAM, Windows 95 ran faster than the Mac OS on the IIci. This is because the OrangePC card has everything Windows 95 needs in order to run, and speed is independent of the IIci's poky processor.



The OrangePC lets you run Windows 95 in a partial-screen window. Notice how the Windows 95 CD-ROM shows up in both the Finder and the Windows 95 My Computer window.

Orange Micro gives you a choice of Intel processors (we had a 100-MHz 486DX4), a SIMM slot that holds as much as 32 MB of RAM (our card had 16 MB), and a 128K Level 2 RAM cache. The card also includes an AMI BIOS chip common in many PCs and Super-VGA video chips supporting 256 colors at a resolution of 1,024 x 768 pixels. All this circuitry occupies every square inch of the 12-inch NuBus card. (Orange Micro should have a PCI version by the time you read this.) You can also connect PC peripherals to the OrangePC card, via the PC serial and parallel ports or a built-in PC Card slot.

Impressive though the hardware may be, it is the new software, version 3.8 of the OrangePC application, that enables Windows 95 (as well as DOS, Windows 3.x, and OS/2 Warp) to run on your Mac. You can even install and run multiple operating systems, although not at the same time.

Best of Both Worlds

Once you've installed Windows 95, you can have Windows fill the whole screen or run it in a partial-screen window, something you can't do with competing Wintel-compatible cards from Apple and Reply. Orange Micro thoughtfully includes an application called Windows Fast Switch, which lets you place a movable button in Windows that toggles you to the Finder; this is truly handy when Windows is running full-screen. So fluid is the interaction between the operating systems that you can cut and paste between Mac and Windows applications and share files, folders, disks, and CD-ROMs.

You can print to Mac network printers through the Mac's LocalTalk port, by setting Windows 95 to a non-network printer port (LPT1, 2, or 3). You can also connect a PC printer to the card's parallel port. The OrangePC supports the Open Data Link (ODI) standard, for connecting to PC networks, by using a PC Card. Unlike with Insignia's software-only SoftWindows, you can't use the Mac's networking hardware for PC networking.

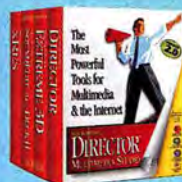
We installed and ran Microsoft Office for Windows 95 without any problems. We also successfully ran Windows software from the Mac's CD-ROM drive and defragmented the virtual C: drive, using the Windows 95 defragmenting utility without a hitch.

The Bottom Line

The OrangePC is a quick and solid product for running Windows 95 on your Mac. It is not as fast as a 100-MHz 486DX4 PC, but it is faster than Insignia's software-only approach. Until Pentium-based cards appear later this year, it's your best PC-compatible option. / John Rizzo

OrangePC Model 290 version 3.8 NuBus version starts at \$999; PCI version starts at \$740; Windows 95 upgrade for OrangePC, \$129 (list). **Company:** Orange Micro, Anaheim, CA; 714-779-2772. **Reader Service:** Circle #406.

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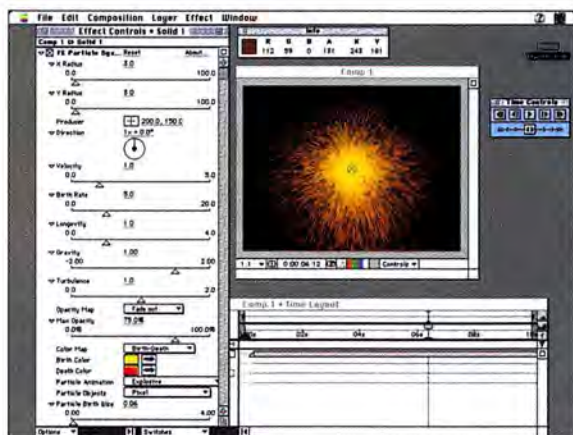


3-D video effects are powerful, precise, and pricey.

IF YOU'RE AN ACTION-ORIENTED video artist, you may be growing a little tired of image-editing plug-in modules that merely alter or distort the surfaces of objects or backgrounds in your movies. KPT Final Effects 1.0, from MetaTools, literally takes video-effect plug-ins to a new dimension, with features previously found only in 3-D-rendering applications.

Animated simulations of shattered glass, smoke, fire, and explosions are standard fare for this remarkable plug-in package, as are particle systems — groups of objects that collide, bounce, and move together realistically, based on physical properties you specify.

Few video artists would want to be without



They may look daunting, but KPT Final Effects' powerful tools — like these, which control the behavior of an exploding shower of particles — invite hands-on experimentation.

this extraordinary tool, although there are two inhibitors: price and platform. Final Effects retails for \$695 and requires Adobe's After Effects, which lists for \$995. We think this product has much broader appeal than its price tag will afford, but that's about the only criticism we can level against a program this elegant.

Money matters aside, Final Effects' reliance on After Effects is actually a great thing, given that After Effects' filtering environment is superior to those of all other Mac video-editing systems. After Effects lets users employ unlimited keyframes to control the rates at which filters are applied and allows filter programmers to separate a filter's properties into individual channels that can be independently

animated. This allows, for example, independent control of changes in a particle system's radius, velocity, gravity, and turbulence.

If this sounds like complex engineering, it is. But you needn't be intimidated: Every setting for Final Effects' many filters — including such arcana as Grid Spacing, Twist Angle, Bubble Speed, and Inverse Reflection — is controlled with an easy-to-use slider bar, complete with previews to show how each change affects your source footage. The interface encourages experimentation, which is not only fun but can also be financially rewarding to professionals: These are the same effects you see regularly on TV and in feature films, and their skillful deployment is much in demand.

Among the myriad uses for Final Effects' particle systems are simulation of fire, snow, and rain, which the program makes so easy that it feels like magic. Other potent features include Light Burst, which lets you simulate light sources behind other objects in a scene, with control over source position, light strength, ray length, halo, burst, and color. The Sphere filter enables you to take a flat piece of artwork or a movie plane and wrap it around a sphere, where you can set its reflectivity and/or transparency or apply light and shadow effects.

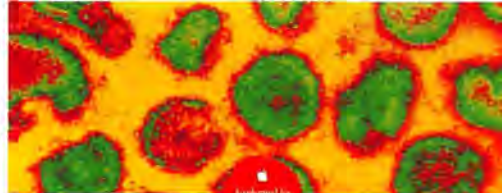
MetaTools recently purchased Final Effects from Sweden-based UDAC Multimedia. The old filters were recompiled to work with After Effects 3.0, and many new filters were added by MetaTools. KPT Final Effects is free to UDAC Final Effects owners.

The effects generated by Final Effects are limited in resolution only to After Effect's constraints of 4,000 x 4,000 pixels. This means it's possible to produce effects from CD-ROM quality up to feature-film resolution.

The Bottom Line

KPT Final Effects brings powerful, precisely controllable 3-D video effects to the Mac desktop in a package that's addictively fun to work with. Professionals will love it, and so would novices and hobbyists — if only they could afford it. / Lynda Weinman

KPT Final Effects 1.0, \$695 (list). Company: MetaTools, Carpinteria, CA; 805-566-6200; <http://www.metatools.com>. **Reader Service:** Circle #407.



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PCI Graphics Cards

Diamond Javelin 3400XL ★★★★★

Matrox MGA Millennium ★★★★★

Number Nine Imagine 128 ★★★★★

PC vendors offer PCI cards for speeding up Mac graphics.

IN OUR JANUARY ISSUE, we reported on the first crop of accelerated-graphics cards for PCI Power Macs (see "Fast on the Draw," page 96). Since then, two more vendors, Matrox and Number Nine — successful graphics-card vendors on the PC side — have joined the fray. In addition, Diamond Multimedia, whose Javelin card didn't fare so well in our earlier report, has released new software that improves the card's performance significantly.

To see how the new cards stack up, we subjected them to a battery of tests and compared them with the 4-MB ATI Xclaim GA, a low-cost (\$449 street), PCI graphics card.

Checking the Specs

The cards we tested included one with 8 MB of onboard video RAM (VRAM) — the Matrox MGA Millennium — and two with 4 MB of VRAM each — the Number Nine Imagine 128 and the Diamond Javelin Video 3400XL. All three are part of card families with various VRAM configuration options; there's a 4-MB version of the Matrox card (which can be upgraded to 8 MB), an 8-MB version of the Number Nine card, and a 2-MB version of the Diamond card.

The Matrox and Number Nine cards, in addition to accelerating graphics speed, each

boast unique specialties that aim to set them apart from competitors. The Matrox MGA Millennium is the first accelerated-graphics card that accelerates QuickDraw 3D. The Number Nine Imagine 128 boasts a 128-bit graphics architecture — with twice the bandwidth of most graphics cards, which use a 64-bit architecture. According to Number Nine, the greater bandwidth enables the Imagine 128 to process graphics data twice as fast as other cards. Unfortunately, its speed didn't reflect this supposed advantage.

The specs of Diamond's Javelin card haven't changed since its release, but improvements to its driver software speed up operations that previously resulted in very poor times in our Word Scroll test (see January article). The 1.0.5 software also promises better-quality QuickTime-video playback.

Speed Readings

To assess the speed of these cards, we installed them in a Power Mac 9500/132 and performed five tests on each card, using a combination of industry-standard MacBench 3.0 tests and application-based tests in Word, Excel, and Photoshop.

Results from this battery of tests were mixed (see charts). Overall, the Matrox MGA Millennium was the fastest card, but it didn't place first in every test. It scored best on both the MacBench Graphics Mix test, which measures a graphics card's speed for common business tasks, and the MacBench Publishing Graphics Mix test, which measures a card's overall speed for professional publishing tasks. ATI's less expensive Xclaim GA, however, did almost as well on both tests.

The Diamond Javelin Video 3400XL turned in a good performance on the Publishing Graphics Mix test but lagged behind the other cards on the Graphics Mix test. The Number



RACING CARDS / testing PCI graphics accelerators

To evaluate the speed of accelerated-graphics cards, we performed five tests: MacBench 3.0's Graphics Mix and Publishing Graphics Mix tests and scrolling tests in Word, Excel, and Photoshop. We ran all tests on a Power Mac 9500/132 with 256 MB of RAM and with a monitor setting of 1,152 x 870 pixels at 24 bits (millions of colors).

	MACBENCH 3.0 SCORES		APPLICATION TASKS			
	Graphics Mix	Publishing Graphics Mix	Word scroll	Excel scroll	Photoshop CMYK scroll	
Matrox MGA Millennium	27.1	31.3	159.9	81.5	20.5	
Number Nine Imagine 128	24.6	19.4	22.7	92.5	14.4	
Diamond Javelin 3400XL	21.3	30.6	31.9	80.0	21.4	
REFERENCE PRODUCT						
ATI Xclaim GA	25.4	30.5	26.8	87.7	25.9	
	SCORE BETTER	SCORE BETTER	SECONDS SLOWER	SECONDS SLOWER	SECONDS SLOWER	



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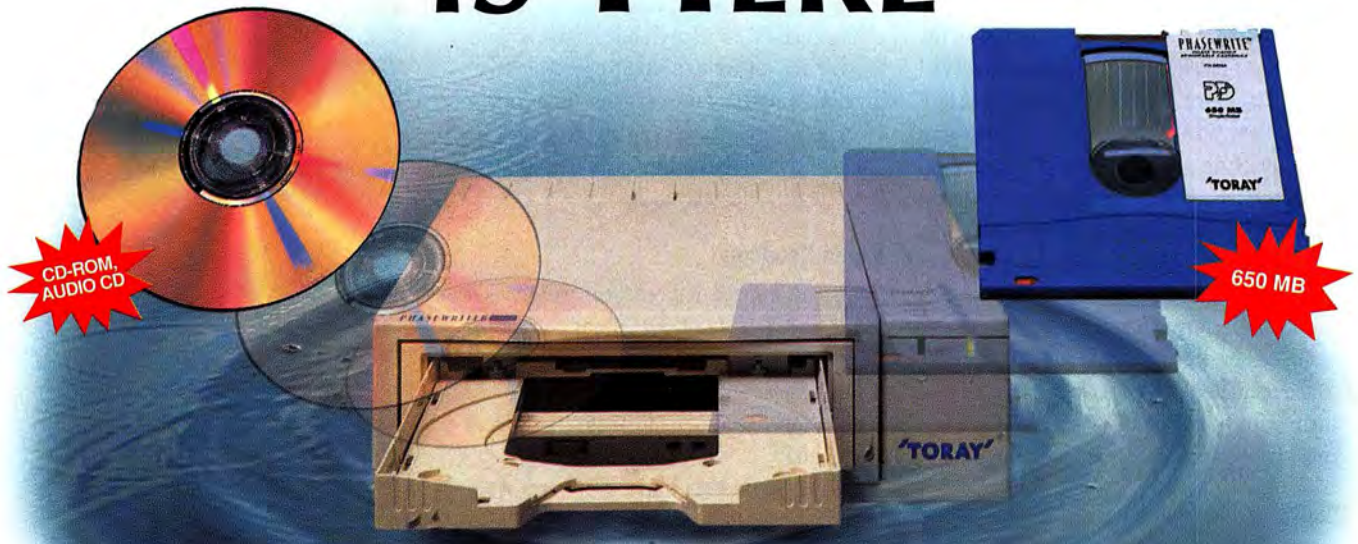
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Nine Imagine 128, conversely, did well on the Graphics Mix test but was over 30 percent slower than the other cards on the Publishing Graphics Mix test. Number Nine investigated this problem and traced it to a conflict with Adobe Type Manager. At Number Nine's suggestion, we renamed the Imagine 128's HawkEye extension ~HawkEye, so that it loaded after ATM, and the Imagine 128's Graphics Mix score increased by more than 60 percent. The Publishing Graphics Mix score increased only marginally, however, by about 3 percent.

Getting With the Programs

Our application-based tests revealed additional strengths — and weaknesses — among the contenders. The most glaring was the terrible performance of the MGA Millennium on our Word Scroll test, in which we scrolled through a simple 131-page Word document. Matrox's card took about six times as long as ATI's and just over seven times as long as Number Nine's to perform this task. Matrox acknowledges the slow-scroll problem, which can also affect Photoshop scrolling when floating palettes overlap the scrolling image, and hopes to have a fix available by the time you read this. The Number Nine Imagine 128's excellent score on this test was due to a special font-caching option, which we enabled.

The Imagine 128's font cache couldn't help it much with Excel scrolling, though. On this test, in which we scrolled a large spreadsheet with multiple embedded bar charts, it was the slowest, but not by too wide a margin. The Imagine 128's poor Excel scrolling speed is due in large part to the same problem that caused it to do poorly on the Publishing Graphics Mix test: As revealed by MacBench 3.0's graphics subtests, Number Nine's card does a weak job of accelerating the drawing of horizontal lines. Number Nine promises that a new version of the Imagine 128 driver, which should be available by the time you read this, will boost line-drawing speed dramatically. The Imagine 128 turned in its strongest showing on our Photoshop Scroll test, in which we scrolled a 50-MB CMYK file from top to bottom.

It's All in the Timing

In addition to testing speed, we looked at how well the cards supported a range of screen timings. Although all the cards advertised support for super resolution (1,600 x 1,200 pixels) at a color depth of at least 8 bits, only the Number Nine Imagine 128 enabled this option on all monitors that supported it.

The Matrox MGA Millennium demonstrated a more severe problem as well, but only at one timing: Pixel jitter was evident at 1,280 x 1,024 pixels at 60 Hz. Again, Matrox is aware of this and is working on a remedy.

Matrox's card does offer one advantage over all the others: It is the only card to accelerate some QuickDraw 3D operations as well as traditional-QuickDraw (2-D) functions. Although it doesn't support texture maps or transparency, the MGA Millennium clearly sped rotation of a shaded QuickDraw 3D model in Strata StudioPro: Object motion was fluid, in contrast to the jerky movement seen with the software-only QuickDraw 3D renderer Apple supplies with System 7.5.2. This makes the MGA Millennium a good choice for someone developing or prototyping 3-D models. If you're looking for high-speed textured rendering, though, whether as a multimedia author or a game fanatic, this card won't meet your needs: the MGA Millennium renders quickly but reduces richly textured worlds to flat monochrome surfaces.

The Bottom Line

If you're on a budget and don't need 3-D capability or super resolution, the choice is simple: Go for the ATI Xclaim GA. It's not the fastest card of the bunch, but it did reasonably well on all tests, and at a street price of \$460, it's by far the least expensive alternative. On the high end, the decision is a little trickier: Given the Number Nine Imagine 128's unreasonably high price (\$899 for the 4-MB model), we don't recommend this card. Choosing between the Diamond Javelin Video 3400XL and the Matrox MGA Millennium is tough: If you're looking for super resolution or accelerated 3-D modeling, you might want to consider Matrox's offering. But because of the MGA Millennium's painfully slow Word scrolling and that it costs some \$400 more than the Diamond Javelin Video 3400XL, for general business or publishing work, we would give the nod to Diamond's card. / Henry Bortman

Diamond Javelin Video 3400XL, \$569 (estimated street). **Company:** Diamond Multimedia, San Jose, CA; 800-468-5846 or 408-325-7000; <http://www.diamondmm.com>. **Reader Service:** Circle #408.

Matrox MGA Millennium, \$999 (estimated street). **Company:** Matrox Graphics, Dorval, PQ, Canada; 800-361-1408 or 514-685-2630; <http://www.matrox.com>. **Reader Service:** Circle #409.

Number Nine Imagine 128, \$899 (estimated street). **Company:** Number Nine, Lexington, MA; 800-438-6463 or 617-674-0009; <http://www.nine.com>. **Reader Service:** Circle #410.



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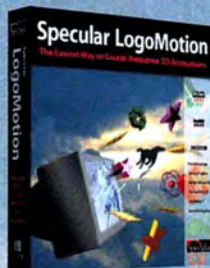
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Connectix VideoPhone

3.5

Videoconferencing just may be ready for the mainstream.

WAS IT DICK TRACY or George Jetson who first fired the public's fascination with voice-and-video communications? Either way, the promise of the picturephone has been long in being fulfilled. Of course, videoconferencing products have been available for years, but they're generally expensive and hard to set up and offer only low-quality, herky-jerky video images. Small wonder that the few technology hounds willing to shell out for videoconferencing have historically had trouble finding anyone on the other end of the line.

Enter Connectix: The company that put RAM Doubler onto zillions of Macs over the last two years is attempting a similar coup with videoconferencing. The company has centered its effort around the QuickCam, its inexpensive, easy-to-use video camera, which connects to the Mac's serial port. The VideoPhone, a combination of the black-and-white QuickCam and some clever software, attempts — with mixed success — to reduce the cost and complexity of videoconferencing.

At a street price of only \$150, the VideoPhone obliterates the traditional price obstacle to videoconferencing. And it does a number on the complex-configuration roadblock too: The VideoPhone feeds the video signal to the serial port of any 68040-or-better Mac and includes a built-in microphone. (You can also use any other mic that works with your Mac.)

The VideoPhone software, which is built around Apple's QuickTime Conferencing

extension, is extremely easy to use and remarkably complete. Once you've plugged in the QuickCam and installed the VideoPhone software, you need only open the VideoPhone application to get started. All you need is to find another user on your AppleTalk or Ethernet IP network (including nodes connected via Apple Remote Access) — and that person doesn't even have to be using a VideoPhone for you to connect. The VideoPhone can connect with any H.320 standard teleconferencing application, including Apple's own QuickTime Video Conferencing, which ships with Power Mac 7500 and 8500 models. (A version of the QuickCam is available for Windows PCs as well, but Macintosh and PC VideoPhones can't communicate with each other — yet. Connectix is working on it.) A fast Power Mac can host as many as six conferees at once, although the video quality suffers greatly with that much activity.

Which brings us to the VideoPhone's chief shortcoming: low video quality. Even a two-way videoconference at the highest-quality video setting (options range from 5 to 30 frames per second) is less smooth than those jumpy 8mm home movies you had to sit through so many years ago. If you're using a 68040 Mac or if your conference has more than two participants, video fidelity quickly degrades. Still, you *do* get a sense of talking face-to-face, and that's really the point, right?

The Bottom Line

The Connectix VideoPhone delivers usable (if unspectacular) video quality in an easy-to-use package. With street prices as low as \$150, it's poised to be popular. Video teleconferencing just might be here to stay. / Nathan Garcia

Connectix VideoPhone, \$249 (list). **Company:** Connectix, San Mateo, CA; 800-950-5880 or 415-571-5100; <http://www.connectix.com>. **Reader Service:** Circle #414.



Users of the Connectix VideoPhone see themselves and their fellow conferees in movie windows (left) and can each annotate or draw in the Shared Window, which is seen by all conference participants.



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UMAX PageOffice



It's not the original article, but it does show promise.

THE PAGEOFFICE, UMAX Technologies' personal scanning system, won't win any prizes for originality — it's an unabashed knockoff of Visioneer's PaperPort Vx. But it has some advantages, and with a bit more refinement, it could give the PaperPort a real run for its money. Like the PaperPort, the PageOffice combines a compact scanner with software that enables you to view, annotate, file, print, mail, or fax the documents you've scanned, either in image format or after conversion to editable text.

The hardware component of the PageOffice is a 300-dpi, 8-bit-grayscale scanner. At 5 inches deep, 12 inches wide, and 11 inches high, it's heftier than the petite PaperPort, but it's still small enough to fit on all but the most crowded desks — and unlike the PaperPort, it doesn't require the use of a bulky power adapter.

SCSI Scanning

Whereas the PaperPort currently requires a free serial port, the PageOffice instead relies on SCSI. The latter has a SCSI-ID selector and two 25-pin connectors, and a cable for connecting directly to the Mac is included; to daisy-chain other SCSI devices, you plug a standard system cable into the second connector. If the scanner is your only external SCSI device, you'll probably need to add a 25-pin terminator, which UMAX does not include in the package. By the time you read this, UMAX will be offering a 25-pin SCSI terminator for \$10. This is a workable option, but we think the terminator should be in the box. SCSI has two distinct advantages over a serial connection: First, most users have unused SCSI IDs available, whereas finding a serial port is a problem if you already have a modem and a printer or LocalTalk connection. Second, SCSI has much more bandwidth, so the scanner doesn't bog down even when doing large grayscale graphics. (Visioneer is planning to offer a SCSI option for its new PaperPort Vx model, but it will cost about \$90 extra.) Other points in the PageOffice's favor: Because it includes a charge-coupled device (CCD) — the technology used in flatbed scanners — it produces

much better grayscale graphics than the PaperPort Vx, which relies on contact image sensors, the low-end technology used in fax machines. (The original, non-Vx version of PaperPort doesn't do grayscale at all.) And the UMAX unit has an automatic sheet feeder that can handle up to ten pages at a time; with the PaperPort, you have to feed each page manually. On the other hand, we ran into some problems with the PageOffice feeder: All too often, even when we thought we'd seated the documents carefully in the feeder, they wouldn't go through without a push.

The Software Side

UMAX's PageManager application looks and works like Visioneer's PaperPort program. When you scan a document, it appears as an icon in PageManager. You can add comments, sticky notes, highlighting, arrows, or freehand markings and then drag the document to icons representing your printer, fax modem, or e-mail. (Only Microsoft Mail, cc:Mail, Quick-Mail, and PowerTalk are currently supported.)

PageManager lets you group documents into stacks and file them in folders, but it doesn't enable you to file by dragging and dropping to the Finder — an important and



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welcome addition in Visioneer's new PaperPort 3.5 software. Likewise, PageManager lacks the intelligent links that make it easy to move scanned data from PaperPort 3.5 to most popular applications, and aesthetically it's marred by ugly and often indecipherable Windows-style icons.

We also encountered several significant bugs in PageManager 1.0: Scanning legal-sized pages produced only cryptic error messages, rotating images caused crashes, and annotations wouldn't print. According to UMAX, all these problems are fixed in version 1.01, which should be shipping with the PageOffice by the time you read this (and should be available free from UMAX's Web site or BBS). UMAX's optical-character-recognition software is just about as good — or, depending on how you look at it, as bad — as Visioneer's: Accuracy is acceptable on clean, simple printed documents, but error rates are frustratingly high on such real-life materials as faxes, receipts, and newspaper clippings. If you intend to do significant amounts of OCR, you may want to invest in a package such as Caere's OmniPage or Xerox's TextBridge. In part because PageManager is not PowerPC-native yet, its appetite for RAM is more easily

sated than PaperPort 3.5's: We left PageManager at its default RAM allocation (3 MB) and had no trouble using all features, including OCR. That means the program, unlike PaperPort 3.5, is usable on an 8-MB Mac.

For graphics, UMAX bundles a limited version of MicroFrontier's Color It! That sounds like a curious choice, since the PageOffice doesn't do color, but the program actually works well with grayscale graphics. Visioneer includes no image-editing software in either the original or the Vx PaperPort package. One unusual feature of the PageOffice: Windows and Mac software is included in the same box; since most PCs don't come with SCSI, UMAX even throws in an ISA-slot SCSI adapter.

The Bottom Line

The PageOffice was until recently a Windows-only product, and UMAX admits that it added Mac support in a rush. The haste shows, but we're glad UMAX decided to reach out to Mac



Even the messiest desk has space enough for the UMAX PageOffice.

users: The PageOffice's SCSI interface, superior grayscale capabilities, automatic sheet feeder, and cross-platform support are significant advantages relative to the main competition, Visioneer's PaperPort line. Toll-free tech support is yet another plus for UMAX. If the company keeps its promise to polish up the product, the PageOffice will make a compelling alternative. / Henry Norr

UMAX PageOffice, \$399 (list). **Company:** UMAX Technologies, Fremont, CA; 800-562-0311 or 510-651-4000; <http://www.umax.com>. **Reader Service:** Circle #412.

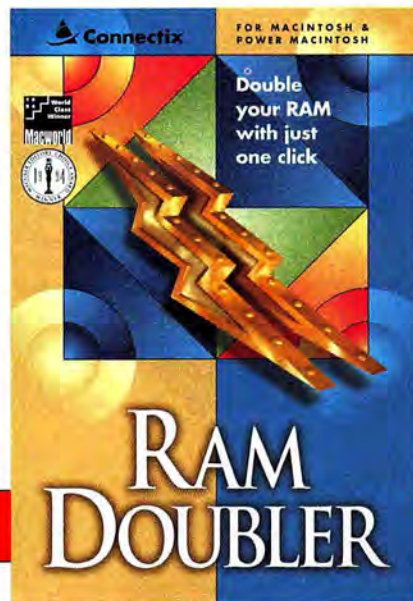
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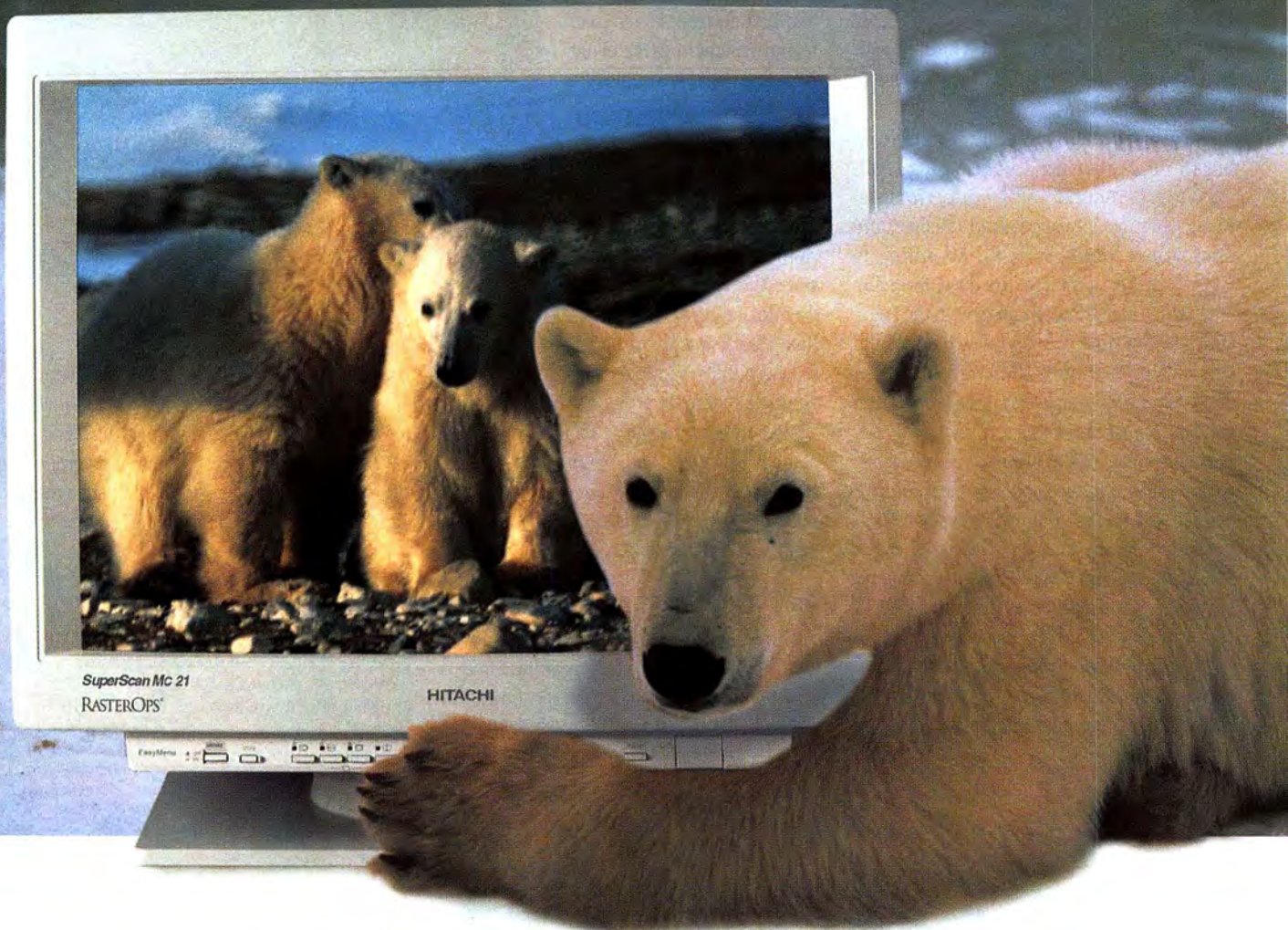
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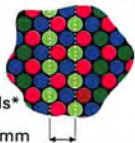
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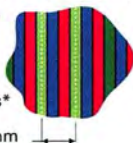
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Timbuktu Pro for Networks



Stalwart remote-control program gets impressive new features.

TIMBUKTU, THE VENERABLE program that lets you take control of or exchange files with other computers on a network or over a phone line, is back with a new version that improves significantly on an already solid product. Version 2.0 of Timbuktu Pro for Networks is fully PowerPC-native and adds support for Novell NetWare IPX networks. It also simplifies Apple Remote Access (ARA) dial-ups, introduces a simple messaging system, and has an overhauled interface.

Timbuktu Pro's basic functions remain unchanged from the previous version. You can still control or observe another Timbuktu user's screen (provided, of course, that you have appropriate access privileges). You can still exchange files with other Timbuktu users as well — but new features let you do so

with many at one time. Farallon has also introduced a plug-in architecture that will allow Farallon or third parties to write modules that enhance Timbuktu.

The most obvious change, however, is in the tools you use to control Timbuktu Pro: You use a button bar to choose among Timbuktu Pro's functions and to add a currently connected user to your address book. You can also use Macintosh Drag and Drop to transfer files.

Your window to other users is a tabbed panel that lets you view AppleTalk, TCP/IP, and IPX networks as well as remote ARA clients and your address books (which can combine users on all networks). You can create multiple address books, which makes it easy to organize users into functional groups.

The presence of ARA clients in the address book is just one token of tight integration with ARA, which is now bundled with Timbuktu Pro. Once you've entered appropriate dial-up and access-privilege information for an ARA user in your address book, you simply select that person's entry and click on the Dial button, and the software will make both ARA and Timbuktu connections with the target Mac.

Although Timbuktu is not intended to replace e-mail, it now allows you to send

messages, called FlashNotes, to other Timbuktu users. Notes can be attached to transferred files and are handy for commenting on a file's contents.

A big cross-platform benefit is the addition of NetWare IPX support. If you're on an IPX network, the network-access window will show you a clickable list of Timbuktu users — whether they're using Windows or the Mac OS — just as it does over AppleTalk. And all of Timbuktu's Mac OS-specific features are preserved even if you're communicating with Windows users.

The Bottom Line

Farallon's Timbuktu upgrade is welcome and makes the software useful for more than just controlling another computer. FlashNotes and the ability to perform multiple file transfers add greatly to its usefulness as a workgroup tool. And for nonworkgroup users, the addition of ARA and Macintosh Drag and Drop file transfer are enough to sell the upgrade, all by themselves. / Shelly Brisbin

Timbuktu Pro for Networks (Mac Edition 2.0) Single-user, \$199; 100-pack, \$5,499 (list). **Company:** Farallon, Alameda, CA; 510-814-5000; <http://www.farallon.com>. **Reader Service:** Circle #413.

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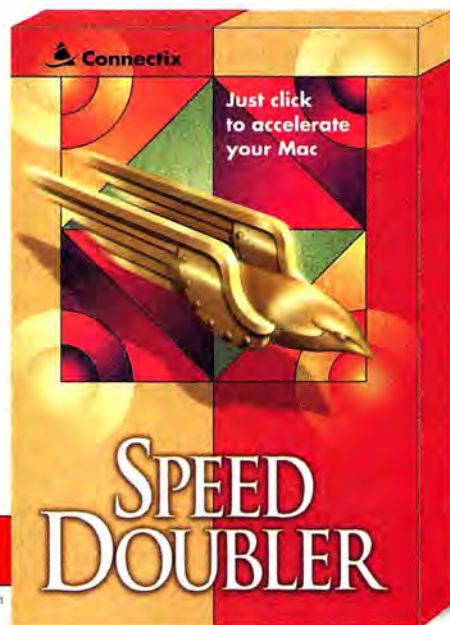
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Requirements: Macintosh equipped with a PowerPC 68040, or 68030 microprocessor • System 7.0 or greater • 8 MB physical RAM or greater • Compatible with Connectix RAM Doubler • Not compatible with Mac Plus, Mac SE, original Mac Classic, original Mac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



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Data loss will happen to half of us this year: meteors, fire, theft, earthquakes, power surges, hard disk failure, human error—it goes on and on. But with Retrospect and a solid backup strategy, nothing can harm your data.



2. Before you back up.

Figure out what you'll back up to—removable cartridges or a dedicated backup drive. For lots of files, you want a device with the capacity for unattended operation—say DAT, DLT, or an autoloader.

3. How to back up if you're a small company.

Retrospect will show you the best way. The EasyScript™

feature sets up a backup strategy from your answers to a few simple questions, then carries it out automatically to whatever media you select.

4. How to back up if you're a big company.

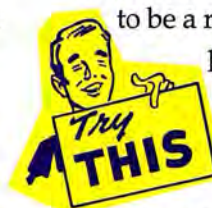
The answer is Retrospect Remote®, our network backup product. Use a set schedule or the more flexible Backup Server™ which automatically backs up Macs with the oldest backup first—ideal for PowerBooks that appear and disappear off the network. The bottom line: Retrospect Remote covers your network like a blanket.

5. How to laugh in the face of danger.

We're not suggesting standing on the top of the building during a lightning storm. But when disaster strikes, Retrospect can restore whatever you're missing—files from your latest backup,

older files, or the entire hard drive.

Take the next step. There has to be a reason why more people rely on Retrospect than all the rest combined. Why it consistently earns the top scores, the best reviews. We have the answers. Call us at 800-982-9981 for our *Understanding Backup* white paper. It would be a disaster not to.



Retrospect.
Powerful Backup Software for the Macintosh



To go forward, you must backup.®

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EasyPhoto Reader



Quick, simple snapshot scanner goes a bit too easy on features.

IF YOU'VE GOT SHOE BOXES of photos to be added to family newsletters or greeting cards but you balk at the bulk and price of most desktop scanners, Storm's EasyPhoto Reader is designed for you. At a street price of \$259 and about the size of a thick paperback novel, this combination of a petite color scanner and software lets you scan photos that are up to 5 x 7 inches. The EasyPhoto Reader is pretty darn cute, but in a bid to make photos fuss-free, Storm may have oversimplified.

You connect the purple plastic EasyPhoto Reader to your Mac via the serial port, open the software, and select an image source (the scanner, a CD-ROM drive, or your hard drive). To scan an original, position a photographic print in the automatic feeder and then push the bright-green Start button. In about a minute, the photo is scanned. Once you've saved the image in a Gallery file, you can use

the EasyPhoto software's image-editing tools to resize, crop, and rotate the image; edit it for contrast and color; remove common defects such as "red eye"; and add captions and keywords for easy retrieval. You can then cut and paste the image into an open document.

The EasyPhoto Reader is easy to use — but in some instances, too easy to be good. For example, Storm says its ClearScan technology performs color correction on the fly, but using good-quality as well as poorly exposed prints, we never got a great scan automatically.

Fair enough. We tried to alter color manually in the EasyPhoto image-editing application. The contrast and brightness adjustments are appropriately simple — just a pair of sliders. The application shows you your image in Before and After windows so you can preview changes, but the After image doesn't update as you move the slider — only after you let go of it — so it's hard to get a feel for the controls. We found ourselves yearning for a correction system like that of Adobe Photoshop's Variations menu, which shows you your image with a range of correction settings applied and then lets you select the best-looking one.

The Remove Red-Eye option also disappoints. You select the eye area with the lasso

tool and move a slider to minimize the red. We found it clumsy and not very effective.

The EasyPhoto Reader forgoes a lengthy manual and relies extensively on Apple Guide-based online help for its documentation. The entries are friendly and well organized but don't go as far as they should: For example, the Guide file tells you how to change the scanner's resolution in dots per inch, but it doesn't give range limits or offer any guidance on settings for best results at various printer resolutions. (The default scanning resolution is 133 dpi, which generated decent output on a 300-dpi color inkjet printer; the box says the scanner's optical resolution is 200 dpi and can be interpolated to 1,200 dpi.)

The Bottom Line

For the money, the EasyPhoto Reader isn't a bad buy, but it needs work. Getting good-quality color photos into your Mac simply is a great goal — but it's anything but simple. By sacrificing image quality for ease of use, Storm may be underestimating users. / Pamela Pfiffner

Storm EasyPhoto Reader, \$259 (estimated street).
Company: Storm Software, Mountain View, CA;
 800-275-5734 or 415-691-6600; <http://www.stormsoft.com/storm>. **Reader Service:** Circle #411.

What Do You Do With A \$100 Digital Video Camera?

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CIRCLE 64 ON READER SERVICE CARD

Data Desk 5.0



Data Description's statistics package gains custom templates, programming language.

EXPLORATORY DATA ANALYSIS — the process of searching for visual patterns in data — has long been Data Desk's forte in the arena of statistics software. Although other programs have focused on providing a comprehensive selection of analyses, Data Desk has concentrated on providing a highly interactive graphical environment for those users who don't know what they're looking for in their data. The latest version builds on an already strong program by adding such features as a macrolike programming language and support for custom automated templates, nonlinear curve fitting, and logistic regression.

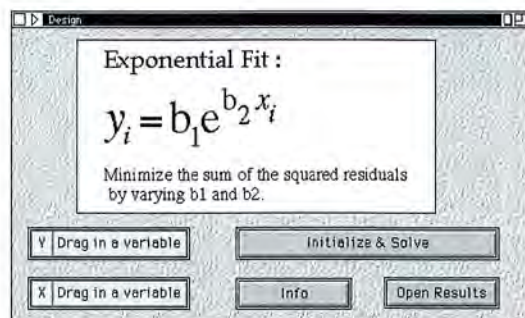
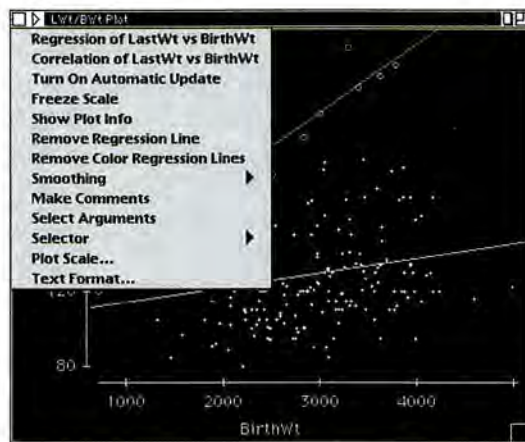
Data Explorations

If you're unfamiliar with the concept of exploratory data analysis (EDA), you can get a sense of it by thinking about how you navigate the World Wide Web. Web pages typically contain links to other locations, encouraging an open-ended exploration that often leads to unanticipated yet worthwhile destinations. The same is true for EDA when you use Data Desk. The program's plot and calculation windows contain context-sensitive pop-up menus that provide options for related analyses and plots, so your initial action serves as merely a launchpad for an entire series of operations on your data.

New features in version 5.0 help users expand the functionality of Data Desk by adding their own statistical and graphical procedures. The Action language, for example, makes it easy for you to build a procedure by selecting commands from pop-up menus. Templates — which can contain a user-defined collection of plots, tables, and calculations — are a boon to educators and to

anyone else who wants to distribute and share custom-built analyses. Buttons in templates can either execute simple commands (such as creating a plot or an analysis) or trigger a more complex sequence of instructions based on the Action language. The beauty of the templates is that you can drop in different variables and have the same analyses performed on the new data.

Another of Data Desk's strengths is that related windows are interactively linked. This means that if you make a change in one window, all other linked windows instantly update to reflect the change. If, for example, you select a subset of scores from a scatterplot and mark them with a unique symbol or color, the selected scores will be similarly marked in every other window in which they appear. You



Context-sensitive pop-up menus in Data Desk windows (top) stand by to help take you to the next logical step in an analysis. Version 5.0 lets you design your own templates to share with students or colleagues.

can even create variables with values that change as you move a slider — linked plots update to reflect the shifting values as you move it.

Windows of Opportunity

Unlike other statistics programs, which use a spreadsheet-style layout for data entry, Data Desk stores each variable's data in a separate

window. Whenever you close a window, the program displays an icon that represents the variable. This approach makes manipulating your data easier — for example, if you want to create a new variable that contains the log values of another variable, you simply click on the variable's icon and select the Transform Log command. To add another variable to a multiple-regression output window, simply drag the variable's icon to the regression window, and — presto — the table is recalculated to include the new data. Data Desk also saves all your results as separate icons, so if you ever want to reexamine an earlier analysis, just click on its icon and it appears.

Once you get used to Data Desk's way of working (and it doesn't take long), you'll never want to return to traditional data-analysis methods again. Data Desk takes the phrase *ease of use* and elevates it to an art form. Check out the program's superbly written manuals for many more neat tricks we can't possibly describe here.

Data Desk's tools are innovative and unique, but the program doesn't skip on the basics. It provides a wide selection of analyses, from t-tests and correlations to MANOVA and multiple regressions. But it doesn't have everything. We particularly missed the ability to calculate power and size-of-effect. It also doesn't have the survival plots and quality-control statistics currently available in several other statistics packages. It can't match JMP for calculating leverage plots. And it's missing many of the more obscure analyses provided by mainframe-derived programs, such as Systat and SPSS. Finally, Data Desk lacks the controls for fine-tuning the look of tables and graphs that StatView provides, making it less than ideal for those who want to publish the results of their analyses.

For such a powerful program, Data Desk maintains a slim, trim profile. The entire application comes on two floppy disks, requires no more than 2 MB of RAM, and zips along in native mode on a PowerPC system.

The Bottom Line

Statistics software doesn't get any better than Data Desk. If you're studying a data set and are unsure of where to begin your analysis or you're seeking new patterns in familiar data, this program is the best tool you can have. / Ted Landau

Data Desk 5.0, \$625 (list); \$357 (education price).
Company: Data Description, Ithaca, NY; 800-573-5121 or 607-257-1000. **Reader Service:** Circle #415.



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Net

You've browsed your

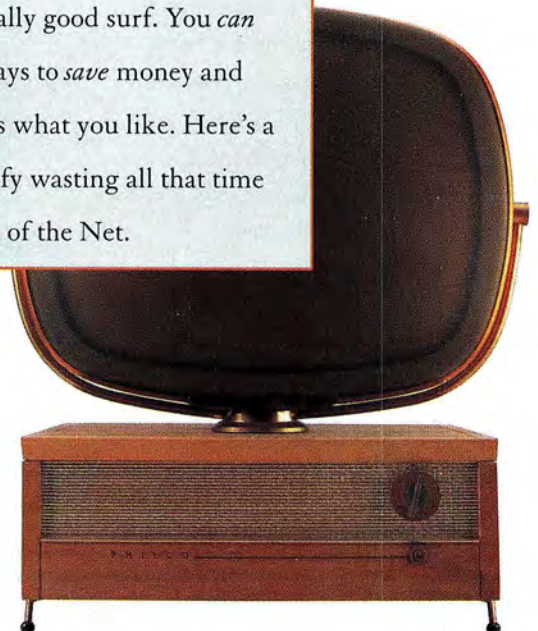
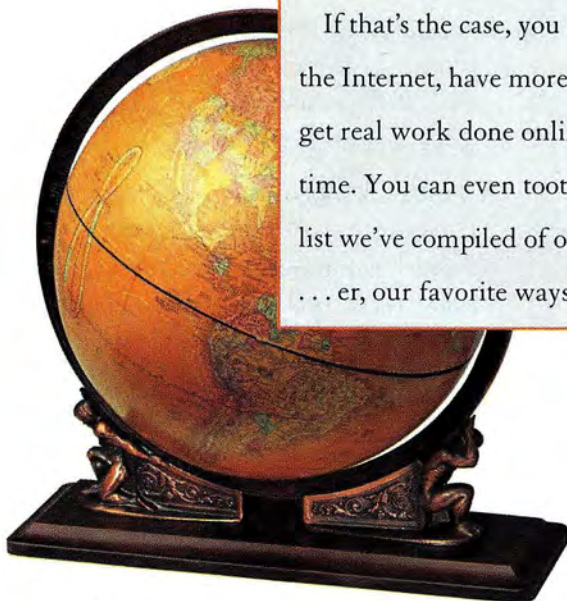
No doubt about it — the World Wide Web is full of thrills, chills, laughs, and surprises.



BUT EVEN ROLLER-COASTER rides can get boring the tenth time around. Maybe you've had your fill of bouncing around in cyberspace. Or maybe you're like us: just feeling guilty about all the hours you've spent poking around the Web with little more to show for it than an unruly collection of bookmarks.

If that's the case, you should know that the Web and its Big Daddy, the Internet, have more to offer than a perpetually good surf. You *can* get real work done online. You can also find ways to *save* money and time. You can even toot your own horn, if that's what you like. Here's a list we've compiled of our favorite ways to justify wasting all that time . . . er, our favorite ways of getting the most out of the Net.

BY STEVE ROSENTHAL



Success

brains out on the Net.

Now isn't it time you got something done?



1 Phone Home for Less

If the phone company takes home more of your pay each month than you do, hang up the phone and reach out and touch someone through the Internet. One of the more promising online technologies, Net-based phone software enables you to use your computer, by way of its microphone and speakers, to dial up and dish the dirt with anyone around the world for the mere cost of your regular online connection fees. Considering that an average call to France rings in at about \$1 a minute, this could add up to some "true" savings for those people who have friends far away.

But you get what you pay for when it comes to voice quality

and convenience. Sound quality and voice delay vary, depending on the speed of your local connection, but even with a standard 14.4- or 28.8-kbps dial-up connection, what you get generally resembles CB-radio sound. And you can't phone your friends unless they're waiting for your call with their Macs running and their applications open, so you'll have to either prearrange all your conversations or just see who's hanging on the global party line. Right now, you also need the same brand of phone software on each end (\$50 to \$100 each), although some firms are at least making their Mac and Windows versions interoperable.

For a free sample of phone software, download the audio portions of Cornell University's freeware CU-SeeMe video-conferencing program (<http://cu-seeme.cornell.edu>), or invest some cash in a commercial program such as Internet Phone, from VocalTec (<http://www.vocaltec.com>), or NetPhone, from Electric Magic (<http://www.emagic.com>).

PROS: You can talk to your French pen pal without having to mortgage your house to finance the phone bill.

CONS: After you've shipped her the necessary software and agreed on a calling time, she'll sound like she's speaking to you from her 18-wheeler.

2 Stay Tuned to the News

Whether your idea of news is the *Wall Street Journal* or *Entertainment Weekly*, chances are good that your favorite publication also has, or soon will have, a Web edition. Some sites even include audio clips and/or digital movies, which you may want to skip if you don't have a very fast Web connection.

Most publications let you flip through their online versions for free; others require a subscription approaching the cost of the paper edition. You can spend \$10 to \$30 per month for newspapers such as the *San Jose Mercury News'* Mercury Center (<http://www.sjmercury.com>) or \$3,950 per year for newsletters such as The Hotline (<http://www.apn.com/info/hotline>). Many publications are still experimenting

with pricing policies, so what you are offered may vary from one day to the next.

We can't list all the individual news sources here, but good jumping-off points to numerous publications include Yahoo News (<http://www.yahoo.com/News>) and The Daily News — Just the Links (<http://www.cs.vu.nl/~gerben/news.html>). Also take a peek at *MacUser's* April '96 Net Traveler column (page 109) for guides to more news sources.

PROS: You get access to Net-native 'zines that can't be found in any store, plus you don't have to worry about thieves stealing your paper before you get up in the morning.

CONS: Online-subscription fees and a lack of local news may keep you buying your local paper anyway.





3 Launch a Full-Scale Job Hunt

Naturally, Net-savvy employers look for Net-savvy employees on the Internet, and vice versa. But you'll also find electronic help-wanted listings ranging from ditch digger to CEO, thanks in part to the growing number of commercial firms, state employment services, and new Web-based employment agencies opening online.

Although deciding which agency or firm to contact isn't always easy, searching and submitting résumés via electronic databases and e-mail messaging can speed along the rest of the quest considerably. Starting your search with online agencies (as many as you have time for) will help you distribute your résumé to a variety of potential employers as well as give you an idea of what the job market has to offer. For pointers to these agencies, stop by The Internet Mall (<http://www.internet-mall.com/4mplymntsrvc.htm>),

which offers links to résumé services, city job banks, career-counseling publications, and a vast resource of specialized agencies serving everyone from accountants to nannies.

Most commercial sites, such as JobHunt (<http://rescomp.stanford.edu/jobs>), and some public agencies accept and distribute electronic résumés. But before you start any mass mailings, take into consideration that each agency has its own distribution method — some will accept your custom-made document, whereas others may provide a template or an online form for you to fill out. You should also be forewarned that many of these services don't come free.

If you'd rather avoid agency fees, you might want to open your browser straight to the classifieds, where you can quickly scan job listings from around the world. CareerPath (<http://www.careerpath.com>) — which was launched by *The Boston Globe*, *Chicago Tribune*,

Los Angeles Times, *New York Times*, *San Jose Mercury News*, and *Washington Post* — divides hundreds of listings by journal and by field of interest. In addition, CareerMosaic (<http://www.careermosaic.com>) offers a database of national job offerings as well as a résumé-posting service and a career-resource center.

If you're looking for an Internet-based career, you may want to skip the middleman and show off your capabilities by posting your own résumé-style home page. You can then distribute the URL to potential employers. At least for Web-related jobs, that's a great way to show that you can actually talk the talk — HTML, that is.

PROS: You won't waste money on fancy résumé paper or oversized envelopes. Access to nationwide job listings cuts down on search hassles.

CONS: Bewildering number of résumé formats prohibits mass mailings for the truly desperate, and you don't always know who you're sending all this personal info to.

4 Get Your Facts Straight

Anyone with a question in need of an answer can exploit the Internet for its most valuable resource: virtually unlimited, easily accessible information. Everyone from serious researchers to the slightly curious can log onto this 24-hour, one-stop connection to university libraries, online databases, FAQs, and all kinds of people just dying to tell you what they know.

Whether you're putting together a marketing report or researching a thesis, you should start searching with Yahoo (<http://www.yahoo.com>), which offers a comprehensive index in outline form. You can also try browsing by way of the Lycos (<http://www.lycos.com>) or InfoSeek Net Search (<http://www2.infoseek.com>) search engines,

which cover large areas of the Net and can be navigated with keyword searches.

If having it all only leaves you thirsting for more, you may be interested in harder-to-reach government and academic data. Still served up in FTP format, some sites can be accessed only through the Net's Gopher system (including the Archie and Veronica Gopher index servers). The Library of Congress provides several good gateways and indexes at <http://lcweb.loc.gov/global/explore.html>.

Anyone who has a vested interest in finance can use the Internet to check out future business partners before cementing the deal, via the SEC EDGAR Database of Corporate Information (<http://www.sec.gov/edgarhp.htm>), which provides background information on all public U.S. companies. Or if you can't decide whether to buy or sell some stocks, you can keep your eye on the market by checking the stock guide at Quote.Com (<http://www.quote.com>). This business hub provides bond prices, investment trends, and corporate-level market reports in addition to a variety of other information, all for a low monthly fee.

For more-personalized attention, post to one of the many Usenet groups corresponding to your interest, ask a question, and wait for the tide of responses. Proper Netiquette requires reading previous messages in a Usenet newsgroup, as well as the group's FAQ (if one is available), to see if your question has already been answered. Blanketing newsgroups with a single question, also known as spamming, is frowned upon. Try it, and you'll feel the heat of the ensuing flames.

PROS: You've literally got a world of information at your fingertips.

CONS: Everyone is an "expert," so you need to check credentials carefully.



.html). You may also want to look at the Guides to Writing HTML Documents (<http://union.ncsa.uiuc.edu/HyperNews/get/www/html/guides.html>) for some instruction on the finer points of style.

PROS: You don't need any real talent to be published internationally, instantaneously, and at almost no cost.

CONS: Ditto.

6 Take Your Database Public

Once you've started publishing information on the Web, one of the first things you'll want to do is unleash your databases and share that product catalog or *Star Trek*-episode guide with like-minded people. How do you get all the information you've got trapped in FileMaker Pro out onto the Internet? You have several options:

- If you don't need to provide database functionality such as customized sorts and searches, you can publish your information by converting it into HTML documents for viewing by Web browsers. One easy way of doing this is to export your data into a tab-delimited text file and then open it in an applica-

tion that supports HTML tables. If you're using Microsoft Excel, you can create and export HTML tables with Kenneth E. Sayward's XTML plug-in, available at <http://users.aol.com/ksayward>. In WordPerfect 3.5 or Microsoft Word 6.0 with the help of Microsoft's free Internet Assistant plug-in (which should be available by the time this article appears), convert your data into a table and then export it into HTML format. However, you'll need to repeat this process each time you update your database, to keep your Web data fresh.

- To gain more control over the process, you can use calculation fields in Filemaker Pro to create HTML code on the fly. Create a calculation field called HTML in your database, and interweave HTML code with fields from your database to format your data in any way you like. Then when you need a new Web page, all you need do is export your HTML field. You can even use AppleScript to further extend this method, making scripts that automate the creation of multiple HTML files based on various parts of your database.

- If you'd like your data to be live on the Web, you'll need to set up your own Internet server with a continuous connection, which is neither simple nor inexpensive to do. However, neither is it impossible (see "Setting Up an Internet Server," in this issue).

However, for a fully functioning database, you also need to use a CGI (Common Gateway Interface), an application that serves as a bridge to StarNine's WebSTAR server application and to other applications. A speedy choice is Web Broadcasting's \$195 WEB FM (<http://macweb.com/webfm>), but a free, albeit slower, alternative is Russell Owen's AppleScript-

based ROFM CGI (<http://rowen.astro.washington.edu>).

PROS: You get your data out of storage and onto the Web, where everybody can use it.

CONS: Data can be difficult to keep current if you're generating HTML pages manually; you'll need a 24-hour-a-day connection if you're serving data daily.

7 Play Games

The Internet may be a serious research tool, but it also has a lighter side that's devoted entirely to playing games. Depending on what you want to play and whom you want to play with, you can take a couple of different routes to the playing field.

If you've been killing yourself over games such as Marathon or Doom, you can take a shot at other players by logging onto such online gaming services as Sim-Net for Macintosh! (<http://www.simnet1.com/simnet4mac.html>) or GameNet (<http://www.gamenet.com/let.html>). Using Apple Remote Access capabilities and SoftArc's FirstClass Client software, both services act mainly as passageways between players, which means that all players must have their own gaming software. Players are also required to pay a flat monthly rate.



If you're feeling a little gunshy, saddle on over to Outland (<http://www.outland.com>), a unique online service offering multiplayer games such as chess, backgammon, Hearts, and the popular Spaceward Ho! 4.0. The great thing about Outland is that even though you have to pay a fee to use it, all the gaming software comes included.

Although many online gaming services make you pay to play, there are also Web-based games that won't cost you any more than your connection time. MUDs (Multi-User Dimensions) are popular text-based fantasy games on widely varying themes ranging from shoot-'em-ups to medieval adventures. A good collection of pointers to these sites can be found at The MUD Resource Collection (<http://www.cis.upenn.edu/~lwl/mudinfo.html>).

If you don't feel like facing off against competition, there are plenty of online games you can play solo.

Submit to the lures of risk-free gambling at Universal Access' Blackjack Server (<http://www.ua.com/blackjack/bj.html>), or take your pick of games at the Games Domain (<http://www.gamesdomain.co.uk>).

Whether you want to play alone or with friends, if you're looking for a playing ground, you'll find tons of pointers at the dozens of newsgroups under the alt.games hierarchy, the Happy Puppy Games You Play on the WWW page (<http://happypuppy.com/games/w3games.htm>), and The Action Games Menu (<http://www.golden.net/games>).

PROS: There's always someone to play with, and you don't have to look under the couch for missing pieces.

CONS: Seemingly "free" games can be expensive when you add up your connection time. It's also harder to cheat.



8 Seek Technical Help

Ideally, online technical support should let you make a quick search of a well-cross-referenced database and provide answers to most-common questions at any time of the day or night. E-mail integrated into the Web page should even enable you to request a more personalized reply without forcing you to camp out on hold.

The reality, however, is that online product support, still somewhat nascent on the Web, has yet to fulfill its potential. Many companies, such as Intuit, have found they've had to hire new support technicians and train them with the skills necessary for supplying accurate, easy-to-follow written instructions. Intuit was also forced to pay these technicians a relatively high salary to compensate for their additional skills. What all this boils down to is that companies must commit a major amount of time, money, and training to produce fully functioning online support. Many companies are still struggling under these demands to iron out the bugs in their tech-support Web pages.

Apple has several online technical databases (the largest is the Tech Info Library, at <http://til.info.apple.com/til/til.html>) in addition to a list of support resources that includes product information for most current hardware and software, at <http://www2.apple.com/documents/productsupport.html>. But unfortunately, although searching

the databases can be less frustrating than calling Apple technicians on the phone, there's no general e-mail help line for occasions when you have more-specialized questions.

Microsoft has its online searchable Knowledge Base (<http://www.microsoft.com/kb>) as well as an online support page (<http://www.microsoft.com/support>), but the content currently emphasizes the Windows side of the house, leaving Mac users waiting at the door.

But although many companies are still experimenting with online support, the information that is out there can often save you the hassle of waiting on the phone and may even save you money. Connectix, for example, covers all of its bases by offering FAQs for RAM Doubler, Speed Doubler, the QuickCam, and the Connectix VideoPhone. It also offers updater files for most of its products and e-mail access to actual technicians for fast and friendly service.

Even smaller companies are trying hard to offer useful online support services, occasionally with even greater success than the industry bigwigs. Although you're not too likely to find a

compiled information collection, many companies do offer a forms-based query page or a clickable "mail to" message item on their Web site. And most companies actually make an effort to answer the questions they receive.

PROS: It's less frustrating than calling Apple.

CONS: Sometimes you still have to make the call.

9 Take a Vacation

Although surfing the Net can't compare to a relaxing day at the beach, serious Web-combers can use online resources for planning a real getaway. With travel newsgroups, Web sites, e-mail-enabled reservation desks, and a fast-growing family of online travel agencies, you should be able to plan and book most itineraries without leaving your computer.

Before you make your reservations, however, you need to decide where you're going. For those who don't have a specific destination in mind, several of the larger Internet travel sites, such as Internet Solutions' rec.travel Library (<http://rec-travel.digimark.net>), offer suggestions and links to lively locales



around the world. For specific recommendations, both foreign and domestic, you can ask around the newsgroups in the rec.travel hierarchy. Most travelers love to share their experiences and will gladly guide you to the area's tastiest restaurants and most-affordable hotels. However, be wary of glowing recommendations for specific resorts, hotels, or restaurants that might come from less altruistic sources.

Online magazines are another great source for travel tips and vacation brainstorming. The Hotel Anywhere! On-Line Travel Magazines Search Page (<http://www.earthlink.net/~hotelanywhere/mags.html>) and Mark Kantrowitz's Travel Periodicals page (<http://www.cs.cmu.edu/afs/cs.cmu.edu/user/mkant/Public/Travel/html/periodicals.html>) are just two sites that will point you to more than 100 Web-based travel publications.

Once you've narrowed your candidate destinations to a few key locations, you should visit their sites on the Web before making the final cut. France, alone, has inspired at least two dozen sites, ranging from The Paris Beer Guide (<http://www.nycbeer.org/paris/>) to the Hotel Reservation Center (<http://www.bonjour.com/wta/center.html>), which allows you to choose from a selection of hotels that fit within your budget and location constraints and then make reservations online. Similarly, there are more than a dozen private home pages for Hawaii in addition to the beach-bordered state's official visitors-bureau page (<http://www.visit.hawaii.org>).

After you've chosen a destination, you can either let a travel agent work out the details or you can plan every little pit stop

yourself. Links to online agencies can be found at the Internet Travel Mall (<http://io.com:8001/>), Joe Witherspoon's Industrial Strength Travel (<http://www.slip.net/~jwithers/index1.html>), or the GNN Whole Internet Catalog Travel Page (<http://nearnnet.gnn.com/gnn/wic/wics/trav.new.html>). Each site also offers links to many hotels, car-rental firms, airlines, cruise lines, and other travel resources, in case you prefer to make your own reservations.

Once you've decided on specific agencies, hotels, rental companies, or airlines, many of these services will respond to your queries or make reservations for you through online forms or e-mail. However, until there's more-widespread use of the secure-transmission features incorporated into new browsers such as Netscape Navigator 2.0, you may be forced to settle the fees via fax or phone.

PROS: Chatting up newsgroups will help you avert some travel disasters before they strike.

CONS: You still can't control the weather.

10 E-Mail to the Max

Although they might not have the glitz of graphics-rich Web sites, simple Internet e-mail messages can be powerful communication tools. You can use Internet mailing lists to broadcast to a large group of people — perhaps you're sending out news bulletins or information about a sale your company is having. In addition, lists let you create online communities for discussing a particular subject. Many mailing lists devoted to popular software packages enable users to provide technical support for one another.

Although creating a mailing list can be complicated, here's a

step-by-step guide to help you get started:

- If you want to give people the power to add and/or remove themselves from your mailing list at will, you will need to use mailing-list-management software. If you're on a budget, consider using Michele Fuortes' Macjoromo, a free list-management program at <http://leuca.med.cornell.edu/Macjoromo>. Macjoromo enables users to add and/or remove themselves from mailing lists. It

also allows users to automatically send messages to every person on a list. StarNine's \$199 ListSTAR (<http://www.starnine.com>) offers more power and customization than Macjoromo, but it is also more difficult to use.

- You need to create mailing-list e-mail accounts, either by adding new accounts to a POP/SMTP server you're already running (if your organization has 24-hour-a-day access to the Internet) or by asking your service provider to create them for you. How many accounts you'll need and what names they should have will depend upon which list-management software you use. Macjoromo requires one "master" account and one additional account for each mailing list it hosts. ListSTAR, on the other hand, enables you to run several lists off one (or more) accounts, depending on your preference — and your budget.

- Unlike if you're running a Web server, you don't need a 24-hour-a-day connection to use your Mac as a list processor (although it does help). People whose lists don't have much traffic can dial into their Internet service



provider, connect their list processor to the provider's mail server, process all the new messages, and hang up. If there are continuing discussions on any of those mailing lists, they'll be fairly sporadic — new messages will appear only when you connect your list processor to the Internet.

If you'd like your list processor to be more responsive, find out if your service provider has a list processor of its own — if it does, you may want to consider using its list processor instead, since it will be connected to the Internet at all times. Unfortunately, such list processors are usually UNIX-based and much more difficult to use than Mac-based ones.

PROS: Mailing lists enable you to broadcast messages to large audiences or to create small communities for online discussion.

CONS: Administering a list can consume a lot of time, and high-profile lists require a 24-hour-a-day connection. ☹

Freelance author Steve Rosenthal has been banging around the Internet since the 1980s. Jason Snell, *MacUser* associate editor and coauthor of *Providing Internet Services via the Mac OS*, also contributed to this story.

THE MAC OF THE FUTURE

By the end of the year, we'll see computers that can run any of several systems, including the Mac OS. What are the potential and the pitfalls?

MORE CHOICE — that sums up the big benefit users can look forward to as Mac OS-compatible machines based on a new hardware architecture called the PowerPC Platform start showing up on dealers' shelves this fall. The choices will start with the brand on the box. The new systems will be available from a variety of vendors — not just Apple and the tiny coterie of current Mac-clone makers, but also a host of others, ranging from giants such as IBM and Motorola to, eventually, no-name local suppliers. Before long there should be more sizes and shapes, with a wider range of price, performance, and configuration options, than Mac buyers have ever before confronted. You'll be able to add PC as well as Mac peripherals — keyboards, mice, printers, and more.

And if the Mac OS doesn't meet your needs, the new hardware will even let you switch to a different operating system. It won't run Windows 95 or even Windows 3.1 (unless you add emulation software or an Intel-standard compatibility card), but it will support PowerPC-native versions of Windows NT; Solaris (Sun Microsystems' version of UNIX); AIX (IBM's UNIX); OS/2 (when and if IBM ever finishes its long-delayed port); and, for server use, Novell's NetWare.

Amazingly, all this flexibility shouldn't cost extra. In fact, since the new architecture will bring unprecedented competition to the Mac market, it may even drive prices to new lows. And because it's based on industry-standard components available from numerous suppliers, odds are you'll be able to get exactly what you want without weeks of waiting.

BY HENRY NORR

What's behind this wondrous proliferation of possibilities? The PowerPC Platform, or PPCP, is a technical specification hammered out over the last 18 months by Apple and its PowerPC partners, IBM and Motorola. (The PowerPC Platform used to be called the Common Hardware Reference Platform, or CHRP. But don't confuse CHRP or PPCP with PReP [PowerPC Reference Platform], a specification IBM developed for its own first-generation PowerPC systems; that standard hasn't had any impact in the marketplace, largely because it does not support the Mac OS.)

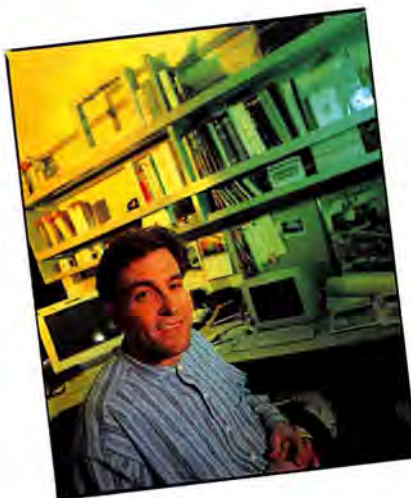
The goal with PPCP was to create, at last, a common, open standard for developers of PowerPC-based operating systems and hardware: a hardware design that any developers could build, using components readily available from mainstream sources; that would provide the maximum-possible compatibility with peripherals and programs designed for use with older Macs and PCs; and that could run any PowerPC operating system. Apple even pledged to modify the Mac OS to support the new design and to make the operating system available, along with the necessary ROM chips, for licensing by any vendor of PPCP hardware.

In late January, Apple publicly showed a functioning PPCP-based Power Mac prototype, and officials say they are on track to ship the system in November. Other vendors are expected to deliver their first implementations around the same time. But before you sell your current Mac, remember that this is the computer industry, where almost nothing happens on schedule. In addition to all the usual risks of development delays and manufacturing glitches, Apple's current effort to restructure its business could throw a wrench into the works.

SPECSMANSHIP

As of early February, the three PowerPC partners were, with input from other vendors of PowerPC systems, finishing up the PPCP specification. The documents describe a hybrid system with a PowerPC processor, PCI slots, and either Mac or PC I/O options (or both). Minimum requirements for desktop and portable systems include 8 MB of RAM, expandable to at least 32 MB; ADB or PS/2 connectors (or both) for a keyboard and a two-button mouse; and 16-bit-stereo, full-duplex audio. The required hard drive can be SCSI, IDE, or PC Card (formerly PCMCIA). PPCP-compliant desktop systems also need an enhanced Centronics port, the latest version of the parallel port generally used for printing in the PC world. Desktop and portable units must also have a 4-MB Mac ROM or at least a socket where such a ROM can be added. In server systems, provisions for the ROM as well as for a mouse and a keyboard are optional.

In their initial desktop models, Apple and the other PPCP-system makers are likely to go beyond the minimum requirements to provide all the standard I/O options that Macintosh as well as PC users are used to: They'll offer ADB as well as PS/2 keyboard and mouse



Apple's first PPCP unit will be a 'basic desktop Power Mac,' according to

Ross Ely, product-line manager for Power Macs. Next year, expect the line to include models tailored to specific market segments.

connectors and Mac- as well as PC-style serial ports. (Technically, one of the biggest challenges PPCP-system designers face, they say, is finding space on the back of their machines for all these connectors — look for the connectors to be closely packed, even stacked atop one another, and keep your fingers crossed that the vendors will mark them clearly.) Most systems will also include ISA slots, the low-cost expansion option that's still the standard in the PC world for devices that don't require a high-performance bus.

All these ports are included for compatibility with each supported OS: Mac users will find all the facilities they expect (and that Mac software and peripherals require), whereas those with Windows NT, for example, will feel equally at home. But the intent of the spec is that users of any OS should also be able to take advantage of the "foreign" ports. Drivers for the PS/2 connectors will be built into the Mac OS, so PC keyboards and other input devices should work as well as ADB products. Ditto with the PC serial ports: Finally, Mac users with a modem and a printer attached will have an easy way to add other serial devices such as a Connectix QuickCam.

With the parallel port, the situation is a little more complicated: Each PC printer model requires a custom driver, and since all the drivers can't all be built into the Mac OS, you won't be able to use just any parallel printer out of the box. You can plug, but it won't play without the necessary software. But if the vendor or a third-party developer chooses to provide a Mac driver, the hardware should work once you drop the driver in. (GDT Software, developer of PowerPrint, has already written Mac drivers for more than 1,000 PC printer models.)

In the case of ISA, Mac drivers don't yet exist, because no Mac has ever before supported this ancient but inexpensive expansion scheme. Anyway, most functions provided by ISA cards in the PC world — Ethernet and

sound support, for example — will be built into PPCP logic boards. But Mac OS users may be interested in some ISA options (ISDN cards for ISA, for example, are considerably less expensive than the external serial-port adapters available for the Mac), and if Mac drivers become available, such cards should work. (But along with the bargains, Mac users will get IRQ conflicts and similar pleasures previously reserved for PC owners.)

MAC AND MORE

Although Apple isn't yet offering details about its PPCP systems, the initial models are likely to be direct descendants of today's Power Macs — they'll use high-speed PowerPC processors, initially the 604 and possibly the 603e or 603ev; they'll definitely have PCI expansion slots; and they'll include the usual array of Mac ports (as well as some others). The first model to ship will be a "basic desktop Power Mac," according to Ross Ely, product-line manager for Power Macs, but next year Apple will expand its PPCP line to include several models tailored to particular market segments, much as the Power Mac 9500 is targeted at professional publishers. Over the next several years, Apple plans to move the entire Mac line to the new architecture. As with the transition to the PowerPC processor, the high end will make the transition quickly, the low end will take longer, and PowerBooks will shift last.

Because the first PPCP systems should ship before Copland, Apple's next-generation OS, they'll come with a new, as-yet-unnumbered version of the Mac OS. It will incorporate some low-level tech changes to accommodate the PPCP hardware, but it should look, feel, and work essentially like System 7.5. Applications and utilities that work on today's Power Macs should run equally well on the PPCP models. As in past hardware transitions, some drivers might need updates, but based on testing so far, Apple says, disruption should be minimal.

Current Mac-clone makers are expected to follow suit



Power Computing says it has been working since last summer on PPCP designs under the

code name Project Grail. Jon Fitch, a former Apple distinguished engineer and now vice president of engineering at Power Computing, is leading the project.

with their own PPCP systems. Power Computing says it has been working since last summer on PPCP designs. (Jon Fitch, a former Apple distinguished engineer and now vice president of engineering at Power Computing, was program manager at Apple for what was then the CHRP project; Carl Hewitt, previously a Power Mac software manager at Apple and now Power Computing's director of software engineering, also played a key role in shaping what has become the PPCP standard.)

UMAX Technologies (which recently took over Radius' Mac-clone business) and DayStar Digital also plan to deliver PPCP systems shortly after Apple does. But the real breakthrough, at least from Mac users' perspective, is that dozens of other companies are also expected to

Changing Horses / switching systems

ONE OF THE MOST COMPELLING features of the PowerPC Platform is its ability to support a variety of operating systems. Since most PPCP users are likely to install and run only one OS, the real beneficiaries of the architecture's OS versatility will be the IS departments of organizations that support multiple platforms. They'll now be able to redeploy hardware across departments and facilities even if various operating systems are in use. If, for example, a prepress specialist in a Mac OS-based publishing department gets an improved machine, IS will no longer be limited to Mac-friendly parts of the company when looking for a new use for the old machine. It can instead pass the system over to a new hire in, say,

an NT-based accounting department. Similarly, large organizations that commit to PPCP can reduce their inventories of parts if all departments are using the same hardware.

If you install multiple operating systems, here are some limitations you need to be aware of:

- Each OS must reside on a separate volume.
- Each OS will need its own set of drivers. Unless the driver for a PCI card, for example, loads from firmware on the card itself, you'll have to install driver software in each OS environment in which you plan to use the card.
- You'll have to reboot to switch from one environment to another. Apple's PPCP systems will default to the Mac OS, but the company will provide utilities that let users choose a different

startup system either in advance or at the beginning of the bootup process.

- Older applications written for DOS or Windows 3.1 running on Intel processors will work under Windows NT for PPCP, but only through Windows NT for PPCP's built-in 286 emulator.
- Newer 16-bit Windows applications developed for Intel processors won't run until Microsoft upgrades its emulator to 486 level. Microsoft has not yet announced a timetable.
- The latest 32-bit applications written for Windows 95 and NT running on Intel processors won't run at all on PPCP, even in emulation, unless the developer recompiles the code on the PowerPC — not an easy task, according to developers.

Under the Hood / *technical details*

NEW TECHNOLOGIES were required to give the PowerPC Platform the flexibility to support a variety of unrelated operating systems. Here are the most important:

- **Open Firmware.** PPCP systems will use a relatively new industry standard called Open Firmware to manage the startup process independently of the operating system to be launched. When a user powers on a PPCP machine, code in Open Firmware tests and initializes the system, scanning it to detect all available devices and load configuration information into memory. The code then locates and loads the selected OS, which takes control of the startup process.

- **Run-Time Abstraction Services (RTAS).** This layer of low-level software provides standard interfaces to underlying functions, consequently simplifying OS and device-driver

development. RTAS also enables hardware designers to choose among a variety of functionally equivalent silicon parts — time-of-day clock chips, for example — without burdening each OS with the responsibility of understanding each silicon implementation's specific features.

- **New memory map.** Each OS supported by PPCP assigns different addresses to the system's various components (such as RAM, ROM, and cards). To prevent conflicts, the designers settled on a new map that all the operating systems will use on PPCP systems. This should make no difference to users but does require some changes to the lowest levels of the operating systems.

- **New interrupt model.** Each platform also has its own techniques for sorting out and processing interrupts, the messages the various components of the system send to the CPU to signal that they require attention or have completed a task.

In this area, the PPCP designers adopted the Open PIC standard. A highly programmable interrupt controller implements the Open PIC technology, including backward compatibility with the Intel 8259 interrupt scheme, used in older PCs.

- **Integrated I/O controllers.** For the PPCP project, Apple, IBM, and Motorola designed a new, high-performance bridge chip linking the CPU and PCI buses. Apple also developed a new ASIC to provide support for the ADB, LocalTalk, and SCSI. Both of these new parts will be licensed to leading chip-set vendors to make it easy for hardware developers to implement the PPCP architecture and, in particular, its required Mac I/O functions. A PCI-to-ISA bridge chip and a "super I/O controller" already widely used in the PC world will coordinate PC I/O functions.

launch PPCP systems — in other words, state-of-the-art Mac-compatibles — later this year and early next year. Along with IBM and Motorola, the list already includes Canon, Zenith Data Systems, and IPC Technologies (parent company of Austin Direct).

More companies are expected to enter the race. With PPCP chip sets — the supporting circuitry necessary to implement the architecture — available from well-known suppliers such as National Semiconductor, Motorola, Texas Instruments, and VLSI Technology, new players should be able to design their own systems with relative ease. But if they prefer to come to market with PPCP systems designed by experts, they'll have at least three choices: Power Computing; the Taiwan New PC Consortium, a group of Taiwan-based companies previously known for their PC logic boards; and FirePower Systems, a Canon-funded startup that has offered logic boards for PowerPC-based NT systems to OEM customers for more than a year. Glen Miranker, FirePower's vice president of hardware engineering, says interest on the part of PC vendors in his company's planned PPCP products (primarily high-end systems, starting at around \$3,000) is intense — "kind of frantic, even."


Assuming they comply with the PPCP specification (which will be certified through some as-yet-undefined testing mechanism), products from any of these companies should be fully compatible with the Mac OS, applications, and peripherals. But how many vendors will actually position their machines as Mac-compatibles — for instance, by building in Mac ROMs, preinstalling the Mac OS, and actively advertising their Mac support — remains to be seen. IBM (after some hesitation) and Motorola plan to license the Mac ROMs and OS from Apple; FirePower is negotiating to do likewise.

But some PPCP vendors may focus on marketing their systems as UNIX or NT workstations and servers. And

even those who want a Mac OS license may not be able to get one immediately: "We're trying to get to a selected group of companies first," says Lamar Potts, Apple's vice president of OS and technology licensing. Others, he says, may have to wait until Apple builds up the infrastructure necessary to provide business and technical support to additional licensees.

Potts insists, though, that the company is fully committed to a broad licensing program. According to David Nagel, Apple's senior vice president of research and development, Apple will even allow other vendors to ship the PPCP version of System 7.5 before it does, if the necessary software engineering and testing are complete and another company has PPCP hardware ready to ship while Apple is still polishing up its own offerings.

Besides, any user who buys PPCP hardware, even from a vendor without a Mac OS license from Apple, will be able to install the Mac environment. Although the details have not been worked out, Apple plans to offer its OS in a shrink-wrapped retail package. Mac ROMs will also be available for users whose PPCP systems came with no ROM in the required socket. (One of the design goals for Copland is to eliminate the need for Mac ROMs. When that goal is reached, in either Copland or a subsequent update, system makers as well as users can stop worrying about Apple ROMs and just load the Mac OS from disk, as they do with other operating systems.)

Apple's definitely on the right path with the PowerPC Platform. We can expect more clones, more versatility, and lower prices for systems that can run the Mac OS. But only time will reveal some of the details: Who will ship the first PPCP units? How will Apple handle licensing for the Mac OS? And when will we see an IBM machine running the Mac OS? 

Henry Norr is editor emeritus of *MacWEEK*.

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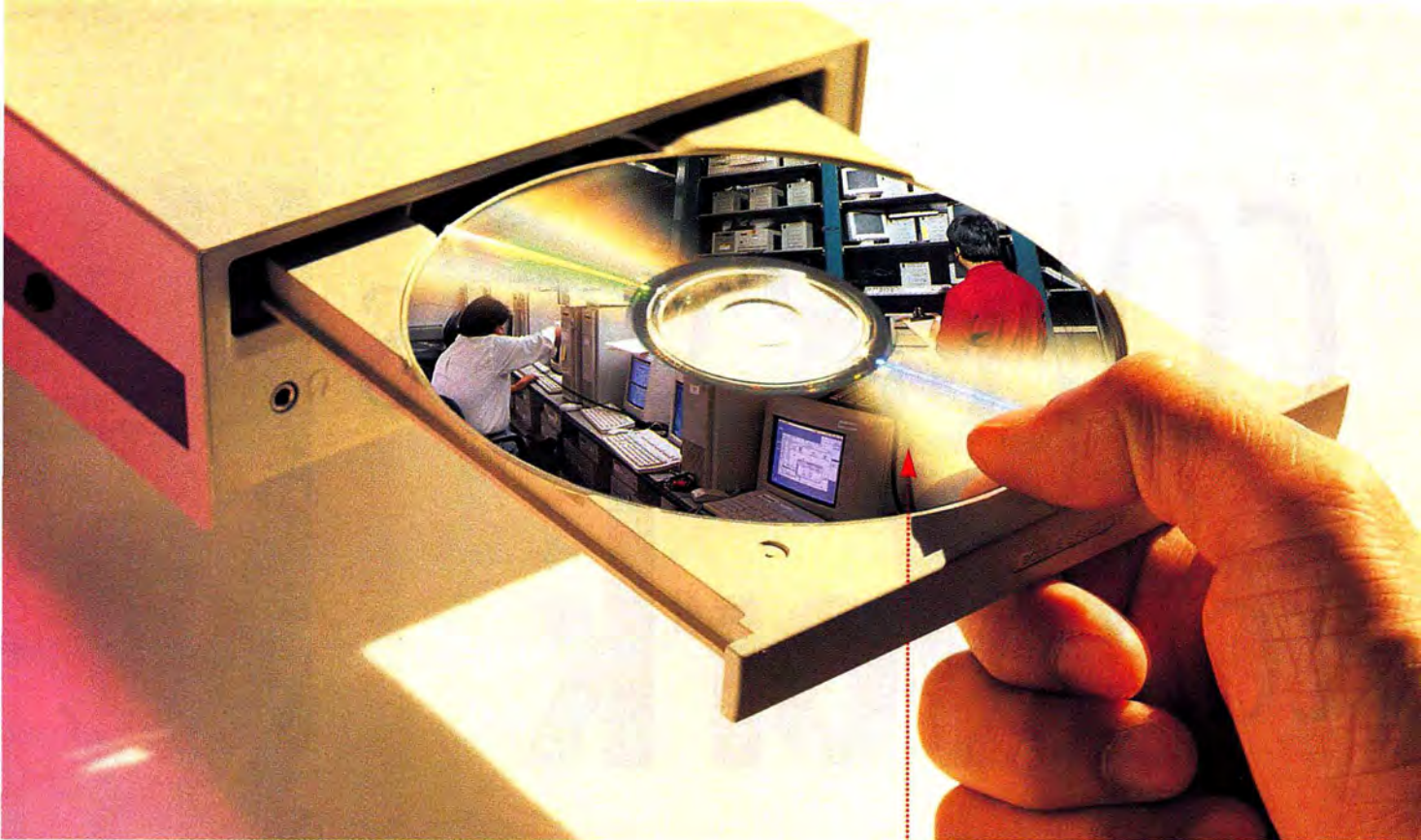
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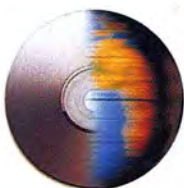
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COLOR goes to **Work**

You know that adding color to your documents makes them stand out. But which color printer is right for *your* business?

LET'S FACE IT — color charts and presentations are better-looking and far more persuasive than black-and-white ones. And if your business is already producing a ton of color files and sending them to a print shop for output, you know how expensive *that* can be. So maybe it's time to invest in a color printer. In the long run, the investment may save you both time and money.

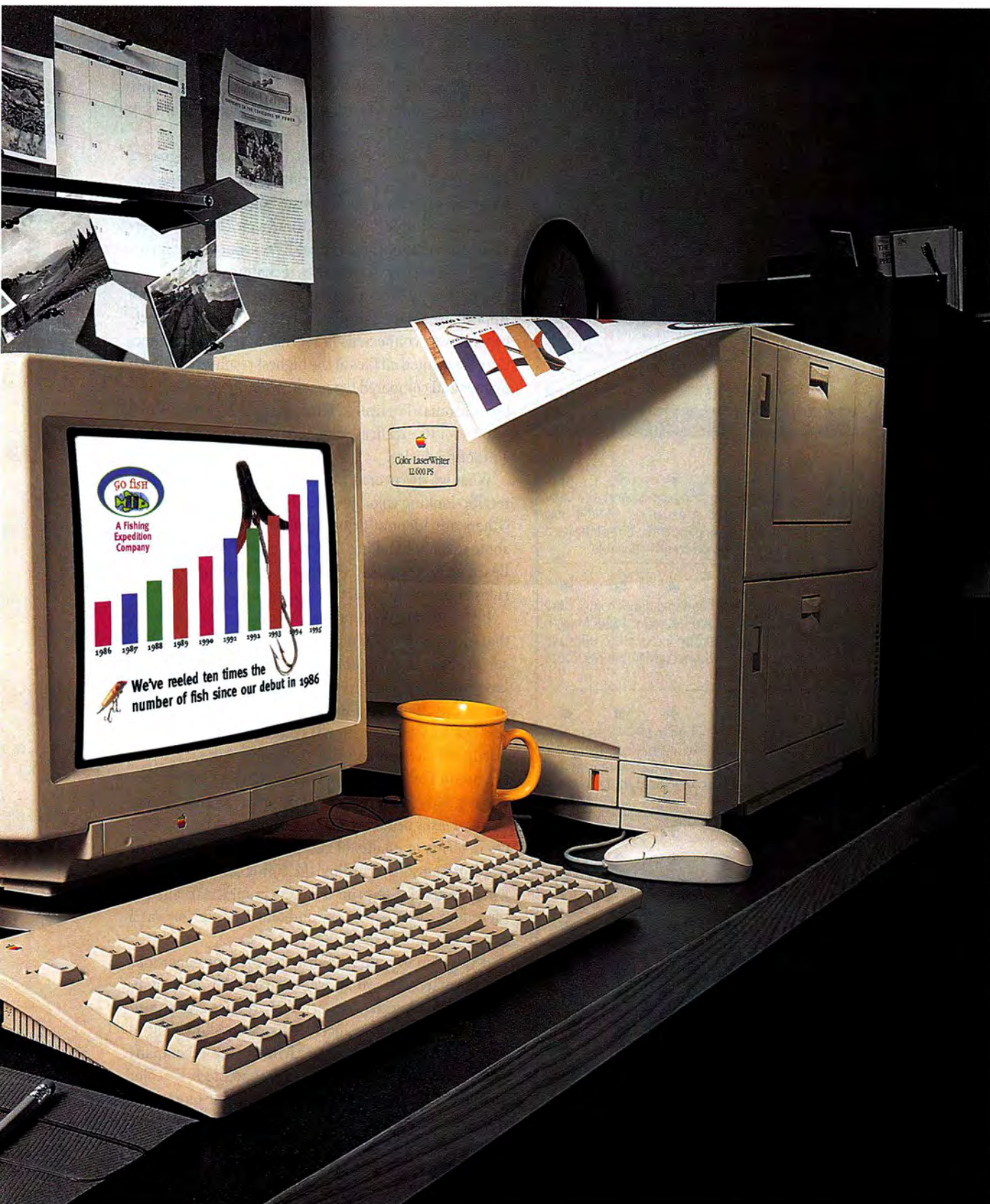
But which color printer should you buy? With a variety of print technologies to choose from and with prices ranging from less than \$500 to more than \$10,000, selecting the right color printer these days is easier said than done. In addition to print technology and price, there are other factors to consider as well — print quality, speed, cost of consumables and paper, and ease of setup and use.

To help you make an informed decision and a smart buy, we tested 15 color printers and rated them according to speed, output quality, price, and vendor support. Because most business

BY ROMAN LOYOLA



PHOTOGRAPHY / MICHAEL LAMOTTE



printers are shared among workgroups, we tested printers that can be connected to a network, either through built-in connectors or via a host Macintosh. Some of the printers we tested come with built-in PostScript, others print with software PostScript RIPs, and one uses QuickDraw and relies on the host Mac to do the image processing. By the time we were finished, we had tested printers from each of the print-technology categories suitable for business — inkjet, thermal-wax, solid-ink, and laser.

IMAGE IS EVERYTHING

If you were to spend any time testing color printers, you'd quickly find, as we did, that the types of documents you print will carry the most weight in determining which printer is right for you. That's because, when it comes to output quality, document A produced with print technology B may look stunning whereas the same document produced with print technology C may look disastrous.

To rate the printers' output quality, we designed a suite of tests that involved printing a variety of document types. Our test files consisted of a Word document containing simple line art, text, and a pie chart; a PowerPoint presentation; and a QuarkXPress document incorporating a variety of elements, including a color photographic image. We connected most of the printers to an Apple Power Mac 7500 via Ethernet; those not Ethernet-capable were connected via a serial or LocalTalk connection. We printed all files at the highest resolution on each printer and compared the results with those of the New-Gen Chromax Pro dye-sublimation printer, which is well known for its excellent color accuracy and popularity as a proofing device.

What we discovered was that some printers produce terrific-looking color graphics but print lackluster text. Others are adept at printing color transparencies, and some excel at handling heavy stock and colored paper. Based on our experiences, we've compiled some general rules of thumb for selecting a printer.

If you plan to print primarily text-heavy documents that incorporate color charts, your best bet is a color laser printer. Among those we tested, the Apple Color LaserWriter 12/600 PS, with its overall outstanding output quality, impressed us the most. Fine line detail and text quality were exceptional, colors were rich and saturated, and the printer's dot pattern was the least pronounced of all the laser printers'. But don't expect top-notch quality when you're printing photographic images — color laser printers can't come close to dye-sub printers in terms of quality of continuous-tone images. One word of caution regarding the Xerox XPrint 4925 — when we used it to print business graphics, it failed to reproduce colors accurately and font substitution was a common occurrence.

If you plan to print primarily business presentations on transparencies, you'll want to consider a thermal-wax printer. Thermal-wax printers produce richly saturated color that's translucent enough to allow light to pass through. And if you want handouts to accompany your overheads, you won't be disappointed — color quality on special paper is also excellent. The one area in which thermal-wax printers consistently come up short, however, is in text quality — large type generally comes out looking OK, but fine type tends to lose detail.

Of the thermal-wax printers we tested, we give the nod to the Tektronix Phaser 240. Several factors related to image quality made this printer stand out. The color

THE BOTTOM LINE

A COLOR PRINTER is an important investment for your business — that's why we looked not only at output quality and speed but also at support and price. Each print technology and output device has its strengths and weaknesses, so examine your requirements carefully before you make your final decision. Three of the printers we tested proved to be of exceptional value.

+ / OUTSTANDING		● / ACCEPTABLE		- / POOR	
RATING	PRODUCT	PRICE	SUPPORT	OUTPUT QUALITY	SPEED



★★★★ Apple Color LaserWriter 12/600 PS (L)

A standout in speed, output quality, and tech support, the Color LaserWriter 12/600 PS (estimated street price, \$6,989) may seem pricey, but it has a low cost per page and is one of the least expensive of the color laser printers currently available.

- + + +



★★★★ HP DeskJet 1600CM (I)

Good output quality on plain paper and speed that comes close to that of a color laser printer make the DeskJet 1600CM (estimated street price, \$1,999) a solid buy for small to midsized workgroups. It comes with an HP JetDirect card for connecting to EtherTalk or LocalTalk networks.

● ● ● +



★★★★ Tektronix Phaser 240 (T)

Rich deep color that's translucent enough to allow light to pass through is a hallmark of the Phaser 240 (estimated street price, \$3,350), a good choice if you print lots of transparencies and handouts for presentations. Color accuracy and smooth gradations are added pluses.

● + ● ●

★★★★	Tektronix Phaser 340 (S)	-	+	●	+
★★★★	Tektronix Phaser 550 (L)	-	+	+	+
★★★★	Epson Stylus Pro (I)	+	+	+	-
★★★★	General Parametrics Spectra*Star 240 (T)	●	●	●	●
★★★★	General Parametrics Spectra*Star 280 (T)	●	●	●	●
★★★★	HP DeskJet 850C (I)	+	●	●	-
★★★★	Lexmark Optra C (L)	-	●	●	+
★★★★	QMS magicolor CX/32 (L)	-	●	●	+
★★★★	Lexmark Color Jetprinter 4079 plus (I)	●	●	●	-
★★★	Fargo Pictura 310e (T)	-	●	-	-
★★	Xerox XPrint 4925 (L)	-	●	-	+

I = INKJET L = LASER S = SOLID-INK T = THERMAL-WAX

NOTE: WE WERE UNABLE TO RATE THE FARGO PRIMERA PRO, BECAUSE IT COULD NOT COMPLETE OUR SPEED TESTS.

LISTING IS ALPHABETICAL WITHIN GROUPS OF EQUAL MOUSE RATINGS.

gradations it printed were the smoothest of *all* those produced by the printers we tested, and we experienced no registration problems. We also found this Tektronix printer's color accuracy to be superior to that of the other thermal-wax printers.

If your printing needs go beyond using standard 20-pound stock, you'll like the flexibility of the Tektronix 340, a special type of solid-ink printer. It produces good-looking results on colored paper, card stock, glossy paper, and plastic sheets. Solid-ink printers can maintain color consistency no matter what the medium — yellow still looks yellow, for example, even when printed on blue paper. Text printed with the Tektronix 340, however, isn't as sharp as that of a color laser printer, and fine lines in line art tend to be on the heavy side.

Something of an anomaly in the thermal-wax-printer category, the Fargo Pictura 310e can print on tabloid-sized paper and can print in dye-sub as well as in thermal-wax mode. Because dye-sub printers are mainly used by graphics pros for color proofing, rather than for producing business documents, we didn't test either of the Fargo printers in dye-sub mode. Overall, we found the switch-hitting Pictura 310e's output disappointing — colors looked faded, registration was poor, and text appeared ragged.

With their versatility and affordability, inkjet printers

are the most logical choice for small businesses on a budget. Although you can save money by printing on plain paper, you'll get the best-looking results if you use the special coated media provided by the printer vendor (which costs more than plain paper, of course). The coating on the special media helps prevent the ink from spreading once it's fired onto a page. Granted, some printers, such as the HP DeskJet 1600CM, have a built-in heater for drying the output, so they're able to achieve good results on plain paper, with only minimal paper wrinkling.

If it's important to be able to print PostScript files and share your inkjet printer on a network, your choice is narrowed to either the HP DeskJet 1600CM or the Lexmark Color Jetprinter 4079 plus — of the inkjet printers we tested, these were the only two equipped with PostScript and Ethernet.

FAST TO THE FINISH

How quickly you can get your hands on a printed document is almost as important as how it looks — especially if you're working on a presentation that was due yesterday. In our speed tests, we used Ethernet whenever possible and printed our test documents at the highest resolution on each printer.

When it comes to speed, the color laser printers lead



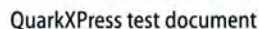
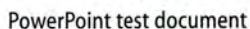
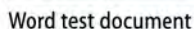
Speed-Testing Color Printers for Business

The fastest printers we tested were the color laser printers, with the Lexmark Optra C in the winner's circle. Not surprisingly, the inkjet printers, as a class, were the slowest. Unfortunately, a PCI Mac-specific bug in the Fargo Primera Pro's driver prevented the printer from completing our speed tests.

	WORD (TEXT ONLY)	WORD (TEXT AND COLOR GRAPHICS)	POWERPOINT (PAPER)	POWERPOINT (TRANSPARENCY)	QUARKXPRESS (COMPLEX DOCUMENT)
	This 20-page test document uses a ROM-resident font. It tests the raw engine speed of the printer for black-and-white printing.	This 2-page document contains downloadable fonts, a pie chart, clip art, and a logo.	Printed on paper, this 4-page document tests the printer's color saturation for whole pages.	Printing on transparencies has the universal effect of lengthening print times.	Printing this 1-page document gives a good indication of how quickly a printer can handle complex files.
MACUSER BEST BUY BEST PERFORMER IN EACH TEST I=inkjet L=laser S=solid-ink T=thermal-wax					
Lexmark Optra C (L)	2:14	1:44	2:18	2:11	3:13
Tektronix Phaser 550 (L)	3:39	1:47	2:35	3:45	1:44
QMS magicolor CX/32 (L)	4:13	2:08	4:05	2:26	1:59
Xerox XPrint 4925 (L)	2:36	2:40	2:51	2:46	5:12
Tektronix Phaser 340 (S)	11:18	1:39	3:01	1:20	1:38
✓ Apple Color LaserWriter 12/600 PS (L)	2:56	3:02	5:29	3:33	4:08
✓ HP DeskJet 1600CM (I)	3:44	2:37	5:33	7:46	2:49
General Parametrics Spectra*Star 280 (T)	22:19	2:39	4:54	2:35	2:11
General Parametrics Spectra*Star 240 (T)	22:28	3:33	5:12	2:50	2:55
✓ Tektronix Phaser 240 (T)	30:25	3:46	7:29	3:16	2:48
Lexmark Color Jetprinter 4079 plus (I)	50:18	7:14	18:31	9:38	6:02
HP DeskJet 850C (I)	10:30	8:09	57:02	23:52	10:29
Fargo Pictura 310e (T)	92:12	10:52	17:27	9:10	6:05
Epson Stylus Pro (I)	173:22	22:16	51:50	10:55	14:52
Fargo Primera Pro (T)	*	*	*	*	7:06
	MINUTES	MINUTES	MINUTES	MINUTES	MINUTES

* Unable to finish test.

Microsoft Word document containing text and simple charts and a logo; a Microsoft PowerPoint presentation containing business charts and graphics, for printing on both paper and transparency; and a QuarkXPress document that incorporated a variety of elements.



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Smooth-looking characters at 600 dpi are the hallmark of color laser printers. Shown here is text printed at 600 dpi by the **Tektronix Phaser 550**.

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PRESENTATIONS



Excellent color saturation, smooth gradients, and good registration make thermal-wax printers a good choice for printing presentations on transparencies as well as paper. Shown here is output from the **Tektronix Phaser 240**.



Ghosting in our PowerPoint test document was a problem with the **QMS magicolor CX/32** color laser printer.



The **Epson Color Stylus Pro** produced bright, well-saturated graphics, but waiting for it to finish printing took patience. It took almost one hour to print our four-page PowerPoint presentation on paper.

PHOTOGRAPHIC IMAGES



Exceptional image detail and color quality made the **Apple Color LaserWriter 12/600 PS** our top choice for a business color printer. Line art and text were also of excellent quality.

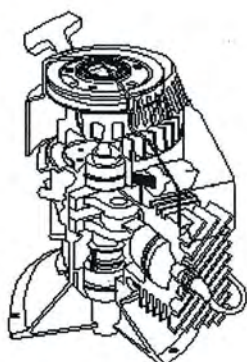


A pronounced magenta shift and black that looked more like dark brown marred output from the **Lexmark Optra C** laser printer.



Good image detail in photographic images is a strength of the low-cost **Epson Stylus Pro** inkjet printer. We used the software PostScript RIP on this printer, which costs an extra \$250.

EPS FILES



EPS files were problematic for the **HP DeskJet 850C** QuickDraw inkjet printer. You can get around this problem by buying HP's software PostScript RIP.



Our QuarkXPress document was the only test file the **Fargo Primera Pro** was able to print completely. And overall, we were disappointed with the output. Some line segments in the engine drawing aren't visible, and the ones you can see aren't very smooth.

the pack. Five of our six overall top finishers — the Lexmark Optra C (the overall fastest printer we tested), Tektronix Phaser 550, QMS *magicolor* CX/32, Xerox XPrint 4925, and Apple Color LaserWriter 12/600 PS — were color laser printers. The sixth printer, the solid-ink Tektronix Phaser 340, was very similar to Apple's color laser printer in overall speed.

At the opposite end of the spectrum, the slowest performer, by far, was the Epson Stylus Pro inkjet printer. The Epson printer's sluggish speed can be attributed to its high maximum resolution, 720 dpi. Granted, you'll probably want to discount the speed results we got printing our 20-page text-only document with the Epson printer at the 720-dpi resolution required by our test suite — the printer's 360-dpi setting would be more than adequate for text and would be faster. But even with graphics pages, the Epson printer was quite a bit slower overall than the other printers we tested. On the other hand, it does produce gorgeous-looking output for the price.

We encountered several problems in testing the Fargo Primera Pro, Fargo's standard-sized thermal-wax/dye-sub printer. The driver had a bug specific to PCI-based Macs that prevented the printer from producing more than one page at a time, so we were unable to get complete speed-test results. According to Fargo, a fix should be available by the time this article appears.

EASY TO ASSEMBLE

A business color printer should be relatively easy to set up, use, and maintain. Not surprisingly, the inkjet printers we tested — the Epson Stylus Pro, Lexmark Color Jetprinter 4079 plus, and HP DeskJet 850C and 1600CM — boast the easiest setup. To install the ink cartridges, you simply snap them into place inside the printer.

The thermal-wax printers we tested — the Fargo Primera Pro and Pictura 310e, General Parametrics Spectra*Star 240 and 280, and Tektronix Phaser 240 — require a little more attention. Thermal-wax printers use a ribbon containing separate panels of cyan, magenta, yellow, and sometimes black. When you install the ribbon, you must make sure it's facing in the proper direction and is well seated inside the printer.

Of all the printers we worked with, the color laser printers were the most laborious to set up, due to the number of components that must be put in place. Each printer uses separate cyan, magenta, yellow, and black toner cartridges. Some vendors, however, make it easier than others to get the toner cartridges into the printer — the Apple and Lexmark printers, for example, have a handy carousel that revolves to accept each cartridge in turn. All the color laser printers also require installation of a fuser unit, but the QMS and Xerox printers have an additional piece to wrestle with — their photoconductors are separate from the toner cartridges.

Features of Color Business Printers

	✓ Apple Color LaserWriter 12/600 PS	Epson Stylus Pro	Fargo Pictura 310e	Fargo Primera Pro	General Parametrics Spectra*Star 240	General Parametrics Spectra*Star 280	HP DeskJet 850C
Estimated street price	\$6,989	\$599	\$4,995	\$1,695	\$2,795	\$3,300	\$499
Price as tested	\$6,989	\$849*	\$5,995*	\$1,895*	\$2,795	\$3,650	\$499
Print technology	laser	inkjet	thermal-wax [†]	thermal-wax [†]	thermal-wax	thermal-wax	inkjet
Maximum color resolution	600 x 600 dpi	720 x 720 dpi	300 x 300 dpi	600 x 300 dpi	300 x 300 dpi	600 x 300 dpi	300 x 300 dpi
RAM (standard, maximum)	12 MB, 40 MB	NA	NA	NA	6 MB, 24 MB	10 MB, 24 MB	NA
RAM (as tested)	12 MB	NA	NA	NA	6 MB	10 MB	NA
Engine speed (color)	3 ppm	1 ppm	4 mpp [‡]	1.5 ppm	2 ppm	2 ppm	1 ppm
Ethernet	standard	\$499	standard	\$499	\$795	\$795	\$369
Built-in PostScript	●				●	●	
Prints on plain paper	●	●			●	●	●
Toll-free tech support	●	●			●	●	
Warranty	1 year	2 years	1 year	1 year	1 year	1 year	1 year
Company	Apple Computer Cupertino, CA 800-776-2333 408-996-1010 800-505-0171 (fax)	Epson America Torrance, CA 800-289-3776 310-782-0770 310-782-5200 (fax)	Fargo Electronics Eden Prairie, MN 612-941-9470 612-941-7836 (fax)	Fargo Electronics Eden Prairie, MN 612-941-9470 612-941-7836 (fax)	General Parametrics Berkeley, CA 800-223-0999 510-524-3950 510-524-9954 (fax)	General Parametrics Berkeley, CA 800-223-0999 510-524-3950 510-524-9954 (fax)	Hewlett-Packard Palo Alto, CA 800-752-0900 415-857-1501 800-333-1917 (fax)

✓ MacUser BEST BUY

*Includes cost of software RIP.

[†]Dye-sub mode also available.

[‡]1,200-x-1,200-dpi option available.

[§]Thermal-wax tabloid page rated.

HIDDEN COSTS

Before you empty your wallet for a color printer, be sure to factor in the cost of supplies. The cost of printing a single color page can vary from a few cents to several dollars, depending on the type of printer you use.

At face value, inkjet printers seem pretty affordable, but the price of consumables can add up. The Epson printer, for example, is one of the least expensive printers we tested. But to print at 720 dpi, you must use Epson's special paper, which costs \$25 for 200 sheets. Factor in \$35 for a color-ink cartridge and \$17 for a black-ink cartridge, and your cost per page adds up to about 20 cents. And because cyan, yellow, and magenta inks are contained in a single cartridge, you have to replace the entire cartridge if one color runs out.


After dye-sub prints, thermal-wax prints are the most expensive per page, costing about \$1. A thermal-wax ribbon can print, on average, about 350 pages, and a replacement ribbon will set you back about \$170. For optimal print quality, you'll want to use special media, at a cost of about 60 cents per sheet. True, some thermal-wax printers *can* print on plain paper, but you probably won't like the results — on plain paper, thermal-wax output often looks dull and faded. Because color laser printers can print successfully on plain paper, their cost per page is the cheapest — only about 8 cents — which helps offset the printers' expensive purchase prices.

FIT TO PRINT

After we had poked and prodded each of the 15 printers we tested, scrutinized their output, and analyzed their price/performance ratios, we were able to come up with several clear recommendations for business buyers.

If you're like most business users, the documents you print are primarily text-based and incorporate some charts and clip art. If that's the case, you can't go wrong with the Apple Color LaserWriter 12/600 PS. It's speedy enough to serve an entire workgroup, and it produces some of the best-looking color output we've seen for business graphics. Text quality is also outstanding.

The Tektronix Phaser 240 thermal-wax printer is excellent for churning out color transparencies and handouts for presentations. Color accuracy, saturation, and registration are very good, although it's not as fast as some of the other printers.

Businesses on a budget will want to take a close look at the HP DeskJet 1600CM inkjet printer. Compared to the cost of most of the printers we tested, its up-front purchase price is relatively affordable, and the cost per page is low. It comes with PostScript Level 2 and a built-in network card for connecting to EtherTalk and LocalTalk networks. 

MacUser assistant editor Roman Loyola is convinced that his color presentations in school are what got him better grades than those of the students who had black-and-white charts. MacUser Labs project leader Rick Oldano managed the testing for this report.

✓ HP DeskJet 1600CM	Lexmark Color Jetprinter 4079 plus	Lexmark Optra C	QMS magicolor CX/32	✓ Tektronix Phaser 240	Tektronix Phaser 340	Tektronix Phaser 550	Xerox XPrint 4925
\$1,999	\$2,699	\$6,400	\$7,999	\$3,350	\$4,950	\$6,995	\$8,546
\$1,999	\$3,698	\$9,198	\$7,999	\$5,130	\$7,390	\$7,590	\$10,493
inkjet	inkjet	laser	laser	thermal-wax	solid-ink	laser	laser
300 x 300 dpi	360 x 360 dpi	600 x 600 dpi	600 x 600 dpi	600 x 300 dpi	600 x 300 dpi	600 x 600 dpi ⁸	600 x 600 dpi
6 MB, 70 MB	4 MB, 36 MB	8 MB, 64 MB	32 MB, 32 MB	5 MB, 21 MB	8 MB, 24 MB	8 MB, 72 MB	24 MB, 48 MB
6 MB	12 MB	64 MB	32 MB	13 MB	24 MB	8 MB	48 MB
2 ppm	1 ppm	3 ppm	6 ppm	1 ppm	4 ppm	4 ppm	3 ppm
standard	\$369	\$369	standard	\$595	\$595	\$595	\$548
●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●
			●	●	●	●	●
1 year	1 year	1 year	90 days	1 year	1 year	1 year	3 years
Hewlett-Packard Palo Alto, CA 800-752-0900 415-857-1501 800-333-1917 (fax)	Lexmark International Lexington, KY 800-891-0331 606-232-2000 606-232-2380 (fax)	Lexmark International Lexington, KY 800-891-0331 606-232-2000 606-232-2380 (fax)	QMS Mobile, AL 800-523-2696 334-633-4300 334-633-4866 (fax)	Tektronix Wilsonville, OR 800-835-6100 503-682-7377 503-682-2980 (fax)	Tektronix Wilsonville, OR 800-835-6100 503-682-7377 503-682-2980 (fax)	Tektronix Wilsonville, OR 800-835-6100 503-682-7377 503-682-2980 (fax)	Xerox Rochester, NY 800-349-3769 716-422-4028 716-422-1339 (fax)

QUICK



LABS

Xerox Printer Means Business • Wide-SCSI Hard Drives • A Winner from ViewSonic

DRUMROLL, PLEASE . . . “Ladies and gentlemen, introducing the newest addition to Quick Labs — Wide-SCSI hard drives!” And no, we don’t mean hard drives with girth. We’re talking drives that use a wider data bus than standard ones do. The reason for adding the new category? We wanted to address the growing need for fast data throughput, important to those who manipulate large files or use graphics-intensive applications. This month’s two contenders stand out not only for their impressive performance but also for their excellent case design.

Wide-SCSI hard drives isn’t the only new category you’ll find in Quick Labs this year. For future issues, we’re exploring the possibility of adding modems and

removable-media drives. Of course, we’ll also continue to keep track of our usual fare: monitors, standard-SCSI hard drives, low-cost color inkjet printers, and monochrome printers.

For this issue, we tested six new monitors and a new monochrome laser printer. All but one of the monitors follow a trend that gets our stamp of approval — they sport digital on-screen settings that are easy to use and that offer lots of image control. The one surprising exception comes from Apple. In the printer category, Xerox’s latest offering *looked* promising, but in the end, it left us lukewarm. Output quality was quite good, but we had problems with the printer’s driver.



ONE NEW WORKGROUP PRINTER

The \$2,550 Xerox DocuPrint 4517mp monochrome laser printer seems to offer a combination of good output quality, speed, and paper-handling options. Its specs look promising for a workgroup printer: a 17-ppm company-rated engine, a paper-tray capacity of 250 sheets, 6 MB of RAM, built-in Ethernet, and resolutions of 1,200 x 600 dpi as well as 600 x 600 dpi.

But our testing was hampered by problems with the bundled On Page driver — complex files failed to print via Ethernet. We were able to get around the problem by switching to the LaserWriter 8 driver, but according to Xerox, you need the On Page driver if you want to be able

to take full advantage of the printer’s paper-handling capabilities. The driver also provides useful utilities for downloading fonts and PostScript files and for remote configuration of the printer’s settings.

As we went to press, Xerox released an updated driver that the company claims fixes the problems we encountered, which are specific to PCI Macs. If the DocuPrint 4517mp you bought doesn’t have the updated driver, you can download it from Xerox’s bulletin-board service.

The output we got using the LaserWriter driver was quite good. Text quality was excellent, thanks to Xerox’s use of the DP Tek

TrueRes resolution-enhancement technology. Line art looked good at 600 dpi (although we noticed dropouts at 1,200 x 600 dpi), and grayscale quality benefited from the DocuPrint 4517mp’s 144-lpi line screen.

The DocuPrint 4517mp is definitely fast enough for a workgroup printer. It also sports a small footprint and a slew of paper-handling options, including a mailbox-collator (\$1,099), a 500-sheet paper tray (\$115), and a duplex module (\$399). When and if Xerox releases a Mac version of its Novell NetWare-only network software, the DocuPrint 4517mp should be an attractive choice for Mac workgroups.

REVIEWER / ROMAN LOYOLA TESTING / JIM GALBRAITH

+ / OUTSTANDING • / ACCEPTABLE - / POOR			ESTIMATED STREET PRICE	COLOR OR MONOCHROME	TECHNOLOGY	RESOLUTION	WARRANTY	TEXT QUALITY	GRAPHICS QUALITY	PAPER HANDLING	SUPPORT	COMMENTS	PAGES PER MINUTE
+++			\$2,550	monochrome	laser	1,200 x 600 dpi	3 years	+	+	•	•	Performance marred by driver problems.	0 6 12

FASTER



TWO NEW HARD DRIVES AND A NEW PRODUCT CATEGORY

Standard-SCSI hard drives use an 8-bit data path, but Wide-SCSI hard drives use a 16-bit data path, which makes them ideal for users who work with extremely large files and need the extra speed that comes from a wider data path.

This new product category requires a new set of Quick Labs tests. A Wide-SCSI drive uses a Wide-SCSI card instead of the Mac's built-in SCSI interface; for our tests, we installed an ATTO

ExpressPCI-MC card in our test Power Mac. We also used MacBench 3.0, but in place of the Disk Mix test, we used the Publishing Disk Mix test, which involves larger file sizes and more-complex tasks. That means we can get a better profile of a Wide-SCSI drive's speed.

The first two Wide-SCSI drives to appear in Quick Labs are from Microtech's BLUE series. The Microtech BLUE Storm 2GB Wide and 4GB Wide are excellent performers that have the same

case design — a sturdy, stackable plastic enclosure with a useful LCD panel that lets you set the SCSI ID, turn the drive on and off, spin the disk up or down, or display Microtech's tech-support phone number.

All MacBench 3.0 Publishing Disk Mix scores are relative to that of a 1-GB Quantum internal drive in a Power Mac 7500/100, which has a score of 10.

REVIEWER / ROMAN LOYOLA TESTING / JIM GALBRAITH

+ / OUTSTANDING ● / ACCEPTABLE - / POOR			ESTIMATED STREET PRICE	WIDE SCSI	FORMATTED CAPACITY	PRICE PER MEGABYTE	WARRANTY	CASE	SOFTWARE/MANUALS	SUPPORT	COMMENTS	MacBench 3.0 Publishing Disk Mix Score
★★★★	Microtech BLUE Storm 2GB Wide		\$1,385	yes	1,904.5 MB	\$.73	5 years	+	●	+	Gets top marks for its industrial case design.	18
★★★★	Microtech BLUE Storm 4GB Wide		\$1,650	yes	3,931.3 MB	\$.42	5 years	+	●	+	Similar to 2-GB version but has a lower price per megabyte.	18



SIX NEW MONITORS

With all our experience testing monitors, we've come to expect a degradation in image quality when we work with large-screen models. But we were in for a surprise with this month's top performer, the 21-inch ViewSonic PT810 (pictured). It boasts image quality so good that even demanding graphics artists and desktop publishers will be pleased. Another plus is the monitor's vast array of easy-to-use on-screen controls. The other large-screen monitor we looked at this month, the Apple Multiple Scan 20 Display, also provides good image quality,

but it doesn't offer on-screen controls. If you're running the latest version of System 7.5, however, you'll be glad to know that you already have the monitor's software installed.

The four 17-inch monitors we tested all have on-screen controls, but to varying degrees. The Mag InnoVision DX1795's controls are part physical, part software — the buttons on the monitor have to be in the correct mode before you can make any adjustments via the software. The Optquest V775's software controls are easy to access, but they aren't as intuitive to operate

as they could be. The Princeton Ultra 17+ uses analog brightness and contrast controls, but all of its other controls are digital. And the Sampo AlphaScan 17gx's software and button controls get the job done, but the monitor lacks a color-temperature adjustment.

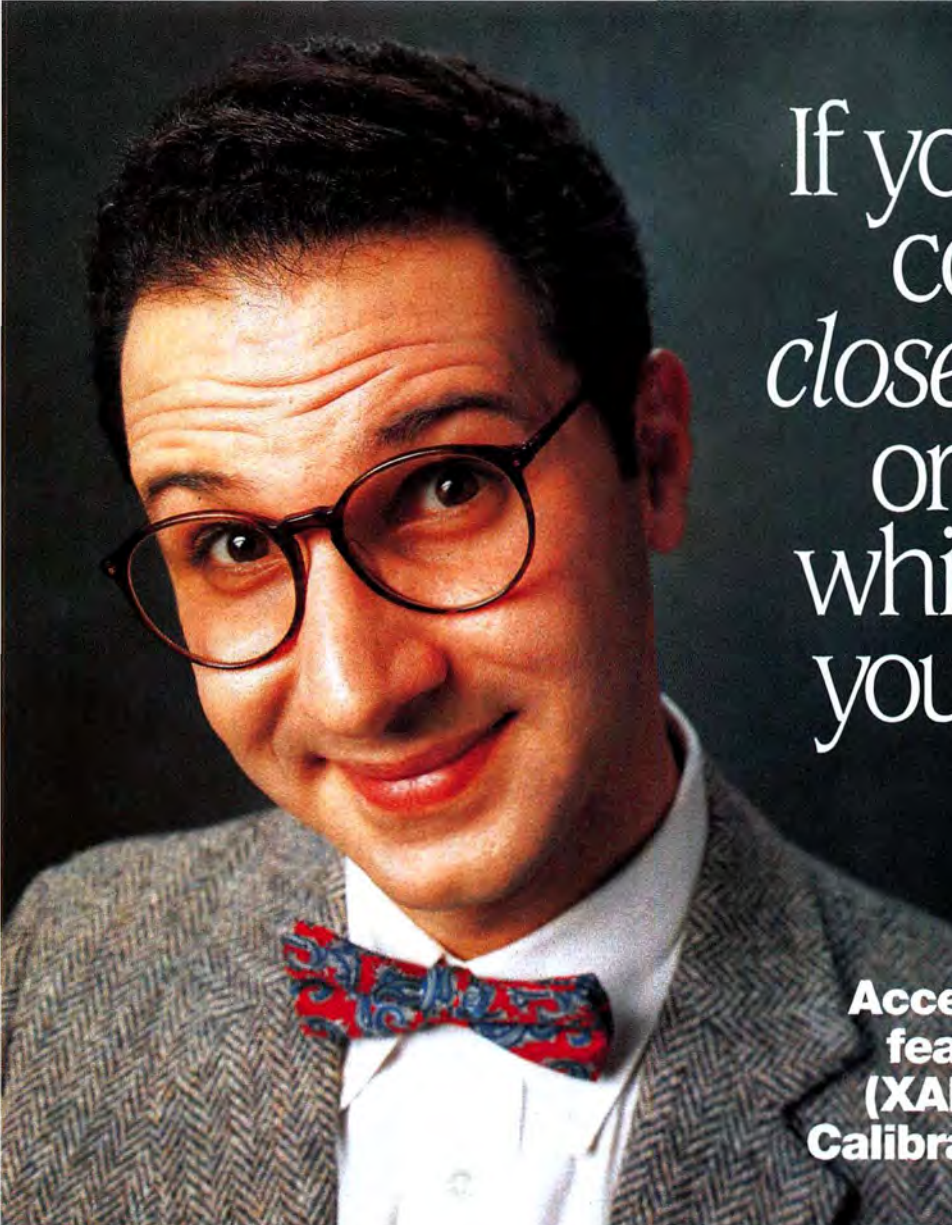
Our image-quality scores reflect the results of our tests for image sharpness, focus, brightness, uniformity, pincushioning, color range, color accuracy, and vibrancy. A score of 1.0 is considered acceptable.

REVIEWER / ROMAN LOYOLA TESTING / MARTIN WONG

+ / OUTSTANDING ● / ACCEPTABLE - / POOR			ESTIMATED STREET PRICE	SCREEN SIZE	MAXIMUM RESOLUTION	WARRANTY	MANUALS	SUPPORT	CONTROLS	COMMENTS	IMAGE-QUALITY SCORE
★★★★	ViewSonic PT810		\$2,250	21 in.	1,600 x 1,200 pixels	3 years	+	+	+	A very good high-end monitor for DTP.	1.5
★★★★	Apple Multiple Scan 20 Display		\$2,149	20 in.	1,280 x 1,024 pixels	1 year	+	●	●	Good image quality, but controls need improvement.	1.4
★★★★	Mag InnoVision DX1795		\$740	17 in.	1,280 x 1,024 pixels	2 years	●	●	●	Control navigation isn't as intuitive as it could be.	1.3
★★★★	Optquest V775		\$795	17 in.	1,600 x 1,200 pixels	3 years	●	●	●	Well-designed on-screen controls.	1.2
★★★★	Sampo AlphaScan 17gx		\$729	17 in.	1,152 x 870 pixels	2 years	-	●	●	Basic button layout that's easy to use.	1.1
★★★★	Princeton Ultra 17+		\$700	17 in.	1,280 x 1,024 pixels	2 years	●	●	●	An affordable, average-performing monitor.	1.0

LISTING IS ALPHABETICAL WITHIN GROUPS OF EQUAL MOUSE RATINGS.

GET INFO / Apple Computer 408-996-1010 Mag InnoVision 714-751-2008 Microtech International 203-468-6223 Optquest 909-468-3750 Princeton Graphic Systems 714-751-8405 Sampo Technology 770-449-6220 ViewSonic 909-869-7976 Xerox 716-422-4028



If your output
could be
close to perfect
or perfect,
which would
you choose?

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Calibration Technology)**

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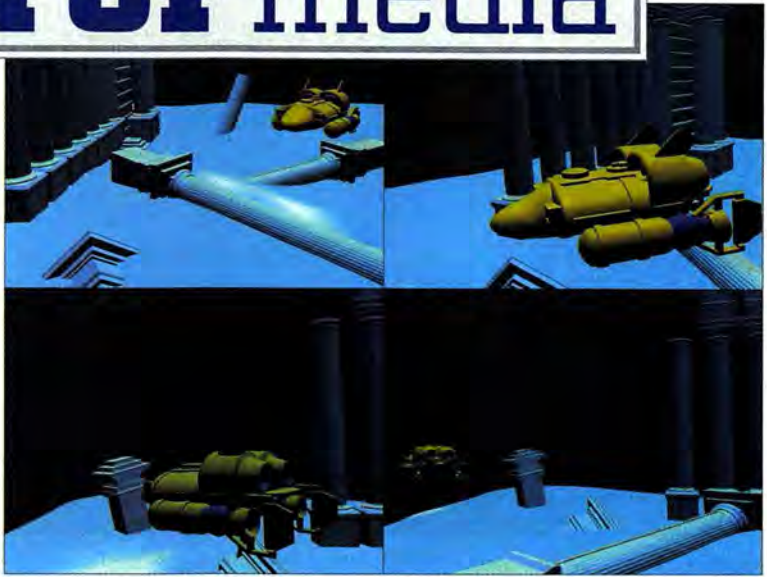
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Adobe PostScript

DESKTOPmedia

If you're not already using QuickDraw 3D, you can expect to soon. Here are some changes to anticipate in the way you work.



By Sean J. Safreed

QuickDraw 3D Takes Off

EYE-CATCHING 3-D ANIMATION is responsible for such lively effects as bringing toys to life, zooming spaceships through screen space, and allowing you to virtually step through your Mac's screen in order to explore an ancient castle. The time-consuming nature of three-dimensional graphic design has made such spectacles slow to arrive — and display — on many users' desktops. But Eddy Award-winning QuickDraw 3D, introduced by Apple last August, is speeding things up considerably. This new standard means that developers don't have to write as much code, designers get smoother 3-D motion, and everybody gets to see more cutting-edge 3-D design. If you create 3-D designs or simply want to view 3-D graphics — on educational CD-ROMs, the Internet, or in games, for instance — it's time to look into QuickDraw 3D.

QuickDraw 3D: A Quick Overview

QuickDraw 3D takes advantage of the Power Mac's horsepower (sorry, 68040-and-earlier folks) to provide three new features: an interactive 3-D renderer (for turning 3-D data into a 2-D image) that all applications can use; a

standard file format called 3DMF (3D metafile format), for transferring 3-D data from one program to another; and a plug-and-play architecture for add-ons such as software plug-ins and cards that accelerate 3-D-game play. These features are freely available, since Apple includes QuickDraw 3D in the system software for new Power Macs (see figure 1). You can find it in the Apple support areas on online services and on the Net (<http://www.info.apple.com/qd3d>). And unlike with QuickDraw GX, QuickDraw 3D is attracting significant support from vendors as well as interest from designers.

Benefits for Designers

If you're a designer, QuickDraw 3D can make your life easier in a couple of ways. First of all, you get a faster renderer. Second, you get a file format that makes importing and exporting 3-D data easier — or will make it easier, once applications support *all* of this format's features.

QuickDraw 3D's renderer is as good as if not better than renderers developed in the past — it's truly *interactive*. That means it lets you manipulate a 3-D model in real time while viewing all of its attributes, such as texture

mapping and lighting. You get to see smooth motion, because the QuickDraw 3D renderer blasts an image to the screen in seconds, taking about half or even one-tenth the time of other renderers in 3-D applications. And QuickDraw 3D's plug-and-play architecture allows for additional speed boosts from any QuickDraw 3D accelerator (such as Apple's own QuickDraw 3D Accelerator Card). Drop an accelerator into your Mac and put the proper extension into your System Folder, and your favorite QuickDraw 3D-savvy application will render scenes more quickly and display higher-quality images. (See the "Need for Speed" sidebar for prices and capabilities of particular accelerators.)

The second major benefit of QuickDraw 3D is the way 3DMF standardizes the import and export of 3-D data among various programs. You can, for instance, use it to move complex scenes that include not only 3-D models but also their surface textures and lighting. Before 3DMF, there was no way to move a 3-D scene in its entirety from one application to another.

Unfortunately, this particular component of QuickDraw 3D isn't as well supported as the interactive renderer (see the "Supporting



figure 1 / QuickDraw 3D is free — it comes with system software for new Power Macs, and you can get it online. Apple includes the demo program Gerbils (shown here) along with it, so you can immediately see a sampling of the smooth 3-D motion.

Cast" sidebar). Although several applications (including auto•des•sys' form•Z, Specular Infini-D 3.1, and Strata StudioPro 1.75+) support the import and export of 3DMF files, they may not support every one of the format's

features. For instance, whenever you save an Infini-D file as a 3DMF document and then proceed to bring it into form•Z, the models get transferred but the textures and the lighting don't.

QuickDraw 3D for the Masses

How will QuickDraw 3D affect the larger mass of consumers outside the 3-D-design world? Aside from the obvious answer — that there will be more 3-D-animation artistry for the world to admire — two particular areas are emerging as likely places for QuickDraw 3D to make an impact: on the World Wide Web and in games.

The key Web development was Apple's January announcement that it is proposing 3DMF as the base file format for version 2 of VRML (Virtual Reality Modeling Language), a language that lets developers create 3-D scenes for the Web. Version 1 of VRML is already used in limited ways to transform the Web from pages of flat text and graphics into a 3-D-exploration site. The current version is so limited, however, that developers are extending it in any way they can — with compatibility often falling by the wayside. With QuickDraw 3D as the new VRML, definitions for such capabilities as texture mapping and embedded animation scripts would be standard. With a better standard, users could see a quicker proliferation of 3-D content on the Web.

For gamers, QuickDraw 3D's ability to support add-on cards may be its most significant

Need for Speed / QuickDraw 3D accelerators

SOME 3-D SCENES are too large for even the fastest 604-based Power Mac to render quickly. That's where QuickDraw 3D accelerators come in. You can get that extra rendering speed you need by plugging in cards from Apple, Matrox Graphics, Newer Technology, YARC Systems, Diamond Multimedia Systems, and ATI Technologies.

Costing about \$400, the QuickDraw 3D Accelerator Card, from Apple (408-996-1010), is the least expensive of the group. It includes some high-end rendering features — for instance, it smoothes grainy textures by using a sophisticated method called trilinear MIP mapping, a feature common on expensive, dedicated 3-D-design workstations, and it can handle up to 12 texture maps simultaneously. The card also lets you render in a program that uses CSG (constructive solid geometry), a method for cutting a hole or shape in an object by using another object — such as boring a hole through a sphere by using a cylinder. (The only software that currently takes advantage of CSG is Microspot's 3D World.) Apple's accelerator is rated at 120,000 polygons per second. Although this is slower than other QuickDraw 3D accelerators, you can increase speed by using multiple cards, which isn't the case with any of the other cards.

All the other cards combine QuickDraw 3D-rendering acceleration and video acceleration on one card. The cheapest of the bunch is the MGA Millennium (\$649), for PCI-based Macs, from Matrox (800-361-1408 or 514-969-6320). It supports

smooth rendering of 3-D objects but not transparency or texture mapping. If you already need to buy a video card, this one's a good deal, because you get QuickDraw 3D acceleration without paying much more than you would for a video card alone.

If you want really high speed, you'll have to spend a bit more — around \$2,000 — and get either the RenderPix, from Newer Technology (800-678-3726 or 316-685-4904), or the Screamer, from YARC (800-275-9272 or 805-499-9444). The RenderPix is the only QuickDraw 3D accelerator that works in NuBus-based Power Macs (via the PDS) as well as in PCI machines. These cards were developed using 3DLabs' GLINT 300SX chip, which can render up to 300,000 polygons per second and can accelerate 2-D graphics. The speed of the cards will increase to up to 400,000 polygons per second as soon as 3DLabs makes the next-generation accelerator chip, the 400TX, available. Look for both the RenderPix and Screamer cards using the 400TX chip to debut in the second half of 1996.

If there's any area of Mac computing that needs absolute speed, it's gaming. With the high-resolution images and interactivity of some games, hardware accelerators are a necessity. But you don't have to buy the most-expensive ones in order to get the speed you need for games. Look for low-cost video cards (probably around \$300, bundled with games) from Diamond (800-468-5846 or 408-325-7000) and ATI (905-882-2600).



Apple QuickDraw 3D Accelerator Card: lowest-priced card.



Matrox MGA Millennium: low-priced combo card.



YARC Screamer: expensive but screamingly fast.

feature; with some cards priced as low as stand-alone play stations, the Mac is an attractive 3-D-game platform. For example, Reality Bytes' Havoc — a cross-platform combat game — is designed to take advantage of QuickDraw 3D hardware acceleration so you can have the sharpest of images while you blast your enemies to bits (see figure 2). A forthcoming update of MacPlay's Descent will also take advantage of hardware acceleration.

Future Installments

The ultimate success of QuickDraw 3D depends on its acceptance by developers of 3-D-design applications. So far, it looks promising — this standard is already much more popular than its poorly accepted sibling technology QuickDraw GX. And Apple is making big improvements to QuickDraw 3D this year.

With version 1.1 of QuickDraw 3D (expected to ship by the time you read this) come two important improvements: higher speed and cross-platform support. The new platforms supported will be Windows 95 and Windows NT (running on a Pentium-based PC with at least 16 MB of RAM). This support will allow cross-platform applications such as Macromedia's Extreme 3D and Ray Dream Studio to take advantage of a single renderer. Apple will also increase the speed of the renderer itself in version 1.1 — and a further speed boost will come from another added feature, support for DayStar Digital's multi-processor Mac clones.

At the same time as Apple is making the renderer faster, third parties are creating plug-in renderers that should be ready soon after version 1.1 ships. Lightworks Design's Advanced Photorealistic Renderer is one such plug-in. It will offer rendering that's of much higher quality than that of the interactive renderer and should be available to any application that supports QuickDraw 3D.

Just when you've adjusted to the changes of version 1.1, Apple will push version 1.5 out the door (the predicted time is late summer). With this release, Apple will finally roll out interface guidelines for 3-D-design applications, standardizing the method for interacting with 3-D objects in a 2-D window. For instance, this version should include a collection of interface widgets that make it easier to move, rotate, and scale 3-D objects. Novices will benefit by having an easier interface, and experienced 3-D-application users will benefit by eventually finding the same controls in all their 3-D-design applications.

Supporting Cast / QuickDraw 3D programs

ACCEPTANCE OF QUICKDRAW 3D is widespread among developers — of 3-D-design programs as well as of a wider variety of design and consumer-oriented software. These developers now don't need to create their own renderers, except perhaps to manipulate objects in their applications' highest-quality modes.

Programs already supporting the QuickDraw 3D renderer include traditional 3-D-design programs, such as Specular Infini-D 3.1 and Strata StudioPro 1.75+, and CAD programs, such as Electric Cafe's Modelshop 3.0, Artifice's Design Workshop 2.0, and Microspot's newly released 3D World. Other 3-D-design applications that are being updated to support the QuickDraw 3D renderer include Byte-by-Byte's Sculpt 3D, Ray Dream Studio, and Macromedia's

Extreme 3D. On the high end, Vertigo Technology's SGI-based rendering and animation program, Vertigo, will support QuickDraw 3D on a Power Mac.

Use of the QuickDraw 3D renderer will also be popping up in other types of programs, such as games, Web browsers, and illustration packages. For instance, the next release of Adobe Dimensions, an illustration program for creating 3-D objects, will use the interactive renderer and 3DMF.

Among the 3-D Web browsers that use QuickDraw 3D to let you travel through virtual scenes are Virtus Voyager; North Plains Systems' VRML Equinox; and Whirlwind, from programmers Bill Enright and John Louch. The browsers were still in nonfinal versions at press time.

The Beat Goes On

As Apple advances QuickDraw 3D, the number of packages that will exploit the power of the renderer and the cross-platform file format should only increase. Whether you're a designer or a user of 3-D software, you can

expect improved speed and quality. Start putting away some extra cash, because you can also expect a need to invest in ever more powerful hardware to reap the benefits. □

Sean J. Safreed is a MacUser associate editor specializing in graphics.

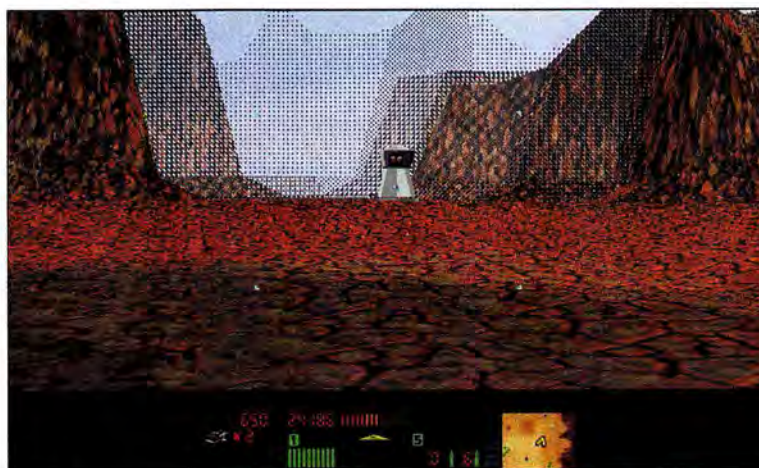


figure 2 / Playing games is more fun now that QuickDraw 3D is here. But to get maximum speed and the highest-quality graphics, you'll need a QuickDraw 3D accelerator. These pictures show a scene in the game Havoc with hardware acceleration (top) and without it.

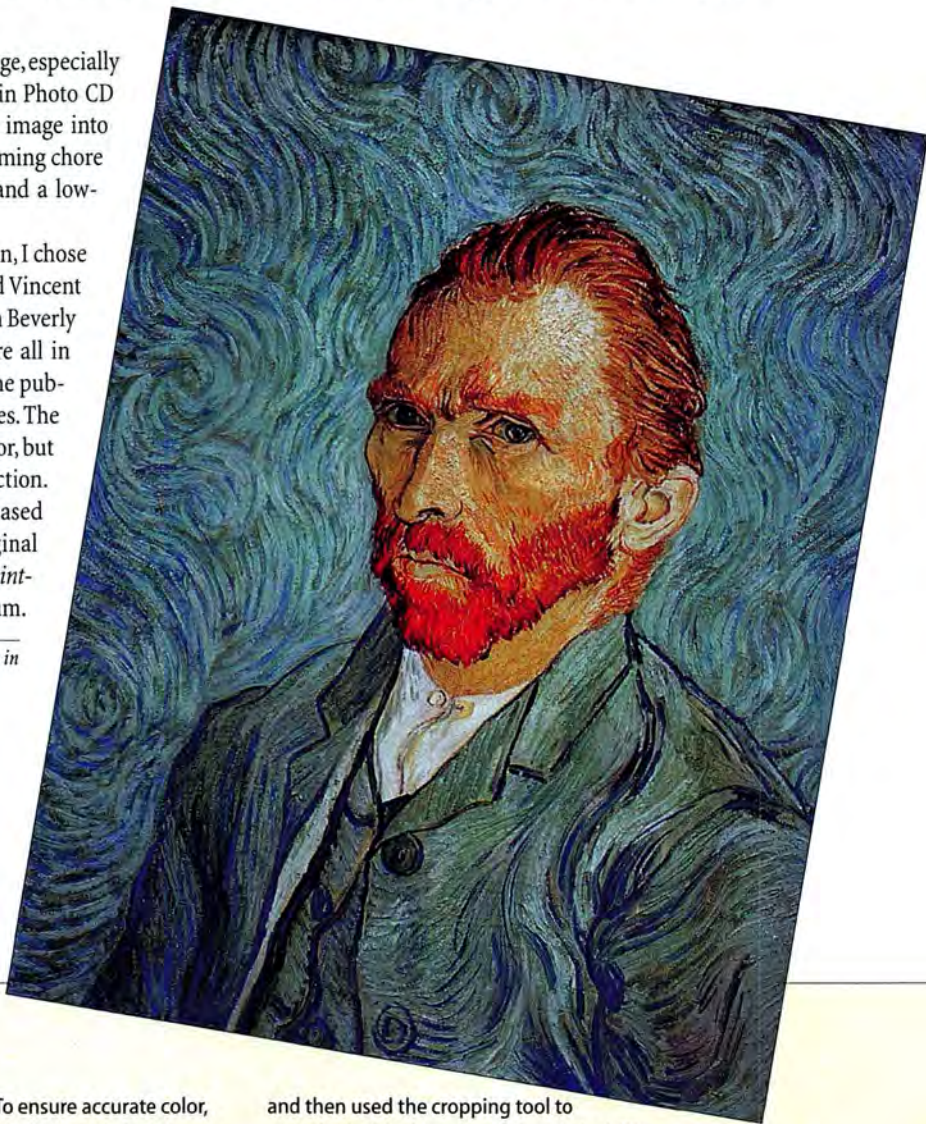
Mastering Photo CD Correction

Use Photoshop's color-correction prowess to turn a mediocre image into a masterpiece.

CLEANING UP COLOR is always a challenge, especially when dealing with images that come in Photo CD format. Transforming an inexpensive image into something usable can become a time-consuming chore if you're making use of incorrect settings and a low-quality original.

To illustrate the practice of color correction, I chose an image from a commercial CD-ROM called Vincent Van Gogh, Selected Works, from Planet Art, in Beverly Hills, California. The images on the disc are all in Kodak Photo CD format and, according to the publisher, were scanned from color transparencies. The color quality of the images on this disc is poor, but I managed to achieve acceptable color correction. For references, I used a transparency purchased from Paris' Musée d'Orsay (where the original painting hangs) and a fine reference book, *Paintings in the Musée d'Orsay*, by Robert Rosenblum.

Brian P. Lawler is a graphics and printing consultant in San Luis Obispo, California.



STEP BY STEP

1. OPEN THE IMAGE WITH KCMS, AND CROP. To ensure accurate color, you must use the Kodak KCMS plug-in automatically installed with Adobe Photoshop 3. It converts the Photo CD color space to the RGB or Lab color mode.

Open a Photo CD image at 1,024 x 1,536 pixels in Photoshop, using the Kodak KCMS plug-in. You will get a good-quality reproduction at 4 x 5 inches. Do not open the PICT version in the Photos folder — this version's colors are less accurate than those of the version processed by the Kodak filter. Click on the Source button, and choose the transform indicated by the Image Info dialog box (A). For instance, the code 052/55 indicates that the source for the Photo CD image was an Ektachrome transparency.

Black border pixels skew Photoshop's Levels and Curves autocorrection results, so I rotated the image to the proper orientation

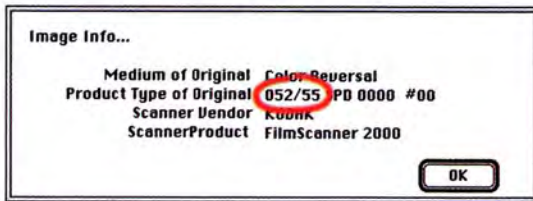
and then used the cropping tool to exclude the black border of the original (B).

2. TRY AUTOCORRECTION FIRST. Before diving into Photoshop's extensive set of correction tools, try using the autocorrection tools. Often the results are quite good, although this approach rarely produces a perfect image, and it fails on images that have no pure white or black.

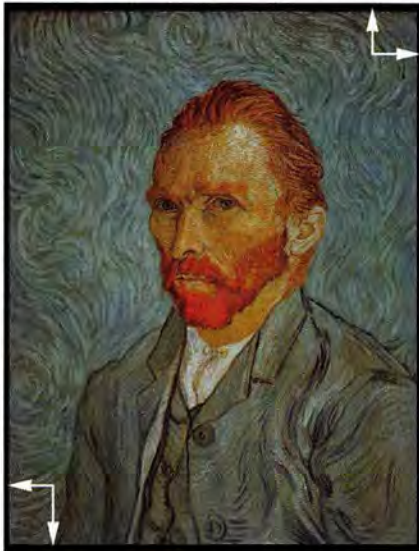
To autocorrect, open the Levels dialog box (Image: Adjust: Levels) and click on the Auto button. The program adjusts the color range to create a pure white and a pure black and makes a weighted RGB adjustment to balance the color casts.

There are significant differences between the autocorrection in RGB (A) and CMYK (B). In the Van Gogh image, the results in the two modes are visibly different; using RGB produces a better image. Although you will have to change the image to CMYK for printing purposes, the larger RGB

1. OPEN THE IMAGE WITH KCMS, AND CROP

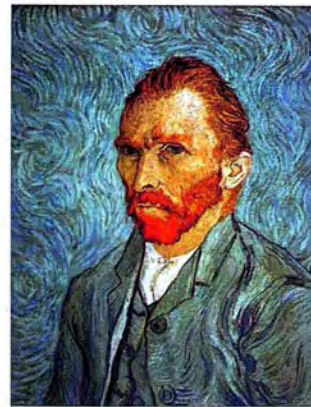


A

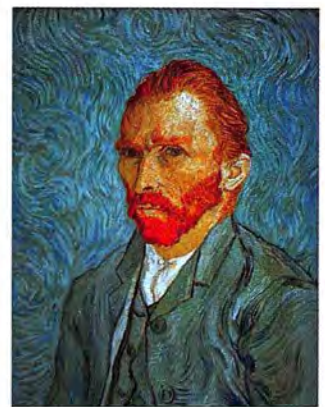


B

2. TRY AUTOCORRECTION FIRST

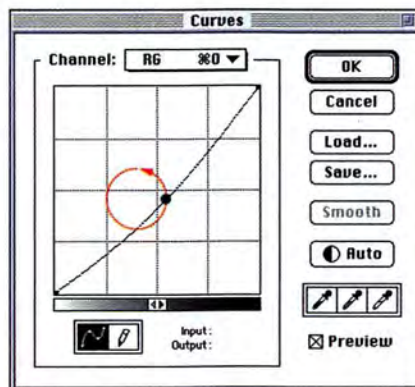


A

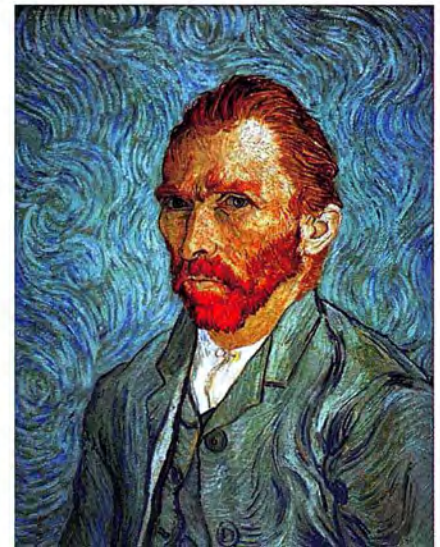


B

3. PERFORM MANUAL CORRECTION



A



B

color space can allow a color match that more closely approximates your reference image. The following manual correction method relies on RGB-correction tools to give you the best results.

3. PERFORM MANUAL CORRECTION. If you aren't pleased with the results of autocorrection, you can correct the color manually, using reference images as a guide. In this case, the reference images are much more subdued than the autocorrected results shown above.

Some of Photoshop's manual color-adjustment controls — Adjust Color, Levels, Selective Colors, and Hue/Saturation — affect colors too broadly or are not precise enough. I turned to Photoshop's Curves control and multiple-channel correction to achieve the best-looking results.

To perform a multiple-channel correction, I started by selecting the red and green channels in Photoshop. I opened the Channels palette (Window: Palette: Show Channels), clicked on the red channel, and then

Shift-clicked on the green one. I opened the Curves dialog box (Image: Adjust: Curves) and manipulated the red and green curve (A) while watching the effect on the full-color image. I clicked on the midpoint of the curve and moved the point around in a small circle, adjusting the color of the image until the color very closely matched that of the reference images. In a matter of minutes, you can reach a point where the color quality of your electronic image quite closely resembles that of your reference images, even if the quality of the original electronic image is poor (B).

As a final step, I sharpened the image, using Photoshop's Unsharp Mask filter (Filter: Sharpen: Unsharp Mask), which I gave an amount of 150, a radius of 1 pixel, and a threshold of 0. The impressionist brush strokes in the low-quality original were enhanced by use of the large amount.

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Things That Go Bump in the Night

System crashes. Weird error messages. Cold chills down your spine. Now what do you do?

WE LIKE TO TEASE our Windows and UNIX friends about their system-configuration nightmares. There's no question that these systems are more difficult to install and maintain than the Mac's. But in terms of complexity, the Mac operating system is no slouch these days either, and periodically we run into bizarre problems that cripple us.

Case in point: the dreaded Type 11 error. If you've read up on the subject, you know that Type 11 errors are usually caused by memory-related problems in Power Macs. Sometimes these errors are blamed on a bad RAM SIMM chip; sometimes they're attributed to a cache SIMM. So the other day when Chuck started getting Type 11 errors regularly in QuarkXPress running on his Power Mac 8100, he set about solving the problem in a conventional way — he pleaded with the machine, then pounded on it, and finally kicked in the monitor. OK, so that's a bit drastic.

What to do first? Judging by our experiences and those of others we talk to, it's common for a software vendor's tech-support person to suggest that you "try reinstalling the system software" in response to a variety of trouble reports. But we think this measure is a Draconian last resort and a lame response to problems. The days when programs and extensions modified the System file's resources are thankfully behind us; it's pretty unusual for the System file or the Finder to become corrupted. And what reinstalling the system software from scratch mostly does is clean out your control panels, extensions, and Preferences folders, which means you'll just have to reinstall *them* again too.

Back to our hero: After a bit of testing, Chuck found that the problem wasn't confined to QuarkXPress — other applications experienced Type 11 errors also. So what did he do? Not wanting to believe that those brand-name SIMMs he had been using for a year could have suddenly gone bad (and not wanting to confront the nightmare of removing the 8100 motherboard), he did the extension

dance. After carefully disabling pieces of the OS through a combination of running Casady & Greene's Conflict Catcher 3 and manually removing files, he failed to isolate the problem (but did manage to waste a couple of hours).

Then, a breakthrough: It seemed that whenever he moved any font into the Fonts folder, the Mac crashed. No apps were running, only the Finder. Aha! If it's a font-related problem, it must be Suitcase, right? Well, to make a long story short, no. What was left? Adobe Type Manager. And whaddaya know: Removing ATM 3.8.3 fixed the problem!

So now Chuck is back to an earlier version of ATM (3.8.2) and crash-free once again. What happened? Who knows. Perhaps his copy of ATM was corrupted in some way; perhaps ATM 3.8.3 had a problem with Power Macs (although there's no online e-mail trail to support this conjecture).

But Chuck's misfortune can serve as a lesson in problem solving for the Rest of Us. How do you handle those pesky Mac crashes?

First of all, *be scientific*. Don't panic and start throwing things out at random. You may fix the problem this way, but you'll never know what actually caused it, so it could return at any time. Keep track of what you're doing; write it down, if necessary. It takes longer to be scientific, but it will pay off in the end.

Second, *be methodical*. Pretend you're Sherlock Holmes. Don't ignore any clue, no matter how inconsequential it seems. Under what conditions does the failure occur? What system and application components are involved during the failure?

Last, *know when to stop*. "The capacity to terminate is a specific grace," wrote the poet Emily Dickinson. She was obviously addressing those people who, once they've found a problem, continue to analyze it in an ever tightening spiral until they know *exactly* what

happened. That's not usually necessary. Once you've found and fixed the problem, button it up and get out of there! There are better things to do in life than analyze program failures (unless you work in a software vendor's quality-assurance department).

But sometimes being logical and methodical doesn't help. One of our clients recently had a severe problem with a RIP (raster-image processor) running on a Power Mac 8100. A certain sequence of events would consistently



cause a crash. The vendor's tech-support people had no clue, so the client reinstalled the System Folder, replaced RAM SIMMs, reformatted hard disks — the whole gamut. Turns out the crashes stemmed from not having a user name in the Sharing Setup control panel.

We all have stories like that, stories of magic and mystery proving once again that the Universe is not benign. But it still pays to start your troubleshooting scientifically before you begin the chanting and face painting. And remember to tell yourself when you're up at 2 A.M. reformatting a disk: Computers make our lives easier. ☐

Bob Schaffel is emerging-technologies consultant for R. R. Donnelley & Sons. Chuck Weger is a consultant and the conference chair for CONCEPPTS 96.



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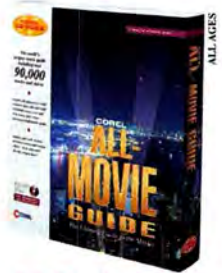
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Enhanced Audio CDs Set Sail

OLD-SCHOOL MUSIC LOVERS have long scoffed at the compact disc, claiming that it was an overpriced digital gimmick that couldn't match the warm sounds of vinyl. But no vinyl album can match the versatility of Primus' *Tales from the Punchbowl*: The Enhanced CD, published by Interscope Records and developed by ION. The Enhanced CD format adds CD-ROM data to leftover space on an audio CD. Unlike full-fledged CD-ROMs, Enhanced CDs focus mainly on audio content — interactivity is simply a bonus. Or as ION CEO Tai Roberts puts it, Enhanced CD technology can transform static album-cover art and liner notes into interactive content.

The Enhanced CD format introduces some special challenges for developers, because computer data can't be read from an Enhanced CD while an audio track is being played. As a result, all graphics must be loaded before audio begins to play and must fit within available RAM. ION accomplished this by using simple animations, small 256-

color images and larger black-and-white or grayscale images. ION used Equilibrium's DeBabelizer to dither images for display in 256 colors.

Because Macromedia Director lacked features essential for the creation of Enhanced CDs, ION developed the Enhanced CD Toolkit, an extension to Director that Macromedia now distributes. The Enhanced CD Toolkit helps developers control audio-CD content via play, fast-forward, and reverse commands and conforms to the special Enhanced CD data format.

In tandem with Todd Rundgren, another Enhanced CD recording artist, ION also developed a proprietary virtual-reality engine called DAVE VR, which allows for real-time panning, scrolling, and zooming of graphics. / Rebecca Olson

WHAT:

Primus' *Tales from the Punchbowl*: The Enhanced CD

COMPANY:

Published by Interscope Records, Los Angeles, CA; 310-208-6547. Developed by ION, San Rafael, CA; 415-455-1476.

TOOLS:

Macromedia Director 4.0 with the Enhanced CD Toolkit; Equilibrium's DeBabelizer; MetaTools' KPT Super Bryce, for rendering panoramic scenes and scanned graphics into 3-D images.



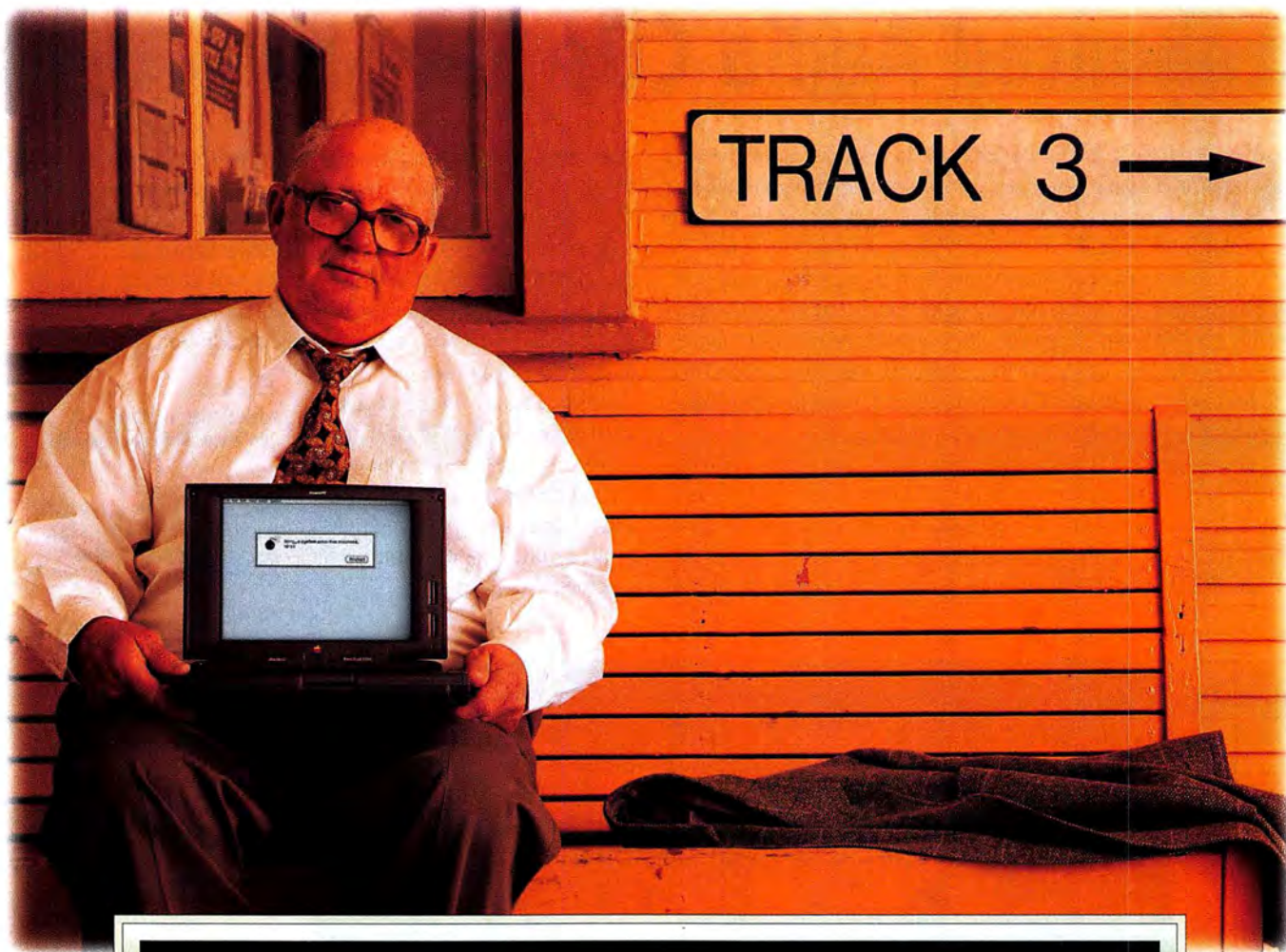
1. MAIN NAVIGATION. The opening screen is an aerial view of a lagoon. The user assumes the role of captain of the ferryboat *Primus*. The ferry itself is surrounded by "islands" — original graphics, created by band members and hooked together by ION, that represent a music track accompanied by images and animations. (You'll notice that one graphic is a conscious tip of the top hat to the Residents.) The user steers the ferry toward an island; landing ashore prompts the screen to fade to black. When graphics resume, animations (and sometimes scrolling lyrics) accompany the audio track of a song.

2. DRIVING THE FERRY. Looking out through a broad window on the bridge, the user navigates the boat through the lagoon. A hodgepodge of controls surrounds the window and comprises the rest of the main screen. A throttle and a steering wheel let users navigate their way through the virtual world. The DAVE VR engine controls the user's movements on the bridge.

3. THE TOYS. Sound effects abound. Sound the foghorn and feel as if you're right in the heart of San Francisco, or touch the radar and suffer the crackling

of a bad-tempered electrical connection. A radio and a bell also emit appropriate sounds.

4. THE LOG. Among the other items on the bridge is a logbook. When the user clicks on it, the screen fades to black and a spiral notebook with rough sketches appears. By flipping through the log's pages, the user can glean biographical information about band members or check out a full-length video. Notable is the QuickTime movie of the filming of a music video in which band members, dressed up as plastic cartoon cowboys, ride coin-operated horses.



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◀ **Xpert Tools Volume II.** Known for its Xpert Tools Volume I, a lowly apprentice productions has released the companion Volume II, a collection of 15 XTensions. Among the highlights are Xpert Character Styles, for creating custom combos of font, size, style, kerning, and so on; Xpert Pilot, a handy thumbnail

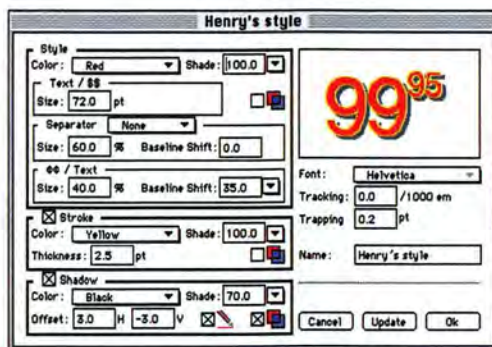
viewer that facilitates document navigation; and Xpert CommandPad, which lets you create a "button bar" for commonly used menu commands — and even for other extensions. \$99. 800-823-0553 or 970-229-0620.

HexWeb XT. The raison d'être of this XTension from HexMac International is to convert QuarkXPress documents to HTML. Hot features include automatic style-sheet mapping; support for Netscape 2.0's Frames; and the inclusion of HexWeb Index, which automatically sets

up a table-of-contents Web page from the headlines in your document. \$349.

▼ **Punch XT.** If making prices stand out in catalogs or generating other high-impact display type is your thing, check out Punch XT, from Globimage. You can create preset combinations of typeface; point size; tracking; text color; outline width and color; and drop-shadow width, position, and color. Enter your text and select a preset, and — presto! — EPS artwork, correctly trapped and ready to place in QuarkXPress or any other EPS-capable page-design application. \$149.

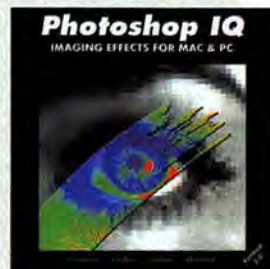
Both HexWeb XT and Punch XT are available from XChange: 800-788-7557 or 970-229-0620. / Henry Bortman



FINE PRINT

Photoshop Helpers

GETTING THE MOST from Photoshop means more than reading the manual. Check out this trio of books for the latest in Photoshop tricks. **Photoshop IQ: Imaging Effects for Mac & PC**, by Dieter K. Froebisch, Holger Lindner, Thomas Steffen, and James Wondrack, is so beautifully designed that it could vie for a spot on your coffee table. Using a single photograph of a human eye as the basis for all of its techniques, the book illustrates dozens of simple yet stunning



visual effects, with understandable step-by-step instructions. \$29.95. Silver Pixel Press; 716-328-7800.

● **Adobe Photoshop: A Visual Guide for the Mac**, by Bert Monroy and David Biedny, also richly illustrated, describes more-complex techniques, concentrating on the creative use of Photoshop's layers and alpha-channel masks. \$34.95. ● **Nick Clarke's Kai's Power Tools: An Illustrated Guide** is a welcome signpost for those who have gotten lost exploring KPT. The book is useful not only for Photoshop but also for Painter and other applications that support Photoshop plug-ins, and it includes a CD-ROM containing clip art and sample filters from MetaTools. \$39.95. Addison-Wesley. 617-944-3700. / HB



KPT Power Photos III



Toolshed

Junk and Punk

IS RETRO PASSÉ? Not quite, but junk is making a comeback. High-quality images of junk, mind you. MetaTools' Junkyards CD, one of five CD-ROMs in its **KPT Power Photos III** collection, contains such delectable textures as broken glass and scrap metal along with masterfully masked images of crushed cars, mufflers, mag wheels, and the like.

75 images, RGB TIFF format with channel masks (300 dpi). \$199. 800-472-9025 or 805-566-6200.

PhotoDisc's **Toolshed** volume takes a reverential approach to antiquated items. Its grayscale images — an old saw blade, an anvil, a hammer, a jar of screws — aim to convey a sense of beauty and craftsmanship embodied in old-time

tools. 120 images, grayscale TIFF with channel masks and clipping paths (72 and 300 dpi). \$149. 800-528-3472 or 206-441-9355.

On a very different note, 4More's offerings are based on the notion that the MTV world we live in is mercifully higher-energy than yesteryear. **NYC: In Your Face** is the first of the company's antiStock series of

discs. With images of drag queens; skateboarders; and the pierced, spiked, and tattooed denizens of The Big Apple, *In Your Face* will appeal to designers for whom subtlety is not even a consideration. Channel masks? Make your own: These images cry out to be tweaked, torn, and twirled. 100 images in Photo CD format. \$150. 800-675-5372. / HB



NYC: In Your Face



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NETWORKING

If you really want to promote your business on the Internet, you'll need to set up your own server. Here's how.



By Shelly Brisbin

Setting Up an Internet Server

OK, YOU'RE CONVINCED. More and more people are using the Internet to find out about products and services, and you'd like to give your company or organization an edge over competitors by taking advantage of this trend. The easiest thing you can do is buy space from an ISP (Internet service provider) and set up a Web page that gives potential customers information about your products. But because you are only renting space on someone else's server, you're limited in the capabilities you can give your Web page. You won't, for example, be able to let people query a database of information.

In order to have total control over your Web page, you need to set up your own Internet server. Here's our step-by-step guide:

Step 1: Find a Provider

Even if you run your own Internet show, your server still needs to be connected to an ISP for information to flow between the Internet and your server. Choose an ISP that knows networking and specializes in managing high-speed connections. Ask businesspeople who use ISPs for recommendations. If you have access to the Internet, check out newsgroups, such as alt.internet.access.wanted, that

specialize in Internet-access issues. Or you can look in the Yellow Pages — you may find some listings for ISPs there. Ask about the ISP's track record for supporting business customers, particularly how it handles network issues and phone-line glitches.

You should also compare prices. We found that, on average, an ISP charges around \$200 per month for connecting your server to its network. (We found prices that ranged from \$90 to \$475, however.) Most also charge \$50 to \$100 per year for DNS (Domain Name System) access. The DNS converts site names (such as <http://www.mycompany.com>) into numeric IP addresses the Internet can handle.

Step 2: Get a High-Speed Connection

Your Internet server must be connected to your ISP, and thus to the Net, at all times. Otherwise, folks won't be able to access your Web page — and you'll lose those valuable hits that can translate into business. You'll also need to make sure the connection is fast, or your Web pages will load slowly and users may give up trying to access your page or, even worse, may not be able to access it at all. Modems simply aren't fast enough; high-speed leased lines and frame relay connections are too expensive.

Today, ISDN is the best connection choice for small companies. The phone company will charge you several hundred dollars to install an ISDN BRI (basic-rate interface), which transmits data at up to 128 kbps. After that, you pay the phone company a monthly flat rate; it's below \$100 in most parts of the country. But installing ISDN is no picnic. You'll need to work closely with your ISP and your local phone company. Many ISPs will even work with the phone company on your behalf.

Step 3: Acquire Equipment

After you've installed ISDN, you need to purchase hardware to connect your ISDN line to your server. You can get an ISDN modem — an external box that has a terminal adapter and NT1 built in. These modems cost around \$400 and allow you to hook your ISDN line directly to your server. The disadvantage, however, is that your Internet server won't be able to interact with the rest of your network.

If you want to hook your Internet server up to your network so that Internet traffic — such as e-mail — can be delivered to both the server and the office network, then you'll need to get a router. (And if you're still running a LocalTalk network, you'll also need to upgrade

it to Ethernet). The router should contain an ISDN interface (for hooking to the ISDN line) as well as an Ethernet connection (for hooking to your network's hub). It also needs to support AppleTalk and the Internet's TCP/IP protocol. If you already have an AppleTalk router that supports TCP/IP, find out if it can be upgraded to support ISDN.

Many ISPs resell routers. If you buy a router from your ISP, you may be able to get better support during installation than if you buy a product your ISP is not familiar with. Just make sure to ask how much the ISP charges for the router — basic ISDN-to-Ethernet routers cost \$750 to \$1,000 each. Even if you purchase equipment on your own, it's still a good idea to take your ISP's advice into account.

Step 4: Choose Your Server

Choosing an Internet server is easy: Get the fastest Mac you can afford, load it with memory, and add a high-capacity hard drive. You can use a pre-Power Mac system as a server, but if your Web page becomes wildly popular, the server may bog down, especially if it must accommodate Web-site searches, FTP downloads, or large mail exchanges. Stock your server with *at least* 16 MB of RAM, since you'll be running several applications at

Interior Decorating / spruce up your site with CGI applications

EXPAND THE CAPABILITIES of your Web-server software in many ways by using CGI's. Listed here are examples of some popular applications. You'll find pointers to other CGI applications at <http://www.comvista.com/net/www/directory.html> and <http://www.webedge.com>.

- ◆ **Apple Search ACGI** (<http://kamaaina.apple.com>) finds and displays text in AppleSearch databases.
- ◆ **Count WWWebula** (<http://uts.cc.utexas.edu/~grgcombs/htmls/counter.html>) adds a graphical hit counter.
- ◆ **Forms.acgi** (<http://www.biola.edu/cgi-bin/forms>) sends data entered in a form to an e-mail account.
- ◆ **Interaction** (<http://www.ifi.uio.no/~terjen/interaction>) supports threaded discussion and chat.
- ◆ **MapServe** (http://www.spub.ksu.edu/other/machttp_tools/mapserve) adds clickable map images.
- ◆ **MovieStar Server** (<http://130.91.39.113/Aspendos/moviestar%20server.html>) serves live audio and video.
- ◆ **NetCloak** (<http://www.maxum.com/netcloak>) creates and serves conditional Web pages based on the user's identity, access privileges, time of day, and so on.
- ◆ **NetForms** (<http://www.maxum.com/netforms>) generates HTML pages based on forms filled out by users.
- ◆ **NetLink/4D** (<http://www.fsti.com/productinfo/netlink.html>) adds a Web interface to 4th Dimension databases.
- ◆ **ServerStat** (<http://www.ericse.ohio-state.edu/ss.html>) analyzes server logs.
- ◆ **Web FM** (<http://www.macweb.com/webfm>) adds a Web interface to FileMaker Pro.

once. A 1-GB hard drive is also a must.

The quickest and easiest way to get a new server onto your desk is to buy Apple's Internet Server Solution. The bundle includes a Workgroup Server (6150, 7250, or 8550) and a CD-ROM full of useful software, including StarNine Technologies' WebSTAR Web-server software, Adobe Acrobat Pro and PageMill, Netscape Navigator, AppleSearch, and more. You'll find details about the bundles at <http://www.solutions.apple.com/internet/default.html>. Prices for the bundles start at \$2,700.

An Internet server must be up as much as

possible. To avoid downtime, add an uninterruptable power supply and shareware such as Keep It Up (a program that tries to restart applications when it senses an "Application unexpectedly quit" error message), AutoBoot (a program that reboots the Mac if it goes down), and Okey Dokey (a program that activates the OK button in error dialog boxes).

Step 5: Load the Software

Apple's Internet-server bundle includes everything you need in order to create and maintain a basic Web site. If, however, you're using

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a spare Mac as a server, you'll need to round up the necessary software. First, you'll need MacTCP: It's included with System 7.5, and you can also get it bundled with commercial Internet packages. (Alternatively, you can use Open Transport 1.1, which will be shipping as part of System 7.5.3.) Second, you'll need Web-server software in order to make the HTML files and graphics on your server visible on the Net. WebSTAR is the best known of these programs for Macs. Many educational

institutions still rely on MacHTTP, a shareware predecessor of WebSTAR. InterCon's InterServer Publisher serves Web pages as well as FTP and Gopher-based information.

Finally, you'll want Internet-e-mail-server software. Like the applications that manage LAN mail systems, these programs let you create e-mail accounts for everyone in your office. All mail addressed to your organization is delivered to your server and is routed to the individual addressees by the mail software.

The Apple Internet Mail Server is easy to use, and it's also *free* from <http://www.solutions.apple.com/aims>.

Step 6: Add Enhancements

You can count the number of visitors to your Web page, let customers search databases, and do more by adding CGIs (Common Gateway Interfaces). CGIs are small programs that process the information your Web server receives, in a variety of ways. You can write your own CGIs in AppleScript, and you can download commercial and shareware CGIs from the Web (see the "Interior Decorating" sidebar).

E-mail, too, can add value to your Internet site. You can run your own mailing list with StarNine's ListSTAR or the freeware Macjor-domo. Each automates the management of list subscriptions and the sending of messages. For a comprehensive list of commercial and shareware server software, you can check out <http://www.pism.com>.

Shelly Brisbin is a MacUser associate editor.

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NET BYTES

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ACCESS TO INTERNET e-mail and the World Wide Web just got a speed boost from **Global Village Communication** (408-523-1000; <http://www.globalvillage.com>), which has added ISDN capabilities to its **GlobalCenter** Internet-access service. Previously available only with a 28.8-kbps modem, the GlobalCenter bundle now includes an ISDN router; software; and a connection to the Global Village service center, which processes Internet traffic. Aimed at small businesses, GlobalCenter delivers Internet e-mail via the customer's existing QuickMail system and lets networked users surf the Web, using the browser of their choice. Prices for the service are \$119 to \$499 per month. ♦ Making databases available on a Mac-based Web site is the forte of **MacSite Searcher**, from **Blue World Communications** (206-313-1051; <http://www.blueworld.com/macsite/searcher.html>). The CGI (Common Gateway Interface) application lets Webmasters put searchable databases onto their sites. Using UserLand Frontier scripts and FileMaker Pro 3.0, MacSite Searcher generates HTML files containing search results. \$295. ♦ **Neon Software** (800-334-6366 or 510-283-9771) has improved IP and SNMP (Simple Network Management Protocol) support in **LANSurveyor 3.0** (\$395), an upgrade to its popular network mapping application. Version 3.0 can import TCP/IP host files, automatically associating the names of IP devices on the network with the correct AppleTalk network segment and with objects on a LANSurveyor map. LANSurveyor can now query networked Macs to find out whether file sharing is active. A new SNMP query tracks bytes transferred to and from each node as well as errors encountered during transfer. LANSurveyor 2.0 users can upgrade to version 3.0 for \$100. / SB

Life in the Virtual World

Fly through a Web that has morphed into a multiverse of hyperlinked 3-D worlds.

YOU TRY TO CONJURE UP an image of virtual reality on the Web, but the image looks something like Netscape Navigator wearing goggles. Virtual reality to most people suggests head-mounted displays and arcade games rather than Web sites. But VR arrived on the Web early in 1994, when Mark Pesce and Tony Parisi launched a three-dimensional banana and called it Labyrinth. You could click on a conventional Web link to display their banana, use the mouse as a joystick to fly through bananaspace, and then click on the banana to jump back to the Web page. Coooo!

VR on the Web means artificial spaces that you navigate in three dimensions and that feel somehow real. Today there are many VR sites on the Web, and you don't need special glasses to explore them.

What You Need. Pesce and Parisi's brainchild, the Virtual Reality Modeling Language, or VRML (pronounced "vermal"), is emerging as the de facto standard for virtual reality on the Web. It's the 3-D equivalent of HTML: an open, platform-independent, compact file format for 3-D graphics. You get to VRML sites, called worlds, via URLs that end with the suffix .wrl.

All you need in order to see the sites is a VRML viewer such as Virtus Voyager, available (free) at <http://www.virtus.com>. It can be configured as a helper application (software that opens text, graphics, and movie files when you download them) for your Web browser, as can VRML Equinox, a Power Mac-only viewer from North Plains Systems, available at <http://www.ipsystems.com/nps>.

Be sure to grab any documentation available for VRML viewers. You'll need such documentation to configure a viewer as a browser helper and to learn the viewer's navigation conventions. Most viewers require System 7.0.1 or later, and those written specifically for Power Macs may require QuickDraw 3-D, Apple's 3-D-rendering software (available for free at <http://www.info.apple.com/Apple.Support.Area/QuickDraw3D>).

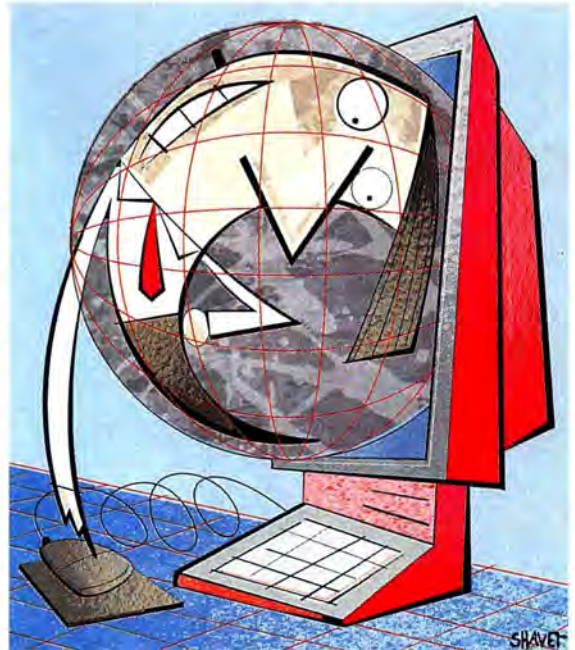
The Ugly Reality of the Virtual. If you think static images load slowly with your Web browser, you'd expect downloading 3-D graphics to be agonizing. But with good compression, some worlds are as small as 3K — although many are more like 3 MB. A future version of the VRML spec will allow the objects that make up a world to reside in various files or sites, causing the world to take shape gradually as the objects materialize.

More annoying than slow downloading is the tendency of some sites to display only a black screen, issue error messages, and/or crash your Mac. There are two reasons: VRML is a very new technology, and current viewers (most of which are alpha or beta releases) haven't yet implemented it fully. If you're having trouble getting anything to work, try <http://www.astro.wisc.edu/~dolan/vrml/cubesphere.wrl>, a truly simple VRML site with a few geometric shapes. If that doesn't display, head back to the viewer documentation. When you're ready for a more stimulating ride, jump over to Crayoland's wraparound world of geometric mountains, trees, and clouds, at <http://jaka.eecs.uic.edu/dave/vrml/CAVE.nongz/base.wrl>.

Easy now; as long as you hold that mouse button down, you're moving. Might want to pull back toward the center of the screen to slow down. That's right: Moving the mouse up moves you forward. See how the clouds, trees, and mountains approach at different rates? Sideways movement causes you to rotate to the right or left. If you want to move linearly up or down or sideways, hold down the Option key; to pitch and roll, use the Shift key. Getting dizzy? You'll get the hang of it.

Your Virtual World. Although there will eventually be VRML programming environments, creating VRML sites with your Mac currently means using existing 3-D- or VR-development

software (such as Apple's QuickTime VR authoring tools, available for sale from APDA at <http://qtvr3.quicktime.apple.com/home.htm>) that generates 3-D images that can be used as the basis for VRML worlds. Virtus is working on a VRML environment, but no release date has been set.



More VR sites are appearing daily, and some even suggest practical uses of the technology, from walk-through architectural models to topographical maps generated on the fly. For further info and sites to visit, check the VRML Repository, at <http://www.sdsc.edu/vrml>; Mecklermedia's VRML World, at <http://www.mecklerweb.com/netday/vrml.html>; or The VRML Forum, at <http://vrml.wired.com>.

Don't Know VR from an RV?

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. ☞

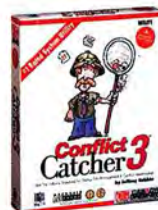
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HANDS ON



From smart shopping to technical tinkering, here's how to make your modem hum.

By Carolyn Bickford

Make the Most of Your Modem

WAY BACK at the turn of the century, most families who bought an automobile hired a chauffeur to go with it, and this chauffeur wasn't just for show. Driving an automobile required some talent; you had to crank the engine, hop in the car, get it in gear, and ease the brake out slowly enough for a smooth start. Likewise, the first modems were driven almost exclusively by technosavvy types, those who knew how to connect correctly by setting jumpers and switches and using arcane commands. Nowadays we have user-friendly automobiles and easy-to-use modems, but that doesn't mean you can always get by on automatic pilot. Here are some tips for tinkering to help you minimize the time you spend sidelined on the information highway.

The Fully Loaded Modem

When you buy your modem, make sure it comes with two essential items: Mac software and a Mac-to-modem cable. Without Mac software, your Mac won't be able to tell your modem how to make connections. Likewise, your modem won't connect if you don't have the right cable. It's all too easy to accidentally pick up the wrong cable, because some PC

cables look like Mac modem cables. If your modem won't connect and you're not sure you have the right cable, it doesn't hurt to try plugging in one you're sure is for the Mac to see if that makes a difference.

To get better transmission, it's also a good idea to make sure your cable has hardware handshaking. Such a cable has an extra pair of wires that work like traffic lights to tell the modem when to send information and when to pause. The sending modem need only check the handshaking wires — rather than wait for acknowledgment from software — to know when to send and pause. Unfortunately, it's not easy to tell if a cable has hardware handshaking. Try asking for a "high speed" cable, which should get you what you want.

Hardware handshaking makes a difference only when you have a modem fast enough to break another modem's (or telecommunication program's) speed limit. If your modem's maximum speed is lower than 9,600 bps, you don't need this capability.

If you don't have a hardware-handshaking cable, make sure you turn off hardware handshaking in your telecommunications software. Otherwise, other modems will expect

signals from your nonexistent hardware-handshaking wires and your modem won't send stop and go signals from software. That can lead to a nasty data collision.

Observing the Speed Limit

If you know how to adjust settings in your communications software, you may be able to work around certain problems that stall modems. Such an adjustment is exactly what's in order if your modem begins dialing before your phone system produces a dial tone. Just as you have to wait a moment for a dial tone on a telephone line before dialing, so should your modem. If your modem begins dialing too soon, you can add a comma or two before the first digit in the dial-up number (the number should be in the connection-setup area of your communications software) to tell it to pause. If you have to use a prefix such as 9 to dial out, add the commas right after the prefix. Most commonly, a comma causes a two-second pause.

Collision Insurance

Call-waiting may prevent you from missing calls, but it can also cause your modem to miss important data. The click that signals an

Modem Commands / configuration-string decoder ring

YOU MAY HAVE GOTTEN a little dirt under your fingernails by following our instructions for fiddling with modem strings, but if you really want to understand strings, you need to do more digging. Configuration strings differ from modem to modem and from online service to online service. Nonetheless, the language they contain is the same for many commands. Here are some common ones:

1. Modem-configuration strings start with AT, whether you see it or not (some telecom software doesn't display this command). These letters tell the modem to pay attention to the instructions that follow. AT is usually followed by DT (although not in the example pictured here), which tells the modem it should connect by using Touch-Tone-telephone signals.
2. Q0 tells modems to send feedback to telecom software about a connection. Most telecom programs need this feedback to know when a connection is made.

3. If a string also contains V1, the feedback from the modem will be in words (such as OK, ERROR, or CONNECT), whereas V0 results in numerical feedback. Most telecom software uses the word form.

4. An X command affects how your modem dials and connects. Usually X is followed by a number between 0 and 4. The higher the number, the smarter your modem is about listening to the phone line. For instance, X0 tells you if your modem has made a connection. X4 does all that X0 does, but it also gives more instruction: It has the modem wait for a dial tone or busy signal and tells you the speed of the connection and whether or not there's a busy signal or no recognizable dial tone at all.

These descriptions of X commands are general and may not apply to all modems. The specifics of these commands and others await your probing mind as you peruse your modem's manual.

incoming call can sound like a transmission error to your modem, or it can mangle a connection so badly that the modem hangs up. This is another hazard you can avoid by adjusting a setting in telecom software — just add the numbers that disable call-waiting (most phone-service providers use *70) to the beginning of the number you're dialing but after any prefixes or commas. For instance, you'd change the number ,555-1234 to ,*70-555-1234. Call-waiting will be enabled again when your modem ends the call.

Under the Hood

Another trick that can help you get your modem up and running is knowing how to adjust *configuration strings* — lines of code that tell your modem how to make connections. Although telecom software sets up configuration strings for you automatically, you may need to customize a string if your modem has trouble with its connections. For instance, tweaking a string can make your modem work when it has to use a phone system it's not accustomed to, such as a rotary dial system (pulse dial) or a system with dial tones that aren't standard in the U.S.

Before you can alter a string, you have to find it. The location depends on the software you're using. For instance, America Online puts modem-configuration strings in a folder called Online Files, and eWorld keeps them in one marked eWorld files. In CompuServe, you can look at modem-configuration strings by clicking on the Modem button located in the connection-settings dialog box.

Once you find that long string of letters and

numbers, here's what to do: To correct for a rotary-phone system, change the DT in the configuration string to DP. If you find yourself in a foreign country with your modem and you don't know how to set up your modem to work with the country's phone system, try changing X4 in your configuration string to X1. That will prevent your modem from waiting for a dial tone before it dials — so it won't be confused by hearing the "wrong" tone. (If you want to know more about the meaning of the commands in a modem string, check out the "Modem Commands" sidebar.)

Engine Tune-up

To improve your connections, it may also be worthwhile to control error-correction and data-compression settings. You can do this through control-panel software that comes with most modems.

Error correction can help your modem overcome such obstacles as a noisy phone line. That's because two modems with error correction can use a sophisticated algorithm to ensure that the information one modem is receiving is the same as the information the other one is sending and that anything that does not match is re-sent. Error correction may slow down transmissions considerably on a noisy line, but you're less likely to lose your connection altogether. The only reasons not to set up error correction are if the modem you're connecting to doesn't support it or if you're using software, such as Apple Remote Access, that has its own error-correction system.

Data compression also improves your

modem's performance, but in a different way — it speeds up data transmission. Data compression may double, even triple, the transmission speed of uncompressed data. It won't make much difference, however, if you're sending already compressed files, such as those compressed by Stuffit, Compact Pro, or DiskDoubler.

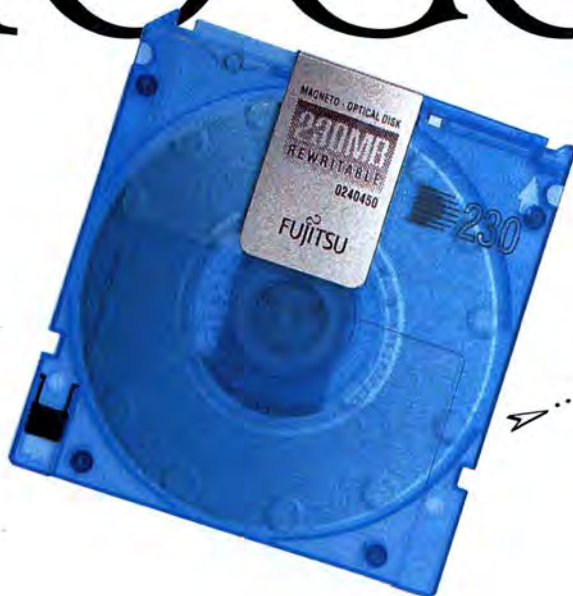
To enable error correction or data compression, you just have to select the right modem protocol in your control panel. If the telecommunications software you're using doesn't specify whether or not you should use error correction, use V.42bis, which enables both error correction and data compression. If you experience numerous modem-connection problems with that protocol, try instead V.42 or MNP Class 4, which enable error correction but not data compression. These latter two protocols work best when you're connecting with telecommunications services, such as MCI Mail, that use older equipment that chokes when you try to use data compression. If you make your modem connections over a cellular-phone line, use the MNP Class 10 protocol, which is used to transmit information through cellular-phone-line noise.

License to Drive

In one short article, we can't tell you all the ways you can jump-start your modem and optimize its performance, but these tips may help you get your modem on the telecommunications road without a chauffeur. ☐

MacUser associate editor Carolyn Bickford wishes to thank everyone who encouraged her to play with modem strings at an impressionable age.

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By Bob LeVitus and Christopher Breen

Help Folder

What Conflict Catcher and gravy have in common, and how to let PCs call Mac networks.

Meaty Memory

Q. My system software is taking up 6.5 MB of the 8 MB (16 MB, with RAM Doubler) my Mac has. Even with many of my extensions turned off, the system logs in at just over 4 MB. What can I do to cut down on this number?

Mike Rabara
via the Internet

CHRIS: Shedding memory-sucking code is a little like dropping those extra few kilos you strapped on at Aunt Vilma's last holiday dinner — it can be done, but you have to know

PlainTalk are some other memory hogs.

CHRIS: And how do you discover which of these doodads is tucking into the memory feed bag with too much gusto? Casady & Greene's Conflict Catcher 3 has a terrific feature that lets you view all your control panels and extensions by memory use (see figure 1). As with Aunt Vilma's fine gravies, the fat rises to the top of the list and the thin stays below.

Once you've worked off that extension load, it's time to check your disk cache (look in the Memory control panel). Yes, the little bugger

that makes your Macintosh so sprightly is also devouring precious RAM. Mercilessly cut that number back down to two digits to free up more memory.

BOB: Of course, Mike, you wouldn't have these kinds of problems if you went ahead and invested in more RAM. The sad fact is that modern Macs running modern software demand more memory than Macs of the past.



figure 1 / What's sucking up your precious RAM? Find out with Conflict Catcher 3.

where to look and be willing to make a few sacrifices.

BOB: Let's start with the obvious: Weed out the extensions and control panels you don't absolutely need. QuickKeys and the accompanying CEToolbox, for example, take up 431K of RAM on my PowerBook. As much as I love QuickKeys, I'd disable it too if I were running out of memory. ATM (Adobe Type Manager), AppleScript, file sharing, QuickDraw GX, and

Remote Control

Q. Is there a way for those attorneys at my law firm who have PCs at home to access our Mac network, exchange files, and use network resources via modem?

Marc Beckman
via AOL

CHRIS: The easiest thing to do, Marc, is to follow the precedent of so many PC-centric companies: demand that your firm's employees purchase, for home and road use, the same type of computer used in the office.

BOB: Chris, check the title of this column — Help Folder. Regardless of how much easier it would be for Marc's coworkers to use Apple Remote Access with their off-site Macs, recommending tens of thousands of dollars' worth of new iron is not helpful.

CHRIS: OK, live in a world overrun with PCs. See if I care.



TIPS / QuickTime

Movie Review

Want to watch the QuickTime movies on a CD-ROM back-to-back rather than wait until they come up? Here's how to gather these often hidden files and play them:

Scan the CD-ROM with ZD Net/Mac's Find Pro [see *How to Reach Us* for information on ZD Net/Mac], and search for files by type. For instance, to get a list of all the QuickTime movies a CD-ROM contains, search by the file type *MooV*.

If you are unable to open a file you find by double-clicking on it, click on the Open With button and then choose the movie-playing application in which you want the file to open.

Once the movie is open, select Save As from the player application, and the movie is yours. [Yours as long as you don't use it in a commercial product, that is. — Ed.]

Paul B. Bartlett
via ZD Net/Mac


But if you insist on using a PC, there are a couple of other solutions. These are just complicated enough that they should be implemented by someone who knows the ins and outs of networking. That said, let's proceed.

For these kinds of situations, I'd use Farallon's Timbuktu Pro for Windows, which lets PCs dial into a Macintosh network. With this product, the Intel-lopers among the staff can dial into the office's PPP (Point-to-Point Protocol) remote-access server running Timbuktu's integrated PPP client software.

WRITE TO HELP FOLDER/TIPS

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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.



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Once connected, the PC becomes a node on the network and connects to other machines via TCP/IP or IPX (if the network supports IPX). Timbuktu Pro lets you transfer files, send messages, and control machines on the network remotely. And it lets you access such TCP/IP network resources as printers, e-mail, and file servers.

BOB: If those with PCs need to access the network only on rare occasions, you can simplify things by using Timbuktu for peer-to-peer Internet access. Set up one Internet-connected machine at work with Timbuktu, and place on it any files the employees may want to access remotely. Remote users with their own copies of Timbuktu can then simply log onto the Internet and type in the office machine's IP address to retrieve e-mail and swap files.

Learning to Share CD-ROMs

Q. More and more of the games my daughter Emma uses are on CD-ROM. The problem is that right now the only way she can play them is by using my Mac instead of hers, because mine has an external CD-ROM drive.

Since her Mac is networked to mine, is there some way she can play the games over the network? I'd like to avoid buying another CD-ROM drive or moving the drive to her machine (even though she uses it more than I).

Peter J. Exley
via eWorld

BOB: I've got bad news for you, Peter. The two solutions you wish to avoid are the only two that'll work. Although it's possible to share a CD-ROM over LocalTalk (just make sure the disc is inserted before you turn File Sharing on) and copy files from it, it's not possible to play a game over LocalTalk.

CHRIS: Unless, of course, you use a networkable game, such as DOOM, Marathon, or Havoc.

BOB: Right. But if she wants to play non-networked games, you're back to having to connect a CD-ROM drive directly to Emma's Mac. The reason is simple: SCSI (the connection between your CD-ROM drive and your Mac) is much faster than LocalTalk (the connection between your Mac and hers). Even if you were to upgrade to the much faster Ethernet, the connection still wouldn't be nearly fast enough to launch and play a game that's on a remote CD-ROM drive.

Apple Guide Dog

Q. Help! Apple Guide used to work fine for me, but now it doesn't. I've rebuilt the desktop, reinstalled System 7.5 and System 7.5

Update 1.0, zapped my PRAM, and turned off all extensions except those for Apple Guide, but no dice. How can I get my Apple Guide back?

Dave Robicheaux
New Iberia, LA

BOB: Wow, the same thing happened to me. I couldn't figure out how to fix it until I read an article in Apple's electronic publication Information Alley (volume 2, issue 14).

CHRIS: Cool, a chance to plug Information Alley. It's full of tips on using Mac hardware and software and is available wherever fine bits and bytes are downloadable. To have it automatically beamed to you, just subscribe to the Information Alley mailing list by sending an e-mail message to infoalley@thing2.info.apple.com. In the subject field of the message, type `subscribe yourname`.

BOB: And now, back to our regularly scheduled answer. The solution to Dave's Apple Guide problem has to do with files called mixins.

CHRIS: This is one of those great technoterms you can toss around to impress others at cocktail parties.

BOB: Mixins are files that add content to Apple Guide. Speech Guide Additions, for example, is a mixin that's installed automatically when you install PlainTalk.

CHRIS: The problem you're having may be caused by having mixins for technologies that aren't present on your computer. For example, if you have a copy of PowerBook Guide Additions on a non-PowerBook computer, the entire Apple Guide system may fail. Among the other mixins that can mess you up are Speech Guide Additions on a Macintosh that is not running PlainTalk and an AV-related mixin (Video Guide Additions, Video Player Guide Additions, or Speech Guide Additions) on a non-AV Mac.

BOB: To round up all the mixins so you can see if you have an inappropriate one, open your Extensions folder and choose By Kind from the sorting options on the View menu. Now all Apple Guide files will be together. Just drag those that may be causing your problem to the Trash. (It's a good idea to make a copy of them first just in case you trash one you actually need.) Restart your Mac, and everything should be hunky-dory.

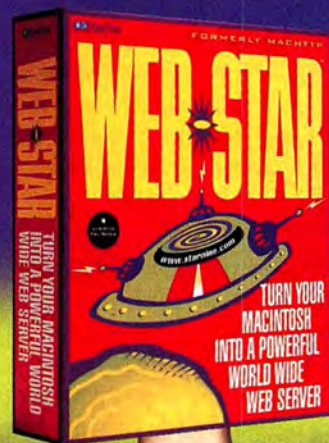
CHRIS: If that doesn't get Apple Guide up and running or you do accidentally delete an Apple Guide file you need, merely perform an Easy Install of both System 7.5 and System 7.5 Update.

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Sibling Rivalry

Q. I've been having a convoluted set of problems that seems to center on rebuilding the desktop. Disk First Aid reports an "invalid sibling link" and says it can't fix the problem. What should I do?

Sadie Vizsla
Austin, TX

BOB: The first thing you should do is . . .

CHRIS AND BOB (in unison): . . . back up your data!

BOB: You know you have semiserious trouble anytime Disk First Aid (that handy tool on the Disk Tools disk that comes with your Macintosh) tells you it's found a problem and it can't fix it.

CHRIS: Don't wait for it to get better on its own. Unlike scraped knees and missing starfish legs, it won't. If you're good and back up your data right now, Bob will tell you how you might be able to fix it without reformatting your disk. Go ahead; we'll wait.

BOB: Finished? Good.

At this point, you have two choices: attempt to fix the problem, using Norton Utilities or MacTools Pro (both from Symantec), or reformat (erase) your hard disk. Both of the above packages can fix damage Apple's Disk First Aid can't, although there's no guarantee. Either of them is worth a try, and no, I don't really have a favorite.

FPU Fixation

Q. When I try to launch certain programs (Word 5.1, FileMaker Pro, Versaterm, Excel) on my Power Mac, I get an error message saying the floating-point processor is missing. Can I fix this situation?

Katherine Cantwell
via the Internet

CHRIS: The good news is that there are a couple of ways to fix it. The bad news is that the only way to reliably fix it is to buy PowerPC-native software. It sounds like your problem is caused by running PowerPC-emulation software, which doesn't always look in the right place for an FPU. PowerPC-native software doesn't make this mistake.

BOB: If you're not ready to plunk down your hard-earned cash for the native version of your software, first try using John Neil & Associates' SoftwareFPU. This shareware control panel can intercept and handle the calls a program tries to send to an FPU. Although a 680x0 version of SoftwareFPU is available for free from all the usual places (see end of article), you'll have to pay the \$20 shareware fee, because you need to get the PowerPC-native version.

CHRIS: If SoftwareFPU doesn't banish those error messages, you will probably have no choice but to upgrade to PowerPC-native software.

Files on the Move

Q. I'd like to transfer some ASCII text files from my old 286 PC to my Macintosh. Since this is just a one-time thing, I'd like to do it the cheapest way possible — in other words, without any major hardware or software expenditures.

The 286 has a dead floppy drive, so sneakernet is out. Is it as simple as connecting a phone wire between the two modems and uploading? Do you know of any other simple methods?

Frank Vlastnik
New York, NY

BOB: Because you imply that both machines

TIPS / PowerBook

Security

The PowerBook's portability is both a blessing and a bother — the machine is easy to lug around, but alas, it's also easy to steal. Here are a couple of ways to mark your PowerBook:

- Record a personalized message such as, "This PowerBook is the property of [insert your name here], you miserable, thieving scoundrel!" and place it in the Startup Items folder in the System Folder. To make this sound file tough to track down, paste a white icon into the file's Get Info box, and make the filename a single space. Be aware that this sound will play every time you restart your PowerBook — unless you hold down the Shift key at startup (to turn off extensions) — so keep it clean.
- In a draw program, create a message that reads something like the aforementioned aural message.

Select the text, copy it, open the Desktop Patterns control panel, and paste. This procedure makes your message one of the desktop patterns. With this pattern showing in the Desktop Patterns window, click on the Set Desktop Pattern button.

For extra security, you can make the Desktop Pattern Prefs file (found inside the Preferences folder) invisible and lock it. To do so, use a file-manipulation program such as Daniel Azuma's FileType (you can find it online; see end of article for details). The pattern now can't be changed until the Desktop Pattern Prefs file is made visible and is unlocked, even if you hold down the Shift key at startup.

Christopher Breen
MacUser contributing editor

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At Home On
The Internet
As You Do
In Your Own
Living Room.



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are modem-equipped, the easiest way would be to upload the files from the 286 to an online service or BBS and then download them to the Macintosh. Or connect the Mac and PC directly, using a null-modem cable. (Both these methods require a terminal program of some sort on the 286.) With the second method, just diddle with the communications program's settings until you can transfer the files directly to the Mac. Of course, the Mac also needs to be running some type of communications program; the shareware program

ZTerm or the communications program in ClarisWorks will do just fine.

CHRIS: And for those of you who don't trust any solution that's priced under \$130 (estimated street), consider picking up MacLink-Plus/PC Connect, by DataViz (800-773-0030 or 203-268-0030). The package contains all the software and cables you need for that Macintosh-to-PC file-transfer lovefest. The DataViz package also offers file translation, for those occasions when you want to swap documents that are more complex than simple text files.

Update Update

CHRIS: Between the time we tapped out the instructions for subscribing to Apple's software-updates list and the time those words were etched in ink (February '96, page 121), the rascals at Apple changed the list's server as well as the instructions for subscribing. The current scoop for getting notification of software upgrades and updates is: Send e-mail to swupdates@thing1.info.apple.com. In the subject line, enter `subscribe yourname`.

Serial Killer

Q. I have a PaperPort, a StyleWriter, and a modem, but I have only two serial ports. Is there any way I can get around having to shut down my Mac every time I want to change the devices I'm using?

Kaustav Mitra
via the Internet

CHRIS: Absolutely. Just cruise down to your local computer-hardware dealer and buy yourself a serial switch box. It will cost something



figure 2 / Get more serial ports by using Port Juggler. It costs more (about \$100) than a plain-old serial-port switcher, but it comes with software to make switching among serial devices easier.

under 20 smackers and is child's play to set up.

BOB: These boxes come with either two or four serial output ports and feature a dial on the front for switching from one device to another. Just run a serial cable from your Mac to the switch box's input port and attach your serial peripherals to the output ports.

CHRIS: If you want a higher-tech solution, you might take a gander at Port Juggler (about \$100), from Momentum. This is an external box featuring four serial ports that you can switch through software (see figure 2). Version 4 will be shipping soon, and among the improvements is advice from the Port Juggler software about what to plug into each port, based on your specific system. For instance, it will tell you which port is the best for your modem.

Watch out, though. Port Juggler doesn't work with some devices. For instance, it's not compatible with the Connectix QuickCam. However, Momentum has promised an update to remedy this problem.

Bookmark Muck

Q. I have a ton of Netscape bookmarks I can't keep straight. Any hints to help me organize them?

Ellie Nichler
via the Internet

CHRIS: It's psychic-prediction time once more: I'll just bet that the estimable pop group Three Dog Night would describe the iteration of Navigator you're using as "the loneliest number."

BOB: Your obscure reference no doubt refers

When Other
Techies Have
Questions,
They Usually
Call You.



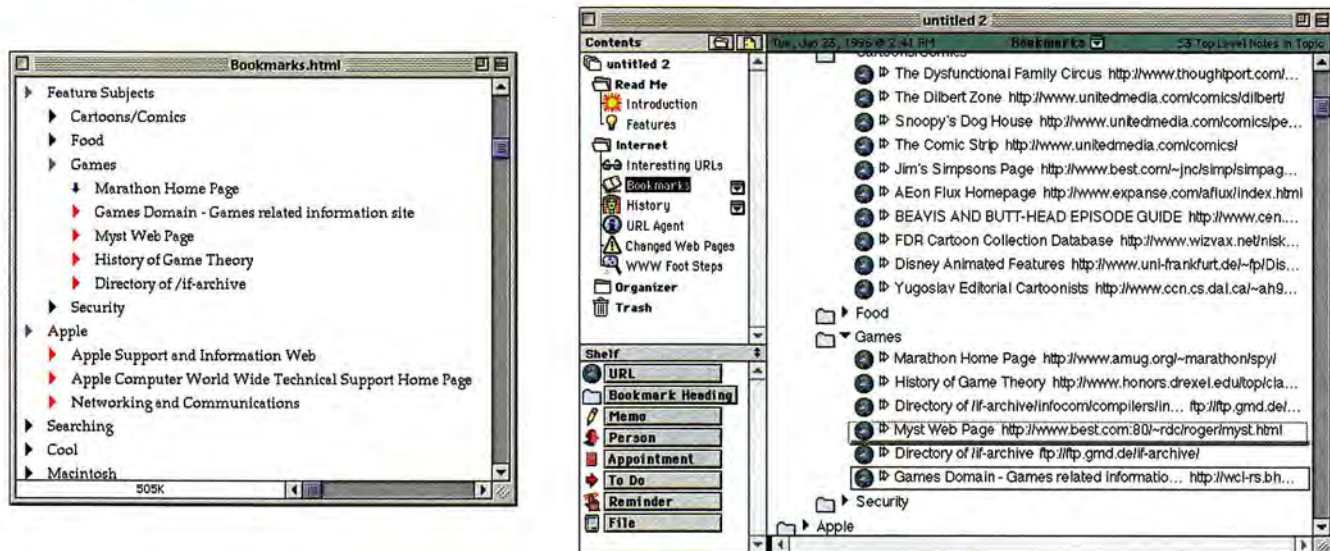


figure 3 / There's more than one way to organize bookmarks. Do it simply, with Clay Basket (left), or do it elegantly, with WebArranger (right).

to the fact that Ellie is using version 1 of Navigator.

CHRIS: Exactly right. If she'd downloaded version 2, she'd be less likely to need our help in this sticky matter. For those sleepy few who aren't completely up-to-date, Navigator 2.0's tools for organizing bookmarks are vastly superior to those of its predecessor. Rather than using those ridiculous arrows to march bookmarks up and down the bookmark list, you can now simply drag 'em from one place on the Bookmarks menu and drop 'em at another.

But if Navigator 2.0's included tools don't satisfy your organizational lust, we do have a few suggestions, starting with the least complicated: For simple bookmark management, I'm partial to creating a home page made up of the bookmarks stored in my Netscape Navigator folder. I just navigate to the Netscape Navigator folder buried in the System Folder's Preferences folder and open the Bookmarks.html file. Behold — all your bookmarks laid out on a single page.

BOB: Gotta love those free solutions. Another freebie is Dave Winer's wickedly cool Clay Basket (see end of article for information on accessing this freeware). Although the Basket is a powerful utility for creating and editing Web sites, you can also use it to organize bookmarks (see figure 3). My favorite feature is the ability to automatically record — complete with URLs — every Web site you visit during a given session.

CHRIS: You want automatic recording? How about a complete history of every site you've visited since the day you installed Navigator? CE Software's WebArranger does this and a

whole lot more (see figure 3 again). We're talking automatic notification if one of your favorite Web sites has changed, a reminder feature that cues you to visit certain sites (which you specify), and password protection for keeping unauthorized eyes from viewing your list of Web sites. And dig this: CE passed out this little jewel for free at the last Macworld Expo. If we're lucky, it may still be a no-cost item on CE's Web site (however, it may have been jerked from the land of the free and rolled into a potentially awesome product called Project DayVision).

BOB: Not quite free (\$30) but still cool is Aladdin's CyberFinder. It lets you create double-clickable URLs in the Finder as well as highlight URLs in any application and launch them with the press of a hot key. It also lets you assign helper applications to your different flavors of URL. For example, you can have Fetch launch when you double-click on a URL for an FTP site and have a Web browser — yup, Navigator, Mosaic, or MacWeb — launch when you double-click on a URL for a World Wide Web site.

CHRIS: Less full-featured but capable bookmark-managing utilities are ForeFront Group's GrabNet (about \$20) and the BookMark Manager, shareware by Shinjiro Nojima (\$20).

Get Off the Port

BOB: Several readers were prompted to write in after our discussion of what to do if your modem won't release the serial port ("Stuck in Port," January '96, page 121). They had a different solution for freeing up the port: If you're using a Communications Toolbox-

savvy (CTB-savvy) program and a CTB dialog box comes up indicating that the port is in use, simply hold down the Option key. The OK button will change to a Reset button. Just click on that to reset the port so that you can use it. ☞

Bob LeVitus is the director of evangelism for Power Computing. Christopher Breen and Bob are both Macintosh-book authors.



You can find the shareware and freeware programs referenced in this article on MacUser's Web page (<http://www.zdnet.com/macuser>). You can also find them in the MacUser and ZD Net/Mac areas on CompuServe. See How to Reach Us for instructions on accessing ZD Net/Mac.

TIPS / Microsoft Word

Getting the Count Down

Here's an easy way to force Microsoft Word to count the occurrences of a word, character, or string in a document. This is handy if, for instance, you want to count all the bulleted items.

Type Command-H to bring up the Replace dialog box. In the Find What text field, type the character, word, or text string you want to count. Type the same character, word, or text string in the Replace With text field. Click on Replace All — Word will replace the item with itself throughout the document. In Word 6, a new dialog box will appear, enumerating the "replacements." In Word 5, you can see the number of occurrences in the lower left corner of your document page, after you've clicked on OK in the dialog box that tells you Word has reached the end of your document. If you're having trouble spotting the number of changes, it could be that you closed the Replace dialog box — the number disappears when you do that.

Richard Huggins
Tyler, TX

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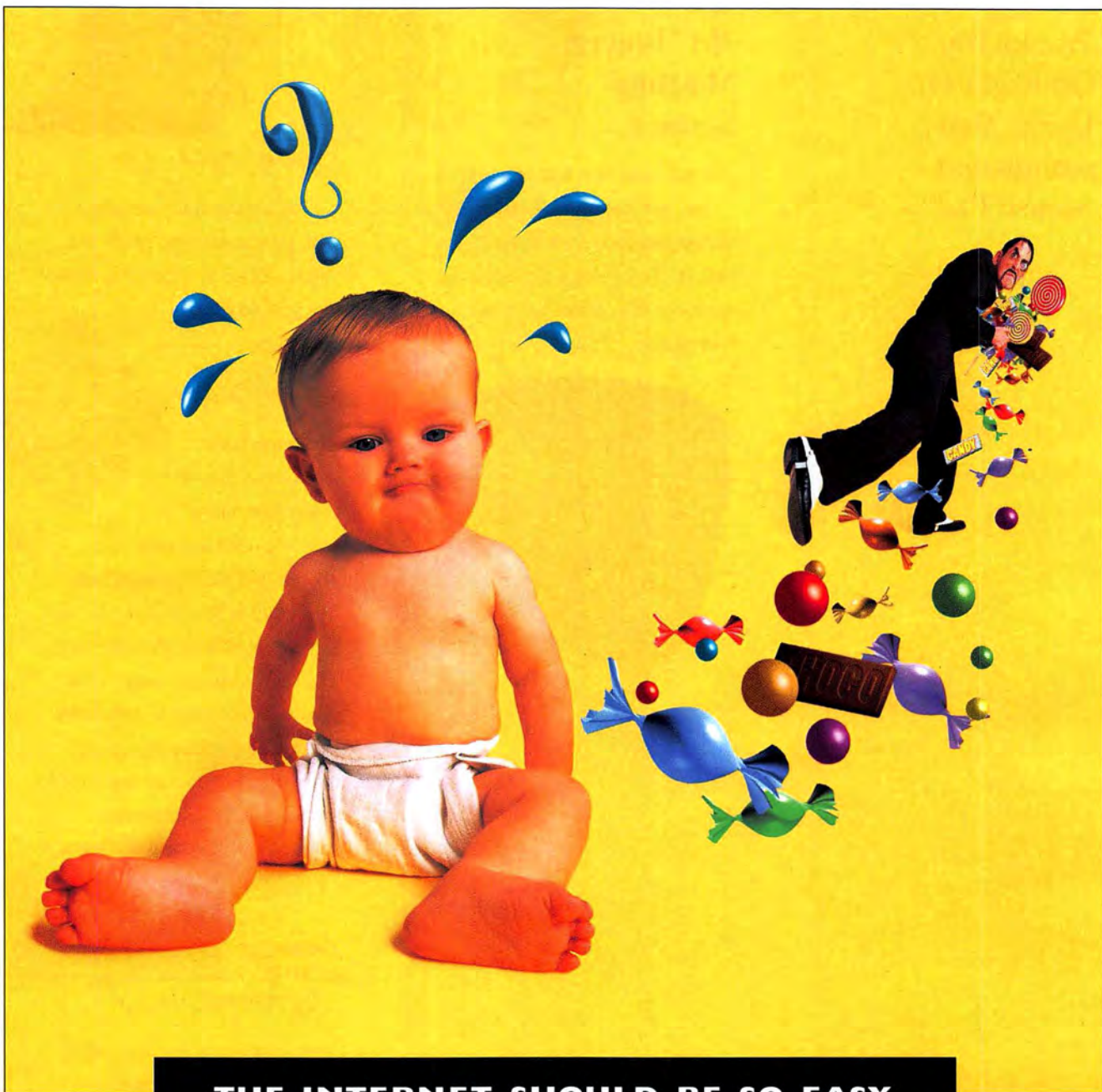


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PERSONALmac

When it comes to planning that much-needed vacation, your Macintosh may be just the ticket.



By Nancy Peterson

Have Mac, Will Travel

MY CHANCES TO SEE the beautiful Three Gorges area of the Yangtze River are submerging fast — the area will be flooded and lost forever when the world's largest dam gets built. If I'm going to see the Three Gorges, I've got to get cracking. But such a major trip overseas — and overland as well, since my dream vacation

also includes a cross-country U.S. stint — involves lots of research, map gazing, and planning. I wasn't quite sure where to get started, until I realized the answer was staring me right in the face: my Mac. With the wealth of available software and online resources, everything from automatic itineraries to travel tips was right at my fingertips.

Road Tripping

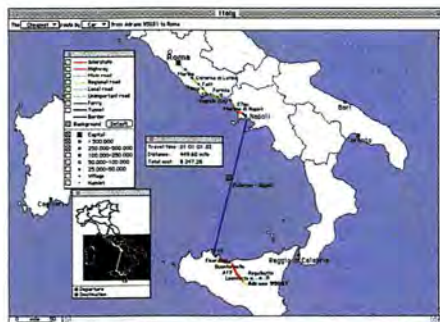
A quick current-events check on CompuServe's Magazine Database Plus (in the News section, under Consumer Magazines) told me that construction of the Yangtze dam won't be finished until at least the year 2009. That buys me some time — so I can fit in that cross-country U.S. road trip I've always wanted to take, before flying to China from the East Coast. OK, so most of us don't have that much vacation time, but this travel plan lets me cover Mac-based map programs — which range from lousy to outstanding at helping you plan your route.

Of those I viewed, my favorite was **Street Atlas USA 2.0** (★★★; \$79 direct), by DeLorme Mapping (800-452-5931 or 207-865-1234). This CD-ROM lets you view roads that go from city to city or from state to state, and it's the only program of the three reviewed here that helps you find streets within a

city. Just search for a street — say, Main Street in downtown Salt Lake City, Utah — and the program will show you a map of that street as well as important sites in the same area. The maps aren't beautiful to look at, but they're clear enough that printouts aren't hard to read. And version 3.0, expected sometime this spring, promises more-informative maps (with better indications of land use), the ability to search by street address, and links to the firm's upcoming Phone Search USA product.

The maps in **Street Atlas USA** may not win any beauty prize, but those in **Automap Road Atlas 3.0** (★★; \$39 list), from Microsoft (800-426-9400 or 206-882-8080), are even worse, because

they're difficult to read. Names of cities are eclipsed by other features on the map, and highway numbers are cut off. In some views, the map is so crowded you can't distinguish any of its features. Furthermore, screen redraws are so slow — even on my Quadra — that I gave up on making any map alterations. Unfortunately, Microsoft has no plans to upgrade the Mac version of Automap to be comparable to the reputedly superior Windows version.



Automap does have some useful route- and distance-calculation features, but you can get similar features and better maps with **Route 66** (★★★; \$79.95 list), from Route 66 Geographic Information Systems (800-569-0878 or 408-446-0660). It lets you pick your departure and destination points and then calculates the route for you. You get a map showing the type of route you specify (generally fastest, shortest, or cheapest) and a step-by-step itinerary. The itinerary tells you which highways to take, how many miles you'll travel, and how many hours of driving you have ahead of you. And, unlike the other two map programs reviewed here, Route 66 is also extensible with maps of European countries (\$35 per module; most modules cover one or two countries).

If you want automatic itineraries and don't mind fairly basic maps, choose Route 66. Its maps show just

the major cities and the ones where you need to switch to a different road on your chosen route. My dream map program would combine the calculations and itineraries of Route 66 with the powerful database and degree of detail of Street Atlas USA — oh, and the simple portability of my paperback road atlas, of course.

Reservation Stations

Once I make it to the East Coast, I'll need flight reservations. And on my trip, I'll need places to stay. One valuable reservation-making tool I found was Easysabre, a service American Airlines provides on all the major online services. Even though American Airlines is the company offering the service, you can reserve flights on hundreds of other airlines; it also lets you reserve hotel rooms and rental cars. And on the Web, I discovered TravelNow (<http://www.travelnow.com>), a service that specializes in hotel reservations and offers encrypted credit-card transactions over the Net (for more Web-based travel resources, see the travel section in "Net Success," in this issue). Because TravelNow charges hotels less to be included on its list, you may find even more hotels — and more affordable ones — than



(<http://www.vtourist.com/vt>). These sites provide a cross between a guidebook, an atlas, and a newspaper, covering hundreds of cities and regions around the world. That's where I can find out the current exchange rate of yuan to U.S. dollars, the requirements for entry into China, and what to expect for medical care in that country. I can also learn some cultural tips. For instance, if I visit Tibet, I can expect to bed down in a yak-hair hut and should encounter mostly yak farmers and nomads.

Another good way to learn about a region is from CD-ROM software, if you can find a title specific to your vacation spot. Check the catalogs at your local computer store, or send away for catalogs from companies such as Educorp (800-843-9497 or 619-536-9999). You may luck out, as I did in finding **Journey to the Source: An Expedition Along the Yangtze River** ▲ (★★★★; \$40 estimated street), by Grid Media, of Hong Kong (U.S. distributor, Brian Lee, 360-256-0294, ext. 11). Featuring beautiful photos, ample written and spoken passages, and mediocre video clips, it shows the Yangtze region through the eyes of explorer How Man Wong.

Packing My Bags

I'm all set. I've got my maps, and I know just where to go online to get hotel and plane reservations — I can even get boat tickets to sail the Yangtze (thanks to my Internet sources). I may even be there in time to join a protest against losing the Three Gorges and all the cities the dammed water will displace. All that's left to do now is make room in my suitcase for cans of coffee. You see, I learned from a fellow Yank online that finding a cup of coffee in China is nearly impossible. And believe me, withdrawal from caffeine and an eight-hour time difference are two situations I don't want to experience at once. ☹



you can on Easysabre. TravelNow is less advanced, however, in its airline and car-rental offerings.

Seeing the Sites

Perhaps the most enjoyable part of planning a vacation is planning your sight-seeing and learning about the people you'll visit. For a general orientation to a specific region, I like City.Net (<http://www.city.net>) and its map-based companion site, Virtual Tourist ▲

The Two Dads

BY RIK MYSELEWSKI AND JIM SHATZ-AKIN

RIK: We've come a long way since *Winky-Dink and You*.

JIM: Winky-What?

RIK: The first interactive electronic edutainment — a '50s TV show for little kids. Its claim to fame was a clear plastic sheet you stuck on your TV. When Winky got in a jam, you'd help him out by using grease pencils to draw scenes and characters on the sheet.

JIM: I was born too late. Or too early — even the littlest kids today have software designed just for them.

RIK: Hardware too. There's the **Comfy Activity Center** ▼, a keyboard made to go with Comfy's little-kid software.

JIM: The sturdy, busy-box-style keyboard is a fabulous idea, but the bundled CD-ROMs are major disappointments. Like, when you hit the drum button on the keyboard, a drum shows up on-screen but doesn't do anything.

RIK: Let's hope the next round of software — which will come from third parties as well as Comfy — is as clever as the keyboard.

JIM: Maxis has another idea for kids who are too young to use a keyboard: ▼ **Marty and the Trouble with Cheese**. Kids advance the story by using the Mac microphone to talk to Marty the mouse.

RIK: And it's so cccccccute. I loved helping Marty blow his cute little boat over the cute little pond toward his cute little home.

JIM: Cute is good, but when it comes to *teaching*, **Baby ROM!** and **JumpStart Preschool** outsmart Marty. At ten months, my Bailey is already using Baby ROM! — in my lap — to begin exploring shapes, numbers, and letters.

RIK: At four she'll tackle more-advanced activities on similar topics, using JumpStart Preschool . . .

JIM: . . . only after graduating from the soon-to-be-released JumpStart Toddler. And later, she'll try JumpStart Kindergarten, JumpStart First Grade, and JumpStart Second Grade.

RIK: Those JumpStart folks are untiring. I only hope JumpStart Clean Your Room is somewhere in their plans.



Baby ROM! ★★½

Ages: 6 months — 4 years.

Price: CD-ROM, \$19.95 (list).

Three levels of simple, straightforward activities that teach letters, numbers, shapes, and body parts; designed for parents to use with their kids.

Company: Byron Preiss Multimedia, New York, NY; 800-945-3155 or 212-989-6252; <http://www.byronpreiss.com>.

Reader Service: Circle #416.

Comfy Activity Center ★★½

Ages: 1 — 6.

Price: Keyboard and two CD-ROMs, \$129 (list).

The colorful, sturdy keyboard with keys that relate directly to the software is a great idea — too bad the bundled CD-ROM-based activities are so dull, ugly, and unimaginative.

Company: Comfy, San Jose CA; 800-992-6639 or 408-865-1777.

Reader Service: Circle #417.

JumpStart Preschool ★★★★★

Ages: 2 — 5.

Price: CD-ROM, \$35 (estimated street).

The entire JumpStart series (Second Grade, First Grade, Kindergarten, and the soon-to-be-released Toddler) is to be commended for its wealth of activities, although Preschool's interface is a bit rough around the edges.

Company: Knowledge Adventure, Glendale, CA; 800-542-4240 or 818-246-4400; <http://www.adventure.com>.

Reader Service: Circle #418.

Marty and the Trouble with Cheese ★★★★★

Ages: 2 — 5.

Price: CD-ROM, \$34.95 (list).

No keyboard skills are needed to navigate through this voice-activated — and exceptionally cute — story. Too bad there's not more to it, however.

Company: Maxis, Walnut Creek, CA; 800-526-2947 or 510-933-5630.

Reader Service: Circle #419.

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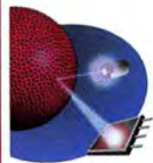
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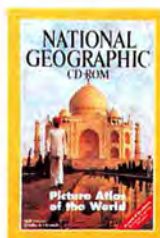
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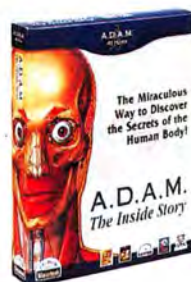
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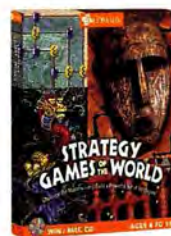


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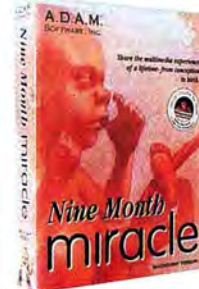


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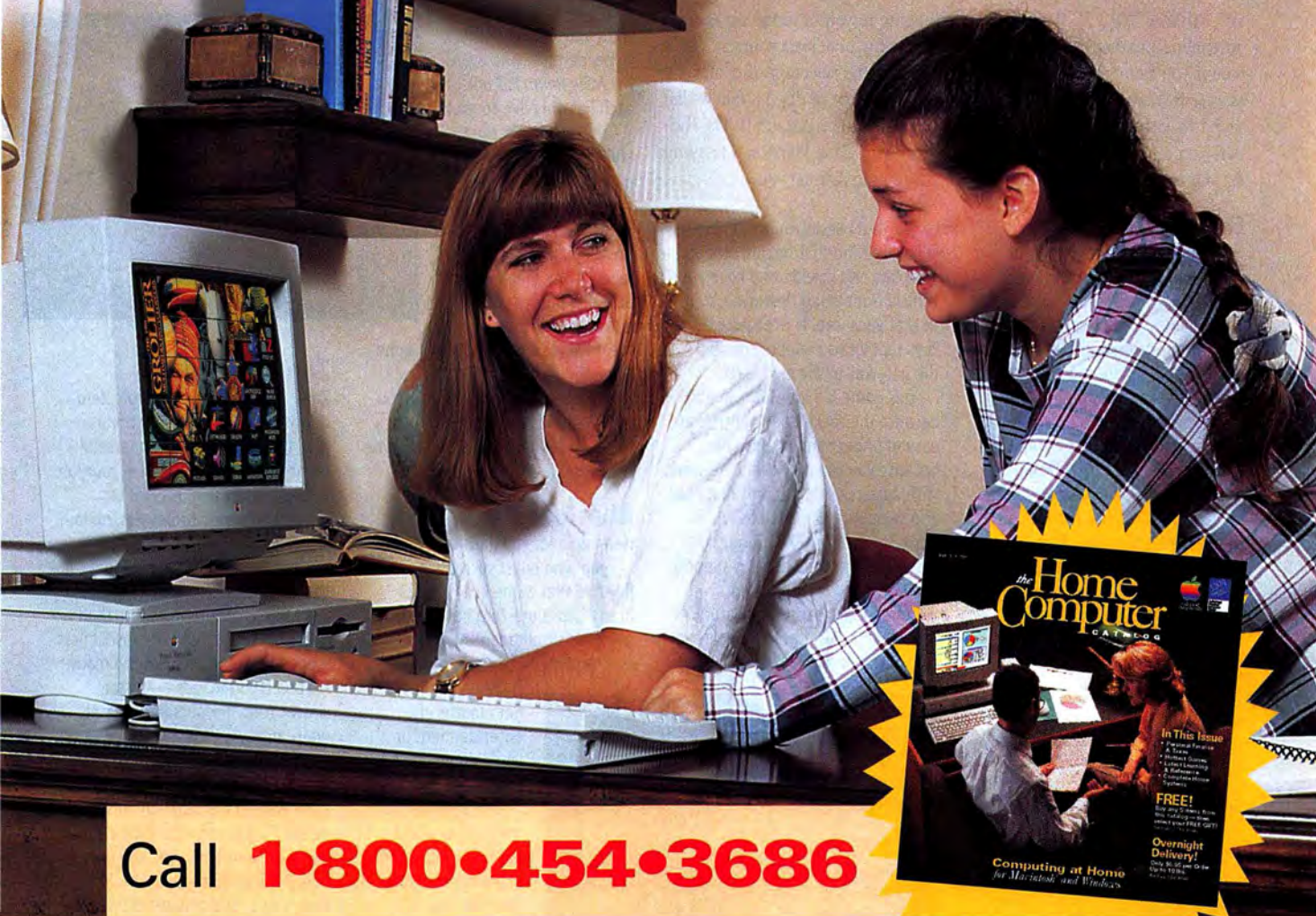
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The Game Room

BY BOB LEVITUS

THE FUTURE WILL BE HOSTILE, and it'll be up to you to pump up enough adrenaline and display enough skill to save the day, or at least yourself. That's true if you immerse yourself in any of this month's selection of games. I'll start with Havoc, the only one with battle in the light of day. I'll follow that with two action games within movies — *Star Wars Rebel Assault II: The Hidden Empire* and *Absolute Zero*. And I'll end with *Zone Warrior*, a fast and furious arcade-style shoot-'em-up with little plot to distract you.

Havoc

Havoc brings a new twist to the shoot-'em-up genre: the great outdoors. Whereas most point-and-shoot games take place in a dark underground labyrinth, Havoc places you in a well-lit, outdoor world of rocks, plateaus, cliffs, and hillocks.

You begin by choosing a combat vehicle (a hovercraft, a motorcycle-like machine, or a tank), each of which gives you a 360-degree view of your surroundings. Then it's off to the Badlands, the first of the increasingly difficult theaters of

GAME POINT

Havoc is an excellent cross-platform battle arcade game for one or more players. *Absolute Zero* has an interesting plot and responsive controls, but it takes many hours to get good at it. If you're looking for something easier but full of action, check out *Zone Warrior*. *Rebel Assault II* is for only the hardest of hard-core *Star Wars* fans.

Havoc ★★★★★

Price: \$50 (estimated street).
Company: Reality Bytes, Cambridge, MA; 617-621-2550.
Reader Service: Circle #420.

Star Wars Rebel Assault II: The Hidden Empire ★★★★★

Price: \$50 (estimated street).
Company: LucasArts Entertainment, San Rafael, CA; 800-985-8227 or 415-472-3400.
Reader Service: Circle #421.

Absolute Zero ★★★★★

Price: \$50 (estimated street).
Company: Domark Software, San Mateo, CA; 800-695-4263 or 415-513-8929.
Reader Service: Circle #422.

Zone Warrior ★★★★★

Price: \$30 (estimated street).
Company: Casady & Greene, Salinas, CA; 800-359-4920 or 408-484-9228.
Reader Service: Circle #423.

battle. Your overall objectives are to kill everything that moves, pick up weapons and shields, and keep your vehicle from being destroyed. Your goal at each level is to acquire three keys that let you teleport through the gateway to the next level.

This game is a lot of fun, in part because the cockpit and controls are easy to understand. It's also fun because you can play over a network, with players using not only Macs but also Windows 95 machines (via AppleTalk or TCP/IP). Among the game's advanced features is support for QuickDraw 3D accelerators, although I didn't test this feature. One drawback is that to play Havoc on a Mac, it must be PowerPC-based.



Rebel Assault II: The Hidden Empire

The original *Rebel Assault* was a low-res, ported-from-DOS bummer. With no place to go but up, *Rebel Assault II* gave me high hopes. LucasArts promised a cutting-edge game engine, higher-resolution graphics, better sound, new ships, and new live-action video. The result? It delivered all it promised but still ended up with a game that isn't much fun.

Rebel Assault II is mostly a movie, a cliché-ridden but new chapter in the *Star Wars* saga. It features such *Star Wars* faves as Lord Darth Vader and is what you'd expect from

LucasArts — spectacular footage.

Unfortunately, movie segments don't make a game fun to play. That task, in this case, falls to 15 interactive action sequences (called chapters), which are where the game falls apart. Even though you get to fly interesting aircraft (B-wing and X-wing fighters, a speeder bike, and even the *Millennium Falcon*), each has only five controls — up, down, left, right, and shoot — which boils down to pointing and shooting, and that's all. What's worse, the pointing and shooting feels mushy. Finally, the action in most chapters becomes repetitive — the enemies look and act the same throughout.

If you're a big *Star Wars* fan, you may enjoy *Rebel Assault II*. If you're not, wait for *Rebel Assault III*. Maybe they'll get it right next time.

Absolute Zero

Here's one for you hard-core gamers — you who boast such things as, "I finished that game in a mere 23 hours." *Absolute Zero* has so much going on simultaneously and so much you need to learn to complete

it that either you'll get months of entertainment or you'll throw up your hands in frustration.

The premise: On the mining world Europa in A.D. 2374, you awaken a long-sleeping race of aliens, who declare war on you. You get to play seven characters who are pivotal at

various points in the game for rescuing your people.

Underneath an interesting plot is the heart of the game: a shoot-'em-up that rivals the best of the genre. You get 7 vehicles and 13 weapons systems, and the controls are smooth and responsive. An unexpected surprise is a VR Helmet that lets you see through your vehicle.

I found *Absolute Zero* extremely challenging, maybe too much so. It took me too long to get comfortable enough with the weaponry, radar, compass, crosshair, and dozens of keyboard commands to finish a mission. If you were one of the *Absolute Zero*

pioneers and you haven't sent in your registration card, you may not know that Domark shipped an update to make the first two levels of the game easier. But be assured that the game's upper levels still hold plenty of challenge.



Zone Warrior

Zone Warrior, unlike *Absolute Zero*, doesn't bother with an elaborate plot. It's a point-and-shoot arcade game and damn proud of it. Your job is to use lasers and missiles to destroy incoming projectiles, raider ships, and command ships.

Zone Warrior is easier to learn than *Absolute Zero*, and its action sequences have more variety than *Rebel Assault*'s. That's because it uses a good variety of, but not too many, keyboard commands — faster, slower, turn, fire missile, fire laser, warp, and two views.

Both *Absolute Zero* and *Zone Warrior* require Power Macs, but *Zone Warrior* has more-modest needs — you can install the entire game on your hard disk, and it uses only 2 MB of disk space. *Absolute Zero* runs best if you install 98 MB of it on your hard disk, but you still need to insert the CD-ROM.

For those of you who prefer games you can learn in minutes instead of weeks or months, *Zone Warrior* is just the ticket. But don't let its apparent simplicity fool you — it has 99 levels of fighting. ☞

Bob LeVitus is a MacUser contributing editor and Power Computing's director of evangelism.

The Tip-Off

Havoc

Faster is usually not better. When you're hurrying, you may not realize what a beating your shields are taking. In this game, it's best to take your time so you can watch your shields.

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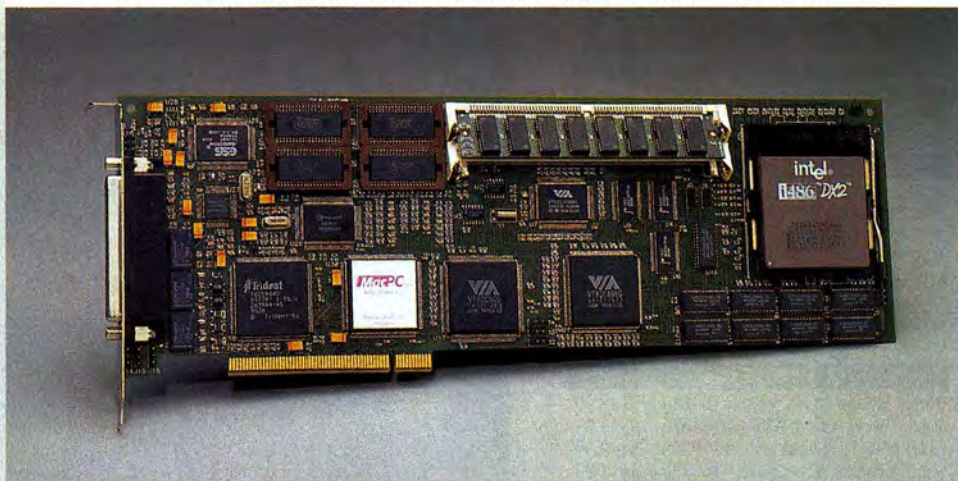
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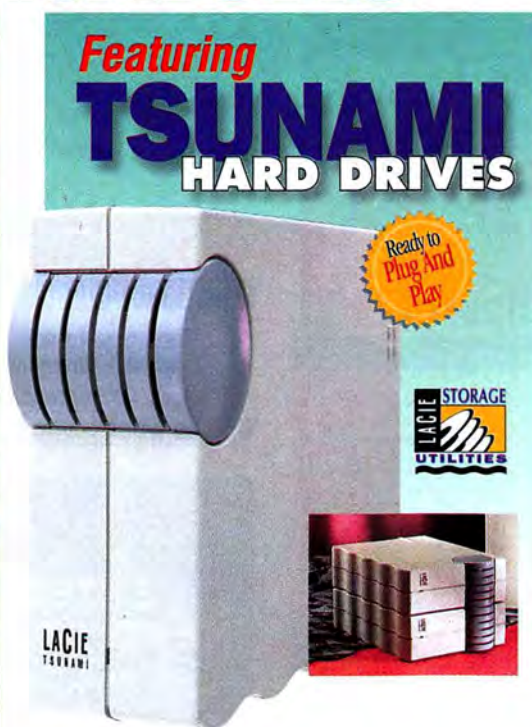


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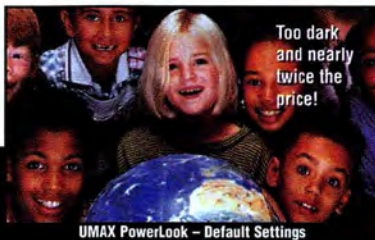
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Quantum 840 Trailblazer			
APS I 1080	1034MB	229 ⁹⁵	329 ⁹⁵
IBM Deskstar XP			
APS Q 1080	1042MB <small>LABS ***** MacWEEK *****</small>	259 ⁹⁵	339 ⁹⁵
Quantum 1080 Fireball			
APS Q 1280	1222MB	299 ⁹⁵	399 ⁹⁵
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APS I 2160	2063MB	499 ⁹⁵	599 ⁹⁵
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APS MS 2000	2000MB <small>LABS *****</small>	549 ⁹⁵	649 ⁹⁵
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Seagate ST 32550N Barracuda			
APS MS 4.0	4064MB <small>LABS *****</small>	999 ⁹⁵	1099 ⁹⁵
Micropolis 3243			
Fast/Wide or AV available for an additional \$100.00			
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Avatar mechanism	Each cart \$49 ⁹⁵	IDE	
APS Q 1.08	1037MB		474 ⁹⁵
Quantum Europa	3800 rpm	Fast ATA2	

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EZ135	128MB	27ms	13ms	1.1m/sec.	0.8m/sec.	1-year	\$1.80

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Travan 4 ConnerQIC 3095 Mech.	**** N/A		
APS DAT	2GB **** LABS		\$649 ⁹⁵ 699 ⁹⁵
DDS-1 Non-Compression Mech.			
APS HyperDAT	8GB **** LABS		849 ⁹⁵ 899 ⁹⁵
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APS HyperDAT Pro	8GB **** LABS		1049 ⁹⁵ 1099 ⁹⁵
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APS DAT Loader600	48GB **** LABS		2699 ⁹⁵
Ideal for large unattended network backups	N/A		

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Model	Capacity/Features	Awards	SR2000
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91099	Tru-form Extended Keyboard w/Pointer	\$99.98
91854	Soft Touch Keyboards	\$48.98
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92698	Alps Glidepoint for Mac	\$56.98
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91862	Drawing Slate II 12x12 w/Pressure Pen	\$224.00
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93628	Thinking Mouse ADB	\$84.98
05176	TurboMouse 4.0 Trackball w/4.1 Software	\$99.98
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90677	Soft Touch Extended Keyboard	\$44.98
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Accessories		
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97855	Port Juggler	\$8.98
CoStar		
95505	LabelWriter XL	\$148.98
95506	LabelWriter XL Plus	\$236.98
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20670	Stylus Color II Ink Jet	\$399.00
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87980	Stylus Pro XL Ink Jet	\$1,789.00
19291	Stylus Color Color Cartridge	\$33.98
19292	Stylus Color Black Cartridge	\$17.98
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91917	Stylus Multi-Protocol Ethernet Interface	\$389.98
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88902	HP DeskWriter 600	\$238.98
94057	HP DeskWriter 600C InkJet	\$389.98
23786	HP LaserJet 5MP	\$1,044.00
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92531	Tektronix Phaser 140	\$1,195.00
90628	Tektronix Supply Startup Kit	\$179.98
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APC		
94396	APC Personal Surge Arrest	\$18.98
94395	APC Personal Surge Arrest w/Phone	\$21.98
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SyQuest		
EZ135 Cartridge Single		#24998
Only \$20		
99364	BackUps 400	\$148.98
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\$0 Down 100% Business Financing NO Payments for 90days

FREE!
5 x 200 m b
Syquest Cartridges
with lease
\$345 Value

DESIGNERS SPECIAL

- PowerMac 8500/120
- Internal CD ROM
- 64MB RAM
- 2GB internal hard drive
- Extended keyboard
- Sony 20SF II Trinitron monitor
- ATI Xclaim PCI Graphics Card
- Microtek Scanmaker 3E
- SyQuest 200 Drive
- TI Microlaser Pro 8 600dpi Printer
- 12x12 Graphics Tablet

PowerMac 8500/120
Starting at \$3089

Per Month
\$299

Most Popular Configuration

FREE VALUE ADDED SERVICES

Why Lease?

- \$0 Down 100% Business Financing No Payments for 90 days. You can lease hardware, software and extended warranties.
- Converts a large cash purchase into low monthly payments.
- Leasing allows your business to pay for equipment as it generates income, not before.
- Computer equipment depreciates rapidly, so don't spend your hard earned capital, it's the most important asset your company has.

Digital Graphix
NO LEASING

Why Lease or Buy from Digital Graphix?

WE PROVIDE THE BEST VALUE ADDED SERVICE IN THE INDUSTRY.

- We are Apple system experts. **WE ARE NOT ORDER TAKERS.** We offer the best service, price and selection.
- We cater to marketing and advertising professionals, printing shops, service bureaus, multimedia, digital imaging, and CAD/CAM professionals. Our Business is knowing your mac system needs.
- Free technical support from certified engineers.
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- We only sell the finest quality **NEW** equipment. **NO REFURBISHED** products!

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NEW

Graphix Systems

Perfect for:
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NEW \$0 down NEW BUSINESS Financing Available



7500/100 **Per Month**
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\$229

- PowerMac 7500/100
- Internal CD ROM
- 40MB RAM
- 1GB internal hard drive
- Extended keyboard
- Sony 17SF II Monitor
- VRAM Upgrade
- ScanMaker IHR color Scanner
- HP 5MP 600dpi Laser Printer
- 6x8 Graphics Tablet
- SyQuest 200 Drive

FREE!

Quark
With Every Graphix System Lease
\$650 Value

Systems Starting at \$1879

8500/120 **Per Month**
MID RANGE DTP SYSTEM
\$389

- PowerMac 8500/120
- Internal CD ROM
- 64MB RAM
- 2GB internal hard drive
- Extended keyboard
- Sony 20SFII monitor
- ATI Xclaim 4MB PCI Video Card
- Agfa Studio Scan IIsi
- Sony 8GB DAT tape drive
- SyQuest 200 Drive
- GCC 608 600dpi, 11x17 Printer
- 12x12 Graphics Tablet

Systems Starting at \$3089

9500/132 **Per Month**
HI END SUPER STATION
\$599

- PowerPC 9500/132MHZ
- Internal CD ROM
- 144MB RAM
- 4GB internal hard drive
- Radius PressView 21SR Monitor
- ATI Xclaim 4MB PCI Video Card
- Sony 1.3GB Optical Drive
- SyQuest 200 Drive
- Microtek ScanMaker III with Transparency
- GCC XL 1208 1200dpi, 11x17 Printer
- 12x18 Graphics Tablet

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Perfect for:
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\$399

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- Internal CD ROM
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- 1GB hard drive
- Extended keyboard
- VRAM Upgrade
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- TrueVision Targa 2000 PCI Digital Card
- 4GB SCSI-3 Fast&Wide disk array
- FWB Jackhammer SCSI-3 controller
- Sony 8GB DAT tape drive

FREE!

Adobe Premiere
With Every Digital System Lease
\$485 Value

Systems Starting at \$3089

LOW Price

9500/120 **Per Month**
MID RANGE POWER SYSTEM
\$499

- PowerPC 9500/120MHZ
- Internal CD ROM
- 64MB RAM
- 2GB hard drive
- Extended keyboard
- Sony 20SF II Monitor
- ATI Xclaim 4MB PCI Video Card
- TrueVision Targa 2000 PCI Digital Card
- 8GB SCSI-3 Fast&Wide disk array
- FWB Jackhammer SCSI-3 controller
- Sony 8GB DAT tape drive

Systems Starting at \$2589

9500/132 **Per Month**
DIGITAL VIDEO WORKSTATION
\$759

- PowerPC 9500/132MHZ
- Internal CD ROM
- 144MB RAM
- 4GB internal hard drive
- Radius PrecisionView 21 Monitor
- ATI Xclaim 4MB PCI Video Card
- TrueVision Targa 2000 PCI Digital Card
- 16GB SCSI-3 Fast&Wide disk array
- FWB 4x CD-ROM recorder
- FWB Jackhammer SCSI-3 controller
- SyQuest 200 Drive
- Exabyte 8505 16GB DAT tape drive

Systems Starting at \$2379

Business Systems

Perfect for:
Lawyers, Accountants, Doctors, and general business professionals

7200/75 **Per Month**
BUSINESS ENTRY LEVEL
\$129

- PowerMac 7200/75MHZ
- Internal CD ROM
- 24MB RAM
- 500MB hard drive
- Extended keyboard
- Apple 15" monitor
- ScanMaker E3 color Scanner
- HP 5MP 600dpi Laser Printer
- SyQuest 200 Drive

FREE!

Microsoft Office
With Every Business System Lease
\$439 Value

Systems Starting at \$779

7500/100 **Per Month**
BUSINESS MID RANGE
\$199

- PowerPC 7500/100
- Internal CD ROM
- 40MB RAM
- 1GB hard drive
- Extended keyboard
- VRAM Upgrade
- Radius PrecisionView 17" Monitor
- Syquest 200 Drive
- HP 5MP Laser Printer
- ScanMaker E3 color Scanner

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Video



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HP 5Mp	\$1045
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PRO 8
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Internal

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Seagate			
Seagate 2GB	\$730	\$805	
Seagate 4GB	\$880	\$955	
Seagate 9GB	\$2190	\$2290	



MICROTEK

SCANMAKER III
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Agfa Arcus II/Transparency	\$1999
ScanMaker IHR	\$779
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Microtek Scanmaker E3	\$379
Epson ES-1200c Pro	\$1179

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- 1200 dpi
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Includes external drive 25/50 cable, active terminator, and Retrospect backup SW.

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Only \$389**



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Lifetime Warranty



Includes External drive, case, 25/50 cable, 50/50 cable, active terminator, and FWB Hard Disk ToolKit

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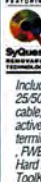
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**74 MINUTE CD ROM
RECORDABLE MEDIA
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Conner 2.1gb.....	625...725	
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4.2gb RAID = 4.5ms	1390
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- Choose the size of RAID you want.
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- Select the RAID controller software which matches your SCSI II card, or your current preferred driver.
- Finally, buy the RAID case. We'll do the rest.

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Prometheus Cyberphone.165
Supra 28.8 PowerBook...239
Supra 14.4 PowerBook...161
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Netlink PC Cellular.....269

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Kodak DC50 camera.....call
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2200MB Capella	C104 0003/C104 0053	\$629/\$689
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Seagate

	Internal/External	Internal/External
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CLUBMAC 2.5" HARD DRIVES

Quantum

	Internal	Internal
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1080MB Europa IDE	C104 0008	\$419

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Seagate

	Internal/External	Internal/External
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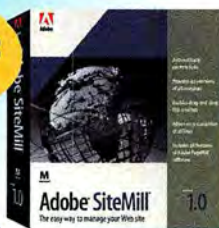
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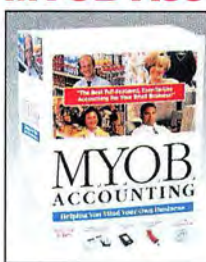


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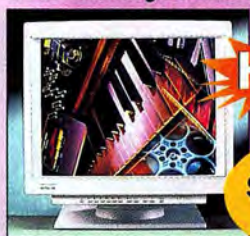
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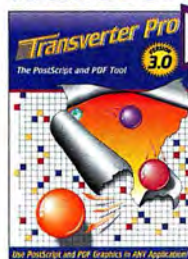
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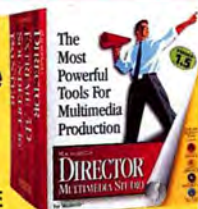
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16MB 70/60NS	365/367
32MB 60NS	771

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32MB 70NS	1219

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16MB 60NS	362
32MB 60NS	762
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Standard 72-Pin Simms:

Quadra 605/630, 610, 650, 700, 800/840AV, LCIII, LC475, LC630, Performa 450-560, 575 and 6115CD, PowerMac 6100, 7100, 8100, WS 80, WS60, WS 95, WS 6150 and WS 8150, 9150.

168 Pin Dimms:

PowerMac 9500, 8500, 7500, 7200

PowerMac Memory Selection Guide

PowerMac 6100

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24MB	(2) 8MB 70/60NS
40MB	(2) 16MB 70/60NS
72MB	(2) 32MB 60NS

PowerMac 7100, 8100

(8MB) Standard 72-pin SIMMS

To upgrade your RAM to:	You need to order:
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24MB	(2) 8MB 70/60NS
40MB	(2) 16MB 70/60NS
72MB	(2) 32MB 60NS
136MB	(4) 32MB 60NS
264MB (7100 only)	(8) 32MB 60NS

PowerMac 9500, 8500, 7500

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48MB	(2) 16MB 70NS DIMMS
80MB	(2) 32MB 70NS DIMMS
144MB	(2) 64MB 70NS DIMMS

PowerMac 7200

(8MB) Standard 168 pin DIMMS

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64MB	(2) 16MB 70NS DIMMS
128MB	(4) 32MB 70NS DIMMS
256MB	(4) 64MB 70NS DIMMS

FPU's/CoProcessors Video RAM

FPU's/Math CoProcessors

Centris FPU 25MHz	\$189
FPU 33MHz DUO/P600	52
FPU Color Classic 16MHz	44
FPU LCIII 25 MHz	49
FPU LC/LCII 16 MHz	49
LC575 33MHz Math CoProc.	239

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2MB Video RAM PM 9500	229
256K/512K Cache Card	72/411
1MB Cache Card	792
256K Cache Dimm PMPCI256	109
512K Cache Dimm PMPCI512	185

MODEMS

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Teleport Platinum 28.8 V.34	\$2
PowerPort 1XX Platinum 28.8 V.34	3
PowerPort Gold PC Card 14.4	1
PowerPort Platinum PC Card 28.8	3
PowerPort Platinum PRO PC Card	5

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SUPRA 28.8 V.34	2
SUPRA 28.8 PB FAX Modem	1
SUPRA EXPRESS 144 PLUS	1
SUPRA EXPRESS 288 External V.34	1

US ROBOTICS

28.8 Sportster V.34 Internet Bundle	\$2
Sportster 14,400 Mac & Fax	2
28.8 V.34 PCMCIA Sportster	2

TDK

28.8 V.34 PCMCIA PB190/5300	\$2
Global Class 288 V.34 PCMCIA	3

Motorola

Lifestyle 28.8 V.34	\$2
Power 28.8 V.34	2
ISDN Bitsurfer	2

MEGAHERTZ

Cruise Card 14.4 PCI	\$1
Cruise Card 28.8	2
Cruise Card 14.4	2

ACCELERATOR

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Turbo 040 40MHz w/cache	\$679
Turbo 040i 33MHz w/cache no FPU	609
PowerPro 601 1 00MHz w/cache	1
Turbo 601 1 00 MHz w/adaptor	1
PowerCard 601 1 00MHz	1

SONNET

Quad Doubler 40MHz Centris 610
Quad Doubler 40MHz w/FPU Centris 610
Quad Doubler 50MHz w/FPU Quadra 610
Quad Doubler 50MHz w/FPU Centris 650
Quad Doubler 50 MHz Centris 660AV/7900

CD-ROM

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F/A-18 Hornet 2.0	49	Soft Windows 2.0
Full Throttle	49	Quicken 6.0 Deluxe
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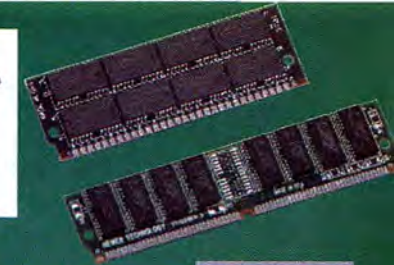
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NEC	1620MB	11ms	4500	256K	3yr	NEC3847	\$269	\$329
Micropolis	2050MB	9ms	5400	512K	5yr	MC4421	\$539	\$599
Micropolis	2050MB	8.5ms	7200	512K	5yr	MC4221	\$585	\$645
Micropolis	2050MB	8.5ms	7200	512K	5yr	MC4221AV	\$665	\$725
Conner	2147MB	9ms	5400	512K	5yr	CFP2105S	\$609	\$669
Conner	2147MB	9ms	7200	512K	5yr	CFP2105S	\$639	\$699
Seagate	2147MB	9ms	5411	512K	5yr	ST32430N	\$609	\$669
Seagate	2147MB	8ms	7200	512K	5yr	ST32550N	\$699	\$759
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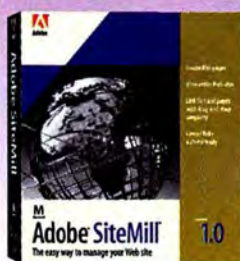
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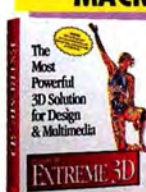
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- Pioneer Quadraspin six disc CD changer w/six CD Photo Library - keep 1000's of image files on-line!
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- HSC Live Picture v2.0
- \$25** FWB Hard Disk Toolkit
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- Formatter Pro Disk Utility
- Retrospect II Back-Up Software
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- Kai's Power Tools v2.1
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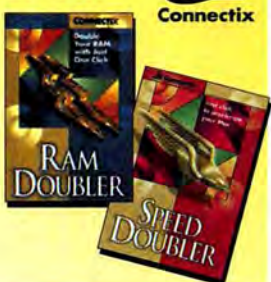
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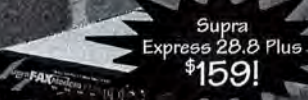
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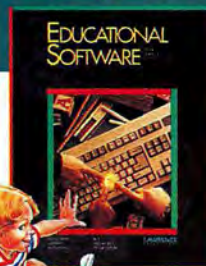
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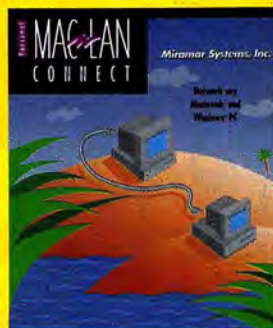
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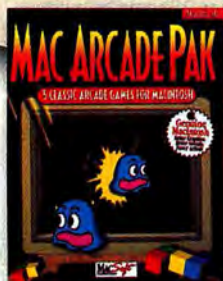
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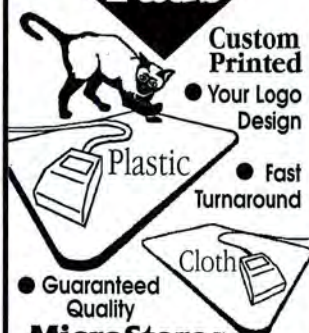
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ANDY IHNATKO

Gulf War

AND THERE, JAMMED in the S-bend of the LaserWriter's paper path, he found the crumpled Photoshop image of a hook!"

The dozen or so computer geeks in the hotel suite exchanged groans. Getting together after the conference to swap horror stories was a group tradition that went all the way back to InterCon '91, and stories that were both new *and* genuinely horrifying were rare.

"Pretty lame, Roger," Sheila pronounced, getting up and crossing the room. "That wasn't even *scary*. Besides, the way I heard the story, the paper just said, 'I Told You Not To Install Open Transport.'" She threaded a beer out of the minifridge and returned to her seat.

"Hey, what about Andy?!" she said, turning to me. "What have you got for us?"

My eyes remained on the beads of condensation on my can of Dr. Pepper. I'd hoped to avoid active participation this year, but my peripheral vision confirmed that I had the attention of the entire room.

I cleared my throat. "I've got only one real horror story. But I don't want to tell it, and I don't think you guys could handle it. It's absolutely ghastly — and it really happened."

I meant what I said, but my response only electrified the group.

My mouth had gone dry, so I took another swig, swallowing so fast that the carbonation burned my throat. "Well, you know how it is," I mused, leaning back. "You always *want* to hear a good horror story, but in the back of your mind you know it'll probably be something incredibly lame involving a hook." Roger cleared his throat and announced he was going out for some more ice. "But there's always the risk that you'll hear something that just

shivers you right to the marrow."

Sheila pulled her chair in closer. "Dish."

I set my soda down on the end table. "OK . . . but remember, this is an absolutely true story. We're all friends here, and adults in some fashion or another," I began. "We have our favorite operating systems, and although we may kid around with each other, deep down we all respect each other's choices, right?"

Everyone nodded.

"This is not our story. This is a story from the *front lines* of the user-interface wars, where the battles are bloody, the stakes high, and the injuries deep. It concerns a kid I'll call Sparky. He goes to a public high school in Maine, where 'official' student computers are all Windows machines."

"oooOOOOOOooooooo . . . scary!" a Mac developer laughed. He received a dozen icy stares as a reward.

"But the school *had* managed to acquire half a dozen Macs," I continued, unruffled, "mainly through donations from local colleges and organizations. They were mostly SEs, but they had some LCs and a perfectly good LaserWriter NT too . . . functional and useful."

"This year, the school upgraded all its PC hardware. In the process, all the Macs were disconnected and exiled to a storage closet. But Sparky, valiant front-line Mac evangelist he is, obtained some unused space in the school and, through lots of scrounging and hard work, set up a fully networked Macintosh lab all by himself. It wasn't long, however, before the school's computer club found it and made *its* contribution."

I stood, to pace and gesture. "Consisting solely of Windows xenophobes, this so-called club usually spent its meetings eating doughnuts and playing Doom II. But on one fateful day, they decided on a different activity: to destroy the Mac lab."

"What do you mean, 'destroy'?" Sheila asked.

"I mean *destroy*. . . what Rome did to Carthage. Sparky wasn't there, but the after-

math was pretty clear. ImageWriters thrown to the floor and smashed. SE screens and cases cracked. Machines taken completely apart. Someone did a little dance on the LaserWriter, and a whole bunch of hardware — including an LC III — just plain vanished. Well, not entirely," I corrected myself. "About \$400 worth of Mac SIMMs reappeared a couple of weeks later as a set of wind chimes in the PC lab."

"So what did the school do when Sparky reported this?" a Windows product manager asked, quietly.

I retrieved my soda. "His principal and vice principal left the matter to the two teachers in charge of computing: the Evil Twins."

"Huh?" Sheila asked.

"Sparky's term, not mine," I replied. "The Twins, both unapologetic Mac haters, took absolutely no action, disciplinary or otherwise, aside from naming the lab 'The Mac Graveyard.' Sparky tried to put the machines back together, but wires had been cut and parts smashed."

There was silence. Finally, a Webmaster spoke. "Damn . . . I mean, what if the literature club went and burned all the foreign-language books in the school library?" she asked. "The administration just doesn't *care*?"

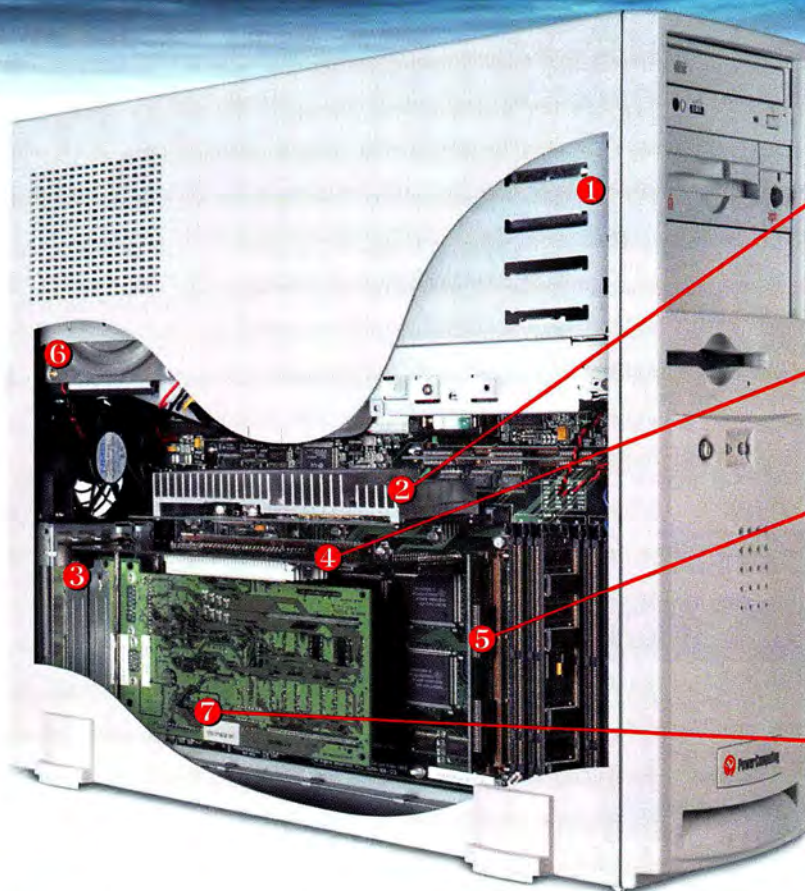
I drained the rest of my drink. "Nope. When Sparky e-mailed me the story, I sent back a long and reasoned message about the importance of diversity in computer education, hoping he'd forward it to the Twins. He forwarded back their reply, which ended, quote, 'He is an angry pantload. Forget him, and fall in love with Windows! Just kidding!' Got me so mad that I started phoning around . . . and Power Computing, bless 'em, decided to give Sparky a nice, hot Power Mac clone."

"Still, these acts of platform bigotry are like cockroaches," I sighed, lofting the empty can across the room. "For every one you see, there are a hundred more you don't." It hit the rim of the wastebasket and skittered away.

And there was more silence. And then we stopped telling horror stories. ☐



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