

NOVEMBER 1994 / \$4.95

Mac User

BONUS!
Special Graphics Guide

POWER MAC SHOOT-OUT!

We Test **Macs** Against
Windows and **UNIX**
Machines in the
Ultimate Photoshop
Showdown.

**the Results Will
Surprise You!**

PLUS

**From Personal to
Prepress: We Explain
Digital Cameras**

**Step-by-Step Guide
to Making Windows Work
with Your Mac**

**Everything You Need to Know to
Pick the Perfect Monitor**



New Microsoft Office 4.2
for Macintosh and Power
Macintosh includes new
versions of Microsoft Excel,
Word, PowerPoint and a
Mail workstation license.



WOULD YOU SETTLE FOR

Granted, every-
thing in your life
may not always
come together.

But on your Macintosh*, it's an-
other story. Because now there's
a family of leading, full-featured
programs for the Mac* that truly
work together like one.

New Microsoft® Office 4.2.



*It's never been this easy to
move data between programs.
All you do is drag and drop.*

Think of Office as programs
that look alike. Programs that
act alike. Programs with links be-
tween them. And finally, think
of Office as programs that work
so closely together, you'll feel
like you're using just one.

But experience is the best
teacher. So prepare a monthly re-
port to your boss. You'll begin,
of course, with Microsoft Word,
our intuitive word processor.

And if you make a common
typo along the way, don't worry.

Word can fix it automatically,
thanks to IntelliSense™ technolo-
gy. It senses what you want to
do, then helps you do it. Making
everyday tasks automatic and
complex jobs a lot easier.

Back to your report. Let's
say you're making a point about
sales growth. Why not add a
sales chart from Microsoft Excel?
Simply drag the chart into Word
and let go. It's that easy.

You can even make changes
to the chart, right where you are.
Click on the chart and instantly
all your spreadsheet tools appear.
Without leaving Word.

Talk about being connected.

But wait, you forgot you
have a big presentation tomor-
row morning. No problem. You're

Teh→The

*Now you see it. Now you
don't. Set AutoCorrect to instantly
fix your common typos.*

at one with your Mac. Just click
a button in Word and automat-
ically turn your document
into a persuasive presentation
in PowerPoint.*

The fact is, the walls are
down. Gone. You're now free to



PERFECT HARMONY IN YOUR MAC?

combine words, numbers and pictures with ease, without leaving your document.

Letting you focus on your work. Instead of the programs you're using.

Better yet, no matter what you're working on, you're always working smart.

Because as we just pointed



One click turns your Word document into a PowerPoint presentation.

out, IntelliSense technology lends you a hand. Whether you need a quick tip in Microsoft Excel. Step-by-step assistance as you build a newsletter in Word. Or help putting together a PowerPoint presentation.

Another smart thing about Microsoft Excel, Word and PowerPoint is how much they resemble each other.

All menus and dialog boxes are virtually identical. Even toolbars look alike. So learn one program and you're on your way to learning them all.

Our spirit of consistency even extends beyond your Mac.

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and Microsoft Office 4.2 for Windows[®]. Without having to convert them.

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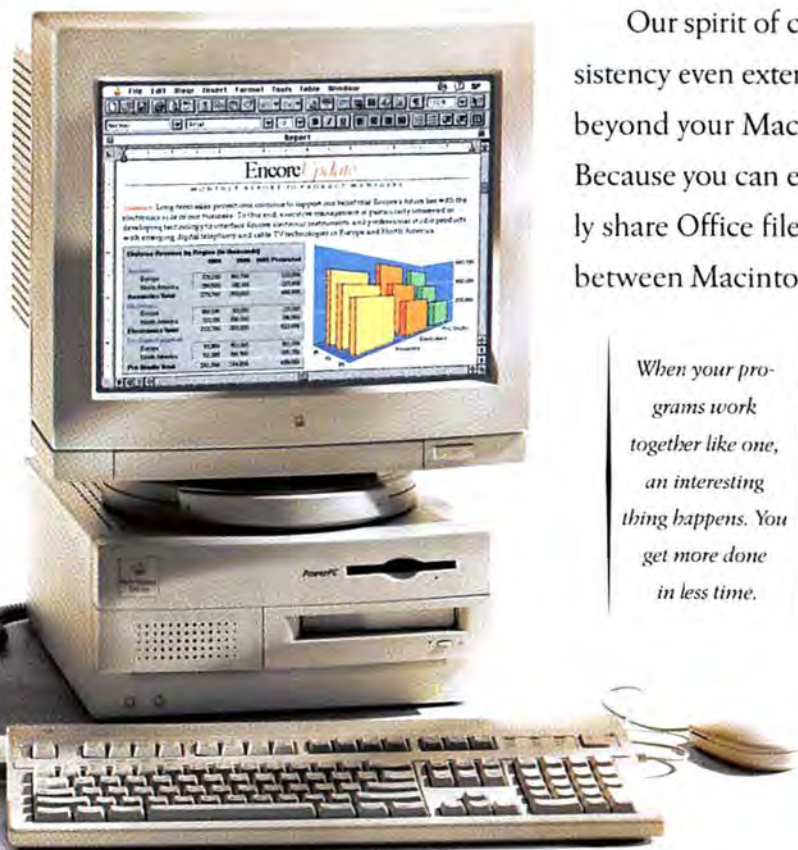
There's even more support built into Office. Or behind it, to be exact. Our unlimited product support is available to you at no service charge.* So whenever you have a question or need help, just call.

But first, call (800) 709-3787, Department YP4, to locate the retailer nearest you. They'll help you learn all about the new Microsoft Office Standard 4.2 in versions for both Macintosh and Power Macintosh[™].

So give us a ring.

Then give your Macintosh something most people spend a lifetime searching for.

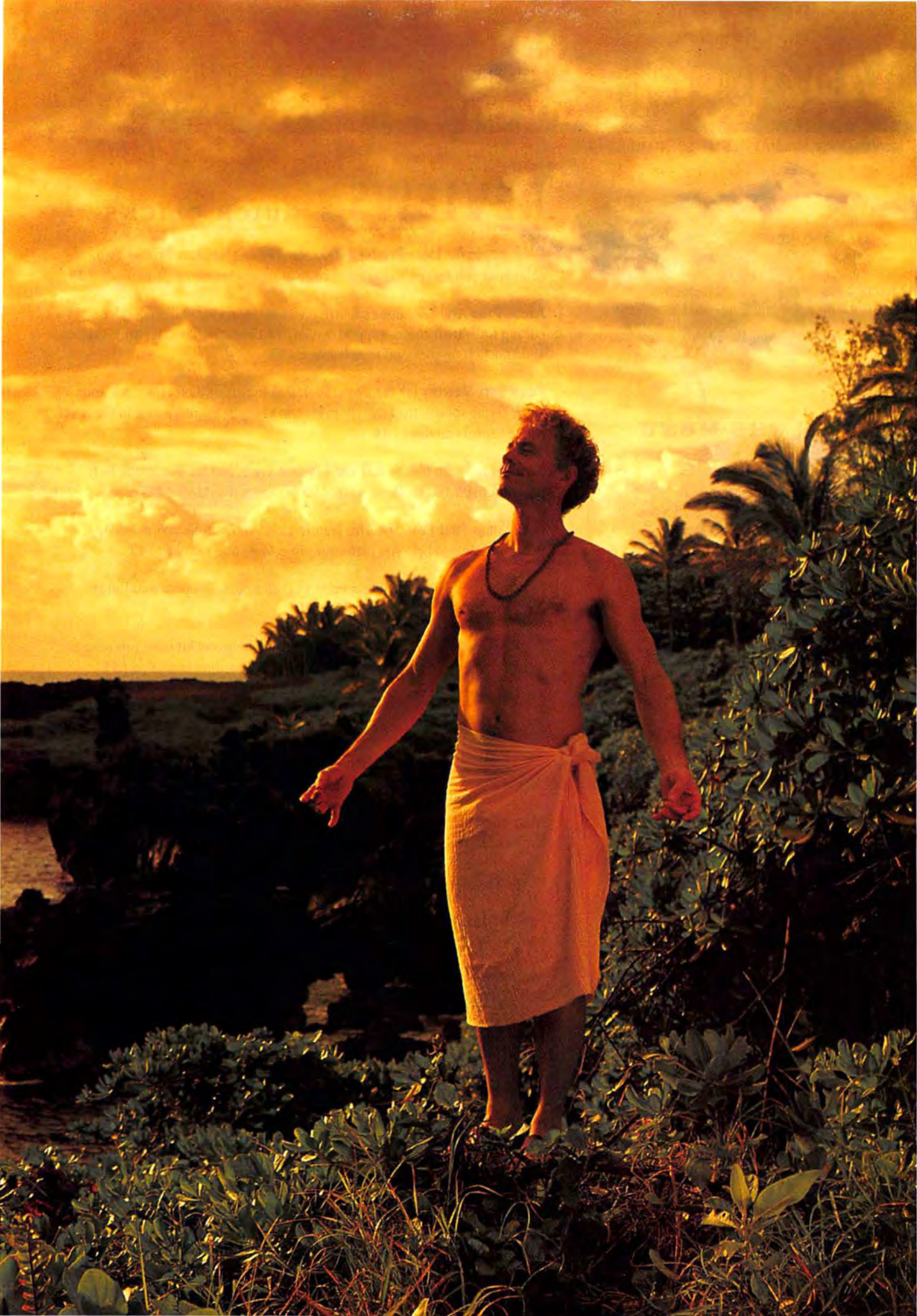
When your programs work together like one, an interesting thing happens. You get more done in less time.



Microsoft Office

**MANY PEOPLE
STRIVE FOR
PERFECT HARMONY
IN THEIR LIVES.**





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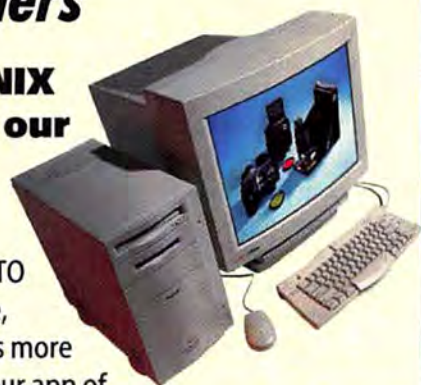
Power Imaging for Power Publishers

Mac, Pentium, and UNIX machines compete in our first-ever Photoshop challenge.

**MacUser ZD
LABS**

WHEN IT COMES TO CPU performance, nothing demands more

than Photoshop. That's why it was our app of choice for a mammoth benchmark-testing effort to explore the limits of various performance-enhancement strategies, including the use of non-Mac platforms. So how did the Power Mac do when thrown into the ring with a Pentium PC and a Silicon Graphics machine? We tell you that and more. BY BRUCE FRASER / 72



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Top-Quality Scanners

**MacUser ZD
LABS**

IF TOP-QUALITY COLOR is what you seek, then a top-quality scanner is what you need. MacUser Labs quality-tested 12 production-level scanners for color saturation, sharpness, and shadow detail and rated them on speed and flexibility.

BY BRUCE FRASER / 82



Choosing the Right Monitor

**MacUser ZD
LABS**

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BONUS

GET INFO:

Getting the Edge in Color Publishing

IN THIS SPECIAL SUPPLEMENT, *MacUser* and *MacWEEK* join forces to bring you the latest technological developments in DTP — from digital cameras as the hot new input devices, through savvy strategies for proofing, to the movement toward putting color output on the desktop by using copiers.

BY BRUCE FRASER, CONNIE GUGLIELMO, BRIAN P. LAWLER / 115



All about digital cameras



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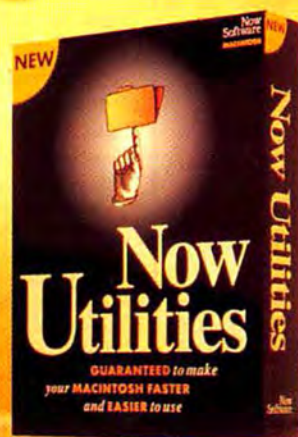
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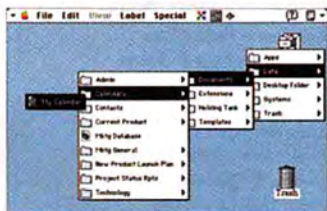
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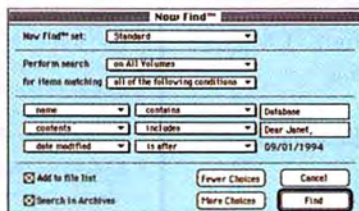
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The original version won countless awards and praise from the experts. Not ones to rest on our laurels, we've spent the last year rethinking, refining and adding major features as well as subtle enhancements. New Now Utilities 5.0. Accelerated for Power Macintosh.™ Introductory street price under \$70, after that \$89. Upgrades available for just **\$39.95 until November 15, 1994.** Call 1-800-689-9425 today, or see your dealer.



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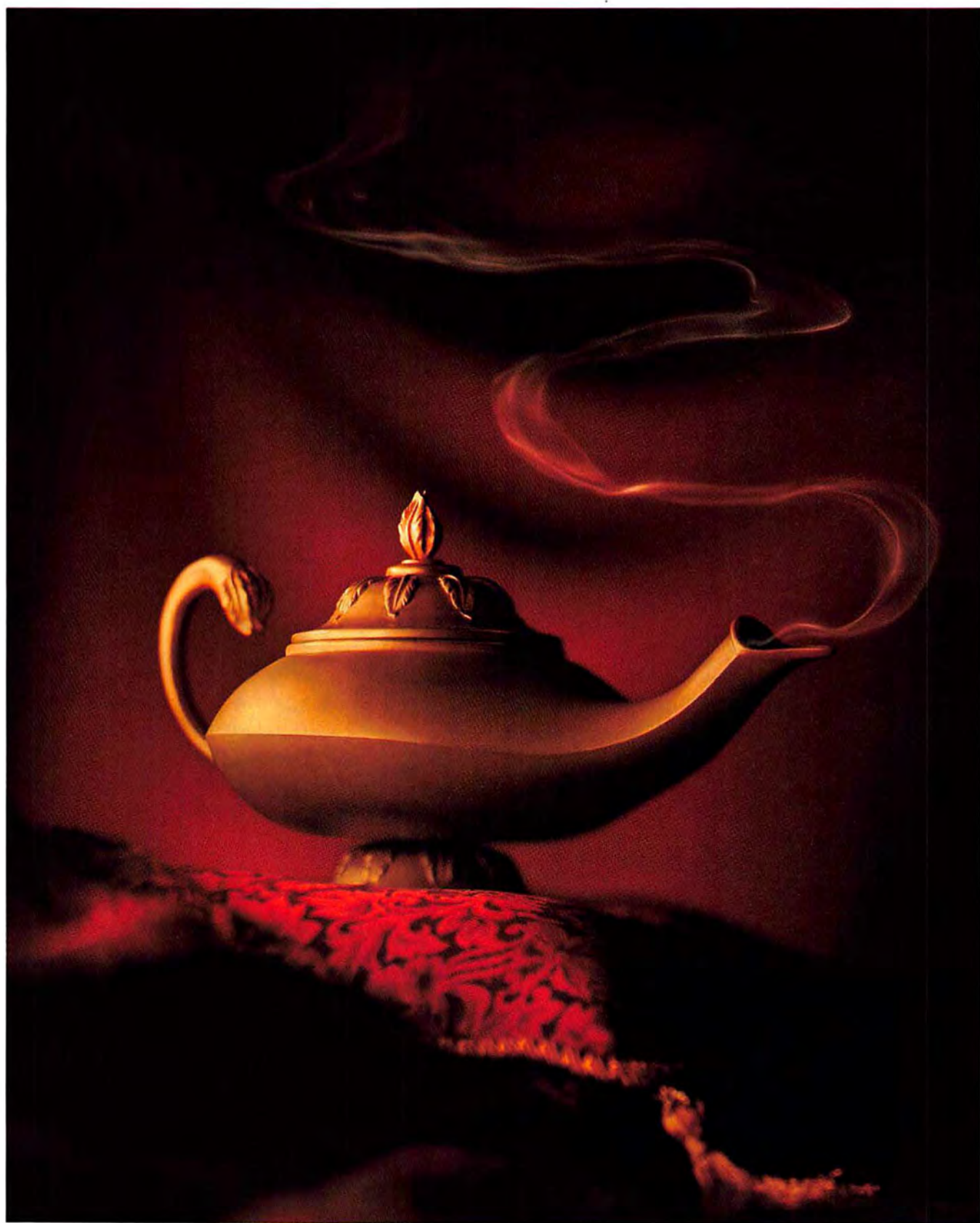
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For those of you who ever wished that a computer could do more to make your work easier, we have some refreshing news: Your wish has been granted.

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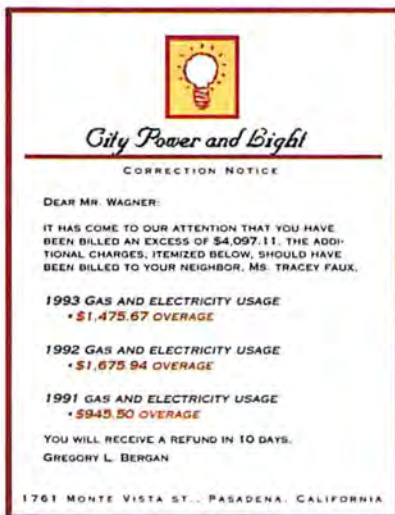
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To find out more, just visit your retailer or call (800) 871-3273, Department RUA.

Either that, or start searching for a lamp inhabited by one of those subservient spirits in a fez.

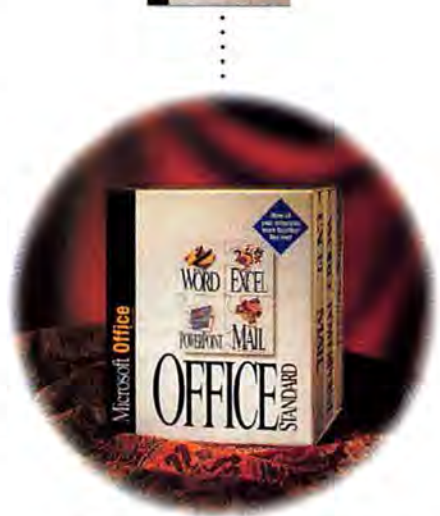
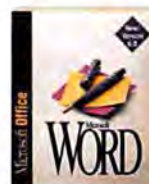
Microsoft Word 6.0 is the latest version of the world's most popular word processor for the Macintosh. It's also part of Microsoft Office family.



To change the look of your document, just click on the AutoFormat button and Microsoft Word will automatically format it.

improvements as some kind of magical hoo-ha, in truth it's merely superior technology at work.

We refer to it as IntelliSense™ technology. Built-in intelligence



Microsoft Office

How Do You Stay A Star In Hollywood's Tough Graphics World?



James Bradley is president of Bradley Group, Inc., a prominent Macintosh-only VAR selling systems to upper echelon graphics studios in Los Angeles. Margo Chase is an award-winning designer whose studio works on identity and packaging for the music and film industry.

Apply The Hammer.

SCSI JackHammer
1993 Eddy Finalist
Best New Storage System



SledgeHammer2000MF
Bottom Line Pick



HammerDisk 130
Bottom Line Pick



James Bradley and Margo Chase are Hollywood stars. Her graphic design shines in work for Francis Coppola, Madonna and others. His work lights the way in computer systems he configures for talents like Margo. To them, storage is no peripheral issue, so Bradley chooses to *Apply The Hammer*. "My clients do demanding production work with tight schedules and lots of money on the line. They depend on us for system performance, reliability and support. I depend on FWB and their Hammer products. They don't ship new models before they're thoroughly tested. Their driver software, disk arrays and tech support are all top-notch. And their JackHammer is the fastest NuBus SCSI accelerator I've seen — great for new and existing drives and arrays."

What else brings Bradley to FWB? "There's a Hammer for every need, including SyQuest-based HammerDisks and the world's fastest magneto optical systems for archiving and transporting large graphics files. Their hard disk systems consistently dominate comparative reviews. And their pricing is always competitive. But when Margo's wall to wall with work, what counts is performance and reliability. That's where FWB stands out."

Hollywood is an up and down business. Bradley keeps his own star rising by keeping his clients' productivity *up* and their costs and problems *down*. That's why he's so good at applying the Hammer. Call 415.474.8055 for the Hammer reseller nearest you.



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HAMMER

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LETTERS

Hot Tips

OF ALL THE MAGAZINES I've received, the August issue of *MacUser*, with "75 Ways to Raise Your Mac IQ" (page 72), was the first one that contained something I could really use as a beginner. Too many of the technical articles in print are way ahead of us poor souls who don't have engineering degrees. Let's get basic!

Leonard Morris
Adelanto, CA

INSTEAD OF GIVING us 75 ways to "tap into the inherent power and brilliance of System 7," I wish you would instead give us just one way to utilize the elegant simplicity and economy of System 6 (on the Centris and PowerBook models). Unfortunately, it can't be done. I honestly believe that the best Mac computers ever made were the IIci and SE/30. Whenever anyone asks me what computer I recommend, I tell them to buy a used IIci.

System 7? Gag me with a mouse.

Bruce Long
bruce@asu.edu

YOU HAD A PERFECTLY suitable article on hard drives for the cover of your August 1994 issue. But you thought the "75 Ways to Raise Your Mac IQ" would sell more copies. By my count, no less than 42 of the 75 "tips" can be found in the *Macintosh User Guide* that comes with every new Mac.

Write to Letters

c/o MacUser
950 Tower Lane
18th Floor
Foster City, CA 94404

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

Here's my manuscript for a new *MacUser* cover article. I think it'll sell a ton of magazines:

1 Way to Raise Your Mac IQ:
Read the manual.

I'll be looking for that check in my mailbox.

Chuck Kallenbach II
c.kallenbach@genie.geis.com

/ Our story was a compilation of the 75 best Mac tips, regardless of where they might have previously appeared. There's so much in the Mac manual — and elsewhere — that not many of us can sift through the avalanche of information. And don't forget that many people — rightly or wrongly — operate their Mac without ever cracking the pages of the manual. / JS

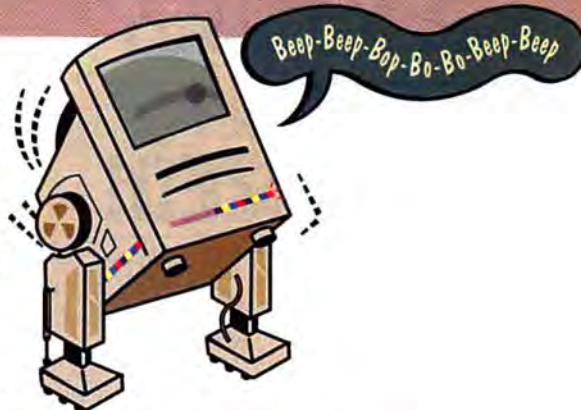
Choosy Buyers Choose Macs

TWO WEEKS AFTER I bought a PowerBook 520, your magazine arrived at my doorstep, with Cheryl England's article ("Choosing the Right PowerBook," August '94, page 81) looming over my purchase. Relief arrived when I finally gained the courage to read the recommendations for educators, which matched my configuration exactly!

Why does Apple push the LC III machines for educators when the PowerBook offers so much more? I can take my computer anywhere to create lessons, give presentations, or record grades, whereas those poor saps with desktop machines have to decide on one place to leave their machines and do all of their work. I can't wait for school to start so I can put my machine fully to use.

Kevin Walthers
Dallas, TX

A TEACHER with a 4/160 PowerBook 520 would be more frustrated than satisfied with the performance of that machine. Most educators can afford only one computer, so that computer has to have color and has to run a variety of applications, including memory hogs. My one machine should be capable of running Adobe Photoshop and Macromedia Director — two programs I use primarily for classroom



OPEN FOLDER

The great and powerful Woz must have been watching over Philip G. DeLoach, of Mt. Airy, North Carolina. When a tornado lifted his mobile home off its foundation and tossed it 50 feet away, his LC III and external hard drive were "smashed against a large pine tree" in his yard. But months later, when a friend tried to clean and reassemble the mud-encrusted Mac, Philip reports, "Not only did he get the external drive working, but the original drive and the internal floppy drive worked" and the data on the drives was still intact. Now click your heels together three times and say, "There's no place like Mac."

This month's conspiracy theory comes to us from Michael Sweeney, of Milwaukie, Oregon, who warns us about the Clipper encryption chip's evil twin, which goes by the seemingly innocuous code name "Chipper." Developed by the National Security Agency, the Chipper would allow electronic devices (whether they're plugged in or not) to eavesdrop on conversations. "Since we've seen from Clipper that we can't depend on the government to watch out for our freedoms and civil rights, it's up to the rest of us paranoids," he writes. Freedom? Civil rights? You know, Michael (if in fact that is your real name), you almost had us going there. But now we're on to your little game, mister. You can't fool us.

A Pentium Death Star? May the force be with J. Nugent, of Amherst, Massachusetts, who writes, "As I thought of the history of Apple Computer, it seemed to be the Star Wars saga come true." Nugent's vision features Apple as the Rebel Alliance and, of course, IBM and Intel as the evil Empire. You know, the Classic does look like R2D2, but whom would you cast as Yoda — John Sculley? Steve Jobs as Han Solo? But just think if the tables were turned and George Lucas were directing Apple: Could Power Macintosh Happy Meals be far behind? The marketing possibilities are endless.

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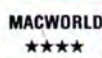
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CIRCLE 60 ON READER SERVICE CARD

ASK DR. POWER MAC

I AM ABOUT TO purchase a Power Mac. This will leave me drained in funds for native software, so initially I will run my 680x0 programs on it. Will I have any problems running them on the Power Mac and then again on a 680x0 system?

Kevin Butler
Brooklyn, NY

/ Probably not. If, however, you modify your preferences, delete certain files, or move them around to cope with minor incompatibilities on the Power Mac side, these changes *could* have an effect when you go back to a 680x0 Mac.

I HAVE SOME MONEY that I have to spend soon. Any word on when the next wave of Power Macs and/or price reductions on the first might occur?

George Wahl
George.Wahl@ncsu.edu

/ A humble prediction? Apple will reduce prices before the Christmas buying season for two reasons: Pentium-based machines are getting cheaper, and Pentium-based machines are getting cheaper.

I HAVE RECENTLY BEEN HEARING about third-party cache cards and clip-on devices that can enhance the clock speed of my Power Mac's processor. How much of a performance boost can I expect from each of these components, and what (if any) are the drawbacks of each?

Chris Bojrab
76500.1631@compuserve.com

/ The performance boost is significant. A clip-on that can push your clock to 80 MHz *almost* enables a 6100 to keep pace with an 8100. However, clip-ons will make your Mac run hotter than normal and can shorten your computer's life. Proceed with caution, and be sure to get a money-back guarantee. Cache cards from Apple and third parties are available for the 6100 and 7100 and are highly recommended.

I OWN A MAC IISI. I thought this was a class machine when I purchased it a couple of years ago. Am I going to be left out in the cold Michigan winter when it comes to upgrading to the PowerPC?

Michael J. Freedman
DRMJFK8GTO@aol.com

/ DayStar Digital will offer a PowerPC 601-based accelerator card for all Mac II machines, including the IISI. To get the very best performance, however, your best bet is to sell your IISI and buy a Power Mac 6100/60, which offers much better video and disk performance than an accelerated Mac II. On the LC front, Apple will be offering a \$599 601-based daughtercard upgrade for 68040 LCs and Performas.

presentations — plus have a humongous hard drive.

Despite what you think, most teachers don't use their PowerBooks for text and calculation if they don't have another machine, unless of course, they're using their CPU limousine to run Subaru errands.

David Gill
via the Internet

/ If you can afford only one computer and need to run Photoshop and Director regularly, you really should purchase a desktop Mac. You'll get better price/performance by purchasing a lower-end Quadra or a Performa, and you can get built-in extras such as a CD-ROM drive, monitor, and VRAM. Desktop Macs are also easier and less expensive to upgrade, whether you are talking about memory or peripherals. Check out "Choosing the Right Mac," in our July issue (page 87). / CE

I WOULD LIKE to thank you for the "Choosing the Right Mac" article. I am an orphaned Commodore Amiga user who is ready to make the jump to Apple and the Macintosh. After reading your breakdown of the assorted machines, I was able to make the decision. I'm going for a Power Mac 7100/66.

Thanks, and you can be sure I'll be referring to your publication every month from now on!

Gene Holman
Reisterstown, MD

Prints Charming

THANK YOU, thank you, thank you! The July issue of *MacUser*, featuring a review of the Apple Color StyleWriter Pro and the Hewlett-Packard DeskWriter 560C and 520 (page 39), could not have arrived at a better moment.

A color printer we had just ordered was in transit, and we returned it to the vendor. We ordered the Color StyleWriter Pro instead. The review saved us lots of money and, according to the review, should give us better performance.

We're also in the process of looking at upgrading an LC II, so "Choosing the Right Mac" was a great help in the decision-making process. This isn't the first time your publication has saved us money, time, and frustration.

Raeann Gooch
Napa Valley Unified School District
Napa, CA

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Stop grinding your gears with old technology. Quit wasting valuable time and energy with outdated graphics tools. Dust off your leather jacket, put on your baddest shades, then visit your favorite Canvas reseller today. Or call 1-800-733-6322 to order, and hop on for the ride of your life. Helmet not included.



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CIRCLE 165 ON READER SERVICE CARD

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UPGRADE

Still using some other graphics program? Now we've made switching to Canvas even easier! Trade in that scooter for some real precision drawing power. Simply show us proof of ownership of any Macintosh graphics program and chop nearly \$250 off Canvas' already low \$399 price!



"FirstClass Goes Beyond The Capabilities Of Most Mail Systems"

BYTE Magazine
09/93



FirstClass

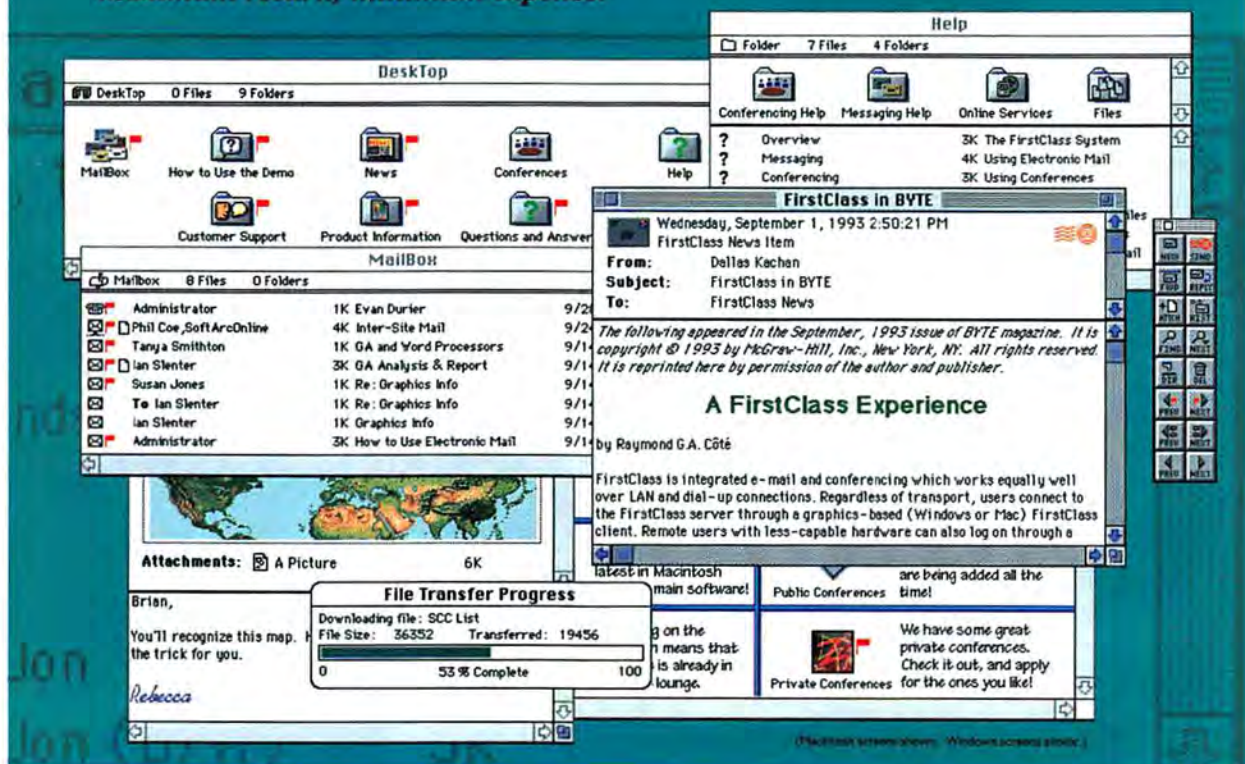
Says BYTE, "FirstClass blends conferencing and mail together under a remarkably clean interface that goes far beyond the capabilities of most mail systems ... a regrettably rare example of a useful piece of software."

FirstClass features **e-mail, workgroup communication and remote access**... all in the same application. Use FirstClass for internal mail, group discussion or even as a public access tech support solution!
Maximum return, minimum expense!

E-mail

Conferencing

Remote Access



What's remarkable about FirstClass? What other communication software lets your PC and Mac users share your ethernet network without a file server... or dial in via modem with the same client software they normally use? Add to this our integrated group communication, comprehensive security features, simple installation and robust server performance!



	FirstClass	Lotus Notes	QuickMail	MS Mail
Workgroup Discussion Areas?	Y	Y	One	-
Cross-Platform Chatting?	Y	Optional	-	-
Fully Customizable Interface?	Y	Y	-	-
Restrict Any Feature?	Y	Y	-	-
File Attachments?	Unlimited	40	16	Unlimited
Autoforward & Reply?	Y	-	Optional	-
Full Message History?	Y	Y	Pseudo	-
BBS Functions?	Y	-	-	-
Modems Per Server?	Up to 22	8	1	1
Internet Usenet Gateway?	Optional	Optional	-	-
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- Macintosh and Windows support on the same network, with the same server, or via modem
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CIRCLE 63 ON READER SERVICE CARD

Go Ahead, Use Us

CONGRATULATIONS on your new usability lab ("Apple's PowerTalk," July '94, page 100). I think it may be the most important development ever in Mac magazines, and you picked exactly the right product to start with.

PowerTalk, as your review indicates, needs a lot of work. Your review was too kind, particularly to AppleMail, which suffers grievously by comparison to QuickMail. Sure, you can use multiple fonts in documents, and it's convenient to drag enclosures into them — but for our five-person office, using QuickMail serves as a terrific, convenient, fast way to get simple messages to each other.

Your usability lab is important because usability is and has always been what distinguishes the Mac from other platforms. With the lab, your magazine can begin to buck the trend of encouraging developers to build increasingly feature-laden software and instead give them reasons to spend more time on ease of use. And then we'll all have better software.

Carl J. Manaster
CARLMANASTER@applelink.apple.com

Talking Back

YOUR ARTICLE about AFP servers for the Mac ("Talking to UNIX," July '94, page 127) covered a lot of the commercial options for Mac file serving, but you forgot one of the most important ones: CAP (Columbia Apple-Talk Package), an implementation of Apple-Talk for many UNIX machines. It can be downloaded from the Internet and, provided you follow the license agreement, is free of charge.

Please do not neglect to mention the free alternatives to the commercial products in your articles. In the same issue, you talk about Mac mail gateways to SMTP UNIX mail. Before investing in any commercial products, a user would be well advised to check out the Mac archives full of shareware alternatives.

Eric Johnson
ejohnson@imsa.edu

NetSpanner in the Works

WE WERE DISAPPOINTED in the rating our NetSpan MultiRouter received in your recent router evaluation ("Breaking Network Bottlenecks," July '94, page 106). It

How do you analyze & present data?

*There's the hard way...
and there's the StatView way.*

Are you trying to wring statistics from a spreadsheet? Struggling with a command-line analysis program? Or shuttling data back and forth among statistics, graphing, and presentation programs? We have a better way.

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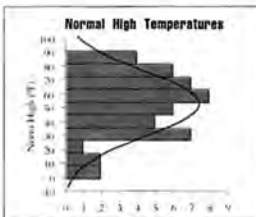
StatView is the best-selling, most award-winning data analysis package for the Macintosh.

No other program combines data management, data analysis, graphing, drawing, and color presentation into a single easy-to-use package. If you need to go from raw data to a finished presentation, the easiest way is the StatView way.

It's our way or the hard way

You can analyze the hard way, or the StatView way — the choice is up to you. For more information on StatView and its companion products — SuperANOVA, QC Tools, and Survival Tools — call us at 1-800-666-STAT.

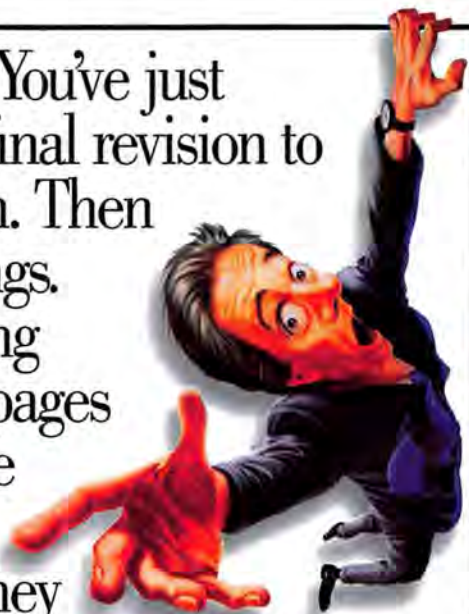
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CIRCLE 168 ON READER SERVICE CARD

It's 3:50 pm. You've just finished the final revision to the sales plan. Then the phone rings. "We're sending over 10 new pages of competitive info." Click. Good thing they lock the windows on this floor. You have to get it into the plan by the end of the day. What now?



CIRCLE 97 ON READER SERVICE CARD

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Specular Collage and Photoshop work together to accelerate the composition of high-resolution images. Collage's intuitive page-layout interface allows you to quickly combine your Photoshop images into stunning compositions.

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See why MacWEEK calls Collage "a valuable tool that should be on the shelf of anyone who manipulates images on the Macintosh."

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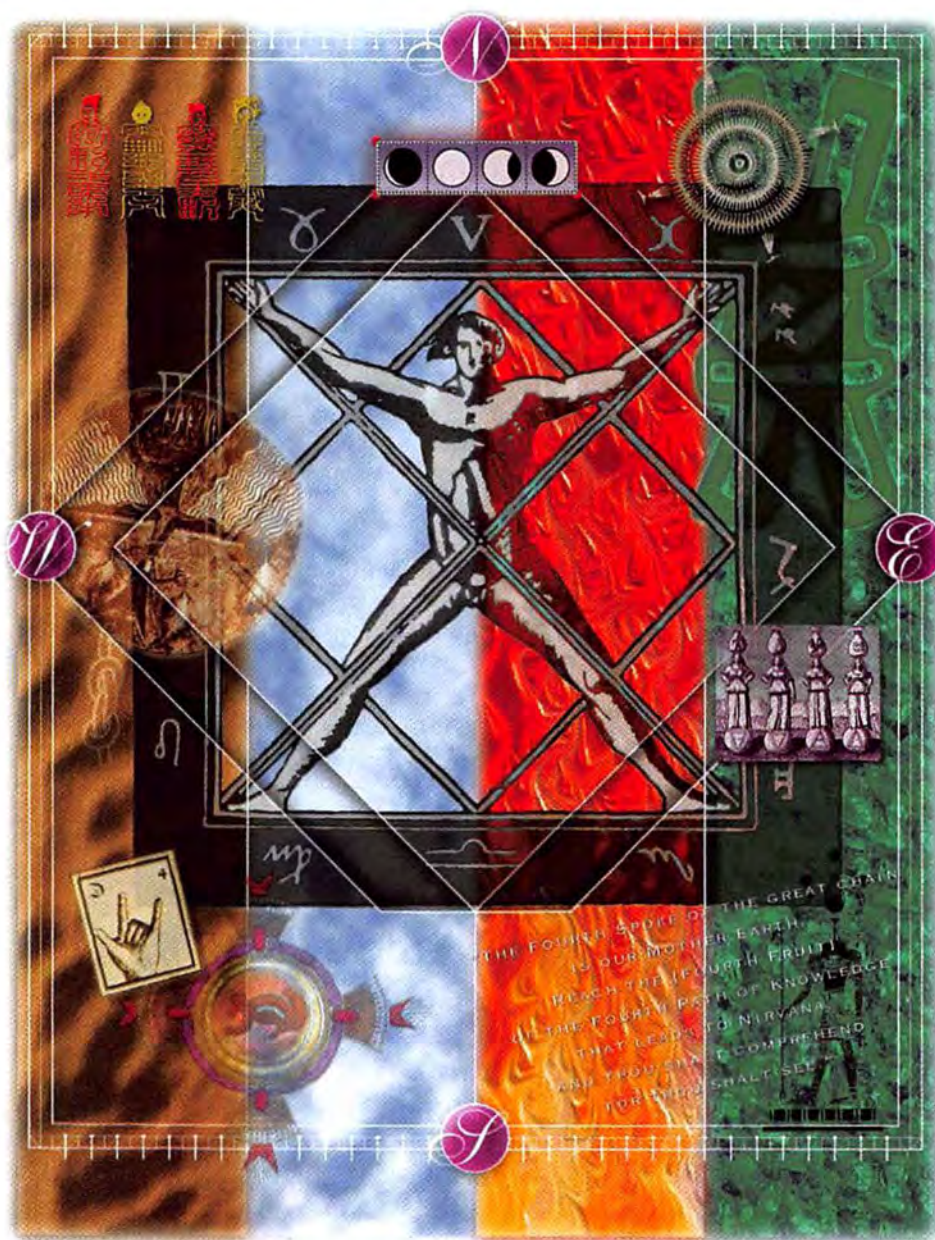
VERSION 2.0
NATIVE FOR
POWER MACINTOSH,
SUPPORTS CMYK
COLOR, AND
HANDLES IMAGES UP
TO 53" X 53"



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CIRCLE 57 ON READER SERVICE CARD

Code: AT002



Familiar page-layout tools make Collage easy to use. Features like rulers, guides, alignment tools, and image grouping let you easily create complex compositions.

Special effects like drop shadows and feathering are only a mouse click away. Collage is object-oriented, so if you move an image its shadow automatically moves with it!

The Information Palette gives you complete numerical control over the layout of your images.



The Element Palette lets you change the layering of your images at any time. When you edit an image in Photoshop, Collage automatically updates your composition.

Collage and Photoshop work together to create high-resolution composites. Photoshop provides the image editing power while Collage accelerates the layout. You can now create your images faster and with less RAM and hard drive space!

appears all the other routers were given pluses for the extra features they possessed beyond basic routing, whereas the major features the MultiRouter offers were not mentioned. The MultiRouter is unique in its modular design — you can upgrade any model to another one merely by swapping interface boards.

Since the performance of our unit is within a few percentage points of that of the units with good performance ratings, we cannot understand how the NetSpan units could have received a poor performance rating. Given that the price of the MultiRouter is at the low end and performance is so close among the units, we feel that putting the MultiRouter at the bottom of the ratings gives an erroneous indication of this product's capabilities.

Lawrence L. Halcomb, President
NetSpan, Richardson, TX

/ Performance was not the only factor used to grade the routers. We found the NetSpan MultiRouter lacking in other areas as well, including a primitive interface on the management software and poor documentation that neglected to mention that the unit had to be turned off and then back on for configuration changes — even though it had no power switch. / JR

Clipper Crack-Up

ANDY IHNATKO'S COLUMN "Duty Now for the Future" (August '94, page 21), was cute, but it's too bad Andy couldn't have looked a little bit ahead — the Clipper Conspiracy just became a bit more ridiculous.

It appears that the Clipper isn't quite what it's cracked up to be. It is possible to use the Clipper chip itself to encode messages that *no one* can crack. In addition, simpler alternatives, such as preencrypting stuff with a public-key encrypter, would also be 100-percent effective in keeping the government from reading the files in question.

What this means is that Clipper has always been totally ineffective for use against slightly informed criminals. Sometimes I'd give a lot to know what's going on in the heads of these people we elect. Sometimes I'm not sure I want to.

Adam Lang
thalen@cs.pdx.edu

CLEARLY, THE GOVERNMENT'S ability to eavesdrop is disturbing to anyone, but consider the alternative. Once the telephone

MacUser

COMING SOON:



ARA SERVERS

This January, MacUser will examine 12 ARA (Apple Remote Access) servers. Our MacUser Labs experts will test, review and give mouse ratings to servers according to performance, reliability, configuration options, ease of installation and maintenance. Business buyers find out which servers make the grade in the magazine with the toughest tests: MacUser.

PIMs

In order to give buyers the best possible choices when buying PIMs, MacUser takes a look at eight PIM (personal information management) software products for speed, flexibility, function integration, and overall product quality. With the help of MacUser experts, find out which PIM product is right for you!

LOW-END COLOR PRINTERS

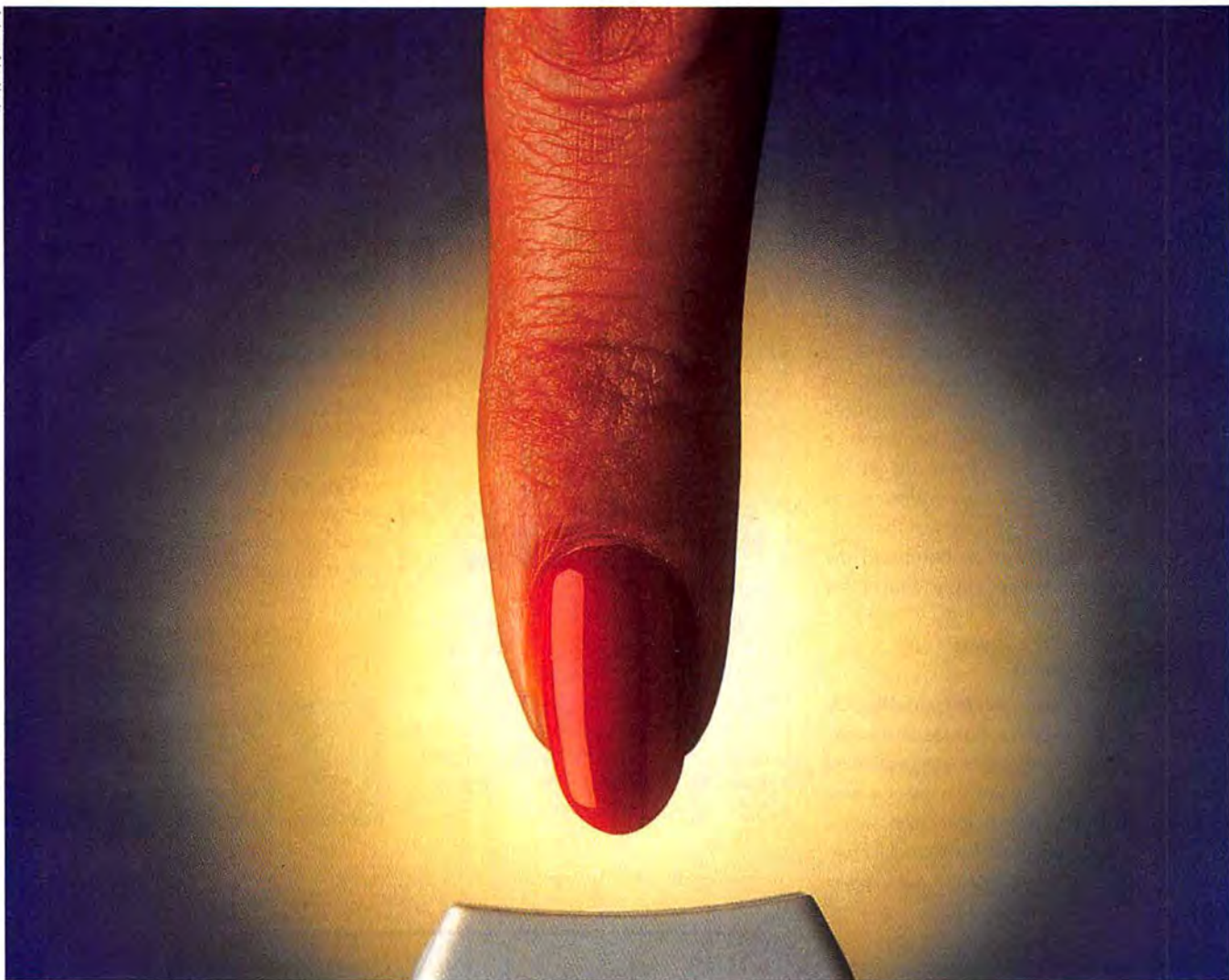
The MacUser Labs test, review and mouse rate color printers that cost under \$1500 and are designed for home, school and business users looking for low cost, low end color output. MacUser focuses on the newest printers available and looks at their image quality, price/performance, technical support, features, and ease of installation. Buyers depend on MacUser to make printer buying easier.

JANUARY AD CLOSE:
TUESDAY,
OCTOBER 25TH, 1994

You think she's finishing the proposal. She thinks you are. Surprise, neither one of you are. And it's 4 hours before the grant committee meets. Let's see, 16 new pages of data, 11 article reviews, 3,600 words sent by your partners in Istanbul. Who can type faster? Aaargh! What now?



CIRCLE 98 ON READER SERVICE CARD



WHAT OUR ENGINEERS
HAD IN MIND
WHEN WORKING
ON OUR
NEWEST SCANNER.



*Introducing the
Agfa StudioScan II.*

Push a button, make a scan. Is
it really that simple? With the new Agfa StudioScan II, it can be.

That's because StudioScan II was designed for simple operation. Two levels of scanning software are built in — easy-to-use Agfa FotoSnap and comprehensive Agfa FotoLook. Plus, our exclusive, 42-page *Introduction to Digital Scanning* will guide you through the scanning process.



What's more, every StudioScan II comes complete with Agfa FotoTune color management software and our IT-8 reference target, along with Adobe PhotoShop™ LE and OmniPage Direct™ OCR software. All in a 400 x 800 ppi, 30-bit, one-pass scanner. And all for about \$1,000.

So if you want an easy way to bring a scanner into your office, all it takes is the new StudioScan II. And your finger. Call 1-800-685-4271 to find out more information on Agfa's new scanners.

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CIRCLE 52 ON READER SERVICE CARD

system is digital and computers interact over long distances as easily as telephones do today, do we really want to live in a world where criminals at any level can freely communicate without fear of discovery? Ultimately, I *want* my government to have the ability to get this information when appropriate court orders have been obtained. Besides, there is no reason to think that such orders will be granted any more easily in the future than they are today; the searches will just be more efficient and easier to carry out.

Karl Seppala
SEPPALA@applelink.apple.com

The Great Chicago Fire

IN "KNOW YOUR ENEMY" (August '94, page 198), John Dvorak says that "Chicago will also do something System 7 cannot: true preemptive multitasking. You will be able to format a disk or download a file while working in your word processor, for example."

Current Mac users can format disks in the background with the use of the Thread Manager Extension and a shareware utility called DiskCharmer. And we can also download files without problems while working in our word processor.

We have multitasking on the Mac, John. It's called *cooperative* multitasking. Now if we could just get you to try a Mac for real.

Eric Garneau
garneau@aster.jsp.umontreal.ca

The Sky Is Falling

I CANNOT REMEMBER a single issue during the five years or so I've been receiving *MacUser* that did not contain, either in a column or in a letter, strident alarms about what Apple must do to survive!

Now the threat seems to be Pentium rather than Windows, but each issue continues to tell me what Apple *must* do. This is the Chicken Little syndrome, and I, for one, am sick of it.

Come on, get off it, will ya?

James B. Donnelly
Hyattsville, MD

CORRECTIONS

On page 64 of the August '94 issue, the U.S. toll-free Apple phone number listed for HyperCard 2.2 is incorrect. The correct number is 800-769-2775, ext. 7810.

*Ivan Neal has put out
a lot of fires.*

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CIRCLE 86 ON READER SERVICE CARD





Hard and Fast

POWER MACS ARE MAKING IT fun again. I know, we're supposed to be impressed with the *power*

of these new machines. After all, Apple didn't call them Fun Macs. But for me and a lot of other people, there's a renewed thrill as each package bearing an "Accelerated for Power!" sticker appears. This enthusiasm is infectious: It's evident with developers and users alike. I find myself thinking, Let's see what this baby can do . . .

One of my first experiences with a shipping native application was with Novell's WordPerfect 3.0. This was just a port of the same WordPerfect I had tried out and then set aside because, well, because it felt too slow on my 68030 PowerBook. Load the native version on a Power Mac, though, and suddenly WordPerfect seems like a completely different program. No trouble keeping up with my typing. A scrolling speed that, if anything, is *too* fast. Search-and-replace operations that seem to happen instantaneously.

As a writer, I appreciate this speed. I'd like to think it lets me concentrate on the task at hand as I spend that much less time waiting for the Mac (yeah, I know, the Mac still spends more time waiting for me, but as a human, I'm capable of impatience, something not even Power Macs have yet mastered). Still, is word processing something that really needs to be accelerated to lightning-fast speeds? It's not like I'm using, say (cue drumroll), Adobe Photoshop.

Speed, Speed, and Speed

Serious Photoshop users care about three things — and they all star Keanu Reeves on a bus. That's why this month we're presenting the exhaustive testing we did to find out which platform — among Macs, PCs, and UNIX workstations — is best for running Photoshop. As much as I might prefer a

snappy word processor, the potential benefits of a Power Mac for me pale in comparison to what one has to offer a dedicated Photoshop user. Why? Photoshop is an application that *demand*s power. Here's an environment in which humans routinely *do* spend more time waiting for the computer than the other way around. Not only is this not fun (unless your idea of fun is watching a thermometer) but it also costs bucks. If you make your living with Photoshop, then upgrading to a faster machine pays for itself pretty fast.

Our tests demonstrated that a Power Mac is clearly the best buy for that Photoshop user. That doesn't necessarily mean Power Macs are the ultimate Photoshop machines, though. That's because, at this point in history, nobody has come up with an affordable machine that delivers more power than Photoshop users know what to do with — at least not yet. And even if someone did, Adobe would find a way to increase the program's requirements.

That's the thing about getting faster machines, you see. It's not just that your current favorite programs will run faster. If that's all the good that came of making Macs faster, then we probably would have seen performance freeze somewhere around the speed of the "wicked fast" IIx. Believe it or not, I remember hearing people claim in about 1989 that Macs were as fast as they would ever need to be to handle typical


business-computing tasks. (Of course, the Photoshop folks were already begging for more power!)

What's great about faster machines such as Power Macs is that they make it possible for developers to create software that does things we couldn't (or wouldn't have dared) imagine just a few short years ago. For me, the real test of the much-awaited

native Power Mac versions of Word and Excel is whether Microsoft will have been able to add all of their new features without making the programs slower. Now I *know* Word 6 would probably make me scream in frustration if I tried to run it on the Mac I owned five years ago. But on a Power Mac?

Well, I'm willing to give it a chance. I'm not sure whether I'll like having a word processor that corrects my typing mistakes as I go along, but at least the increased horsepower of a Power Mac will make it likely that I'll give it a try.

By the time you read this, WordPerfect will have shipped an upgrade to its original native Power Mac program. And Photoshop 3.0 — a fully native version — will also be shipping. Gradually, new features and enhanced usability will start chipping away at the abundant processing power.

That's just the way it is. Sometimes the hardware gets a little ahead of what the software can do, but the software always manages to catch up. And discovering what the software can do when it does catch up — that's what makes it exciting. I can hardly wait to see what I can do with the first application to slow down my Power Mac. 

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that really needs to
be accelerated to
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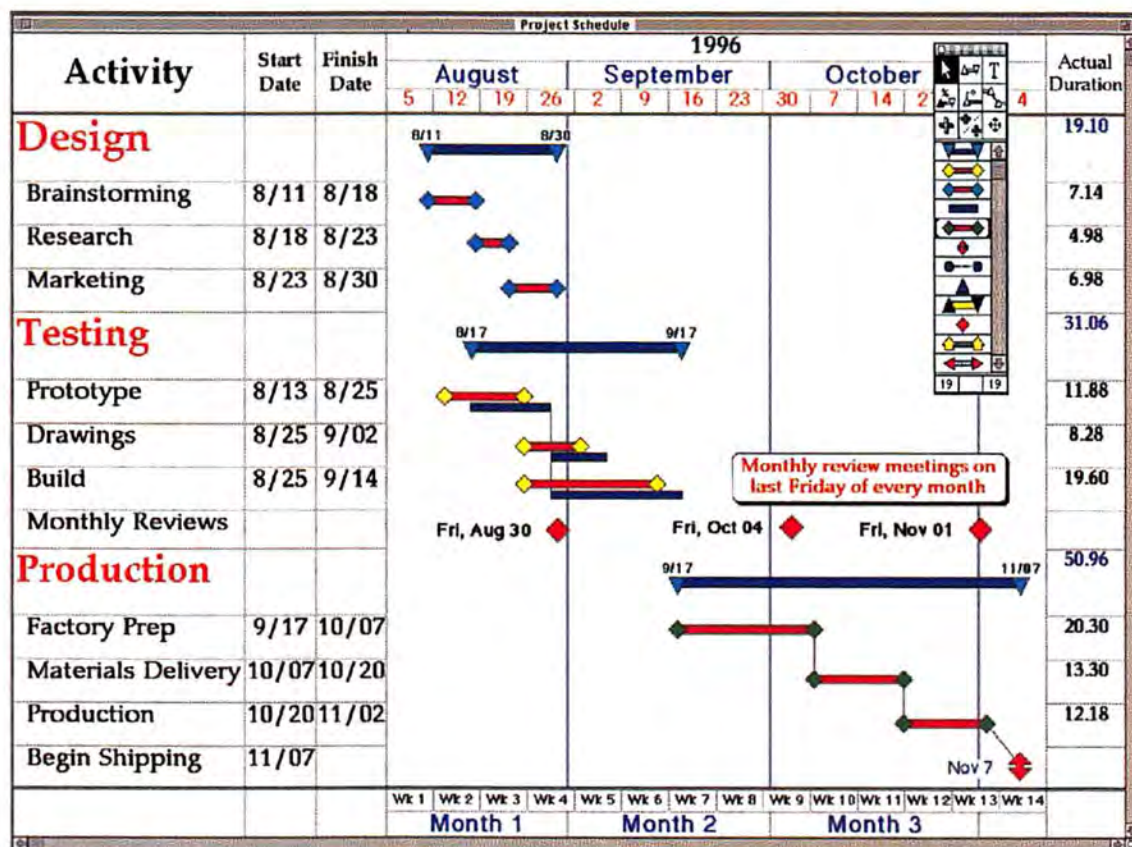
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Karmic Strip

OK, I AM GOING TO SAY THIS right here at the top: Yes, I *did* spend most of an afternoon in a

New York City strip club a few months ago. But before you arch an eyebrow to communicate whatever response an arched eyebrow tends to communicate these days, I wish to emphatically stress the following: (1) I was *not*, as one *MacWEEK* report had it, up there on stage at *any* point in the proceedings, and (2) this was all just clinical, inspired, and highly necessary research, pivotal to the production of this column. Merely another step in the creative process, as it were, so there's no need whatsoever to tell my mom.

I was spending a week in the city for a couple of reasons. Foremost among them was to visit John, a good friend of mine who traded the idylls of New England living for a habitat where the newspapers are far more likely to put the word *TORSO* into a headline, but I was also there to attend a big PC exposition. Now, I don't want to hyperbolize my goals in the latter regard. I enjoy drinking a nice cup of tea and then hammering out such ripe phrases as "Tracking the spoor of evil to its source, staring deep into the unholy maw of the Foe Eternal, and much like Thor and the Midgard Serpent, wrestling it through destiny, knowing full well that the fate of the Industry lay in the balance," but in truth I just wanted to immerse myself in a sea of PC users and learn what I could about that community. I didn't pick up a whole lot, but I did manage to discern two basic facts:

They enjoy blowing things up real good. Games featuring a point-of-view shot of a guy running through a maze and applying the algorithm "If it moves, blast it; if it doesn't, load it into the gun and blast something *with* it" were about as difficult to find as carpeting, and the Javitz Convention

Center was carpeted throughout. It would be irresponsible for me to suggest a logical correlation between all this apparently pent-up rage against society and the daily use of Microsoft Windows, so I'll merely imply it instead.

They aren't terribly bright. I mean, really. I stopped numerous attendees to ask whether they thought Apple's transition from System 7.5 to the forthcoming Copland OS would be smooth, or if they thought QuickDraw GX merely duplicated printing abilities we *already* enjoy as built-in application features, or if, with the arrival of the scriptable Finder, AppleScript would finally take off. Hard to believe, I know, but I got nothing but blank stares, except for the guy who looked like he'd just been playing those aforementioned games, which caused me to leg it out of there toot sweet.

So the next day, I was very much the tortured soul, strolling along Broadway with plenty of time to brood over the previous day's events. I mean, there I was, a columnist for a great metropolitan magazine, and what did I *really* know about the attitudes of the average business consumer? According to all surveys, they're Windows users, overwhelmingly. OK, maybe they use PCs just because that's what their offices have standardized on. But that's not even an excuse anymore; a Power Mac can run Mac and Windows software, with more or less the same price and

performance! Using Windows is about as pleasant as tripping and falling on a concrete sidewalk and landing right on the pocket your keys are in. Why *wouldn't* they embrace a machine that lets them run the Mac OS when their bosses aren't looking? I simply didn't get it.

And then, like the proverbial burning bush in the desert, it appeared before me: a gargantuan billboard with a PowerPC

processor on it — and directly along its line of sight, an upscale strip club. Not being one to question what appeared to be divine guidance, I crossed the street, paid a modest cover charge, and found myself seated at a small table in a sea of loud music and flashing multicolored lights, away from the

club's main stage. As I pondered how best to proceed, a woman in a surprisingly conservative dress approached.

"Would you like a table dance?"

"Actually, I'd rather talk than gawk, if you don't mind," I said, sliding two fives across the table. "Interested?"

"Er — sure," she replied, adding the bills to the thick sheaf in her garter. "I'm Debbie. What do you want to talk about?"

"It's like this," I began. "I write about the Macintosh for a living, and I'm just trying to understand the minds of modern businesspeople. Most of all, I want to figure out why they overwhelmingly buy Windows machines when the Mac is just so much better in every way I can imagine."

"Oh, yeah," she replied, relaxing a bit. "I have an old Mac I bought in college."

"So you can understand my problem. I

PROBLEM:

How can a Mac columnist comprehend the PC mind-set?

SOLUTION:

A visit he wouldn't want his mom to know about.

thought maybe someone in your line of work might have some insights into the mind of the average businessperson I would have missed. Er, well," I finished, looking around, "the minds of the businessmen, at any rate."

She thought for a moment. "Well, just take a look around you," she said, lowering her voice and indicating the roomful of men dressed in nice suits. "I don't know if these guys are typical businessmen, but I mean, how many of them do you think are single and unattached?" she asked, as Thomas Dolby's "She Blinded Me with Science" blared.

"Well, besides me? I don't know," I considered. "Not many."

"Exactly. I'd say that maybe seventy percent of these guys are either married or committed to someone. Do you think they're going to go home tonight and say, 'Hi, honey — I spent my lunch hour stuffing our rent money into a dancer's T-back?' I doubt it."

"It does seem pretty unlikely."

"Right. I mean, maybe they're nice guys

"DO YOU THINK these guys are going to go home and say, 'Hi, honey — I spent my lunch hour stuffing our rent money into a dancer's T-back?' I doubt it."

and everything, but here they are. So what about when they're choosing a computer for the office? They can either buy Macs, knowing that they're not exactly the most popular computers . . ."

I saw her line of thinking. "...or they can tell their bosses to requisition the same computers they think everyone *else* is buying," I finished. "Nobody ever got fired for buying Windows machines."

She leaned back. "Right. You can't really stereotype people, but I dunno. That guy,

for instance," she said, pointing to someone doing something he's probably not proud of, "will probably work at the same company for twenty years and always order the same sandwich for lunch. Not exactly Prince Valiant."

She made perfect sense. I tried to continue the conversation but couldn't compete with 200 watts of "Sister Midnight" coming from all sides.

"Thanks a lot, Debbie!" I shouted. "You've really helped!"

"No problem," she replied. "By the way, my real name's Susan."

"Andy." We shook hands and I left the club, after stopping by the front desk to get receipts for tax purposes.

And she did help me understand things a bit better, although I'm still a bit foggy on the motivation of the businesswomen. But that's for another column. As for this one, I want to emphatically stress two more points before I finish: (1) No strippers were harmed in the production of this column, and (2) it all really happened, except for the bits and pieces I made up completely. ☺

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DOT PITCH	N/A	.28	.28	.28	.28	.31	.31
SCAN RATE H	31.5KHz	35.0KHz	31.5/35.2/35.5	30-48KHz	30-66KHz	30-58KHz	30-64KHz
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Clone Alley

SMART MONEY SAYS THE JUSTICE Department's settlement with Microsoft won't noticeably alter

the landscape of the personal-computer industry. Smart money also says Apple's current plans to license its operating system won't noticeably alter said landscape.

Smart money has been wrong before . . .

Cloning the PC

In the early '80s, IBM was feared, deferred to, and followed. Industries grew up overnight to supply software for IBM's PC; peripherals for IBM's PC; and magazines, books, classes, and conferences on IBM's PC. Nobody ever got fired for buying IBM, smart money said.

Not everyone listened, though. Some startups licensed MS-DOS from Microsoft and built imitation IBM PCs. These almost-compatibles altered the landscape too — like a jet flying at negative altitude. IBM rolled over the rubble of their defeat.

But when a legal, 100-percent IBM-compatible BIOS came on the scene, it suddenly became possible to build truly compatible PCs. *Clones*, they came to be called, and the term had exactly the right connotation, just as the clone makers had exactly the right strategy: 100-percent compatibility at a lower cost. Unlike the early manufacturers of compatibles, these clone vendors did not crash and burn. Today IBM sells one in five of all IBM-type computers sold; clone makers sell the other 80 percent.

IBM made the mistake of believing its own myth. Price, smart money whispered in IBM's ear, is less important than brand loyalty. And IBM listened.

Cloning Windows

When the Justice Department decreed this summer that Microsoft had to stop offering its per-processor license agreement, it

created an opportunity for Microsoft's competitors in the operating-system market.

Microsoft had been offering OEMs a deal that in effect made using an operating system from another company an extra-cost option. Whether that was just good business or restraint of trade, Microsoft can't do it anymore.

Smart money says that it won't make any difference, on the assumption that no competitor will seize the opportunity. What opportunity? The opportunity to do to Microsoft what the clone makers did to IBM.

DOS clones already exist, and the firms that are making them will likely profit from the Justice Department's decision, but DOS isn't a big deal in the PC market any longer. As for Windows, an operating system that could take a piece of the Windows market wouldn't have to look like Windows any more than a Compaq machine looks like an IBM machine. It *would* have to run Windows apps almost as well as Windows, work on all Windows machines and Windows-supported peripherals, and cost less than Windows. Does any company have the moxie to compete with Microsoft on its own turf? Well, IBM says it has.

Cloning the Mac

The irony deepens.

As I write this, Apple is moving toward licensing its operating system to other computer manufacturers, and IBM is to be the first. Apple's plan is to license the software

for use in markets in which Apple is weak or absent. IBM, for example, will sell Mac clones in the enterprise market.

This licensing plan differs from IBM's unintentional creation of a clone market a decade ago, in that direct competition is not the idea. Not IBM's idea, surely. Every license Apple signs could mean a market closed to Apple's own hardware. This licensing move has been characterized as the first step toward Apple's transition

from being a hardware manufacturer to being a technology licensor. No kidding: I'd say it's an *irrevocable* first step.


If all this works as Apple intends, it may well change the landscape of the personal-computer industry noticeably. If something goes wrong, it could change things even

more noticeably. And there are a *lot* of things that could go wrong with this plan, including the markets Apple has reserved for itself drying up, the licensees not selling Macintosh clones aggressively (IBM licensed NextStep from NeXT, and what has it done with it?), and products not respecting the carefully drawn market boundaries (cheap Chinese Macintosh clones filtering back into the U.S. market, IBM selling Macintosh-operating-system-equipped PowerPC machines to DTP and video professionals).

Apple may end up competing with clones after all. But there's nothing to worry about, smart money whispers in Apple's ear, because price is less important than brand loyalty.

I hope Michael Spindler knows when not to listen. ☞

Apple is moving toward licensing its operating system to other computer manufacturers, and IBM is to be the first.

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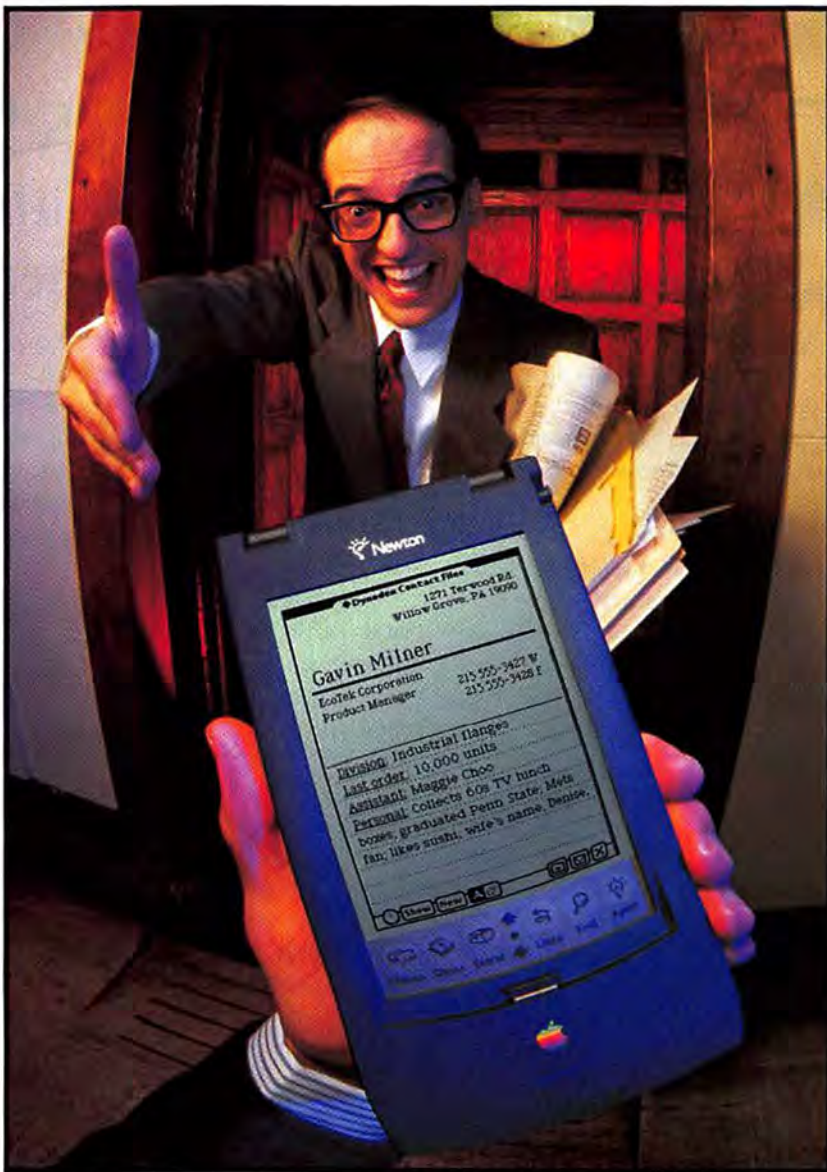
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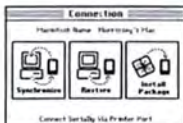
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TECHNOLOGY TRENDS /

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V.34 modems are the next watershed in telecommunications. By the time you read this, units should be available from General DataComm, Motorola ISG, MultiTech, Paradyne, and U.S. Robotics, and more are in the pipeline. Chip-set vendors AT&T and Rockwell are gearing up as well, feeding technology to Practical Peripherals, Hayes, Cardinal, Logitech, Global Village, Zoom, and Supra, among others.

The initial V.34 modems were geared to the general telecom market, which includes IBM PC clones. Expect to see connection control languages (CCLs) and other forms of Mac support soon. Also, because older Macs may not be able to handle such high data-

transfer rates, super-serial-port cards such as Creative Solutions' Hustler may be a necessity on older Macs.

Do these speed demons live up to their claims? Testing of early V.34 modems indicates a qualified no.

Even though V.34 transfers data faster than V.32bis (14.4 kbps), V.32terbo (19.2 kbps), and the one-year-old V.FC (28.8 kbps) with a particular connection, you don't always

get the top rate with V.34. For most connections, you can depend on well-designed V.34 modems to transfer data at 24 kbps, but they'll run faster than that more than half the time.

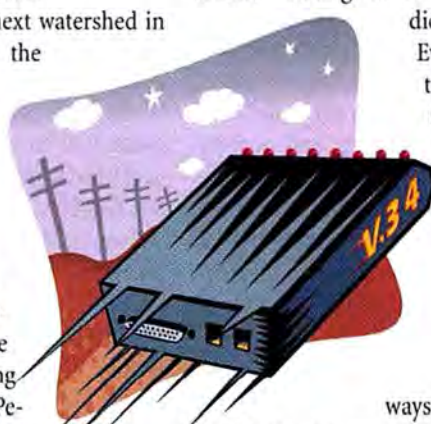
This variability in data-transfer rates can be traced to the nature of the telephone network itself. The number of individual pieces of the network is staggering, and each component has its quirks. As technology pushes

closer to the edge of the modem-speed envelope, all those little individual quirks add up to limit potential speeds.

V.34 departs from its slower cousins by testing the line before using it and using certain tools to compensate for speed-limiting quirks. The line-probing tone, which is part of the V.34 handshaking sequence (and sounds like a Bronx cheer), lets a V.34 modem learn a great deal about the network in three-quarters of a second as it connects to another V.34 modem. The two V.34 modems trade observations and then use that information to set up the best connection possible, automatically selecting the right settings for each call.

Of course, V.34 modems will be useful for traditional modem applications such as file transfer and remote access, but products that merge voice and data communication are also on the horizon — Radish, MultiTech, AT&T, and others have been working hard to create V.34-based products for use in teleconferencing. Indeed, many of the proposals for voice/data standards rely heavily on V.34 technology to make them work.

/ Stephen Satchell



STORAGE SYSTEMS /

Hybrid Device Combines SyQuest Drive, PCMCIA

THEY'RE SMALL, INEXPENSIVE, and sturdy — that's the advantage of using PCMCIA cards for portable storage. Standard on many PC systems, PCMCIA slots are now on 500-series PowerBooks and Newton MessagePads. But what's the best way to move data to or from your desktop machine?

MASS Microsystems has developed an interesting twist on the desktop PCMCIA-card reader/writer: the MiniMASter III, a hybrid SCSI storage unit that combines a 3.5-inch SyQuest drive and a PCMCIA-card reader/writer. The device accepts a 105- or 270-MB SyQuest cartridge, two Type I or II

flash RAM cards with capacities as high as 5 MB, and a single Type III hard-drive card with a capacity as high as 170 MB — all of which appear as SCSI devices on your Mac.

Strange bedfellows? Not really. The MiniMASter III has interesting implications for photographers: An image stored on a PCMCIA card in a digital camera such as the Kodak DCS 420 could be loaded into a desktop Mac for image editing and then transferred to a SyQuest cartridge for transport to a service bureau for output.

The MiniMASter III is expected to cost less than \$1,500. A similar device, the

MiniMASter, is available without a SyQuest drive. It's expected to cost about \$581 for an internal device and \$670 for an external model.

MASS Microsystems, returning from Chapter 11, is betting that the PCMCIA standard takes off on the Mac. But given the relative paucity of Mac devices that support the standard and the current lack of PCMCIA drivers for the Mac, its acceptance remains to be tested. 800-522-7970 or 408-956-5999. / Pamela Pfiffner



UTILITIES /

THAT WAS THEN, THIS IS NOW 5.0

Now Utilities sports more modules, flexible interface, and Power Mac support.

THE MAC INTERFACE has been a point of pride for Mac users since 1984 — but that doesn't mean they're satisfied with Apple's bare-bones system-software interface. That's where Now Utilities 5.0 comes in. This new version of Now Software's suite of system enhancements focuses on improving productivity and ease of use.

Two new modules top the additions to version 5.0. The Now QuickFiler (which runs native on Power Macs) replaces the Find command in the Finder, letting users set as many as ten search criteria based on filename, document information, and even text in the document itself.

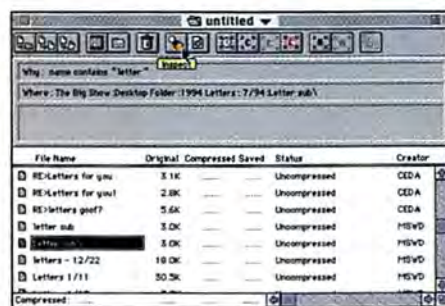
Like Inline Software's PopUpFolder, the Now FolderMenus module makes all folders in the Finder spring-loaded — clicking and holding on a folder pops up a hierarchical menu as many as five levels deep.

Older Now Utilities modules have also received a face-lift in version 5.0. In addition

to creating a customizable hierarchical Apple menu, Now Menus can create an unlimited number of extra menus (represented by user-selectable icons) in the menu bar. Users of System 7.5 can add files to a menu simply by dragging them into the

Now Menu window. Now Startup Manager features the ability to isolate two-way and three-way extension conflicts and reorder the conflicting extensions and can also force groups of connected extensions to be turned on and off together.

Like Now QuickFiler, the Now WYSIWYG Menus font-menu enhancement also runs native on Power Macs. The Scrapbook replacement Now Scrapbook and system-information utility Now Profiler support the PowerTalk Mailer. And all of the package's modules boast an updated, standardized interface with Hot Help windows, which appear when the cursor is placed over menu buttons. \$90; upgrade, \$40. 503-274-2800. / Jason Snell



The Now QuickFiler module searches for files, displays them in an informational hit list, and offers assistance via yellow Hot Help windows.

ON-LINE SERVICES /

Making GENie, Prodigy More Mac-like

THE INTERNET gets all the hype these days, but that doesn't mean that commercial on-line services have faded away. In fact, two on-line services are making it easier for Mac users to come aboard their systems.



GENie. General Electric's GENie has been accessible to Mac users only through plain-text terminal-emulation software. The service's new Mac client application, however, puts a Mac-like graphical interface on the system for the first time. Users can navigate through GENie messaging areas in hierarchical windows similar to the ones found in the Finder. GENie costs \$8.95 per month, which includes four hours of evening/weekend connect time, with \$3 for each additional hour. 800-638-9636. Also available is Raven Software's GENieNav (\$25), an extension for MicroPhone that allows Mac users to download GENie messages for off-line reading. 407-859-5222.

Prodigy. The Mac interface for the Prodigy service has also received an update, its first in four years. Version 9 of the Prodigy software finally supports the Mac menu bar and allows you to copy information to the Clipboard. Another new highlight: The software can now download and display Prodigy's JPEG-compressed images on the fly. Prodigy costs \$14.95 per month, including two hours of premium services, and \$3.60 for each additional hour. 800-776-3449. / JS



MACUSER/ZMAC UTILITY OF THE MONTH



Budget Image Editing

IT'S CHEAP AND POWER MAC-NATIVE. That's the rap on this month's MacUser/ZMac Utility, The Cheaper Image. A lightweight image editor that's designed for speedy image manipulation, this fat-binary application is fully compatible with 680x0-based Macs but still takes advantage of Power Mac speed.

The Cheaper Image lets you work on images in black-and-white, gray-scale, or color (including full 24-bit color); you can switch among palettes and dither colors. Images can be resized and cropped; select a portion of a picture, and you can scale it, rotate it, flip it, and adjust its transparency as well.

A selection of basic filters — blur, sharpen, and so on — is supplied. But The Cheaper Image also supports Photoshop-compatible plug-ins such as Kai's Power Tools and Aldus Gallery Effects, so you can apply wacky filters to your images.

Created by peerless programmer and playwright Mike Throckmorton, of Throckmorton Software, The Cheaper Image is available, for only the cost of download time, exclusively from the ZiffNet/Mac service on CompuServe (GO ZMC:MACUSER), ZiffNet Selections on AppleLink, and ZiffNet/Mac service on eWorld (Shortcut: MacUser). / Mark Simmons

PCMCIA Comes to Macs

CREDIT-CARD-SIZED modems, network cards, and hard drives can now be used with PowerBook 500-series laptops, with Apple's PowerBook PCMCIA Expansion Module (\$199). The Expansion Module holds two Type II cards or a single Type III card in a PowerBook 500's second battery port. Now Mac users can increase the storage capacity of their PowerBooks with PCMCIA cards, such as the \$629 170-MB hard-drive card from Epson America. 408-996-1010.

/ John Rizzo



POWER MAC UPDATE

MOVING AT YARC SPEED

Multiprocessor monsters fuel 3-D tasks.

NOT FAST ENOUGH for you? If that's how you feel when running 3-D renderers and similar applications on your Power Mac, then multiprocessing may be the answer. Now YARC Systems is delivering accelerator cards that put the power of as many as 12 extra PowerPC processors

into your Power Mac. The first products out, YARC's Zuma-SE cards, offer a single PowerPC 601 processor and can have as much as 64 MB of RAM, using standard 60-nano-second, 72-pin SIMMs. Base prices for the cards are \$1,495, \$1,795, and \$2,095 for the 66-MHz-, 75-MHz-, and 80-MHz versions, respectively, with no RAM installed. In the future, YARC will offer faster 601 chips.

YARC will also introduce two cards with multiple PowerPC 601 processors: the two-chip O-2 card and the four-chip Hydra. Each

card was slated for September release, but pricing and RAM configurations had not been set at press time.

For the most multiprocessing muscle, YARC developed NewNIX, a threading system that allows applications that support it to parcel out tasks across multiple cards. For example, three Hydras working together would harness the processing power of 12 PowerPC 601 chips. Currently, applications that support multiprocessing are YARC's Shade III, VIDI's Presenter Professional, and Pixar's MacRenderMan.

YARC is also offering a PostScript-compatible RIP that currently works on one Zuma-SE card but is planned to support NewNIX multiprocessing as well. Pricing was not available at press time. 800-275-9272 or 805-499-9444. / Sean J. Safreed



New Compilers Bring Pascal to PowerPC

ACHIEVING FAST DELIVERY of software on Power Macs means speaking the right language — and that has meant fluency in C or C++. Those who wanted to port Pascal code to the PowerPC were out of luck (Claris comes to mind in the case of FileMaker Pro, for example). But new Pascal compilers for the PowerPC should broaden the range of packages available for Power Macs.

Language Systems' LS Object Pascal CD-ROM contains more than 100 MB of tools and documentation to aid in porting Object Pascal code. Priced at \$399, the package includes not only 680x0 and PowerPC compilers but also Apple's MPW 3.1.1, a debugger, a native interface generator, and technical support via e-mail. LS Object Pascal is 100 percent compatible with Apple's Object Pascal. 703-478-0181.

Pascal tools are now part of Metrowerks' CodeWarrior package, albeit without Object Pascal support. CodeWarrior Gold (\$399)

offers a cross-compiler for 680x0 machines and Power Macs, with support for C and Pascal. The \$99 Bronze version offers the same tools but only for 680x0 Macs. The current Pascal compiler in CodeWarrior, release 4, is just a development version. 514-747-5999.

Both versions should be final by year's end. / SJS

A Quicker FoxBase Pro

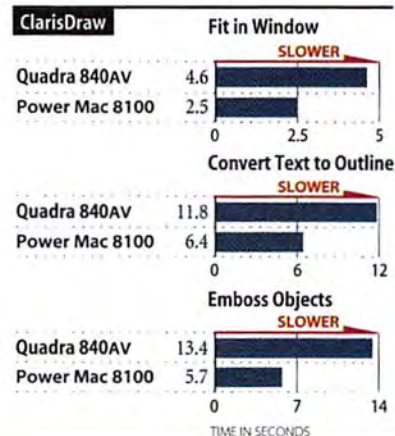
MICROSOFT MAY BE POKY in releasing native versions of its Office products, but a native version of its database application began shipping in September. FoxBase Pro 2.6 (\$99) also includes a Catalog Manager, for organizing elements, and Wizards, for simplifying tasks.

In addition, Microsoft said that it would ship Connectix's \$99 RAM Doubler 1.5 with its Office applications to make it easier for RAM-lean machines to run several Office programs simultaneously. 206-882-8080. / Pamela Pfiffner

Power Mac Time Trials

CLARISDRAW is the latest drawing application to go native, following in the footsteps of Adobe Illustrator and Aldus FreeHand. How fast is it? We put it through its paces, using a Mac Quadra 840AV running on-board video and a Power Mac 8100 with a VRAM card. All tests were done in 16-bit mode. Each system had 16 MB of RAM, a 1-GB Apple hard drive, and a 16-inch Apple monitor. We found that the native version of ClarisDraw on the Power Mac was as much as 135 percent faster than the 680x0 version on the Quadra. / SJS

MacUser ZD LABS



NATIVE POWER MAC APPLICATIONS

THE FOLLOWING IS a list of selected native Power Mac applications that shipped between July 18 and August 4.

Business		
Arrange 2.0	Common Knowledge	415-325-9900
FileMaker Pro Server	Clariss	408-727-8227
4D First	ACI	408-252-4444
KaleidaGraph 3.0	Synergy Software	610-779-0522
MacWrite Pro	Clariss	408-727-8227

Games		
Sensory Overload	Reality Bytes	617-621-1555
Solitaire Antics	Masque Publishing	510-522-1164

Multimedia		
Elastic Reality 1.2	Elastic Reality	608-273-6585
MovieFlo	Valis Group	415-435-5404
Premiere 4.0	Adobe	415-961-4400

Networking and Communications		
Mosaic 2.0	NCSA	on-line

Publishing and Graphics		
ClarisDraw	Clariss	408-727-8227
TrapWise	Aldus	206-622-5500

3-D/CAD		
StrataVision 3d 3.0	Strata	801-628-5218
Dimensions 2.0	Adobe	415-961-4400

WORD PROCESSORS /

FULLWRITE TRIES FOR A COMEBACK

Classic word processor needs little RAM.

HISTORY LOVES a comeback: Nixon in '68, Muhammad Ali in '78, Dan Quayle in '96. Now Akimbo Systems seeks a second chance for FullWrite Professional, a legendary word

processor from the Mac's early days. At press time, the company expected the program, renamed FullWrite 2, to ship at the end of August. But if its ship date were to slip, history would only be repeating itself.

The original FullWrite, released by Ashton-Tate in 1988, was the most famous vaporware product of its time, taking almost two years to appear after being announced by its original developer, Ann Arbor Softworks. At the time, FullWrite was a powerful and innovative program whose chief failing was that it demanded more

RAM than most Macs had available: 2 MB. Ashton-Tate was later acquired by Borland International, which sold FullWrite to Akimbo Systems, a company with one of FullWrite's original programmers as its chief technologist.

For the faithful few who have clung to FullWrite over the years, version 2 comes none too soon. New and improved features include automatic marking of document changes; integrated tables; "drag or drop" editing; and a full set of annotations, including citations, rereferencing, and hypertext. The program is also now extensible, which means that new features can be added through plug-in extensions.

The biggest improvement Akimbo claims, though, is that the program is now significantly faster. Slow performance had been the No. 1 failing FullWrite users complained about. A native Power Mac version, planned for the near future, should speed things up even more.

Ironically, FullWrite's one-time weakness — its memory requirement — is now a strength. Although the program requires about the same amount of RAM it did five years ago, even low-end Macs now come with more than enough RAM to run FullWrite. \$395; upgrade, \$99. 800-375-6515 or 617-776-5500. / James S. Bradbury



Scans More, Costs Less

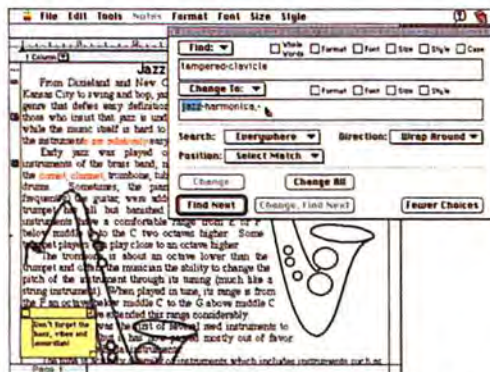
COLOR SCANNERS these days cost less but offer better quality. Three cases in point, each of which offers 10 bits per color:

Agfa StudioScan II. Agfa's new low-end unit scans at 400 x 800 dpi (with interpolation as high as 2,400 dpi) in one pass. It includes Agfa's FotoTune Light (color-management software), FotoSnap (an automatic-scanning utility), FotoLook (an advanced driver), and Adobe Photoshop LE. \$995. 508-658-5600.

Epson ES-1200C-Pro Mac. This 600-x-1,200-dpi scanner offers interpolation as high as 4,800 dpi. You can choose either one- or three-pass scanning. It ships with Adobe Photoshop, HSC Software's Kai's Power Tools, and the ScanTastic Photoshop plug-in. \$1,499. 310-782-0770.

Nikon AX-1200 Scantouch. This three-pass scanner has a resolution of 600 x 1,200 dpi (as high as 2,400 dpi by means of software interpolation). It ships with Nikon's Photoshop plug-in and Nikon Control, a stand-alone scanning application. \$1,535. 516-547-4355.

All three models offer optional transparency modules. / Pamela Pfiffner



FullWrite 2 allows you to track editorial changes by color and annotate text with sticky notes.

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GAMES /

Everything Old Is New Again

MULTIMEDIA CD-ROMs may be the hottest thing in computer games right now, but there's still no substitute for the manic energy of vintage arcade games. Now modern Mac users can get a hit of high-tech nostalgia from some early-'80s arcade classics — without running out of quarters.

Microsoft Arcade. The five Atari games that make up Microsoft Arcade (\$30) have been designed to look like the original article, right down to samples of the original video-game sounds. The Microsoft Arcade package contains Asteroids, Battlezone, Centipede, Missile Command, and Tempest. Players can customize all of the game's variables, from firing speed to the number of lives each player is granted. 206-882-8080.

Digital Eclipse Games. Joust, Defender, and Robotron (\$25 each) are just some of the Classic Entertainment games that Digital Eclipse

Software is bringing to the Mac, via emulation. Just as Power Macs can emulate the Motorola 680x0 chip found in earlier Macs, Digital Eclipse's Mac system emulates the 6809 chip, found in old video games. Digital Eclipse's games play just like the real thing, because they are, in every measurable way, the originals. 510-547-6101.

Lode Runner. The venerable Apple II game Lode Runner is being revamped for modern machines by Sierra On-Line, featuring new twists (such as extra weapons) of the classic pursuit game. \$46. 800-757-7707 or 206-649-9800. / Jason Snell

BLURB OF THE MONTH

"It represents the first in what promises to be a full line of instant publishing titles . . . Great care has been taken . . . to avoid sensationalism." / Press release for

The People v. O.J. Simpson, an interactive multimedia CD-ROM "companion" to the murder trial, from Turner Home Entertainment (404-827-2890).

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Date Of Birth (Month/Day/Year)		Mother's Maiden Name		Home Phone Number And Area Code ()			Name Home Phone Is Listed Under		
Previous Home Address, Number And Street				City Or Town		State	Zip Code	Years There	

Please Tell Us About Your Job

Business Name Or Employer		Position		Years At Job	Business Phone Number And Area Code ()	
Check Here If You Are: <input type="checkbox"/> Retired <input type="checkbox"/> Self-Employed		If Retired Or Self-Employed, Give Bank Name		Bank Phone Number And Area Code ()		Bank Account Number

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Your Total Personal Yearly Income	Other Yearly Household Income
Other Yearly Income Sources	

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<input type="checkbox"/> Money Market/Investment Account	Bank/Institution Name:
<input type="checkbox"/> Checking Account	Bank/Institution Name:
<input type="checkbox"/> Savings Account	Bank/Institution Name:
<input type="checkbox"/> Visa/MasterCard	<input type="checkbox"/> Diners Club <input type="checkbox"/> American Express
<input type="checkbox"/> Dept. Store/Sears	<input type="checkbox"/> Gasoline <input type="checkbox"/> Other

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1UBAL 014NB LY11V 0000



A vintage Apple II computer setup. The monitor displays a rainbow-striped Apple logo with a bite taken out of it. The computer unit is a beige desktop model with a floppy disk drive. A keyboard is in front of the unit.



Apple



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Variable Rate Information	The annual percentage rate for purchases may vary each calendar quarter. We will calculate the variable rate by adding 9.4% to the rate disclosed as the U.S. Prime Rate as reported in the "Money Rates" table of <i>The Wall Street Journal</i> on the third Tuesday of March, June, September and December of each year. Because the annual percentage rate is variable, the current rate may not be in effect when your card is issued. This rate will not be lower than 12.9% or higher than 19.8%. However, if a cardmember fails to keep all his/her Citibank accounts in good standing, the rate will increase to 19.8% on the full purchase balance.
Grace Period For Purchases	30-25 days
Minimum Finance Charge	50¢
Method of Computing The Balance For Purchases	Average Daily Balance (including new purchases)
Late Fee On Purchases And Cash Advances	\$15
Transaction Fees For Cash Advances	At a financial institution or by check, 2% of amount of advance but not less than \$2 or more than \$10. At an Automated Teller Machine, \$1.75.
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ADOBE ACROBAT OPENS SECOND ACT

Free reader, smart navigation, and security features star in version 2.0.

AFTER STAKING OUT TURF in the portable-digital-document arena with Acrobat 1.0 last year, Adobe Systems watched competitors such as No Hands Software's Common Ground, Farallon's Replica, and WordPerfect's Envoy encroach on its territory. Now Adobe is striking back, with Acrobat 2.0, an update that improves on some of the inaugural version's biggest deficiencies.

Free Reader. The key addition of a free PDF (Portable Document Format) viewer application for Mac, Windows, DOS, and UNIX systems puts this version on an equal footing with its competitors. Previously, Acrobat users who wanted to widely distribute documents had to purchase copies of Acrobat Reader for their entire readership.

Navigation. One balancing act Acrobat 2.0 performs better than its predecessor is taking documents formatted for letter-sized pages and making them easy to read on-screen. Users can create "articles," a series of linked page areas that lets readers navigate

through an entire article a mouse click at a time, with Acrobat doing the page turning and magnification. The page-size limitation has also been removed: The pages of a single PDF file can have any number of dimensions and orientations.

File Size. Acrobat 2.0 also strikes a balance between file size and document quality — users can choose to embed only the individual characters of a font that are used in a document, eliminating the inclusion of unnecessary font information and avoiding the use of font metrics to create facsimiles of missing fonts.

Security. Improved security of PDF files means document creators can choose to password-protect files or disable copying, printing, or saving of files. Security-enabled PDF files are automatically encrypted for an extra layer of protection.

Text Search. Acrobat 2.0 also includes the powerful Acrobat Search engine, which allows users to search the full text of any Acrobat document located on their local network. The catch? The index server software, Acrobat Catalog, is currently available only for Windows.

In addition to new features, Acrobat 2.0 also comes with a big conflict. According to Adobe, Acrobat is currently incompatible

with QuickDraw GX, so users have to turn off GX

before launching Acrobat.

And because installing GX re-

quires the irrevocable conversion of

all Type 1 fonts in the

system to GX format, Acrobat 2.0 may be a

tough sell to Mac users who want to take advantage of QuickDraw

GX's features.

Acrobat 2.0, \$195; Acrobat Pro 2.0 (includes Acrobat 2.0 and Acrobat Distiller, Adobe's PostScript-to-PDF application), \$595; Acrobat for Workgroups (includes Acrobat Pro 2.0 and Acrobat Catalog for Windows), \$1,595. 415-961-4400. / Jason Snell



ILLUSTRATION / LIN WILSON

Mitsubishi's DiamondTron Takes on Sony CRTs

IF YOU'VE WANTED the superior image quality of a Sony Trinitron CRT but have held off because a 20-inch screen is too small, wait no longer. Mitsubishi has moved ahead by bringing out the DiamondTron, the first non-Sony aperture-grille CRT. Compared to the more common shadow-mask CRTs, aperture-grille CRTs are brighter and less prone to distortion.

Mitsubishi expanded the tube to 21 inches but maintained a fine, .31-millimeter aperture-grille pitch. The company also added a proprietary NX-DBF dynamic beam-forming gun, which it claims improves corner-to-corner sharpness. Mitsubishi has incorporated the DiamondTron into its Diamond Pro 21T high-performance color monitor (\$2,525). The monitor is MPR



II-compliant for ELF/VLF emissions; has automatic power saving that meets Energy Star standards; and includes an antiglare, antistatic treatment. Its maximum supported resolution is 1,600 x 1,200 pixels at a vertical-refresh rate of 66 Hz.

Mitsubishi has addressed the problem of cumbersome digital controls with the new Diamond Control software, which lets you make all monitor adjustments through software in conjunction with a serial cable connected to your Mac's modem or printer port. It includes controls for adjusting image and position, setting color temperature, and configuring automatic power-down. Extensive built-in help explains all controls and helps you with monitor jargon. 800-843-2515 or 714-220-2500. / Jeffrey S. Pittelkau

CD-ROM /

Thai This One On

EXOTIC CUISINES require ingredients, techniques, and philosophies unfamiliar to many budding cooks. For fans of Thai food, 4 Paws of Crab takes up where static cookbooks leave off. This CD-ROM includes 45 Thai recipes with how-to videos and cross-references to an ingredient glossary that includes photos. To provide cultural context, 4 Paws of Crab contains political histories of the U.S. and Thailand and video diaries of a Thai and an American visiting each other's countries for the first time. \$44.95. 800-454-7557 or 510-654-7480. / Pamela Pfiffner



NEW & NOTABLE

HARDWARE /

Radius IntelliColor Display/20e. This Trinitron-based 20-inch monitor comes with Radius' Dynamic Desktop software, which allows resolution and bit-depth switching on the fly; IntelliColor color-management software; and PowerSaver energy-saving software. It supports resolutions as high as 1,600 x 1,200 pixels and offers four user-selectable color-temperature settings. \$2,399. 408-434-1010.

▼ **Wacom ArtPad.** When desktop real estate is at a premium, this graphics tablet can be the solution. With a sketching area of 4 x 5 inches, the \$199 ArtPad offers 256 levels of pressure sensitivity and

supports resolutions as high as 2,540 lpi. Its batteryless stylus, the UltraPen, weighs just 8 grams. The ArtPad will also be bundled with Fractal Design's Painter. 206-750-8882.

Xanté LaserPress 1200. A 1,200-x-1,200-dpi printer, the LaserPress 1200 (\$7,495) comes with 20 MB of RAM and supports LocalTalk, parallel, and serial connections and, optionally, Ethernet. It's powered by a 33-MHz RISC processor and comes equipped with Adobe PostScript. Midtones of halftone images can be calibrated with controls on the printer's front panel. 205-476-8189.

Samsung SyncMaster 17GLs. Supporting resolutions as high as 1,600 x 1,200 pixels, this 17-inch flat-screen monitor features front-panel controls for color, focus, and other screen adjustments. The SyncMaster 17GLs also offers three low-power monitor states for saving energy. \$999. 201-229-4000.

NoRad JitterBox. Preventing image jitter and distortion by shielding monitors from magnetic fields is the goal of the JitterBox. It consists of four identical pieces of alloy, which are placed on the corners of a monitor, blocking out interference. \$395 (9- to 15-inch monitors), \$495 (16- to 17-inch monitors), \$595 (19- to 21-inch monitors). 310-605-0808.

SOFTWARE /

StatView Survival Tools. A series of drop-in data-analysis tools for the StatView application adds regression models and other calculations for determining statistical probabilities over a given period of time. The

tools are targeted at researchers in the social and natural sciences. \$295. Abacus Concepts. 510-540-1949.

DeltaGraph Pro 3.5. The latest upgrade to this charting program includes support for such System 7.5 features as Macintosh Drag and Drop, Apple Guide, and PowerTalk. Six quality-control charts have been added, and a revamped chart gallery makes it easier to select and preview charts. The native Power Mac application also offers full network support, so multiple users can access the program concurrently. \$195; upgrade, \$30. DeltaPoint. 408-648-4000.

Fax PRO 1.5.1. Delrina's popular fax package adds support for the Apple Express Modem and the GeoPort Telecom Adapter for AV Macs in this new version. The package also includes an option for automatically printing faxes and comes bundled with OCR software. \$129. Delrina. 408-363-2345.

OceanLife Volume IV: The Great Barrier Reef. A two-CD-ROM set, this package includes more than three hours of video of the Great Barrier Reef along with comprehensive text, maps, and photographs. \$50. Sumeria. 415-904-0811.

Grolier Multimedia Encyclopedia (1995 edition). Although the tried-and-true method of using an encyclopedia to look up specific items still works on CD-ROM, the new version of this disc allows users to meander through new subjects by following the varied interests of such pathmaker personalities as Kurt Vonnegut, Buzz Aldrin, and Jackie Joyner-Kersey. The encyclopedia also now features 8,000 new images and a graphic historical time line. \$395. Grolier Electronic Publishing. 203-797-3530.

Rebel Assault. ▶

Can you fill Luke Skywalker's shoes? This CD-ROM puts you into the cockpit of a *Star Wars* X-Wing as you pilot your way through a series of 3-D simulations. But even the most skilled players must keep in mind that sometimes they've just got to close their eyes and use the Force. \$80. LucasArts. 415-721-3300.

DeskTape 2.0. The revision of this tape-mounting package allows users of System 7.5 to mount volumes that are as large as 4 GB. Users can access files directly from tape. \$329; upgrade, \$29. Optima Technology. 714-476-0515.

MACINTOSH PRICE INDEX

THE UNITED COMPUTER EXCHANGE index reflects average sales prices of new and used Macs as of August 4, 1994. Prices (except those for compact models and Performas) do not include a monitor or a keyboard. The United Computer Exchange is a national clearinghouse of used micro-computer equipment.


Mac Model	New	Used
Plus (1/20)	•	\$150
SE (1/20)	•	\$250
SE/30 (5/40)	•	\$550
Classic (2/40)	•	\$375
Classic II (4/40)	•	\$525
Color Classic (4/80)	•	\$700
LC (2/40)	•	\$325
LC II (4/40)	•	\$425
LC III (4/80)	•	\$525
Performa 475 (4/160)	\$1,499	\$1,300
Performa 550 (5/120)	\$1,799	\$1,600
II (5/40)	•	\$350
IIx (5/40)	•	\$425
IIcx (5/40)	•	\$450
IIci (5/80)	•	\$650
IIfx (8/160)	•	\$950
IIvx (4/80)	•	\$900
Quadra 605 (4/80)	•	\$675
Quadra 610 (8/230)	\$1,399	\$1,125
Quadra 650 (8/230)	\$2,069	\$1,750
Quadra 660AV (8/230)	\$1,399	\$1,275
Quadra 700 (8/230)	•	\$1,400
Quadra 800 (8/230)	•	\$2,025
Quadra 840AV (8/230)	\$2,599	\$2,350
Quadra 900 (8/230)	•	\$1,700
Quadra 950 (8/230)	\$3,599	\$2,400
Power Mac 6100 (8/160)	\$1,649	\$1,500
Power Mac 7100 (8/250)	\$2,829	\$2,575
Power Mac 8100CD (8/250)	\$4,399	\$3,975
PowerBook 100 (4/20)	•	\$625
PowerBook 140 (4/40)	•	\$750
PowerBook 145 (4/40)	•	\$875
PowerBook 145B (4/80)	•	\$1,000
PowerBook 160 (4/80)	•	\$1,200
PowerBook 165 (4/80)	\$1,399	\$1,250
PowerBook 165c (4/80)	•	\$1,450
PowerBook 170 (4/40)	•	\$1,325
PowerBook 180 (4/80)	•	\$1,800
PowerBook 180c (4/80)	•	\$2,125
Duo 210 (4/80)	•	\$1,050
Duo 230 (4/120)	\$1,529	\$1,275
Duo 250 (4/200)	•	\$1,500
Duo 270c (4/240)	•	\$2,150

• = discontinued model

For more pricing information on these and other models, call 800-755-3033 or 404-955-0569 or find it on ZiffNet/Mac, in Library 1 (Special Reports) of the MacUser Forum (GO ZMC:MACUSER). On AppleLink, look for it in ZiffNet Selections:MacUser Software:Reference. On eWorld, go to shortcut MACUSER, in MacUser Software Library:MacUser Special Files.

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With Retrospect from Dantz you'll be backing up to the storage device of your choice in seconds — including SyQuest, Optical, Bernoulli, floppies, and file servers. And just about any Macintosh tape drive you choose.



Retrospect packs more power than all the others put together.

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Dantz Development Corp., 4 Orinda Way, Building C, Orinda CA 94563 (510)253-3000.



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There is nothing like the feeling of losing your data. There is nothing like booting up to find that your twenty-page conference report has burned to a crisp. Or watching a month's worth of virus-infected spreadsheets go up in smoke right before your eyes.

When it happens, a rush of job-security panic begins in your legs and rapidly bolts all the way up to your cerebellum. And the impact of losing all of your hard work affects you in a way you'll certainly never forget.

Data loss. It's one fiery disaster that makes for an awfully bad day.

PROACTIVE PROTECTION FOR YOUR MACINTOSH.

This being the way things are, at Symantec we subscribe to the theory that the best way to deal with a disaster is, well, to prevent it in the first place. Which is the very reason for our newly updated Norton Utilities® and SAM®. In a word, they're proactive. But to put it more poetically, this improved

data-protection software actually snuffs out fires without so much as the stirring of your mouse.

NEW NORTON UTILITIES DETECTS DAMAGE BEFORE DISASTERS HAPPEN.

For starters, look at our new Norton Utilities 3.0. We've taken the industry's most powerful data recovery and repair program and improved it to where it's almost invisible. So that now you can virtually load it and forget it.

NEW NORTON AND FIRES EVEN BEFORE YOU



- ◆ The enhanced Filesaver feature proactively and consistently works to maintain your system at premium health by scanning in the background for early signs of trouble. This new
- ◆ agent-oriented technology is a Norton exclusive that personally reminds you when it's time to do basic data maintenance such as backing up or optimizing. In terms you can easily understand. It also automatically monitors your data for up to 500 deleted files so they can be easily recovered.
- ◆ Once a problem has been detected, Norton Disk Doctor takes over. Improved Disk Doctor recommends a solution and then executes it on your command. It now hunts down, diagnoses, and repairs problems in more areas of the disk than any other software.

The enhanced Speed Disk's unique customization feature lets you defragment everything from a whole volume to a selected file.

And Norton Utilities 3.0 now also includes enhanced backup. Which creates self-extracting and self-restoring backups of your data.

This improved capability makes it even easier for you to restore data during emergency situations. And our backup now also supports tape drives.



Peter Norton has always been well ahead of the pack when it comes to desktop data recovery and antivirus protection software.

greatest level of protection against new viruses as they are discovered.

The new SAM also scans for and destroys viruses in more types of compressed files than any other antivirus software can. SAM covers DiskDoublers, Compact Pro, Stuffit, and Now Compress. This ensures your ability to detect and eliminate a virus in any compressed file.

And for all of you who have a healthy appreciation for speed, the

means accelerated scanning speed, greater productivity, along with even more transparent protection.

What it shakes out into is that improved Norton 3.0 and SAM 4.0 now provide your Mac with the ultimate available levels of proactive protection against data loss. It's all rather amazing.

Then again, maybe all of these advancements are not so amazing. After all, Symantec is, of course, the proven industry leader when it comes to Mac data repair and recovery and virus protection.

SAM. THEY PUT OUT CAN SMELL THE SMOKE.

NEW SAM PROVIDES THE BEST PROTECTION AGAINST VIRUSES.

However, that's just the half of this proactive pair. We've also fully redesigned SAM 4.0 to provide the most complete and most effective virus protection, detection, and elimination of known and unknown viruses. So that what could turn

your entire system into a towering inferno never even becomes a spark.

One of SAM's exclusive features is automatic virus updating. Through your modem, SAM automatically dials the Symantec BBS daily, weekly, or according to any schedule you tell it to follow.

It then downloads the latest virus antidotes and updates your virus definition files. So you now no longer have to mess with manual updating. This assures you have the

improved SAM is also the faster SAM. The 4.0 version scans for viruses significantly faster than its predecessor. Which makes virus protection more seamless and less disruptive to your work flow.

Want more? Okay, SAM is also the only virus protection software that allows you to create a custom decontamination disk specific to your machine. This lets you reboot your Mac easily should your system crash from a virus.

The 4.0 version also simplifies the user interface by combining SAM Intercept and Virus Clinic into one easy-to-use component. This advancement allows you to configure more expert options from one convenient location.

POWER MAC NATIVE.

While these new versions will protect your original Mac, they are also Power Mac native. So those of you with a Power Macintosh can take full advantage of the increased processing power. Ultimately, that

So, pick up the entirely new versions of Norton Utilities and SAM. And then, if you smell something burning at the office, you'll know it's either yesterday's coffee or that guy two cubes upwind who's trying to put out his fiery data disaster. That you well know could have been prevented in the first place.

CALL 1-800-628-4777.

To keep data loss from casting a glow on the office landscape, call 1-800-628-4777 ext. 9GGH. If you own Norton Utilities and SAM, you can order upgrades for \$39.95 and \$29.95 respectively.* Or you can purchase the new versions at your software store.



SYMANTEC.®

Q.

What's the easiest way to connect my LocalTalk printer to Ethernet?

Hassle-free Ethernet for LocalTalk Printers

Farallon's award-winning EtherWave technology is now available for LocalTalk printers. You don't need to invest in new printers just because you're migrating to Ethernet—it's easy to connect a LocalTalk printer to Ethernet with the EtherWave Printer Adapter.

You can place your printer wherever it's convenient, using the unique daisy-chaining technology of EtherWave to connect it and a desktop Mac or other 10Base-T device to the network. No need to add a new Ethernet drop. Just plug the adapter into any LocalTalk printer and attach your Ethernet cable. You'll be printing in minutes. And, EtherWave works with any LocalTalk printer, including printers from Hewlett Packard, QMS, Apple, Tektronix, GCC, and others.

Just plug it in—really

- Put your printer where you need it without pulling more wire
- Daisy-chain several devices to the same Ethernet port
- Monitor the printer adapter with 7 diagnostic LEDs
- Connect your LocalTalk printers and Macs, with or without a hub



Farallon offers you not only the most affordable Ethernet solutions, but the easiest and fastest to install. And unlike others, the EtherWave Printer Adapter requires no additional hardware!

The Farallon Advantage

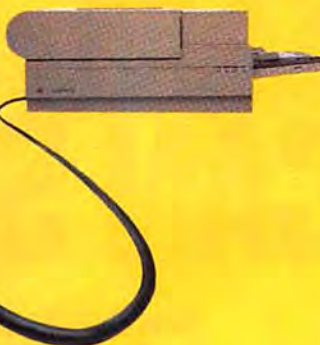
	Farallon	Other Products
Estimated Street Price	\$319	\$349
10Base-T Daisy-chaining	Yes	No
Directly plugs into printer	Yes	Needs cable or connectors \$\$\$
Diagnostic LEDs	7	1
Lifetime Warranty	Yes	?

An EtherWave product for any device:

	Part #
• EtherWave AAUI Transceiver	PN802
• EtherWave AUI Transceiver	PN801
• EtherWave Mac/PowerBook Adapter	PN840
• EtherWave Printer Adapter	PN842
• EtherWave Macintosh NuBus Card	PN890
• EtherWave Macintosh LC Card	PN892
• EtherWave ISA Card (for PCs)	PN880
• EtherWave PCMCIA Adapter (for PCs)	PN885
• Timbuktu® for Windows/EtherWave Kit	PN881

A.

EtherWave® Printer Adapter



You want the speed and power of Ethernet for every device on your network. But you've invested in all those LocalTalk printers. The EtherWave Printer Adapter connects your LocalTalk printer directly to 10Base-T Ethernet, with the plug-and-play simplicity that's made Farallon the #1 provider of Macintosh networking solutions.

Building a small Ethernet network? EtherWave is Farallon's award-winning daisy-chainable 10Base-T technology that lets you connect several devices without an Ethernet hub. So it's perfect for the small office or stand-alone workgroup. Or you can expand your larger network by daisy-chaining devices from a single 10Base-T port.

Plug your printer into Ethernet today. Call for information on the EtherWave Printer Adapter and Farallon's complete EtherWave family of daisy-chainable 10Base-T products for Macs, PCs, workstations, PowerBooks, and PC notebooks!

More Questions?
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REVIEWS & Quick Clicks



QMS *magicolor* Laser Printer and Xerox 4900 Color Laser Printer

Color consistency challenges new laser printers.

TWO NEW COLOR laser printers — the QMS *magicolor* Laser Printer and the Xerox 4900 Color Laser Printer — promise you high-quality color and crisp monochrome output from the same laser printer, but unfortunately they're only a step, not a leap, in the right direction.

The QMS *magicolor* Laser Printer and the Xerox 4900 Color Laser Printer each give you color and black-and-white output by

placing as many as four layers of color toner onto a transfer drum, which, using heat, imprints the image onto plain paper. Each printer has parallel, serial, and LocalTalk interfaces for easy integration into a mixed-platform network (EtherTalk is optional). Each printer can save you money by printing on regular paper instead of the special paper thermal-wax-transfer printers demand. But these printers won't give you the color quality you might expect, considering that with the RAM necessary for high-resolution printing and EtherTalk capability, their prices run into the five-digit range.

Xerox 4900 Color Laser Printer

With its excellent manual and great tutorial, the Xerox printer is considerably easier to set up and use than the QMS printer. Its driver gives you some useful options for,

among other things, resolution, color mode (graphics, pictorial, gray-scale), and media type (plain paper, transparencies, labels). The higher the resolution you want, the more RAM you need in the printer: 8 MB for 300 x 300 dpi, 12 MB for 600 x 300 dpi, and 24 MB for 1,200 x 300 dpi. Including consumables, printing a monochrome page at 5-percent coverage costs 2 cents; a four-color page at 5-percent coverage for each color costs 17 cents. The Xerox printer ships with 35 fonts in ROM and doesn't have any hard-drive storage capability.

If you're in a busy environment, be prepared to restock the paper tray frequently. The Xerox 4900 has a disappointing 250-sheet capacity; an optional lower tray increases total capacity to 500 sheets. Although the printer can print on legal-sized paper, the actual print area is the same as on letter-sized paper.

QMS *magicolor* Laser Printer

If you use a wide variety of fonts, you'll appreciate the QMS printer's internal 80-MB hard drive, with 65 fonts installed, and the SCSI port for additional hard-drive storage. Like the Xerox 4900, the QMS *magicolor* needs extra RAM for higher resolutions: 12 MB for 300-x-300-dpi color and 600-x-600-dpi monochrome on 8.5-x-11-inch, letter-sized media; 24 MB for 600-x-600-dpi color and monochrome on letter-sized media; and 28 MB for 600-x-600-dpi monochrome on 11-x-14-inch, legal-sized media. With its 250-sheet tray and optional lower tray that increases capacity to 500 sheets, the printer shares the limited sheet-feed capacity of the Xerox. It does, however, cover a legal-sized area on legal-sized paper, but only using black toner. Including consumables, a monochrome page at 5-percent coverage costs 4 cents; a four-color page with 5-percent coverage costs 7 cents.

You need a QMS technician to set up your printer (setup is free). The manual — which explains the complicated color control panel and also Crown Technology, for improving processing speed and network performance — is sketchy and confusing.

Reviews Rating Key

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

Testing Speed and Skill

In our MacUser Labs tests, we were unable to get consistent color with either printer, even though the Xerox printer has a unique technology called QuadDot, which is notable for its ability to create smooth color gradations. When we printed a complex Illustrator 5.5 document with fine lines and color subtleties, the Xerox printer blurred the finer lines and produced colors that were undersaturated at 300 x 300 dpi and posterized at 1,200 x 300 dpi, but it created smooth color gradations. The same image printed on the QMS printer had crisper lines but suffered from vertical striping and rougher gradations.

When it came to printing text, the QMS printer gave us noticeably crisper text at 600 x 600 dpi; in contrast, text printed on the Xerox printer didn't seem to change noticeably at higher resolutions.

We also tested each printer for its ability to accurately print a five-page Microsoft PowerPoint document containing lots of saturated color. The pages, when printed at 1,200 x 300 dpi on the Xerox printer, had smoothly graduated color, but the background color pooled behind black text, creating an undesired shadow effect. The QMS printer, at 600 x 600 dpi, did better on producing saturated, brilliant colors but not as well on color gradation.

Most printers have a pages-per-minute (ppm) engine rating, but engine ratings don't take into account image complexity or network throughput. To check the 4900's 12-ppm and the *magicolor*'s 8-ppm engine ratings for monochrome printing, we tested printing speed on a variety of documents.

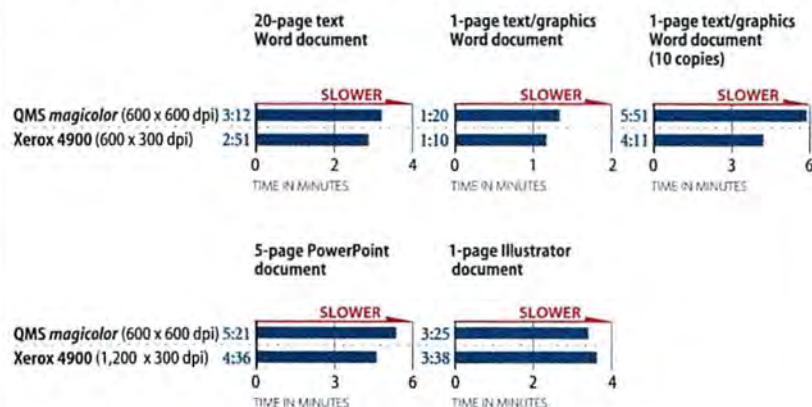
At a resolution of 600 x 300 dpi, the Xerox printer churned out a 20-page Microsoft Word document containing only double-spaced 12-point Times Roman text at 7 ppm. Printing the same document at 600 x 600 dpi, the QMS printer was slightly slower, at 6 ppm.

When printing a one-page Word document with simple four-color graphics, the Xerox printer edged the QMS printer by a few seconds with comparable resolutions, but the QMS printer gave us sharper-looking text again.

To test how quickly the printers were able to continuously print four-color documents, we printed ten copies of the one-page color Word document. The Xerox

Close Race

In most of our speed tests, the QMS *magicolor* and Xerox 4900 color laser printers showed very similar results. Overall, neither printer impressed us with its speed — neither managed to print faster than 7 ppm, and for complex documents, speed slowed considerably.



printer averaged 2.4 ppm over all the resolutions and the QMS 1.7 ppm.

When it came to printing more-complex color images, however, the QMS printer was faster than the Xerox printer. At 300 x 300 dpi, the QMS took 11 seconds less than the Xerox printer to print our Illustrator 5.5 image, and the QMS printer at its higher resolution, 600 x 600 dpi, took about 13 seconds less than the Xerox at its highest resolution, 1,200 x 300 dpi. When printing the five-page PowerPoint document, the QMS printer managed 1.53 ppm at 300 x 300 dpi and the Xerox printer took almost 30 seconds longer to print the document, producing 1.27 ppm. But at 600 x 600 dpi, the QMS printer took its time, printing just less than a page a minute; the Xerox printer was faster at 600 x 300 dpi and also at 1,200 x 300 dpi.

The Bottom Line

The QMS *magicolor* and the Xerox 4900 printers aren't ideal for color-critical work. The process that imprints a color image onto plain paper causes the paper to curl if you use a high percentage of color, and if you're used to the speed of monochrome printers, you'll be disappointed at how long color laser printers take to print. The Xerox printer has fewer features, but because of that, it is somewhat easier to use, less expensive, and better suited for an office that needs monochrome output with occasional color. The QMS printer, on the other hand,

points toward the color laser printers of the future: With its SCSI interface for hard-drive font storage, color control panel, and crisp text at high resolution, the printer is better suited for graphic-design and desktop-publishing offices that will readily adopt the color laser printers once color-consistency issues have been addressed.

/ Tony Bojorquez

QMS *magicolor* Laser Printer

Rating: ★★

Price: \$10,999 (with 28 MB of RAM); EtherTalk daughterboard, \$599; connector, \$149 (list).

Pros: Plain-paper color printing. Better intensity and saturation of color. SCSI port to enable additional font storage.

Cons: Difficult to set up and use. Inadequate manual. Only 250-page capacity. Color inconsistencies.

Company: QMS, Mobile, AL; 800-523-2696 or 205-633-4300.

Reader Service: Circle #401.

Xerox 4900 Color Laser Printer

Rating: ★★

Price: \$9,444 (with 24 MB of RAM); EtherTalk card, \$649 (list).

Pros: Plain-paper color printing. Excellent manual and tutorial. Better color blending.

Cons: Only 250-page paper-tray capacity. No hard-drive storage. Color inconsistencies.

Company: Xerox, Rochester, NY; 800-275-9376 or 716-256-4446.

Reader Service: Circle #402.

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Adobe Premiere 4.0 / The king of digital-video editing adds advanced videography features.

ADOBE PREMIERE'S fourth major revision has support for SMPTE time code, more-finely-tuned controls, and a virtually limitless amount of new filters. Also, given that it runs native on the Power Macintosh, you can apply those filters and render your QuickTime videos nearly twice as fast as on a 680x0 Macintosh.

Perfect Timing

Video pros will be pleased with Premiere's support for the SMPTE-format time-code track in QuickTime 2.0. Premiere adheres to the NTSC 29.97-frame-per-second standard for capture as well as editing by creating one duplicate frame after each thousandth frame.

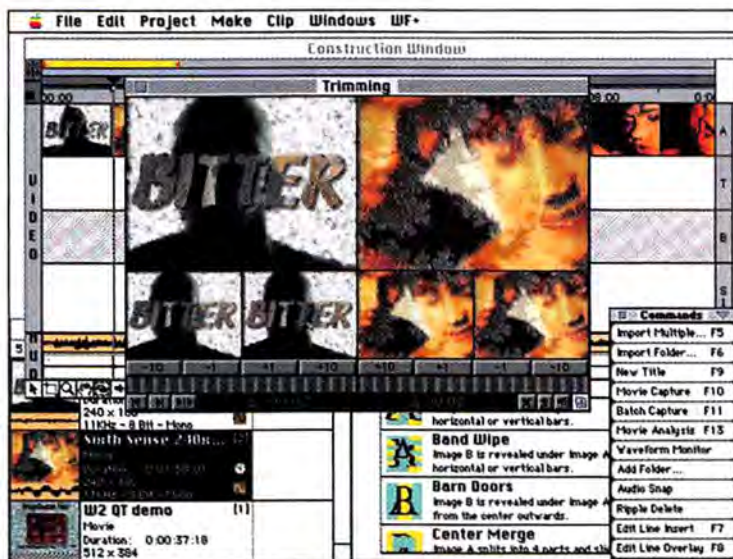
The real magic, however, is in Premiere's ability to use OCR (optical character recognition) to read time-code numbers burned into video clips. Among other things, the ability to use SMPTE time code to read and edit lets you create a practical EDL (Edit Decision List), which you can take to a postproduction studio with your source videotapes and create a professional-quality analog movie with the cuts, effects, and transitions you created in Premiere.

Premiere's EDL format is fully compatible with the EDL formats for the majority of film-industry-standard analog edit controllers and switchers, including those from CMX, Grass Valley, and Sony. The ability to render both of the interlaced video fields in a frame at 30 fps adds to the support for NTSC analog video, and if you have a video-processing card such as the Radius Video-Vision or the RasterOps MoviePak, you're able to alter parameters such as field dominance and interlacing according to hardware requirements.

Premiere continues to improve its ability to handle large amounts of visual data. For

example, you can compile several movies at once with the Batch Movie Maker command and save batch lists.

With a high-quality source deck, you can also capture video in several new ways, including in slow motion and time lapse.



Take a look at any frame in a QuickTime movie with the new Trimming window. You can view as many as four frames around the selected frame in a 1:1 ratio.

F/X Galore

Special effects are a favorite of makers of digital movies, especially when they're as easy to use as Premiere's. It's even easier now that you can apply filters to several video clips at once.

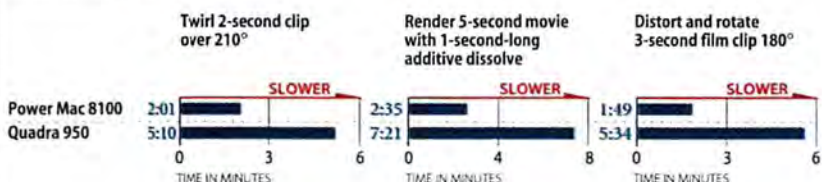
With Premiere 4.0, you can create your own filters and transitions with the Filter and Transition Factories. You can base new filters on Photoshop and Illustrator files and save the filters as Premiere plug-ins. You can also apply Photoshop filters over time by specifying starting and ending parameters for the filter settings. Unfortunately, this works only with basic Adobe filters: Most third-party filters, such as those in Aldus Gallery Effects and HSC's Kai's Power Tools, can't be applied over time.

Premiere also has some of its own new filter effects and transitions. Among the filters, Burn Time Code burns time code onto a movie; Clip trims pixels from the edges of a clip; Polar swirls your video image around a circular path for a fish-eye-lens effect; Lens Flare creates camera glare that follows a moving light source; and Shear distorts your video image along a curve. New transitions include Gradient Wipe, in which a gray-scale image becomes a wipe template. The motion effects render more smoothly with Premiere

4.0 than they did in earlier versions, and in our tests, the native Power Macintosh version was able to render effects filters and motion settings more than twice as fast overall as the 680x0 version on a Quadra 950 did.

Power Mac Premiere

New with Premiere 4.0 is the native Power Mac version, which blows the socks off the 680x0 version for processor-intensive tasks. We compared Premiere running on a Power Mac 8100 with the application running on a Quadra 950 and found that it took as much as three times as long on the Quadra.



Familiar Face

Overall, Premiere 4.0 looks and works like its earlier version. You import your elements — including QuickTime movies; Illustrator, Photoshop, and PICT still images; PICS animation files; and audio in AIFF and snd formats — into a Project file and then drag the elements onto time tracks in the Construction Window. You can combine as many as 99 tracks of video, animation, transitions, effects, and pictures with as many as 99 audio tracks.

However, unlike previous versions, Premiere 4.0 lets you insert, overlay, or replace a clip by issuing a single command. A new floating control bar, much like the one in QuickTime movies, lets you scrub the playback marker like a record needle over your construction so you can coordinate sound with video, and it gives you a SMPTE time-code display. You can now preview your video constructions (albeit without the transitions and effects) instantly, instead of having to wait for them to render.

The new Trimming Window zooms in on one frame of your construction while it's

displaying as many as four of the frames that come before and after the frame, all in a 1:1 ratio, which is tremendously helpful for precise editing of the beginning and ending frames of a selection.

Premiere now also has a floating tool palette, much like the one in Photoshop 3.0. You can insert buttons for the commands you use most frequently, a relief if you have a large-screen or a multiple-screen system.

The documentation is complete and easy to read. The manual is logically organized, making it easy for experienced users to get started quickly, and has enough reference material to teach novices about such topics as basic video technology, drop-frame editing, and the SMPTE and NTSC standards. The full two-CD-ROM kit, which was optional in previous versions, is now included in the package and contains QuickTime 2.0, nine Adobe typefaces, full program documentation in Acrobat format, an assortment of sample video clips, and a full-length video from avant-garde video artist John Sanborne as well as his tips on how he created his special effects.

The Bottom Line

As a general-purpose digital-video editor and effects system for the Mac, Premiere 4.0 can't be beat. In this version, an already outstanding tool has become easier to use and integrates better with analog-video sources and devices. And with its awesome speed when running native on the Power Macintosh and its ability to batch-render movies and show you previews of your constructions, Premiere 4.0 allows you to organize a long project more effectively than before.

/ David Biedny and Nathan Moody

Adobe Premiere 4.0

Rating: ★★★★★

Price: \$795; upgrade from version 3.0, \$79; any other upgrade, \$129 (list).

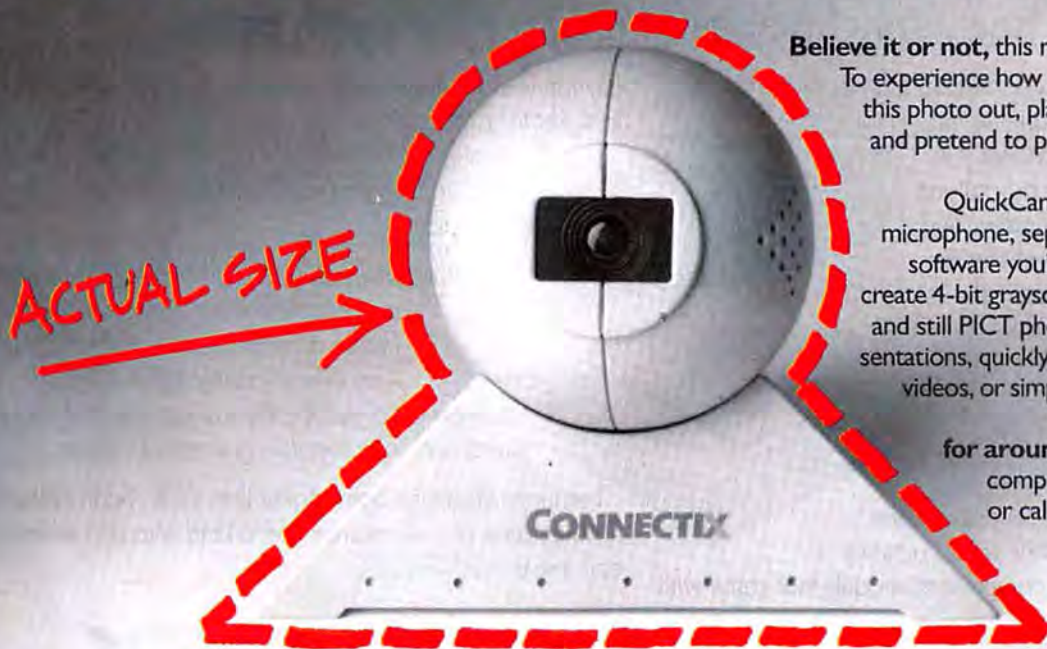
Pros: Support for SMPTE time code. More finely-tuned controls and more special effects. Dynamic QuickTime-movie previews.

Cons: None.

Company: Adobe Systems, Mountain View, CA; 800-833-6687 or 415-961-4400.

Reader Service: Circle #403.

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PowerPort/Mercury for the PowerBook Duo / Zippy modem stumbles with ARA

POWERBOOK DUO OWNERS who want an internal-modem alternative to the Apple PowerBook Express Modem have had no choices — until now.



Global Village's PowerPort/Mercury for the PowerBook Duo can transfer data at rates as high as 19.2 kbps; in contrast, the Apple Express modem can get up to only 14.4 kbps. And the PowerPort/Mercury comes with Global Village's well-designed telecommunications software.

The Global Village control panel lets you set the modem so that it sleeps when you're not using it, which frees up about 300K of RAM. The modem wakes up automatically when you use it to call out and sleeps again when you're done.

The Global Village software has a menu bar that displays, among other things, your current data-transmission rate, a data-transfer progress bar, and a virtual front

panel that shows the modem's status.

When we tested whether the PowerPort/Mercury was *really* faster than an Apple Express modem — using PowerBook Duo 230s as our test platforms — we were in for a surprise. Sending a fax from one PowerPort/Mercury modem to another was 85 percent faster than sending a fax from one Apple Express modem to another. When we transferred files directly, using the Zmodem protocol, the PowerPort/Mercury modem was 40 percent faster than the Apple Express modem. But when we used Apple Remote Access (ARA) 2.0 to transfer files, the Express modem was as much as 30 percent faster than the PowerPort/Mercury. Global Village confirmed our results and was working on a fix as we went to press.

The PowerPort/Mercury had no trouble connecting to America Online or eWorld, but for CompuServe Information Manager 2.2 or earlier, you have to use a patch that's

available in the Modem Vendor Forum on CompuServe. Unfortunately, when we tried to call technical support about this matter, we waited for 45 minutes before giving up.

The Bottom Line

With its well-designed software interface and zippy faxing speeds, the PowerPort/Mercury is a viable alternative to the Apple Express modem. But if you use ARA much, you might want to stay with the less expensive Express modem until Global Village can rectify the speed disparity. / Mark Frost

PowerPort/Mercury for the PowerBook Duo

Rating: ★★

Price: \$399 (list).

Pros: Easy-to-use software. Fast data-transfer rates. Sleeps to save RAM.

Cons: Slower than Apple Express modem with ARA. Long wait for technical support.

Company: Global Village Communication, Mountain View, CA; 800-736-4821 or 415-390-8200.

Reader Service: Circle #404.

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Macworld Magazine, 9/94



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CIRCLE 62 ON READER SERVICE CARD

Kensington Turbo Mouse 4.0 and Logitech TrackMan for Macintosh / Two mouse killers roll in for our verdict.

SWITCHING TO A GOOD trackball with programmable buttons, such as the Kensington Turbo Mouse 4.0 or the Logitech TrackMan for Macintosh, not only provides you with a greater level of cursor control than the single-button mouse that came with your Mac but can also help longtime mouse users reduce the risk of repetitive-stress injuries.

Kensington Turbo Mouse 4.0

The Kensington Turbo Mouse, of course, is not a mouse at all; it's one of the best trackballs you can find. The large, weighted ball — almost as big as a billiard ball — rolls with ease and precision inside a wedge-shaped case. The two buttons, one on either side, are responsive and easy to reach, and the symmetrical design is equally suited for left- or right-handed users.

The customizing software that comes with the Turbo Mouse unleashes the real power of the trackball. You can control the cursor acceleration by plotting cursor speed on an acceleration graph so, for example, your cursor creeps when you move the trackball slowly but tears across the screen in response to quick movements.

You can program both buttons as well. For example, you can set one of them to send a specific keyboard command, such as Command-P for Print. You can also link the buttons' functions to specific applications. For instance, you might set the left button to issue the Find command in the Finder and to place a file in PageMaker. You can program a third command so you can issue it by chording — that is, pressing both buttons at the same time — but we found chording somewhat awkward. Pressing two buttons exactly simultaneously is more difficult than it sounds.

The Turbo Mouse has Brilliant Cursor technology, which is supposed to jump the cursor to a predefined screen location, called a HotSpot, when you issue a keyboard command and roll the ball toward the HotSpot. But if you have more than one HotSpot in the same area, the cursor may jump to the wrong spot.

Logitech TrackMan

The Logitech TrackMan takes a different approach to trackball ergonomics. Contoured to fit the shape of a hand, the Logitech TrackMan has a small ball, which



Instead of steering a mouse, try rolling your hand over the agile Kensington Turbo Mouse 4.0 (right) or the comfortable Logitech TrackMan for Macintosh.

fits underneath your thumb, and a sloping, curved surface that supports the weight of your palm and leaves your three middle fingers positioned comfortably on three side-by-side buttons. You can control small cursor movements by simply rolling your thumb on the trackball, but for larger maneuvers, you'll probably have to lift your fingers from the buttons and use them to roll the ball.

For extended use, the unique shape of the TrackMan makes it more comfortable for most users than the Turbo Mouse. Unfortunately, it is designed for right-handed users only.

Like the Turbo Mouse software, the TrackMan software lets you customize tracking speed (although not as precisely), assign specific functions to each of the buttons on the trackball, and create different button functions for different applications. Pressing a third button is also more intuitive and natural than pressing two buttons at once on the Turbo Mouse.

One of the TrackMan's most interesting features is its function-key support, which you get whether or not you have an extended keyboard. If you have a program, such as Microsoft Word, with commands preassigned to function keys (F9 for Revert to Style, for example), you can use the

TrackMan software to set a button trigger for that command, even if you don't have that key on your keyboard. The Turbo Mouse software, on the other hand, requires you to press a key in order to link the command to a button.

One drawback of the TrackMan's ball is that it's more exposed and isn't set as solidly as the Turbo Mouse's. After only a week of use, we had to remove the ball and clean out the dust that was causing it to stick.

The Bottom Line

Either the Kensington Turbo Mouse or the Logitech TrackMan for Macintosh provides better cursor control and comfort than the standard Apple mouse does. Choose the Turbo Mouse if you want the most-precise cursor control, or purchase the TrackMan to get the most (right)-hand-friendly design.

/ Joseph Schorr

Kensington Turbo Mouse 4.0

Rating: ★★★★★

Price: \$169.95 (list).

Pros: Large, easy-to-maneuver ball. Sophisticated cursor-control software.

Cons: Chording and Brilliant Cursor technology can be awkward.

Company: Kensington Microwave, San Mateo, CA; 800-535-4242 or 415-572-2700.

Reader Service: Circle #405.

Logitech TrackMan for Macintosh

Rating: ★★★★★

Price: \$99.95 (list).

Pros: Outstanding comfort. Three buttons.

Cons: Right-handed design only. Ball sticks occasionally. Limited cursor-speed options.

Company: Logitech, Fremont, CA; 800-231-7717 or 510-795-8500.

Reader Service: Circle #406.

First Things First Proactive / Time manager possesses a labyrinth of features.

BORN AS A TO-DO-LIST and reminder program three years ago, First Things First has grown up into a full-fledged electronic calendar that has an integrated outline, three calendar views, and networked-group calendaring features. In its current incarnation, First Things First Proactive (FTFP), it is an ambitious organizational tool but lacks several useful features other group-scheduling programs provide. And the program's confusing array of windows may frustrate some users.

Lifetime Planning

The FTFP manual encourages you to use your electronic calendar not only for scheduling meetings but for setting life goals as well. You create an outline based on your goals (or a project) and drag items from the outline to dates and times in the calendar

of other headings. In this manner, you can turn a month's worth of daily schedules into a hierarchical list that divides your responsibilities by project or category so you can see what progress you've made on specific projects.

The Desktop Timekeeper

First Things First Proactive appears as a floating clock on your desktop or as a clock in your menu bar. When you double-click on the clock, the program opens in the outline view. The views icon, on a floating tool bar, or a menu selection lets you view your schedule in a daily, weekly, or monthly calendar. You can also view a yearly calendar, in which you can't look at or schedule events.

First Things First has always had exceptional reminders. Among other things, you can reset an alarm or snooze, set recurring reminders, and use the system sound of your choice as your alert.

Links in Time

With FTFP, you can link documents to your calendar events — unfortunately you can link only one document per event. A link appears as an icon, on which you click in order to launch the document. You should also be able to use Apple events to

and reminders and send such information to other people in the group. Users can control the access that others have to their FTFP schedules.

Assuming that everyone gives viewing privileges to everyone else, one user can look at others' schedules and compare free blocks of time to find the ideal time for a meeting. However, most dedicated group schedulers, such as ON Technology's Meeting Maker XP, identify possible meeting times automatically without forcing users to make their schedules public.

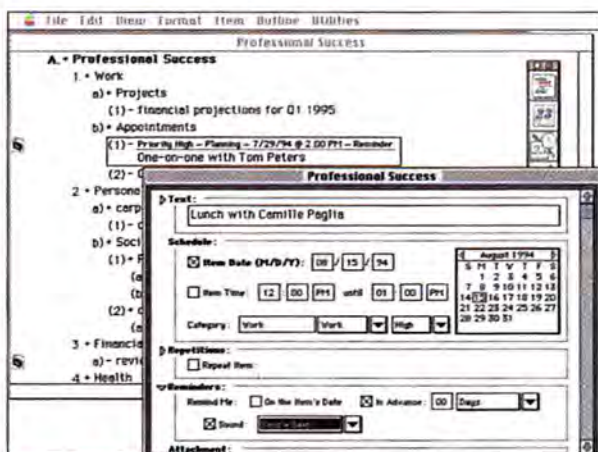
Timely Support

The thoroughly thought-out help system, which includes the entire manual in electronic form, is completely on-line; with all the new features in FTFP, you will definitely need to refer to it. If you prefer your documentation in paper form, you can buy the comprehensive 278-page manual, with a quick-reference card, for \$20.

Compact-Mac owners will probably find FTFP too slow and too screen-greedy. On our Mac Classic with 4 MB of RAM, FTFP was painfully slow and the screen was a confusing mess of overlapping windows and tool palettes. We had to quit RAM-hungry applications just to look at a schedule. Using FTFP was much more comfortable on our more robust Quadra 605, which also had enough screen space to accommodate enlarged views.

The Bottom Line

Even though FTFP has adequate tools for group scheduling over a network, more-expensive programs such as Meeting Maker XP are better suited for coordinating groups and meetings. FTFP is appropriate for individuals who want a goal-centric scheduler with great alerts even if they have to put up with a cluttered interface. / Mitzi Waltz



Remind yourself, and others, of important events with First Things First Proactive's excellent alarms.


views. This unique free-form approach to scheduling is well suited to creative professionals, such as software designers, who find it hard to predict how long a project will take and may want to add elements as a project develops.

However, you're not limited to listing events in an outline. If you schedule an event in your calendar, it will automatically appear in your outline under a calendar-items heading; you can drag the event from one heading and place it under any number

of other headings. In this manner, you can launch a FileMaker Pro database and pull information directly out of it, but this feature is virtually undocumented and confusingly implemented, so we had difficulty testing it properly.

You can also link FTFP files, such as outlines and schedules for various goals and projects, to each other. You can even make use of FTFP as a group scheduler. For instance, individuals are able to link their personal FTFP files to a general FTFP project file and receive schedule updates

First Things First Proactive 1.1

Rating: 

Price: \$149 (list).

Pros: Excellent alarms. Flexible calendaring tools. Links among FTFP files.

Cons: Cluttered interface. Slow on compact Macs. Short on groupware functionality.

Company: Visionary Software, Portland, OR; 800-877-1832 or 503-246-6200.

Reader Service: Circle #407.

Zoom / Abvent's sophisticated modeling tools are compromised by an awkward interface.

POWERFUL MODELING capabilities such as flexible Boolean operations and full vertex-level editing capability are offset by a decidedly irregular interface and weak documentation in Zoom, one of the relatively new players in the crowded Mac 3-D graphics field.

Measures of Extrusion

To create 3-D objects with Zoom, you use the program's healthy selection of 2-D drawing tools — including primitive shapes such as lines, circles, rectangles,

floating tool palette. Because you can enter exact values for any operation or for variables such as the shape or position of an object, you can control your 3-D sculpting with numerical precision.

Zoom is one of a handful of Mac programs that can perform Boolean operations. These operations, which use one object to subtract from or add to another object, are extremely useful for advanced modeling tasks. For instance, you might use a small sphere as a subtractive Boolean operator; by overlapping the sphere with

another object, you could use it to scoop out a spherical hole.

Quick Creation

In general, Zoom was impressively fast on a Quadra 950. Screen redraws, wire-frame creation, and moving objects with Zoom were decidedly snappy compared to the speed of other 3-D modelers, in particular auto•des•sys' form•Z, one of Zoom's closest competitors.

One especially fascinating feature in the

Zoom program is its use of gestures, a feature usually found only in handwriting-recognition systems. Instead of employing a Command-key combination to trigger a sequence of events, you press the Command key and make a gesture with your mouse (or with the stylus, if you're using a drawing tablet). For example, making a circle with your mouse opens the 2-D circles tool palette; dragging the mouse in a horizontal straight line creates a light source.

When it comes to textures and rendering, Zoom is considerably less spectacular. The program has few options for combining and accurately placing textures and has fewer controls for lighting than some basic programs such as Ray Dream Designer.

Although Zoom's built-in rendering options include Gourand and Phong shading, anti-aliasing, and basic shadows, you'll get the best results if you use an external rendering-and-animation setup. You can edit shading and control rendering for Zoom from within Pixar's MacRenderMan, but Zoom is not as tightly integrated with MacRenderMan as VIDI's Presenter Professional is.

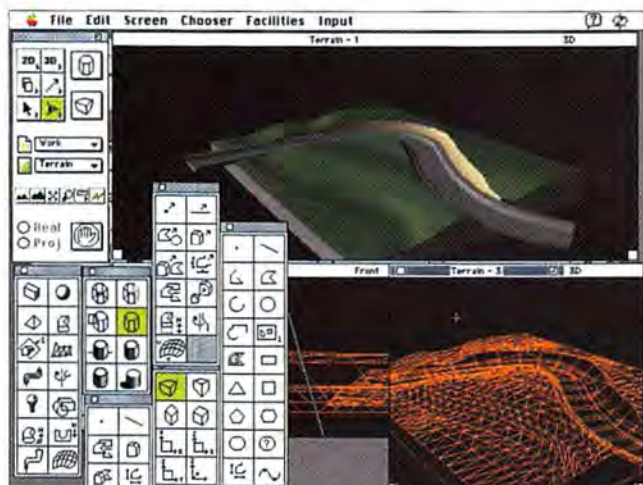
Convoluting Access

Zoom's biggest drawbacks are its unorthodox interface and inadequate documentation. Although Zoom gives you more control over your models than an easier-to-use program such as Strata's Studio Pro, availing yourself of that control can be confusing. The icons are unclear, and the palettes clutter up the screen. You have to become accustomed to looking for any error messages in a bar at the bottom of the screen.

The slim, poorly organized tutorial manual contains some examples, none of which are particularly clear. The reference manual is marginally better but suffers from a poor writing style and an almost worthless index. More-advanced users might be willing to take the time to adapt to Zoom's methodology in order to use the program's tools; others will give up in frustration hours after cracking the shrink-wrap.

The Bottom Line

Zoom has some excellent 3-D-modeling tools, and users willing to spend the time to become accustomed to the clumsy interface will get real modeling power. Anyone looking for an intuitive, easy program with Zoom's kind of power will have to look elsewhere, however. / David Biedny



Boolean operations let you carve a canal into terrain, but an overabundance of floating palettes may obscure your work.

triangles, and hexagons as well as spline tools for curved lines — to draw on a plane and then extrude the shapes into the third dimension. Zoom has a robust 3-D tool set; along with ordinary lathe and extrude functions, you get advanced tools such as piping (extrusion along a path), rounded extrusions (extrusion with user-customizable beveled edges), and polygonal meshes. Full vertex-level editing is also available, giving you excellent control for creating complicated shapes. You additionally have basic animation capabilities for creating simple camera flybys.

Each group of tools, such as primitive 2-D shapes, pops up from icons on the main tool palette. You can drag any group of tools off the main tool palette to create a separate

Zoom 4.0.2

Rating: ★★

Price: \$1,495 (list).

Pros: Speedy. Advanced 3-D-modeling tools, including Boolean editing. Allows handwriting gestures for issuing commands.

Cons: Awkward, cluttered interface. Poor documentation. Limited textures and rendering.

Company: Abvent; distributed by Graphisoft, South San Francisco, CA; 800-344-3468 or 415-737-8665.

Reader Service: Circle #408.

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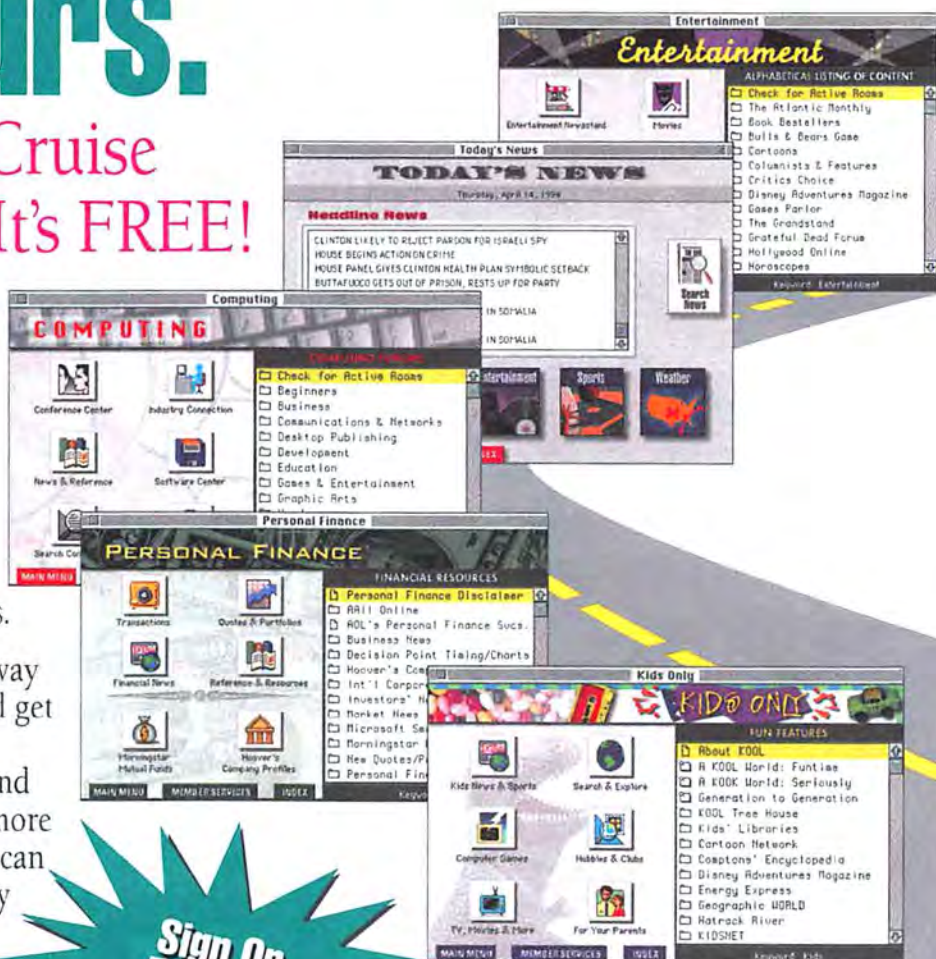
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Silver Streak / Cost-effective LocalTalk-to-Ethernet upgrade.

IF YOUR LOCALTALK network is creeping along at a snail's pace, you're probably ready to upgrade to Ethernet, but you may be concerned about how expensive it might be. To help keep the cost in check, Tut Systems has created the Silver Streak family of Ethernet networking products, which uses existing voice-grade LocalTalk cabling to create a plug-and-play Ethernet environment. Because it eliminates the cost of running new cable, Silver Streak provides a cost-effective upgrade to Ethernet that's particularly well suited to daisy-chained LocalTalk networks.

All in the Family

The Silver Streak product line comprises a comprehensive array of transceivers, cards, and hubs, but it doesn't have a connectivity option for LocalTalk printers. Instead, the company recommends products from Asanté, Sonic Systems, and Dayna.

A benefit of Silver Streak is its ability to daisy-chain as many as 30 nodes on a single network segment with a maximum length of 185 meters. AAUI and AUI transceivers cost \$99 each, and LC, ISA, and NuBus Ethernet cards cost \$199 apiece. The LC and NuBus cards use Apple's Ethernet drivers and come with a simple diagnostic application. There are also SCSI-based Ethernet products for connecting PowerBooks and slotless Macs. Unlike Farallon's EtherWave products, which have an automatic termination feature, Silver Streak transceivers use an external terminator, which is easy to lose or misplace.

Star Hubs

If you plan to use a star network topology and connect all of your cable runs in a single location, you can use Silver Streak hubs to interconnect the network. These hubs come in 4-, 8-, and 16-port models and range in price from \$499 to \$1,999. The hubs are really repeaters, so Silver Streak networks appear as one large network segment to Ethernet management software.

To replace a LocalTalk star controller, you need to purchase Silver Streak hubs with enough ports to match the number of ports

on the controller you're replacing. You also need to add one \$25 Silver Streak UTP converter for each node attached to the hub. For those who are expanding a network, Tut supplies a \$199 10BASE-T converter that lets you integrate Silver Streak devices into any 10BASE-T environment.

In our tests, daisy-chained Silver Streak devices worked flawlessly and had true plug-and-play simplicity. However, integrating a Silver Streak hub required a little work. We had to make several calls to Tut's toll-free technical-support number (the poorly written manuals weren't as helpful as they should have been). We also found it necessary to order custom-wired connector cables and to add UTP converters.

The Bottom Line

With Tut Systems' Silver Streak family of networking products, you can easily retrofit existing LocalTalk networks to high-speed Ethernet, using existing network wiring. You can also build an Ethernet network from scratch. However, any installation that goes beyond a simple daisy-chain topology requires a comprehensive understanding of network design and installation.

The Silver Streak line is not as closely integrated as we would have wanted. We would like to see autotermination, consistent wiring schemes throughout the product line, and improved documentation that contains wiring schematics. In short, Silver Streak works flawlessly once it's installed, but its design quirks will limit its appeal.

/ Blake Roberts

Silver Streak

Rating: ★★☆☆

Price: Transceivers, \$99; cards, \$199; hubs, \$499 to \$1,999; single UTP converter, \$25; 10BASE-T converter, \$199; network interfaces, \$99 to \$349 (list).

Pros: Cost-effective LocalTalk-to-Ethernet upgrade solution. 30 nodes per segment.

Cons: Poor documentation. Confusing wiring requirements.

Company: Tut Systems, Pleasant Hill, CA; 800-998-4888 or 510-682-6510.

Reader Service: Circle #409.

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CIRCLE 125 ON READER SERVICE CARD

Maple V Release 3 / Waterloo's math powerhouse features a new look and more functions.

IF AN INDUSTRIAL-STRENGTH math program is what you need, Waterloo Maple Software has your number. Maple V Release 3 features a totally revamped interface that will be much more warmly received by Mac users than the previous version's. Also, Waterloo has beefed up Maple's computational muscle and enhanced the program's statistical and plotting capabilities.

Calculating Program

Maple handles just about any type of mathematical computation — symbolic, numeric (including differential equations, power series, and fancy calculus methods such as fast Fourier transforms), and graphical. If Maple can't solve an equation or evaluate an expression, it helpfully tells you why with an error message (most likely, it's your error, not Maple's).

Before the current release, Maple's UNIX heritage was apparent in its interface. We were glad to see that in Release 3, Maple looks and drives like a true Mac application. For example, you enter Maple commands, expressions, and annotations into worksheet windows that comply with conventional Mac guidelines for sizing, control, menus, and so on. Each worksheet looks like a word-processing window, and you can specify fonts, colors, and sizes by using familiar Mac commands. Maple allows only one active worksheet at a time, but it does provide scratch-pad windows that look just like worksheets. The scratch pads, however, are not wired to the Maple math engine.

Release 3 also includes more-robust math functions. The numerical integrator includes more functions than the previous version, and the company has redesigned

the differentiation function so that it produces more-accurate results for a wider range of input. Maple now also handles convolutions and complex numbers, so you can build systems around them fairly easily.

Maple's discrete mathematical functions have been enhanced, so you can do vector operations (curl, div, grad, and Laplacian) in non-Cartesian coordinate spaces, such as cylindrical and spherical spaces.

For statistical functions, you may not have to resort to another application, because the new version offers much improved statistical functions. Most noteworthy is the addition of the statistical-list data type. Another welcome enhancement is improved control over the appearance of complex plots. You can specify the types of point symbols, line thicknesses, and the style of axis labels. Last, the documentation and tutorial are more helpful than before.

Programming with Maple

Maple includes its own programming language, which works much like Pascal and FORTRAN. That means you can create your



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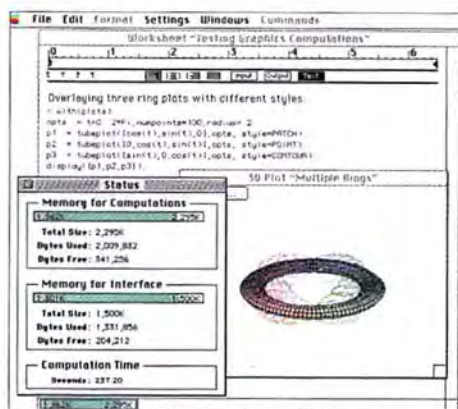
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A new worksheet interface makes Maple V Release 3 easier to use than the previous version, which clearly showed the program's UNIX roots.

own Maple applications and specify Maple output in FORTRAN 77, LaTeX, and EQN formats, all of which are important if you intend to integrate Maple with another mathematical application or incorporate Maple results in a scientific paper.

Maple's primary competitor is Wolfram Research's \$895 Mathematica. Each of the two programs provides a true programming language, a worksheet metaphor for

data entry, and a powerful math engine, and both have similar feature sets.

What sets Mathematica apart from Maple and makes it worth the extra \$100 is its built-in sound and waveform functions (important for digital-signal-processing work) and a very useful distributed-processing protocol called MathLink, which lets you run the Mathematica front end on a Macintosh while running the calculation kernel on a fast UNIX workstation or a mainframe.

Maple performs faster than Mathematica on the Mac, however, a consideration that really hits home if you're doing complex 3-D functional graphing. Maple is also easier to operate, and its math engine is first-rate, whereas Mathematica's engine is not as reliable for some types of calculations. Maple also sports better connections to other, more esoteric math software such as Matlab, with its numerous analysis modules, including simulation modeling and DSP.

To get the most out of the program, we recommend using a high-end 68040 Mac

equipped with an FPU (the software can run on a Power Mac, but it can't take advantage of the Power Mac's FPU), 16 MB of RAM, and a fast hard drive.

The Bottom Line

Maple V Release 3 packs even more computational and plotting power than the previous version, and with its overhauled interface, the new release makes it easier for Mac users to get to the program's power. Overall, Maple offers a compelling mathematical feature set in a package that won't overwhelm you. / Don Crabb

Maple V Release 3

Rating: ★★★★★

Price: \$795 (list).

Pros: Much improved interface. Snappy performance. Excellent math engine.

Cons: No native Power Mac version.

Company: Waterloo Maple Software, Waterloo, ON, Canada; 800-267-6583 or 519-747-2373.

Reader Service: Circle #410.



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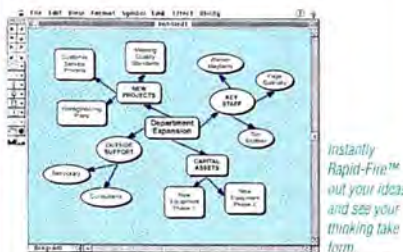
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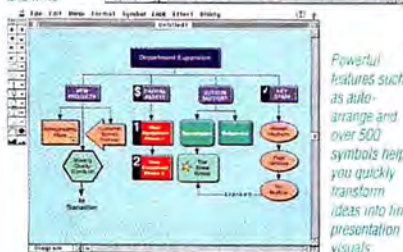
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Atlantic Technologies SlimWriter / New portable printer is slim, trim, and slow.

A PORTABLE PRINTER makes a great PowerBook companion, but these days, you have to choose your printer carefully. The list of mobile printers is growing longer, and the printers are getting smaller, but smaller doesn't necessarily mean better. What gives Atlantic Technologies' new SlimWriter its size advantage is a hinged design that enables the printer to lie flat in transit—it's a mere 1 inch thick and small enough to fit in a standard carrying case along with your PowerBook. But when it comes to speed and image quality, the SlimWriter can't keep up with the competition.

Slim Pickings

The SlimWriter weighs about 2.5 pounds and measures about 2 x 12 x 4 inches when operating. Unlike its chief rival, the color-capable HP DeskWriter 310 portable inkjet printer, the monochrome SlimWriter uses a 360-dpi thermal-fusion engine. A small thermal print head transfers ink to paper from a cartridge that's similar in size and appearance to an audio minicassette.

The SlimWriter wins no awards for speed. We compared the SlimWriter's speed with the DeskWriter 310's, using a PowerBook 180 equipped with 14 MB of RAM. The SlimWriter performed best in our Excel test, but it still took about 20 percent longer than the HP printer to print. A complex MacDraw Pro image took the SlimWriter an hour and 20 minutes to print—almost twice as long as it took the DeskWriter 310. The SlimWriter cranked for over 15 minutes to complete a simple three-page Word document—nearly five times as long as the DeskWriter 310. And the SlimWriter's speed was even less impressive when we compared it to that of the DeskWriter 310 using its AppleTalk interface (the SlimWriter is a serial-only device).

Output quality, especially of gray-scale images, was also a disappointment. The SlimWriter wasn't able to print the gray-scale text and gradient fills in our test document. The engine itself posed a major image-quality hurdle. When the ink density



A hinged design enables Atlantic Technologies' SlimWriter to lie flat in transit, but the printer's speed and image quality are a disappointment.

was set high enough to produce rich blacks and solid text, gray-scale areas became so dense that we couldn't tell blacks from grays, but when it was set low enough for acceptable grays, the printer produced banded images and sketchy text.

Although Atlantic Technologies estimates output of 24 pages per \$6 ink cartridge, we were able to print no more than 6 text pages before the ribbon-out light came on. Printing graphics is even more expensive—our complex MacDraw Pro test image used up almost an entire cartridge.

The Bottom Line

The SlimWriter's moniker fits, but the printer suffers from a myriad of flaws. Considering a price that's more than half again as high as the faster and color-capable DeskWriter 310's, you'd be better off leaving your extra sweater or pair of shoes at home and packing a more capable but slightly larger portable printer. / Anita Epler

Atlantic Technologies SlimWriter

Rating: ★★

Price: \$350 (list), including Mac cable and drivers.

Pros: Compact and lightweight.

Cons: Slow. Extremely short ribbon life. Monochrome only. Expensive. Poor gray-scale-image quality.

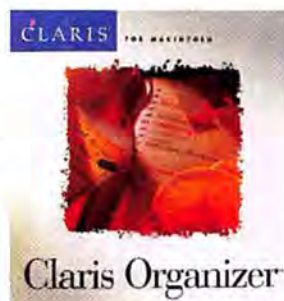
Company: Atlantic Technologies, Wilmington, NC; 800-779-7705 or 910-350-0700.

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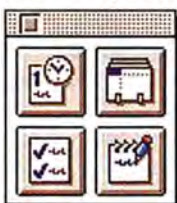
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After Effects 2.0 and Video Graffiti

Eye-catching special effects for makers of digital movies.

DIGITAL-VIDEO ARTISTS looking to expand their special-effects tool kits will want to check out CoSA's After Effects 2.0 and Neil Media's Video Graffiti. Each program offers a distinctly different feature set for handling complex image-processing tasks: After Effects is a high-priced tool that excels at creating a wide variety of broadcast-quality video effects, and Video Graffiti is a low-cost program aimed specifically at rotoscoping.

After Effects 2.0

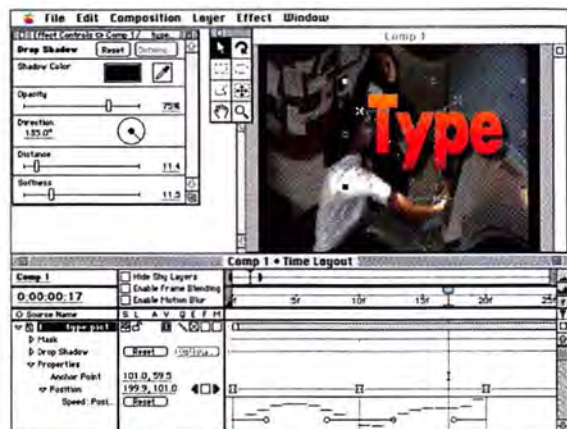
After Effects combines an extensive set of layering tools with an impressive collection of animated image-processing effects. Version 2.0 features an enhanced Time Layout window capable of displaying multiple elements and their in and out points (the previous version displayed only one element at a time), improved rendering performance, and more-realistic motion-blur effects than the previous version's.

What makes After Effects so appealing to professional videographers is the fine level of object control it offers as well as its broadcast-quality imagery — motion effects, for example, are much smoother than those created with Premiere or with VideoFusion, another special-effects package.

At \$1,995, After Effects is pricey, but you get your money's worth. The program enables you to combine any number of QuickTime movies, animation files, and still images. Plus, you have a fine degree of control over the position, opacity, and scale of each element. If, for example, you've rendered a flying logo in a 3-D-animation program, you can composite the rendered animation with other elements, using alpha-channel information, which allows for a seamless composite with perfectly anti-aliased edges.

The special-effects filters in After Effects 2.0 are quite extensive, and you can expand the collection by adding new effects in much the same way you add plug-ins to

Photoshop. The real beauty of After Effects' filters is that you can animate them in a nonlinear fashion. For example, the Twirl filter is similar to Photoshop's, but you have the ability not only to animate the actual twirling effect but also to control the diameter and anchor position of the twirl. By changing the anchor position over time, for



For broadcast-quality special effects, no program can match After Effects. To assist in compositing, its newly enhanced Time Layout window includes multiple elements.

example, you can easily simulate a storm moving across the surface of an image or a QuickTime movie.

Effects don't have to be uniform: For one effect, you can specify multiple keyframes that allow you to control its acceleration and change its position (neither Premiere nor VideoFusion supports multiple-keyframe animation).

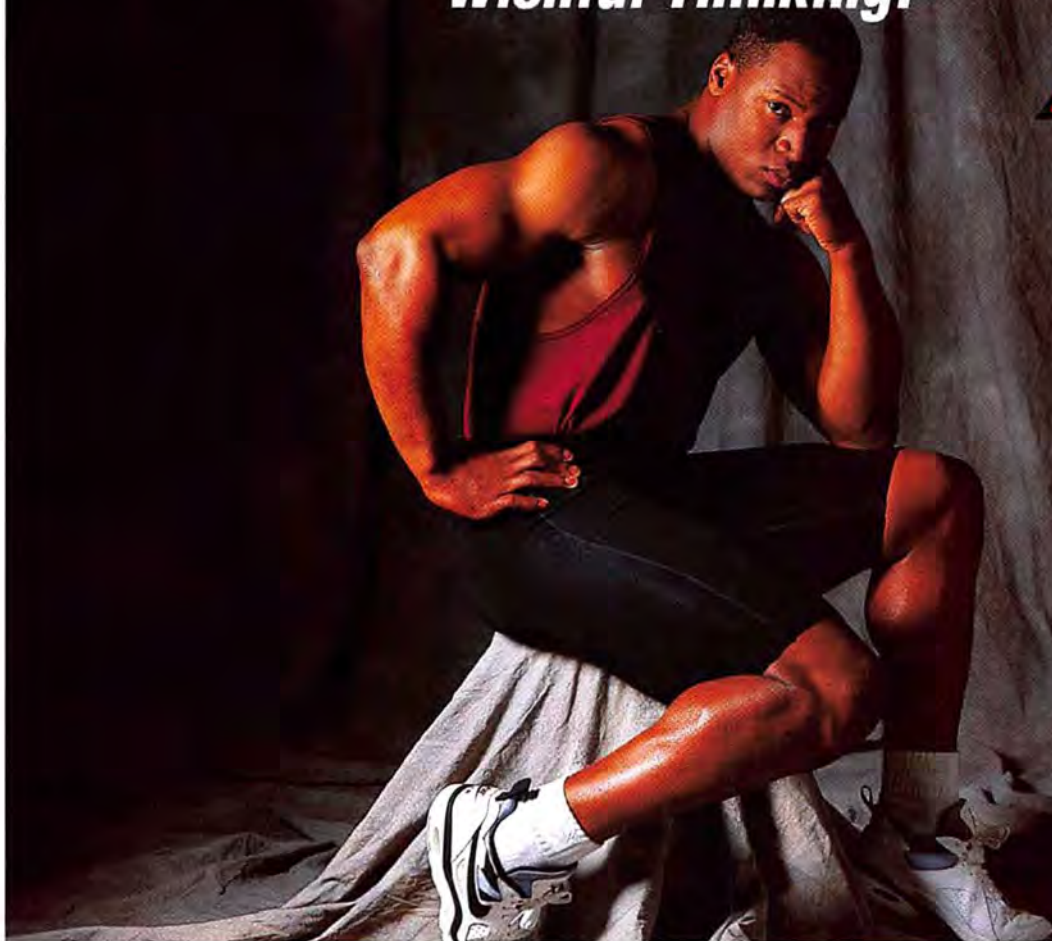
After Effects produces exceptional image quality, which makes it well suited for the most-demanding broadcast applications. Another advantage is support for field rendering, which is crucial for obtaining the smoothest results when you're moving animations to videotape.

If you are on a restricted budget and don't need After Effects' professional-level tools, you may want to take a look at CoSA's \$595 AfterImage, a scaled-down version of After Effects that provides most of its more expensive sibling's effects but lacks field rendering and support for high-resolution formats, such as Academy Aperture and HDTV.

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REVIEWS Video

We also looked at the native Power Mac version of After Effects and found that some operations on a Power Mac 8100 were at least twice as fast as on a Quadra 950. Processor-intensive filters ran as much as four times as fast on the Power Mac.

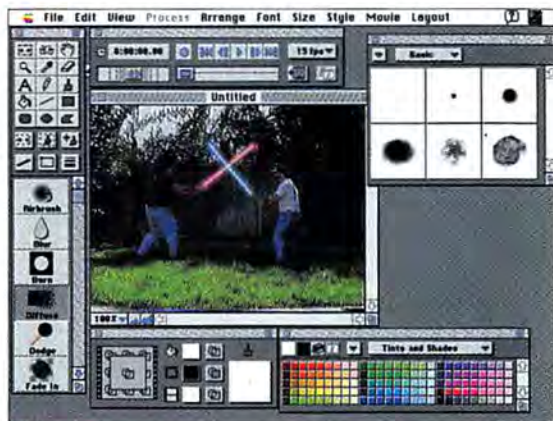
Video Graffiti

Rotoscoping — painting on movie frames — is a time-consuming and often frustrating process that benefits from a software approach. Although you can use Premiere and Photoshop in tandem to paint on Filmstrip files (you first save a QuickTime movie as a strip of static images and then paint on the frames in Photoshop), the process is cumbersome at best.

Video Graffiti is the first program that lets you paint directly on QuickTime movies. You can paint either on a QuickTime movie frame by frame or on the movie itself as it plays. You use a dedicated paint layer that lets you make changes without affecting the underlying movie. The program provides an assortment of paintbrushes and airbrushes as well as text and shape tools. The brush tools are serviceable, but they aren't pressure-sensitive and you can't change paint colors on the fly. Selection and filtering tools make it easy to apply standard image effects (sharpen, blur, diffuse, dodge, and burn, for example) to any painted area. One of the most exotic effects allows you to employ a QuickTime movie as a brush, so you can paint one movie onto another.

But despite these strengths, Video Graffiti fails to provide several necessary tools. It lacks alpha-channel support for masking — a serious omission that drastically limits the overall usefulness of the product. And although it offers commands that facilitate the process of copying paint strokes from one frame to another, an onionskin mode is noticeably absent, as is support for Photoshop and Premiere filters and plug-ins. Finally, support for pressure-sensitive tablets would be a welcome addition that would enable moviemakers to vary the thickness of their paint strokes as a movie plays.

According to Neil Media, the first native Power Mac version, 1.5, which will be under a new name and which should be available



Video Graffiti provides an assortment of paintbrushes and airbrushes as well as selection and filtering tools for applying image effects to painted areas.

by the time you read this, will boast Photoshop-plug-in compatibility; version 2.0, planned for early 1995, will provide alpha-channel support.

The Bottom Line

Although it's pricey, After Effects 2.0 is the last word in tools for broadcast-quality digital-video effects. With its impressive collection of filters and its ability to animate effects, After Effects is a must-have for professional videographers.

We were less impressed with Video Graffiti. Although it fills an important gap in the digital-video tool lineup, the initial release lacks several important tools. We're looking forward to version 2.0 / David Biedny

After Effects 2.0

Rating: ★★★★★

Price: \$1,995 (list).

Pros: Excellent compositing and animation tools. Superior image quality.

Cons: None.

Company: CoSA, A Division of Aldus, Seattle, WA; 206-628-4526.

Reader Service: Circle #413.

Video Graffiti 1.0.2

Rating: ★★★

Price: \$395 (list).

Pros: Paints directly on QuickTime movies.

Cons: Lacks support for alpha channels, Photoshop plug-ins, and pressure-sensitive tablets.

Company: Neil Media, Redwood City, CA; 415-369-6345.

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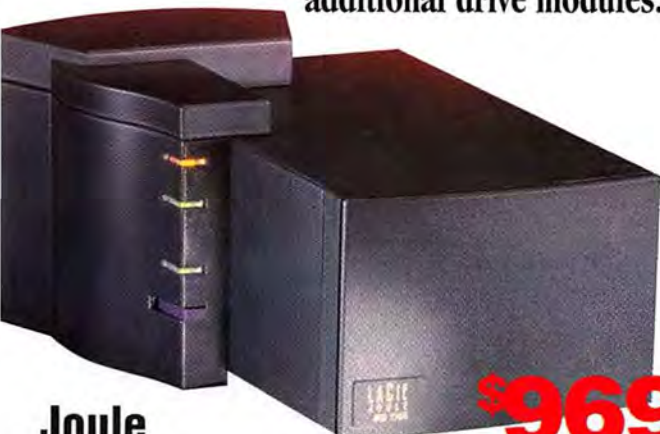
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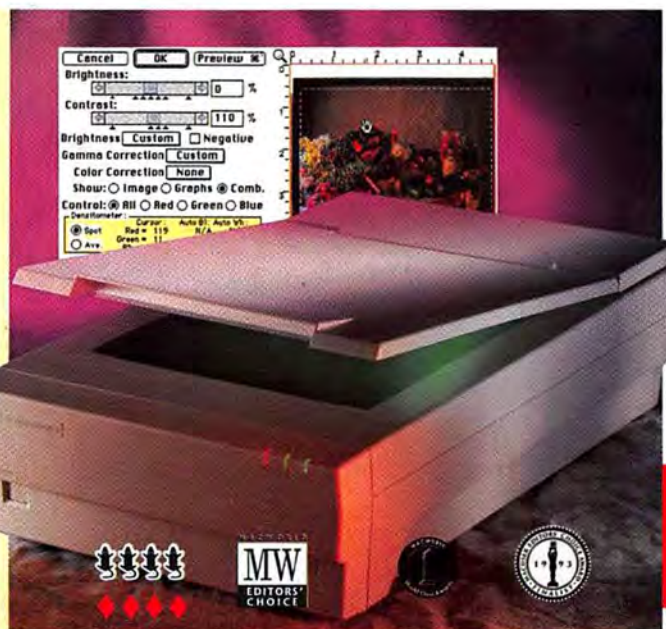
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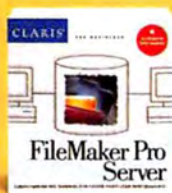
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Prince of Persia 2: The Shadow and the Flame / Swordplay, magic, and drama

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As you start Prince of Persia 2, the Grand Vizier has assumed your appearance and tricked the court into believing you are a beggar. You flee Persia but must return, traveling through caverns and ruins to find your way back and defeat Jaffar.

Spectacular Scenery. Although the plot is similar to the one in the first Prince of Persia game, the graphics are all new, with a dramatic voice-over in a cinematic opening and gorgeous graphical interludes between and behind scenes. As in the original game, there is swordplay, but now the opponents you face



are more gruesome and challenging. Fortunately, you also have more ways to move and you move more efficiently.

Along the way, you have to find bits of magic to help you defeat the Grand Vizier in the final battle, which takes place in a fantasy world filled with illusions that can kill you.

You pay a price for the beautiful graphics, since the game can gobble as much as 15 MB of hard-disk space, and you'll be happier with response and redraw times if you have a 68040 or Power Mac.

Fans of the original game and new players alike will find this sequel an extremely satisfying challenge. / Sean J. Safreed

Prince of Persia 2: The Shadow and the Flame ★★★★★ / Price: \$40 (list). Company: Broderbund Software, Novato, CA; 800-521-6263 or 415-382-4400. Reader Service: Circle #415.

Specular TextureScape / Weave your own textures

CREATE UNIQUE PATTERNS with Specular TextureScape, a snazzy texture-generation program that gives you extensive control over your work.

Interlaced Forms. The basic building blocks for textures are a variety of shapes, ranging from a simple circle to squiggles and leaves. To process the shapes

into a texture, you control, among other things, beveling, lighting, spacing between shapes, bumpiness, and transparency. You can layer the textures to create extremely intricate, detailed patterns, all of which tile seamlessly. Each of the shapes is in EPS (Encapsulated PostScript) format, which means the textures can be rendered at very high resolutions (as high as 4,000 x 4,000 pixels) with no image-quality degradation.

Moving Loom. You can also create animated patterns by morphing between two textures and saving the results as a QuickTime movie, with alpha-channel support. Our only complaint is that TextureScape can be slow at creating textures; it would be nice if Specular had a native PowerPC version. But it's hard to beat TextureScape for an endless supply of cool textures. / David Biedny

Specular TextureScape 1.0 ★★★★★ / Price: \$195 (list). Company: Specular International, Amherst, MA; 800-433-7732 or 413-253-3100. Reader Service: Circle #416.

SuperMac Spigot II Tape / Low-budget digital video

QUICKTIME MOVIEMAKERS with limited resources will delight in SuperMac's variant of its popular VideoSpigot video digitizer. The Spigot II Tape can, among other things, capture full-sized still images from live-video sources and encode NTSC signals into QuickTime movies for better output to videotape.

The new system is a NuBus card with composite-video as well as S-video-in and -out ports. It comes with all the necessary extensions (also known as VDIGs) to enable you to control the card with any desktop-video program, including Adobe Premiere, and with its own stand-alone application, Screenplay II.

Digitizing Videotape. SuperMac claims that the Spigot II Tape can digitize movies into 320-x-240-pixel (quarter screen) QuickTime movies at 30 fps (frames per second); however, we could process video that quickly only with the fastest Quadra — a 40-MHz Quadra 840AV — and then only when digitizing directly into RAM. By contrast, with a 33-MHz Quadra 650, we were able to digitize video into 320-x-240-pixel QuickTime movies and record the movies to a hard disk at about 20 fps. Nonetheless, the quality of the resulting QuickTime movies, including their video resolution and audio synchronization, was noticeably better than that of QuickTime movies made with the VideoSpigot.

Moviemakers who output their movies to videotape will surely appreciate that the Spigot II Tape can encode NTSC signals into

QuickTime movies. But it's not flawless: To fill the screen of a 480-x-360-pixel NTSC monitor, the Spigot II Tape hardware essentially doubles the size of 320-x-240-pixel QuickTime movies. The resulting movies are usable but fall short of a full-resolution video image such as the one you might get with the more expensive Radius VideoVision system.

The Spigot II Tape card can capture interlaced-field signals from a video source and digitize them into a still image that fills a



640-x-480-pixel frame. In comparison, the VideoSpigot can grab only one field signal and has to interpolate the other.

When it comes to digitizing videos, the Spigot II Tape may not outclass its higher-priced competitors, such as the VideoVision, but at a street price of less than \$750, it is a decent, inexpensive choice for QuickTime moviemakers. / David Biedny

SuperMac Spigot II Tape ★★★★★ / Price: \$849 (list). Company: SuperMac Technology, Sunnyvale, CA; 408-541-6100. Reader Service: Circle #417.



CameraMan 2.0

Filming your Mac desktop

CREATE DYNAMIC software demos, instructional movies, and QuickTime presentations with CameraMan 2.0, which enables you to record everything that happens on your Macintosh screen, in black-and-white or color, as a QuickTime movie, PICS, or sequen-

tial PICTs with your voice-over narration.

The CameraMan extension takes repeated screen shots of your screen: You use function keys or Command-key combinations to begin, pause, and end the recording. You can frame a section of your screen for close-up views and then move the frame around, focusing in on action anywhere over your entire screen's area. Especially nice is the Follow Cursor option, which centers the frame around the cursor as it moves.

Sound and Vision. During the editing process, you can combine movies or paste PICT graphics into them. You can add several tracks of sound, such as voice-overs and music, using any sound-input device recognized by the Sound control panel. And version 2.0 lets you add voice-over narration while you film.

Our PowerBook Duo recorded 256-color full-screen movies at a slightly jerky 4 fps (frames per second). Slightly higher recording rates are possible with a smaller screen area or in black-and-white.

Contrary to what the documentation says, you must have QuickTime installed, even if you only want to make PICS films. And CameraMan has a few quirks: For instance, we could not reposition a movie within a movie by dragging it, and CameraMan records sounds only externally. But overall, you'll find CameraMan 2.0 a more complete and full-featured package than its predecessor.

/ Joseph O. Holmes

CameraMan 2.0 ★★ / **Price:** \$149 (list). **Company:** Motion Works International, San Francisco, CA; 800-800-8476 or 415-541-9333. **Reader Service:** Circle #418.

Type Twister for Macintosh / Distortion on demand

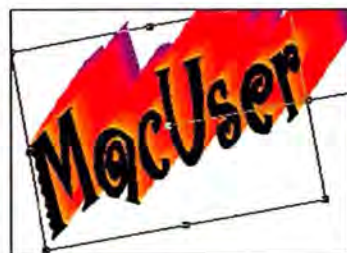
DISTORT, SPINDLE, AND MUTILATE your fonts easily with Type Twister for Macintosh, an inexpensive alternative to high-end type-manipulation programs.

Choose Your Look. To distort type, all you have to do is type a word and select one of Type Twister's 50 preset designs, which range from drop shadows to flamboyant explosions of color and shape. You can even rotate, skew, and stretch designs, changing their colors and fonts, and add these new looks to Type Twister's collection.

Type Twister does not support printing or exporting, which means you have to cut your contorted text and paste it into another application. You can also place your designs dynamically into Microsoft Word or Excel under System 7 simply by using the Insert Object command, since Type Twister supports Apple events and OLE. An option lets you embed PostScript code into your Type Twister designs as well, for better printing on laser printers.

Scant Guidance. The manual combines instructions for Type Twister's Mac and Windows versions in one sparse volume and does so poorly: It's sometimes difficult to know which version is being described. The program lacks features you would find in more-sophisticated type-manipulation programs; for instance, there's no option for kerning wayward letter pairs.

But for a street price of less than \$30, Type Twister is a good deal. It's fun, even if it's not fancy. If you need something more refined, turn to Pixar Typestry, TypeStyler, or even an illustration program such as Illustrator. / Gregory Wasson

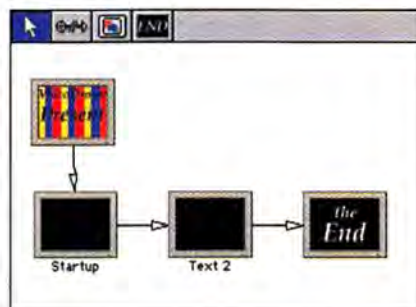


Type Twister for Macintosh 1.0 ★★ / **Price:** \$29.95 (estimated). **Company:** Aldus Consumer Division, San Diego, CA; 800-888-6293 or 619-558-6000. **Reader Service:** Circle #419.

VideoDrome / Eccentric presentation tool warrants no praise

BILLED AS "your video composer," VideoDrome is a simplistic multimedia-presentation program with a stand-alone player. You can place PICT images, QuickTime movies, text, and sounds on individual screens and then link the files to each other by drawing arrows from one screen to the next to define a playback path.

Restrained Process. You have to define start and end points for your presentation, but these points won't make your presentation run by itself. Each and every screen has to have a button, which you have to click on in order to get VideoDrome to move to the next screen. It's impossible to create something as simple as a self-running slide show.



We don't have enough space to accurately convey all that's wrong with VideoDrome. You are restricted to using only PICT files for graphics and the AIFF format for sounds. The program has no rulers to guide picture and text placement. Links between screens — and therefore your entire presentation — fall apart if you so much as move a file.

Inarticulate Instructions. But towering above all the other problems is the program's scanty 20-page manual. Typographical errors run rampant, and English grammar has been thrown out the window, which makes the manual read like total gibberish. It also contains confounding terms coined expressly for the program, such as *maps* and *knots* for the presentation's playback path and its links between screens, respectively. More-familiar terminology would have been helpful.

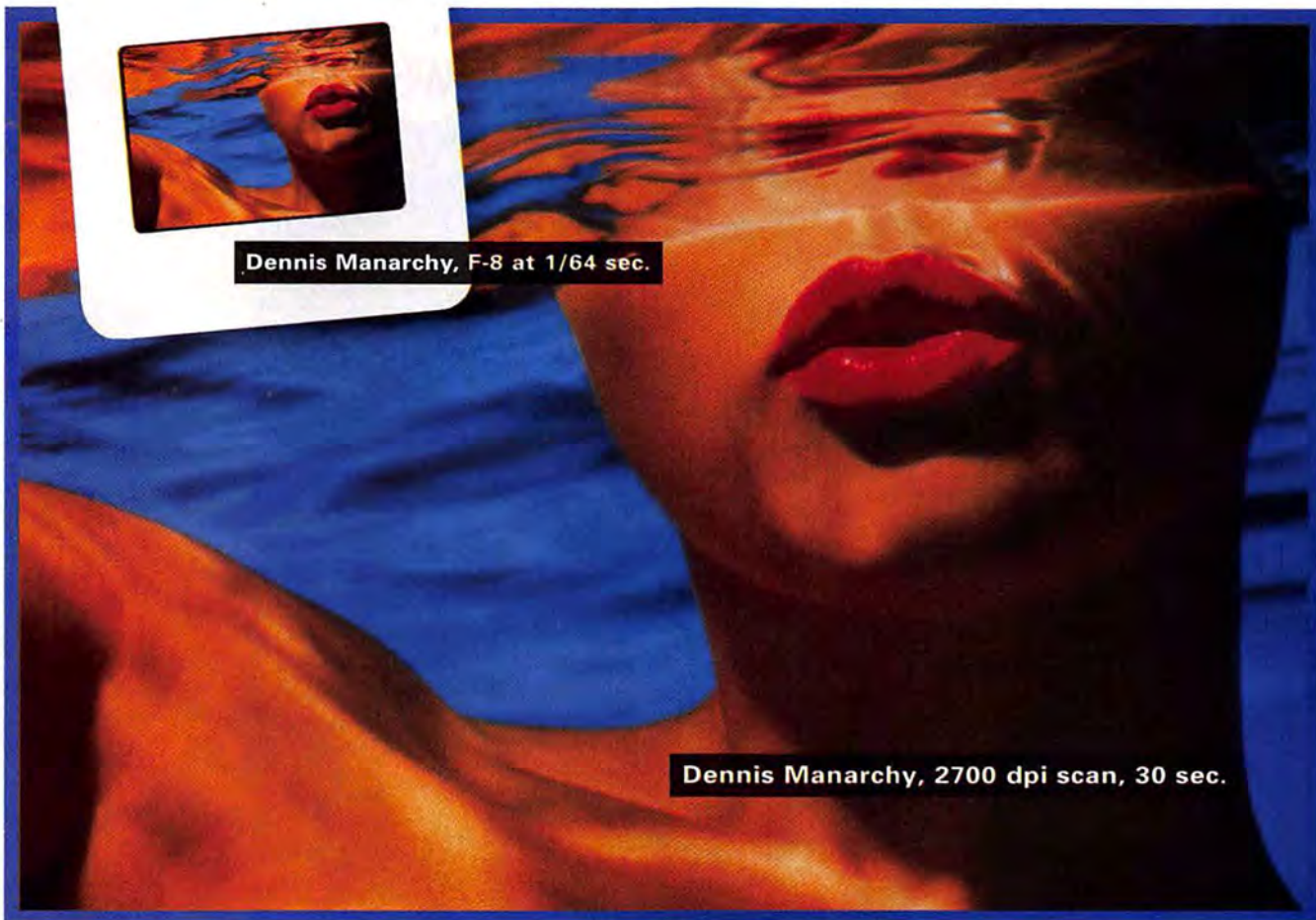
For those who need to design multimedia presentations easily, there are many better programs around, such as HyperCard. / Ken Gruberman

VideoDrome 1.0 ★ / **Price:** \$199 (list). **Company:** SoftTeam USA, Baltimore, MD; 800-305-8326 or 410-243-1130. **Reader Service:** Circle #420.

The only thing missing is the wait.



Dennis Manarchy, F-8 at 1/64 sec.



Dennis Manarchy, 2700 dpi scan, 30 sec.

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LogoVista E to J / Turn your computer into an English-to-Japanese translator

PROFESSIONAL TRANSLATORS and companies that conduct business with Japan can save translating time by using LogoVista E to J, a well-designed English-to-Japanese translation program. But although E to J is capable and easy to use, you will need to be able to read Japanese to catch subtleties and select the right variant translation.

Hiragana Made Easy. The main window for LogoVista E to J has English text on the left and the Japanese translation it creates on the right. You have a variety of options for translation, including the tone (informal, polite, or formal), font, and type size. These options can appear in either English or Japanese.

Similar programs we have encountered on other platforms can translate only a single sentence at a time and require you to identify words by their parts of speech. LogoVista E to J had no problem translating as much text as the memory of our Macintosh could handle. The program relies on context to figure out how a word should be translated. Although you are able to improve the translation by marking words with their parts of speech, we were delighted

to find that E to J did not demand a thorough knowledge of the intricacies of English grammar.

The accuracy of the translation also depends on any training you've given the program and the speed of translation you choose. E to J can give you alternative translations for words or sentences, and you can set up preferred translations for certain words. You can set the translation speed on a scale of 0 to 100. At 0, a very slow translation speed that can take as long as a minute to translate a simple sentence, the program takes the time to analyze the sentence for the most-accurate results. At 100, it translates words rapidly but is much less accurate. We found 50 to be an acceptable compromise between speed and accuracy.

As you type in or import English text, we recommend scanning for unusual words, names, and places and adding them to the user dictionary. Additionally, you can purchase any of Language Engineering's 22 technical dictionaries, which cost \$495 to \$995 each.

Space-Hungry. E to J has some hefty hardware requirements. The program itself needs 35 MB of hard-disk space. Although it can run with 8 MB of RAM, it ran much more comfortably when we gave it 16 MB. Since it also requires KanjiTalk 7.1, you need 4 to 7 MB of RAM for your system software as well. E to J can run in native PowerPC mode on a Power Macintosh to take advantage of that machine's speed; otherwise, the program works fine on a 68040 Macintosh.

Costing almost \$2,000 and guarded by hardware copy protection, LogoVista E to J is certainly not designed for casual users. But if you can proofread Japanese, having E to J is almost as good as having a translator on staff. / Hiromi Ueno

LogoVista E to J 2.0 *** / Price: \$1,995 (list). Company: Language Engineering, Belmont, MA; 800-458-7267 or 617-489-4000. Reader Service: Circle #421.



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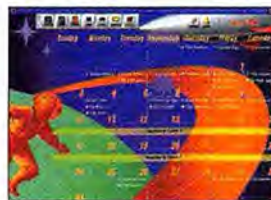
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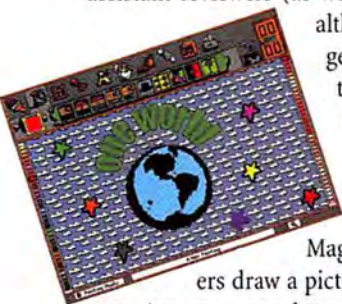


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CIRCLE 30 ON READER SERVICE CARD

Microsoft Fine Artist and Microsoft Creative Writer / Kids' creativity programs

TODAY'S COMPUTER-SAVVY CHILDREN expect more than cartoon reruns on Saturday night. Microsoft Fine Artist and Microsoft Creative Writer are two educational-software packages designed to stimulate the creative juices of 8-to-14-year-olds. Most of our young assistant reviewers (as well as the wise grown-ups) agreed that although each of these programs has its general appeal, alternatives are available that use less space, less memory, and more imagination.



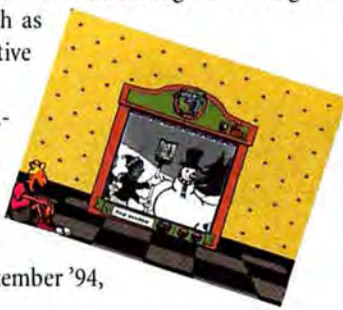
Both Fine Artist and Creative Writer lack a formal manual, but on-line help is plentiful, in the form of Maggie and Max, the children who help users draw a picture or form a wacky sentence to start a story. A more paternal cartoon figure, McZee, pops up with general advice on such topics as how to save a file.

Neither of the programs recognizes all the Mac keyboard command equivalents. Creative Writer responded to the command equivalents for cut, paste, copy, and quit, but it did not recognize Command-P, for print. Fine Artist recognized only the Quit and Save command equivalents. Microsoft tech support contends that children do not use these command equivalents anyway.

Each of these programs gobbles up hard-disk space: Creative Writer alone consumes 8 MB. For instance, a one-page newsletter that required 9K in Microsoft Word required 45K in Creative Writer.

Fine Artist. Despite the drawbacks, this program has some delightful features. It boasts a variety of media, including chalk and crayon, and graphics that can be peeled off a roll and pasted onto the canvas. Maggie, the helper, walks users through a drawing lesson that teaches concepts such as perspective and the use of negative space.

Fine Artist has enough educational value to warrant its price, although parents may want to compare its appeal to Fractal Design's more sophisticated Dabbler (see review, September '94, page 52).



Creative Writer. Like Fine Artist, this program has options for aspiring young ones. In the Idea Workshop, children can use pictures or a slot-machine sentence generator for interesting story ideas. Children can also create banners, newspapers, or cards, using a variety of fonts, shapes, shadows, and stickers.

Programs such as Brøderbund's Kid Works and Print Shop can offer young children some of the tools in Creative Writer, however, and teenagers may be ready to graduate to a word-processing or publishing program, which can teach more-adult computer skills as well. / Carol Dorf and Kristin Mellone

Microsoft Creative Writer 1.0 ★★ / Price: \$49.95 (estimated). Company: Microsoft, Redmond, WA; 800-426-9400 or 206-882-8080. Reader Service: Circle #422.

Microsoft Fine Artist 1.0 ★★ / Price: \$49.95 (estimated). Company: Microsoft, Redmond, WA; 800-426-9400 or 206-882-8080. Reader Service: Circle #423.

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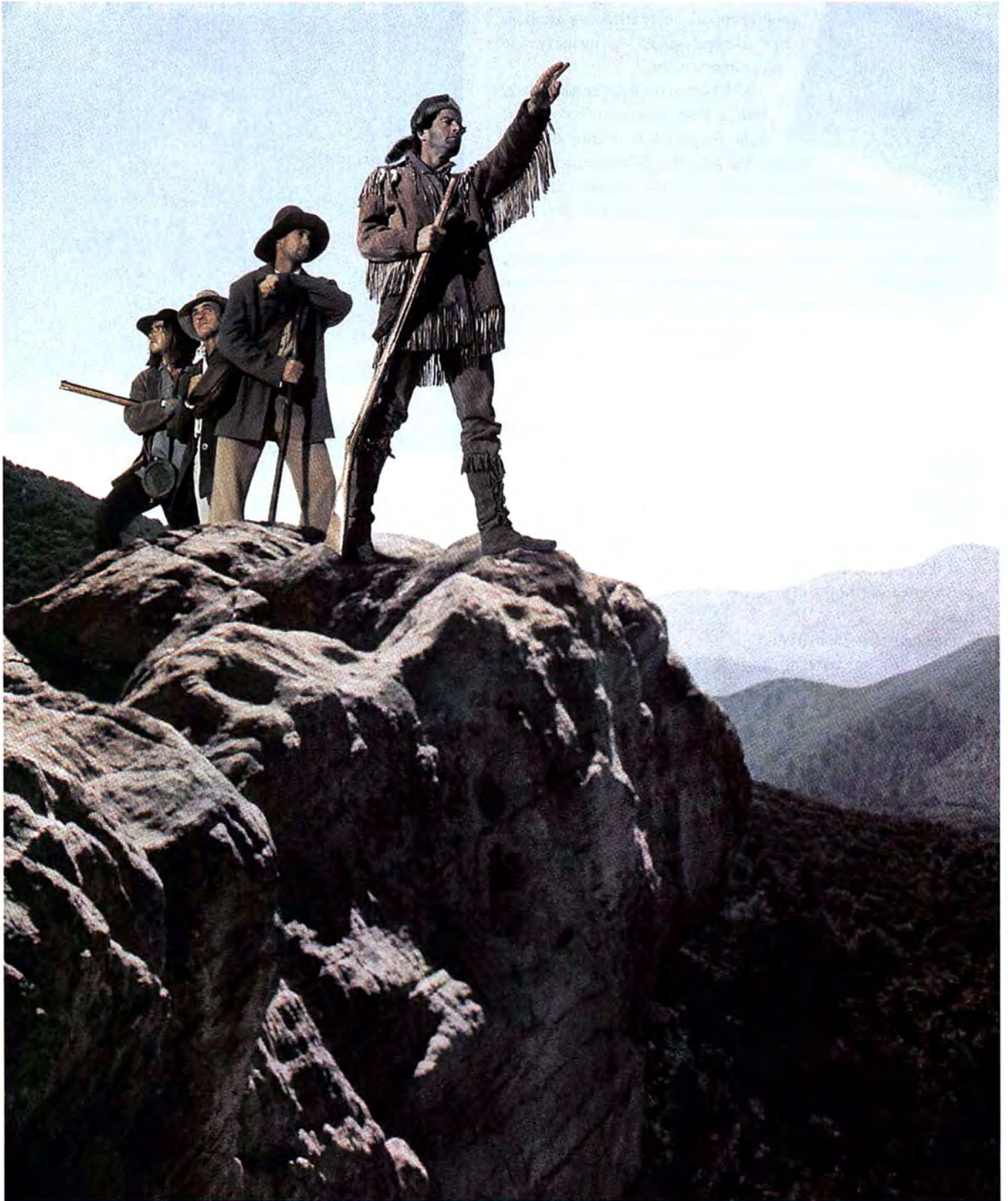
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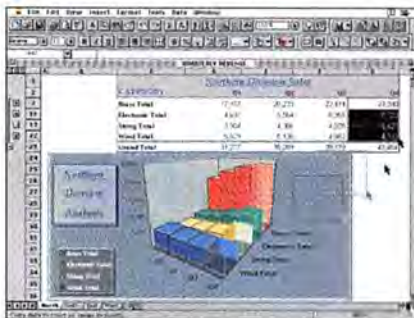
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You're an Adobe Photoshop power user. Should you buy a **Power Mac**, upgrade your **Quadra**, or switch to a **Pentium PC** or **Silicon Graphics** workstation? **By Bruce Fraser**

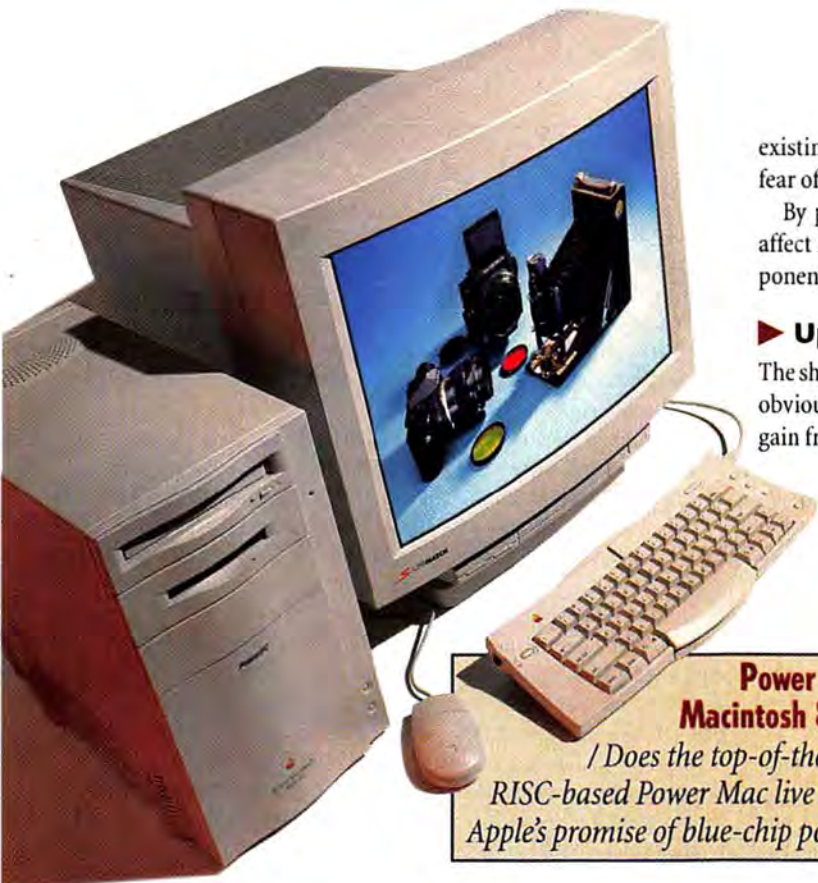


Silicon Graphics Indy / Can the one-two punch of RISC and UNIX power the Silicon Graphics Indy past the Power Mac?

Working with large color images taxes the Mac more than just about any other kind of task. If you regularly work with images in Adobe Photoshop, you've probably wondered if there are ways to make Photoshop faster. Maybe you've thought about upgrading to a Power Mac. Perhaps you've wondered if it's time to add more RAM. Or you may have considered



Macintosh Quadra 950 / Long favored by Photoshop professionals, can this venerable Mac meet today's speed needs?



**Power
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*/ Does the top-of-the-line
RISC-based Power Mac live up to
Apple's promise of blue-chip power?*

existing system or point you on the road to a new one without the fear of making costly mistakes.

By posing a few questions, we identified factors most likely to affect Photoshop speed. First we'll discuss each of the system components we tested, and then we'll offer some recommendations.

► Upgrade to Power Mac?

The sheer horsepower of the PowerPC chip makes the Power Mac an obvious choice for graphics professionals. But to get the greatest gain from using a Power Mac, you need native Power Mac software.

Because the fully native version of Photoshop, version 3.0, was still in beta when we prepared this report, we weren't able to test it. But Adobe's PowerPC Accelerator plug-in exploits the Power Mac's speed more than you may expect. With the plug-in, Photoshop's entire imaging engine — not just a few filters, but global operations such as adjusting Levels, Curves, Color Balance, and Hue/Saturation and using the various Calculate modes — runs in native mode. With the plug-in, the Power Mac 8100 was the fastest base machine of those we tested, outperforming the Quadra 950 by a factor of 3 and easily outdistancing the Pentium PC and the Silicon Graphics Indy (see figure 1).

Of the machines we tested, the stock Quadra 950 was the slowest, but adding an Apple Power Macintosh Upgrade Card, which effectively doubles the Quadra 950's 33-MHz clock speed and adds a PowerPC 601 processor, made it almost as fast as the 80-MHz Power Mac 8100. Installing a PowerPC upgrade card isn't the only option for boosting the Quadra's speed with Photoshop, as you'll see later — depending on the kind of work you do, a DSP accelerator may give you more bang for the buck.

For Photoshop work, Macs that have PowerPC chips have a decided edge over those that have a Motorola 68000-series chip — they'll have an even greater advantage when the fully native

getting a DSP (digital signal processor) accelerator, an accelerated-video card, or a faster hard drive. Maybe you've even been swayed enough by ads for Pentium machines or Silicon Graphics systems to think about switching platforms entirely.

Which way should you go? What are the benefits of these various strategies? To answer these questions, MacUser Labs designed and executed a mammoth Photoshop benchmark-testing effort that allowed us to quantify just how much of a speed improvement you can get from several possible solutions. Our test suite was designed to exercise all aspects of Photoshop performance (see the "How We Tested" sidebar).

We tested the effect of RAM upgrades and the installation of a variety of DSP accelerators, QuickDraw accelerators, and fast hard drives. We looked at upgrading a Quadra 950 with an Apple Power Macintosh Upgrade Card. In addition to using the Quadra 950 and a Power Mac 8100, we checked out Photoshop performance on two of the Mac's leading rivals — a Dell Pentium PC running Windows and a Silicon Graphics Indy, which uses a MIPS RISC chip. In the end, some of the results were as we expected, but others were downright surprising.

For our tests, we used Photoshop 2.5.1 with the PowerPC Accelerator plug-in where appropriate, but our results should be equally valid for Photoshop 3.0 (see the "Moving On to Photoshop 3.0" sidebar). Whether you're a seasoned Photoshop pro or just starting out in the world of digital imaging, our findings can help you wring every last ounce of speed out of your



Pentium PC / *Can
the Power Mac's closest
rival take a bite out of Apple's
well-deserved publishing dominance?*

How We Tested / *putting Photoshop through its paces*

WE SET OUT TO ANSWER this basic question: What can we do to make Adobe Photoshop run faster? In the process, we looked at the role played by the CPU itself, by RAM, by application-specific DSP accelerators, by QuickDraw accelerators, and by hard drives. We used the following stock platforms: a Quadra 950 (the most common Mac for high-end Photoshop use), a Power Mac 8100/80, a Silicon Graphics Indy, and a Dell Dimension XPS P90.

We loaded each machine with enough RAM to allocate 60 MB to Photoshop — sufficient for handling our 18-MB RGB TIFF test file comfortably (see "Stock Machines Tested," below, for details). We then subjected each machine to our battery of tests. We ran the complete test suite three times on each platform and averaged the results, all of which included screen-redraw time.

After reducing the amount of RAM allocated to Photoshop, we repeated this procedure, running the tests with allocations of 2.5 and 1.5 times the file size. This gave us a clear idea of the performance penalty exacted by having insufficient RAM and let us quantify the benefits of fast hard drives for low-memory configurations.

For the Macs, we then installed a representative sampling of third-party add-ons, one by one. We tested Radius PhotoBooster and DayStar Charger and Charger PFS DSP accelerators, Radius LeMansGT and SuperMac Thunder II GX-1360 QuickDraw accelerators (the latter has

DSP acceleration on-board), an Optima Internal DiskOvery 2100 high-speed hard drive, and a 2-GB FWB SledgeHammer2000FMF Disk Array. We also added an Apple Power Macintosh Upgrade Card to the Quadra 950. We tested the platforms with one add-on at a time and with the add-ons in various combinations, running the same test suite we used for the stock platforms so that we could determine the incremental speed benefit each add-on provided.

We designed the test suite to exercise all aspects of Photoshop performance. At first glance, the suite might seem to give the greatest weight to DSP acceleration, but the operations accelerated by the DSPs — primarily use of filters — are precisely those that take the most time. Figure 2 reveals which functions benefited from DSP acceleration: If you don't use these functions on a regular basis, you should weigh our results accordingly.

We couldn't detect any significant difference between accelerated and unaccelerated QuickDraw in these tests, so we also tested vertical and horizontal scrolling on machines with QuickDraw accelerators. Using the arrows on the scroll bars, we scrolled the 18-MB test image at 1:1 display from side to side and from top to bottom. Only then could we discern a difference between third-party QuickDraw accelerators and the Mac's built-in video. No one works this way, however, so we've omitted the results of those tests here.

STOCK MACHINES TESTED



Apple Macintosh Quadra 950
Processor: 33-MHz 68040.
RAM: 72 MB.
Hard Drive: 1 GB.
Monitor: SuperMac SuperMatch 21-T XL.
List Price: \$5,309 (computer only, 16 MB of RAM, 1-GB hard drive).
Company: Apple Computer, Cupertino, CA; 800-767-2775 or 408-996-1010.



Apple Power Macintosh 8100
Processor: 80-MHz PowerPC 601.
RAM: 72 MB.
Hard Drive: 1 GB.
Monitor: SuperMac SuperMatch 21-T XL.
List Price: \$6,159 (computer only, 16 MB of RAM, 1-GB hard drive, internal CD-ROM drive).
Company: Apple Computer, Cupertino, CA; 800-767-2775 or 408-996-1010.



Dell Dimension XPS P90
Processor: 90-MHz Pentium.
RAM: 72 MB.
Hard Drive: 1 GB.
Monitor: Dell 17esUltraScan.
List Price: \$6,418 (includes 72 MB of RAM, 1-GB hard drive, 17esUltraScan monitor, keyboard, software).
Company: Dell Computer, Austin, TX; 800-613-3355 or 512-338-4400.



Silicon Graphics Indy
Processor: 100-MHz R4600PC.
RAM: 128 MB.
Hard Drive: 1 GB.
Monitor: Silicon Graphics 16" Color Display.
List Price: \$20,195 (includes 128 MB of RAM, 1-GB hard drive, 16-inch color monitor, keyboard, 21-MB internal Floptical drive, external CD-ROM drive, IndyCam).
Company: Silicon Graphics, Mountain View, CA; 800-800-1980 or 415-960-1980.

Photoshop 3.0 ships this fall. Should you rush out and buy a Power Mac? Of course, there will always be something faster, cheaper, and better six months down the road, but if you want the fastest Photoshop speed *now*, getting a Power Mac 8100 is clearly the way to go. Given the computational muscle of the PowerPC, even the entry-level Power Mac 6100 should run Photoshop much faster than a similarly configured Quadra.

► Add More RAM?

There's a saying that you can never be too rich, be too thin, or have too much RAM. We must admit we personally haven't experienced the first two, and although it's possible to give Photoshop more

RAM than it actually needs for a specific task, we suspect that doesn't happen very often.

We designed our tests to check the theory that RAM is the single most important factor in Photoshop speed, and our findings uphold that theory. Adobe's somewhat vague guideline is that for optimum speed, you need to give Photoshop an amount of RAM equal to 3 to 5 times the size of the file on which you're working. With less than this, Photoshop is forced to use its own virtual memory, paging data to and from a scratch file on-disk, which is much slower than keeping everything in RAM. Don't be tempted to use Apple's virtual memory to fool Photoshop into thinking it has more RAM than it really does. Photoshop's virtual-memory scheme is much more

THIRD-PARTY ADD-ONS TESTED



Apple Power Macintosh Upgrade Card
List Price: \$699.
Company: Apple Computer, Cupertino, CA;
800-767-2775 or 408-996-1010.



DayStar Charger
List Price: \$499.
Company: DayStar Digital, Flowery Branch, GA;
800-962-2077 or 404-967-2077.



DayStar Charger PFS
List Price: \$1,999.
Company: DayStar Digital, Flowery Branch, GA;
800-962-2077 or 404-967-2077.



FWB SledgeHammer2000FMF Disk Array
List Price: \$2,949.
Company: FWB, San Francisco, CA;
415-474-8055.



Optima Internal DiskCovary 2100
List Price: \$1,899.
Company: Optima, Irvine, CA;
714-476-0515.



Radius LeMansGT
List Price: \$2,499.
Company: Radius, San Jose, CA;
800-572-3487 or 408-434-1010.



Radius PhotoBooster
List Price: \$999.
Company: Radius, San Jose, CA;
800-572-3487 or 408-434-1010.



SuperMac Thunder II GX-1360
List Price: \$3,299.
Company: SuperMac Technology, Sunnyvale, CA;
800-334-3005 or 408-541-6100.



SuperMac SuperMatch 21-T XL
List Price: \$2,599.
Company: SuperMac Technology, Sunnyvale, CA;
800-334-3005 or 408-541-6100.

efficient, but it relies on knowing what's really in RAM and what's really on-disk. Apple's virtual-memory scheme simply confuses Photoshop, which results in severe performance degradation.

In practice, except for a very few filter operations (such as performing Gaussian blurs with the pixel radius set above 100), RAM of 3 times the file size is enough to keep Photoshop humming along happily without having to swap things out to disk. But keep in mind that many common Photoshop operations increase the file size, either temporarily or permanently.

For example, when you rotate an image, Photoshop enlarges the file size. If you rotate a typical 18-MB, 2,000-x-3,000-pixel Photo CD image 90 degrees, Photoshop needs a 3,000-x-3,000-pixel area to

work in, so the image size balloons to about 26 MB. To stay within the RAM guideline of 3 times the file size, you need almost 80 MB of RAM instead of the suggested 54 MB. Once the rotation is complete, the file will return to its previous size. The worst-case scenario — rotating the image 45 degrees — permanently doubles the file size, and consequently the RAM requirements for optimum speed double as well, bringing your total RAM requirements to 6 times the original file size, or 108 MB.

Other operations increase the file size too. For instance, adding an alpha channel to an RGB image or converting it from RGB to CMYK color pads the file size by one-third. And remember to clear the Clipboard after pasting a large image, which also takes up valuable RAM. (The easiest way to do this is to copy a tiny selection so that it writes over what's on the Clipboard.)

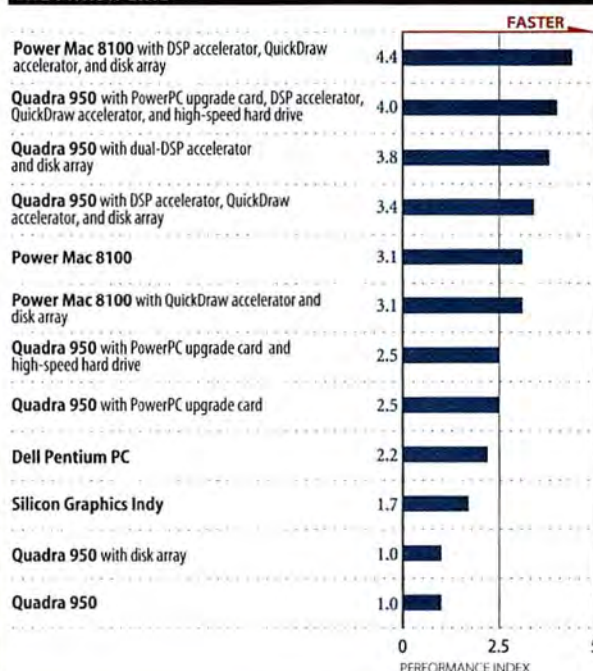
Performance degrades when you have less than 3 times the file size in RAM, but it doesn't do so linearly; instead, it follows a slippery slope. Our tests show that with RAM of 2.5 times the file size, the performance hit compared to 3 times is minimal, but with only 1.5 times the file size, it's terminal. Photoshop becomes agonizingly

figure 1

MacUser LABS Photoshop Dream Machine

What's the fastest system for running Adobe Photoshop? Using the Quadra 950 as our starting point, we ran exhaustive tests on five stock machines. To get a sense of what various technologies can do to make Photoshop faster, we threw in such add-ons as DSP accelerators, QuickDraw accelerators, and faster hard drives. We then averaged our results to get a representative sample of how DSP and QuickDraw accelerators affect Photoshop's overall speed. All results are normalized to that of a stock Quadra 950, which we gave a score of 1. Although an enhanced Power Mac 8100 won the race handily, we found that a souped-up Quadra 950 still had legs, in some cases beating a stock 8100.

THE FINISH LINE



slow, so much so that decreasing the amount of RAM further has no effect.

Our speed charts showing how an 18-MB file fared in Photoshop under three RAM configurations (see figure 3) are a little misleading in this respect. They show the slowdown incurred for specific operations, but they don't show the destructive effect insufficient RAM has on interactivity. With RAM equal to only 1.5 times the file size, we found that almost anything we did triggered a screen redraw that took about 10 seconds. If you're doing batch processing, using a scripting utility such as DayStar's PhotoMatic, this may be tolerable, but for any kind of interactive work, it's maddening. The results of our Load Selection test offer a good guide to the kind of performance degradation you'll see in a RAM-poor configuration — almost all the time in that test is taken by screen redraws.

The bottom line: For the best interactive performance, give Photoshop a little more than 3 times the file size for its RAM allocation. More may help sporadically; less will definitely hurt. Also remember that if you plan to take advantage of the layering features in Photoshop 3.0, your files will be even bigger and you'll need even more RAM.

► Buy a DSP Accelerator?

The advent of the Power Macs has led many pundits to proclaim that DSP acceleration is dead. We found that reports of the demise of DSPs are premature, although on a Power Mac, the benefit of DSP acceleration is less dramatic than on 680x0 Macs.

DSPs are special-purpose chips that speed up specific types of math-intensive operations in Photoshop, such as those involved in using the Unsharp Mask, Gaussian Blur, and Despeckle filters; the Rotate function; and any resizing operations. Their weakness is that they accelerate only a limited number of operations; on the other hand, their strength is that those they do accelerate are among the most time-consuming.

Our testing wasn't set up to rigorously compare vendors' DSP implementations; instead, we wanted to look at DSP acceleration as a whole, at what the technology offers Photoshop users. In fact, it's fair to say that the speed differences among the DSP accelerators we tested were relatively small. Where they differed was in their feature sets, what they accelerated: For a DSP accelerator to speed up a given function, it needs software designed for that purpose, so vendors' implementations of the same chip set may accelerate different operations.

It's also important to differentiate third-party products from the DSP built in to the Quadra 660AV and 840AV. Apple's DSP implementation wasn't designed with Photoshop in mind; the single AT&T DSP3210 in the AV Quadras doesn't offer nearly as much acceleration as the third-party products, each of which uses at least two DSPs.

Here's an interesting tidbit: The fastest speeds we clocked for using the Feather Selection function and the Despeckle, Find Edges, custom, Unsharp Mask, and large-radius Gaussian Blur filters were turned in by the Quadra 950 with a third-party DSP accelerator, beating a stock Quadra 950 by as much as 1,000 percent and outpacing the Power Mac 8100 by as much as 400 percent in some cases (see figure 2). Clearly, DSPs aren't dead yet.

A Power Mac with a DSP accelerator is extremely fast too, but DSPs don't bring anything like the bang for the buck to the Power Mac that they do to the Quadra. Our fastest configuration overall was a Power Mac 8100 equipped with a SuperMac Thunder II GX-1360 (which has DSP acceleration on-board). This configuration rivaled the speed of the DSP-accelerated Quadra 950 in tests where DSP acceleration speeds up specific operations and passed it on those where DSP acceleration makes no difference. For the task that benefited most from DSP acceleration on the Power Mac — using a custom 5x5 filter — adding a DSP accelerator gave the Power Mac a boost of a little over 300 percent. In most cases, the

Moving On to Photoshop 3.0 / *new version won't change system demands*

A DOBE PHOTOSHOP 3.0 will offer more creative tools and production controls than its predecessor, but how will these features affect system demands? Based on our examination of a beta version of the new software and extensive discussions with Adobe representatives, we're confident the results we obtained with Photoshop 2.5.1 will be equally valid for Photoshop 3.0. If anything, the Power Macs will have a greater edge over the other systems we tested, because Photoshop 3.0 will be fully Power Mac-native.

One certainty is that Photoshop 3.0 will be every bit as RAM-hungry as its predecessor, particularly if you use its new layering features. Each layer contains a full 24-bit image the same size as the original and occupies RAM accordingly. Transparent background areas will use a smaller but still hefty amount of RAM. In addition, each layer will be able to have its own mask, which also requires RAM, and channels will work exactly as they do in Photoshop 2.5.1. Add that up, and RAM becomes an even more vital performance factor in Photoshop 3.0.

Using time-consuming filters such as Unsharp Mask and Gaussian Blur hasn't changed in the new version, although the addition of previews to the filters' dialog boxes will make it possible to arrive at the

correct settings more quickly. But the actual filter operations should take about the same time as they do in Photoshop 2.5.1, so DSP accelerators will deliver roughly the same benefits with the new version. It's possible that some DSP-accelerator vendors will write software to accelerate some of Photoshop 3.0's new features too, but no plans had been announced at press time.

Large monitors will, of course, be every bit as useful with Photoshop 3.0 as they are with Photoshop 2.5.1 — perhaps more so, given the Layers palette, new in this version. Drive speed may be slightly more important with Photoshop 3.0, but for complex, multilayer files that not only balloon in size but also eat up scratch-disk space, disk capacity will likely be much more critical than drive speed. The incremental lift a fast drive provides will still pale into insignificance when compared with the importance of having enough RAM.

When it comes to RAM requirements for Photoshop 3.0, the 3-times-file-size rule will still apply. Just note that Photoshop 3.0 offers many killer new features that will increase the size of your files. Fortunately, it also offers a pop-up menu that shows at a glance how much working space your image occupies, so you won't have to do the math yourself.

figure 2



How Fast Is Fast? / and the winners are . . .

To find the fastest system for Photoshop use, we tested 15 configurations. Our goal was to find which speed-boosting strategies have the greatest effect on Photoshop speed, not to recommend specific products. Your needs will vary depending on the kind of Photoshop work you do. DSP accelerators, for instance, are designed to speed up

specific Photoshop functions, so they excel in certain tests but deliver lackluster results in others. If using the Unsharp Mask filter is your bread and butter, take a close look at the products that finished first in those tests. Here are the winning configurations for each test, compared to the Power Mac 8100.

TEST	WINNER	WINNER'S TIME*	POWER MAC 8100'S TIME*
Launch Application	Dell Dimension XPS P90	6.5	9.9
Open File	Power Mac 8100 with SuperMac Thunder II GX-1360 and FWB SledgeHammer2000FMF Disk Array	7.7	9.8
Open Levels	Power Mac 8100	3.1	3.1
Apply Level Change	Power Mac 8100	3.3	3.3
Rotate Image 90°	Power Mac 8100 with SuperMac Thunder II GX-1360	5.9	6.4
Calculate: Screen	Power Mac 8100 with SuperMac Thunder II GX-1360	2.5	2.6
Load Selection	Power Mac 8100 with SuperMac Thunder II GX-1360	1.0	1.3
Feather Selection	Quadra 950 with DayStar Charger and Charger PFS and FWB SledgeHammer2000FMF Disk Array	17.8	18.5
Despeckle	Quadra 950 with DayStar Charger and Charger PFS	19.7	55.9
Find Edges	Quadra 950 with DayStar Charger and Charger PFS	15.7	26.6
Custom Filter (3x3)	Quadra 950 with Radius LeMansGT with PhotoBooster	12.2	41.9
Custom Filter (5x5)	Quadra 950 with DayStar Charger and Charger PFS	19.1	100.6
Mode Change (RGB to CMYK)	Power Mac 8100	32.5	32.5
Unsharp Mask (1-pixel radius)	Quadra 950 with Radius LeMansGT with PhotoBooster	21.4	45.0
Unsharp Mask (2.3-pixel radius)	Quadra 950 with DayStar Charger and Charger PFS	38.9	51.6
Gaussian Blur (1-pixel radius)	Power Mac 8100 with SuperMac Thunder II GX-1360	15.8	39.1
Gaussian Blur (2.3-pixel radius)	Quadra 950 with Apple Power Macintosh Upgrade Card and SuperMac Thunder II GX-1360	18.6	45.8
Gaussian Blur (10-pixel radius)	Quadra 950 with DayStar Charger and Charger PFS	35.1	56.9

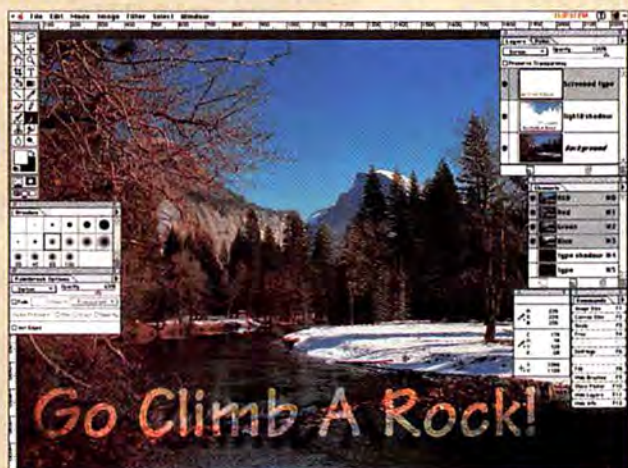
*All times in seconds

speed benefit was much smaller. At pixel-radius settings between 2 and 5, adding DSP acceleration didn't speed up Unsharp Mask and Gaussian Blur filter operations by any significant amount over their speed on a stock Power Mac.

Although DSP acceleration isn't dead yet, it will likely have little or nothing to offer the next generation of Power Macs, especially when machines using the PowerPC 604 come on the market. They should be four times as fast as today's PowerPC 601 Power Macs. But DSPs can still do wonders for 680x0 Macs.

► Try a QuickDraw Accelerator?

Since Photoshop relies so heavily on the screen, you'd assume that an accelerated-video card would help it considerably. You'd be wrong. Photoshop draws directly to the screen, so QuickDraw acceleration has almost no effect on Photoshop speed. The only way we could find measurable differences between built-in and third-party accelerated video was by scrolling images from end to end, using the arrows on the scroll bars. Here we saw significant differences between third-party QuickDraw accelerators and the speedy video built in to the Power Mac's VRAM. But few Photoshop users actually work this way — you're more likely to scroll by the screenful or use the grabber hand. In such situations, and in every other operation



Photoshop 3.0's new layering features give users much more flexibility for compositing, shadowing, and type treatment, but using them adds to the file size, thus increasing the need for RAM.

we tested, the benefit from QuickDraw acceleration comes down to a few tenths of a second, if indeed it can be measured at all.

To be sure, there are other reasons to buy a QuickDraw accelerator, especially if you're using a Quadra. For example, the Quadra 950's built-in video is limited to 832 x 624 pixels at a 24-bit depth. If you need to look at every pixel in an image, as most Photoshop users usually do, using a larger monitor makes a big difference. That

means using a third-party video card. And if the QuickDraw calls have to travel across the NuBus bottleneck, you'll want QuickDraw acceleration.

But for the Power Mac 8100, the 4-MB VRAM option provides fast, 24-bit, 1,152-x-870-pixel video for much less than the price of a third-party card. If you're buying a Power Mac, spend the money on RAM instead.

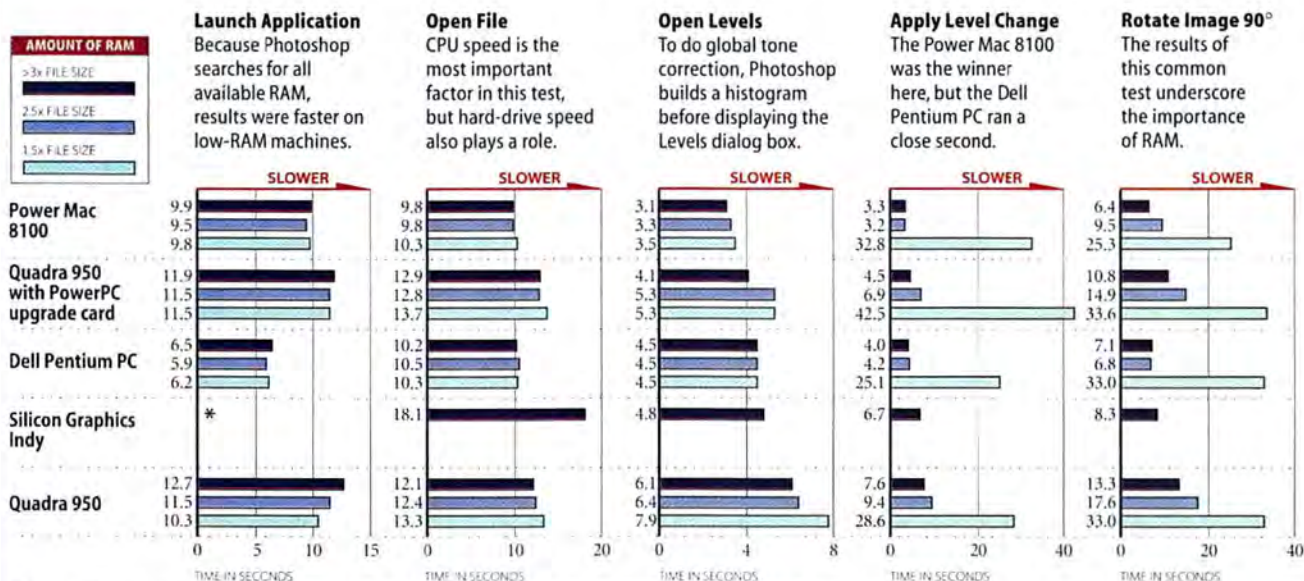
figure 3

MacUser
LABS

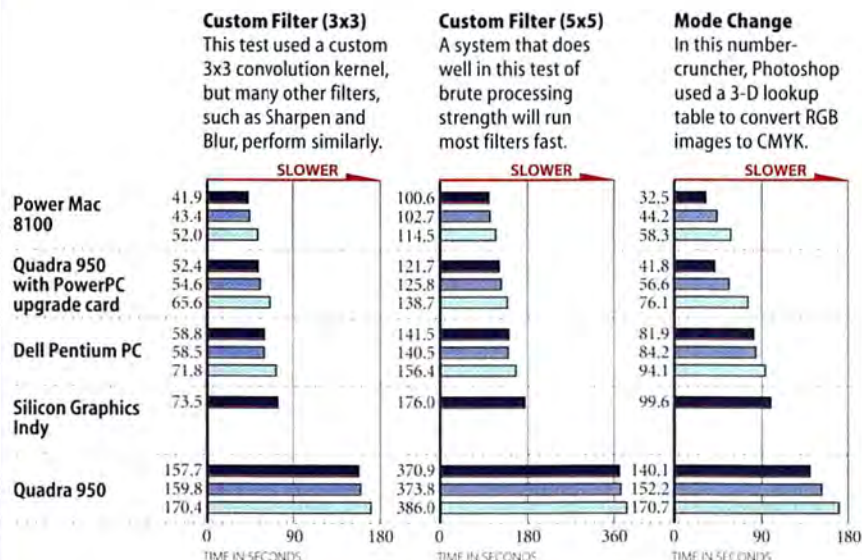
Photoshop Nuts and Bolts / stock machines and the effect of RAM

Our tests were designed to provide a comprehensive picture of real-world Photoshop use. The tests included everything from operations everyone does, such as launching the application and opening files, to

relatively obscure operations, such as applying a custom filter, which nevertheless provide worthwhile information about Photoshop's behavior on a particular system. To provide you with baseline information



*Photoshop's copy-protection scheme requires a log-on password, so obtaining an accurate launch time for the Indy wasn't possible.



Filter Finesse

Of Photoshop's filters, Unsharp Mask and Gaussian Blur are two of the most commonly used — and they cause notorious bottlenecks. Unsharp Mask, applied to almost all images destined for print, evaluates the contrast of adjacent pixels and increases it accordingly. Gaussian Blur, a frequently used tool for creating soft edges, uses a technique similar to Unsharp Mask to eliminate contrast. Photoshop uses three algorithms for these filters, depending on the pixel radius you choose.

► Get a Faster Hard Drive?

Our biggest surprise was finding that drive speed had essentially no impact on Photoshop speed beyond the obvious fact that a fast hard drive can open a file faster than a slow one. For slightly less than optimal RAM configurations, using a fast hard drive shaves a second or two off most operations, but even the fastest hard drive is no substitute for enough RAM. For RAM-starved configurations, we

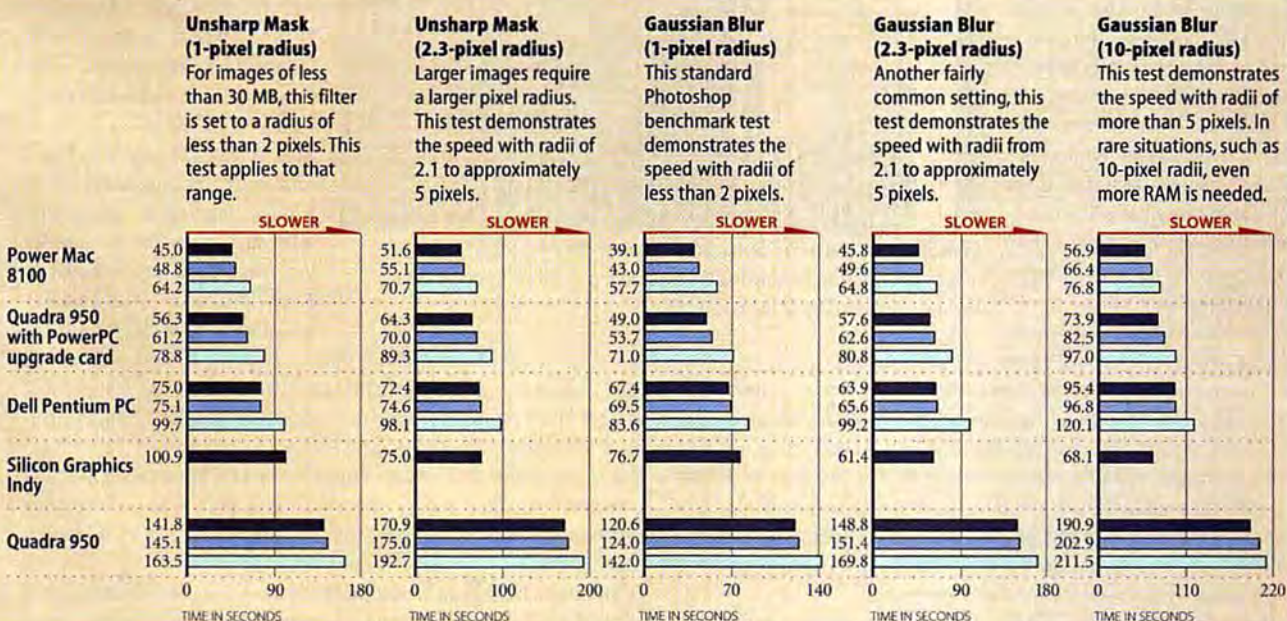
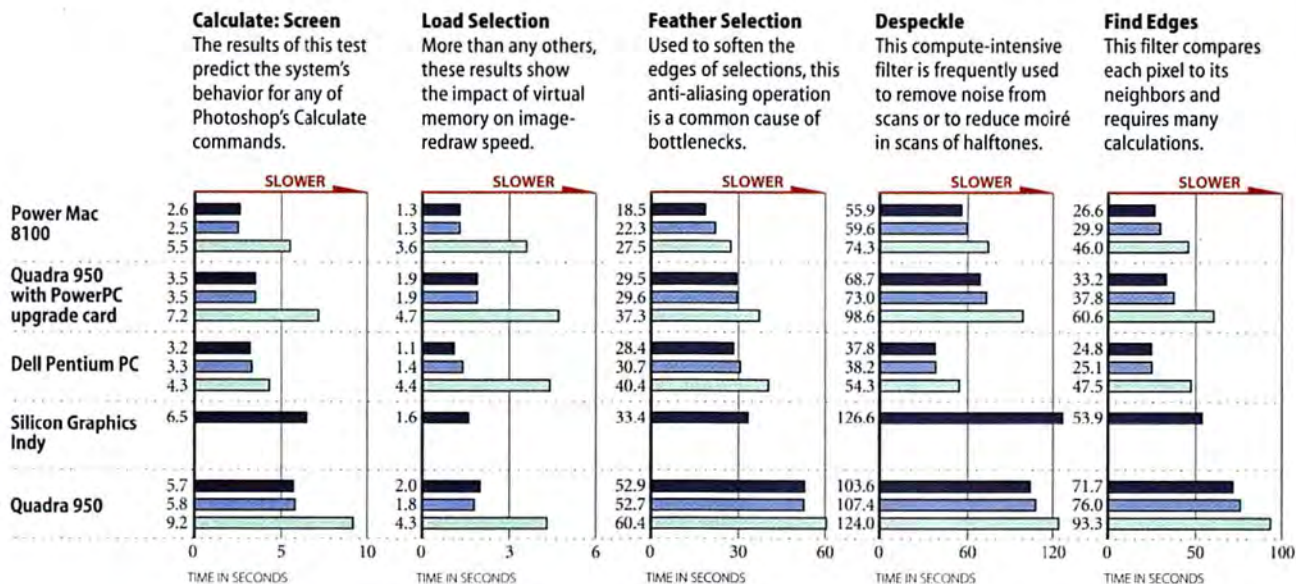
found that Photoshop speed is unbearably slow regardless of the speed of your drive. Publishers have plenty of good reasons to get a fast hard drive — for instance, page-layout applications can take a long time to read image files from disk — but Photoshop use isn't one of them.

We did uncover an interesting hard-drive-related item: Apple's Power Macintosh Upgrade Card can impede SCSI performance. Our

about various CPUs, these charts focus on the stock machines we tested.

To show the effect of RAM on Photoshop speed, we ran all the tests with three levels of RAM allocated to Photoshop: 3+ times the file size,

2.5 times the file size, and 1.5 times the file size. UNIX implementations of Photoshop simply grab all the available RAM, so we were unable to allocate specific amounts to Photoshop on the Indy.



2-GB FWB SledgeHammer2000FMF Disk Array ran much slower when booted from the PDS upgrade card than when booted from the 68040 or when the disk array was configured as two separate drives. FWB is developing a workaround for use of the upgrade card with its RAID systems. Apple says its card shouldn't have a problem with single-disk mechanisms, but nevertheless we did notice that single-disk systems took a slight performance hit when running from it.

► Switch Platforms?

If you've been driven to consider abandoning the Mac to make Photoshop faster, think again. True, our base platform, the stock Quadra 950, is getting noticeably long in the tooth, but somewhat to our surprise, we found that the Pentium PC and the Silicon Graphics Indy each lagged noticeably behind the Power Mac 8100 and the PowerPC-upgraded Quadra 950.

The Indy's speed in particular was an eye-opener. When we used compute-intensive filters such as Unsharp Mask and Gaussian Blur,

the Indy was more than twice as fast as a stock Quadra 950 but was slower than even the PowerPC-upgraded Quadra 950 on all but the 10-pixel-radius test for Gaussian Blur. For some common operations, such as applying a levels change, it was only slightly faster than a stock Quadra 950.

We suspect that the limitation here is with the implementation of Photoshop for the Silicon Graphics platform rather than with the hardware itself. The Indy clearly has power to burn — you can, for example, execute a complex 3-D rendering in the background without slowing down Photoshop.

But use of Photoshop isn't in itself a good reason to buy an Indy. If you want a UNIX machine, can take advantage of UNIX's many benefits such as multitasking and multithreading, and can deal with its occasional complexities (in other words, typing commands into the UNIX shell), getting an Indy is an attractive option. But don't make the mistake of saying, "I don't really want UNIX, but I'll put up with it for the extra power." You'll be disappointed, at least with Photoshop.

Beyond Photoshop / new technologies tackle huge files

TRULY ENORMOUS IMAGE FILES will remain a challenge for the upcoming Photoshop 3.0, despite the welcome addition of many features that will appeal to imaging professionals. For those who routinely work with files of 100+ MB, it's physically impossible to stuff enough RAM into a Mac for Photoshop to execute complex operations in RAM; as a result, huge chunks of image data get paged out to disk, resulting in performance that's leisurely at best, painful at worst. But several new products that can ease the pain of working with large images on the Mac are either shipping or waiting in the wings.

Live Picture. The long-awaited and much-ballyhooed Live Picture, from HSC Software, shipped in June of this year. It lets users of Quadra-class Macs equipped with at least 32 MB of RAM work with files of essentially unlimited size (limited only by hard-disk space and sanity) in what HSC characterizes as *near real time*, a term you're probably going to hear a lot in the next year or so.

Live Picture accomplishes its imaging magic by means of a proprietary technology called FITS (Function Interpolating Transformation System), which uses a technique called hierarchical sampling. This exploits the fact that you can display only one screenful of image data at a time. To use Live Picture, you first convert images into a proprietary format that's structured to display only the data needed from the original image for screen display at a given level of zoom. All operations are stored as mathematical descriptions and aren't applied to the full-resolution data until you've built the final image. The original scans remain untouched.

Unlike the proxy-based systems used in Scitex and Linotype-Hell's

high-end retouching stations, which use static proxies, with a fixed resolution, Live Picture allows you to view images at any level of detail you choose — it updates the screen display dynamically.

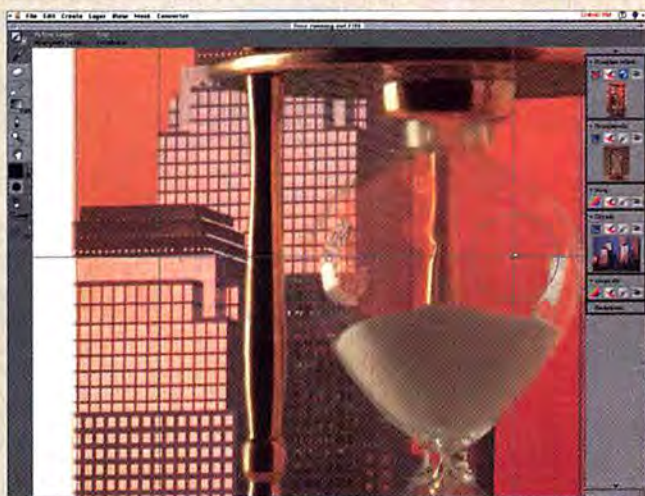
But unless your work consists mainly of compositing high-resolution images, Live Picture isn't a substitute for Photoshop. Although it deals

with huge files much faster than Photoshop, it's much slower than Photoshop for files of 20 MB or less and the preprocessing and postprocessing of images can interfere with work flow. Unless you need Live Picture's specific and formidable strengths, you're almost certainly better off staying with Photoshop. At \$3,995, Live Picture can be considered the ultimate Photoshop add-on — the two complement each other very well. 310-392-8441.

xRes. A considerably less costly solution to the large-file problem is being readied by Fauve Software, known on the PC side for the paint program Matisse. Its \$795 application xRes requires only 8 MB of RAM, but it also uses

hierarchical sampling techniques to edit large files — upwards of 100 MB — in near real time. As with Live Picture, you must first convert images into a proprietary format. The feature set is akin to those of applications such as Photoshop and Fractal Design's Painter X2, with active layers, global filters, and natural-media brushes as wide as 1,000 pixels. We've looked at only early versions of xRes, so we can't yet say just how much postprocessing will be needed to build final images. 919-380-9933.

ColorRetouch. MicroSpot is putting finishing touches to ColorRetouch, a \$249 image editor aimed at the low end of the market. The application



Live Picture, from HSC Software, picks up where Adobe Photoshop leaves off, offering sophisticated masking, unlimited undo, and fast compositing of files of over 100 MB.

The Dell 90-MHz Pentium PC is a closer contender than the Indy — it launched Photoshop faster than any other system we tested. But in most of our other tests, its speed was comparable to that of a Quadra 950 with an Apple PowerPC upgrade card, with the Mac system having a slight edge overall. For everything except launching Photoshop and using the Despeckle filter, it was slower than the Power Mac 8100. The upcoming 100-MHz Pentium machines should breathe down the neck of the Power Mac 8100 but are unlikely to surpass it. Power Macs that have the upcoming 100-MHz PowerPC 601+ chips should stretch the lead even more — and when the PowerPC 604 Power Macs are released, Pentium PCs will quite simply be blown out of the water.

► Abandon Photoshop?

Depending on your level of frustration, you might be tempted to punt Photoshop altogether in favor of another imaging program. Several whizzy new technologies and products are emerging that would appear to be attractive alternatives to Photoshop (see the

uses hierarchical sampling more as a means of lessening RAM demands with small- to medium-sized files than as a solution to working with huge ones. The program lacks the prepress-oriented features of Photoshop — it's strictly RGB — but it may find a welcome among those whose imaging needs are modest. 408-253-2000.

MacEurope Imagician. A hardware/software combination from MacEurope Information Systems, the Imagician (\$3,495) allows manipulation of large images in near real time thanks to a proprietary NuBus card stocked with 16 MB of RAM. Unlike the software-only products, it doesn't require preprocessing or postprocessing; instead, the software offloads processing to the card. The feature set of the beta version we examined was relatively limited, but it did let us load a 100-MB image and scale, rotate, stretch, skew, and bend it in near real time. What we saw was clearly closer to being a technology than a finished product, but it's nevertheless a technology well worth watching. 408-454-0239.

Radius PhotoEngine. As our tests show, DSP accelerators can greatly boost Photoshop speed. Radius recently shipped the PhotoEngine, a \$1,099 NuBus card stocked with four DSPs designed to tackle the most-taxing Photoshop operations. Radius says that the PhotoEngine offers significant speed improvements on Power Macs as well as on 680x0 Macs. It also bears the Adobe-charged label, so it takes full advantage of Adobe Photoshop 3.0's architecture. 408-434-1010.

Adaptive PowerShop. Adaptive Solutions is working on perhaps the most ambitious Photoshop accelerator so far. Early in the fourth quarter of 1994, it plans to ship a NuBus card based on a proprietary chip containing no fewer than 64 DSPs and with a list price under \$4,000. The developers claim that the Adobe-charged package, dubbed the PowerShop, will use the power of parallel processing to dramatically and transparently accelerate time-consuming operations such as filter use, resizing, rotation, color-space conversions, and compression, delivering near-real-time performance within Photoshop. 503-690-1236.

Clearly, digital imaging is growing up. Other developers who declined to be named are also working on image-processing products for very large images, and we expect to see a whole raft of them by mid-1995. But it remains unclear whether a new pretender will muster enough muscle to displace Photoshop from the digital-imaging throne.

"Beyond Photoshop" sidebar), and some of them show great promise — but as complements to, not substitutes for, Photoshop. If you work with color images and you're thinking about abandoning Photoshop, we offer this advice: Push yourself back from the monitor, take a couple of days off, and try one of the recommendations that follow.

► So Where Do I Go from Here?

Now that you've explored the options, what should your next course of action be? You can take several routes on the way to building a killer Photoshop machine.

If you're putting a system together from scratch, the answer is simple. Get a Power Mac 8100 with the 4-MB VRAM option, and stuff it with as much RAM as you need in order to work on your largest files, following the 3-times-file-size rule. For even faster speed, you can add a DSP accelerator, but unless one of the operations the DSP accelerates is causing a real bottleneck in your work, it probably isn't worth the extra expense.


If you've invested heavily in a 680x0 Mac, the situation is considerably more complex. Even if you want to stay with your existing system for now, you'll almost certainly want to move to a Power Mac in the future, so you need to consider which components can migrate to the Power Mac and what your bottlenecks really are.

If you're using a Quadra 700, 900, or 950, your machine uses 30-pin SIMMs, which can't be used in a Power Mac (Power Macs use the newer, 72-pin SIMMs). If you've bought a lot of RAM that you can't move to a Power Mac, consider adding a DSP accelerator, a PowerPC upgrade card, or both. If your major bottleneck is time-consuming filter operations such as Unsharp Mask and Gaussian Blur, you should opt for a DSP accelerator — especially if other aspects of your work rely on fast drive speed, given the SCSI limitation of the PowerPC upgrade card. If you already have a DSP accelerator and it's Power Mac-compatible (check with the vendor), getting a PowerPC upgrade card makes sense, despite the SCSI limitation.

On the other hand, if insufficient RAM is causing a Photoshop bottleneck on your current Quadra, you have to weigh whether it makes sense to invest in expensive RAM that you can't take with you when you move to a newer Mac. For those who are using a newer Quadra, such as an 800 or 650, the RAM is Power Mac-compatible; it's worth spending a few extra dollars on 60-nanosecond SIMMs to ensure future compatibility. If you use Photoshop regularly, you'll want a Power Mac sooner or later.

In the end, a couple of things are clear. First, despite advances in hardware and software, when it comes to Photoshop, sufficient RAM is still the key to faster speed. Second, advances on other platforms notwithstanding, the Mac is still the platform of choice for serious Photoshop work. The combination of the Power Mac and Photoshop 3.0 may just prove unbeatable. 🐼

Contributing editor Bruce Fraser is coauthor of *Real World Photoshop 3.0*, to be published this year by Peachpit Press. MacUser project leaders Tony Bojorquez and Jeffrey K. Milstead managed the testing for this report.

 Want to dig deeper into our Photoshop benchmark suite? The complete test results for this report are available on-line on ZiffNet/Mac. See page 4 for instructions on accessing ZiffNet/Mac. Also, check out this month's MacUser/ZMac Utility, The Cheaper Image, an entry-level image-editing application that accepts Photoshop plug-ins (see New on the Menu, page 30).

If you want to save money by bringing your prepress work in-house, then one of these scanners is for you. *By Bruce Fraser*

Top-Quality **Scanners**

By now, you've probably heard someone praising low-cost flatbed scanners. They are fast, usually include a generous software bundle, and provide an easy way to get images into your Mac. So why should you spend over \$2,000 on a scanner?

Because — as with many things in life — you get what you pay for. The scanners we tested have list prices in the range of \$3,500 to \$20,000. For this much cash, you can get a scanner designed to handle specific types of images: prints, transparencies, or 35mm slides. And you'll get higher-quality output than you can with inexpensive flatbed scanners. You'll see more color saturation, better sharpness, and increased shadow detail. For transparencies or 35mm slides, you'll notice an even greater difference between the output quality of an inexpensive flatbed scanner and that of one of its higher-priced cousins.

If you're scanning images for personal use or if you just need an occasional image for a presentation or a newsletter, a low-cost flatbed scanner will fill the bill. But if scanning images is part of your job, you should check out the 12 production-level scanners we tested. These units range from multipurpose flatbed scanners, to dedicated transparency scanners (35mm slide scanners as well as multiformat scanners, which can handle 35mm slides and



larger transparencies), to oversized flatbed scanners, to baby drum scanners. Not only do these scanners offer better output quality (thanks to their ability to capture 10 or more bits of data per color) but they offer other advantages as well.

Some of these units let you scan directly to CMYK color, a major time-saver for prepress use. Some allow *gang scanning*, in which multiple images are placed on the scanner and scanned simultaneously to individual output files. A few are even capable of handling both reflective (print) and transmissive (transparency) art equally well. In general, we were impressed with the quality of the results we could obtain, but it quickly became clear that there's no such thing as a perfect all-around scanner. Each one has strengths and weaknesses that make it suitable for some uses but not for others.

Capturing the Right Colors

Scanned images contain a maximum of 24 bits of color information per pixel — 8 bits each of red, green, and blue — which is sufficient for just about any output process. But photographic originals contain a greater range of tone or color than 8 bits per color can represent.

The trick in scanning is to get the *right* 8 bits per color on output — the ones that best represent the original image (or your custom version of it).

The production-quality scanners we tested help you capture the right bits in several ways. First, each of them captures more than 8 bits per color internally. When you bring an image into Photoshop to correct the tone or color, you throw away data. But if you make those same corrections during a scan, a scanner that captures more than 8 bits of data per color will produce better shadow and high-light detail and greater dynamic range in the final output.

A scanner's software also plays a key role in getting the right 8 bits on output. If you want to reproduce an original as closely as

possible, you should look for a scanner with a good autoexposure feature. If you need to tweak the color on originals, you need scanner software that offers precise control over tone curves and color balance and that is easy to use.

If you're scanning for press, you need software that can translate levels of luminance to amounts of ink. Some of the scanners we tested include software that automatically creates separations, using presets based on color-management technology such as Agfa's FotoTune or on expert knowledge embodied in software such as PixelCraft's ColorAccess. Of course, if you have a thorough understanding of prepress, you can use Adobe Photoshop to produce good color separations from any of the scanners.

There's a bit more to consider with scanning software than just what features it offers for capturing color data. It should also let you set the desired output size and resolution and calculate the necessary input resolution. You shouldn't have to do the math — that's what computers are for. And it should allow you to easily arrive at the correct settings for a scan.

Small Flatbed Scanners

Flatbed scanners are designed mainly for scanning reflective art, but they can also scan transparencies. In fact, the flatbed scanners gave us the best output results from prints. They didn't do as good a job of scanning transparencies as did some of the dedicated transparency scanners or the "baby drums," however.

The two least expensive scanners — the Microtek ScanMaker III (\$2,540 street) and the UMAX PowerLook (\$3,100 street) — are desktop scanners that can scan letter- or legal-sized prints as well as medium- or large-format transparencies. These scanners are good choices for people who scan only small numbers of images and who are satisfied with midrange output quality.

The Microtek ScanMaker III is a promising 12-bit scanner that can handle legal-sized reflective art as well as 8-x-10-inch transparencies at an optical resolution of 600 x 1,200 dpi. This unit produced excellent output from prints and acceptable results from transparencies. But the ScanMaker III's software controls are limited — for example, the software can't figure out the resolution you need based on output size. And although the software offers individual gamma-curve controls for the three color channels, it lacks an on-screen densitometer, so you have to base your adjustments on what you see in a postage-stamp-sized preview (which, by the way, offers only one level of zoom).

The other desktop flatbed scanner, the UMAX PowerLook, scans reflective art as large as 8.3 x 11.7 inches and transparencies as large as 8 x 10 inches, capturing 10 bits of data per color at an optical resolution of 1,200 x 1,200 dpi. The PowerLook's output from prints and transparencies wasn't quite as good as that from the ScanMaker III. In general, the PowerLook's output showed slightly less saturation and, on the transparencies, less shadow detail.

The PowerLook offers much better software controls than the ScanMaker III, however. For example, the PowerLook has good automatic-exposure features, strong interactive color-curve controls, the ability to set output size and resolution, and the ability to perform gang scanning. This fast, easy-to-use scanner is well suited to tasks, such as the production of newspaper inserts or trade magazines, that require medium-quality print.

The Bottom Line

MacUser ZD LABS TO NARROW YOUR CHOICES among these professional-quality scanners, first figure out what type of images you need to scan (print, slide, or transparency). Then consider each scanner's output quality, software usability, and scanning speed. But remember that there's no such thing as a perfect all-around scanner.

⊕ = OUTSTANDING
● = ACCEPTABLE
⊖ = POOR

PRICE/
PERFORMANCE
CUSTOMER
SERVICE
OUTPUT
QUALITY
SOFTWARE
USABILITY

★★★★ PixelCraft Pro Imager 8000 ⊕ ● ⊕ ⊕
This powerful flatbed scanner (\$12,995 list, \$11,880 street) lets you get the best-possible scans from all varieties of images — whether weather-beaten prints, large-format originals such as paintings, or high-quality photographs. The software is top-notch.

★★★★ Kodak RFS 2035 Plus ⊕ ● ● ⊕
A speedy slide scanner, the RFS 2035 Plus (\$8,995 list, \$7,430 street) makes acquisition of mounted or unmounted 35mm slides or negatives nearly foolproof — and very fast. For high-volume scanning of originals that need little or no correction, this slide scanner is hard to beat.

★★★★ Leaf Leafscan 45 ● ● ⊕ ⊕
This high-quality transparency scanner (\$17,000 list, \$15,830 street) is the only scanner we tested that can capture 16 bits of data per color. It provides excellent output quality, and its software offers good controls. Overall, it's a good choice if you need to make lots of color corrections or if you are creating output for film recorders. Scanning can be slow, however.

★★★★	Agfa Horizon Plus	●	●	⊕	⊕
★★★★	Microtek ScanMaker III	⊕	●	●	●
★★★★	UMAX PowerLook	⊕	●	●	⊕
★★★★	Microtek ScanMaker 45t	⊕	●	●	●
★★★★	Nikon LS-3510 AF	●	●	●	⊕
★★★★	ScanView ScanMate Magic	●	●	⊕	●
★★★★	PixelCraft Pro Imager 4520RS	⊖	●	⊕	●
★★★★	Screen DT-S1015AI	●	●	⊕	⊖
★★★★	Sharp JX-610	●	●	●	●

Listing is alphabetical within groups of equal mouse ratings.

figure 1

MacUser
LABS**Output Quality / the best and the worst of the bunch**

HIGH-QUALITY OUTPUT HAS excellent shadow detail, sharpness, clarity, color balance, and color saturation. To find out what level of output quality you can expect from the scanners in this review, we produced two test images. One was a correctly exposed original; the other had serious color flaws. In general, we found that scanning from transparencies gave us the best results. None of the scanners could completely compensate for the errors in the awful image. Here are some examples of the best and the worst results we got for each of the two images.

THE CORRECTLY EXPOSED IMAGE

To test each scanner at its best, we scanned a good original. Although we generally got our best results with transparencies, the PixelCraft Pro Imager 8000 produced equally good results from prints **A**. The output shows good saturation, flesh tones, shadow detail, and color balance. The output from the Leaf Leafscan 45 **B** exemplifies the quality we got from most of the scanners — solid but not premium quality. The final output **C** was produced by the Screen DT-S1015AI. Note the excellent shadow detail, typical of drum scanners. The odd halos around elements of the image and the slightly off color are because we over-sharpened this image — the DT-S1015AI was notoriously hard to work with, due to its poor software interface and nearly incomprehensible manuals.

THE FLAWED IMAGE

To challenge each scanner and test its software controls, we scanned a flawed image. The Agfa Horizon Plus produced above-average output from a print **D**. The Horizon Plus' software offers excellent controls; we were able to get reasonable color-cast and exposure correction without sacrificing too much image data. The next-best output **E** came from a transparency scanned by the Leaf Leafscan 45 — another scanner with excellent software controls. Note the quickly degrading quality between the best output and this example. Believe it or not, this output is still much better than average. The output from a print scanned by the Sharp JX-610 **F** is more typical of the quality we got. The JX-610's software has limited controls — for example, you can't set highlight and shadow points, the preview area is very small, and it offers no interactive prescan mode.

Large-Format Flatbed Scanners

Large-format flatbed scanners are more accurately described as *tabletop* than as desktop devices. They produce higher-quality output than the small, desktop scanners, and they can handle tabloid-sized images. The three we tested — the Agfa Horizon Plus (\$18,360 street), the PixelCraft Pro Imager 8000 (\$11,880 street), and the Sharp JX-610 (\$11,370 street) — let you scan prints, transparencies, and 35mm slides as well as large-format originals such as paintings.

The Agfa Horizon Plus impressed us with its high-quality results, the flexibility and ease of use of its software, and the clarity and

depth of its manuals. This scanner handles reflective art as large as 11.7 x 16.5 inches and transparencies as large as 9.5 x 13.4 inches, capturing 12 bits of data per color, with an optical resolution of 1,200 x 1,800 dpi. The Horizon Plus produced high-quality output from a correctly exposed print and a 4-x-5-inch transparency. But we were particularly impressed with this scanner's ability to produce an acceptable scan from a seriously flawed image. Additionally, the Horizon Plus was the only flatbed scanner we tested that had high enough resolution to produce acceptable results from 35mm originals.

The Horizon Plus includes a Photoshop plug-in, FotoLook, that

MacUser ZD LABS Testing the Scanners / productivity is a critical factor

BEFORE YOU DECIDE ON ONE OF THESE SCANNERS, you'll want to know how productive they can make you. In order to find out, we sat three experienced scanner operators down with the scanners covered in this report and asked them to spend a maximum of two days with every one

of them, trying to get the best output they could from each.

We gave the testers two images for use in the tests. Each contained challenging elements such as flesh tones, dark areas, and reflections. One image was correctly photographed and developed, whereas the other

SCANNER MODEL	OVERVIEW	TYPE OF INPUT JUDGED	OUTPUT QUALITY	EASE OF ACQUISITION	COLOR CORRECTION	INSTALLATION	MINUTES FOR SCAN
 AGFA HORIZON PLUS	An excellent but expensive flatbed scanner for those who need high-quality output — and who need it fast. The software contains a variety of automated features that make the scanner a great choice for high-volume, minimal-intervention scanning.	print and transparency	⊕ Sharp. Bright, saturated colors. Good color balance. Good flesh tones.	⊕ Excellent automatic features (the ability to calculate densities and balance colors, for example). Good batch-scanning capabilities.	⊕ Numerous highly accurate options for correcting color. Manual color-correction features. Can save settings. Offers several different interfaces.	● Easy. Required a field technician to fix a hardware-calibration glitch.	⊕ 1:52 (print/transparency)
 KODAK RFS 2035 PLUS	Everything about this slide scanner is designed to make acquiring reasonable-quality scans both foolproof and quick. A perfect choice for the no-muss, no-fuss set.	slide	● Good color balance. Slightly blurry.	⊕ Specially designed slide holder helps orient the image correctly. Color preview and fast black-and-white preview. Autofocus feature. Intuitive interface.	● Limited software controls. Can get very good exposure and cast correction by enabling autobalance and using sliders to adjust brightness, contrast, and color.	⊕ Very easy. Small, easy-to-move scanner.	⊕ 0:50 (slide)
 LEAF LEAFSCAN 45	This 16-bit transparency scanner produces excellent output. We recommend this scanner to users who frequently need to make difficult color corrections on slides or transparencies or who need to output images to film recorders.	slide and transparency	⊕ Very clean. Sharp. Rich, saturated colors. Wide dynamic range.	⊕ Default settings work well. Maximum range can capture all available information, eliminating the need to set highlight, shadow, or midpoint. Poorly implemented prescan.	⊕ Offers 48-bit-color capture. Photoshop's Levels and Curves controls give corrected 24-bit images. Prescan doesn't automatically reflect parameter changes.	● Bulky. SCSI-ID selection via DIP switches. Manual aperture.	● 4:13 (slide) 2:54 (transparency)
 MICROTEK SCANMAKER III	This flatbed scanner is a solid choice for budget-minded users. Output is very good, installation is a snap, and scanning speeds are fast. Software features, however, pale when compared to those of competing scanners.	print and transparency	● Very good clarity, color saturation, and shadow definition. Good flesh tones. Sharp.	● Flimsy transparency holders. Nonintuitive interface. Must set midpoint in master gamma curve by eye. Controls work very well.	⊖ Limited color control. Extremely small preview image. Printouts required to show color corrections.	⊕ Very easy.	⊕ 1:10 (print/transparency)
 MICROTEK SCANMAKER 45T	This multiformat transparency scanner produced solid output from 4-x-5-inch transparencies. We think this scanner has great potential, given its high-quality hardware, but we'd suggest waiting for the next software revision.	slide and transparency	● Sharp. Good shadow detail. Good saturation. Best results from transparencies.	● Flimsy transparency holders. Nonintuitive interface. Must set midpoint in master gamma curve by eye. Controls work very well.	⊖ Limited color control. Extremely small preview image. Printouts required to show color corrections.	⊕ Very easy.	● 3:22 (slide/transparency)
 NIKON LS-3510 AF	If you need to scan 35mm slides and you want to do it accurately and efficiently, you should check out the LS-3510 AF. This easy-to-use scanner produces impressive output — and its small size makes it perfect for a designer's desktop.	slide	● Great clarity and sharpness. Good color saturation. Very good flesh tones. Good color accuracy.	● Lets you quickly and easily change slides in the slide holder. Excellent default settings. Large preview image. Handy file-size control.	⊕ Easy-to-use, accurate controls. Offers interactive, visual gamma-curve adjustment. No color-cast-removal feature. Easy to modify color balance.	● Awkward connection scheme. SCSI port located inside unit on an interface board. Small footprint.	● 2:58 (slide)

KEY ✓ MacUser RECOMMENDS ⊕ = OUTSTANDING ● = ACCEPTABLE ⊖ = POOR

one had serious color flaws. Our testers dutifully recorded the steps they had to take (and sometimes the hoops they had to jump through) in order to get the best-possible output.

To judge the final quality, we made four-color separations on an

imagesetter and had Matchprint laminated proofs made. We also timed how long it took each scanner to create a final 4-x-5-inch, 300-dpi scan. To preview and correct scans, we used PrecisionColor Displays, LeMans GT graphics accelerators, and a PrecisionColor Calibrator — all from Radius.

SCANNER MODEL	OVERVIEW	TYPE OF INPUT JUDGED	OUTPUT QUALITY	EASE OF ACQUISITION	COLOR CORRECTION	INSTALLATION	MINUTES FOR SCAN
PIXELCRAFT PRO IMAGER 4520RS 	If you need to get output quickly, you should avoid this transparency scanner. The Pro Imager 4520RS comes with solid scanning software and PixelCraft's excellent ColorAccess color-separation program, but acquiring an image is painfully slow.	slide and transparency	⊕ Very sharp. Good color balance. Good clarity and flesh tones.	⊖ Slow (calibration takes more than 11 minutes). Requires multiple prescans. No color preview. Provides background calibration. Occasionally reads color cast incorrectly.	⊕ Weak tools for correcting color during acquisition. Color correction needs to be done later with ColorAccess. Makes color separations.	⊖ Frustrating. Requires system extension. Frequent recalibration malfunctions during setup.	⊖ 7:30 (slide) 7:26 (transparency)
	This huge, quick (and slightly noisy) flatbed scanner handles large-format reflective art, filling the niche between desktop and prepress scanners. It took us only about 5 minutes to correct and output a high-quality scan of our good image.	print	⊕ Clean images with wide tonal range and good shadow detail. Good saturation.	⊕ Prescans execute quickly. Good color-cast correction. Interactive feedback for selecting highlight and shadow points. No color preview.	⊕ Weak tools for correcting color during acquisition. Color correction needs to be done later with ColorAccess. Makes color separations.	● Large, heavy unit. Solid manual. Scary warnings about improper installation and consequent irreparable damage.	⊕ 0:46 (print)
SCANVIEW SCANMATE MAGIC 	This baby drum scanner delivers incredibly sharp, saturated output from transparencies, but scans of reflective originals are flawed. In addition, mounting originals on the drum is tedious, the software is hard to use, and scanning is slow.	print and transparency	⊕ Excellent crispness, shadow detail, color saturation, and reproduction from transparencies.	● Difficult to mount transparencies and reflective art. Very good automatic controls. Requires minimal intervention. Long prescan times. Extensive batch controls.	● Cryptic software. Handy saturation-curve control. Awkward cast correction. Cast correction can cause plateaus of color correction.	● Easy. Sturdy, well-packaged unit. Confusing software installation despite step-by-step instructions in manual.	⊖ 9:20 (print) 9:30 (transparency)
SCREEN DT-S1015AI 	This baby drum scanner is the least likely to win users' hearts and minds, due to confusing software, the weakest color-correction tools of all, and virtually incomprehensible manuals. But output quality on transparencies is excellent.	print and transparency	⊕ Clear, bright, sharp. Saturated colors. Good flesh tones and shadow detail.	⊖ Must manually recalibrate for each scan. Calibration establishes highlight and shadow defaults. Good automatic features for removing color cast.	⊖ Limited functionality. No interactive preview. No visual gamma curves. Hard to fine-tune numerical controls. Best results with RGB scans.	⊖ Manuals badly translated from another language. Setup requires use of five highly disorganized manuals.	⊕ 1:35 (print/transparency)
SHARP JX-610 	When it comes to speed, price, and output quality, this flatbed scanner sits squarely in the middle of the pack. Inadequate vendor-supplied software prevents us from recommending the JX-610 for prepress work.	print and transparency	● Good color balance and saturation. Good shadow detail.	⊖ PixelCraft software works only with prints. Sharp's software is difficult to use. Small preview. Individual gamma controls for each color channel.	⊖ Cannot set highlight and shadow points. Supports automatic white-point balancing. Difficult to adjust parameters. No interactive prescan.	⊕ Very easy.	● 2:26 (print) 2:59 (transparency)
UMAX POWERLOOK 	This fast, inexpensive flatbed scanner creates solid output. It doesn't have all the bells and whistles of its higher-end relatives, but it's a great choice for users who need to produce numerous scans of middle-of-the-road quality.	print and transparency	● Good clarity and color saturation. Fair shadow definition. Good flesh tones. Sharp.	⊕ Fast, zoomable preview. Good automatic color controls. Effective slider for gamma correction. Poor cropping and sizing tools.	⊕ Several interfaces for color correction. Easy to use. RGB densitometer. Has highlight and shadow eyedroppers.	⊕ Very easy.	⊕ 0:33 (print) 0:38 (transparency)

KEY  MacUser RECOMMENDS ⊕ = OUTSTANDING ● = ACCEPTABLE ⊖ = POOR

offers a large, fully interactive color preview. The software includes strong automatic-exposure features and precise color-balance controls for setting white and black points and individual color curves. An on-screen densitometer provides constant numerical feedback. When used in conjunction with Agfa's FotoTune color-management system (a limited version ships with the scanner), the Horizon Plus can deliver CMYK output directly from a scan. These features plus its strong batch-scanning mode make the Horizon Plus a great choice for high-volume, minimal-intervention scanning.

The Sharp JX-610, which captures 12 bits of data per color at 600 x 1,200 dpi, produced high-quality results, but Sharp's software is limited. The preview doesn't update to reflect changes to the settings, so you need to create multiple prescans. There's no curve control or white- and black-point settings. Sharp supplies a version of PixelCraft's QuickScan software, which offers much better control, but the version we received didn't support the transparency adapter. (Sharp claims, however, that it should work with the adapter.)

The JX-610 is considerably slower when scanning than the other two large-format flatbed scanners, and unlike the others, it has no provision for gang scanning. Thus, the only actual use you can get from its large, 12-x-17-inch image area is to scan tabloid-sized

originals. The JX-610 is considerably smaller than the other two large-format flatbeds but requires almost as large an operating area, because of its copierlike design (the lid moves during scans).

The PixelCraft Pro Imager 8000 produced the best results from prints of any of the scanners. (The transparency adapter wasn't available at testing time but should be by the time you read this.) The scanner handles reflective art up to 11.7 x 17 inches, capturing 12 bits of data per color at an optical resolution of 400 x 1,400 dpi.

It comes bundled with the QuickScan plug-in driver and ColorAccess, an application that does an excellent job of converting RGB scans to CMYK color separations. QuickScan lets you scan directly into either Photoshop or ColorAccess: It allows you to set the desired output size and resolution and find the white and black points visually. It doesn't offer color-correction features, relying instead on ColorAccess, which, for example, automatically removes color casts from images you scan into it.

Although the PixelCraft Pro Imager 8000 and the Agfa Horizon Plus each provide a potent package for scanning from prints, we give the nod to the Pro Imager 8000, because it is significantly less expensive than the Horizon Plus, is faster, and has easier-to-use software.

figure 2

Features of Color Scanners / the specifications you need to know

	Agfa Horizon Plus	✓ Kodak RFS 2035 Plus	✓ Leaf Leafscan 45	Microtek ScanMaker III	Microtek ScanMaker 45t	Nikon LS-3510 AF	PixelCraft Pro Imager 4520RS
List price	\$19,995	\$8,995	\$17,000	\$3,499	\$7,999	\$9,995	\$16,995*
Street price	\$18,360	\$7,430	\$15,830	\$2,540	\$6,100	\$7,860	\$15,320
Scanner type	flatbed	slide	transparency	flatbed	transparency	slide	transparency
Bits of data captured	12 bits	12 bits	16 bits	12 bits	12 bits	12 bits	12 bits
Optical resolution	1,200 x 1,800 dpi	2,000 dpi	5,080 dpi	600 x 1,200 dpi	1,000 dpi	4,096 dpi	2,000 dpi
Interpolated resolution	1,800 x 1,800 dpi	NA	NA	2,400 x 2,400 dpi	2,000 dpi	NA	NA
Maximum reflective size	11.7 x 16.5 in.	NA	NA	8.3 x 14 in.	NA	NA	NA
Transparency formats supported							
35mm	●	●	●	●	●	●	●
120 roll film	●		●	●	●		●
4 x 5 in.	●		●	●	●		●
Transparency adapter included	●	NA	NA	§	NA	NA	NA
Sensor type							
Linear CCD	●		●	●	●	●	●
Area CCD		●					
PMT							
SCSI interface		●		●	●	●	●
SCSI-2 interface	●		●				
Manual focus							
Automatic focus	●	●	●			●	●
Fixed focus				●	●		
Gang scanning	§						●
Supports scanning to CMYK	●		**	**	**		**
Exposure control	●	●	●			●	●
Editable prescan	●	●	●	●	●	●	●
Color preview	●	●	●	●	●	●	●
Background scanning						●	●
Histogram	●		●	●	●	●	●
Toll-free tech support	●	●					●
Service contract available	●	● ^{††}	●				●
Warranty	90 days	90 days	90 days	1 year	1 year	1 year	90 days

✓ MacUser RECOMMENDS

*The Pro Imager 4520RS and 8000 are sold together for \$24,995.

**With Photoshop or ColorAccess only.

[†]Price is for SE Bundle, which includes Photoshop LE, QuickScan,

^{††}Available through dealer.

Slide Scanners

Scanning 35mm originals presents a special challenge. They are so small that the scanner needs very high resolution if you want to reproduce images at a larger size with acceptable quality or if you want to crop them and enlarge parts of them. This constraint narrows your choice of scanner to either a transparency scanner or a desktop drum scanner.

If you need to scan *only* 35mm originals, a dedicated slide scanner is your best bet. Multifformat transparency scanners are either more expensive than dedicated slide scanners or they don't have quite enough resolution. Desktop drum scanners have high resolutions, but the original image must be taped to a fixed drum — an awkward and time-consuming affair.

We looked at two slide scanners — the Kodak RFS 2035 Plus (\$7,430 street) and the Nikon LS-3510 AF (\$7,860 street). Each captures 12 bits of data per color, allowing for plenty of flexibility in making corrections on scans. The results we got from the two scanners were very similar: The Nikon LS-3510 AF had a very slight edge in overall sharpness, but the color quality from the two scanners was virtually identical.

The Kodak RFS 2035 Plus runs more than three times as fast as

the Nikon LS-3510 AF, but the Nikon LS-3510 AF gives you more control over color correction. For example, the Nikon LS-3510 AF provides interactive control over the individual gamma curves for each color channel. The Kodak RFS 2035 Plus, on the other hand, offers master contrast and brightness controls plus slider controls for color balance.

If you simply want to scan 35mm originals as quickly and faithfully as possible with minimum intervention and you don't need to enlarge the results beyond 8 x 10 inches, the Kodak RFS 2035 Plus is an excellent choice. It's particularly useful for newspaper work, where 35mm is usually the format of choice and speed is of the essence. If, however, the 35mm originals you work with are of such quality that you can make conventional prints larger than 8 x 10 inches with acceptable sharpness, you may want the higher resolution of the Nikon LS-3510 AF.

Multifformat Transparency Scanners

Multifformat transparency scanners generally handle transparencies from 35mm to 4 x 5 inches or even larger — but that doesn't necessarily mean these scanners are able to handle all formats equally well. We tested three very different multifformat transparency

scanners — the Leaf Leafscan 45 (\$15,830 street), the Microtek ScanMaker 45t (\$6,100 street), and the PixelCraft Pro Imager 4520RS (\$15,320 street).

The Microtek ScanMaker 45t did quite well on the 4-x-5-inch transparencies, showing good shadow detail. It didn't fare nearly as well on the 35mm slide, however, due in part to its relatively low 1,000-dpi optical resolution. Unlike the other multifformat scanners, which apply the full resolution of the scanner to the 35mm image area, the ScanMaker 45t treats 35mm slides as a small part of the 4-x-5-inch image area.

The ScanMaker 45t has a few other faults as well. First, it can't handle mounted slides — we had to take the slide out of the mount to scan it. Second, the software is weak — small changes made to the gamma curves result in disproportionately large changes to the image. (Microtek claims that it is currently updating the software.)

The PixelCraft Pro Imager 4520RS produced some of the best results from transparencies of any of the scanners, due to the seamless integration of the QuickScan plug-in driver and PixelCraft's excellent ColorAccess separation software. The Pro Imager 4520RS has two main drawbacks, however. First, with an optical resolution of 2,000 dpi, the Pro Imager 4520RS is well suited for scanning 4-x-5-inch transparencies but can't produce top-of-the-line scans from 35mm originals. Second, the Pro Imager 4520RS is slow. To get a good scan, we had to

✓ PixelCraft Pro Imager 8000	ScanView ScanMate Magic	Screen DT-S1015AI	Sharp JX-610	UMAX PowerLook
\$12,995*	\$13,000	\$19,995	\$13,500	\$3,695 [†]
\$11,880	\$12,150	\$18,350	\$11,370	\$3,100
flatbed	drum	drum	flatbed	flatbed
12 bits	12 bits	10 bits	12 bits	10 bits
400 x 1,400 dpi	2,000 dpi	2,500 dpi	600 x 1,200 dpi	1,200 x 1,200 dpi
4,000 x 4,000 dpi	NA	NA	1,200 x 1,200 dpi	2,400 x 2,400 dpi
11.7 x 17 in.	8.5 x 11.5 in.	5.8 x 5.9 in.	12 x 17 in.	8.3 x 11.7
●	●	●	●	●
●	●	●	●	●
●	●	●	●	●
5	●		●	●
●	● [°]		●	●
●		●		
●	●	●	●	●
		●		
●	●		●	●
●	●	●		●
**	●	●	●	**
●	●	●	●	●
●	●	●	●	●
●	● ⁵	●	●	●
●	●	●	●	●
●	●	● ^{††}	●	●
90 days	90 days	90 days	1 year	1 year

and ColorAccess.

[°]Optional.

[°]Uses a single photodiode that provides enhanced dynamic range.

The Leaf Lumina / scanner or camera?

EVERY SO OFTEN, we run into a product that just doesn't fit into any of our traditional categories. The Leaf Lumina, a combination scanner and digital camera, is one such product. Like many of the scanners we tested, the Lumina houses a trilinear CCD (charge-coupled device) array that scans images, it captures 12 bits of data per color, and it handles reflective and transmissive originals. But like a camera, the Lumina mounts on a tripod (or a copy stand), can capture 3-D images, and uses standard 35mm Nikon SLR lenses. It has a maximum optical resolution of 2,700 x 3,400 dpi, but that resolution varies depending on which lens you attach.

We quickly developed a love/hate relationship with the Lumina. Assembling the camera, attaching its cable to the Mac's SCSI port, and installing the Photoshop-plugin driver were simple, taking only about ten minutes. But to use the Lumina as a scanner, you must attach it to a copy stand, set up adequate lighting, and position the

originals correctly on the copy stand. Just assembling the copy stand took us two hours, and positioning the lights and the originals was an ongoing project.

The Lumina's software is heavily oriented to RGB color space, lacking references to CMYK output or half-tone frequencies. Controls are powerful and straightforward. It has a scalable RGB densitometer and a histogram that uses an f-stop metaphor. Exposure controls are extensive, and you can control tonal range manually or have the Lumina do it automatically. It even has a

semiautomatic tonal-range mode that lets you crop an image to isolate the area for which you would like the scanner to make its tonal-range decisions. You can also select a neutral image area for the software to use in making automatic adjustments to color casts.

The final output was of acceptable quality. We had to adjust curves and exposure levels quite a bit in order to get acceptable shadow detail. The camera tends to vibrate on the copy stand, causing the lens to lose focus after repeated scans. In some cases, the output we got was noticeably streaked, possibly due to the movement of the camera on the copy stand or light reflecting from people passing by.

Our final opinion? If you need to scan only standard prints, transparencies, or slides, we think you will be better off with one of the traditional scanners we tested. The Lumina is expensive (\$7,500 list, \$6,765 street), and you need to spend an above-average amount of time focusing on, composing, lighting, and adjusting images in order to get high-quality scans. Photographers who have never done scanning and scanner operators who have never done photography will likely be frustrated by the setup.

If, however, you have a job you just can't do with a conventional scanner, you may find a solution with the Lumina. Photographers who take a lot of product shots or who must acquire a lot of images from flat copy-stand art can make good use of the Lumina. And because of its ability to accept originals of all shapes and sizes, the Lumina can work well for companies that need to produce brochures or mail-order catalogs that are filled with product images.

/ Cheryl England and Sabin Paul Speiser



produce three or four prescans — each of which took 30 seconds. The final scan (for a 4-x-6-inch, 300-dpi image) took over 7 minutes. Final scans can, however, be performed in the background.

The Pro Imager 4520RS is a reasonable choice for prepress work. Its resolution is a fine match for the range of colors that can be reproduced in four-color printing. Anyone scanning for output to digital transparencies via a film recorder (which has a wide color range), however, would almost certainly be disappointed with the limited saturation and dynamic range this scanner produces.

The Leafscan 45 produced excellent results with the 35mm slide and the 4-x-5-inch transparencies. It has a resolution of 5,080 dpi (sufficient for virtually any purpose), and it captures 16 bits per color (providing excellent shadow detail and allowing you to make very aggressive color corrections without introducing posterization). The Photoshop-plugin driver provides strong controls over tone and color, has a very good automatic-exposure feature, and includes a resizable preview window. With Photoshop 2.5.1, you also have the option of ignoring the scanner's own tone and color controls and simply bringing the entire 48-bit image, which contains all the data the scanner can capture, into Photoshop to use its Levels and Curves controls to correct tone and color, respectively.

The only complaint we have about the Leafscan 45 is that its prescan module is poorly implemented. You must recalibrate the scanner every time you open the acquisition module. Still, for images destined for output to a digital film recorder, the Leafscan 45 is an excellent choice.

Desktop Drum Scanners

Desktop — or baby — drum scanners are smaller, less expensive versions of the full-fledged drum scanners many service bureaus use. These scanners work with prints, transparencies, and slides and, in general, provide the best-possible shadow detail. If you need premium-quality output, check out the two desktop drum scanners we tested — the ScanView ScanMate Magic (\$12,150 street) and the Screen DT-S1015AI (\$18,350 street).

The two have very different personalities, but they share one attribute: Each has a fixed (nonremovable) drum that makes loading images a considerable hassle (see figure 3). The ScanMate Magic's drum accommodates images as large as 8.5 x 11.5 inches, but the Screen DT-S1015AI has a tiny drum that accepts originals only as large as 5.8 x 5.9 inches. Unlike full-sized drum scanners, these baby units don't offer gang scanning.

The ScanMate Magic produced the best results for transparencies of any of the scanners we tested. The output from the reflective art, however, was disappointing. If you don't want to damage the print, you need to place it in a clear plastic sleeve, which cuts down light transmission and gives a poorer scan. All scans take a long time to produce — a 4-x-5-inch, 300-dpi scan took an average of 9 minutes, 30 seconds, and a prescan took almost 4 minutes, making this far and away the slowest scanner of all.

For an extra \$1,650, you can get the ScanMate Magic with a powerful but somewhat confusing set of applications, collectively called ColorQuartet, that offer scanning and separation controls and an expert system for scanning. ColorQuartet is probably better suited to ScanView's pricier drum scanners, which have larger drums.

The Screen DT-S1015AI also produced excellent results from

figure 3

Aligning an Image / the drum-scanner dilemma



Like placing a label on a jar, aligning an image on the drum of a drum scanner requires a bit of experimentation. First of all, you must put some tape onto the chrome (left), and then you must tape the chrome to the drum (right). If the chrome doesn't end up being completely straight, either you have to try again or you have to resort to using Photoshop to align a crooked scan.

transparencies and fared somewhat better with prints than did the ScanMate Magic. The DT-S1015AI is also very fast, scanning a 4-x-5-inch image at 300 dpi in about 1 minute, 30 seconds.

The DT-S1015AI's software, however, is definitely aimed at experienced drum-scanner operators. It doesn't show corrections interactively in the preview, nor does it offer any curves or levels controls. Instead, corrections must be made strictly by the numbers. The manuals are of little help — they are obvious translations from a foreign language into something that only superficially resembles English. If you're an experienced drum-scanner operator, you may find the DT-S1015AI attractive, but if you're used to doing color correction by using curve or gamma controls, you may find it more than a little baffling.

Picking and Choosing

Money can buy happiness: We found clear differences in output quality between the less expensive scanners and those with five-figure price tags. These differences were particularly apparent in the scanners' ability to capture shadow detail from transparencies. Whether or not that difference in output quality will be noticeable in your work is another question. The golden rule of computing — garbage in, garbage out — applies to scanning as well. If you're scanning prints from a one-hour photo lab, there's a limit to what even the best scanner can achieve. Likewise, not every print job demands premium scans — the requirements for newsprint are much lower than for glossy brochures, for example.

For those who are on a limited budget and need flexibility, the two desktop flatbed scanners — the Microtek ScanMaker III and the UMAX PowerLook — are worth a look. The ScanMaker III produced better output, but the PowerLook comes with more-powerful software. Neither scanner captured enough shadow detail for high-quality work, however.


If you need to go a step up in output quality — and can afford to leap up in price — but still want a flatbed scanner, we suggest you look at either the Agfa Horizon Plus or the PixelCraft Pro Imager 8000. The Horizon Plus is very versatile. It can handle everything from oversized reflective art to, in a pinch, 35mm slides. Output

quality ranges from acceptable to excellent, depending on the type of image, and scans are always quick. The Horizon Plus is an excellent choice for a service bureau that needs to scan whatever it receives. If, however, you need a scanner primarily for reflective art, you should consider the PixelCraft Pro Imager 8000. This speedy scanner produced the best results we obtained from prints.

For scanning 35mm slides, two scanners — the Leaf Leafscan 45 and the Kodak RFS 2035 Plus — stand out. The Leafscan 45 can handle transparencies as well as slides, it has the highest resolution of all the scanners we tested, and its software controls offer almost unparalleled flexibility. The RFS 2035 Plus is faster and has very effective automatic-exposure

and color-balancing features that work extremely well for reproducing originals as closely as possible.

For scanning transparencies, our overall choice was the Leaf Leafscan 45. The ScanView ScanMate Magic is a close contender, however. It gave us the best results for transparencies, but unfortunately, those results took a very long time to produce. The Microtek ScanMaker 45t gave us good results from transparencies, but this scanner's software was too weak to make it a true competitor.

None of the scanners was an overall winner. At this level, scanners start to become quite specialized. You need to consider the relative importance of speed, output quality, and flexibility in scanning different types of originals and weigh all three according to your needs. 

Contributing editor Bruce Fraser is coauthor of *Real World Photoshop 3.0*, to be published this year by Peachpit Press. Anita Epler, a ZD Labs project leader, managed the testing for this report.

Directory / vendors of scanners tested

Agfa

Ridgefield Park, NJ
800-685-4271
508-658-0200
508-583-4168 (fax)

Kodak

Rochester, NY
800-242-2424
716-726-9728 (fax)

Leaf Systems

Southborough, MA
800-685-9462
508-460-8300
508-460-8304 (fax)

Microtek

Redondo Beach, CA
800-654-4160
310-297-5000
310-297-5050 (fax)

Nikon

Melville, NY
800-526-4566
516-547-4355
516-547-0305 (fax)

PixelCraft

San Leandro, CA
800-933-0330
510-562-2480
510-562-6451 (fax)

ScanView

Foster City, CA
415-378-6360
415-378-6368 (fax)

Screen (USA)

Rolling Meadows, IL
800-372-7737
708-870-7400
708-870-0149 (fax)

Sharp Electronics

Mahwah, NJ
800-237-4277
201-529-9113 (fax)

UMAX Technologies

Fremont, CA
800-562-0311
510-651-9488
510-651-8834 (fax)



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NEC

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Choosing the Right Monitor

A MONITOR CAN BE your most nerve-racking peripheral purchase — and your most important. Nerve-racking because monitors are increasingly complex and highly individual. Most important because your monitor is the part of your system with which you interact most directly. A fast hard drive may be critical to your work, but you're not staring at it for hours on end. Your monitor is your window into your Mac.

In the past year, there's been an explosion of monitors to choose from and a flood of new places to buy them. The days of a single reigning champ — the 13-inch, \$999, available-at-dealers-only AppleColor High-Resolution RGB Monitor — are long gone. Today quality, resolution, service, and price are all over the map. Many monitor vendors — especially those that have crossed over from the PC world — now offer you a choice between low-cost and high-quality models. Even Apple is selling monitors at many stops along the price/performance continuum.

To make matters even more troubling, some vendors' quality control is so poor that there are large variances in sharpness, brightness, and other

You spend more time looking at it than at anything else in the world. Pick the right monitor, or pay the price in fatigue, eyestrain, and lost productivity.

By Rik Myslewski and Jeff Pittelkau



aspects of image quality from unit to unit. If you're buying just one monitor at your friendly neighborhood Mac dealer, you can carefully examine the unit you're about to haul off. But what if you're buying a couple dozen monitors for your department? And what if you're buying from a mail-order firm? You need to know which technology to choose, what features you need, how to evaluate the shipment when it arrives, and what terms to demand from the vendor.

That's where we can help.

MASK AND GRILLE: Each Has Its Uses

Monitors and televisions are the last hurrah for vacuum-tube technology. Inside each monitor is a CRT (cathode-ray tube). The CRT contains an electron gun that fires beams through a *shadow mask* or *aperture grille*, which limits each beam to striking a red, green, or blue phosphor (see the "Monitor Evolution" sidebar). Most current shadow masks are made of an *Invar* alloy, which resists deformation by the heat produced by beams from the electron gun. If

Monitor Evolution / the benefits of a state-of-the-art monitor

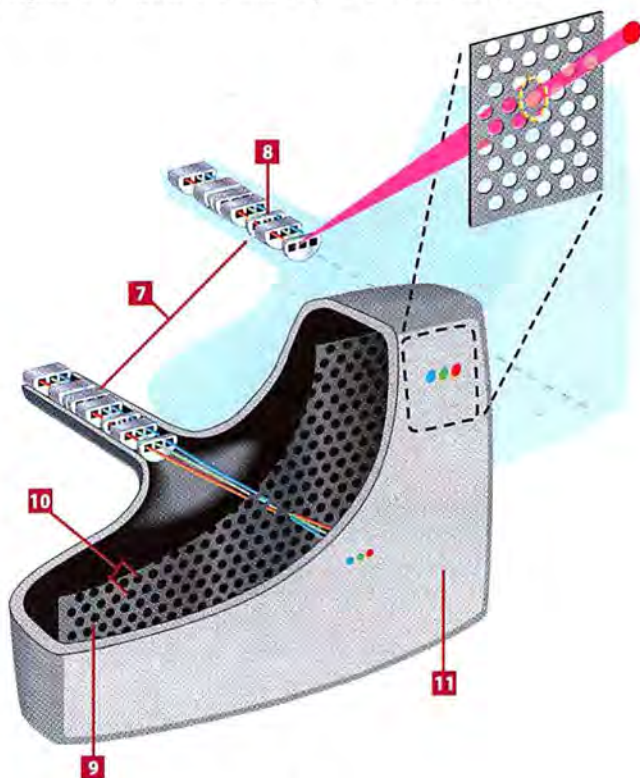
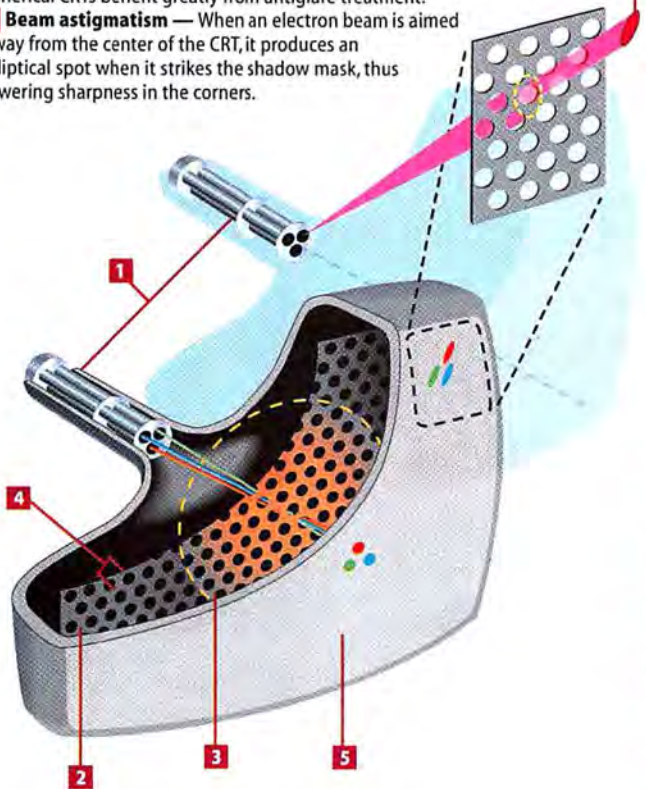
MONITORS CONTINUE TO IMPROVE, so make sure you don't buy one based on an out-of-date technology. Original shadow-mask CRTs had problems such as doming and overly large dot pitch. Subsequent shadow-mask technology has overcome most of the deficiencies of earlier designs. Sony's Trinitron aperture-grille CRTs — first

introduced back in '68 — were a great advance over then current shadow-mask technology. Mitsubishi has recently introduced some improvements over the venerable Sony design.

CRT quality can vary greatly: CRTs come off the assembly line with varying degrees of sharpness and uniformity — some even have small

Early Shadow Mask

- 1 Delta gun** — Original shadow-mask CRTs used three separate guns arranged in a triangular configuration.
- 2 Iron shadow mask** — Precisely aligned so that only the appropriate beam is allowed to hit the red, green, or blue phosphor, a shadow mask absorbs electron energy, which is converted to heat.
- 3 Doming** — When iron shadow masks heat up, expansion causes doming, which in turn causes the electron beams to stray from their intended target phosphors. Color and brightness distortion results.
- 4 Dot pitch** — The distance between two holes in the shadow mask masking two adjacent dots of the same color is called dot pitch. Early CRTs had high dot pitches and, thus, low resolution.
- 5 Spherical CRT surface** — Because they reflect overhead lighting, spherical CRTs benefit greatly from antiglare treatment.
- 6 Beam astigmatism** — When an electron beam is aimed away from the center of the CRT, it produces an elliptical spot when it strikes the shadow mask, thus lowering sharpness in the corners.



Advanced Shadow Mask

- 7 In-line gun** — Three in-line guns produce fine electron beams and have precise alignment. This trio allows for high-resolution displays and has helped shadow-mask designs compete with aperture-grille ones.
- 8 Double quadrupole lens** — Each electron beam travels through two lenses that preshape the beam to minimize astigmatism in the corners, allowing for excellent sharpness over the entire screen surface.
- 9 Invar shadow mask** — The Invar alloy can operate at a higher temperature without doming, so the electron beams can be stronger, resulting in a brighter picture.
- 10 Fine dot pitch** — Modern shadow-mask CRTs can have a dot pitch as fine as .25 millimeters, for exceptional image clarity. However, fine-dot-pitch shadow masks are difficult (and expensive) to manufacture.
- 11 Flat-square CRT surface** — Compared to older shadow-mask CRTs, a flat-square shadow-mask CRT has greatly reduced curvature and less rounded corners for a much flatter image that's less distorted.

you purchase a shadow-mask monitor, make sure the mask is made of Invar or a similar distortion-reducing alloy. Aperture grilles contain stretched wires instead of a mask, so they're essentially impervious to heat.

Aperture-grille CRTs — such as the familiar Sony Trinitron (also supplied by Sony to numerous other monitor vendors, such as Apple, Nanao, and Nokia) and the Mitsubishi DiamondTron — are known for their crisp focus and benefit from having cylindrical

screens, which cut down on reflections from overhead lighting. Shadow-mask CRTs, once justly derided as inferior, have improved markedly and become more widespread over the years. Monitors manufactured by such shadow-mask leaders as Hitachi and Matsushita and supplied to vendors such as SuperMac and RasterOps are now preferred by many designers, who credit their vertical and horizontal lines with being more equally rendered — a benefit for CAD/CAM work, for example.

imperfections in the phosphor coating or air bubbles in the glass.

Sony makes all Trinitron aperture-grille CRTs — and you can bet it saves the best for its own monitors and those of key customers who demand top quality. At press time, the Mitsubishi DiamondTron CRT was available only in monitors from Mitsubishi, SuperMac, and Ikegami.

Shadow-mask monitors are a whole different story: Because many manufacturers make shadow-mask CRTs, and because many of these CRTs are essentially interchangeable, monitor vendors may buy CRTs from several competing manufacturers — one reason why shadow-mask monitors cost less and why their quality can vary greatly.

Sony Trinitron

12 Trinitron gun — A Trinitron gun has dynamic quadrupole lenses for reduced beam astigmatism. Unlike with shadow-mask-CRT guns, however, all three electron beams travel through the same lenses.

13 Aperture grille — Fine, tightly stretched wires align the electron beams with the appropriate phosphors. Since an aperture grille allows more electrons to pass through, the electron beams needn't be as powerful as those in a shadow-mask CRT. Also, aperture grilles are not susceptible to doming, so image uniformity is very high.

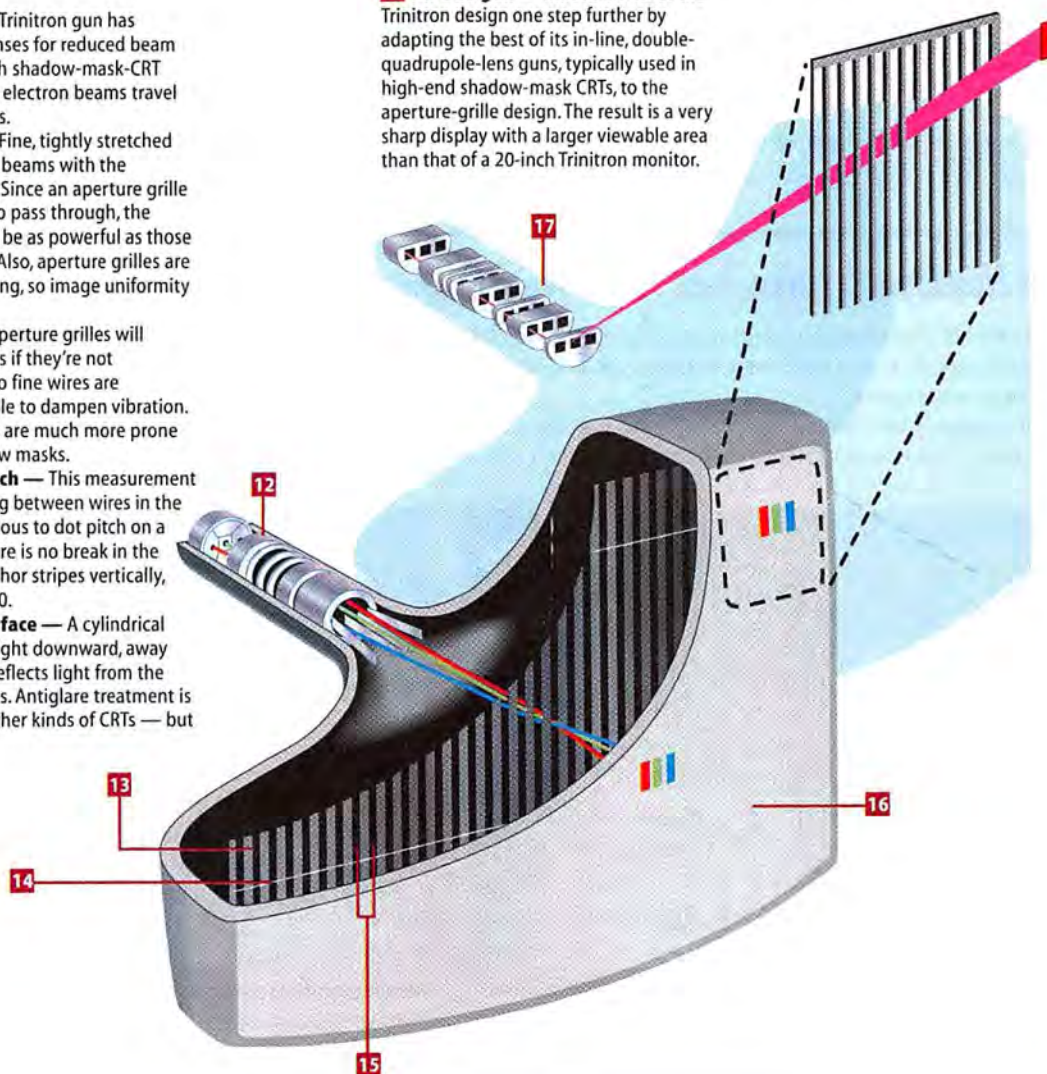
14 Tension wires — Aperture grilles will vibrate like piano strings if they're not restrained, so one or two fine wires are stretched across the grille to dampen vibration. Even so, aperture grilles are much more prone to vibration than shadow masks.

15 Aperture-grille pitch — This measurement of the horizontal spacing between wires in the aperture grille is analogous to dot pitch on a shadow mask. Since there is no break in the aperture grille or phosphor stripes vertically, the vertical dot pitch is 0.

16 Cylindrical CRT surface — A cylindrical face reflects overhead light downward, away from the user, but still reflects light from the sides into the user's eyes. Antiglare treatment is less critical than with other kinds of CRTs — but is still helpful.

Mitsubishi DiamondTron

17 NX-DBF gun — Mitsubishi takes the Trinitron design one step further by adapting the best of its in-line, double-quadrupole-lens guns, typically used in high-end shadow-mask CRTs, to the aperture-grille design. The result is a very sharp display with a larger viewable area than that of a 20-inch Trinitron monitor.



Clustered around the end of the CRT is critical support circuitry. The most important is the *yoke*, with two precisely wound electromagnets that rapidly direct the electron beams across the inside surface of the screen. The manufacturers fine-tune color purity and *convergence* — the beam's ability to strike the screen in the proper place — with the help of magnets that are placed by hand at the factory and held in place with glue. However, these magnets can fall off and the yoke can slip during shipping mishaps. This delicacy is one reason you should buy from a local dealer or from a mail-order vendor that offers a no-questions-asked money-back guarantee or exchange program.

SIZE: Bigger Is Better — Usually

A monitor's image is generated when an electron gun draws lines across the inner surface of the screen in a sequence called a *raster scan*, with each line made up of small dots called *pixels*, or picture elements.

There are four primary Mac display standards for *resolution*: 640 x 480 pixels, for 13-, 14-, and 15-inch monitors; 832 x 624 pixels, for 16- and 17-inch monitors; 1,024 x 768 pixels, for 19-inch monitors; and 1,152 x 870 pixels, for 20- and 21-inch monitors. Each of these resolutions operates at its own scanning frequency, and until recently, most monitors sold for use with the Mac could operate at only one of those frequencies — the one appropriate to the size of the monitor.

Things are different today, however. Most high-quality monitors can display multiple frequencies — if they're connected to a Mac

with the proper cable. These versatile performers are called *autosynchronous* monitors, since they can automatically synchronize their display circuitry with video signals of various frequencies. Apple has adapted to this change in monitor technology: Its new Multiple Scan series includes autosynchronous capability, and on all post-Quadra 700 Macs and PowerBooks with video-out capability, the latest version of the Monitors control panel supports switching among available resolutions without restarting.

If you're a business user, buy the biggest well-focused monitor you can afford — or fit on your desk. Because the Mac's multitasking capabilities allow for many open windows, a large display lets you spread out your work instead of overlapping it. Consider at least a 16- or 17-inch monitor. You can find a multiple-frequency display in this size range that'll handle resolutions as high as 1,152 x 870 pixels.

If you spend your day doing DTP or image processing, don't trap yourself with limited screen real estate: Move up to a 20- or 21-inch monitor. You may save money up front by buying a smaller monitor, but the increased productivity you'll get with a wide-screen view of your layout or image will soon pay for what you first thought was merely a luxury. But be forewarned: The bigger the monitor, the more trouble it has displaying crisp text and graphics at all points on the screen — especially the edges and corners.

If you're a Performa user and simply need a straightforward color display, stick to a 13-, 14- or 15-inch monitor that displays 640 x 480 pixels — the standard Mac resolution since the Mac II. Most color edutainment and game software is written to this standard, so avoid

The MacUser Screen Test / do-it-yourself monitor evaluation

MONITORS ARE INDIVIDUALS. More than with any other type of Mac peripheral, quality can vary from unit to unit and — as a monitor ages — from month to month.

The comprehensive monitor testing we conduct at MacUser/ZD Labs employs sophisticated test equipment to determine the quality of

a monitor's design and engineering. Using this equipment, we can confidently predict that the monitor models we stamp with the MacUser RECOMMENDS seal of approval have the capability to perform exceptionally. However, we also suggest that you carefully examine the individual monitors you purchase to ensure that they're living up to their

Adjust Screen Geometry

If your monitor has size and position controls — rotation, pincushion, trapezoidal distortion, and linearity — this image will also allow you to adjust them to achieve a perfectly proportioned grid.

If your monitor does not have these controls and if the grid is in any way distorted, choose another monitor or have this one serviced.

Set Convergence

If your monitor has user-accessible vertical and horizontal convergence controls, use them to align the red and blue lines as closely with the green crosshairs as possible.

If your monitor does not have these controls and if the red or blue lines are noticeably out of alignment, ask your dealer to adjust the monitor's internal controls.

Many autosynchronous monitors allow you to precisely adjust a display's *geometry* — its ability to display straight, parallel, and evenly distributed lines. If your monitor lacks these controls, and if it has poor geometry, only your dealer can adjust it.

Better monitors provide user-accessible convergence controls that allow you to precisely line up the monitor's electron beams for red, green, and blue. Poor convergence causes a fuzzy color halo around objects and text.

the temptation to buy a used 12-inch, 512-x-384-pixel Apple monitor, once popular for LCs. Stay with the standard, and you'll easily find a good monitor at a great price: Your kids'll be happy when *Putt-Putt Joins the Parade* fills the screen, and your home office won't be overwhelmed by an immense cyclopean invader.

COLOR: We Needn't All Be Millionaires

The Mac's Color QuickDraw supports several color options — sometimes referred to as *bit depths* — from black-and-white (1 bit) to millions of colors (24 bits). The number of colors your Mac can display depends on the capabilities of its built-in video or add-in video card. On many Macs, you can expand your built-in video's color capability by adding inexpensive video RAM (VRAM). Check out this option before spending serious bucks on a video card — you may just need a couple hundred dollars' worth of VRAM. In any case, keep in mind that on most built-in video and some third-party video cards, higher resolutions usually mean lower bit depths.

Don't buy more color than you need. Most business and home applications do just fine with an 8-bit (256-color) display. Many — if not most — CD-ROM multimedia titles are developed with a 256-color palette; paying extra for 16-bit video (thousands of colors) or 24-bit video won't improve the quality of what you see.

On the other hand, if you're doing even semiserious DTP or image processing, it's time to move up to more colors — but don't immediately leap to millions of colors. Unless you're a practiced DTP professional, 16-bit color may be virtually indistinguishable from 24-bit. And speaking of professionals — and you know who you are

— if your work involves 24-bit-color layouts, investigate the fastest video system you can afford: either a QuickDraw accelerator or the VRAM option on a Power Mac. These snappy options dramatically improve the responsiveness of your Mac.

CABLES: Not as Simple as They Look

Perhaps the most frequent error people make when hooking up a monitor that wasn't specifically designed for the Mac is attaching the wrong cable. PCs require jumpers for selecting video resolutions, but Macs use a standardized pattern of *sense lines* built in to the video connector of the Mac. When you power up your Mac, certain combinations of interconnected pins inside the video cable tell it which resolution to display.

Most third-party asynchronous monitors come with a cable that has a VGA connector, commonly used with PCs. To use such monitors with your Mac, you need to ask for the appropriate adapter, commonly called a *dongle*, or your Mac won't know what resolution to display. For newer Macs with the latest system software, we recommend using a multiple-frequency dongle so you can vary the resolution. Otherwise, your Mac will be hardwired to the resolution the installed dongle dictates.

CONTROLS: Beyond Brightness and Contrast

Asynchronous monitors come with several controls — if you learn how to use them, you can tweak your monitor's image quality. Size and position controls are mandatory — resolution switching usually requires size and position adjustments. Convergence controls

capabilities — and if they don't, send 'em back.

To help you test them — and to help you keep your desktop monitor finely tuned during its productive life — we've developed the MacUser Screen Test and made it available on ZiffNet/Mac. (See page 4 for information on how to access ZiffNet/Mac.) The MacUser Screen Test guides

you through a set of test images and prompts you, both to evaluate your monitor's performance and to adjust its display to achieve peak image quality. The following are a few images from the MacUser Screen Test to give you an idea of how easy it is to use — and how important it is for you to assess each monitor as an individual device.

Inspect Grays (Color Tracking)

The gray blocks below should show no coloration. If they appear to have a slight color cast, you should choose another display or have this monitor adjusted by your dealer.

Note: A monitor color calibrator will correct for this problem but may reduce available colors.



Good color tracking ensures that your monitor can display colors precisely. If it fails this test and if your dealer can't handle the repair, try your local TV-repair people — they're used to adjusting color tracking on color TV sets. If they fail, return the monitor.

Inspect Colors

The red, green, and blue squares below should be bright and saturated. On a high-quality monitor, you should be able to see a small, darker square inside each larger square.



No printed image can do justice to the subtlety of this test: Within each pure-color square is a smaller square that's 98-percent color. If these smaller squares are visible, your monitor is capable of displaying minute color variations.

— a highly recommended plus — help you align the electron beams for maximum clarity.

Choose a monitor with all controls up front. Newer monitors come with digital controls that remember your settings for each displayed resolution, so you won't be hunting for those size and position controls each time you change resolutions. Most digitally controlled monitors also allow you to fine-tune image-quality controls, such as those that adjust convergence; on less-capable monitors, these controls are locked away inside the monitor case and preset at the factory. The latest fad in digital controls is on-screen guidance, which is very much like on-screen programming for VCRs.

Premium monitors may include custom Mac software and cables that allow you to make adjustments from a familiar, easy-to-use Mac interface. The better software, such as Radius IntelliColor, Mitsubishi DiamondControl, and SuperMac PressView, puts up test patterns that help you make the adjustments. Stay away from cheap monitors that lack good controls — even though the image may look nice when the monitor's new, its quality will drift as it ages, and convenient controls will help you keep it looking its best.

GLARE PROTECTION: Treat Yourself to the Best

Some high-quality monitors, such as Apple's venerable AppleColor High-Resolution RGB Monitor and the more recent 14-inch Macintosh Color Display, have no antiglare treatment — and not without a good reason: Antiglare treatments cost money and, if not

well designed, can reduce the overall image quality. However, we recommend spending extra for a high-quality antiglare treatment, because it reduces eyestrain.

Do not — we repeat, *do not* — choose a color monitor with an etched antiglare treatment. The outdated etching technique, used only on the cheapest monitors, not only reduces sharpness and clarity but also refracts the light the individual red, green, and blue phosphor dots produce, creating a shimmering effect that's more stressful than glare is.

There are two high-quality antiglare treatments: *silica* and *antireflective* (sometimes called *OCLI*). Silica is a spray-on coating that's baked onto the surface of the screen, creating a microfine uneven surface that scatters light without causing the shimmering effect of etching. Since silica coating alters the surface of the screen, it reduces sharpness — but only slightly. The more expensive antireflective coating reduces glare by partially canceling out incoming light but doesn't reduce sharpness — its effectiveness is reduced, however, by the oil in your fingerprints, so don't touch it. Cleanup is easy, but you need to use only recommended cleaners: Stay away from commercial window-cleaning products, because they can damage the antireflective coating.

EMISSIONS: Nothing to Worry About — We Hope

There has been some concern of late regarding the health risks associated with the *ELF* (extremely low frequency) and *VLF* (very low frequency) emissions of computer monitors. Since a monitor's yoke

Monitorspeak Phrasebook / knowing the language will help you find the right monitor

SALESPeOPLE DON'T DELIBERATELY TRY TO CONFUSE you — it just seems that way sometimes. Precision equipment requires precision description — but sometimes clear technical language can cross the

line into the realm of opaque jargon. Here are a few questions your friendly neighborhood monitor salesperson might ask, along with our translations, the right answers, and why each question is important.

Monitorspeak:

"Do you need a dongle for your autosync?"

Translation:

"Do you need an adapter that will allow your automatically synchronizing multiple-frequency monitor to work with your Mac?"

The right answer:

"Yes."

A dongle is a small adapter that mates the Mac's video-out port to the VGA-style connector on most autosynchronous monitors. Choose your dongle carefully, making sure to get the one that's appropriate for your Mac and monitor.

Monitorspeak:

"Do you need true WYSIWYG for DTP?"

Translation:

"Do you need the size of the image on the monitor to match the size of the image when you print it from your desktop-publishing application?"

The right answer:

"Probably not."

QuickDraw (the Mac's imaging model) assumes that all monitors display images at 72 pixels per inch. At that resolution, a monitor's images are WYSIWYG — what you see is what you get. More pixels per inch makes images appear smaller than they will be when printed — in most cases, this is no big deal.

uses powerful electromagnets to deflect the electron beams, magnetic fields are produced that correspond to the monitor's vertical and horizontal *scan rates* — how quickly the monitor's electron gun paints the entire screen vertically or a single line horizontally.

Vertical scanning frequencies, or *refresh rates*, typically 60 to 75 Hz, fall within the ELF range. Horizontal scanning frequencies, typically 35 to 100 kHz, fall within the VLF range. Monitor vendors have done two things to reduce the magnetic emissions the yoke produces: They've beefed up shielding in the monitor's case and equipped yokes with compensation electromagnets to limit the magnetic field's strength outside the monitor's case.

The jury's still out on the health risks from ELF and VLF emissions. However, two industry guidelines, both from Sweden, specify a range for ELF- and VLF-emission limits. MPR II is the older guideline; most quality monitors now comply with its criteria. The stricter TCO '92 guideline, which specifies lower ELF/VLF emissions, is only beginning to elicit interest in the U.S.

If you're really concerned about ELF and VLF emissions, you can take other steps besides choosing an MPR II- or TCO-compliant monitor. First, throw out your electric blanket and hair dryer. These household conveniences — along with fluorescent lights, toasters, pasta makers, and electric shavers — are all sources of ELF emissions that can emit far more ELF at close range than your Mac's monitor. Of course, you spend more time with your monitor than you do with your electric shaver — but then again, you don't rub your monitor against your lymph nodes every morning.

ENERGY: Help the Planet — and Your Wallet

The newest feature in monitors with digital controls is automatic-sleep and -shutdown capability — sometimes referred to as *Energy Star* compliance. The U.S. Environmental Protection Agency has set computing-product guidelines, dubbed Energy Star, that dictate that when monitors are not in use, they should use less power.

Most Energy Star-compliant monitors use a two-step process to go to sleep. First, the high-voltage power supply that feeds the electron beams — where most power is consumed — is turned off. Second, the cathode heaters inside the CRT and scanning circuitry are shut down; at this point, some monitors shut off entirely.

In most cases, Energy Star-compliant monitors include control-panel software that tells the monitor to go to sleep after a nonusage period you specify. Most home users won't see a big impact in their electric bill, but a business will. Remember, you're paying for electricity twice: first to operate the monitor and then to power the air conditioner that removes the heat it produces.

SERVICE: The Customer Is Always Right

Finally, when you've tracked down the monitor that seems right for you or your business, take care to choose the right dealer. Don't let the dealer befuddle you with jargon: Read our tips for understanding important monitor terms (see the "Monitorspeak Phrasebook" sidebar) before entering into negotiations, and you'll be OK.

If you're buying a monitor from a dealer, take along the Mac-User Screen Test software (see the "MacUser Screen Test" sidebar),

Monitorspeak:

"Do you want a bottle with a dot pitch tighter than .28 millimeters?"

Translation:

"Do you want a monitor with a picture tube containing a shadow mask (or aperture grille) with holes (or vertical wires) that mask adjacent red, green, or blue phosphor dots (or stripes) at a distance closer than .28 millimeters?"

The right answer:

"Great" (if you can afford it).

Although a dot pitch (in aperture-grille monitors, more correctly called a slot pitch) of .28 millimeters is perfectly acceptable, if you're working with finely detailed images or editing tiny text, a finer dot pitch is a godsend.

Monitorspeak:

"Does this monitor's refresh rate make you see flicker?"

Translation:

"Is this monitor repeatedly scanning the image across the screen so slowly that the image doesn't appear stable?"

The right answer:

(None — it depends on each individual's eyes.)

Most people find that a refresh rate of 75 Hz (75 screen redraws per second) is fast enough to eliminate flicker, but some need a faster refresh rate and some get by with a slower one.

Monitorspeak:

"Do you want a dynamic beam-forming gun?"

Translation:

"Do you want a monitor that can adjust the shape of its electron beams to ensure equal focus in all areas of the screen?"


The right answer:

"Sure."


Because the electron beams inside a monitor's CRT fire at an angle to all areas other than the very center of the screen, a beam that starts out cylindrical at the gun creates an elliptical — not a circular — dot when it hits near the edges of the screen. Dynamic beam forming — sometimes called *dynamic astigmatism control* — preshapes the beam to eliminate most of this focus-degrading effect.

available on ZiffNet/Mac. This HyperCard-based series of test screens and explanatory text will ensure that the monitor you take home provides crisp, well-focused, and color-balanced images.

If you're buying a monitor from a mail-order vendor, make sure the vendor allows you enough time to set it up; run it through its paces, using the MacUser Screen Test; and return it for replacement or a full refund if it flunks. Of course, if you're buying a dozen monitors, make sure the vendor gives you enough time to test them all. Even among the best brands, you may occasionally find a monitor

that doesn't quite make the grade. Finally, our survey of 10,000 *MacUser* readers (see the "MacUser Poll" sidebar) will tell you which vendors pleased most of our readers most of the time — and which didn't. 

Jeff Pittelkau, director of MacUser Labs, designed *MacUser's* first color-monitor tests. Rik Myslewski, executive editor, used them.

 The MacUser Screen Test, available on ZiffNet/Mac, provides images you can use to ensure that your monitor is performing at its best. See page 4 for information on how to access ZiffNet/Mac.

The MacUser Poll / our readers pick their favorite monitor companies

YOU'RE SATISFIED WITH YOUR MONITOR — if your opinion matches many of those expressed by the 10,000 *MacUser* readers we surveyed in a major product-satisfaction poll. You're a bit less happy about the service and support provided by your monitor's vendor, however. And a few of you who own displays made by some of the most familiar names in the monitor business are downright cranky.

We conducted a nationwide survey of monitor users from October 1993 through February 1994. Working with the Ziff-Davis Research Department and Chilton Research Services (an independent market-research firm), we collected readers' opinions on top Mac monitor vendors. Of the 10,000 randomly chosen *MacUser* subscribers we surveyed, 4,500 provided opinions on as many as four monitors they had used in the past two years. We ignored responses that did not indicate a specific manufacturer as well as those about vendors for which there were fewer than 50 responses each — samples too small to ensure statistical accuracy.

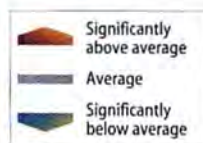
In the table below, the companies are ranked in order of how the survey respondents rated them on overall satisfaction. For each question we asked our readers, we gave each company a satisfaction ranking of significantly above average, average, or significantly below average; the statistical method we used to determine these rankings is explained in "Doing the Numbers," August '94, page 97. Detailed data

on all the companies and how their rankings were determined is available on ZiffNet/Mac.

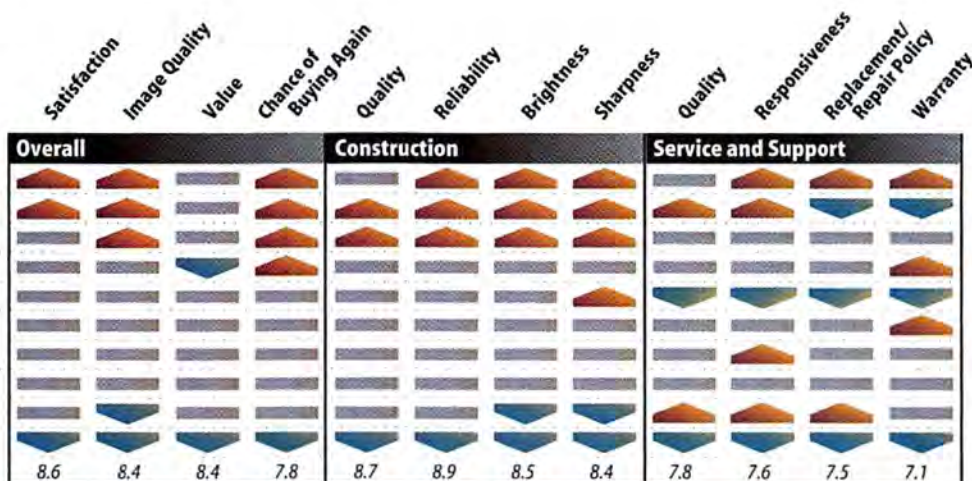
NEC and Apple lead the field, with Sony a close third. Apple's success in satisfying its customers is hardly surprising: It established a high standard back in 1987 with the original 13-inch AppleColor High-Resolution RGB Monitor and has rarely slipped since.

The praise our readers lavished on NEC and Sony should finally and firmly put to rest any doubts about the quality of autosynchronous monitors — or about the ability of vendors who cross over from the PC world to satisfy demanding Mac owners. NEC and Sony each scored significantly above average in the coveted Chance of Buying Again category, along with Apple and SuperMac.

Radius is not as well regarded as its probable future partner, SuperMac. When this article went to press, the planned SuperMac/Radius merger had not yet been formally consummated. We hope that if, by the time you read this, SuperMac and Radius are united, they'll maintain the level of customer satisfaction sparked by SuperMac. Although Radius had recently upgraded its technical-support efforts, its renewed dedication to service hadn't yet convinced our readers: Radius was handed the only significantly below-average score in the Chance of Buying Again category — and significantly below-average scores in every other category as well.



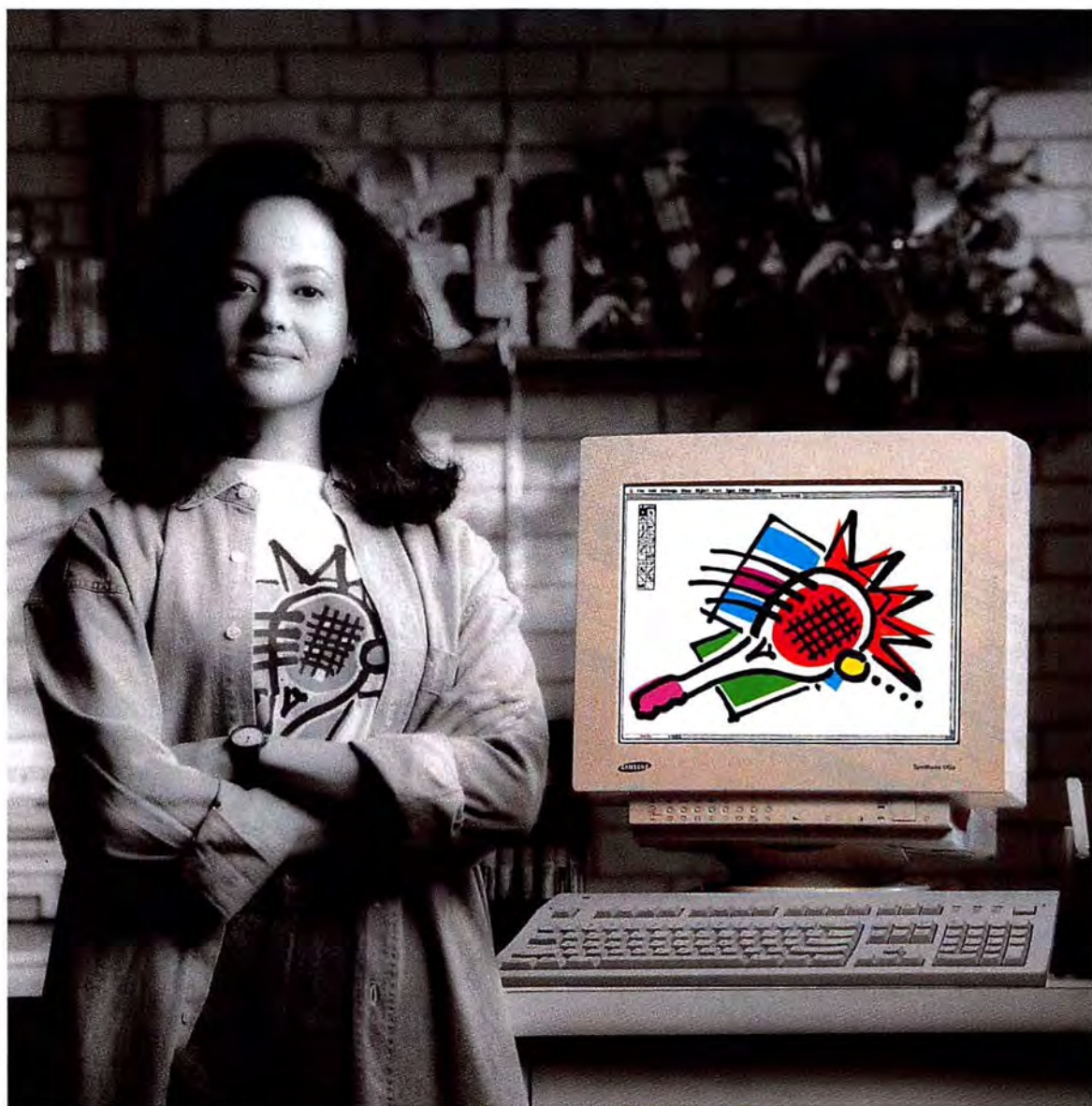
NEC
Apple
Sony
SuperMac
Seiko
RasterOps
Mobius
E-Machines
Mirror
Radius
Average score



We asked 10,000 *MacUser* readers to tell us, on a scale of 1 to 10, how satisfied they were with the quality, reliability, and performance of their monitors and with the service and support of their monitor vendors. We converted their responses into significantly above-

average, average, and significantly below-average rankings for each company. Overall, readers were more pleased with their monitors than they were with the service and support they received from the monitor vendors.

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SyncMaster	14GL	15GL	17GL	17GLs
CRT Size	14"	15"	17"	17"
Dot Pitch	28	28	28	26
Maximum Resolution	1024x768	1024x768	1024x768	1152x870
Maximum Refresh Rate at Maximum Res. (Hz)	75	75	75	75
MPR-II (Low Radiation)	•	•	•	•
Power Management	•	•	•	•
Flat Square Screen		•	•	•
On-Screen Programming			•	•
Real Color Control				•
Warranty	2 Years	2 Years	2 Years	2 Years

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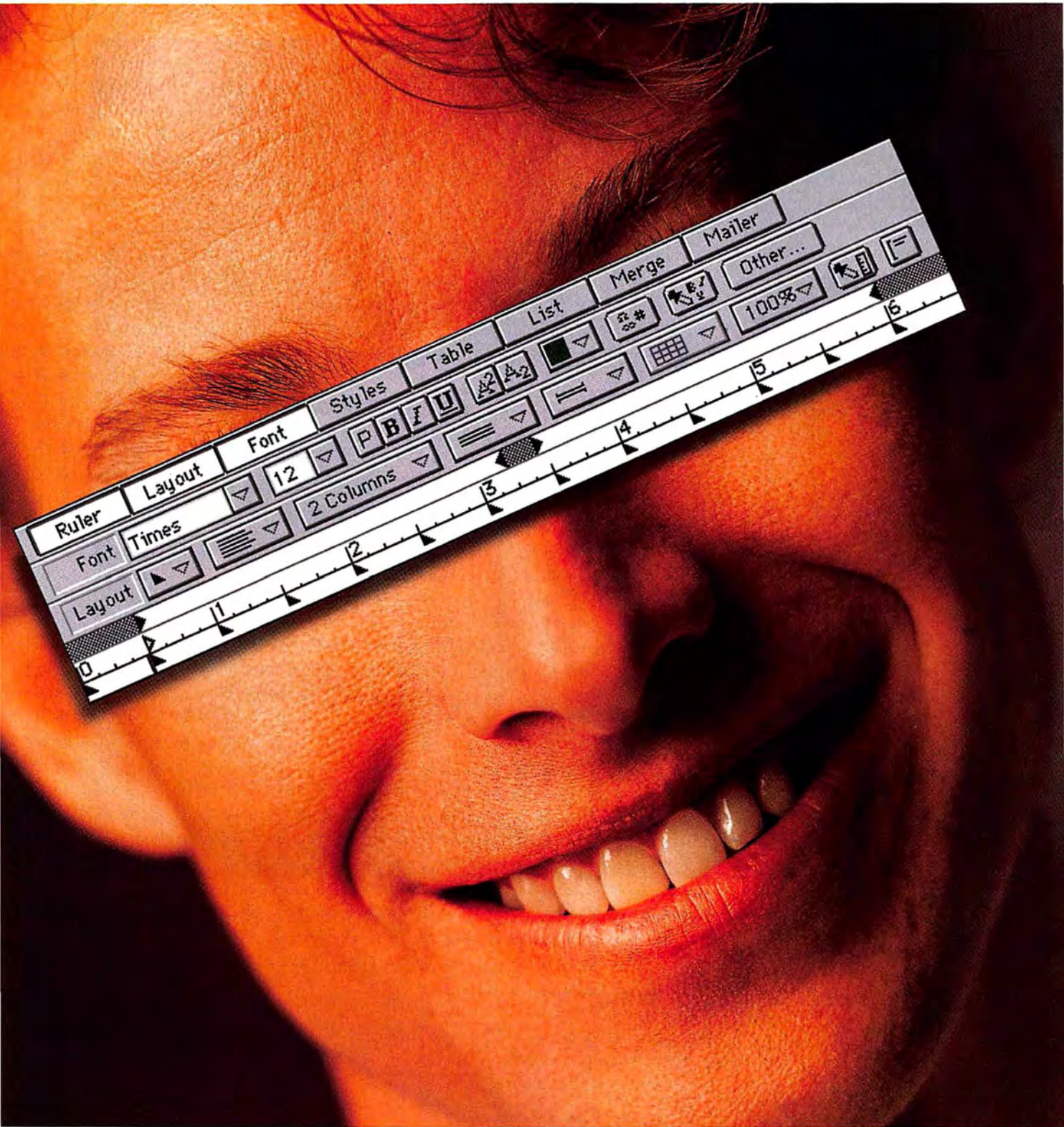
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button bars put your favorite tools right there, too. Like spell checking.

Grammar checking. Our integrated drawing program. Whatever
you want. There's even buttons for common tasks like

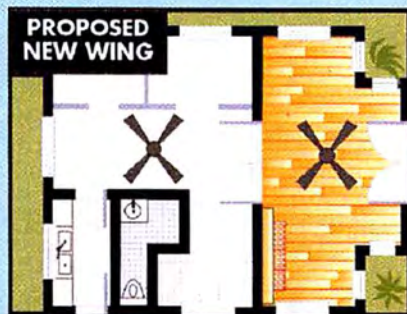


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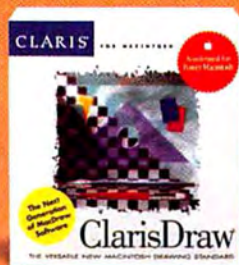
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OUTPUT DEVICES /

PREPRESS COMES TO THE DESKTOP

DESKTOP PREPRESS? Producing film in-house for final output usually means purchasing a large-scale, big-ticket imagesetter — and that entails working with photographic chemicals. Now LaserMaster has devised an in-house prepress system for producing design comps, color proofs, and final film — all without chemicals.

LaserMaster's PostScript prepress system consists of two parts: the Unity 1800PM-R (\$9,995), an 1,800-dpi laser printer for printing camera-ready monochrome output on 12-x-19-inch paper, and the PressMate (\$19,995), a 2,400-dpi thermal output device for producing film negatives or color proofs as large as 12 x 24 inches. The PressMate connects to the Unity to share the laser printer's 48-MB controller. Each unit has LocalTalk, parallel, serial, and Ethernet

connections.

The PressMate's two thermal technologies allow printing on film and paper without chemicals. To produce film with screens as dense as 133 lpi, you load the LaserMaster's clear ThermalRes Film (for negatives) or Overlay Film (for ColorKey-type proofs); the PressMate's direct-thermal head affects the film color. To print four-color proofs, you install a thermal-wax ribbon and print to special paper. The LaserMaster's ColorMark color-management system helps ensure color fidelity for proofing.

The products were due by October. 612-944-9330. / Pamela Pfiffner



DayStar's ColorMatch Made in Heaven

COLOR MATCHING between screen and print is a holy grail for desktop publishers. It was also one of the main features of Kodak's \$11,000 PCS 100 hardware and software add-on for the Mac. Now DayStar Digital is offering the same Kodak technology under license in its \$219 ColorMatch package.

Like other color-management systems, KCMS, the Kodak system that ColorMatch embodies, uses a color-matching engine and a set of device profiles that describe the color characteristics of monitors, scanners, and printers. An XTension for QuarkXPress and a set of plug-ins for Adobe Photoshop let you correct the color for various input and output devices and preview the results on-screen in either application. Conversion from RGB to CMYK is automatic.

ColorMatch ships with device profiles for several popular desktop scanners; for PhotoCD; for Sony and Hitachi monitor CRTs; for desktop printers; and for SWOP-standard press output. The ColorSet application allows you to calibrate your monitor visually and create a custom monitor profile. For more-precise calibration, DayStar Digital also offers the \$599 Colorimeter 24, a tristimulus colorimeter that works with ColorSet and plugs in to the ADB port. 404-967-2077.

/ Bruce Fraser

PAGE LAYOUT /

VivaPress Professional Offers All-in-One DTP



UNSEATING QUARKXPRESS and Aldus PageMaker as the page-layout programs of choice has been the goal of many upstart applications. The latest to take a crack at it is VivaPress Professional, a native Power Mac program that combines page layout, drawing functions, and job tracking.

Developed in Germany, VivaPress Professional 1.5 has its roots in the high-end program LinoPage, and it shows. You can work in imposed spreads, create documents with 2,000 pages, generate color separations, and tag text for inclusion in footnotes and indexes. It also sports a robust word processor and boasts sophisticated type controls, such as aesthetic rag, for more-pleasing line endings.

Perhaps VivaPress' whizziest feature is the ability to create text and graphic boxes out of any shape, thanks to its Bézier tools. The cursor senses whether you're in a text

box or a graphic one and switches tools automatically. You can also open and edit Aldus FreeHand and Adobe Illustrator files in VivaPress Professional, although you can't export changes.

In VivaPress, any page or item can serve as a master object, or Alias. Changes made to an object will automatically update its Aliases.

VivaPress Professional's object-oriented approach extends to style sheets as well. You can define style sheets for text and graphics, specifying word and line spacing, run-arounds, and so on, down to the character level. But unlike style sheets based on previous styles, VivaPress Professional's style sheets are modular, so you can apply several styles on top of each other.

For basic work-flow management, VivaPress Professional permits unlimited users on a network and offers control of access privileges. Job sheets can be attached to documents for editorial and production tracking.

QuarkXPress and PageMaker fans may find some aspects of VivaPress Professional's interface counterintuitive (clicking on the leading icon did nothing in our demo version). If VivaPress Professional is serious about making inroads into a solid market, some refinements are needed. \$895. Interpress Technologies. 212-245-2700. / PP






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XTraordinary XTensions

There's a slew of third-party add-ons for QuarkXPress, ranging from general productivity enhancers to specialized commercial tools. If you need more from QuarkXPress, then it's time to explore XTensions. BY KATHLEEN TINKEL

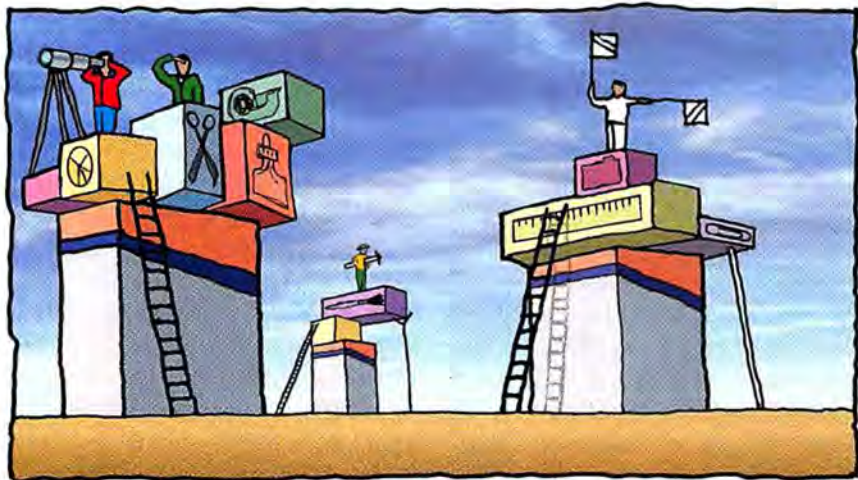
QUARKXPRESS has many strengths, but its plug-in modules — what Quark calls XTensions, or XTs — are what give the program its extraordinary power and flexibility. Most QuarkXPress users have heard of XTs, but many use only those that come with the application, such as the EfiColor XTension and the Kern/Track Editor.

But with 200 or so XTensions for sale, from \$30 shareware to \$6,000 professional tools (and many more in development), it's well worth exploring what's available.

At the commercial end of the scale, programs such as KeyLiner and Step & Flex-It, both from DataStream Imaging Systems, enable QuarkXPress to stand in for powerful proprietary production tools. On the other end of the spectrum are tiny, one-task aids such as Scitex Nudge, which lets you move a selected object by increments you define, or Durrant Software's CombsXT, which places vertical marks called combs on data-entry forms.

In between are dozens and dozens of interesting extensions, some of them useful, if not actually essential, to many QuarkXPress users. Here we take a look at a few of the more intriguing ones: Many of these have an extremely narrow focus; others are more general. You may not need all of them — yet — but together, they showcase the work of some of the more inventive developers creating XTensions today.

One caveat: XTension developers have yet to settle on a single approach to dealing with the QuarkXPress network-registration (copy-protection) scheme. You may need to supply your QuarkXPress serial number when ordering some of these XTs. For others, an Installer on the floppy disk will decompress the XTension, snag your serial number from QuarkXPress, and place a registered copy on the distribution floppy



disk. Still others may ask you to enter the serial number manually the first time you launch the XT. If you're running QuarkXPress in isolation, you shouldn't have problems with any of these approaches, but if you're buying a license to use multiple copies on a network, be sure to make this clear when you order the XT, because you may need to go through a more complex installation process.

Except where noted, all the XTensions listed here are sold through XChange, a retail clearinghouse that specializes in these small programs. To obtain the quarterly catalog, which is chock-full of interesting stuff, call 800-788-7557 or 303-229-0620.

Azalea UPC-EAN XTension. If you've ever gone through the struggle to build bar-code symbols for a label or book cover, this classy single-purpose XT (\$129) will ease your frustration. All it does is make bar codes, but considering the homeliness of the end product, it does the job with something close to élan and verve. You select the type of bar code you need (UPC A or E; EAN-8/JAN-8; EAN-13/JAN-13; or Bookland, for placing ISBN numbers on book covers), enter the required figures, and click. The software creates an EPS file, stores it in the same folder as the QuarkXPress document, and places a screen preview in its own

picture box — all in a few minutes.

Because bar codes have to be read by sensitive electronic devices, Azalea has built in provisions for clearing printing, such as compensating for ink gain. You can also specify either opaque-white or transparent backgrounds behind the codes. It ships with a pair of OCR fonts that are used appropriately, and the software knows the format for each bar-code variety and won't let you enter the wrong pattern of figures.

Azalea Software, Seattle, WA; 206-932-4030; 206-937-5919 (fax).

INposition Lite. If you've ever been frustrated by making printer spreads — ordering pages for assembly into a booklet (see "Some for the Books," September '94, page 121) — INposition Lite (\$195) will make you happy. It imposes pages two- or four-up on as many as four sheets (for a 16- or 32-page booklet), with user options for the type of binding (saddle-stitched, perfect, or none), the gap between spreads on the imposed form, page orientation, and other printing specs.

Imposition is generally a commercial printing function, and for large jobs — a 100-page book, for example — most of us willingly leave this responsibility to the printer. But for small booklets, including those with pages small enough to be

printed two-up on a laser printer, you can save time and money by delivering output in printer spreads.

DK&A, San Diego, CA; 619-488-8118; 619-488-4021 (fax).

Kerning Palette 3.3. Manual kerning of type is a thankless chore. For one thing, you're bound to be inconsistent. And customizing kern pairs in fonts is tedious. Quark's solution is to have you modify the kern pairs in a QuarkXPress document and save the changes in the Prefs file. But if you manually kern a font in a QuarkXPress document, you can't easily save the modified kern pairs with your fonts, and type you set in, say, Aldus FreeHand won't match the same type set in QuarkXPress.

Kerning Palette (\$195) helps. It allows you to kern type as if you were kerning manually, but each adjustment applies to all instances of that letter pair in a document. You can work at whatever size is convenient to help compensate for low screen resolution (and you can apply QuarkXPress' manual tracking temporarily to help compensate for size-related optical problems that are inherent at large type sizes). When you're finished, you can leave the modifications with the document Prefs file or save them to the screen font (or both).

Clearface, Buskirk, NY; 518-686-1760.

Kitchen Sink. Aptly named, this XTension (\$79) combines a slew of useful functions, most of them designed to allow you to work faster and more productively. The most obvious of these is the Command Pad palette, a dense collection of tiny icons that provide single-click access to virtually any of QuarkXPress' dialog boxes and palettes. Other features and functions include Spot, a window that shows you all the colors specced in a document and lets you easily convert spot colors to process (and vice versa); Page Sets, a sort of style-sheet controller for pages; ViewIt, pop-up menus with preference selections that control the

position and size of windows, palettes, and menus; and Co-Pilot, a palette containing a page proxy that has its own easy page-magnification menu as well as a navigational aid that lets you move quickly to any point on a page by clicking on a proxy image.

One of Kitchen Sink's several productivity palettes lets you nudge a selected object by clicking on a cursor arrow; another lets you size a picture box to the image within; and others offer alignment, text inset, and other QuarkXPress functions. You probably don't need all these tools, but they can easily be ignored (although they can't be deleted from menus, alas). The small icons on the Command Pad palette could be larger, but Kitchen Sink is close to irresistible.

a lowly apprentice production, La Jolla, CA; 619-942-1968.

Mark My Words. Although not really an XTension, Mark My Words (\$50) is a useful adjunct to QuarkXPress. Unless you process a lot of text, you don't need this Word-to-QuarkXPress filter — or most of Greg Swann's other text-cleaning utilities, including the fast, customizable search-and-replace tool Torquemada The Inquisitor or the even more ferocious text filter XP8 (all of these products are sold directly from the

developer). But if you're a book designer or a production typesetter, Mark My Words is the filter for you: Drag a formatted Word file over the Mark My Words icon, and seconds later you'll find a new file of QuarkXPress-tagged ASCII text in the folder with the original.

Why is this useful? It saves a lot of time, particularly with large files; it retains italics and bold placed within paragraphs (most filters can't do this reliably); it converts Word's paragraph styles and all local formatting into QuarkXPress tags so that you don't have to do it manually; and it creates a small text file for archiving.

Greg Swann, 1331 W. Baseline Road, #236, Mesa, AZ 85202 (no phone calls).

ProTabs 2.02. Using QuarkXPress to set up tables and other tabular material is a pain. Of the few XTensions for automating the process, ProTabs (\$30) is among the best. Formerly a commercial XTension, ProTabs is now distributed as shareware and is not available through XChange. (If you're not on-line, you can order a copy by mail from the developer.)

With ProTabs, you can control stub columns and headings as well as the data entries. This XT even formats rules in a table, although you may find that using QuarkXPress' rule-above or rule-below function yields a better-looking result. Tables ProTabs produces are QuarkXPress text, and you can style them by using style sheets and other QuarkXPress controls.

A powerful utility, ProTabs is fairly difficult to learn. Although the matter-of-fact on-line documentation is complete, you'll probably learn more about ProTabs by playing around with it. Reading about the program in Brad Walrod's *QuarkXPress Unleashed* (New York: Random House, 1994) is also helpful.

Software Extensions, Gainesville, FL; 904-371-9722.

Resize XT. For those who design ads, Resize XT (\$99) is a godsend: When you have to convert an ad (or any collection of text and graphics) from one size to another, just unleash Resize XT, which scales text and graphics (and their boxes), line thicknesses, gutters, tabs, and text insets at the click of a mouse. There are two ways of activating the XTension — from its dialog box and from the QuarkXPress tool bar, to which Resize XT adds a scaling tool. This

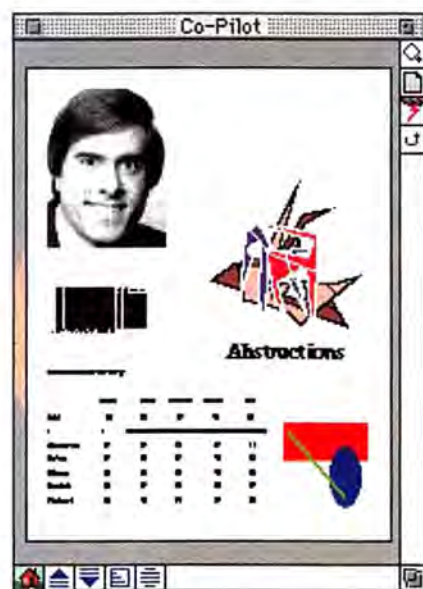
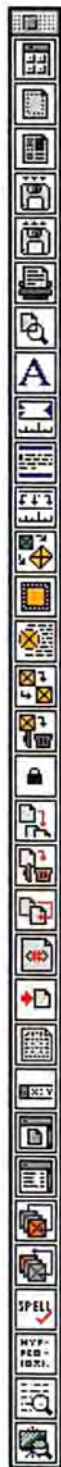


Figure 1 / **Kitchen Sink** combines several must-have productivity tools. Command Pad (left) provides one-click access to most of QuarkXPress' palettes and dialog boxes. Co-Pilot (above) is a cute resizable page proxy that speeds access to any part of any page and lets you scale the screen view without going to the QuarkXPress menus.

single-purpose utility can recoup its meager cost in a single job. Vision's Edge is one of the most prolific XTension developers, with dozens of text and productivity XTensions.

Vision's Edge, Tallahassee, FL; 904-386-4573; 904-386-2594 (fax).

SXetch Pad. An XTension that adds basic drawing functions to QuarkXPress, SXetch Pad (\$229) is fairly easy to use, although it may not be intuitive for users of Adobe Illustrator or Aldus FreeHand. You have to select the SXetch Pad tool from the QuarkXPress menu bar; draw a SXetch box; and work within it, using a small tool palette that pops up whenever the SXetch box or the QuarkXPress content tool is selected. SXetch Pad's arsenal includes basic text and drawing tools (for creating lines, circles, curves, rectangles, round-cornered rectangles, and polygons), a scissors tool, and a rotation tool.

SXetch Pad objects can be grouped and joined (to make composite objects that have interior voids, or knockouts), type can be bound to a path or converted to curves, and colors — including multicolor blends — can be applied to any object but not to text. Using SXetch Pad to create simple illustrations or logos (instead of creating them in another program and importing them as EPS files) makes good sense — it helps keep the file size down, and it lets you take advantage of QuarkXPress' autotrapping. If you want to use a SXetch Pad illustration more than once, you can export it as an EPS file or stash it in a library for use in other QuarkXPress files (for which it retains its trapping specs).

DataStream Imaging Systems, Lexington, KY; 606-255-6686; 606-259-1541 (fax).

vjXT. Vertical justification (VJ) is not the best idea, typographically speaking. The essence of readable text is the illusion of evenness and regularity. The essence of vertical justification is to align the bottoms of the page, come hell or high water — mostly by introducing variable line spaces on the page. But VJ is a necessary evil in typesetting, and although most desktop implementations are crude and unsatisfactory, KyTek has done a good job with vjXT (\$149).

You begin by enabling vertical justification in the vjXT menu and then set relative values for each style-sheet entry — A-head,



figure 2 / **Resize XT** is a great time-saver if you need to scale an ad or other collection of type and graphics to a different size.



figure 3 / **SXetch Pad** brings some of the power of a draw program to QuarkXPress, adding Bézier-curve tools and multicolor blends.

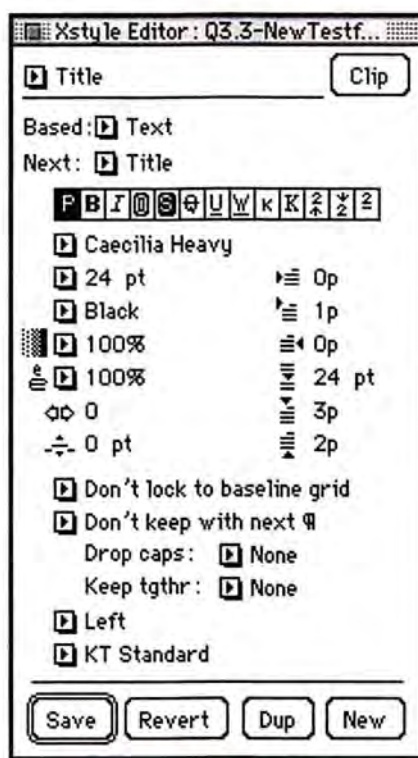


figure 4 / **Xstyle Editor's** dense palette lets you define style sheets and avoid QuarkXPress' labyrinthine menus and dialog boxes.

B-head, text, and the like — indicating, for example, that you'll allow space before and after any A-head at a 3:2 ratio and a B-head at 2:1 but no space before or after text paragraphs. To apply the vertical justification, choose it in QuarkXPress' Item/Modify dialog box, and seconds later vjXT does its thing, leaving your columns aligned on the bottom baseline and rationally distributing line spaces on the page.

KyTek also offers the \$99 program called SeXT (or Shortline Eliminator) for applying manual tracking to eliminate widows. Like vertical justification, this use of tracking is all too often abused, but KyTek's XT gives you control over minimum and maximum adjustments and helps keep the spacing consistent throughout a document.

The KyTek people have a typesetting background, and it shows. Another of KyTek's XTs, CursorPos (\$59), with its unobtrusive palette that can be stuck into any corner of the monitor screen, is aimed at traditional typesetters who want to be able to track the position of the text cursor at all times.

KyTek, Weare, NH; 603-529-2512; 603-529-2015 (fax).

Xstyle. If you use style sheets to format text in QuarkXPress (and you really should, or you're working too hard), Xstyle (\$99) is a necessity. You get two palettes: a style-sheet editor that vastly simplifies the creation of new styles and a character/paragraph palette that shows style-sheet specs and lets you apply them with a click or modify them on the fly, all without recourse to the labyrinthine menus and layers of QuarkXPress style-sheet dialog boxes. (The character/paragraph palette is much more powerful — and compact — than the style-sheets palette built in to QuarkXPress, which you can probably put away for good if you have Xstyle.)

The palettes can float on-screen or be invoked by a hot key and set to disappear after use. (It would help reduce screen clutter if more XT developers — and even Quark itself — would build this function in to the many palettes that litter the screen.)

Em Software, 203-399-8472; 203-399-2447 (fax).

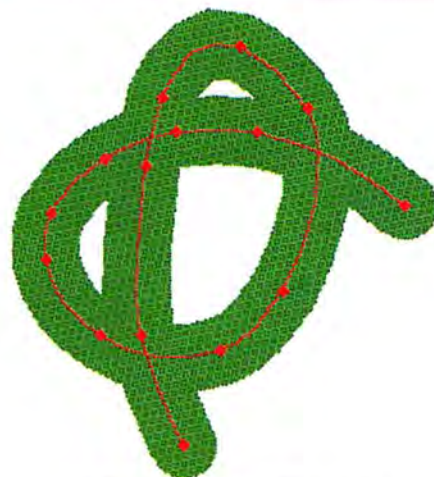
Designer Kathleen Tinkel writes frequently about desktop publishing and prepress for graphic-art and computer publications.

Tied in Knots

Adobe Illustrator's Pathfinder and Objects filters make it easy to create the illusion of a knotted rope. BY JANET ASHFORD

EVER TRY TO TIE A KNOT in PostScript? Visual illusions are fun, but making a stroked path look as if it's passing in front of and behind itself is tricky — a task that used to involve drawing your own patch shapes. When Adobe added filters to Illustrator 5.0, however, the process changed. Now you can use Illustrator filters to easily make overlapping lines. To help you sort out which pieces cross over, you might want to tie a knot in a piece of rope and use it as a visual reference. (A pretzel works too — and you can eat it later.)

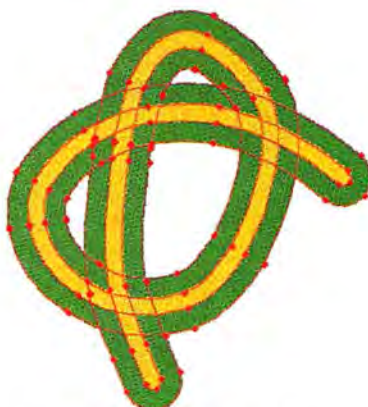
Janet Ashford is the coauthor, with Linnea Dayton, of *Adobe Illustrator: A Visual Guide for the Mac* (Graphic-sha/Addison-Wesley).



1. Draw a knot. Use Illustrator's pen tool or freehand tool to draw a pretzel-shaped path. Specify a color, a thick stroke, and round end caps.



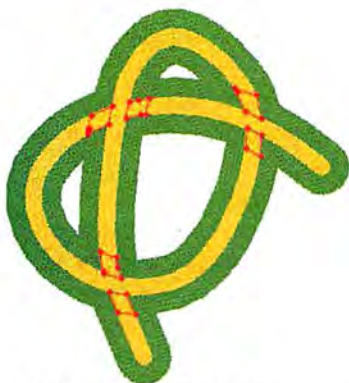
2. Create a stripe. To follow the course of the knot, you need a contrasting edge or stripe. Copy your original path, paste the copy in front, and specify a thinner stroke and a contrasting color.



3. Use the Outline Stroked Path filter. Select each path, *one at a time*, and apply the Outline Stroked Path filter to convert it from a stroked path into an outlined shape.



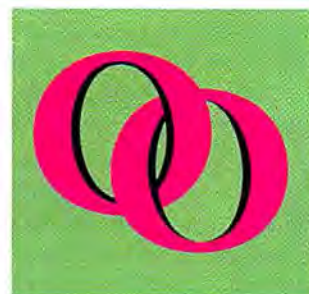
4. Divide the shapes. Select both shapes, *at the same time*, and apply the Divide Fill filter (version 5.0) or the Divide filter (version 5.5) to separate them into segments, as in this exploded view.



5. Select the overlap pieces. Ungroup the two outlines and then select the two shapes at each intersection where the color must change to make the rope look knotted.



6. Change the color. Change the color of the selected shapes (in this case, we changed them from yellow to green so the yellow lines pass under the green lines) to complete the knot illusion.



7. Intertwine type. This method has many uses. To make linked letters, for instance, use Create Outlines to convert typed characters to outlined shapes and then follow the steps above.

Checking Files Before Takeoff

Inspecting your PostScript files before sending them for high-resolution output saves time and money. Here's what to look for and when. BY BOB SCHAFFEL AND CHUCK WEGER

IF YOU'RE IN THE BUSINESS of producing imagesetter output of other peoples' files (or your own), you may have heard the term *preflight*. What does preflight mean? Stepping through a well-thought-out, systematic checklist before going through the time-consuming and expensive step of producing film or paper on a high-resolution output device. The systematic checklist is analogous to the preflight checks pilots use before takeoff. Preflight checks are necessary for aircraft and imagesetters alike because both are extremely complicated, require technical skill to operate, and will crash if improperly run.

When one of us (Chuck, to be precise) coined the term *PostScript preflight* at a high-end-prepress conference in 1992, he was referring to specific tests for checking the job's PostScript code and all included files, such as fonts and graphics.

But these days, preflight checks apply to a variety of quality-control checks performed before the final output stage. In the imaging business, if you don't do preflight checks, jobs can print incorrectly, fail to print, or take longer than necessary, gumming up production and racking up the dough. A central tenet of doing preflight checks is to catch errors as early in the production stream as possible. Correcting errors on-press is the costliest; the least expensive point is while the job is still a gleam in the designer's eye.

You can run preflight checks at several stages in the life of a PostScript job:

- Before the pages are built (that's smart).
- After the pages are built but before they're sent for output (a logical place, obviously).
- Before the job is put into the manufacturing stream (a customer-service representative should check it here).
- Just before the job is output (it's the last chance to catch errors).
- After the job comes out (because you

need to identify errors that got through).

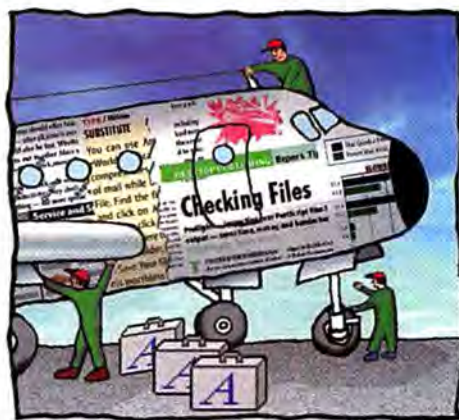
Preflight checking is *not* triage. Triage — determining which files receive corrective treatment and how much treatment they get, in what priority — is what happens to files that are pulled out of the production stream because of errors. Preflight checks help avoid excessive triage.

Checklist specifics are unique to each production environment and vary with work flow, but there are some common threads. Typically these include fonts, page geometry, color, and placed graphics.

Fonts. Improper font usage is an ongoing problem. Take TrueType versus PostScript fonts, for example. Most high-resolution output devices still have problems rasterizing TrueType fonts, especially when they're mixed with PostScript Type 1 fonts. Without the creator's font suitcase, you can't tell which font technology has been used. We recommend that TrueType not be used for high-resolution output. In any event, check to see that the fonts used in a job are all there (unless you like the look of substituted Courier type scattered across the page).

Page geometry (page size, trim and bleed, register marks, and other page-setup booby traps). Each publishing application has a unique Page Setup dialog box. A preflight checklist helps organize the myriad of setup options. Check for "gotchas" such as tiling (used when printing oversized test pages to laser printers, but it wastes imagesetter film) and "rough" printing (an output option in QuarkXPress that omits printing imported art). For those who are using QuarkXPress 3.3, a helpful preflight utility is QuarkPrint, an XTension that allows you to define and save standard Page Setup and Print dialog-box options.

Color. A common mistake is forgetting to designate custom colors as *process* for four-color output (especially when you're using the CMYK color model to define them). Print separations to a laser printer to check



color breaks and ensure there is no excess film. When printing four-color jobs, check that imported images are pre-separated (no RGB TIFF images placed in the page layout, for example). In complex four-color documents, allow extra time to fix trapping of adjacent colors.

Placed graphics (EPS files, TIFF images). Check that included graphics have not been rotated or sized in the page-layout application; make such changes in the originating application instead. Although RIPs (raster-image processors) are getting faster, you still pay a performance price for rotating and scaling computations that are done in the RIP instead of the host computer. Check the included images to ensure they're at the right resolution. In QuarkXPress, TIFFs should have a 0-percent-black background (instead of none); this avoids jagged boundary edges when the software rasterizes to ascertain where the edge of the image is.

We've only scratched the surface here. Make your own checklists for the kinds of work you do, and use them. Finally, don't forget that underlying our preflight prescription is the assumption of good client/vendor communication. Without that, we might as well all be selling doughnuts. ☐

Bob Schaffel is technology director of the Professional Prepress Alliance, a trade organization of pioneering service providers. Chuck Weger is an independent consultant and publisher of the *Photoshop Monitor* newsletter.



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INPUT

Digital Vision

Hands On:

Lone photographer explores the digital frontier

PROCESS

Final Proof?

Hands On:

Tulip Graphics thrives with Iris proofing

Hands On:

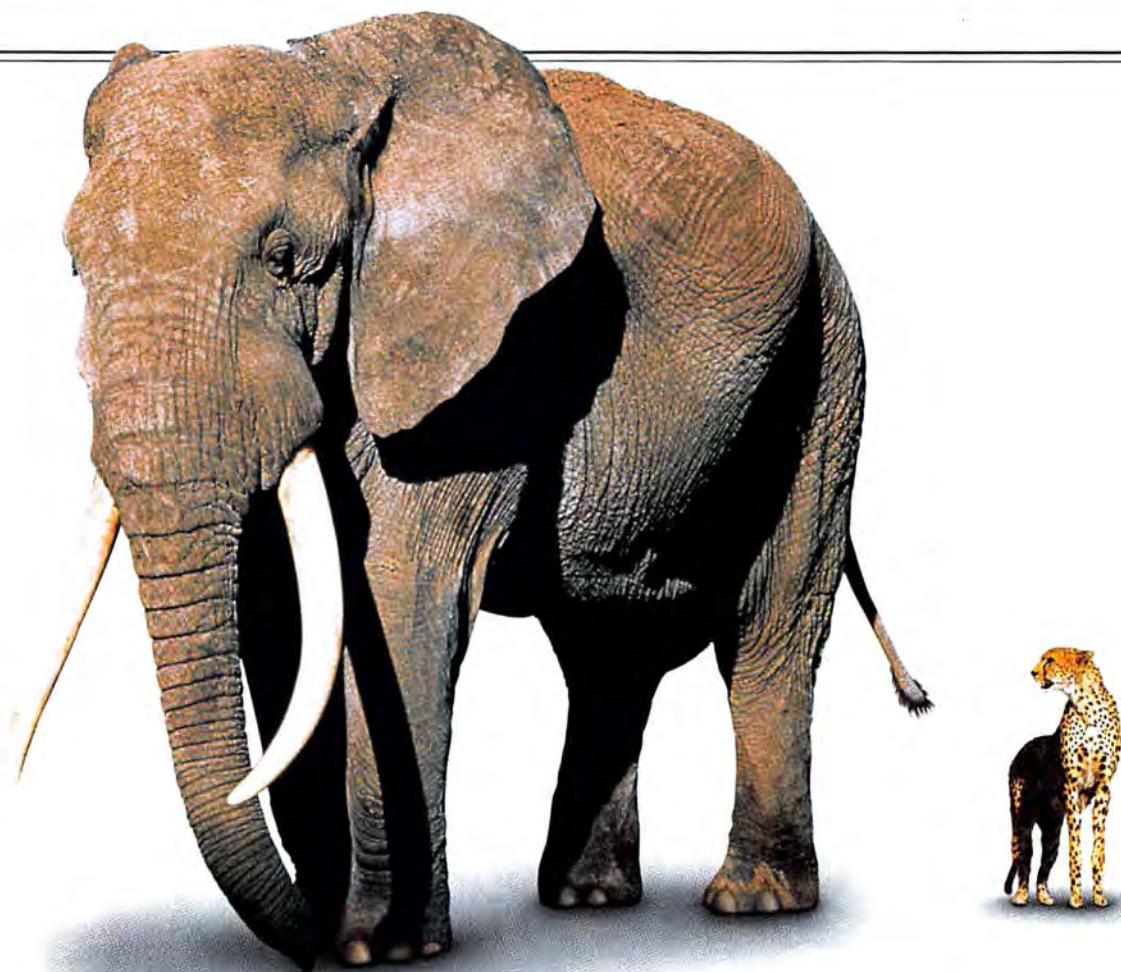
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The Next Revolution

The revolution that began with a PostScript printer, a copy of Aldus PageMaker, and a Mac Plus nearly a decade ago has fundamentally changed the way we place text and images on paper. Today, few publishing professionals can imagine how they managed to print anything before the mouse replaced the X-ACTO knife.

We take it all for granted now. Publishing is the Mac's stronghold, territory the Windows platform is only beginning to explore. And yet, like all revolutions, the one called desktop publishing is on its way around again.

Advances in system software, digital imaging, color-capable hardware, and printing presses are moving publishing away from film-based plates that yield 4-color halftone dots on paper to a future in which pages are sent directly to the press for printing in 6, 8, or even 12 process colors. The revolution isn't stopping there either, as publishing moves from paper as its ultimate destination to electronic, interactive media.

The Power Mac offers publishers huge strides in performance, outpacing its 680x0-based predecessors and challenging workstation rivals in graphic-intensive tasks. The graphical user interfaces of competing platforms may imitate the Mac interface's appearance, but it's what's under the hood that counts.

The Mac operating system incorporates key publishing technologies such as QuickTime, QuickDraw, and Color



What two factors will link the second desktop-publishing revolution with the first? The Macintosh and constant change.

Sync, not to be found anywhere else. In the future, QuickDraw GX may open a whole new spectrum of typographic and imaging capabilities. ColorSync 2.0, Apple's system-level color-management architecture, leads the way toward resolving the problems inherent in translating the computer's red, green, and blue phosphors into the printer's cyan, magenta, yellow, and black inks. Backed by key hardware and software vendors for all platforms, ColorSync 2.0 is the cornerstone for building tools that ensure colors are consistent from monitor to printer, from printer to press.

Today we're poised on the brink of a second revolution, one in which traditional publishing paradigms of input and output are recast in a new light. Can we capture digital images with the same fidelity as their film-based counterparts? Can we accurately predict

how a page will print on a press without seeing the film that exposes the plates? Can we produce in-house color pages that rival those printed on an offset press?

Well, yes — and no. As you'll see in this special supplement, three emerging directions in publishing — digital photography, digital proofing, and short-run color printing — offer distinct advantages in terms of time, money, and flexibility. As to whether the compromises are worth the results, read on. But as desktop publishing brings more capabilities in-house that have in the past been the territory of outside specialists, it's clear the next revolution is about creating new standards

and accepting the changes they will ultimately bring. For this to happen, these new technologies must be evaluated at a work-flow level. That's why, along with stories about the products and processes themselves, Get Info includes Hands On stories, where you can read about the experiences of publishing professionals who are trying to get on the leading edge.

Within this whirlwind of new publishing technologies, the Mac continues to be at the eye of the storm, driving its revolution and evolution. The combination of the PowerPC, new operating-system extensions, and new third-party hardware and software promises to enable in-house publishing in ways we could only wish for a few years ago. By the turn of the century, we'll probably wonder how we ever managed without them. — Andrew Gore and Pamela Pfiffner



1

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8

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Here's the recipe. It begins with nine scanned images of restaurants, tables, chairs, a waiter, picture frames and a dinner to die for. Background layer ❶ holds master image. On another layer ❷, sections of two restaurants complete overall scene. Layer Masks are used to hide unwanted portions of image. Wine bottle shadow ❸ is extended using airbrush on Fade setting. Replace Color feature ❹ changes color of wine from red to white. Lighting Effects filter ❺ is used to reduce ambient light and add high-lights that reflect multiple light sources. Color Range feature ❻ isolates waiter (originally shot against textured wall), and he is placed in the scene. Mirror images ❼ are copied to multiple layers where they are scaled, composed and further manipulated. Clouds filter ❽ creates window to outside world. Original photographs by Robert Mizono.

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Digital Vision

BY BRUCE FRASER

Digital cameras, although still first-generation products, are no longer mere curiosities. A wider range of these devices is now available than ever before, and in specific applications, they can offer significant advantages in cost and productivity over using film.

At Primary Color, a prepress house in Irvine, California, using the Leaf Digital Studio Camera has resulted in cost savings of 15 to 20 percent, according to digital-camera department manager Martin Brower. "When you shoot digital, you don't have to charge for a scan."

But the savings don't end there. "We can blow a background out to a 0-percent dot, so we don't have to spend time [silhouetting]. That can save \$30,000 on an \$80,000 job," Brower said. Unlike film, digital cameras need no toxic chemicals and since the results are more or less instant, there's no need to shoot Polaroids to check lighting and composition.

The term **digital camera** is really an umbrella phrase covering several approaches to image capture, each having unique advantages and limitations.

Instead of using film, digital cameras use CCDs (charge-coupled devices), photoelectric sensors that convert light to electricity. Each sensor creates a voltage that varies with the amount of light received. Individual CCD elements are arranged in an array, and each element creates a pixel in the captured image.

Two types of CCD array are in use today. In a *linear array*, the elements are



Ranging in price from \$700 to \$45,000, digital cameras span the spectrum of quality, speed, and technological sophistication.

lined up in a single row. The array moves across the image area, scanning the image line by line. The \$7,500 Leaf Lumina and the \$22,500 Dicomed Digital Camera are two examples of cameras that use this type of array.

In an *area array*, the CCD elements are arranged in a matrix that captures the entire image in one exposure, without moving the array. The \$700 Apple QuickTake 100, the \$10,995 Kodak DCS 420, and the \$35,500 Leaf Digital Studio Camera each use area arrays.

Linear-array cameras have an obvious disadvantage — the array must move across the entire image area before a capture is complete, requiring long exposure times. This limits their use to static subjects, since any movement during an exposure smears the image. A more serious limitation is that

strobe or flash lighting systems cannot be used; the subject must be kept under constant illumination.

Area-array cameras have short exposure times — $\frac{1}{10}$ to $\frac{1}{200}$ second — so standard strobe lighting systems can be used on moving objects.

So why use linear arrays? Area arrays are more expensive to manufacture than linear arrays. Resolution is dependent on the size of the array, so for tasks in which a very high resolution is required, a linear array is at present the only economically feasible option. A 2,048-x-2,048-element area array (which produces a 2,048-x-2,048-pixel image) is about the largest commercially available one, whereas some linear-array cameras can produce images of 7,500 x 6,000 pixels.

Some digital cameras, such as the Kodak DCS 420, are designed to fit on existing conventional cameras, but the CCD is much smaller than the film frame it replaces. This size disparity effectively increases the focal length of the lenses, so a standard lens behaves like a telephoto and a wide-angle lens is needed for normal shots. The DCS 420, for example, ships with a 28mm f2.8 lens.

Color introduces another layer of complexity. Color images result when incoming light passes through red, green, and blue filters, in either one or three passes. In a one-pass approach, all three color channels are captured simultaneously, whereas a three-pass approach demands three separate exposures, one for each color channel.

Linear-array cameras can use a trilin-

ear array, with three arrays mounted in a single scanning head. A colored dye covers the elements in each array, making them sensitive to red, green, or blue light. All three color channels are captured in one pass of the scanning head.

With area arrays, several techniques are used. The Leaf Digital Studio Camera makes three separate exposures and combines them to make a single RGB image. This limits the camera to stationary subjects, since any movement of either the camera or the subject results in misregistration of the color channels.

Obtaining one-pass color with a single exposure involves using individual CCD sensors that are coated with either red, green, or blue dyes and varying both the number of sensors devoted to each color and their arrangement in the array. What suffers in this approach is resolution, since it takes more than one sensor in the array to make a single color pixel. A few cameras, such as the \$40,995 Sony SEPS 1000, get around this problem by employing three area arrays: The incoming light is split into its red, green, and blue channels by use of a beam splitter, with each channel going to its own array.

Camera models are also differentiated by on-board storage. Those that lack it

must be tethered to a host computer, which limits their portability.

With the many permutations of digital-camera technology, the choice generally boils down to low cost, short exposure time, or high resolution — pick any two. Today's cameras fall into three distinct price ranges: under \$1,000, \$7,500 to \$11,000, and upwards of \$20,000.

At the low end, Apple's QuickTake 100 digital camera is almost alone in its field. It uses an area array to capture 24-bit-color images, with shutter speeds ranging from $\frac{1}{30}$ to $\frac{1}{175}$ second, at 320-x-240-pixel or 640-x-480-pixel resolution. The camera's internal memory can store as many as 8 high-resolution images or 32 low-resolution ones. Critics point to the camera's lack of interchangeable lenses and the relatively low overall resolution.

By year's end, the QuickTake will be challenged by a Mac version of the \$795 Dycam Model 4 Digital Still Color Camera. The Dycam camera has a lower resolution, only 496 x 365 pixels, but boasts interchangeable lenses, autofocus, autoexposure, and automatic flash.

The midrange comprises linear-array cameras, such as the Leaf Lumina, and
See Digital, page 10



Steve Johnson's Digital Landscape

Digital cameras have made inroads into markets as diverse as prepress law enforcement, insurance-claims adjustment, real-estate sales, and sports photography, but they aren't normally associated with fine-art landscape photography.

Stephen Johnson's work with the Dicomed Digital Camera, a 4x5 linear-array insert that fits any 4x5 view camera, is changing that perception. Earlier this year, Johnson made history by taking the first digital view-camera images of Yosemite National Park in association with the Ansel Adams Gallery — an event that coincided with the gallery's first-ever exhibit of digital work.

The results encouraged Johnson to seek sponsorship for an 18-month project entitled "With a New Eye," the first digital photographic survey of the National Parks. "Photography played a key role in the establishment of the National Parks," said Johnson, "so it seems fitting to use the new technology to create a contemporary view and to spark discussion about the extraordinary land-use pressures on the parks system and its function in today's culture."

For the first phase of the project, Johnson plans to produce a touring fine-arts exhibit of approximately 75 images, probably in the form of 30-x-40-inch Iris-printer output; a poster; and a resource CD-ROM containing images, video, and documentation of the project. He hopes to eventually produce both a book and an interactive CD-ROM. A satellite-based Global Positioning System receiver will be used to record the exact location of all images, further enhancing their archival value.

See Hands On, page 10

Two Ways to Capture Reality

Linear-array scanning wand

CCD elements



Linear arrays capture an image by scanning it one column of pixels at a time, making them impractical for capturing moving images. But they produce the highest-resolution images.

CCD



Area arrays capture an entire image at once. The larger number of CCD elements makes these cameras more expensive, and they still produce lower-resolution images than linear-array cameras.

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Max Resolution	4800	1600	2400	2400
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One & Three Pass	yes	no	no	no
Dual Connectivity	yes	no	no	no

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The Dicomed Digital Camera is key to the project. "This is the first portable digital camera that's capable of delivering quality that rivals and, in some ways, surpasses film," said Johnson. The camera can capture 7,500-x-6,000-pixel 24-bit images. Unlike most other high-resolution digital cameras, it features its own storage, sufficient for eight high-resolution images, and a battery pack for field operation.

A PowerBook controls the camera and also makes possible the feature Johnson finds most compelling. "You can get immediate feedback on your image, seeing the photograph right there, on the spot. In some ways, it's the ultimate experience for photographers, to see the image as you make it."

Using the camera isn't without its challenges, however. Like all linear-array cameras, the Dicomed Digital Camera requires several minutes to complete an image, so any moving objects in the frame are distorted, often in strange ways. Also, the sheer volume of data generated can be a problem. Johnson uses writable CD-ROMs for image archiving; opening a high-resolution image on a PowerBook 540c with 36 MB of RAM takes about 12 minutes.

Johnson sees the challenges as opportunities. "I look at this as a way to explore new ideas of photographic time," said Johnson. "It opens up a way of seeing that is really no more artificial than conventional photography. I believe I can bring my unique photographic style to this portrait of the parks. And with digital technology, I can record what I see with purer color, more detail, and greater dynamic range." — *Bruce Fraser*



Stephen Johnson made history by taking the first digital view-camera images of Yosemite National Park.

Product Information

CAMERA	PRICE	EFFECTIVE RESOLUTION*	ARRAY TYPE	ONBOARD STORAGE
Apple QuickTake 100	\$700	640 x 480	area array	8 high- or 32 low-resolution images
Dicomed Digital Camera	\$22,500	7,500 x 6,000	trilinear array	8 high-resolution images
Dycam Model 4 Digital Still Color Camera	\$795	496 x 365	area array	8 high- or 24 low-resolution images
KanImage Digital Photography GA System	\$39,000	3,072 x 2,320	area array	none
Kodak DCS 420	\$10,995	1,524 x 1,012	area array	unlimited, using PCMCIA removable storage
Leaf Digital Studio Camera	\$35,500	2,048 x 2,048	area array	none
Leaf Lumina	\$7,500	3,400 x 2,700	trilinear array	none
Sony SEPS 1000	\$40,995	1,476 x 1,108	area array	none

*In pixels

DIGITAL continued from page 7

single-shot cameras, such as the Kodak DCS 420. The Lumina takes about 3 minutes to capture a 3,400-x-2,700-pixel RGB image and has no internal storage. The DCS 420 is a stand-alone camera based on a Nikon N90 body. It offers a maximum resolution of 1,524 x 1,012 pixels and has a burst mode, which can capture five full-resolution images in only 2.25 seconds. This, and the fact that it uses standard PCMCIA cards as removable storage, make it of particular interest to photojournalists. Both cameras capture 12 bits per color per pixel.

The main difference between expensive cameras and their cheaper counterparts is resolution. The Leaf Digital Studio Camera is a digital back that comes in three models: for Hasselblad motorized cameras, for Mamiya RZ67 cameras, and for Cambo and Sinar 4x5 view cameras. Its 2,048-x-2,048-element area array can capture single-pass black-and-white and three-pass color images up to 2,048 x 2,048 pixels with a color depth of 14 bits per color per pixel. It requires a

computer for control and image storage.

The \$39,000 KanImage Digital Photography GA System is an interesting hybrid. It uses a 480-x-512-element area array but moves the array in single-micron increments to build an image with a maximum resolution of 3,072 x 2,320 pixels. Completing a full-resolution image takes approximately 16 seconds.

At September's Photokina show in Cologne, Germany, Leaf Systems planned to unveil the Leaf Digital Portrait Camera, which uses the same CCD array as the company's Digital Studio Camera but has a proprietary non-RGB dye-set-and-filter arrangement whose patent is pending. The camera has a hefty price tag of about \$50,000 and is aimed at the high-volume portraiture market. Reportedly, it will require a Power Mac for combining color samples into a fully anti-aliased image.

For the present, digital cameras are most likely to be used in vertical applications that fit their individual strengths and weaknesses; film will clearly be with us for many years to come. But digital photography is now a full-fledged industry, not just a promising technology. □

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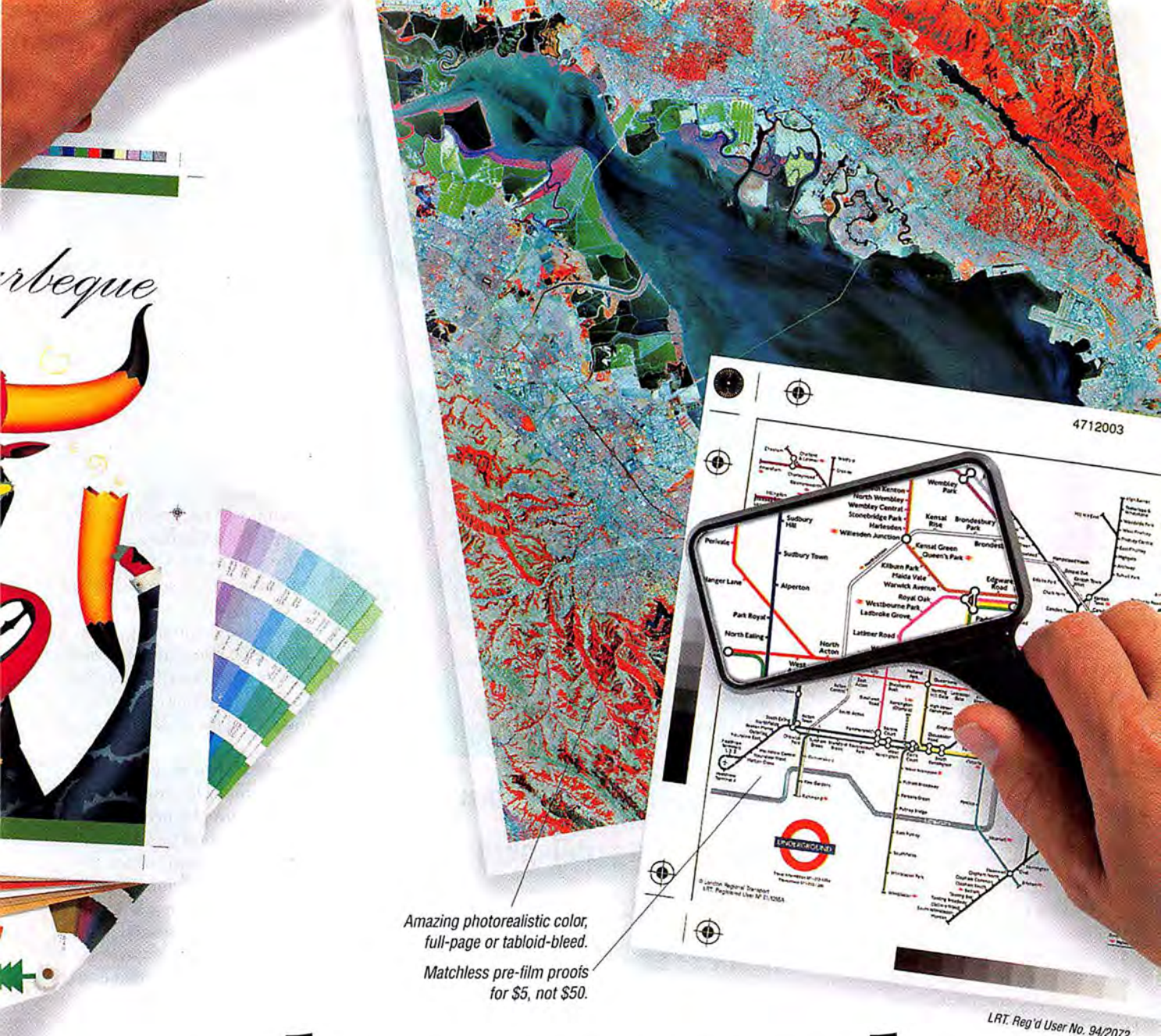
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Final Proof?

BY BRIAN P. LAWLER

In the end, publishing comes down to putting ink on paper. No matter how pages are created, one step has remained unchanged — the need to see a proof of a page before it's printed. Traditionally that has meant producing a photographic proof from final film. But as the publishing process moves in-house to save time and money, designers and production specialists are looking for new ways to proof pages, using everything from expensive direct-digital proofers, to high-end inkjet devices, to desktop dye-sublimation printers, to color-accurate monitors.

Although the idea of quick, in-house proofing has appeal, many printing plants have resisted. Proofs have always served as the contract between the client and the print shop, indicating what's acceptable in terms of color accuracy, element placement, and film flaws.

When a digital proof is substituted for a conventional proof, press operators often ask, "Where are the halftone dots?" But as color accuracy improves and prices decline, using a digital device for proofing becomes more compelling. Soon too, as direct-to-plate and direct-to-press processes evolve, the need for prepress proofs may disappear altogether. The tools are almost there; what's needed is a shift in perception.

The arrival of digital printing, which eliminates film altogether, is the most radical change confronting prepress professionals. If you use a Heidelberg GTO-DI, which creates printing plates



Proofing takes many forms in the era of digital publishing. But can electronic techniques completely replace traditional methods?

on-press directly from digital data, where and how do you proof your job? The Eprint 1000 press, developed by Indigo, and Xeikon's DCP-I press, sold as the Agfa Chromapress, don't use film or printing plates — the first image these devices create is on the final paper.

In addition, most imagesetter manufacturers are developing direct-to-plate imagesetters, which will eventually eliminate film from the printing process. Proofing in a world where no film or plates are ever made requires that we rethink the proofing process altogether. The responsibility for color proofing must move upstream to dye-sublimation printers or inkjet proofers.

"Some of our customers are looking at the Chromapress as a proofing device," said Jacki Hudmon, regional sales specialist for Xeikon, in Mount

Prospect, Illinois. "Other people will be calibrating their 3M Rainbow or Iris proof printer to match the Chromapress."

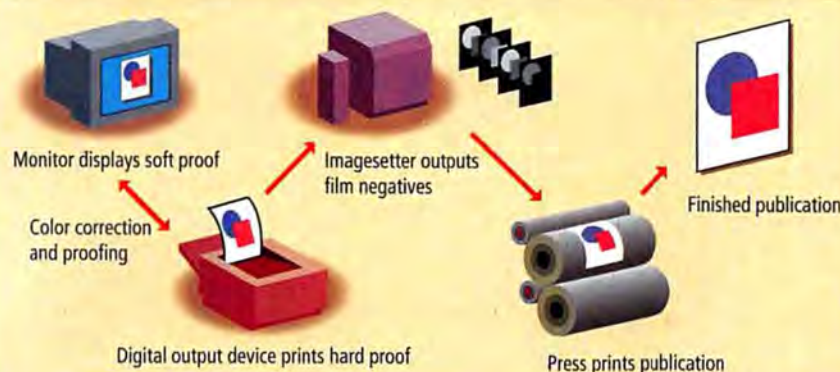
Even those who have no intention of imaging directly to film or paper are moving toward digital proofing. With the right equipment, the benefits are great in terms of both cold hard cash and precious minutes of production time.

Prepress proofing has been synonymous for years with laminate proofs, such as 3M's Matchprint and Eastman Kodak's Contract, which are made from final film. More recently, digital-proofing techniques have rushed to fill the void between no proofs and laminate proofs that cost \$150 each at prepress houses. Eastman Kodak's Approval

and 3M's Digital Matchprint are among the digital-proofing technologies that make proofs directly from the file that would otherwise make the film, complete with halftone dots that simulate those generated by an imagesetter. But the machines that produce these proofs cost \$250,000 or more, so savings in labor and materials over conventional proofing are spent on costly technology.

Somewhere between the quarter-million-dollar systems and low-cost desktop printers, it's possible to assemble a color proofing system that delivers good proofs at a reasonable price. With so much development in computer systems, scanners, and imaging devices, it's not surprising that several competing technologies have emerged for desktop prepress proofing.

Pathways to Digital Proofing



Using a color printer as a proofing device has only recently become an option that desktop publishers could consider. The resolutions of desktop inkjet or thermal-wax printers are too low to allow their output to serve as press proofs, and their water-based inks or wax pigments usually do not match press inks accurately enough to be used for proofing colors. As a result, these devices have become comping devices, used to check design elements and select basic color choices.

A more popular type of desktop proofing device today is the dye-sub printer, which imparts tonality to an image by varying the intensity of the dyes. Although it lacks halftone dots, dye-sub output can be surprisingly accurate compared to a press sheet if enough care is taken to adjust the colors through software. And with costs of about \$6 per full-bleed letter-sized page, dye-sub printers are quite a bargain.

Printers from Tektronix, Eastman Kodak, SuperMac Technology, 3M, and others are being used successfully in electronic prepress, but they can require a significant initial investment. The Tektronix Phaser 480 and Kodak ColorEase PS Printer, for example, are stand-alone units that have PostScript interpretation in hardware. These types of units cost \$8,000 to \$17,000. The SuperMac ProofPositive and 3M Rainbow each require a Mac to host the software interpreter. The latter systems work best with lots of RAM (upwards of 64 MB) and a high-capacity hard drive. The cost of the total system — printer, computer, hard drive, and RAM — can add up to \$25,000 or more. Dye-sub-media costs can add up too.

No matter which dye-sub model you choose, installing a dye-sub printer is not plug-and-play; you must adjust it carefully to get balanced color, and col-

ors appear brighter on its media than on the target paper. As a result, press operators are still reluctant to accept dye-sub prints as prepress proofs.

High-quality inkjet printers are more readily accepted as proofing devices. There are currently just two players in this market: Iris Graphics, and Stork Graphics, of Boxmeer, Holland, whose system is sold as the core of Du Pont's digital-proofing system. Market leader Iris, owned by Scitex, produces inkjet printers capable of imaging sheets as large as 34 x 46.8 inches. Iris printers are very popular for prepress and can image with various specialized pigments onto a variety of media as thick as .01-inch. Stork has a smaller share of the inkjet prepress-proofing market. Like those of its competitor, Stork's proofing units can make handsome proofs on a variety of media as large as 34 x 46 inches.

Inkjet proof printers are priced about midway between low-cost desktop printers and quarter-million-dollar proofers. Iris' mid-sized model, the 3024 (which has a 24-x-24-inch image area), is quite popular with prepress and print houses. It costs just over \$120,000, complete with the RIP hardware and software. That's not peanuts, but over a period of a few years, buying one is more cost-effective than purchasing individual photographic proofs. Unlike dye-sub printers, high-end inkjet printers require no special paper; in fact, you can use the same paper you use for your final printed piece.

These inkjet printers use electrostatic energy to control the distribution of water-borne pigments onto the proofing medium. They create tonal change not by drawing halftone dots but by varying the percentage of pigment that reaches

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HANDS ON

From Proof to Fine Art

Trusting Iris Graphics inkjet printers as proofing devices has been an education for Tulip Graphics as well as its clients. "We taught our customers to rely on our proofs," said Mario Assadi, founder of the full-service color shop in San Francisco. By working tirelessly to match the color on the Iris proofs to the color of the traditional photomechanical proofs his firm also produces, Assadi and his staff improved their ability to produce extraordinarily accurate inkjet proofs for their customers.

"It took many hours... no, many weeks of test runs," recounted Richard Capone, prepress supervisor at Tulip. "We've gotten our clients to accept digital inkjet proofs by showing them side-by-side comparisons with photomechanical proofs, and we've been able to get the colors very, very close. With the Iris, the color doesn't change at all — once it's adjusted correctly. The Iris has worked for us because we've spent considerable time getting it to match our Fuji, Kodak, and Enco proofs."

"When we use a particular Iris pattern [Matrix No. 3] that simulates halftone rosettes, our proofs come closer to a press sheet than a photomechanical proof," Assadi said. "Conventional lithographers can look at them through a loupe and be satisfied."

Using Tulip's Iris 3024 and 3047 inkjet printers to make proofs without having to generate film results in real cost benefits. "If we can make the first proof an inkjet, we can save hundreds of dollars for the client; if we can

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By using Iris inkjet proofers instead of producing traditional proofs, Tulip Graphics' Mario Assadi saves his clients money while achieving faster turnaround.

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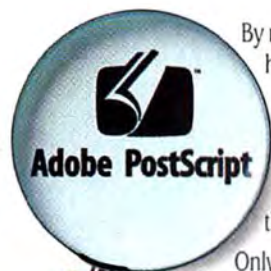
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CIRCLE 127 ON READER SERVICE CARD

the medium. Companies that use inkjet proofs contend that once press operators become accustomed to the absence of halftone dots, they're pleased enough with the proof's color to accept it as a surrogate photomechanical proof.

High-quality color monitors available for the Mac, combined with the accelerated-video cards that drive them, give some potential for using the screen itself as a "soft proofing" device. Displays on monitors such as SuperMac's PressView 21 can come as close to resembling the printed sheet as the color physics involved allow. In conjunction with the digital printing presses of the future, a Mac display may serve as a reference for judging the basic acceptability of a color page. Does the logo appear in the company's corporate color?

With Apple's ColorSync 2.0 system-level color architecture and the many color-management profiles that are being developed for use with it, the Mac has a definite advantage over other computer systems that are just beginning to address the problems of achieving accurate color. Color device profiles for monitors, proof printers, scanners, and even printing presses are all within the range of products that support or accept the ColorSync device-profile standard.

The InterColor Consortium was

formed to establish and promulgate color standards based on Apple's ColorSync. Among the firms that have agreed to develop their color-specific products within this framework are Adobe Systems, Agfa, Apple Computer, Eastman Kodak, Microsoft, Silicon Graphics, Sun Microsystems, and Taligent.

Once InterColor-compliant profiles and products are available, matching and comparing colors on a variety of devices should be much simpler. InterColor software profiles will make it possible to work with contract proofs, digital color proofs, dye-sub and inkjet proofs, and even color displays with a greater degree of confidence.

Much of the resistance to new proofing media is related to people and their resistance to change. But change is inevitable in the printing and prepress industries. Just as halftone dots are no longer the assumed basic element for communicating tonal information and just as typography, image assembly, and color separation are so different today from what they were just a few years ago, changes in proofing technology require each of us to be nimble in our attitudes. As inkjet and dye-sub proofing improves and the printing industry grows accustomed to proofs from non-halftone sources, the electronically generated proof will become as common as the photomechanical proof is today. □

make the final proof an inkjet, we save both time and money for everyone," Assadi said.

The high quality of their Iris proofs has enabled Assadi and company to spin off another business — fine-art reproductions. After seeing the Iris-printer output, one of Tulip's Fortune 500 clients commissioned the firm to make reproductions of the corporation's rare art for display in various buildings around the world. The artwork is photographed, the transparencies are scanned with a Linotype 3800 drum scanner, and then the digital images are printed on archival paper with an Iris 3047 proof printer. Displaying the framed digital duplicates in highly visible locations reduces the risk of damage to fragile artwork while making the art more accessible to the public.

The staff at Tulip attacked the problem of accurate colors on thick, watercolor paper with the same fervor as they did their prepress proofs. Instead of playing with ink sets, however, they meticulously altered the color curves in software for greater color fidelity.

San Francisco's California Academy of Sciences took note of Tulip's capabilities and tried a run of museum display boards on the Iris printer instead of using conventional screen-printing methods. The cost dropped, the quality was extraordinarily high, and the turnaround was days less than it would have been with the conventional technique.

By taking a risk with the Iris printers — and taking the time to make them fit into its production flow — Tulip has leveraged a new business. The company now has enough work to keep three Iris printers humming along.

— Brian P. Lawler

Directory

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302-992-3261
Du Pont Digital Proofer (Stork Inkjet), \$139,290

EASTMAN KODAK COMPANY

Rochester, NY
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716-724-4000
Kodak Approval Digital Color Proofing System, \$250,000
Kodak ColorEase PS Printer, \$7,999

IRIS GRAPHICS

Bedford, MA
800-947-4712
617-275-8777
Iris SmartJet 4012, \$39,000
Iris 3024, \$84,500
Iris 3047, \$123,000

MITSUBISHI INTERNATIONAL

White Plains, NY
914-997-4999
ColorStream DS, \$7,950
ColorStream DS/Plus, \$15,500

NEWGEN SYSTEMS

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Chromax Color Printer, \$15,995

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San Jose, CA
800-873-4561
408-922-5900
Professional ColorPoint 2 Model 4, \$8,999
Professional ColorPoint 2 Model 14, \$16,499

SUPERMAC TECHNOLOGY

Sunnyvale, CA
408-541-6100
SuperMac ProofPositive (full-page), \$7,999

SuperMac ProofPositive (two-page), \$14,999
PressView 21 Color Display System, \$3,999

TEKTRONIX

Wilsonville, OR
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503-682-7377
Phaser 440, \$7,995
Phaser 480, \$14,995

3M IMAGING SYSTEMS GROUP

St. Paul, MN
800-328-1684
512-737-6509
3M Digital Matchprint, \$328,900
3M Rainbow 2720, \$17,000



Tulip Graphics' Mario Assadi and Scitex operator Ruby Yip inspect display boards created for the California Academy of Sciences and printed on an Iris 3047 inkjet printer.

Making Prints Match

Accurate color matching has been one hurdle facing publishers who want to use desktop printers and monitors as prepress proofing devices. The idiom of RGB phosphors does not translate easily to the language of CMYK inks. But progress has been made. It is possible to get reasonably consistent color from your desktop system. All it takes is the right software and hardware, a good eye for color, and a little patience.

We asked Peter Alan Gould, *MacUser's* associate technical art director, to explain how he calibrates his system to achieve color fidelity among on-screen images, dye-sublimation prints, and final four-color pages from the offset printing press. Follow these simple steps to get better color matching among your monitor's display, desktop printer, and final printed page. Here's proof that in-house proofing can work. — *Sean J. Safreed*

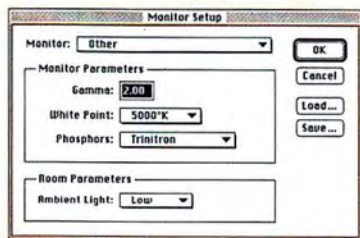
1.



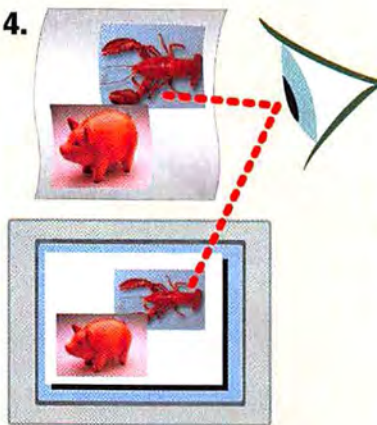
2.



3.



4.



5.-6.



1. Take an image you've previously had printed on an offset press. Open the electronic file of the image in Adobe Photoshop. It should be representative of something you typically send to your printer, including colors you frequently use.

2. Using a calibration device such as those sold by Radius and SuperMac Technology, calibrate your monitor. If you don't have a hardware calibrator, use Knoll Software's Gamma control panel, which ships with Photoshop, to adjust the monitor's response curve. Try to match a white area in the image to the color of the paper on which it will be printed.

3. In Photoshop, set preferences for Monitor Setup, Printing Inks Setup, and Separation Setup. Set the values for monitor preferences to match those of the calibration device — for our SuperMac PressView, we set Gamma at 2.00, White Point at 5000°K. The ink and separation preferences should match those dictated by your press operator.

4. Here's where the eye for color comes in: Compare the final, printed image to the on-screen image. In Photoshop's CMYK mode under your preferred lighting conditions, the two images should be close in overall color.

5. Now that your monitor matches the final output, it's time to bring the dye-sub printer into the mix. In Photoshop, open the same image you used to color-correct the monitor. Print the image to the dye-

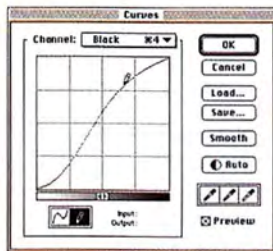
sub printer; we used the ProofPositive Export SCSI module with the EfiColor processor set for SWOP-coated paper.

6. Compare the on-screen image to the dye-sub print.

7. In Photoshop's Adjust Curves dialog box, use the pencil tool to tweak the individual CMYK curves so that the on-screen image more closely approximates the printed sample (be sure to check Preview first). Save the curve settings with a filename such as Color Correction Curves 1, but do not click on OK to accept the changes you've made; click on the Cancel button instead. You've now stored the curves as a separate file that more closely aligns the monitor's gamut with that of the printer. Download the curve settings you created in Photoshop to the printer (in the ProofPositive Export CPSI module, select the curves file in the CMYK Ribbon dialog box). If the image presented on-screen still does not match the dye-sub print, open the saved file in Photoshop's Curves dialog box and repeat steps 6 and 7. In our experience, the ProofPositive requires considerable darkening on the magenta curve.

8. By using the EfiColor SWOP settings for our dye-sub printer, we were assured of a good gamut match between the dye-sub printer and the press. The custom curves created in Photoshop for the dye-sub printer allowed us to find a good match between the dye-sub print and the screen representation.

7.



8.



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Just Add Copier

BY CONNIE GUGLIELMO

Bringing a full-service print shop in-house seems impractical to many companies. But more and more corporations are taking advantage of a new generation of PostScript RIPs (raster-image processors) that turn digital copiers into short-run printing stations capable of producing full-color materials for just pennies a page.

Corporate users have long been eager to add dashes of color to business documents but have been wary of spending hundreds or even thousands of dollars for short offset-print runs — generally 500 copies or less — on such documents as promotional materials and presentation handouts that have a limited life span.

"There's a lot of interest in color document publishing, and it's going to grow," said Bryan Corrigan, a partner with Charles A. Pesko Ventures, a market-research firm based in Marshfield, Massachusetts. "Companies are very competitive about how they create and share information. As one company or division starts to employ color in its documents, other people around it are driven to want color. It's called keeping up with the Joneses."

The use of color printers has been the domain of graphic artists. Inkjet, thermal-wax, and dye-sublimation printers have been too slow (.5 ppm for inkjet printers), too costly (at least \$3 per page for dye-sub), or too fragile (in the case of thermal-wax) to be used for more than the occasional printed piece at cor-



A new generation of PostScript RIPs coupled with color copiers is making in-house, short-run color printing a reality.

porate sites. Most units also require special paper for the best results.

A more enticing development for corporate users is to use desktop color laser printers, which are slowly making their way onto the market. Using one of these 3-ppm units may seem like a cost-effective solution for limited-run color printing, but there's a drawback. "Who wants their computer tied up so that it can print 100 copies?" said Corrigan. "Companies are starting to look at whether they acquire several color printers for \$7,000 to \$10,000 apiece and spread them throughout the corporation or buy a copier/printer system, where the print quality is higher but so is the cost. It depends on how frequently documents are being produced."

For occasional short print runs, corporate users have another option: digi-

tal offset presses, such as Heidelberg's GTO-DI or Xeikon's DCP-I (Agfa Chromapress), specifically designed for short print runs. These systems are more cost-effective than traditional presses, but they do require a trip to a print shop.

What color-copiers-turned-color-printers offer is a way to get fast (5 to 7.5 ppm), good-quality (400 dpi), four-color (CMYK) output onto plain paper at costs of 10 to 50 cents per page — all in-house. The benefits are cost, convenience, and control.

Using color copiers as color printers for short-run printing is not a new concept — Canon showed its PS-IPU PostScript printer interface for its copiers in 1990. More successful was

Electronics for Imaging, which introduced its line of Mac-based Fiery Color Servers for Canon, Kodak, and Xerox color copiers in 1991.

The concept is straightforward: An image is sent from the Mac via a high-speed PostScript RIP (thus freeing up the Mac) to the print server, which is stocked with its own memory, hard drive, and processors for handling output to the color copier. Mac users select the copier from the Chooser, as they would any networked printer.

Earlier this year, EFI, which claims to have a 90-percent share of the market for color-copier-based printing products, announced that it had shipped 10,000 Fiery units worldwide.

But who's using these systems? The largest audience for PostScript-based copiers, according to Mike Zeis, editor

Cost-Conscious Color



Source: Charles A. Pesko Ventures. *Costs based on 30-percent image coverage.

and publisher of *Color Business Report*, in Uxbridge, Massachusetts, has been copy shops with enough color-printing volume to justify buying or leasing the \$80,000-to-\$120,000 systems.

But Mac vendors are hoping to broaden the market. Following EFI's lead, SuperMac Technology, Agfa Graphics Systems, ColorAge, DICE America, and Colorbus have introduced lower-end versions of their RIPs over the past year to target corporate users. At the same time, copier makers such as Canon and Xerox have continued to release lower-priced copiers retailing for less than \$30,000.

These price shifts have moved the combined price of the RIP and the copier into the \$35,000-to-\$60,000 range (not including the Mac or PC front end). That's not cheap, but businesses that have a constant need to produce color documents have found that these copier-based systems offer a compelling cost advantage over other methods.

Choosing a PostScript interface that turns a copier into a printer means deciding at the outset which copier engine you want, because most RIPs are designed to work with specific engines. Although printer interfaces exist for Kodak and Minolta copiers, most Mac vendors are developing their products for two main engines: those of Canon U.S.A.'s Color Laser Copiers (CLCs) and Xerox's MajestiK line.

In general, the color copiers available today have several features in common, notably the ability to produce vibrant continuous-tone output on plain copier paper. Printing to common bond is a real boon for keeping costs down but prevents you from using heavy or

glossy stock for a report cover, for instance. Color copiers can't handle automatic duplex printing or perform binding and other finishing techniques.

Copier models differ primarily according to resolution and print speed when printing to different paper sizes: For instance, although all copiers support 400-x-400-dpi printing of letter-sized pages, the lower-cost copiers may support only a 400-x-200-dpi resolution when printing an 11-x-17-inch page. Some printer interfaces can boost resolution at larger paper sizes, however.

Canon pioneered the use of copiers as PostScript printers, and today its 5-ppm CLC line is popular with Mac vendors. Xerox made news when it shipped its first color copier that listed for less than \$30,000: the 6-ppm MajestiK 5760.

Other than price, a variety of features distinguish the printer interfaces being offered by Mac developers. Among them are RIP speeds, the amount of onboard memory, the speed of processors for handling I/O, the resolutions supported at various print sizes, and the bundled software for ensuring color consistency and handling print-management tasks such as queuing. Some of the newer RIPs also allow you to use the copier to scan hard copy. Because these print servers are often stand-alone computers, networking options are also a consideration.

Given the increased competition in this arena, it's not surprising that, earlier this year, EFI announced a lower-cost version of its popular \$37,500 Fiery Color Server 200i for Canon, Kodak, and Xerox copiers. The \$28,500 Fiery Color Server 150i supports Adobe Systems' PostScript Level 2 RIP and ships with a variety of EFI software, including FieryScan software, for scanning images on copiers, and EfiColor Works, a suite of color-matching tools.

Unlike PC-based solutions, SuperMac's Splash technology consists of Mac software and a NuBus card containing the PostScript RIP, which turns a Mac into a print server for Xerox MajestiK copiers. After making its entry into the market with its Splash•MX controller, SuperMac bolstered its lineup with the Splash•MX_{plus} and the Splash•TX cards. The new products let you scan images off MajestiK copiers

See *Copier*, page 26

HANDS ON

Making Short Run Work for the Long Term

Juan Ramirez will tell you there's a very simple reason why Dallas-based Southwestern Bell made the decision to lease EFI Fiery print servers and Canon CLC 500 color copiers in 1991: cost.

"The main reason we went to the system is that it's less expensive [than other solutions we looked at]," said Ramirez, a graphics specialist in the integrated-systems marketing group responsible for producing sales proposals for Southwestern Bell's account representatives. "We write and design sales proposals, and we customize the proposals for our clients, including putting their logos on the covers. In the old days, we were sending all of our covers to offset printers and spending about \$800 for 25 copies of a four-color cover."

That worked out to be about \$32 per 15-page proposal, not including the cost of printing and copying the rest of the pages, which, because of costs, were limited to black-and-white.

Ramirez and his colleagues set out to look for ways to cut the cost per proposal while at the same time adding more color to their layouts, which are created with QuarkXPress, Aldus FreeHand, and Adobe Photoshop. After shopping around at local service bureaus and getting bids for printing services, Ramirez said, the company decided to lease Fiery/CLC systems for its documentation centers in Dal-

See *Hands On*, page 26



At Southwestern Bell, the combination of Canon Color Laser Copier and EFI Fiery RIP allows graphics specialist Juan Ramirez to add more color to marketing proposals while decreasing costs.

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HANDS ON continued from page 23

las, St. Louis, and Houston. These sites are responsible for producing sales proposals for the company's account representatives selling Southwestern Bell's telephone service to clients in five states.

"We wanted something fast, and the Fiery processes pages really fast. We first tested the Canon interface to the copier, and it processed a 15-page document, with color throughout, in about 30 minutes," said Ramirez, adding that a Mac IIx and IIci serve as the front ends to the Fiery/CLC system in Dallas. "But the Fiery cuts the RIP time by one-third. And after the proposal's been RIPed, we can print about 5 pages per minute, and it's all right here in-house."

Best of all, the Fiery/CLC systems (which Southwestern Bell leases for \$1,500 each per month, including servicing) cut the total cost to less than \$1 per page, allowing Ramirez and his colleagues to produce seven proposals per week — with color on every page — at less than half of what they were paying to offset-print just the cover.

Although the print quality is not as high as that offered by offset-printing techniques, and although the CLC is limited to plain-paper stock, Ramirez said the account executives "just love it. When we first started to do color, we got a lot of requests for more color throughout the proposals."

And although Ramirez reports that Southwestern Bell has been extremely satisfied with the EFI/Canon systems, he added that the decision to lease rather than buy the systems has ultimately turned out to be the right one. "The technology has already changed so much. When our lease expires next year, we'll be ready to look at and compare the other copier-based products on the market." — *Connie Guglielmo*



Southwestern Bell produces seven proposals a week with covers customized for clients and color on every page, thanks to its copier-based in-house printing system.

COPIER continued from page 23

directly into Mac applications such as Photoshop. Sold through Xerox, the Splash cards start at \$17,995.

A recent entry into the field is Agfa, which offers its CR-A RIP for Canon CLC 300 and 350 copiers. Starting with a 32-MB model that sells for \$18,600, the three models differ only in price and in the amount of on-board memory: The more memory, the higher the print resolution supported at various print sizes. All three use an Agfa-developed PostScript interpreter called AgfaScript, which incorporates the company's FotoFlow color-management and color-half-tone-screening technology.

With its \$19,995 ColorQ 1000 and \$29,995 ColorQ 2000 print servers, ColorAge targets small-business and corporate users, respectively. Both versions, which support PostScript Level 2, work with Canon CLC and Xerox Majestik copiers. The ColorQ 3000, starting at \$29,995, has the distinction of offering built-in support for the Pantone Color Matching System.

As part of its DICE Net product line, DICE America offers \$14,500 interface cards, with drivers, that turn a PC into a dedicated print server. PostScript and TIFF files are then sent from a networked Mac through the DICE Net interface to Canon and Xerox copiers, which can also be used as scanners.

Although it had not made any

In-House Color Compared

	COLOR LASER PRINTER	COLOR COPIER
Class of equipment	desktop	department
Average monthly volume in pages	2,000	5,000
Initial average capital expense	\$8,000	\$50,000
Time to print	33 minutes	13 minutes

Source: Charles A. Pesko Ventures.

announcements by press time, Colorbus will reportedly announce a Mac version of its \$32,995 Cyclone PS image-manipulation and digital-printer-controller technology, which is currently driven from Silicon Graphics workstations. The Colorbus system supports output to Xerox copiers.

A wave of copier-based products is headed for the market as more corporate users grow comfortable with the idea of producing color documents from the desktop. Some business users will still want the convenience of a desktop color printer for everyday use, but for high-volume printing, a digital copier/printer may be just the ticket. The initial setup of such a system may seem like a significant expenditure, but their low per-page costs make these systems an effective long-term option. □

Directory

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Canon CLC 300, \$23,000
Canon CLC 350, \$20,400
Canon CLC 550, \$52,400

COLORAGE

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508-667-8585

ColorQ 1000, \$19,995
ColorQ 2000, \$29,995
ColorQ 3000, \$29,995

COLORBUS

Irvine, CA
714-852-1850
Cyclone PS Printstation, price not
available for Mac (prices on
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Splash•MXplus, \$21,000
Splash•TX, \$29,000

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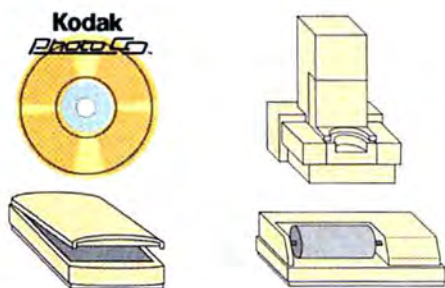
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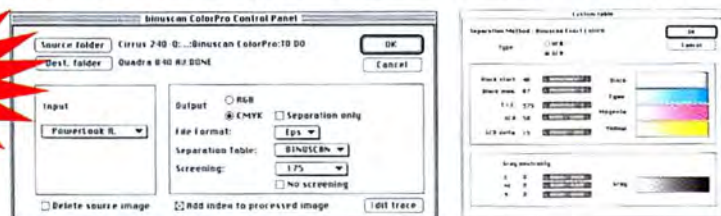
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HANDS ON Networking

WIRELESS LANS /

ETHERNET IN THE AIR

WIRELESS ETHERNET ARRIVES for LANs this fall, with the DaynaCOMM series of products, from Dayna Communications (801-269-7200), and more products on the way from Digital Ocean (913-888-3380).

The DaynaCOMM PCMCIA Roamer (\$699) is a credit-card-sized Type II adapter for 500-series PowerBooks that have PCMCIA slots. The card offers Ethernet at 1 Mbps, using a spread-spectrum, frequency-hopping radio technology, so you can establish Ethernet networks with other units in a 150-foot radius.

For PowerBooks (or other Macs) that lack built-in Ethernet, Dayna offers the 4.5-ounce DaynaCOMM Serial Roamer Cordless Adapter (\$699), a wireless LocalTalk adapter that clips onto a PowerBook's screen or onto a Newton. The 5.5-x-2.5-x-.75-inch Serial Roamer can use several standard sizes of cellular-phone



battery packs, which clip onto the unit without using cables.

The DaynaCOMM Network Access Point (\$1,499) can connect as many as ten Roamers to a wired Ethernet network.

Users can wander out of one access point's range and into another's without losing the network connection.

DaynaCOMM products operate at around 2.4 GHz, a frequency band available worldwide without licensing. The actual frequency in use hops among 83 possible frequencies, preventing data loss in the case of interference from, say, microwave ovens. The DaynaCOMM products work with AppleTalk, MacTCP, MacIPX, and other network protocols.

Digital Ocean has announced the Manta and the Starfish, a radio-based Ethernet adapter and a network access point, respectively. The battery-powered Manta (about \$800), which is larger than Dayna's Serial Roamer, will clip onto a PowerBook 500's screen and plug in to the AUI port. The Starfish (about \$2,000) will perform Ethernet-to-LocalTalk routing. Both will ship around the end of the year. / John Rizzo



Apple and InterCon Aid Net Searches

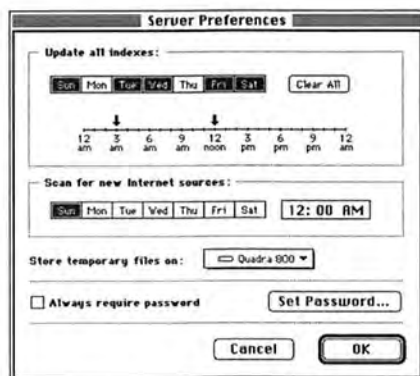
FINDING A WAY onto the Internet is just one of the challenges you face if you're a would-be cyerpunk; another one is finding your way through the vast sea of information you encounter when you get there. Fortunately, new upgrades to Apple's AppleSearch and InterCon's TCP/Connect II software can make both tasks easier.

AppleSearch 1.5 allows as many as 50 users on a LAN to search for information on as many as 100 administrator-chosen Internet Wide Area Information Servers (WAISs) as well as search for information on the Internet-connected local server running the server software (\$1,799; upgrade, \$99 or less). You can use AppleSearch's easy-to-use search tools (natural-language or Boolean queries, automatic updates from personalized search agents, and relevancy rankings) to find information from both sources.

Unlike AppleSearch 1.1, which offered Internet searching but was available only in an education bundle with the Workgroup Server 95 and A/UX, version 1.5 of the server software runs on any Apple Workgroup Server, Power Mac, or 68040

Mac — and software for all 50 clients is free. 408-862-3385.

For searchers with individual Internet connections, there's also TCP/Connect II 2.0 (\$495), from InterCon (703-709-5500). Version 2.0 adds Gopher client software, for retrieving information from Gopher servers around the Internet. Other improvements in version 2.0 include an iconic tool bar for easier navigation and support for new types of file attachments (sound, graphics, and so on) in the mail and news readers. / Shelly Brisbin and Karen J. Ohlson



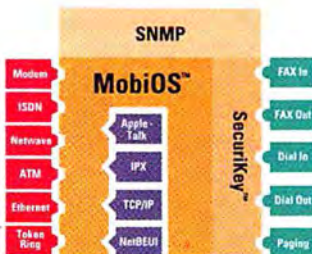
LICENSE COMPLIANCE /

Tracking Software Use

SOME SAY THAT as much as two-thirds of all software is obtained illegally. And yet many businesses pay too much for their software, because they buy more copies than they need to use at any one time. Fortunately, network managers now have two new options for monitoring cross-platform software activity: KeyServer 4.0 (20 users, \$1,148; 50 users, \$2,550; and so on), from Sassafras Software (603-643-3351), and SofTrack (50 users, \$495; 100 users, \$695; and so on), from ON Technology (617-374-1400).

KeyServer 4.0, which runs on a Mac, monitors "keyed" applications that reside on individual Macs and PCs (PC-client support is new in version 4.0). The server communicates with the individual machines over AppleTalk, TCP/IP, and IPX. In contrast, SofTrack is implemented as a NetWare Loadable Module (NLM), monitoring unmodified applications run from a NetWare server. Although the latter situation is less common for Mac users, either package can help keep networks off the Software Publishers Association's blacklist while providing the information that businesses need in order to minimize excess software purchases. / Mark Bieler

After This, You'll Think Of Remote Access Servers In One Of Two Ways.



DaynaLINK for ARA is a mobile networking platform built on Dayna's multi-tasking MobiOS operating system, allowing all industry protocols and services to be added with PCMCIA-based software modules. Each module can be independently managed via SNMP, and SecuriKey security software lets you control access to available services.

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DAYNALINK'S ADVANTAGES: *PCMCIA Type II and Type III compatibility, hot swappable data links, high performance RISC-based processing, trouble-shooting light panel and Dayna's Two-Year Warranty and 24-Hour Replacement Program.*

Introducing DaynaLINK™ The First PCMCIA-Based Mobile Access Server.

A remote access server that uses PCMCIA technology is a pretty startling innovation.

Especially when you realize it helps you avoid the rat's nest of cords that come with exter-



State Of Shock.



nal modem servers. Not to mention the inflexibility of those with proprietary internal modems.

But if you think simplifying dial-in remote access is all there is to DaynaLINK for ARA, you're in for a bigger surprise. This patented technological breakthrough utilizes the multi-tasking MobiOS™ operating system, which will soon let you add such protocols as TCP/IP, IPX and NetBEUI, as well as services like dial out, fax in, fax out, paging, and both local and wide area wireless access. All as easily as popping in a PCMCIA card.

Which is precisely why we call DaynaLINK a Mobile Access Server. Any remote access server can give you dial-up network access once your mobile users finally find a place to connect. But only DaynaLINK is designed to cover you down the road by supporting cordless and cellular wireless networking. Now that's what we call mobile access.

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For a free guide to Mobile Access Communications,
call 800-443-2962, ext.551

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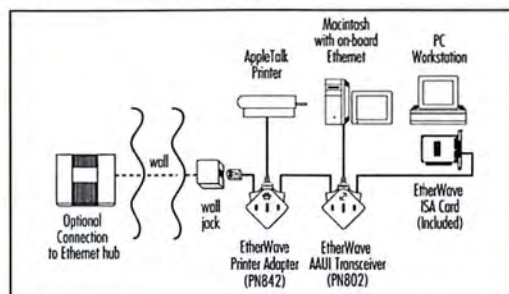


Q.
What's
the easiest
way to add
a PC to my
Macintosh
network...
fast?

Timbuktu® EtherWave® Kit: Easy Networking for Windows Users

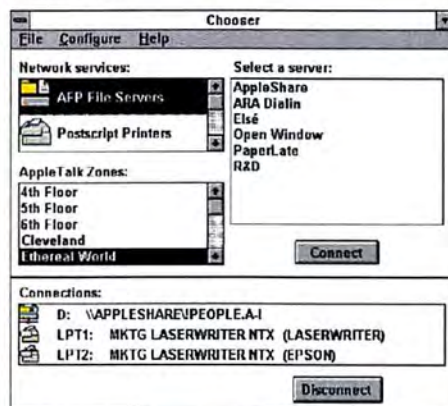
Mixed PC and Mac workgroups can be more productive than ever with the Timbuktu for Windows EtherWave Kit from Farallon. This kit includes everything you need to connect your PC to any Macintosh 10Base-T Ethernet network: award-winning Timbuktu software and the revolutionary new daisy-chainable 10Base-T Ethernet.

The plug-and-play simplicity of EtherWave makes it easy to connect your PC to the network. The EtherWave ISA card has 3Com's Parallel Tasking Architecture built in, for the highest Ethernet performance available for PCs. Installation is a matter of minutes with an auto-configuration utility. Because it's 100% 10Base-T compatible, EtherWave is flexible and easily expandable as your network needs change.

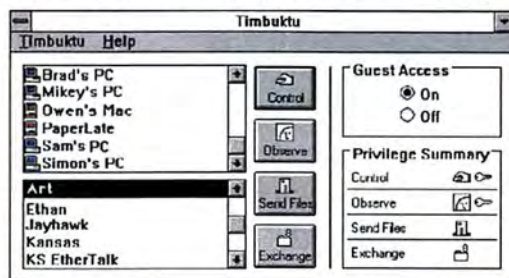


With the Timbuktu for Windows EtherWave kit, you can send and exchange files across the network between PCs and Macs.

And once you're connected, Timbuktu lets Windows users access the same high-quality printers and AppleShare-compatible file servers that Macs use, and even work together on projects by sharing screens in full color between Macs and PCs. File exchange and printing are quick and easy, and occur smoothly in the background. Customizable passwords provide complete security for your critical data.



Access network printers and servers, manage print queues, and receive print status messages with the Chooser for Windows and Windows Print Manager.



Send and exchange files across the network between PCs and Macs.

The Timbuktu for Windows EtherWave Kit is one of several easy-to-use Timbuktu options, available now from your favorite dealer.



A. Timbuktu® EtherWave® Kit



Adding a PC to your Macintosh network doesn't have to be a headache full of PC printing and file transfer problems. And you don't need two aspirins and a lot of equipment — you just need one simple little box from Farallon. The Timbuktu EtherWave Kit gives you everything you need to connect a PC to your Macintosh Ethernet network. The plug-and-play simplicity of award-winning EtherWave means installation in a matter of minutes. And you'll end the office hazard of low-flying floppies when you use Timbuktu for Windows to exchange files across the network with other Timbuktu users, on PCs or Macs. So forget the two aspirins. Get the all-natural cure for network headaches: the Timbuktu EtherWave Kit from Farallon.

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Network Help

A top network consultant tells you how to increase data integrity and use network addressing to increase efficiency. BY KURT VANDERSLUIS

Network Data Corruption

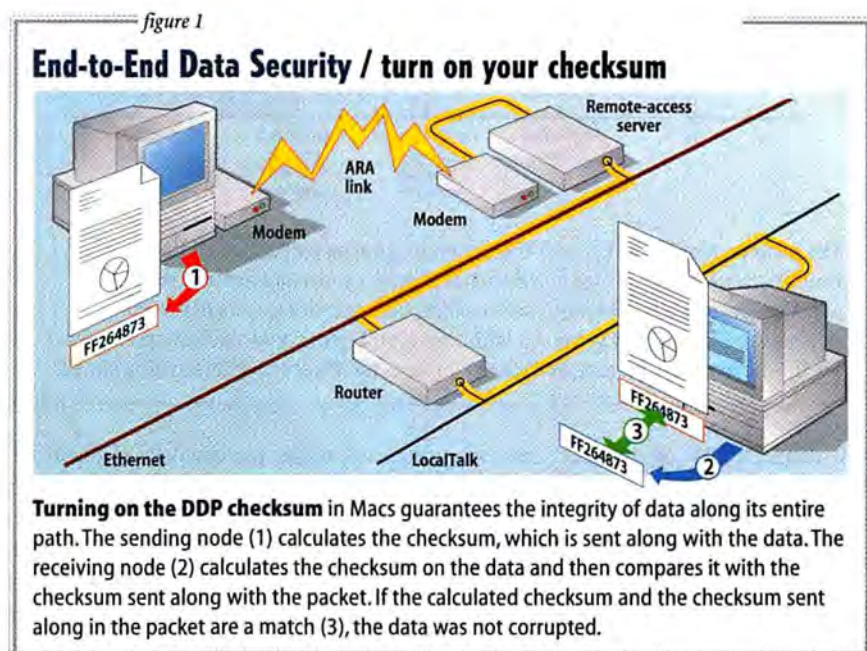
Q. Sometimes when I transfer a Stuffit file from the server to my hard disk, Stuffit tells me that it can't expand the file, because of errors in the file. What does this mean?

Lisa Swanson
Minneapolis, MN

A. The bad news is that the data in your file became corrupted as it traveled across your AppleTalk internet. The good news is that you can avoid future data corruption if you employ a patch file called ForceDDPChecksum, created by Rich Brown at Dartmouth, that you can access on-line (see end of this article).

When your file was corrupted on the network, Stuffit recognized the corruption whereas AppleTalk failed to notice it. For each compressed file, Stuffit calculates a CRC (cyclical redundancy check) number from a set of data. The CRC, included along with the file in the Stuffit archive, acts like a file's fingerprint. When you try to expand the file, Stuffit recalculates the CRC. If it doesn't match the original, corruption has occurred.

Why did AppleTalk miss this corruption? Normally, AppleTalk uses an automatic segment-level checking mechanism in your Ethernet, LocalTalk, token-ring, or remote-access hardware. The problem with this segment-based strategy is that it doesn't involve a comprehensive, end-to-end check and can miss corruption when there are bridges or routers between the data's source and destination. When these internetwork devices forward a packet from one link to



another, they buffer the data momentarily. If the packet data is corrupted at this time, the bridge or router will calculate a CRC that's characteristic of the corrupt data, not the original data. The segment-level integrity mechanism is now meaningless, because it merely checks to make sure the (corrupt) data is delivered intact.

Routers that are known to commonly create this kind of memory corruption include the Shiva FastPath 4 (before the "plus" upgrade) and Novell's NetWare AppleTalk Router 3.0. However, memory corruption can happen with any bridge or router (and it does for a very small number of packets).

If you view data integrity as a high priority, you can turn on the DDP checksum (see figure 1), a data-integrity-checking mechanism for AppleTalk. Apple leaves the DDP checksum turned off in all Macs by default. Although programmers can turn the DDP checksum on for an application, hardly any applications use it.

You can turn on your DDP checksum with the ForceDDPChecksum patch file. Bear in mind that turning on the DDP

checksum slows AppleTalk data transfer significantly in early Macs, since it requires the Mac to calculate a checksum for every packet. However, a powerful Mac of recent vintage can handle the checksum calculation much more easily, with little or no perceptible slowdown.

Measuring Mac Usage

Q. Is there a way to tell over a network how much a particular Mac is being used?

Marc Levy
Bergenfield, NJ

A. A method that's not invasive is the echo test built in to Apple's Inter-Poll and other network-management software. This test sends echo packets to a distant AppleTalk device, which then sends them back. The busier a device is, the longer it takes to respond to an echo. When you send a group of echo packets, Inter-Poll tells you the minimum, average, and maximum response times for the packets.

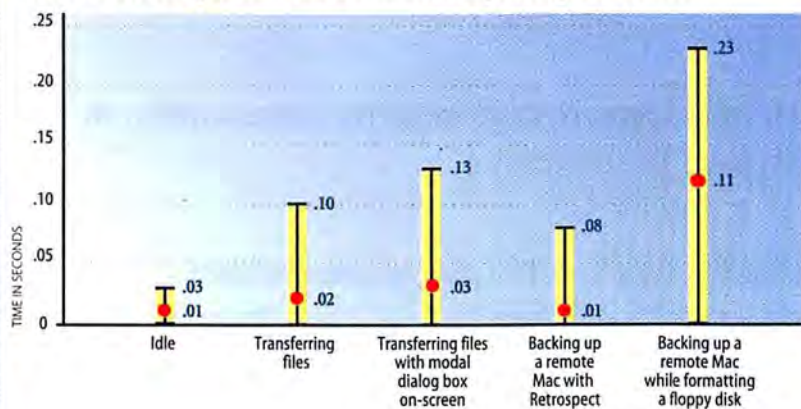
To give you an idea of how this test works, I conducted some tests under various conditions (see figure 2) on a Quadra

Write to Network Help

c/o MacUser
950 Tower Lane
18th Floor
Foster City, CA 94404
You can also send your question to
Kurt VanderSluis on AppleLink
at KVANDERSLUIS.

figure 2

Inter•Poll Response Times / how busy are your Macs?



The busier a Mac is, the longer it takes to return an echo packet Inter•Poll sends to it over a network. To get an idea of what types of results you might expect, take a look at the results of this test, in which echo packets were sent to a Quadra 610 running AppleShare File and Print Server 3.0, with several processes going on. The times shown are the minimum (0), average, and maximum times for the echo packets to be returned.

610 connected to an Ethernet network. Whenever I do this test on a LAN, I always use the same parameters: 100 long echo packets, 0-second delay between packets, 1-second time-out. On a WAN, I use 3 seconds for the time-out value. Each test returned all 100 packets, as you should expect for a reliable network.

Inter•Poll is now an "orphan" product, which means Apple no longer sells it and won't mind if you copy it from a friend. For those who don't have a friend who has Inter•Poll, it is available on-line (see end of article) and is also sometimes available on AppleTalk-related CD-ROMs Apple distributes. Inter•Poll is now six years old, but it's still a very handy tool — every network manager should have a copy.

Network Addressing Options

Q. When I set up my router, it requested that I assign the network a range of network addresses. I set the network range of our Ethernet backbone to be 1 to 1,000. Is that a good range?


Donald Sirkin
San Francisco, CA


A. Sometimes. Because of AppleTalk's dynamic addressing, you always want to have more node addresses available on a network than you have devices, so that Macs that are starting up can find an unused address quickly. You can always do this, because for every network address in the

network range, you can have 253 node addresses. On an extended network such as an Ethernet or token-ring network, I recommend having five times as many node addresses as you have devices. For example, if you plan to have 200 AppleTalk nodes on an Ethernet network, my rule of thumb says you need 1,000 node addresses available. To get 1,000 addresses, you need to assign a network range of 4 network addresses

($4 \times 253 = 1,012$), such as 1 to 4 or 56 to 59.

The only case in which you need more addresses than this is for networks that have bridges, such as a bridged (not routed) WAN or a LAN with more than three bridges. When an AppleTalk device starts up on an Ethernet or token-ring network, it spends two seconds searching the network for any devices that are already using the node address the new node wants to use. In highly bridged or remote networks, you may end up with duplicate node addresses if a new node chooses an address that is already in use by a node too far away to respond during the two-second period.

To reduce the possibility of duplicate addresses, you can use a very large network range, such as your range of 1 to 1,000. This will make 253,000 possible node addresses available, so the chances of a new device accidentally duplicating another node's address will be very low. Using such a large network range is not advisable if you need to conserve your network addresses on a large internet. You also might want to check with your router manufacturer before assigning such a large range, to make sure the router's code can handle it. 

 You can find ForceDDPChecksum and Inter•Poll in the MacUser and ZiffNet/Mac areas on CompuServe and eWorld. See page 4 for details on how to access ZiffNet/Mac.

BREAKING THE RULES / using old wiring

Q. Can I use the old circuits in our old office buildings until we can afford better wiring? How can I tell if a circuit is good enough for Ethernet?

Daniel Waller
Boston, MA

A. The easiest way to check wiring is with a TDR (time-domain reflectometer). This is a wonderful device to have on hand, and a flock of them is available from various manufacturers. For about \$1,500, a TDR provides automatic testing of a variety of wire types. Most of today's models give you a yes/no answer to tell you whether the wiring can support a given type of network, such as Ethernet or 16-MB token-ring. They can also tell you the impedance, attenuation, and near-end crosstalk as well as how long the cable is and whether it's open, shorted, or terminated on the ends. My favorite TDR, the LanCat 1500, from Datacom Technologies (206-355-0590), also gives me an audible indication of the traffic level and numerically displays the current and maximum traffic level and collision rate.

If you've already made the move to Ethernet and are wondering in hindsight about your cabling, the most likely indication of a less-than-acceptable circuit is an unusually high collision rate. Although there are a few exceptions to this rule, you should expect a maximum of one collision per 1,000 packets during times of low network utilization (less than 10 percent). Poor wiring will consistently give you a higher collision rate, because transmitted signals will create crosstalk in the receive pairs of the circuit, causing the transceiver to perceive a collision. In good wire, the amount of crosstalk is below -40 decibels, which means that the crosstalk signal is less than one ten-thousandth the strength of the transmitted signal.

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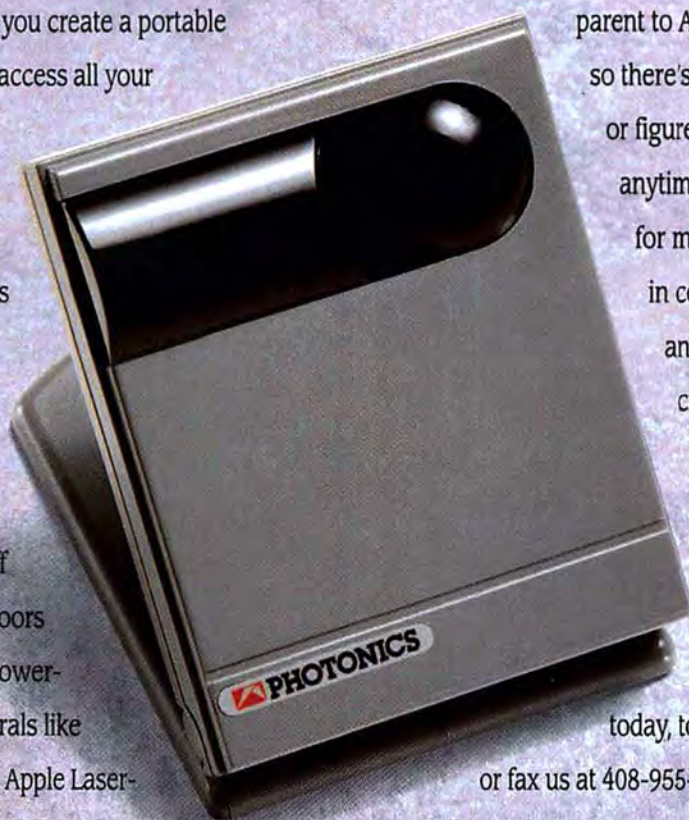
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Cross-Platform Card Tricks



The PCI and PCMCIA expansion-card standards, popular in the PC world, can be Apple's keys to opening the doors of corporate America to Macs — if it plays its cards right. BY JOHN RIZZO

ONCE AGAIN, the reports of Apple's death have been greatly exaggerated. Just this past summer, industry analysts downgraded Apple's stock as Mac-hostile corporate managers interpreted the advent of Windows 4 (a.k.a. Chicago) as a reason to dump their Macs. After all, Microsoft's new operating system contains such Mac-like improvements as 32-character filenames, a file manager that actually works, and the copyrighted marketing slogan "Plug and Play." Even Mac users were worried — I know of one Mac user group that considered admitting Windows users as a way to stay alive in case Apple folded.

Then, in July, Apple did something that surprised the analysts — it announced third-quarter earnings more than five times those of the same period last year. Apple isn't on the brink of extinction after all. At least for now.

The question is, Can Apple keep pulling such rabbits out of its hat? Can it start convincing those Mac-hostile IS managers not just to refrain from dumping their Macs but also to buy more of them — and to make the Macs equal players in their corporate environments?

Actually, I think the answer lies not in hat tricks but in card tricks — cross-platform

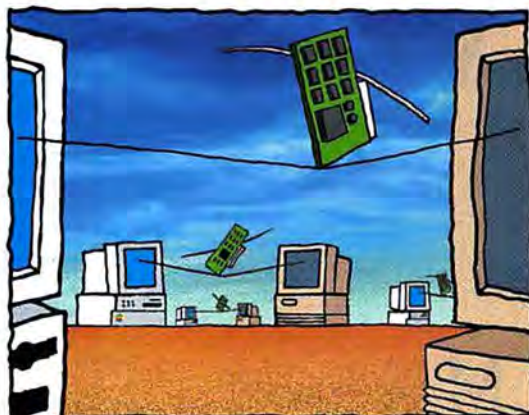
card tricks. The ability for Macs to use the same expansion cards as PCs would do a great deal to ease the Macintosh reticence of IS managers in organizations where Intel machines dominate the desktops. More important, Mac hardware will fall behind PC hardware technologically if Apple doesn't adopt some of the latest PC standards.

So, without further ado, here are two suggestions for what Apple can do to make sure it plays the right cards:

1. Implement PCI Correctly

Apple isn't completely in the dark on these issues. Last year the company announced that it would adopt the PCI (Peripheral Component Interconnect) expansion bus for future Power Mac models. Although initially developed by Intel, PCI is now an open standard defined by the PCI Special Interest Group, of which Apple is a member. PCI is being used in a growing number of PC workstations and servers. In fact, there are Mac developers at work on PCI cards right now.

PCI will probably replace NuBus eventually, for several reasons. First of all, it's faster; it can transfer data at 132 MB per



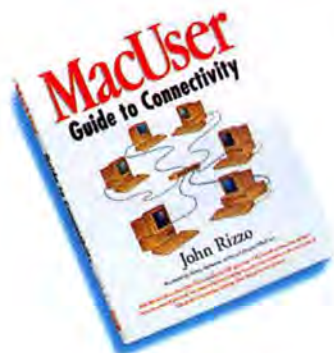
second in today's 32-bit systems — that's three times the bandwidth of NuBus. And PCI's bandwidth can be doubled in future 64-bit systems, such as Power Mac models using the PowerPC 620 chip. Also, since PCI is a *local bus*, one that connects a computer's CPU directly to other hardware systems, it can potentially be used to build a high-bandwidth video port on the logic board. In addition, PCI provides a processor-independent path between the CPU and multiple peripherals, so that peripheral components and add-in boards can work with several different CPUs.

Physically, a PCI card would have no trouble fitting in a Mac, since it's the same length as a NuBus card: 13 inches for the full-sized version, with versions as small as 7 inches (like the small NuBus cards in the

MULTIPLATFORM EXPANSION SLOTS / pick a card, any platform

	Uses	Features	Card size	Maximum bandwidth	Platforms
PCI	video, network interfaces, peripherals	fast	13-inch standard, shorter lengths as small as 7 inches	132 MB/sec at 32 bits wide	higher-end PCs, future Power Macs, RISC workstations, lab equipment
PCMCIA	modems, RAM, wired and wireless network interfaces, hard drives, removable-storage devices	portable, low-cost	Type II (85.6 x 54 x 5 mm), Type III (85.6 x 54 x 10.5 mm)	20 MB/sec at 16 bits wide	PC laptops, 500-series PowerBooks, PDAs, peripherals

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CIRCLE 17 ON READER SERVICE CARD

Quadra 610 and Power Mac 6100) also available. And Mac users wouldn't be giving up much in the ease-of-use department, since, like NuBus, PCI is autoconfigurable — you don't have to set any DIP switches or jumpers.

Naturally, Mac users would also benefit

stick it into your Macintosh.

A simpler booting standard, Intel's Boot BIOS, works only on Intel x86- and Pentium-based PCs. PCI cards with Boot BIOS cannot be used in Macs. Boot BIOS is being used by many of today's PCI developers. However, as the number of non-Intel-



figure 1 / As small as a battery, Apple's PCMCIA expansion module fits in one of the two battery slots in a 500-series PowerBook and holds one Type III or two Type II PCMCIA cards. When Apple implements the PCMCIA Card and Socket Services standard, 500-series PowerBooks and Newtons will be able to use the same RAM, modem, wireless-network, and even hard-drive cards used in PC laptops. The credit-card-sized cards can be *hot-swapped* — that is, you can remove or replace them without having to reboot the computer.

from economies of scale, as expansion cards that work in millions of PCs and Macs would be cheaper than today's NuBus cards. However, two things have to happen before we can see such cross-platform cards.

First, Apple must implement PCI in a strictly-by-the-book manner. If it decides to "improve" the standard or implement it differently, PCI in the Mac won't be cross-platform. Fortunately, things are looking good in this area. From what developers in the know tell me, Apple is not following its traditional path of avoidance of technology invented elsewhere; it's planning to do a straightforward implementation of PCI.

The second necessary condition is that card vendors must implement a cross-platform booting standard in the card's ROM. Such a standard, called Open Firmware, already exists. Open Firmware allows computers with any processor to recognize and load drivers and configure a cross-platform PCI card at startup time. Drivers for multiple processors (PowerPC, Alpha, and 486, for example) could be included in the card's ROM or installed with floppy disks, enabling you to pull the card out of a PC and

processor machines with PCI increases, it makes more sense for card vendors to employ the cross-platform Open Firmware standard.

2. Adopt PCMCIA for PowerBooks

Apple's commitment to PCI is stronger than its intentions regarding PCMCIA — one of the worst abbreviations in the computer industry but one of the best slot technologies. The abbreviation isn't derived from the credit-card-sized expansion-card hardware but rather from the name of the industry group that maintains the standards: the Personal Computer Memory Card International Association. PCMCIA cards can contain other things besides memory, including modems, Ethernet interfaces, and even hard drives and removable-storage devices.

Apple's first implementation of PCMCIA in a Mac is an option in the 500-series PowerBooks: an expansion module that fits into the second battery slot (see figure 1). The expansion module lets you insert two 5-millimeter-thick Type II cards (the more popular type) or a single 10.5-millimeter

Type III card, usually used for miniature hard drives.

The first release of Apple's PCMCIA expansion module is only a partial implementation, in that it can use only a few specific PCMCIA cards. Apple's Phase II PCMCIA implementation, which may or may not have been released by the time you read this, was expected to implement the PCMCIA Card and Socket Services standard, which allows cross-platform use of cards with a driver written for the Mac.

Apple needs a standard implementation

THE PROPER implementation of PC standards in Macs would help managers justify Mac purchases in PC-dominated environments — environments in which Apple needs Macs to succeed.

of PCMCIA to keep PowerBooks competitive with PC laptops and to give Mac users access to the inexpensive PC expansion cards already on the market. It's unfortunate that PCMCIA, which should be (but isn't) available in *all* PowerBooks, wasn't finished when the 500 series shipped. Instead, Apple put its research effort into technologies such as the controversial trackpad, which the company is purportedly redesigning, because the pad is too big to allow the addition of a second mouse button between it and the keyboard (the missing button eliminates the ability to click and drag items without removing your hands from the keyboard — an option possible in the original PowerBooks and now in several PC laptops, such as the IBM ThinkPad).


Rumor has it that Apple will eliminate built-in Ethernet if PCMCIA becomes standard in PowerBooks. I hope not. We need PCMCIA slots for goodies, such as RAM, EPROM cards with software, and modems (which get faster all the time and need to be replaced periodically). Since there is no real need to upgrade Ethernet cards, Ethernet is fine on the logic board.

A Winning Hand

The proper implementation of these PC standards in Macs would help pro-Mac managers justify Mac purchases in their

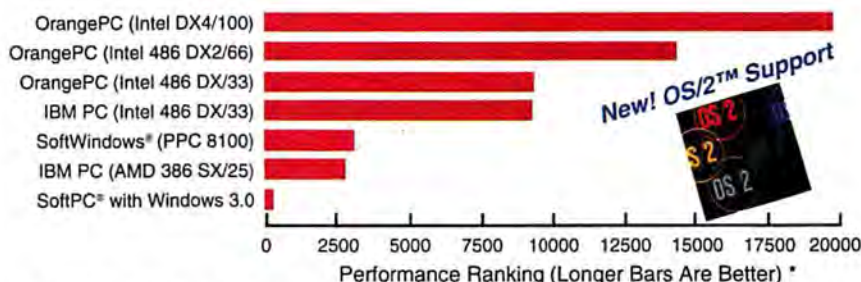
PC-dominated environments — environments in which Apple needs Macs to succeed. Despite Apple's strong third quarter, the 300,000 Power Macs shipped in the machine's first four months came in under Apple's projected sales.

Whatever the cause of this slower-than-expected start (fear of version 1.0 hardware, lack of native PowerPC software from

Microsoft), there is still time for Apple to use PCI and PCMCIA to help get back on track to its forecast 1 million Power Macs by mid-March 1995 — an outcome I hope is in the cards. 

MacUser technical editor John Rizzo is the author of *MacUser Guide to Connectivity and How Macs Work* (Ziff-Davis Press).

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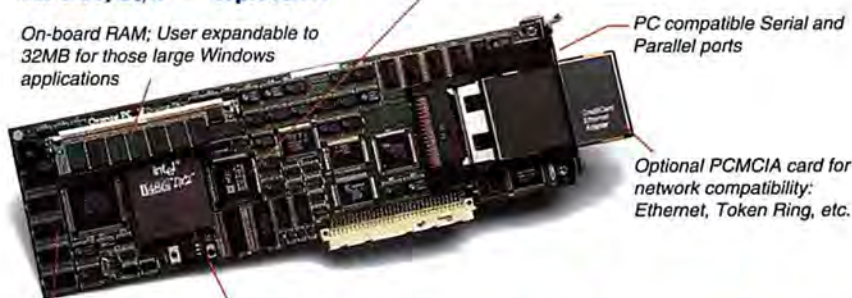
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SoftPC with Windows was run on a Quadra 700. SoftWindows was run on a Power Macintosh 8100.
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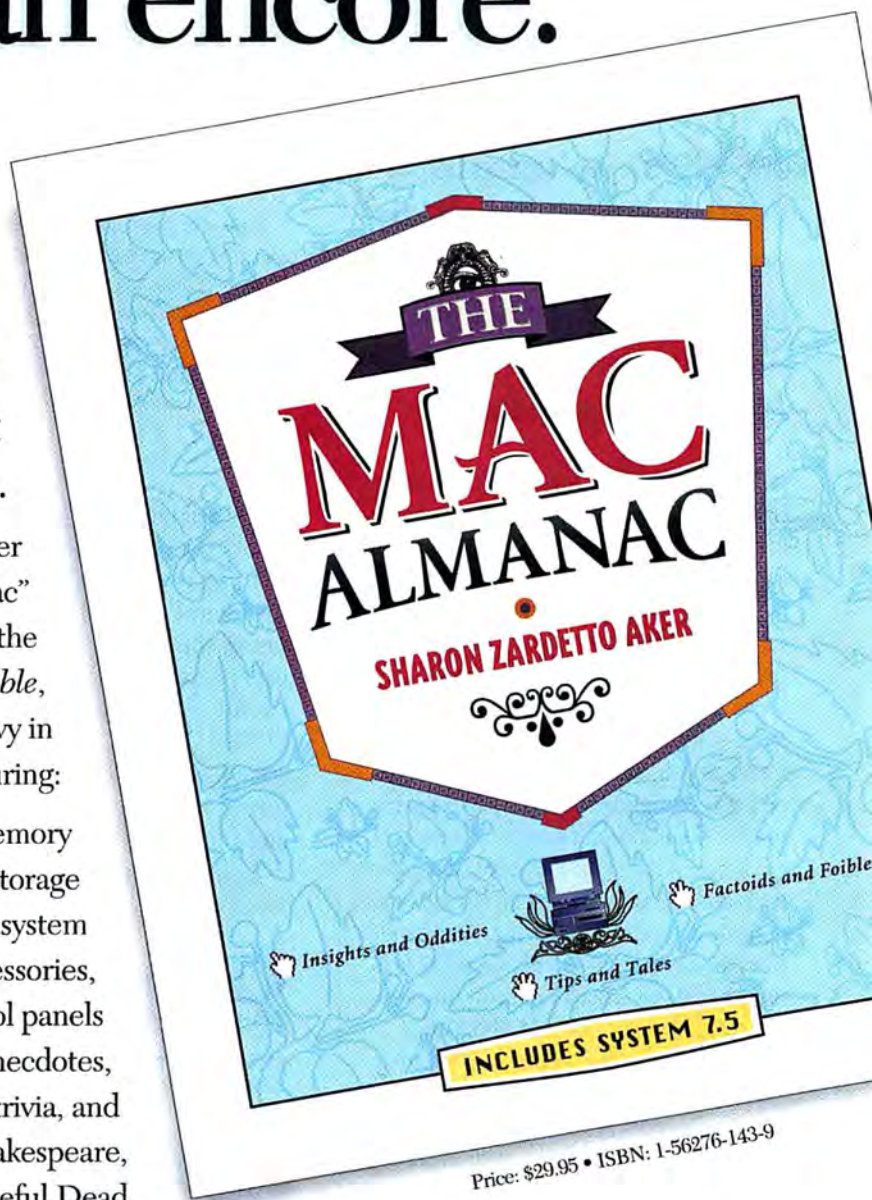
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HANDS ON Power Tools



SoftWindows Survival Guide

THESE TIPS WON'T REPEL ANY MALARIA-carrying bugs, but they will help you make your way through the Windows jungle on your Power Macintosh. **BY GREGORY WASSON**

Now that we have native PowerPC SoftWindows, Windows programs can run fast enough on a Power Mac to make using them practical. Even better, Insignia Solutions plans to upgrade SoftWindows by the end of '94 to make it 486-compatible. This means you will be able to use just about any Windows program on your Power Mac.

Despite its progress, SoftWindows is still Windows — it requires DOS commands at times, and some features can be downright deceiving to Macintosh users, because they're not as similar to the Mac's features as they appear. To survive using SoftWindows, you'll have to learn how to deal

with the idiosyncrasies of Windows. The following tips should help you as you wade through those murky waters.

Avoid the DOS Editor

SoftWindows lets you customize startup activities: You can have programs load automatically, run batch files, change memory configuration, or run virus checks at startup. However, you have to use the DOS editor to alter startup files — that is, if you follow the manual's suggestions. But there's an easier, undocumented way: You can use the hidden system editor, Sysedit, which has a graphical user interface.

To do so, you first need to make Sysedit

accessible, by following these steps:

1. Double-click on the Main group in the Program Manager.
2. Choose New Item from the File menu to bring up the New Item dialog box.
3. Type **Sysedit** in the Description box, and then tab to the Command Line box.
4. Click on the Browse button, and navigate to the System directory in the Windows directory.
5. Scroll through the file list until you have located **SYSEDIT.EXE**. Select it, and then click on OK to return to the New Item dialog box.
6. Click on OK again to add the Sysedit item to the Main group.

Once you've made Sysedit accessible, you simply double-click on the Sysedit *item* (file, in Macintosh parlance), in the Program Manager, in order to open it. Four startup files will cascade open, and you'll be able to customize startup activities to your heart's content.

Dressing Up SoftWindows

THE BEST WAY TO CLEAN UP some of Windows' irritating little quirks is to make Windows work like the operating system it imitates — the Mac operating system. You can use the following programs with SoftWindows to make it feel more like the Mac environment as well as make it easier to use:

Gain Fast Access to Programs. Dashboard (\$39), from Hewlett-Packard (800-554-1305 or 408-345-8931), is a Program Manager substitute that gives you fast access to your Windows programs by letting you select them from a pop-up launch menu. In addition, its virtual screens allow as many as nine desktops.

Manage Fonts Easily. Managing lots of fonts is even more painful under Windows than it is in System 7. FontMinder (\$79.95), from Ares Software (800-783-2737 or 415-578-9090), lets you manage your font collection through a slick drag-and-drop interface.

Enter Special Characters. Avoiding typing DOS commands, such as Alt-0233 to get é, is what WinGreek (\$35) shareware is all about. You can use it to enter accented letters or curly quotes. (To find it on CompuServe, type GO CIS:FLEPO.)

Delete Programs All the Way. Deleting programs in Windows is trickier than on the Mac, because you have to round up all the extra files — sometimes dozens of them — that are installed along with a program. UnInstaller (\$69.95), from MicroHelp (800-922-3383 or 404-516-0898), finds all those extra files and deletes them for you.

Bypass the C:> Prompt

With Sysedit handy, you're set to try your next trick: eliminating the C:> prompt that appears when you start SoftWindows.

1. Open Sysedit.
2. Open the AUTOEXEC.BAT file.
3. Add **WIN** after the last line.
4. Choose Save from Sysedit's File menu, and quit Sysedit.

Next time you start up, you'll automatically go into Windows. If you don't want the Microsoft Windows logo to appear each time, type **WIN :** in that last line. This will even shave a couple seconds off your start-up time.

Fix Broken Windows

The only problem with editing startup files is that you can inadvertently enter errors such as typos and incorrect commands. If you wake up one day and find you can't open Windows or DOS, rest easy — the fix is simple: Just press the Shift key while starting SoftWindows, in order to force DOS, instead of Windows, to start up. DOS will employ pristine CONFIG.SYS and AUTOEXEC.BAT startup files in place of the ones you have altered.

You will now be able to open your custom AUTOEXEC.BAT or CONFIG.SYS file by typing

EDIT AUTOEXEC.BAT or, alternatively, **EDIT CONFIG.SYS** and pressing the Return key at the DOS prompt. Because you're operating in DOS now, this forces you to use the DOS editor rather than Sysedit. Unfortunately, there's no way around it. You'll also have to use the arrow keys to move your cursor, because the software that controls the mouse isn't loaded during a Shift startup.

Manage Files, Not Items

One hurdle you need to clear with SoftWindows is learning the difference between the way the Mac and Windows operating systems work. File-management tasks, such as deleting, renaming, moving, and duplicating files, are confusing in Windows, because you can't perform them where you would expect — from the Program Manager (see figure 1). Although the Program Manager is similar to the Finder (because

it's the first interface, or shell, you see in Windows), you have to open the File Manager program in the Program Manager's Main group and make changes to files there.

You can't manage files in the Program Manager because what appears to be files in that area is actually Program Manager items, which are similar to aliases on the Mac. Changes to items, such as deleting them, won't affect the files to which they point.

Share Data via OLE

If you've played around with System 7's publish-and-subscribe, you've probably decided it's not worth the trouble and assumed the same holds true for Windows' OLE (Object Linking and Embedding). However, you'll be pleasantly surprised to find that using OLE to share data (such as graphs and graphics) among programs is easier than publish-and-subscribe. The following provides a quick lesson in OLE's two data-sharing methods — embedding and linking. (In this example, we use Microsoft Paintbrush and Write, both of which come with SoftWindows.)

Embedding data requires less storage space than linking, because you don't create a separate document to store shared data. You should use this method if you need to use the data in only one document rather than share it among several.

To embed data (for instance, a graphic logo), follow these steps:

1. Create the graphic in an appropriate application, such as Paintbrush.
2. Copy the graphic to the Clipboard.
3. Close Paintbrush without saving, because you want only the copy of the graphic you're about to embed in another program.
4. Open a new document in Write, and

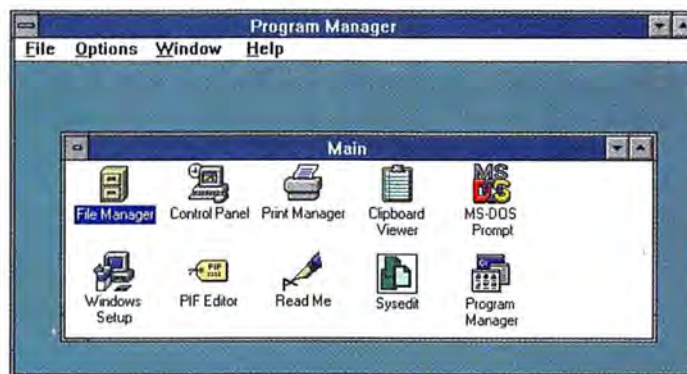


figure 1 / The deceptive icons in the Windows Program Manager are more like System 7's aliases than files. You can't manage files — for instance, move or delete them — from the Program Manager. You have to do it from the File Manager.

choose Paste from the Edit menu to embed the graphic.

5. Save the Write file to disk.

6. To edit the pasted graphic, double-click on it in order to open an untitled Paintbrush window.

7. Make changes, and choose Exit and Return from the File menu. This closes Paintbrush and returns you to the Write document, where you'll see the updated graphic.

If you want to share data among numerous documents, it's easier to link documents. To do so, simply create the graphic in Paintbrush (this time saving the file to disk before copying and closing), and then select the Paste Special command in Write and click on the Paste Link button to finish linking. You can paste-link the graphic in

several documents. Whenever you make changes to the graphic in the saved Paintbrush file, OLE will update the graphic in all of the linked documents.

Ease the Pain

Not even Chicago (the code name for an upcoming version of Windows) is likely to offer Windows users System 7's ease of use.

Until Windows catches up with the Mac operating system— assuming it ever will — you can use tips such as the ones listed here to make the best of SoftWindows. ☐

Gregory Wasson is a *MacUser* contributing editor who is delighted he can finally work in Windows on a Power Mac instead of a PC. His ZiffNet/Mac and CompuServe address is 72511,36.

Seeing Through Windows

One way to understand how Windows works is to compare its features to those of the Mac operating system. Here are some common Windows terms along with their Mac equivalents.

Windows	Mac Equivalent
Calendar in Accessories group	Alarm Clock on Apple menu
Character Map in Accessories group	Key Caps on Apple menu
Control Panel in Main group	Control Panels folder
Fonts icon in Control Panel	Fonts folder
Notepad in Accessories group	Note Pad on Apple menu
Printers in Control Panel	Chooser on Apple menu
Program Manager item	alias file
right mouse button	= on numeric keypad*
StartUp group	Startup Items folder
Write in Accessories group	TeachText or SimpleText

*For those who use the OrangePC board, from Orange Micro, instead of SoftWindows, the Mac equivalent is Command-click.

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The Panels and the Promise



A guided tour of the latest developments in Apple's PowerBook control panels and Control Strip — what's new and improved, and what still has a ways to go. BY SHARON ZARDETTO AKER

APPLÉ'S HIGHFALUTIN PHRASE *mobile operating system* is cropping up more and more frequently. Who is Apple kidding? A couple of control panels and a mediocre file-syncing package hardly constitute an operating system.

OK, with that out of my system, I'll gladly admit that the PowerBook's specialized control panels have been evolving as the basic system software changes. Let's take a look at the current baby step forward in their evolution.

The latest version of the PowerBook control panel has been totally redesigned, although parts of the old version live on in the PowerBook Setup control panel. Both control panels are included with the System Update 3.0 for System 7.1 and, of course, are in System 7.5.

A third new control panel, the Control Strip, is not as widely available. It's in System 7.5; it's *not* in System Update 3.0; but it *is* in the System 7.1 that's shipping with the 500-series PowerBooks, the PowerBook Duo 280s, and the PowerBook 150.

The PowerBook Control Panel

For the most part, the new PowerBook control panel (see figure 1) is good news — especially for novices. With the control panel's Easy/Custom toggle set to Easy, all you see is a Better Conservation/Better Performance slider control. This new slider differs from the old control in three ways: the labels (*Better* instead of *Maximum*), the position of the labels (with *Conservation* on the left instead of the right), and the number of aspects of PowerBook operation affected by the Conservation/Performance setting. In

POWERBOOK SECRETS / taking control of the Control Strip

IT SEEMS IMMOVABLE at first, that Control Strip in the lower left corner of the screen. You can't even reorder the icons by renaming them in the Control Strip Modules folder. Still, there *are* some not-so-obvious customization options for the Control Strip. Press the Option key while you drag the pull tab, and you'll find you can move the Control Strip up or down. Option-drag toward the other side of the screen, and the whole strip flips over, attaching itself to the opposite edge. To reorder the icons, simply Option-drag an icon to a new spot on the strip.

Add-in modules provide another way to change the look and capabilities of your Control Strip. The first heavy-duty module is included in

version 2.0 of the PBTools utilities package (still in beta at press time), from VST Systems (508-287-4600). The PBTools Strip module puts all PBTools functions and its menu onto the Control Strip. And it works the way Apple's modules *should* work, with single-click instead of menu-only commands for actions such as disk spindown and spinup and sleep.

Initially available only with System 7.5 or preinstalled on late-model System 7.1 PowerBooks, the Control Strip will also be included in the PBTools package, as will all of Apple's modules — five of which you can dump right away, since PBTools supplies more-elegant replacements. / Sharon Zardetto Aker and Richard Wolfson

Apple's Control Strip

Option-drag to move strip up, down, or to other edge of screen

Option-drag to reorder icons

Click to open pop-up menus

AppleTalk

Battery monitor

File sharing

Hard-disk spinup/spindown

PowerBook control panel

Sleep

Sound volume

Control Strip with Replacement Modules from PBTools 2.0

Current processor speed

Modem status

Numeric battery-charge display

Single-click hard-disk spinup/spindown and AppleTalk on/off

EtherTalk on/off

Time remaining (for Duos and 500s)

the new version, the setting affects not only system sleep and disk spindown but also screen dimming, the control for which used to be hidden away in the PowerBook Display control panel.

Experienced users will want to set the Easy/Custom toggle to Custom, which pops up several more controls. First, you get three more slider controls that provide separate settings for sleep, disk spindown, and screen dimming. Change any of them, and the Conservation/Performance setting will change accordingly. (The reverse is also true: If you change the Conservation/Performance setting, each of the separate sliders will change.) Those of us who complained when the original PowerBook control panel took away the minute-by-minute

combinations of all the settings in the control panel — one for when you're using the adapter and one for when you're running on battery power. To activate a saved setting combination, you click on the Auto button and choose Power Adapter or Battery from the pop-up menu. To override those settings temporarily, you click on the Manual button. Why, you might ask, didn't Apple just provide three options — Power Adapter, Battery, and Manual? Good question.

Banished to the new PowerBook Setup control panel are three options from the previous PowerBook control panel you don't often need to access: the modem settings (internal or external, and Wake On Ring), the automatic wake-up option, and the SCSI Disk Mode ID setting.

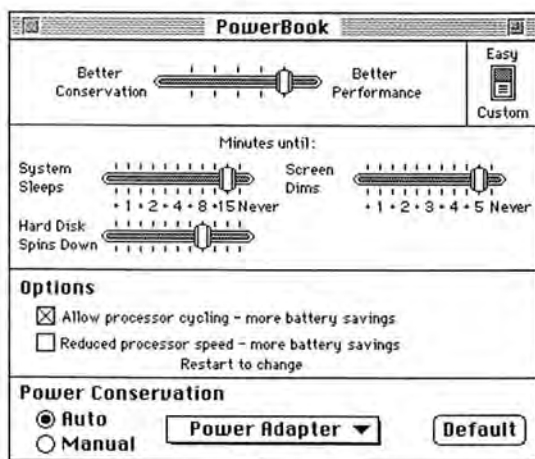


figure 1 / The new PowerBook control panel expands from the easy version, in which you see only the Better Conservation/Better Performance slider, to the expanded version (shown here) via the Easy/Custom toggle. The expanded version lets you customize conservation individually and provides up-front access to processor-cycling and processor-speed control. You also get the confusingly implemented ability to save specific setting combinations for when you're using an adapter or battery power.

settings of the Portable control panel for sleep and disk spindown get the best of both worlds here, since the individual controls are marked with time values.

In the next section of the control panel, the processor-cycling and speed options are easy to access instead of hidden away — a much needed change, since these controls affect battery life greatly. A faster processor speed is the single most battery-draining function in your PowerBook; notch it down, and you get automatic, painless extension of battery time (well, painless for *most* applications — I wouldn't recommend the slower speed for playing QuickTime movies). The processor cycling is just as important: With cycling, the processor goes into a reduced-power, "rest" mode when you don't use it for a few seconds.

The bottom section of the control panel isn't as straightforward. It lets you save two

The Control Strip

The Control Strip (see the "PowerBook Secrets" sidebar) is a new addition to Apple's PowerBook-specific system software. It provides access to most of the options in the PowerBook control panel and the Battery DA plus AppleTalk and volume controls, all in one iconic menu strip.

Let's get the complaints out of the way first. The Control Strip control panel consists of nothing but two buttons: Show Control Strip and Hide Control Strip. Wouldn't it be easier if choosing the control panel just opened the strip? The Hide control could be in the strip itself. Which leads to another complaint: What looks like a close box at the end of the strip only collapses the strip down to the minimalist pull tab that lets you resize it.

But the real problem with the Control Strip's interface is its icons: They look like

buttons and "move" like buttons (when you click on one, the shading changes as if you had pushed a real button down), but they're *not* buttons — they simply bring up pop-up menus. And some of the menus consist of only one command: Sleep Now, Show Battery Level, Spin Down Hard Disk, AppleTalk Active. Why aren't these buttons? Having to drag to a command just adds an extra step.

What's good about the Control Strip? Well, even with its flaws, using it is often easier than opening the control panels that would otherwise provide these functions. If you want to use the control panels in question, you can open most of them by using a menu command from the Control Strip. Plus, the Control Strip is modular: Each option on the strip is controlled by a file in the Control Strip Modules folder (inside the System Folder); you can easily take out the ones you don't need or add new ones.

Also, some of the modules respond intelligently to the environment they're in. For example, the Video Mirroring icon doesn't show up on my PowerBook 170 (even though the file is in the Control Strip Modules folder), because the 170 doesn't have video-out capabilities. And the Battery Level icon shows single or double battery read-outs, depending on your PowerBook model. In addition, the icon for the File Sharing module changes from a plain folder (file sharing's off) to a marked one (file sharing's on) to the users/groups face icon (someone's logged on), as appropriate. And if file sharing is in the midst of starting up, the icon blinks between the plain and the marked folder — saving you the bother of choosing the Sharing command and finding out that file sharing is already starting up. Alas, not all of Apple's module icons reflect the status of the function they control — but those that do show off the advantages of having a control strip rather than a standard system menu.

Overall, the Control Strip isn't bad for the first version of a control panel. It may not be everything you want it to be, but then neither was the first PowerBook control panel — and look how far it's come! ☞

The Control Strip has reminded Sharon Zardetto Aker and Rich Wolfson that their single-battery PowerBooks have no video-out and no color or gray-scale capability. She's looking at a 540; he's considering one of the new Duos.

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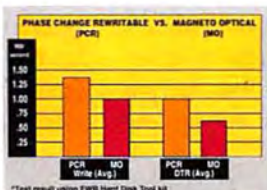
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/ TIPS COMPILED BY CHRISTOPHER BREEN

Unfinished Business

BOB: For tackling the tricky task of taking screen dumps of screen-saver images, such as those in Berkeley Systems' After Dark, I recommended in June that you use Capture, from Mainstay (see "Screen Saver Saved," June '94, page 144). Several readers wrote to say that they were able to capture screen-saver images by using the Mac's built-in Command-Shift-3 screen-shot feature. Although I couldn't get that keyboard command to work consistently, it does work some of the time, and best of all, it's free. I still recommend Capture for anyone who takes many screen shots, because it has extra features.

A more hotly debated topic here in Help Folder, and one we've never gotten Apple to answer — until now — is whether it's better to turn a Mac off or leave it on when you're not using it. Thanks to Richard Gilpin, of Jennings, Missouri, who forwarded a letter from the Apple Customer Assistance Center, we now know that "It is usually best to turn the computer off whenever it won't be used for eight hours or more." With that question finally answered, we can sleep soundly — assuming we remember to turn off our Macs.

A more urgent question along those same lines came from Muriel Kowlessar, of Bryn

Mawr, Pennsylvania, who asked if she should turn her Mac off during electrical storms. The answer is, Not if you have a high-quality surge suppressor. (An inexpensive surge suppressor is all but worthless against lightning or strong power surges.) According to Paul McGraw at APS Technologies, high-quality surge suppressors have a minimum of three stages of protection, which should protect you against everything except a direct lightning strike. Also, when buying a surge suppressor, look for a manufacturer, such as Kensington Microware, Panamax, and Permapower, that guarantees that it will cover surge damage to all equipment connected to the surge suppressor.

Empty Finder Syndrome

Q. Last month, my Mac turned into a doorstop — I got the happy Mac when I turned it on, but as soon as the menu bar appeared, my Mac went into a loop, switching between the arrow pointer and the wristwatch.

I tried rebuilding the desktop, turning off all extensions, starting from a floppy, starting from an external hard drive, and screaming and slamming my fist against the keyboard. The only thing that worked was having a service person reformat the disk. What caused the problem?

**Kelley Sugrue
Mansfield, MA**

ANDY: Oh, Kelley, dear Kelley, as certain as I am that you'll hit the roof and then your service technician when I tell you that you could have fixed the problem with just one



TIPS / QuicKeys

TAKE OUT THE TRASH

Dragging files to the Trash can be a chore, especially if you have a large-screen monitor. You can ease your burden by giving QuicKeys the dirty job of taking out the Trash.

Using QuicKeys, select Record One Shortcut and record dragging a file to the Trash. Upon completion of the drag, the Click dialog box will appear. Click on the Click button to bring up the Click Location dialog box. Under Click Relative To, click on the Mouse Position radio button. Under Drag Relative To, select the button for Screen. Click on the OK button, name the shortcut, assign a keystroke, and exit QuicKeys.

To run the shortcut, click on the icon of a file or application you want to move to the Trash and, with the mouse cursor still over the highlighted icon, activate the shortcut. QuicKeys will put that item into the Trash before you can blink.

[To empty the Trash, simply add a Menu Selection QuicKey. — Ed.]

**Roger E. Smith, Tech Support
CE Software**

keystroke, and as much as I want to spare your feelings, I just can't lie to America.

Here's the straight dope — the Finder keeps a record of every single Finder window that is open on the desktop whenever you shut down your computer. When you start up the Mac again, the Finder uses that information to draw the desktop. If, by some subtle error, the coordinates of one of those windows are switched — the bottom right corner gets listed before the top left — the Finder reacts as though you've just whopped it on the ear with an ax handle and that petulant cursor dance is the result.

Write to Help Folder/Tips

c/o MacUser

950 Tower Lane

18th Floor

Foster City, CA 94404

Don't want to wait for an answer? Post your question on ZiffNet/Mac, MacUser's on-line service, and get a reply from Bob (76004, 2076) or Andy (72511, 204). We pay \$25 - \$100 for any undocumented tips we publish. Send them to Christopher Breen (72241, 1036).

The fix — and you really might want to avert your eyes here, Kelley — is to restart the computer while holding down the Option key. That's all. The Finder will act as though there were never any windows open on the desktop to begin with, and you won't lose any data.

BOB: Right. Holding down the Option key while restarting closes all the Finder windows. That technique probably would have solved the problem, but there's no way to know for sure. I'd give your service technician the benefit of the doubt. There's a slight chance the tech tried the Option-key trick and it didn't work.

Well-Dressed Icons

Q. I love System 7, but ever since I started using it, I keep losing those fancy icons (see figure 1). My control-panel icons are OK, but most of the other system-software icons are dreary and plain. How can I make the icons come back?

Benjamin J. Ludeman
Somewhere in the universe

BOB: The first thing to try is rebuilding the desktop (hold down Command-Option during startup). That usually brings 'em back. If that doesn't work, boot from the Disk Tools disk that came with your Mac, run Disk First Aid (which also comes with your Mac), make all the repairs it recommends, and then rebuild the desktop again.

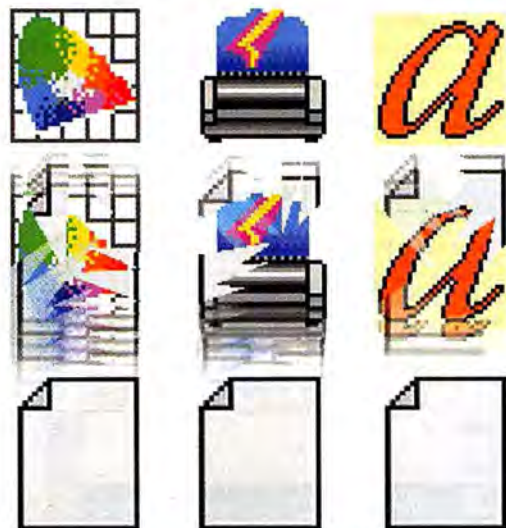


figure 1 / Icons changing from colorful to drab is a common problem in System 7. There are several techniques for giving icons back their pretty face, ranging from rebuilding the desktop to backing up your hard disk and reinitializing it.

If that doesn't work, there's something screwy with your disk. The first thing to try is one of the commercial disk fixers, such as MacTools or Norton Utilities for Macintosh, both from Symantec (800-441-7234 or 408-253-9600) these days.

As a last resort, try backing up your hard disk, initializing it, restoring everything, and rebuilding the desktop yet again. After this procedure, you may have to reinstall your system software and applications to get the icons working properly.

ANDY: This question pops up so frequently that I've just installed System 7.5c — a special edition for columnists — that automatically enters the reply "Try rebuilding the desktop. That usually brings 'em back," whenever QuickDraw puts the words *icons* and *disappearing* or *losing* into a window. Try rebuilding the desktop. That usually brings 'em back. (See what I mean?)

The other solution that comes to mind is to open the Get Info box for each affected file, click on the generic icon in the upper left corner, and then select Clear from the Edit menu. That doesn't work all the time, but it's quick and simple to try.

Spelling Checkers Unite

Q. Does Apple have any plans to create a standard spelling-checker dictionary for all Mac software to use? I hate having to waste all of that space on my hard disk just because FileMaker, Word, Canvas, and all the other programs out there have to have their own special dictionary files.

Larry Scaccia
via ZiffNet/Mac

ANDY: Well, sure, but there are also rumors that Apple has plans to fill a pool to the top with \$20 bills and let employees spend every lunch hour rolling around in it naked. Doesn't necessarily mean it's going to happen, although I've got my water wings packed just in case.

A standard dictionary is certainly not a new idea, and every now and then, you do hear of a plan for Apple and the major software publishers to finally sit down and solve this problem, dag-nab it, but invariably nothing ever comes of it. Truth

TIPS / Utilities

-  **Universal List**
-  **np calendar**
-  **Product Order Form**
-  **Report.03**
-  **'94/'95 overview**

NOW MENUS CORRECTION

Your tip for removing the names of deleted files from a Now Menu submenu, detailed in your July issue (Help Folder, page 146), was creative, but there's a simpler solution — highlight an item in the submenu, and press the Delete key. The filename is struck through (see figure above), and the next time the submenu appears, that file will be gone.

Michael Lekas, Technical Services
Now Software

POWER MAC SPEED FIX

Numerous Power Mac test sites reported slowdowns when they installed non-native startup files in their new Macs. These programs create *patches* to native code that can cut speed by as much as 30 to 40 percent.

To identify those patches, you can use Casady & Greene's Conflict Catcher II 2.1 to generate a system report that analyzes startup files and marks suspected patches. To gain a more realistic sense of your Power Mac's capabilities, disable these suspicious startup files.

Judith Frey, Public Relations Manager
Casady & Greene

POWER MAC SPEED FIX, PART II

Worried that non-native startup files are slowing down your Power Mac? Here's one certain way to tell: Time some basic steps in your favorite applications. Then restart your Mac while holding down the Shift key and retime the same operations.

It's unlikely you'll find much difference, because even extensions that patch native system routines with emulated code rarely cause any noticeable slowdown. Real-world performance depends on many additional factors, including drive-access time, emulated system code, and your own decision time. However, if your tests do reveal a performance loss, Now Utilities 5.0's conflict-isolation feature can help narrow down the cause.

Adrian Russell-Falla, Product Manager
Now Software



figure 2 / In the spelling-checker revolution, Baseline Publishing's Thunder 7 was the innovator in providing a feature that corrects your spelling as you type. Microsoft Word and WordPerfect followed Thunder 7's lead, adding this feature to their most recent versions.

be told, every publisher thinks its spelling checker is the best. Rather than risk embracing a standard that could be slower than their own, they've each decided to go their own way.

Until they come to an agreement, you can try substituting Thunder 7 (see figure 2), from Baseline Publishing (901-682-9676), for the whole lot of the spelling checkers out there. Thunder 7 is a \$99 control panel that checks your spelling as you type and suggests corrections as you go along or checks all text within a user-defined selection. Because it works in virtually all applications — even those without spell checking of their own, such as SITComm — you can trash all those application-specific dictionaries and use Thunder 7's main and custom dictionaries exclusively.

BOB: I wouldn't dream of operating my Mac without Thunder 7. My favorite part is that it can correct common mistakes on the fly. For example, when I type *teh*, it automatically changes it to *the* without slowing me down or even beeping. Some word processors, such as Microsoft Word 6.0 and WordPerfect 3.1, have also added this feature, but Thunder 7 led the way.

Thunder 7 also solves one of the most annoying problems caused by using several spell checkers: having to learn several different sets of keyboard commands to begin spell checking. With Thunder 7, you have to remember only one keyboard command, no matter what program you're using.

Keyboard Hex

Q. My keyboard keeps going slightly coo+coo every now and then. As you can see, for the most part it works perfectly fine (however) and this is the interesting part = some of the punctuation marks come out wrong.

Does my keyboard need cleaning? Is this a Dvorak layout? Or is it my breath?

Jeff Greene
via the Internet

ANDY: I dunno . . . maybe your keyboard just wants some Cocoa Puffs?

This is a nice, simple one — somehow, your system has switched to a foreign-keyboard layout. Most of the keyboard layouts keep the letters where you would expect them but swap around some of the other characters. Simply open the Keyboard control panel and select the U.S. layout (see figure 3).

PowerBook Lifesavers

Q. I'd like to create a RAM disk to minimize use of my PowerBook's hard drive, but I want to be able to boot from the RAM disk. How is that possible, since shutting down wipes out RAM disks?

Another thing: Would it be preferable to put a program onto a 10-MB RAM disk or to assign that program 10 MB of

TIPS / QuickKeys

LAUNCHING APPLICATIONS

I use QuickKeys' File Launch shortcut to launch all of my favorite applications — assigning each application to one of the Fkeys on my extended keyboard. This is especially useful, because the same Fkey can be used to switch to an application if it's already running and you're working in another program. However, there's a glitch when using applications that require a specific settings file, such as SmartCom II and CompuServe Navigator. For those types of applications, you have to assign QuickKeys a particular document to launch. When you leave the application running, go into another application, and then try to go back by using the assigned Fkey, you have to wait while the document that was open closes and then reopens.

QuickKeys' Decision Extension provides a workaround. Set Decision Extension to check for the running application. If the application is running, the extension will trigger a shortcut that simply switches to the application. If the application is not running, the extension will launch the document.

Joseph Holmes
Brooklyn, NY

preferred memory in its Get Info box?

Eric Sprung
Atlanta, GA

BOB: You can start up from a RAM disk, but not without a special utility such as RAM-DiskSaver, from Atticus (203-324-1142), or Maxima, from Connectix (800-950-5880).

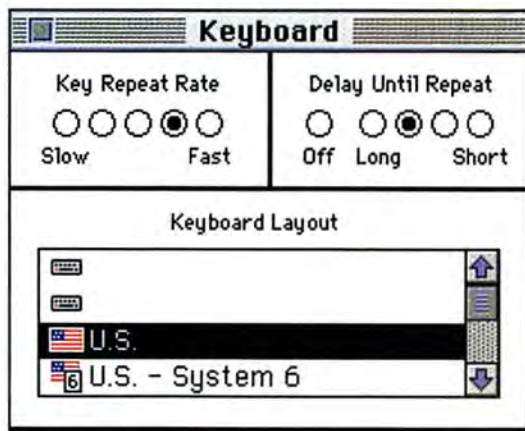


figure 3 / If the wrong characters show up on-screen when you type, you may need to reset your keyboard layout in the Keyboard control panel.



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**INSIGNIA
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or 415-571-5100). These utilities preserve RAM disks even after shutdown, and they let you designate a RAM disk as your startup volume.

As to the question of putting a program on a RAM disk versus increasing its memory allocation — your best bet is the RAM disk if what you want is more speed. Not only is opening a program on a RAM disk lightning-fast but *running* the program is also faster. This is because no matter how high you set their memory allocation, most programs access the disk frequently. When the disk accessed is a RAM disk, the access time is almost unnoticeable.

ANDY: The most popular use for RAM disks has nothing to do with speed, though. RAM has no moving parts (not including subatomic particles), and therefore a RAM disk places infinitely fewer demands on a PowerBook's batteries than does a mechanical hard drive. Lilith, my own PowerBook, runs off an 8-MB RAM disk when I have eight hours of work to go and I'm on my last battery pack.

BOB: RAM disks are fast and wonderful, but only if you've got a bunch of RAM, say 12 MB or more. As much as I love the speed of a RAM disk, I don't use one. My System Folder is so big that it would take up a lot of RAM — and RAM is expensive.

ANDY: To conserve that expensive RAM, maximize storage space on your RAM disk. The easiest and best dodge is to put aliases

of fat and rarely used files, such as fonts and control panels, into your RAM disk, instead of the real deals. That way, you can still use your Star Trek screen-saver modules without having to throw another 10 megs of RAM into your Mac.


For detailed instructions on creating a RAM disk, take a gander at "RAM-Disk Heaven," in the August '94 issue (page 125).

Visiting Gamma's House

Q. The phrase “Use Special Gamma” appears in a dialog box if I hold down the Option key and click on the Options button in the Monitors control panel. What would happen if I clicked on the check box next to that phrase?

Scott Leslie
Oklahoma City, OK

BOB: The term *gamma* refers to the balance of colors on your screen. Different gamma settings show subtly different colors on your monitor. Not all monitors and video cards give you more than one gamma setting, but if they do, you can check the Use Special Gamma box and choose the setting most pleasing to your eye. For instance, I prefer Mac RGB Gamma to Uncorrected Gamma.

Unless you're involved in color prepress or other work where the absolute correctness of colors on-screen is a must, there's no reason not to choose the setting that you prefer. 

TIPS / RAM Disks

RAM DISK AS REPAIR TOOL

Using emergency floppy disks to perform hard-disk optimization and repair can be painfully slow. You can speed things up considerably if you have access to the System 7 RAM-disk feature.

Build a RAM disk, using the Memory control panel. Copy your System file, Finder, any necessary enablers, and your repair and optimizing tools to the RAM disk. Set the RAM disk as the startup disk, and restart your Mac. You can now optimize and repair your hard disk, using the RAM disk. Don't throw out your emergency floppies, though — you'll need them if sometime your Mac simply refuses to boot from your hard disk.

Don Turnbull
via CompuServe

SPEEDY PRINTING

You can improve printing performance by using a RAM disk, if you use version 4.0 or later of AppleShare File-and-Print Server. Because the new version lets you change the location of the queue folders, you can place them on a RAM disk, eliminating hard-disk contention with the file-server software. And because spool files are temporary in nature, the loss of the RAM disk because of a crash would be only a minor inconvenience.

David Atkinson
via CompuServe

TIPS / Excel

AUTOMATIC TIME SHEET

Here's help in designing a Microsoft Excel time sheet or a general calendar that automatically enters the dates corresponding to the weekdays of the current week:

- 1.** To get the current date, enter the formula `=NOW()` in the cell in which you want the current date (I used cell B16) and set the number format as `m/d/yy`.

	A	B	C	D	E	F	G	H	I	J
1	Weekly Time Sheet: ReallyBigCorp									
2	Week Ending: 10/23/94									
3										
4										
5										
6		10/17	10/18	10/19	10/20	10/21	10/22	10/23		
7	Departments	Mon	Tues	Wed	Thurs	Fri	Sat	Sun	Total	
8										
9										
10										
11										
12	Total Hours									
13										
14										
15	Today's Date				Week End					
16	10/20/94		5				10/23/94			

2. Enter the formula =**WEEKDAY** (B16) in another cell, say cell C16, using the General number format. Excel will assign a number between 1 and 7 to represent the day of the week, where 1 represents Sunday and 7 represents Saturday.
3. To get the date of the last day of the week, enter this formula in another cell, such as E16:
=IF (C16=1, B16, IF (C16=2, B16+6, IF (C16=3, B16+5, IF (C16=4, B16+4, IF (C16=5, B16+3, IF (C16=6, B16+2, IF (C16=7, B16+1))))))), and set the number format to m/d/yy. (This formula gives the date for the Sunday at the end of the current week, even though Excel considers Saturday the seventh day of the week.)
4. To have Excel enter the dates of all the days of the week, select Define Name, on the Formula menu, and define cell \$E\$16 as Date. Choose a row of seven cells, such as C6 through I6; set the number format as m/d; and enter these formulas:

```
=Date-6, =Date-5, =Date-4, =Date-3, =Date-2,  
=Date-1, =Date
```

John Deane
New York, NY

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06519	The Disney Collection Screen Saver	\$25.80
04053	More After Dark Vol 1	\$21.27
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340MB	12ms	4500	128K	2yr	LPS340S	\$239	\$299
540MB	12ms	4500	128K	2yr	LPS540S	\$293	\$353
540MB	9.5ms	5400	512K	5yr	EMP540S	\$489	\$549
1080MB	9.5ms	5400	512K	5yr	EMP1080S	\$633	\$693
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200MB	18ms	44, 88, 200MB	SQ5200C	64K	\$449	\$509
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530MB	13.8ms	4500	256K	Fujitsu	5 Years	\$285	\$345
720MB	12ms	4500	192K	IBM	2 Years	\$439	\$499
1052MB	8.5ms	5400	256K	Micropolis	5 Years	\$629	\$689
1080MB	9.5ms	5400	256K	Fujitsu	5 Years	\$619	\$679
1750MB	10ms	5400	256K	Micropolis	5 Years	\$909	\$969
2040MB	9.2ms	5400	512K	IBM	5 Years	\$1249	\$1299
2145MB	8ms	7200	1024K	Seagate	5 Years	\$1319	\$1399
2148MB	9ms	5400	512K	Seagate	5 Years	\$1189	\$1249
3020MB	11ms	5400	256K	Micropolis	5 Years	\$1959	\$2029
4250MB	11ms	5400	1024K	IBM	5 Years	\$2239	\$2339
4290MB	9ms	5400	1024K	Seagate	5 Years	\$2249	\$2349
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CD ROM DRIVES

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580MB	MiniCart	Teac	\$539	\$599	4-8Gig	DDS DAT	HP	\$1029	\$1079
.75-1.5Gig	MiniCart	Exabyte	\$589	\$649	4-10Gig	DDS2 DAT	Sony	\$1079	\$1139
2Gig	DAT	Conner	\$819	\$869	4-10Gig	DDS2 DAT	Conner	\$1069	\$1129
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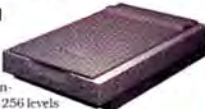
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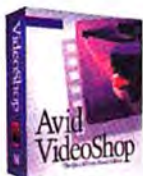
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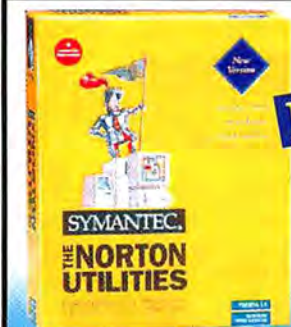
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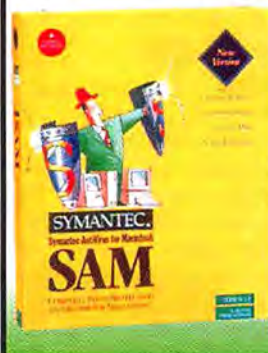


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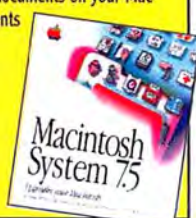
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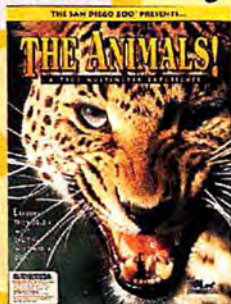
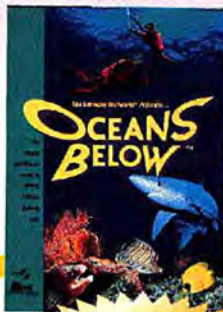
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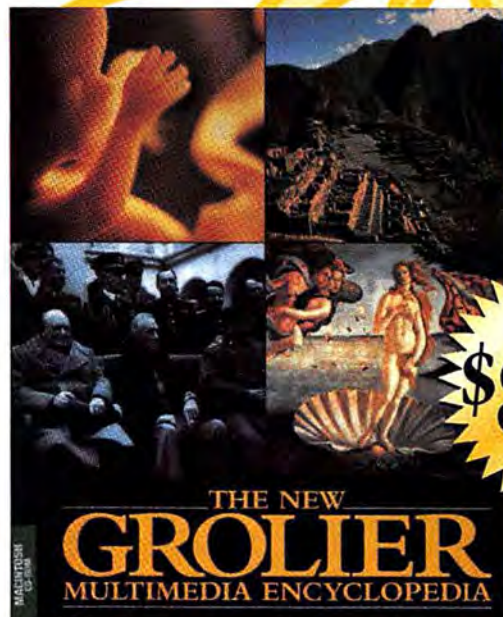


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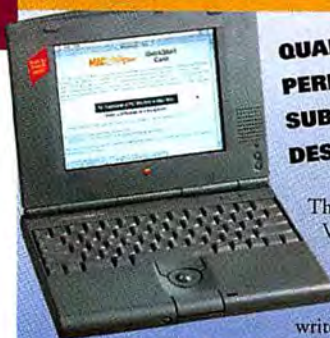
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—MacWorld Sept 94*

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APS Q 540 ²	516MB	329	429
Quantum 540 mechanism			
APS I ^{mm} 720 ²	700MB	499	599
IBM DSAS 3720 mechanism			
APS MS1.2AV ⁵	965MB	759	859
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Micropolis 2217AV mechanism			
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Micropolis 2217S mechanism			
APS I 2.0 ⁵	1920MB	1299	1399
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APS MS 3.0G ⁵	2845MB	1999	2199
Micropolis 1936 mechanism			
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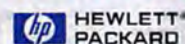
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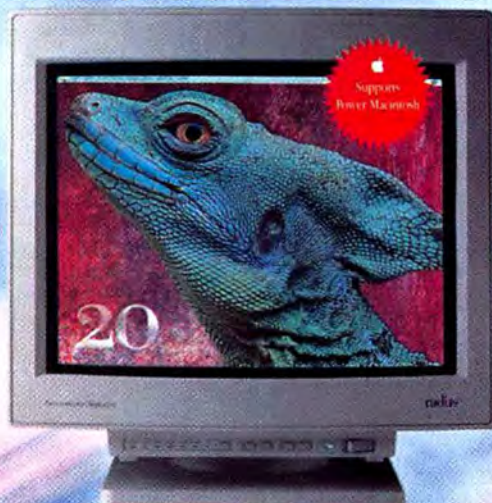
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Deborah Tyo, Account Executive (415) 378-5630
Margy Level-Green, Sales Assistant (310) 268-1375

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Doug Meer, District Sales Manager
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Margy Level-Green, Sales Assistant (310) 268-1375

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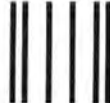
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1. For how many micro computers do you buy products?
(check one)

☐ 01) 1-4 ☐ 02) 5-49 ☐ 03) 50+

2. Your primary job function is: (check one)

☐ 01) Administrative/General Management ☐ 03) Engineering/R&D
☐ 02) MIS/DP, Communications Systems, Programming ☐ 04) Finance/Accounting
☐ 05) Marketing/Sales ☐ 06) Computer Dealer/VAR

3. For which of the following products are you involved in selecting brands/models to be bought by your company or organization? (check all that apply)

4. Which of the following products have you bought in the last 6 months? (check all that apply)

SOFTWARE:
Accounting ☐ 01 ☐ 02
Spreadsheets/Financial Planners ☐ 03 ☐ 04
Project Managers/Planners ☐ 05 ☐ 06
Word Processors ☐ 07 ☐ 08
Database Managers ☐ 09 ☐ 10
Graphics/Presentation Software ☐ 11 ☐ 12
Integrated Software ☐ 13 ☐ 14
Communications ☐ 15 ☐ 16
Utilities ☐ 17 ☐ 18

HARDWARE:

Modems ☐ 01 ☐ 02
Scanners ☐ 03 ☐ 04
Microcomputers ☐ 05 ☐ 06
Printers/Plotters ☐ 07 ☐ 08
Monitors/Displays ☐ 09 ☐ 10
Storage ☐ 11 ☐ 12
Add-in Boards ☐ 13 ☐ 14
Networking ☐ 15 ☐ 16

03 04
☐ 10 ☐ 11
☐ 12 ☐ 13
☐ 14 ☐ 15
☐ 16 ☐ 17

5. If so, what function do you serve in the buying process?
(check all that apply)

☐ 01) Initiation/ Determine Need
☐ 02) Selection of Brand and Model
☐ 03) Selection of Source
☐ 04) Authorization
☐ 05) Other

6. Over the next 12 months, how much will your organization spend on computer products or services? (check one)

☐ 01) over \$5 million ☐ 05) \$50,000 - \$99,999
☐ 02) \$1 - 5 million ☐ 06) \$10,000 - \$49,999
☐ 03) \$500,000 - \$999,999 ☐ 07) under \$10,000
☐ 04) \$100,000 - \$499,999

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☐ 05) Marketing/Sales ☐ 06) Computer Dealer/VAR
☐ Systems, Programming

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 Accounting
 Spreadsheets/Financial Planners
 Project Managers/Planners
 Word Processors
 Database Managers
 Graphics/Presentation Software
 Integrated Software
 Communications
 Utilities

Q3 Q4
☐ 01 ☐ 01
☐ 02 ☐ 02
☐ 03 ☐ 03
☐ 04 ☐ 04
☐ 05 ☐ 05
☐ 06 ☐ 06
☐ 07 ☐ 07
☐ 08 ☐ 08
☐ 09 ☐ 09

HARDWARE:

Modems
 Scanners
 Microcomputers
 Printers/Plotters
 Monitors/Displays
 Storage
 Add-in Boards
 Networking

Q3 Q4
☐ 10 ☐ 10
☐ 11 ☐ 11
☐ 12 ☐ 12
☐ 13 ☐ 13
☐ 14 ☐ 14
☐ 15 ☐ 15
☐ 16 ☐ 16
☐ 17 ☐ 17

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- 10ms access time
- WriteCache & DisCache Firmware



Includes all necessary brackets and software

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256mb	17ms	\$339	\$459

LPS SERIES 3.5" LOW PROFILE

170mb	14ms	\$179	\$239
270mb	11ms	\$199	\$259
340mb	11ms	\$239	\$299
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EMPIRE SERIES 3.5" HIGH PERFORMANCE

1080mb	9.5ms	\$699	\$759
1400mb	9.5ms	\$839	\$899
2100mb	9.5ms	\$1169	\$1229

Quantum Pro and Empire series carry a TWO Year Warranty
Go-Drives carry a ONE Year Warranty



Seagate drives include a 30-day Money Back Guarantee and a FIVE Year Warranty. Seagate drives are preformatted and thoroughly tested. The latest stable Apple system software preloaded. Also SCSI Director Formatting Utility software, brackets and cables for internal configurations, and users manual are included.

Unformatted Capacity	Model	Description	Access Time	Actual MAC Capacity	Internal	External
3.5" HALF HEIGHT						
2.1GB	ST12400N	Hawk 2	9ms	2000mb	\$1279	\$1339
4.3GB	ST15230N	Hawk 4	9ms	4000mb	\$2139	\$2199
1.7GB	ST11950N	Barracuda 1	8ms	1350mb	\$1379	\$1439
2.1GB	ST12550N	Barracuda 2	8ms	2050mb	\$1389	\$1449
4.3GB	ST115150N	Barracuda 4	8.5ms	4000mb	\$2479	\$2539
5.25" FULL HEIGHT						
2.9GB	ST43400N	Elite-3	11ms	2750mb	\$2089	\$2189
9.1GB	ST410800N	Elite-9	11ms	8600mb	\$3739	\$3839

CD-ROMs

NEC MultiSpin 3Xp

The 3Xp combines 3X transfer rate performance, 250ms access time and a 256 KB continuous-flow cache in a compact design, making it and incredible value. At only 2.4 lbs the 3Xp is the world's lightest triple speed CD-ROM reader.



MultiSpin 3Xp CD-ROM Reader



NEC



\$385

CD-ROM READERS

	w/o bundle	w/ClubMac CD bundle
MultiSpin 3Xp (Portable, 250ms access time, very light; 2.4 lbs)	\$385	\$485
MultiSpin 3Xi (Internal, 195ms access time, 450KB/sec data transfer)	\$429	\$529
MultiSpin 3Xe (External, 195ms access time, 450KB/sec data transfer)	\$469	\$569
MultiSpin 4X Pro (External, 180ms access time, 600KB/sec data transfer)	\$929	\$1029

NEC MultiSpin CD-ROM Readers carry a TWO Year Warranty

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ClubMac Removable Drives



CLUBMAC 3.5" REMOVABLES

CLUBMAC REMOVABLES

ClubMac 44mb 5.25" (SQ555)	Internal \$199	External \$229
ClubMac 88c 5.25" (SQ5110C)	\$328	\$368
ClubMac 200mb 5.25" (SQ5200)	\$448	\$488
ClubMac 105mb 3.5" (SQ3105)	\$259	\$299
ClubMac 270mb 3.5" (SQ3270)	\$459	\$499

All drives include SCSI Director formatting software, ONE FREE Cartridge, necessary cables for "plug-and-play" and documentation. All SyQuest drives include a TWO Year Warranty. All SyQuest cartridges include a FIVE Year Warranty.



CLUBMAC 5.25" REMOVABLES

CARTRIDGES

44mb (SQ400)	\$57
88mb (SQ800)	\$69
200mb (SQ2000)	\$79
105mb (SQ310)	\$57
270mb (SQ327)	\$65

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INTRODUCING THE NEW CLUBMAC 230MB OLYMPUS OPTICAL DRIVE

- 28ms Average Seek Time
- MTBF: 50,000 hours
- SCSI-2 Interface
- Includes a FREE formatted optical disk
- TWO Year Warranty



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	Access Time	Internal	External
ClubMac (MOS-320E) 3.5" 230MB Olympus Optical	28ms	\$865	\$895
Fujitsu (M2512A-DYNAMO) 3.5" 230MB Dynamo	30ms		\$929
ClubMac (JY-750) 5.25" 650MB Sharp Optical	40ms	\$1669	\$1699
ClubMac (JY-800) 5.25" 1.3GB Sharp Optical	40ms	\$2069	\$2099
MaxOptix Tahiti III (9400) 5.25" 1.3GB Optical	19ms		\$2499
Hewlett-Packard (C1716T) 5.25" 1.3GB Optical External	28ms		\$2399

All ClubMac Opticals include ONE cartridge and ONE Year Warranty.



ClubMac Tape Backups

ClubMac 2.0GB DDS DAT Drive

- 20 second average data access time (based on 60m tape)
- Up to 266 KB/sec data transfer rate
- SCSI-1/SCSI-2 Interface • MTBF of 60,000 hours

Capacity	Model	Format	Media	Internal	External
2.0GB	ClubMac DAT	DDS	60m, 90m	\$739	\$789
2-4GB	ClubMac DAT/DC	DDS-DC	60m, 90m	\$929	\$979
4-8GB	ClubMac DAT/2	DDS-2	60m, 90m, 120m	\$1139	\$1189
2-4GB	EXB-820SS	8mm	112m	\$1499	\$1549
5-10GB	EXB-850SS	8mm	112m	\$2315	\$2365

ClubMac DAT and DAT/DC drives include Retrospect v2.1 Backup Software, ONE 90 Meter Tape and a TWO Year Warranty. Exabyte Tape Backup drives carry a ONE Year Warranty. The ClubMac DAT/2 drive includes Retrospect Remote v2.0 (3-Pack) Network Backup Software, ONE 120 Meter Tape and a ONE Year Warranty.

CD-ROMs

ClubMac 2X Speed CD-ROM Reader

- 320ms access time • Caddy-Less design
- Double Speed performance
- Headphone jack and RCA jacks
- PhotoCD compliant

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ClubMac Dual-Speed (External, 320ms access time)	w/o bundle \$199	w/ClubMac CD bundle \$299
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ClubMac CD Bundle \$800 VALUE



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The T16 II delivers 70% more display area, providing you with the above room for full-page layouts or working with several applications in multiple windows at the same time. Its multiple resolutions range from 640 x 480 to 1024 x 768. Automatically syncs to most popular Macintosh timings; plus it works with on-board graphics on the Quadra and Centris.

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Pivot Display (0361)	\$549
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Studio

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\$3295DigitalFilm
Deluxe

Real-time capture of 60 fields/sec, full-motion video and audio to disk, supports 30 frames/sec with video capture up to 640 x 240, hardware JPEG compression, includes Macromedia Director.

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VideoVision Studio (0418)	\$3295
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VideoVision Studio Basic (0416)	\$1509
DigitalFilm Deluxe (DV2050)	\$1699
Spigot II Tape (DV1530)	\$835
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Video Spigot NuBus LC (DV1050)	\$235

**\$1835**

LeMansGT

Delivering 24-bit color at resolutions up to 1152 x 870, Radius' high-octane LeMansGT delivers the best on-screen performance of any interface in its class. The LeMansGT features a 7" board, instantaneous resolution switching, on-board acceleration, razor-sharp photorealistic color, and Adobe Photoshop Acceleration.

**\$2169**Thunder II
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Thunder II GX 1152's 1152 x 870 resolution is great for viewing a full two-page spread without scrolling. A cost-effective solution with all the power of CMYK acceleration, image-processing acceleration, image-processing acceleration, and QuickDraw acceleration. It is also Power Macintosh compatible.

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PrecisionColor 24X (0421)	\$929
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NEC

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The Silentwriter 1097 carries a ONE Year Warranty.

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• True 600 x 600 dpi
• PostScript Level 2
with 35 scalable fonts
• 6 MB RAM, expandable to 22MB

HP DeskWriter Inkjet Printers carry

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HP DeskWriter 310 Printers carry

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HP LaserJet Printers carry a ONE Year Warranty.

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33 MHz PowerCache (P31UV-033)	\$275 / \$357
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28.8 MC

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222-223

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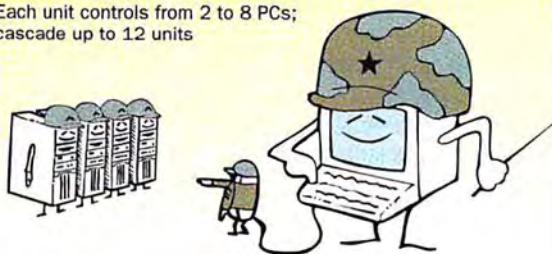
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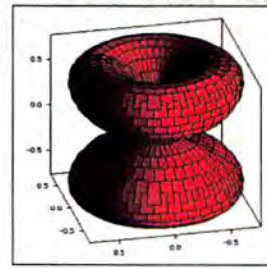
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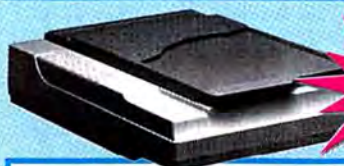
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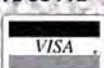
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Seven Big Myths

APPLE'S GOING OUT of business any minute now. At least, that's what you'd think

after listening to the latest round of doomsayers regarding Apple's future. This pessimism is nothing new. When I give talks about the industry, I like to point out that people were predicting the imminent demise of Apple Computer when it was a \$100 million company. Then it was destined to fail at \$500 million. At \$1 billion, it was too big to survive. The company was unmanageable at \$2 billion and going down the tubes. It was at the end of the line at \$4 billion. It was in terrible shape at \$5 billion. Now as the company heads toward \$10 billion, it's doomed for sure. I get to say this year after year; all I have to change is the last number.

The point is that just because some analyst says Apple's going to fail doesn't mean the company's going to oblige by keeling over. Most of the reasons for Apple's downfall I've heard spouted on the PC side defy common sense. Here are the latest:

1. The Apple-Can't-Compete-with-Compaq Syndrome. This is an interesting theory. It goes like this: Golly, once IBM and all the cloners in Taiwan start making PowerPC machines, then Apple will be competing in the big market with the likes of Compaq. Heck, Apple can't compete with companies like that! This theory ignores the fact that Apple is bigger than Compaq.

It's Compaq that should be worried, not Apple. Cutting Apple loose in the so-called big market is exactly what these same people were advocating some years back when Apple "couldn't

compete" because it was proprietary. It needed clones, they all said. My advice on this issue: Make up your mind.

2. The System 7 Conundrum. Although I'm predicting that System 7.x running on a non-Apple PowerPC machine would be adored by the larger community, people — including Apple execs, it seems — are in a quandary about this. To license or not to license: that is the question. The PC people need this software, though. Let's hope that by the time you read this, Apple will have taken the plunge and licensed the Mac operating system.

3. The Niche Market Assertion.

"Who needs all the power of a Power Mac?" Answer: Everyone, but especially graphic artists, who can cut their rendering time by hours.

"Oh sure, *them!* But you don't think the Mac can survive as a *niche* machine, do you?" Sheesh. Lots of bookkeepers use PCs running Lotus 1-2-3. Does that make the PC a niche machine? Macs and PCs and Power Macs all have their individual strengths and weaknesses, but most intelligent users agree that people want power — the more power, the better. Powerful, affordable machines don't create niche markets.

4. The Multitasking Dilemma. "The Mac is doomed because it doesn't multitask like Windows. Multitasking is the future." The Mac task switches just like Windows. Windows is not a true multitasking operating system, by any means. OS/2 and the Amiga are genuine multitaskers. Man, people sure flocked to those platforms, didn't they? Obviously, in the real world this feature isn't as important as engineers think.

5. The Apple's-Quitting-the-Hardware-Business Contention. This rumor keeps cropping up on the PC side. It doesn't make any sense that Apple would drop its lucrative hardware business to concentrate on software à la Microsoft. It's daft. The way to emulate Microsoft is to exploit to the max every revenue opportunity.

6. The PowerPC Floperoo. "Power Macs aren't selling." This theme has been showing up in the literature since the summer, as the Power Mac pipeline was filled and all the pent-up demand was satisfied. The same thing happened when the original 128K



Mac was released. The sales curve goes up and then down faster than you'd like to see. This is a common phenomenon. The Power Mac is no fluke or short-term deal.

7. The It-Ain't-the-Same-Apple Lament. Observers like to point out that Apple's corporate culture isn't what it used to be. This is true, and it's too bad, because Apple must now rely on critics like me, rather than the cult boosters who used to do it, to boost the company. Whatever happened to those guys, anyway? They're probably all wasting their time hacking away on the Internet. The fact is, it ain't the same Apple, but those cult roots will never disappear. Hopefully, Apple will go back to exploiting that potential fanaticism once again.

Maybe then it won't be up to *me* to set the record straight. ☹️



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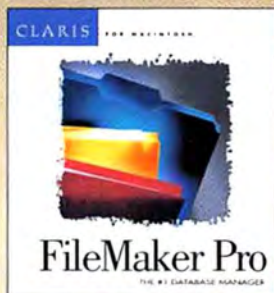
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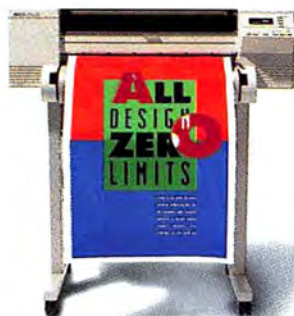
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