SEPTEMBER 1995 / $3.95

MacUser

ZD ZIFF-DAVIS PUBLISHING COMPANY

5 EASY STEPS TO PERFECT VIDEOS

A Guide to Do-It-Yourself Multimedia on the Mac

SET UP HARDWARE

CAPTURE VIDEO

EDIT FOOTAGE

ADD SOUND TRACK

SHOW IT OFF

PLUS

Superfast CD-ROM Drives
Trade Up for a Speedup

Image Magicians
The Hottest Special-Effects Tools Rated

Beyond SimCity Check Out
The Game Room – page 133

MacUser CONTENTS
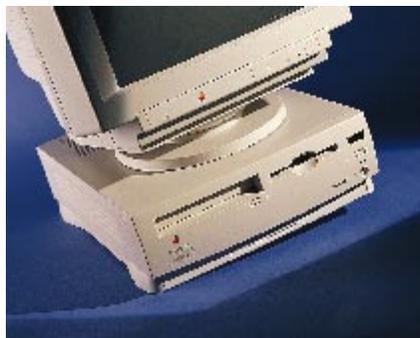
On the cover / Moviemaking the Macintosh way.

Cover photo / Michael LaMotte

REVIEWS & QUICK CLICKS

39 / From colorful images to sharp-looking type, Apple's new printer does it all.

47 / Photo opportunity.

MacUser

How to Reach Us

THE EDITORS of *MacUser* want to hear from you. Send questions, tips, complaints, or compliments to *MacUser,* 950 Tower Lane, 18th Floor, Foster City, CA 94404; 415-378-5600. Send electronic mail to letters@macuser.com (Internet) or 72511,422 (CIS). We are unable to look up stories from past issues, recommend products, or diagnose Mac problems by phone. Call Apple toll-free at 800-538-9696, ext. 500, for information on user groups. By submitting a tip to *MacUser,* either directly or via ZiffNet/ Mac, you agree that Ziff-Davis Publishing Company, L.P., and its affiliates and licensees can reproduce, publish, display, and distribute your tip worldwide in all print and electronic media and in all other forms, manner, and media now known or hereinafter devised.

Subscription Inquiries/Change of Address

FOR SUBSCRIPTION SERVICE questions, address changes, or ordering information, call 303-665-8930; fax 303-604-7455; or write to *MacUser,* P.O. Box 56986, Boulder, CO 80322-6986. New subscriptions and address changes take six to eight weeks. For back issues (subject to availability), send $7 per issue, $8 outside the U.S., to Back Issues Dept., Ziff-Davis Publishing Company, L.P., P.O. Box 53131, Boulder, CO 80322-3131. We periodically make lists of our customers available to carefully screened mailers of quality goods and services. If you do not wish to receive such mailings, please let us know by writing to us at *MacUser,* P.O. Box 56986, Boulder, CO 80322-6986. *MacUser* (ISSN 0884-0997) is published monthly by Ziff-Davis Publishing Company, L.P., One Park Avenue, New York, NY 10016. Editorial Offices: 950 Tower Lane, 18th Floor, Foster City, CA 94404. Telephone: 415-378-5600. U.S. subscription rates are $27 for 12 issues, $45 for 24 issues, and $62 for 36 issues. Additional postage for Canada: Add $16 per year to the U.S. rates for surface mail. Single-copy price is $3.95. Canadian GST registration #R-123669673. Canada Post International Publications Mail Product (Canadian Distribution) Sales Agreement No. 278521. POSTMASTER: Send address changes to *MacUser,* P.O. Box 56986, Boulder, CO 80322-6986. Second-class postage paid at New York, NY 10016, and at other mailing offices.

ZiffNet/Mac: *MacUser* Online

ZIFFNET/MAC IS a commercial online service that provides selected articles, reviews, and electronic supplements to *MacUser.* In addition, you will find thousands of reviewed shareware files and have a chance to interact with editors. To order a free starter kit to access ZiffNet/Mac hosted on CompuServe, call 800-848-8199. On **CompuServe,** just type GO ZMC:MACUSER. On **eWorld**, use Shortcut:MACUSER. *MacUser'*s home on the **World Wide Web** is http:// www.macuser.ziff.com/~macuser/.

MacUser on CD-ROM

MACUSER IS AVAILABLE on Computer Select, a CD-ROM published by Computer Library. For subscription information, call 800-827-7889, ext. 708. If you're calling from Canada, 212-503-4400; from Europe, 44-344-710091; or from anywhere else, 212-503-4425.

Complaints About Advertisers

MACUSER EDITORS are not responsible for the contents of the ads in the magazine. However, if you bought a product advertised in *MacUser,* are dissatisfied, and can't resolve the problem, write to Ad Department, *MacUser,* 950 Tower Lane, 18th Floor, Foster City, CA 94404.

Permissions and Reprints

MATERIAL IN THIS PUBLICATION may not be reproduced in any form without permission. Send permission requests to Chantal Tucker at 212-503-5420 (fax) and reprint requests to Carol Peters at 212-503-5419 (fax) or Ziff-Davis Publishing Company, L.P., One Park Avenue, New York, NY 10016.

Product Announcements and Updates

SEND PRODUCT INFORMATION to Jason Snell (News) and send new products to Kristin M. Balleisen (Reviews) at *MacUser,* 950 Tower Lane, 18th Floor, Foster City, CA 94404.

LETTERS

Go, Go, Speed Modem

GREAT ARTICLE ON V.34 modems ("Mach-Speed Modems," June '95, page 84). It cleared up a lot of misconceptions I've had — even though I've been hungrily reading about these modems for quite a while.

But what about the Global Village TelePort/Platinum? How does it rate? I assume it was released too late for you to benchmark.

Robert Pater
rpater@teleport.com

/ You assume correctly. For our evaluation of Global Village's entry into the V.34 sweepstakes, check out the review on page 48. / JS

YOUR ARTICLE STATES that upgrading to a V.34 modem is not recommended for online users, because online information services do not yet offer 28,800-bps access numbers. You mentioned that CompuServe was beta-testing 28,800-bps access, but I find it disturbing that you didn't mention America Online. AOL currently has 28,800-bps access in many large cities and is expanding.

Chris Bonhorst
via the Internet

/ Both America Online and CompuServe now offer 28,800-bps service in major cities (AOL began in April, CompuServe in May), but neither offered such service when our story went to press. / RM

YOUR ARTICLE ON V.34 modems is one of the most comprehensive I have read. There are a few inaccuracies I wish to correct,

however, and a few details you missed.

First, the flash memory in a U.S. Robotics Courier V.Everything with V.34 can't be upgraded from a Mac; it must be done from a PC. Second, the SupraFAXModem 288 does support Caller ID and MNP 10, contrary to your feature comparison. Finally, many users won't be able to achieve full 28,800-bps speed when using a V.34 modem. Although they may get a 28,800-bps connection nearly every time, many users may be limited to 21,600 bps, because full 28,800-bps operation requires higher-quality telephone lines than phone companies are required to provide.

Steve Lim
skul@mcs.com

/ It's always good to hear from another dedicated modem junkie. You're right about the Supra and U.S. Robotics modems — although you can also upgrade the Courier's flash memory from a Power Mac running SoftWindows. In any case, since over half of *MacUser* readers use Macs *and* PCs, U.S. Robotics' snub of its Mac customers is less painful than it might otherwise be. / RM

YOUR REVIEW STATED that the Zoom V.34X Model 460 modem did not perform well in the connection-reliability test. We have determined that the setup string we provided for the modem was erroneous. When the test is performed with the correct setup string, our modem performs much better, particularly when tested on phone lines that are typical of 97 percent of the phone lines in the United States.

In addition, the test results you published were not weighted based on the recommendation of the TSB-37A test standard. These weightings were established to represent the frequency of occurrence of telephone-line conditions. The new test results, correctly weighted, produce a connection-reliability rate of 94.24 percent for the Zoom V.34X, in contrast to the 78.2 percent you reported.

Dana B. Whitney, Director of Engineering
Zoom Telephonics, Boston, MA

ILLUSTRATION / DAN HUBIG

OPEN FOLDER

The pursuit of wisdom is a common theme of the letters we receive each month, but some people need a little guidance before they can seek knowledge. "What is your definition of a Mac guru?" writes Brett O'Donnell, of Oak Forest, Illinois. To find an answer, we need look no further than our own resident Swami of SCSI, Andy Ihnatko.

Andy's widespread appeal was made apparent by the response to his offer in the June issue to send an "informative illustrated pamphlet" on relationships and dating in the '90s to anyone who sent him e-mail. The masses unenlightened about Andy's humor sent in dozens of requests, and Andy begged us to design an icon to forewarn readers about his jokes. Sounds like sour grapes from a man who's found his true calling — advice to the lovelorn.

A forward-looking guy such as Andy would no doubt parlay his cultlike following as a romantic advisor into a business that would change life as we know it, eventually leading to mass weddings of Andy Acolytes in holy Cupertino. Perhaps Andy's high-tech love empire could benefit from a variation of this suggestion, sent via the Internet from Chris Mims and James Holback: "Close your eyes, move your mouse around in a circle, and click once. Whatever you've clicked gets thrown in the Trash. This adds an element of danger to our otherwise drab lives." With a little modification, this game of Mac roulette could become the on-line equivalent of *The Dating Game*. Click on a date, and if the person doesn't meet your expectations . . . just drag 'em into the Trash.

Aimless mouse clicking isn't the only reader pastime that makes us understand why so many people sought Andy's dating advice. "In your June issue, I spotted a profanity," writes Ross Otto, of Kentfield, California, fingering a microscopic word in a photograph. We wholly endorse careful study of *MacUser*, but we'd prefer you do it with a special someone. And when you're in front of a crackling fireplace, scouring our pages for hidden meanings, be sure to ask your loved one what his or her favorite section is. If the answer is Open Folder, your mystical search for true love will be over at last.

/ We were pleased to discover that the setup string Zoom provided after our testing was completed significantly improved the performance of the Zoom V.34X Model 460 modem. However, we stand by the weighting of our connection-reliability test results. In our opinion, the weighting method that we used more accurately downgrades the importance of connection reliability over less likely line types. / RM & SS

Phone Amateur

I READ WITH INTEREST your review of PhonePro 1.5 (June '95, page 43). Your giving a four-mouse rating to this program is beyond belief. We tried several different modems, and PhonePro didn't work with any of them, although Cypress claimed that it would.

You also neglected to mention Cypress' lack of service and support. We were told that our calls would be returned, only to find that they weren't. And even though the Cypress technician also encountered our problem, it was never resolved.

You say you "used quite a bit of imagination in an attempt to push the program to its limits." I was trying to develop a real-life application that didn't attempt to push the program to its limits and found that the program fell woefully short, to the extent that it was simply unworkable for us. A 1-mouse rating is all it deserves.

Arthur A. Joyce
ArthurAJ@aol.com

FOR THE BETTER PART of the year that my company has been in business, I have tried to make PhonePro work. It has been an ongoing saga of endless upgrades and repeated unanswered calls to tech support. There is nothing "Pro" about PhonePro, and giving it four mice is truly laughable.

Joe Banko
ir000974@interramp.com

/ As we noted in our review, PhonePro 1.5 is vastly improved over earlier versions of PhonePro. In our tests, every feature in PhonePro 1.5 worked as billed, including compatibility with all the modems Cypress said it supported. We received excellent service and support from Cypress; any *MacUser* readers who are getting substandard service should contact Bryan Bunch at Cypress (408-752-2700) with their concerns. / DC

DON CRABB'S REVIEW of PhonePro 1.5 states that the software works with the Supra SupraFAXModem V.32bis. However, it does not work with the current "new" V.32bis modem Supra is shipping. The new modem features a single chip, whereas the older modems that support voice sport two chips.

Supra does have used V.32bis modems available for $125 plus $19.95 for a power supply. I had purchased one of the new, one-chip-style modems, and Supra exchanged mine for no charge.

Andrew J. Knasinski
knasinskia@jdpub.com

/ When we wrote the review in early January, the new Supra SupraFAXModem V.32bis was not yet available; Cypress says PhonePro 1.5.1 will support it. / DC

Whirly Gig

YOUR REVIEW OF 1- TO 2-GB hard drives ("Think Gig," June '95, page 74) is silent on the subject of drive noise. I have a hearing impairment that requires me to seek a quiet environment. My new drive must be both quiet and reliable. I realize that noise is a complex, subjective topic: Steady and variable tones, pitch, overtones, harmonics, and acoustic masking make noise hard to quantify in a single number; but can you find space in your magazine to print some sort of sound rating and to comment on any particularly annoying sounds users might encounter?

Mike Breslau
Mike_Breslau@bmugbos.org

/ MacUser Labs is equipped to test hard drives and other devices for the amount of sound they make, and we have done so in the past. However, we have found that recent-generation drives (and their fans) are far quieter than their predecessors. We believe that users are now most concerned with drive-speed issues, and we therefore focus our testing in that area. If we're wrong and more readers echo your request, we'll consider resuming noise tests. / JSA

THE MOST IMPORTANT FACTORS in comparing drives are reliability and service policies. An in-depth comparison of quality and support from the various drive manufacturers would be much more useful than a comparison of cost per byte and transfer speed.

In addition, 1- to 2-GB drives are hardly "humongous." For anyone doing CD-ROM or digital-video development, a 2-GB drive is minimal. How about an article on 4-GB and larger drives?

Bob Nicholson
via the Internet

/ We'll certainly look into covering bigger hard drives in the future. For the time being, you can check out our new Quick Labs section for regular updates on new hard drives, including some *very* big gig drives. / JS

Net Gain

I'VE JUST VISITED your page on the Web for the first time, and to keep this short and sweet, I just thought I'd let you know that your site is far and away one of the most informative, complete, content-heavy, logically organized, best-looking sites on the Net.

Brett L. Kessler
bkessler@ios.com

I USED YOUR WEB SITE to research color scanners. Thanks to your online indexes for 1994 and 1995, I have a list of reviews, including issues and page numbers. This has proved to be an invaluable resource for me.

Thanks for making this type of service available!

Rich Hansen
via the Internet

I BUY EVERY ISSUE of *MacUser* and enjoy reading it online. I've found that *MacUser's* Web site has been improving all the time, and the Breaking News section, which contains news from each issue just as it's being mailed out, is really great.

Kevin Chan
via the Internet

/ We appreciate the kind words. We're always trying to improve our presence on the Web, which now includes an index of all the products we've reviewed in 1994 and 1995 as well as a sampling of news stories, a feature story, a review, and all the columns from every issue of *MacUser*. / JS

I'M USING America Online's new Web browser for the first time. And guess what I visited first? *MacUser's* Web site!

I was on the verge of dropping AOL in favor of a true Internet account, but due to this most recent development, I may just wait a while. My view of AOL has just changed dramatically!

Jason Tucker
epicvision@aol.com

IS THERE ANY WAY I can access *MacUser* from America Online?

Carolyn Colella
via the Internet

/ Since America Online is beginning to offer World Wide Web access to Mac users, you can now access our Web site from AOL. Use the URL http://www.ziff.com/~macuser/ to go there. / JS

More Power to Us

YOU STATE THAT the StyleWriter 1200 (New on the Menu, June '95, page 28) "[has] no power switch." A simple glance at the picture shows that there is, indeed, a power switch. Perhaps it's time to get the ol' vision checked.

Dennis T. Cheung
DTC@aol.com

/ What we meant to say was that Apple's new Desktop Printing Extension allows you to turn the printer on and off from the desktop. Those of you with itchy fingers can still press the button to your heart's content. / PP

Power Edsel

IN "BRING ON THE CLONES," (June '95, page 64), you say that "if a stripped-down . . . version of a Power Mac 6100 is the machine you've been saving up for, the clone market has nothing to offer you. Not yet." Why not go with the 6100 itself? The general public just wants a computer to be up to today's standards, not a super computer with a nasty price tag. It makes sense to sell a good product, such as the Power Mac 6100, to the average Joe and then go for the high ground. (Just look at how Henry Ford succeeded!)

Chris DeAngelus
Phishter@aol.com

/ Although the Power Mac 6100 carries a nice price tag, it's no Model T — it may not be inexpensive enough to satisfy many new buyers. Power Computing's forthcoming clone (see New on the Menu, August '95, page 27) may finally please folks who want to pay rock-bottom prices for a RISC-based computer. / JS

Power Hula Hoop?

ONLY SEVEN SHORT months ago, I scoffed when I heard about the new Macintosh front line — the Power Macs. "Oh," I chuckled, "here comes the next Newton." I was certain they would prove to be a fad packed with incorrigible flaws and flashy but useless features.

Much to my surprise, the PowerPC-based line has matured and become a respectable series of leading-edge Macs. Although the idea of emulating an inferior system such as DOS by using expensive hardware still seems a wee bit futile, I find the Power Macs to be a new and admirable source of extreme envy, since I own an LC.

Thomas J. Ringer
Thomas_J._Ringer@tvo.org

Macro Maniacs

THANKS FOR AN EXCELLENT article on macros ("Perfecting Your Word Processor," June '95, page 106). Readers who want more information on WordPerfect macros will want to check out WordPerfect Mac News, our monthly electronic magazine. We feature our Macros of the Month, as well as a monthly macro tutorial written by noted Mac author John Rethorst. You can find WordPerfect Mac News on CompuServe, on America Online, and on the World Wide Web (http://www.novell.com/ServSupp/mac).

Daniel Midgley
Editor, WordPerfect Mac News
macmail@wordperfect.com

ALTHOUGH IT'S NICE that Nisus Writer is at least mentioned in passing in the first sentence of "Perfecting Your Word Processor," the article would have been much more balanced if it had presented some examples of writing macros in Nisus Writer, which has had a full-featured word-processor scripting language for many years now. It would have been a useful comparison to note the differences in the way Nisus Writer (a Mac-only program), WordPerfect, and Word each approach scripting. I can't help but compare Word's syntax for applying bold and italic to selected text: `Sub MAIN Bold(1):Italic(1)End Sub` with Nisus Writer's menu dialect equivalent: `Bold Italic`.

I would never claim that all of Nisus Writer's syntactical features are perfect, but this example sure seems simpler.

Readers interested in learning more about the powerful features of Nisus Writer may wish to subscribe to the Nisus Users mailing list by sending a message to listserv@dartmouth.edu with "subscribe nisus" in the body of the message.

Mel Martinez
mem@rowland.pha.jhu.ed

It's a Drag

ONE SUPERB APPLICATION you neglected to mention in your review of DragStrip (June '95, page 59) is Rick Christianson's VersaTile Pro. This shareware, PowerPC-native application creates 3-D-looking palettes with the same features as DragStrip and more. The palettes can take on any look you want, because you can choose backgrounds for the tiles from libraries of textures or from textures you have created. There's even an active-applications palette that lets you open files by dragging them onto the application's icon. The aesthetics of this utility — combined with its multi-launching, total user configurability, and System 7.5-savvy capabilities — make it a great choice for any Mac user.

Scott C. Russell
ManlyBird@aol.com

ANOTHER GREAT PRODUCT for launching files from palettes is James Thomson's DragThing, which is PowerPC-native and — best of all — free!

Bob K. Chen
via the Internet

/ Thanks for the contributions. Due to space constraints, our review wasn't able to mention all of DragStrip's commercial and shareware competitors. As for palette utilities, we should also mention the MacUser/ZMac utility QuickLaunch, which is available exclusively from the ZiffNet/Mac service on CompuServe (GO ZMC:MACUSER), ZiffNet Selections on AppleLink, and ZiffNet/Mac services on eWorld (Shortcut: MacUser). / JS

Think Quietly

AFTER READING John Dvorak's column ("Dvorak Psychic Friends Network," June '95, page 178), I'm convinced that Mr. Dvorak has been moonlighting on the technical-support line of a major computer-hardware vendor.

Nick Hodges
jnhodges@nps.navy.mil

/ Funny, Nick — you read our minds. / JS

CORRECTIONS

ViewSonic doesn't sell monitor adapters, as we indicated in Quick Labs (July '95, page 90). The company supplies adapters to its customers free of charge.

The second image that accompanied our review of MapInfo 3.0 (April '95, page 68) should have been credited to Chalk Butte, Inc.

Golden Rules

"AND WHAT FRESH HELL IS THIS?"

Dorothy Parker might have cried if she'd lived long enough to confront the magic

mix of computer cards, cables, code, and content that we call multimedia. Enticing ads are everywhere, whetting our appetites for multimedia desktop systems that are accessible enough to allow average users to create professional-looking productions, complete with digital movies, compelling sound tracks, and sharp-looking type.

But when you actually go to buy the hardware and software tools you need for multimedia production, things can get very murky very fast. What exactly do you need to make a digital movie? How long will it take to string together all the elements required for a full-blown multimedia presentation? And can you actually achieve results that match the quality promised by the ads?

Contrary to what starry-eyed marketers may tell us, digital moviemaking and multimedia authoring are still a long way from being everyday computing tasks. And although computer companies love to draw parallels between the desktop-publishing revolution and what's happening today in multimedia, the process of creating a six-page newsletter is a world apart from producing a basic multimedia production.

To help you begin your adventure in multimedia, our cover story features a step-by-step guide to the hardware and software you'll need. Until "multimedia solutions" are ready for prime time — meaning systems come standard with all the required tools and setup and use are as simple as with mainstream DTP tools, you'll need all the help you can get. Here are five simple rules for mastering multimedia today:

1. Focus on content, content, content. I can't tell you how many whizzy presentations I've seen in which the whizziness was all there was. No matter how glitzy the effects, you'll still need to tell a compelling and well-organized story. Great images, professional-quality video, and the right music help sell your message, but what you say still matters more than how you say it. And map out your message early, so you can tailor the format of your presentation to the content.

2. Keep your expectations realistic. The process of creating multimedia isn't easy, and for many business users, the results aren't going to be as slick as those created by the pros. The magic of multimedia can't transform the quality of video captured by your camcorder into the quality of a Hollywood motion picture. We've come a long way from Quick-Time 1.0, but we're still not talking *Forrest Gump* here.

3. Learn to recognize what works and what doesn't. Analyze the productions you see for their overall effectiveness (or lack thereof). Did the presentation drag on interminably, or was it so engaging that you didn't find yourself looking at the clock even once? Did the music create the right mood? Did the images fit the message? Was the text readable? The better you get at spotting good multimedia productions and knowing what makes them tick, the better you'll be at creating your own effective presentations.

4. Use the right tool for the job. Using your home video of your kid's softball game to create a multimedia memory is not unlike making meat loaf the Martha Stewart way. It's an elaborate project, and you may start to miss Mom's hallowed tomato-soup-based recipe. Likewise, creating a complex desktop

production that requires lots of system resources may be the wrong approach if your account reps will be presenting it on grayscale laptops.

5. Know your own technical strengths and weaknesses. Remember when your dad would spend an entire afternoon trying to fix the sink — unscrewing U-joints and washers? An admirable effort, but the sink was still backed up when he was done (probably it had something to do with his being an accountant, not a plumber.) The point is, if you're a business communicator and your strength is creating persuasive

Digital moviemaking and multimedia authoring today are still a long way from being everyday computing tasks.

sales messages or corporate policy statements, you might consider focusing your efforts on the message, not the medium. Not everyone has the technical savvy required to build an effective QuickTime-based multimedia presentation.

But that doesn't mean you have to give up on the idea. Look around for the office techie — you know, the person in the black T-shirt and bill-to-the-back baseball cap who spends evenings diddling with computer equipment — and get in cahoots. You manage the message while the techie manages the media.

If you happen to *be* that office techie, take a little time out from your pet projects to show off your stuff to the pinstripe crowd. If you're fluent in video capture and titling, you've got valuable skills they should know about. If you succeed in making great-looking presentations for your company's executives, chances are they'll be back for more. Then comes the best part: You can ask for more multimedia toys, and — who knows — you may even be up for a promotion.

Word's Worth

MARCH'S COLUMN ON THE THEN NEW
release of Microsoft Word 6.0 resulted in a virtual avalanche of public reaction.

Normally, of course, when I say "avalanche of public reaction," it's just a euphemism for "e-mail from four readers, three of whom almost immediately shifted gears to ask why their Macs keep showing a flashing diskette with an X through it." But no, this time I mean that my analog and digital mailboxes were flooded with responses, requiring the hiring of a small team of assistants to shovel through the mounds of letters in my office in a desperate attempt to locate Copley, my black-footed ferret, missing for two months and eight days at this writing. An avalanche of public reaction is nice but clearly has its downside as well.

It all just makes me wonder what sort of reaction would have resulted if I'd submitted an earlier draft, entitled "Word 6: Don't Even [expletive gerund deleted] Bother." Since then, Word 6 has become 6.01. The obvious question is, "Is 6.01 an improvement?" and the obvious answer is . . . uh, yyyyes. OK, yes, sure. For one, East and West Coast users are no longer required to move their Macs 400 miles inland before launching Word, the fear that the natural inexorable movement of the Earth's plates might result in their property's sitting on a new offshore land mass before Word finally presents them with a flashing cursor now completely a thing of the past. Version 6.01 now tolerates the presence of additional system extensions with considerable élan (that is, they do not send Word off on a hissy fit). The improvements are just stunning.

For that reason, I'm willing to upgrade my opinion of Word slightly. Whereas I'd rather be poked in the eye by a sharp stick than use Word 6.0, with the release of 6.01, I'd now have to ask to see the actual stick. Whereas the original was, in my opinion,

unusable and unreleasable, 6.01 has at least a *toehold* on credibility as a useful tool. Besides, I've spent a lot of time talking to Microsoft folks since then, and although I don't anticipate any revolutionary changes in Word any time soon, they do seem to have learned something from this experience. Word 6 has become the New Coke of Microsoft, so much so that Microsoft Word Classic (my terminology, for comedic effect; actually, it's plain old 5.1a) is still available from the Mothership to anyone who wants to buy it.

But Word 6's most serious problems are still unresolved and just as difficult to ignore in 6.01. This just is not a Mac application by any definition. I think I flailed my arms around quite enough on this subject last March, but it bears repeating: If you are happy with the way the Macintosh operates, you're going to be terribly *unhappy* with Word 6.01. The second major problem is one I barely touched on earlier: Word is loaded with features that, although nice, are rather narrow in scope and that, for most users, only serve to make a slow, corpulent, and complicated program that much more so. I think the time has come for Microsoft to ask itself if Word has become so huge that it needs to be split into separate products in order to preserve the utility of its core function: the transferal of ideas from highly volatile wetware to more permanent magnetic or mashed-pulp substrates. Bloated applications and memory requirements are big problems, certainly,

but they can be worked around (traditionally by the quick and strategic application of moolah to the afflicted areas). When a user is confronted by a bloated *user interface,* however, there's nothing left to do but try to adapt — or switch to another word processor. The amount of memory, storage space, and megahertz you can slap into a computer is, for all intents and purposes, infinite. The number of menus, dialog boxes, and buttons you can cram into a user interface is sorely limited by the patience of the users.

This is a limitation that Microsoft has almost completely ignored and that all newly hired Claris employees have tattooed, in reverse, right on their foreheads so they're reminded of it as they shave and/or apply their makeup each morning. MacWrite Pro is like Brookstone's World's Greatest Hammer. The thing isn't An Entire Toolbox In The Palm Of Your Hand, or even The Most Technologically Advanced Hammer Ever Made. It's just a hammer. But it's perfectly balanced, it's exactly the right weight, and its handle is contoured to fit your hand precisely. As a result, it functions more as an extension of your arm than as an Impact-Based Nail-Driving Solution. Similarly, although MacWrite Pro's feature set pales in comparison to other word processors', no program is nearly as unobtrusive; the interface fades away, so you can concentrate on words. It's been finely tuned so that every feature is right where you'd expect it to be. Even its use of color cues is spot-on. It's the most natural conduit between brain and paper you can buy. MacWrite Pro also offers something most product reviews don't

> *Whereas I'd rather be poked in the eye by a sharp stick than use Word 6.0, with the release of 6.01, I'd now have to ask to see the actual stick.*

evaluate: *responsiveness.* Lack of responsiveness is a key failing of Word 6.01.

("Responsiveness is all about knowing what the car's doing and what progress you're making just by the way the seat's vibrating your butt," says one three-time Indy champ. I look forward to attending a trade show and seeing a big banner reading "MacWrite Pro: You'll Know How Good It Is By The Way Your Seat Vibrates Your Butt.")

MacWrite Pro is rarely the first program that comes to mind when you're thinking of switching word processors; I had forgotten all about it until one of my favorite authors told me he uses it. Unfortunately, although Claris has provided steady upgrades for both compatibility and additional features, it's not a high-priority product by any means. What about its more full-featured competitors, Nisus Writer and Word-Perfect? Nisus Writer remains my Main Ax, but it now shares duty with MacWrite. Like the mythical Spirograph, Nisus lets me do things I'm constantly amazed by. It's really the Photoshop of word processors, with diesel-powered yet easy-to-use macro and search/replace features that trivialize even the gnarliest problems of text manipulation. Nisus' overall interface is a bit clumsy at points, but that's a tiny price to pay for all that raw power. As for WordPerfect, it's everything Word 6 could and should have been. Seemingly geared to business use but nonetheless a sturdy all-around word processor with a clean, clear interface and a fat feature set that doesn't compromise performance, it's replaced Word 5.1a as my default recommendation when people ask me which program to buy. I suspect that that sentence is more likely to appear on a banner than the other one, although in this case, I hasten to point out that I'd more likely ask one or two follow-up questions to determine whether Nisus or MacWrite was better suited to their needs.

Can't I say *anything* nice about Word 6.01? Well, it still has the best style sheets in creation, offering a range of text attributes limited only by your imagination (and patience for reading every page of Word's documentation). It's hard to improve on Word's functions for preparing obscenely long and complicated documents. And even though We Of The People view its user interface as an affront against God and humanity, its imitative interface and file compatibility with Word for Windows have obvious advantages in a mixed-breed office. Still, outside those limited areas, I just can't recommend Word 6.01 any more than I could catapult an anthrax-ridden piece of livestock over my neighbor's fence during his Labor Day family barbecue.

Finally, many of you are no doubt waiting to learn which Mac word processor I used for this column. Actually, for nostalgia's sake, I hauled out my Kaypro and fired up WordStar for the first time in Tarim-knows how many years. The program has no user interface to speak of, because frankly it doesn't have enough features to require one. It's just you, the words, and nothing else on the screen to distract you. That's not an altogether incorrect picture of an ideal word processor.

Iomega Tunes Up Snazzy Jaz Drive

New low-cost drive plays 1-GB media.

THE RUNAWAY SUCCESS of the Zip drive is only the first step in Iomega's strategy to again become a player in the removable-storage market. With the 100-MB-capacity Zip drive, Iomega wooed everyday users who need fast, cheap removable media. Now, with the 1-GB Jaz drive, the company is targeting users who demand higher-capacity storage, but still at a low price.

Unlike the Zip drive, which uses a flexible magnetic medium encased in a floppy-sized enclosure, and unlike its flagship product line, based on its proprietary Bernoulli technology, Iomega's new Jaz drive uses standard 3.5-inch Winchester hard-disk technology enclosed in a cartridge, similar to products from archrival SyQuest.

But unlike comparably priced 270-MB SyQuest-based drives, the Jaz offers more capacity at a price in line with that of 1-GB hard drives. The external Jaz drive will cost about $600, and an internal version is expected to cost about $500, with 1-GB cartridges selling for about $125 apiece or $100 each in quantity. By contrast, a 3.5-inch, 270-MB SyQuest drive costs about $500, with 270-MB cartridges priced about $60 each in quantity. The Jaz can also read 540-MB cartridges ($69).

The Fast SCSI-2 device also delivers high performance, with a 10-MB-per-second transfer rate, 12-millisecond average seek time, and 17.5-millisecond average access time — fast enough, the company states, to play full-screen, full-motion video. Equipped with two 50-pin SCSI connectors, the Jaz has automatic SCSI termination and a fully user-selectable SCSI ID. The snazzily designed Jaz case is sporty green, has a window for viewing disk labels, and can be stacked horizontally. Jaz cartridges cannot be used in SyQuest drives or vice versa. The drive weighs just two pounds, making it easy to tote to the service bureau, and its Jaz Tools software makes it easy to connect to guest computers without installing extensions on the host. 800-697-8833 or 801-778-1000. / Pamela Pfiffner

PHOTOGRAPHY / FRED STIMSON

Apple Adds Performa Choices

MANY HOME USERS should beam with satisfaction at Apple's latest Performa models — the 5200 series and the 6200 series. These models offer PowerPC speed, big hard drives, internal modems, and a list of software as long as your arm — without costing an arm and a leg.

For a couple of months now, educators have had their hands on Apple's all-new all-in-one system, the Power Mac 5200 LC (see New on the Menu, June '95, page 25). Performa buyers don't have to wait any more. The Performa 5200 model sports the same brains as the 5200 LC: a 75-MHz 603 chip, a 256K Level 2 cache, and 8 MB of RAM. The outside is identical too, with a built-in 15-inch display that offers either 16-bit color at 640-x-480-pixel resolution or 8-bit color at 832-x-624-pixel resolution. As with the Performa 5200's LC cousin, the integrated stereo speakers and microphone are geared for multimedia users.

On the inside, the new 6200 is very similar to the 5200 — it uses the same motherboard — although it's housed in the now familiar low-profile, Quadra 630-style case with single speaker, detached microphone, and separate monitor.

So what sets these models apart from one another and from the LC model? There are several configurations available, all with indecipherable model numbers and different price tags. The Performa 5200 series lists for $1,999 to $2,299, depending on the bundled software. The 6200 series lists for $2,399 to $2,999, depending on software and display options.

The first difference among them is drive capacity: 800-MB and 1-GB drives are available

as options in the 5200, and 1 GB drives come across the board on all configurations of the 6200 — enough room for light video editing, if you so desire. All Performa 5200 and 6200

The Internet Becomes Multimedia-Savvy

Macromedia, Sun nab Netscape Navigator.

JACK OF ALL TRADES — that's what you could call a new version of Netscape Communications' Internet-spanning Netscape Navigator application, which will be available by this fall. The new version of Navigator will include built-in support for Adobe Acrobat documents (see New on the Menu, July '95, page 24), Macromedia Director multimedia files, and applets written in the new Java language, designed especially for the World Wide Web.

Net Director. Because Macromedia's Director player is embedded in Netscape, Internet surfers will be able to access multimedia files more easily. Currently, Netscape Navigator and other Internet browsers launch "helper applications" in order to play back sounds, QuickTime movies, and animations. But Navigator will now be able to download and display multimedia documents created with Macromedia Director, an application many developers use for creating their multimedia CD-ROMs. In the same window in which you currently view your favorite Web sites, you'll now be able to take part in interactive experiences similar to those you'd find on CD-ROM. (Of course, the more animation and high-quality images in a file, the longer it will take to download the file over the Internet.)

With the Macromedia Director player embedded in Netscape, Net surfers may be able to access CD-ROM-style animations via the Internet.

A Cup of HotJava. Navigator will also support multimedia through Java, a cross-platform, object-oriented programming language created for the World Wide Web by Sun Microsystems. Java gives users the ability to write small programs that can be embedded into a Web page. When you visit a Web site, Java applets automatically launch, playing sounds and displaying animations within your Web browser. Although Java support first appeared in Sun's HotJava Web browser, Netscape's decision to support Java improves its chances of becoming a standard for expanding the capabilities of the Web.

Catching the wave of the growing desire to surf the Net, Netscape will also sell a version of Netscape Navigator through mail-order and software stores. Dubbed the Netscape Navigator Personal Edition, the $40 package will include Netscape Navigator, Eudora Light e-mail client software, 90 days of free technical support, and an automated Internet-connection system. Macromedia, 415-252-2000; Netscape, 415-528-2555; Sun, 415-960-1300. / Jason Snell

models come with quad-speed CD-ROM drives offering 167-millisecond access time.

Connectivity is also included. Both series offer a Global Village 14.4-kbps internal fax modem. To help you make full use of the modem, Apple has included a custom version of Cypress Research's MegaPhone application that gives you a full duplex speakerphone and digital-answering-machine capabilities as well as a built-in address book. You may have trouble getting used to talking to your computer, but your teenager won't.

And that's not all, folks. Software available with various configurations includes such titles as ClarisWorks, Intuit's Quicken, Apple's At Ease, and Grolier's Multimedia Encyclopedia 1995. By signing up with eWorld, using the preinstalled client software, you can get full access to the Internet, including: the World Wide Web, Usenet newsgroups, ftp servers, and e-mail. 408-996-1010. / Sean J. Safreed

Power Computing, Radius Line Up New Allies

MAC CLONES ARE TRICKLING into the market, but there's a torrent of action behind the scenes at Radius and Power Computing.

Radius. Although Radius had yet to begin shipping its Mac-compatible Radius System 100 computers in significant quantity at press time, the company's clone business has been much in the news of late. Radius apparently plans to meet customer demand for its computer systems by having IBM manufacture them. Despite this manufacturing agreement, however, IBM itself probably won't get into the Mac OS market until its first Mac OS-compatible systems, based on the Common Hardware Reference Platform, ship next year.

Radius' decision to rely on IBM's greater manufacturing capacity makes particular sense in light of the fact that Radius, which originally announced plans to build Mac compatibles only for the high-end-publishing and digital-video arena, will soon announce a broader line of computer systems that targets a much larger potential market. To assist in delivering systems to that market, Radius recently signed an exclusive distribution agreement with retail giant Ingram Micro to sell Radius clones. Radius will be responsible for providing technical support for systems sold by Ingram.

Power Computing. Meanwhile, Power Computing, which hopes to make its mark in the Mac market in part by responding more quickly than its competitors to new technology, announced that it will offer an internal version of Iomega's Zip drive as an option on its Power 80, 100, and 110 computers. The Zip removable-storage drive, priced at less than $200, utilizes 100-MB cartridges that retail for less than $20 apiece — a far lower cost per megabyte than that of competing SyQuest and magneto-optical cartridges. Unlike external Zip drives, which offer users a choice between only two SCSI-ID addresses (5 or 6), the internal Zip drive will enable users to select from a full range of SCSI-IDs.

In other news, Power Computing is reportedly close to announcing OEM agreements with three foreign computer manufacturers: Olivetti, Acorn, and Goldstar. The three companies will acquire motherboards from Power, but the computer systems they build will not be available in the United States. Olivetti will focus its sales in Europe, Acorn in the U.K. education market, and Goldstar in Korea and other Far East countries. Olivetti is a major investor in Power Computing. / Henry Bortman

WorldWrite Offers International Appeal

New writing tool tackles languages, layout.

CHALLENGING NISUS WRITER'S popularity with international users while appealing to Mac users who are short on RAM or disk space is WorldSoft's WorldWrite 3.0, a word processor built in the Middle East,

sold in Europe and Asia, and coming to U.S. shores this summer.

International Appeal. Considering its globe-trotting background, WorldWrite's strongest suit is probably its support for international languages. It supports left-to-right, right-to-left, and top-to-bottom writing formats as well as Mac-supported character sets such as Hebrew, Arabic, and Chinese. Multiple writing formats and character sets can even be used in the same document.

Svelte and Speedy. It might seem somewhat *zaftig* in 1985 terms, but WorldWrite is a lightweight compared to today's word processors: The application itself takes up less than 2 MB and requires less than 2 MB of RAM. WorldWrite runs PowerPC-native and supports just about every Apple technology we can think of: Macintosh Drag and Drop, PowerTalk, PlainTalk text-to-speech, QuickDraw GX printing (with full GX support in the works for a future version), and a completely Apple Guide-based help system.

Page-Layout Power. Beneath a sleek interface reminiscent of WordPerfect (with a dash of Nisus Writer), WorldWrite offers some powerful page-layout tools by dividing its pages into a text layer and a graphics layer. Just as in any other word processor, the text layer is home to the main text. Users are able to specify multiple balanced or unbalanced columns of text on a page. In the graphics layer, users can place and manipulate graphic objects and text blocks and can set text wraps that affect text in the text layer. Roman languages only, $149; with dongle for non-Roman-language support, $199. 800-225-9299 or 408-867-6757. / Jason Snell
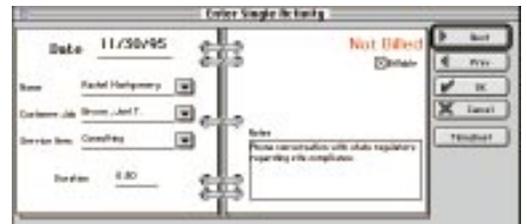
QuickBooks Pro Does Time

FIRST WITH QUICKEN, Intuit revolutionized personal financial management; then it tackled small-business accounting with QuickBooks. But QuickBooks doesn't address the needs of those whose work is project-, job-, or time-based, such as contractors, consultants, designers, and the like. Now with QuickBooks Pro, Intuit provides a package for those who need to track time and money.

QuickBooks Pro integrates tasks critical to small businesses: job estimating, time tracking, expense tracking, project costing, payroll processing, invoicing, and accounting. Once information is entered for a client or subcontractor, it is linked to other functions and instantly available. For example, you can track hours on weekly time sheets or individual job slips, note which hours will be billed to the customer or the contractor, compare hours worked against hours estimated, attach actual hours worked to a specific task for future jobs, and preview the hourly breakdown for each employee before printing paychecks. In each instance, 11 customizable project reports let you monitor the profitability of any job or activity.

QuickBooks Pro borrows the QuickFill function from Quicken, so entering information is a snap: Type a few letters in the customer field, and all pertinent information fills in automatically. QuickBooks Pro accepts data from both Quicken and QuickBooks. $189; $50 rebate for Quicken and QuickBooks owners. 800-624-8742 or 415-322-0573. / Pamela Pfiffner

Keeping Tabs on Copland

CODE-NAMED COPLAND, version 8 of Apple's Mac OS features lots of productivity-enhancing features, such as tabbed windows. While we're waiting for Copland, this month's utility, ZMac's TabMania, gives you a taste of what's in store for the Mac OS future. TabMania allows you to shrink your open windows to handy tabs with a single click. The tabs obediently line up along the edge of your screen, keeping windows out of the way, but stay in the foreground for easy access. Each window's title appears on its respective tab, making digging through the desktop a snap.

Created by John Wallace, ZMac's TabMania is available exclusively from the ZiffNet/Mac service on CompuServe (GO ZMC:MACUSER), ZiffNet Selections on AppleLink, and ZiffNet/Mac services on eWorld (Shortcut: MacUser) as of July 25. / Scott Love

IQ Test

YOU DON'T KNOW JACK. That's not just an insult — it's also the name of Berkeley Systems' new game show on CD-ROM, due this October. Featuring a digital-

audio sound track with original music, sound effects, and narration from a smarmy host, this disc takes three players into a sort of Trivial Pursuit from Hell, featuring categories such as "The Sociological Implications of Scooby Doo." If you think *Jeopardy!* is hard, You Don't . . . well, you know. $30. 510-549-2300. / JS
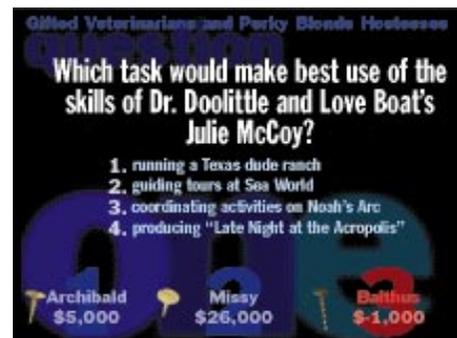
PCI Display Cards Arrive

ATI and Radius deliver high resolutions.

PCI POWER MACS ARE HERE, and it's time to start filling those slots. ATI and Radius are ready with display cards that drive monitors at resolutions of up to 1,600 x 1,200 pixels.

Xclaim GA. ATI, well known in PC circles, is entering the Power Mac market with its first display card, the Xclaim GA. This card is similar to its cousin in the PC world but tailored for the Macintosh.

The card comes with either 2 or 4 MB of VRAM (the 2-MB version is upgradable with a 2-MB VRAM module). The 4-MB version ($649) supports 24-bit color at a resolution of 1,152 x 870 pixels and 8-bit color at 1,600 x 1,200 pixels; the 2-MB version ($449) supports 24-bit color at 832 x 624 pixels.

The ATI Displays control panel lets users set a host of options, including Virtual Desktop and panning and zooming hot keys. The software also supports on-the-fly resolution and bit-depth switching. There is even Apple Guide support. 905-882-2600.

Thunder PCI. Radius is moving its entire line of Precision and Thunder graphics cards to the PCI bus. At the low end, Radius' new PrecisionColor 8/1600 ($599) sports the same features as ATI's 2-MB Xclaim GA. In fact, the feature list is nearly identical, including resolution and bit-depth switching, and hardware pan and zoom. Radius also includes ColorComposer software, for matching on-screen colors more accurately to printed output, and custom ASICs, for fast QuickDraw acceleration.

The Radius Thunder 30/1152 ($999) and 30/1600 ($1,499) cards offer the same software as the low-end PrecisionColor 8/1600 but support 24-bit color at resolutions of up to 1,152 x 870 pixels and 1,600 x 1,200 pixels, respectively. When used with a Radius ProSense Display Calibrator, the card also takes advantage of 10-bit-per-channel color for more accurate color display in all applications. With the optional ColorEngine daughterboard, your CMYK image display and Photoshop filters are accelerated with four 80-MHz DSPs.

For those who want it all, the ThunderColor 30/1152 ($1,999) and 30/1600 ($2,499) offer all the above software as well as the ColorEngine. Changes in Radius' accelerated Photoshop filters allow them to work in many applications that support the Photoshop filter standard. 408-541-6100.
/ Sean J. Safreed

COLOR PRINTERS /

Xerox, Tektronix Rev Lasers

SINCE APPLE HAS ENTERED the color-laser-printer ring (see New on the Menu, August '95, page 26), vendors are preparing second-generation printers that are more competitive with current offerings (see "The Color-Laser Promise," March '95, page 91).

Xerox XPrint Series. Building on its earlier 4900 Color Laser Printer ($6,100), Xerox has introduced the XPrint family of color laser printers.

The three new models — the Xerox XPrint 4915 ($6,895), the 4920 ($7,995), and the 4925 ($9,495) — have the same foundation as their predecessor. All three PostScript Level 2 printers are rated to print 3 ppm in color and 12 ppm in monochrome. All three print on letter- and legal-sized paper and have a 250-sheet internal paper bin (auxiliary 250- and 1,500-sheet bins are optional). All three feature Xerox Intelligent Color, which ensures better color printing of various graphic types.

The difference among the three is primarily in resolution and bells and whistles. The 4920 and 4925 each print true 600 x 600 dpi in color and monochrome; the 4915 prints 1,200 x 300 dpi in color and monochrome through software interpolation. The 4925 features an internal 340-MB hard drive that caches jobs for fast printing of collated document sets. PCL 5E emulation is an option on the 4920 and 4925.

The maximum RAM in all three units is 48 MB; the 4915 and 4920 ship with 16 MB, and the 4925 ships with 24 MB. LocalTalk, parallel, and serial interfaces are standard; Ethernet and token-ring options are also available. 800-349-3769 or 716-442-4028.

Tektronix Phaser 540 Plus. Tektronix has enhanced its Phaser 540 color laser printer by adding legal-sized-paper output. It has one of the fastest-rated engines on the color-laser market, with 4 ppm for color printing and 14 ppm for monochrome. The $8,995 printer offers a true resolution of 600 x 600 dpi for both color and monochrome output. It ships with 20 MB of RAM. Serial and parallel ports are standard; LocalTalk, Ethernet, and token ring are optional. 800-835-6100 or 503-682-7377. / PP
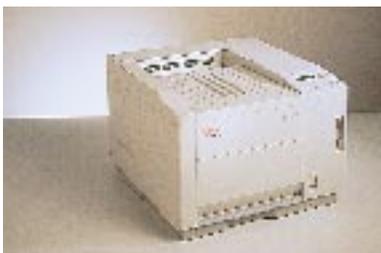
DRIVES /
Doin' the CD Shuffle

Pioneer's six-disc changer is fast, affordable.

AS CD-ROM LIBRARIES GROW, it gets tiring to shuffle discs in and out of single-disc drives. The latest vendor to tackle that problem is consumer-electronics giant Pioneer, with its DRM-624x CD-ROM changer.

Designed to provide fast playback of multimedia titles and quick access to reference and archival materials, this six-disc changer contains a 4.4x mechanism with impressive specs: a data-transfer rate of 676K per second; an access time of 150 milliseconds; and an average seek time of 110 milliseconds. Pioneer says that the drive switches discs in about five seconds.

Like most other changers on the market (an exception being those based on the tray-loading Nakamichi CD-ROM mechanism), the DRM-624x uses a multidisc magazine into which you load the discs before inserting it into the drive. The drive reads most CD formats, including audio CD, and has an audio-out jack for headphones.

But unlike most CD-ROM drives, in which the lens is positioned at the bottom of the drive, the DRM-624x has its optical head mounted at the top. This positioning reduces the risk of dust settling on the lens when discs are changed, but the upshot is that you must insert discs into the magazine upside down. The magazine can be locked inside the drive to deter theft.

Priced at $795, the changer ships with a magazine, cables, and software drivers for Windows and DOS machines as well as Macs. 800-444-6784 or 310-952-2111.
/ Pamela Pfiffner

COLOR PRINTERS /
HP Inkjet Targets Office Workers

COLOR LASER PRINTERS may be the hot new thing for corporate types, but Hewlett-Packard bolsters the case for color inkjet printers in the office with its new DeskJet 1600CM, a fast, networkable PostScript Level 2 printer. Its $2,479 price tag means corporate buyers can purchase several without breaking the budget.

The DeskJet 1600CM is a beefed-up revision of Hewlett-Packard's earlier 1200C/PS model. With reformulated black ink and revamped print heads, the 1600CM offers monochrome printing at 600 x 600 dpi, as opposed to the 300 x 300 dpi of the 1200C/PS. Color printing remains at 300 x 300 dpi.

Geared for small workgroups, the 1600CM comes equipped with a bidirectional parallel port as well as Hewlett-Packard's JetDirect card for LocalTalk and Ethernet. And to help boost office productivity, it can print monochrome pages at speeds up to 9 ppm and color pages up to 2 ppm. Printing transparencies takes two minutes per page. Monthly output is rated at 12,000 pages. The printer comes standard with

6 MB of RAM, upgradable to 70 MB.

For more-efficient ink usage, the 1600CM uses separate cartridges for each ink color. The printer detects when cartridges run dry, alerts you to which one is empty, and shuts off if not replenished. The printer's heating unit dries pages without buckling the paper.

The 1600CM accepts 150 letter- or legal-sized sheets of paper, and a 500-sheet feeder is optional. Envelopes need to be fed manually.

Finally, the 1600CM has most of the standard features you'd expect from an HP printer, such as EconoFast, for fast, low-ink printing; Color-Smart, for better printing of color graphics; and Resolution Enhancement technology (REt), for improved edge definition of text and line art. 800-752-0900. / PP

CD-ROMS /
Virtual Vestibules

ISN'T TECHNOLOGY GRAND? For desk jockeys everywhere, these new CD-ROMs open gateways to ancient lands, new spiritual planes, and perhaps your own backyard.

Passage to Egypt. It tackled ancient history with its award-winning Cartoon History of the Universe. Now Human Code sets out to travel 4,000 miles (and 5,000 years of history) along the world's longest river in its newest CD-ROM, Nile: Passage to Egypt. Commissioned by the Discovery Channel, Passage to Egypt lets you explore regions along the Nile with 360-degree views and original material on the culture, writings, and music of this intriguing land. $50. 800-762-2189 or 317-579-0400.

Eastern Minds. Sick of shoot-'em-up games? Try a game in which death (and multiple reincarnation) is the key to victory and enlightenment. Developed by Osamu Sato and distributed by Sony Imagesoft, Eastern Minds: The Lost Souls of Tong Nou is an introduction to Eastern metaphysical culture and a multimedia experience rolled into one. As Rin, the main character, you awaken one morning to discover that your soul is missing. To recover it, you must embark on a journey that entails gathering useful items, interacting with animated creatures, and being reincarnated nine times. Beats death by laser gun. $40. 800-922-7669 or 818-587-6029.

TOPO! San Francisco Bay Area. The weather's fine, so put down that remote and head out for the great outdoors. Wildflower Productions' TOPO! is a mapping program specifically for outdoor enthusiasts. Using U.S. Geological Survey topographical maps, you can chart a course, generate an elevation profile for your route, and make a printout to take with you. The San Francisco Bay Area version is available now, with other regions — including Yosemite, Los Angeles, Seattle, and other U.S. National Parks — to follow later this year. $99. 415-282-9112.
/ Kristin Balleisen

NEW & NOTABLE

HARDWARE /

Microfield SoftBoard 205. An electronic whiteboard that allows users to store and play back pen strokes on a Mac, SoftBoard's latest iteration is small enough (39 inches high and 40.5 inches wide) and light enough (35 pounds) to be used in cubicles and conference rooms. Special dry-erase markers and software are included. $2,795. 503-626-9393.

❋ **Xanté LaserPress 1800.** Offering 1,800-x-1,800-dpi printing on letter- and legal-sized paper and 1,800 x 900 dpi on paper up to 12 x 19 inches, this printer comes with 48 MB of RAM, upgradable to 128 MB. Powered by a 33-MHz RISC processor, the LaserPress 1800 offers simultaneously active serial, parallel, and LocalTalk ports, with Ethernet ($395) available as an option. $8,495. 334-476-8189.

Tektronix Phaser 480X. Featuring color-correction software and Adobe PostScript Level 2, this dye-sublimation printer is targeted at the digital-proofing market. In addition to 32 MB of RAM (expandable to 112 MB) and support for full-bleed tabloid printing, the printer includes Tektronix's PhaserMatch software, which allows the creation of custom color profiles. $14,995. 800-835-6100 or 503-682-7377.

Panasonic PanaMedia Monitors. Stereo speakers are integrated into the front of these 17-inch ($999) and 15-inch ($599) monitors, which also feature a built-in unidirectional microphone, two headphone jacks, and a microphone input. Both offer a resolution of 1,280 x 1,024 pixels. 800-742-8086 or 201-348-7000.

Proxima Desktop Projector 5100. Sporting a 250-watt metal-halide lamp, 24-bit-color capability, and a 1.6:1 zoom lens, this LCD projector weighs in at 23 pounds. In addition to having Mac and PC inputs, it can display NTSC and PAL video and features a backlit remote control. $9,495. 619-457-5500.

SOFTWARE /

Eudora Pro 2.1. The popular Internet e-mail application receives a face-lift and gets targeted at home users with Eudora Pro. Based on Eudora 2.1.2, Eudora Pro also includes the Spellswell 7 spelling checker, integrated SLIP and PPP clients, and an automated signup offer with a national Internet service provider. $89. Qualcomm. 800-238-3672 or 619-658-1291.

MacDesign Billing 2.5. Publishing and graphics professionals are the targets of this cross-platform invoicing and billing package, which features estimate and invoice templates, an automatic statement generator, an accounts-receivable module, and a client-contact database. $399. Desktop Graphics Services. 800-378-3000 or 310-391-5275.

Science Fiction Multimedia Encyclopedia. Based on the award-winning book, this multimedia CD-ROM contains entries on SF writers, artists, films, TV series, magazines, and more. $60. Grolier Electronic Publishing. 800-285-4534 or 203-797-3500.

Animated Greetings. Making trips to your Mac instead of the Hallmark store may be in the cards for users of this CD-ROM, which lets you create personalized greetings and deliver them on a diskette or via e-mail. The first collection contains birthday graphics and templates, but future editions will cover all the big occasions. $40. Software Affiliates. 818-385-3710.

VPick. Is it an air guitar, or is it an input device? VPick is a 2-inch-long guitar pick that lets you play along with any of Ahead's music CD-ROMs, including its Quest for Fame disc ($60), featuring Aerosmith. Attach the VPick to your serial port and use any object (say, a tennis racket) as an ersatz guitar, and you're ready to rock. $15. Ahead. 617-271-0900.

4-Sight Fax LS-30. Workgroups of up to 30 people can send and receive faxes via one phone line with this cross-platform package. Users can send faxes via the Print command, with a drag-and-drop operation, or through their office e-mail system. The package includes a 19.2-kbps modem. $999; Windows client package, $495; Flex Router, for automatic routing of incoming faxes, $1,690. 4-Sight. 515-221-3000.

❋ **How Animals Move.** Swinging monkeys, lumbering elephants, and fluttering butterflies are all part of this multimedia CD-ROM, which explores the nature of movement in the animal world. Edited by an authority on biomechanics, this disc also includes 16 original games. $50. Discovery Channel Multimedia. 800-762-2189 or 317-579-0400.

Special Delivery 2.1. This graphical multimedia-authoring tool now offers a number of new transition effects, the ability to create a sound track that runs throughout a presentation, and the ability to have active regions of the screen highlight automatically. $399. Interactive Media. 415-948-0745.

MACINTOSH PRICE INDEX

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

Mac Model	New	Used
SE/30 (5/40)	•	$525
Classic II (4/40)	•	$425
Color Classic (4/80)	•	$700
LC III (4/80)	•	$450
Performa 475 (4/160)	•	$850
Performa 550 CD (5/160)	•	$800
Performa 575 CD (5/250)	•	$1,100
IIsi (5/40)	•	$375
IIci (5/80)	•	$650
IIfx (8/160)	•	$800
Quadra 605 (4/80)	•	$575
Quadra 610 (8/160)	•	$800
Quadra 630 (4/250)	•	$800
Quadra 650 (8/230)	•	$1,800
Quadra 660 Av **CD** (8/230)	•	$1,175
Quadra 700 (8/230)	•	$1,200
Quadra 800 (8/230)	•	$1,875
Quadra 840 Av **CD** (8/230)	•	$2,300
Quadra 900 (8/230)	•	$1,600
Quadra 950 (8/230)	•	$2,150
Power Mac 6100/60 (8/250)	•	$1,075
Power Mac 6100/66 CD (8/350)	$1,799	$1,550
Power Mac 7100/66 (8/250)	•	$1,750
Power Mac 7100/80 CD (8/700)	$3,049	$2,600
Power Mac 8100/80 (8/250)	•	$2,700
Power Mac 8100/100 CD (16/1GB)	$4,399	$3,800
Power Mac 8100/110 CD (16/2GB)	$5,799	$4,500
PowerBook 145B (4/80)	•	$750
PowerBook 150 (4/120)	$999	$800
PowerBook 165 (4/80)	•	$1,150
PowerBook 165c (4/80)	•	$1,200
PowerBook 170 (4/40)	•	$1,075
PowerBook 180 (4/80)	•	$1,500
PowerBook 180c (4/80)	•	$1,700
PowerBook 520 (4/160)	$1,499	$1,300
PowerBook 520c (4/160)	$1,999	$1,700
PowerBook 540 (4/240)	•	$1,800
PowerBook 540c (4/320)	$3,699	$3,100
Duo 250 (4/200)	•	$1,475
Duo 270c (4/240)	•	$1,800
Duo 280 (12/240)	•	$2,050
Duo 280c (4/320)	$3,499	$2,900

• = 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.

Apple Color LaserWriter 12/600PS / Apple's new printer heats up the color-laser race.

PRINTERS FROM APPLE have long been known for their ease of setup, simple controls, and fuss-free maintenance. The long-awaited Apple Color LaserWriter 12/600PS — Apple's first foray into the color-laser-printer arena — is no exception. It not only boasts the easiest setup and maintenance of any color laser printer we've seen to date but it also has an aggressive (about $6,500) price tag that undercuts competing printers by several thousand dollars. Moreover, the Color LaserWriter produces such excellent-quality output that it can do double duty as both a color and a no-compromise mono-chrome printer.

The only color laser printer we've tested so far that's genuinely comparable to the Color LaserWriter is the considerably more expensive $8,995 Tektronix Phaser 540 (see review, May '95, page 48). The Phaser 540 has a slight edge over the Color LaserWriter in terms of speed, but Apple's offering wins for ease of use and offers print quality that is as good or even slightly better. Other desktop color laser printers currently available from Hewlett-Packard, QMS, and Xerox simply don't come close to Apple's offering in terms of print quality, simplicity, or all-around flexibility.

Apple's new printer is clearly built for handling the demands of busy offices. It has a rated engine speed of 12 ppm for mono-chrome, 3 ppm for two or more colors, and 1 ppm for transparencies. Actual print times, of course, depend on the contents of the page. The printer has no monthly page limit, but the fuser assembly should be replaced after 60,000 pages. Toner cartridges are rated for approximately 4,000 pages. The photoconductor cartridge has a rated lifespan of 40,000 pages, and each bottle of fuser oil is good for about 10,000 pages.

Although most color laser printers offer several print resolutions — which can make things more complicated than they need to be — the Color LaserWriter is strictly a one-resolution 600-x-600-dpi unit. Apple's Color PhotoGrade resolution-enhancement technology provides the equivalent of a 200-lpi halftone screen with 122 possible gray levels for each color. There are no options to set: Unlike Apple's mono-chrome laser printers equipped with Photo-Grade, the Color LaserWriter offers only one screen frequency and no resolution choices. You can, of course, override the default screen by using PostScript-savvy applications that let you set specific screen frequencies, but since the default produces such good-looking results, you'll probably never want to change it.

The printer engine is driven by an Adobe PostScript Level 2 interpreter running on an AMD Am29030 30-MHz RISC processor. The printer comes standard with 12 MB of RAM, which can be expanded to as much as 40 MB by using standard 72-pin SIMMs. Unlike other color laser printers, the Color LaserWriter does not require RAM expansion to achieve full 600-dpi color printing. An Apple-proprietary data-compression scheme allows it to utilize the full image area — that's up to 7.8 x 13.3 inches on legal-sized paper — by using only 12 MB of RAM. Extra RAM does increase the Color LaserWriter's processing speed, however. The unit we tested had 28 MB of RAM.

For networking, the printer comes with built-in LocalTalk, parallel, and Ethernet ports. The Ethernet port supports the EtherTalk, Novell NetWare, and TCP/IP protocols. All ports and protocols are active simultaneously and have automatic switching. A PowerBook-type SCSI port lets you attach an external hard drive for font storage. The printer's ROM contains 39 Type 1 Adobe fonts.

The Color LaserWriter's Canon engine sets a new standard for simplicity of consumables replacement. Setup took less than half an hour — the most difficult part

REVIEWS RATING KEY	
⭘⭘⭘⭘⭘	OUTSTANDING
⭘⭘⭘⭘	VERY GOOD
⭘⭘⭘	ACCEPTABLE
⭘⭘	POOR
⭘	SERIOUSLY FLAWED
✳	DANGEROUS

Win, Place, Show / Apple's new color laser printer holds its own in print speed

	25-page Word document (text)	1-page Word document (graphics and text)	10 copies of Word document (graphics and text)	1-page Illustrator document	1-page Photoshop document
	SLOWER	SLOWER	SLOWER	SLOWER	SLOWER
Apple Color LaserWriter 12/600PS (600 x 600 dpi)	3:14	1:37	3:56	5:33	8:35
Tektronix Phaser 540 (300 x 300 dpi)	2:25	0:47	3:27	2:25	8:40
Tektronix Phaser 540 (600 x 300 dpi)	4:10	1:19	6:16	3:26	9:37
Tektronix Phaser 540 (600 x 600 dpi)	7:33	1:21	6:17	3:53	10:26
	0 4 8	0 1 2	0 3 6	0 3 6	0 5 10
	TIME IN MINUTES	TIME IN MINUTES	TIME IN MINUTES	TIME IN MINUTES	TIME IN MINUTES

was wrestling the 110-pound unit out of the box and onto the desktop, definitely a two-person task. The printer has a fairly large footprint, measuring 18 x 21 x 23 inches, so a large, sturdy surface is essential.

Initial setup requires the removal of a shipping screw and two spacers and the installation of the following items: the fuser-oil bottle (a dripless, hamster-feeder type of device); the photoconductor cartridge, which comes packaged on a guide that helps you slip it easily into place; the waste-toner bottle (which has a cap for clean disposal); and the four toner cartridges — one each for cyan, magenta, yellow, and black. The toner cartridges are installed in a carousel with each cartridge mechanically keyed so it's impossible to load one in the incorrect slot. Loading paper in the paper tray is the final step. Once you've turned the printer on and printed a startup page, you're ready to attach the printer to your network and load the software.

The Color LaserWriter ships with the new LaserWriter 8.3 driver, which provides two noteworthy capabilities — the convenience of Apple's Desktop Printing (which doesn't require the use of QuickDraw GX) and support for ColorSync 2.0, Apple's new industrial-strength color-management system.

With Desktop Printing, once you've set up a printer in the Chooser, it's represented by an icon on your desktop — to print a document, you simply drag it to the icon. For color management, a device profile for the Color LaserWriter is installed with Color-Sync 2.0. To use ColorSync's screen-to-print color matching, you set the System Profile for your monitor and then choose Color-Sync from the color-matching options in the Print Options dialog box. We found Color-Sync much easier to use than the various color-management options offered by Tektronix for the Phaser 540. It's also much

faster than competing color-management systems such as EfiColor. Essentially, you set it once and you're done. The final component of the software is the new Laser-Writer Utility, which lets you rename the printer and configure various aspects of its behavior, such as paper-handling settings.

We found the Color LaserWriter's print quality to be excellent for color images *and* black-and-white text. Type is rendered sharply, even at very small sizes, and colors are extremely accurate and consistent. In our speed tests, the Color LaserWriter was in the upper echelons of color-printing speed. It's also a very respectably paced monochrome device. The 600-x-600-dpi Color LaserWriter proved somewhat slower than the Tektronix Phaser 540 set at 300 x 300 dpi, but when we upped the Phaser 540's resolution to 600 x 600 dpi, the Apple printer was faster for some tasks. The Phaser 540's faster processor, however, gave it the edge for printing our complex Adobe Illustrator document.

The Color LaserWriter is a true standout for ease of use. A front panel displays warnings when any of the consumables are running low — there are separate warning lights for paper, fuser oil, photoconductor assembly, and each toner cartridge. Other warnings show you which doors to open to clear paper jams — or so we were told. We didn't experience a single one.

At printing time, the only unusual options to select are color matching and print-quality mode. The color-matching options are None, ColorSync Color Matching, and PostScript Color Matching. For the last two, you also need to choose the printer's ColorSync profile. The difference between ColorSync and PostScript Color Matching is that the Mac does the work when ColorSync is selected and the printer does the work when PostScript is selected. The results

seem identical in either case. With a reasonably fast Mac, it's unlikely that you'll be able to detect a significant speed difference between the two, but with older Macs, the PostScript option should be a little faster.

For print quality, you have to choose between Normal/Faster and Better/Slower. We found this is a bit misleading — you need very keen eyes indeed to see any differences in quality and a stopwatch to detect differences in speed. Unless you're in an extreme hurry (or you're running benchmarks), we suggest leaving the printer permanently in the Better/Slower mode.

The Bottom Line

The Apple Color LaserWriter 12/600PS has all the features you'd expect from an Apple printer: It boasts excellent print quality and extremely simple setup and operation. What *is* different is the cost — the Color LaserWriter is priced much more aggressively than Apple printers have been in the past.

Fast and simple enough for general business use but with good enough print quality to satisfy graphics professionals, the Color LaserWriter sets a new standard for fast, accurate, and affordable color printing. In short, it may be the only printer you need.
/ Bruce Fraser

Apple Color LaserWriter 12/600PS ○○○○✳

Price: $6,500 (estimated street).

Pros: Excellent print quality. Solid speed. Aggressive price. Convenient setup. Easy to use. Good color-management features.

Cons: Unnecessarily confusing print-quality options.

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

Reader Service: Circle #401.

PowerSecretary 2.0 Power Edition
Voice-recognition technology is alive and well in Articulate Systems' new offering.

THIS IS THE FIRST review ever to appear in *MacUser* without being written. We didn't type it on a keyboard, nor did we scrawl it out on a Newton or a MacHandwriter tablet. We dictated it into a Power Mac 8100/80 by using PowerSecretary 2.0 Power Edition, Articulate Systems' new speech-recognition software package.

Voice-recognition products have always generated special excitement among computer users, especially those who need hands-free input. It's hard not to be intrigued by the thought of our machines working with us on a more human level. In the past, products such as Apple's PlainTalk and Articulate's Voice Navigator turned out to be busts when real people tried to do real work with them. But what makes Power-Secretary unique is that it actually works. It's certainly not for everyone, not even the average technology enthusiast. It's expensive and requires enormous computing resources and hours of repetitive training before it reaches a usable level of accuracy. But if you can learn to speak a little bit like a robot — by pausing between each word or phrase — and if you can afford the hardware it requires, you can type — slowly — using only your voice.

The PowerSecretary package consists of

If PowerSecretary misunderstands you, you can easily correct it in one of several ways, including verbally spelling out the word you want until the program finds it in its 120,000-word dictionary.

an application; a headset microphone; a small preamp that plugs in to your Mac's sound-in port; and several extensions, including AppleScript and a full copy of CE Software's QuicKeys.

The program has a 120,000-word dictionary and uses an active vocabulary of 30,000 to 60,000 words, depending on how large the user's own active verbal vocabulary is. Each word is mapped to your pronunciation. You don't have to train Power-Secretary for your pronunciation on each and every active word: Once you've recited a few hundred commonly used and acoustically problematic words three times each, it uses what it's learned about your pronunciation to recognize other spoken words. And it keeps learning and becomes more accurate as you use it — provided you correct it when it makes mistakes. To have it recognize your speech properly, you must pause briefly — very briefly — between words or short phrases.

PowerSecretary is usually sold through value-added resellers who set up the system for you and teach you how to use it, but we got started on our own without much trouble. The manual is well organized and clearly written, and there's an introductory videotape that's helpful as well. Once you've finished the ten-floppy installation, initial training takes about an hour. Then comes the hard part: As you dictate text for the next several hours of use, PowerSecretary will constantly make mistakes. Because by default it learns continuously from each word you speak, you have to correct each mistake immediately or the wrong word will forever be mapped incorrectly in PowerSecretary's phonetic model of your voice. Once you've built up a comprehensive model of your voice, however, you can change Power-Secretary's Preference settings so that updates occur only when you make corrections — so you can ignore mistakes or defer corrections until it's convenient.

Fortunately, correcting PowerSecretary when it makes a mistake is easy. When an incorrect word appears on the screen, you can simply say, "Scratch that" or "Scratch

word," and pronounce the word again. Or you can say, "Correct word," and Power-Secretary will present you with a numbered list of alternative words. For example, if the word you want to use is No. 3 in the list, simply say, "Choose 3," and after a momentary pause, it will be entered automatically. If the word you want doesn't appear in the list, you can add it by either typing the desired word's first few letters or by telling the program to go into spell mode and spelling the first few letters out loud, using the International Communications Alphabet ("alpha" for A, "bravo" for B, "charlie" for C, and so on). With each letter, the list is updated and narrows in on the word you want. In our tests, the correct word typically appeared either immediately or after we'd entered just two or three letters. You can also add words that aren't in the dictionary, and you can teach the program to specifically ignore nonverbal sounds such as sneezes and throat clearing.

Articulate claims that most users can enter about 25 words per minute after initial training and can get up to 55 words per minute after using PowerSecretary for 6 to 8 hours. We didn't do that well but have achieved rates of up to 40 words per minute after about 20 hours of use, and we're still improving.

We encountered only one persistent problem: Several times, the phonetic information for a critical command such as "scratch that" became corrupted, making the command unreliable. Retraining that command helped, but in the meantime, PowerSecretary mapped a few words to our voice incorrectly. And short of erasing your entire phonetic model and retraining PowerSecretary from the start, there's currently no way to tell PowerSecretary to forget what it thinks it knows about an individual word and your pronunciation of it.

In addition to entering text into an application word by word, you can also train PowerSecretary to output — in one operation — entire phrases, technical terms, or even large chunks of boilerplate, and you can have it execute commands or launch macros that automate normally time-consuming tasks. The program has built-in verbal commands you can use to indent text and capitalize words, and you can use Quic-Keys and AppleScript to create commands or launch programs. Articulate provides

more than 100 predefined AppleScript scripts for basic editing and formatting functions.

The edition we reviewed, the $2,495 PowerSecretary 2.0 Power Edition, runs in almost any application that uses text, with the notable exception of Microsoft Word. (This is due to limitations Microsoft is currently working to correct.) Articulate also offers a $995 WordPerfect Edition, which works only in WordPerfect 3.1, and a $3,000 Med Edition for health-care professionals.

Whichever edition you buy, you'll need a Power Mac, an AV Quadra, or — if you buy a special preamp that costs $150 extra — a PowerBook 540c. You can also run the software on other 68040 Macs if you have a PowerPC accelerator and a 16-bit-sound card that's compatible with PowerSecretary. The program requires a minimum of 13 MB of free RAM and prefers more. Since you need to run system software and at least one application as well, we recommend that you have at least 24 to 32 MB of RAM.

The Bottom Line

PowerSecretary isn't fast or accurate enough to keep up with even a half-decent typist. Furthermore, it requires much greater system resources and hardware than the average user has, and it requires diligent, thorough training. The program makes sense, however, for people who can't use a keyboard, whether it's because of a disability or a repetitive-strain injury. It can also be useful for laboratory scientists and health-care professionals who need to use their hands for other things while recording data. If you're in one of those categories and can afford the program's price in dollars, hardware, and training time, Power-Secretary was made for you. / Henry Norr

---

PowerSecretary 2.0 Power Edition ○○○✳

Price: $2,495 (list).

Pros: Transcribes voice dictation into almost any Mac application. Large and expandable vocabulary. Can operate solely with verbal input.

Cons: Expensive. High system requirements. No Untrain command. Doesn't work with Microsoft Word.

Company: Articulate Systems, Woburn, MA; 800-443-7077 or 617-935-5656.

Reader Service: Circle #402.

Apple QuickTake 150 / Apple gets the picture with take 2 of its digital camera.

DUBBED AS INNOVATIVE yet impractical, the first Apple QuickTake 24-bit-color digital camera fell somewhat short of the mark. The latest incarnation, the QuickTake 150, addresses two of the biggest gripes about the original product. The new camera can store 16 high-quality images — twice as many as before — and it comes with a close-up lens.

The QuickTake 150 is the digital equivalent of a point-and-shoot camera — it does the work of selecting shutter speed and aperture (f2.8 to f16) and focuses images for you. But the advantage of the QuickTake 150 over traditional cameras is that you have direct computer access to your photos.

The pictures you take with the QuickTake 150 boast terrific color reproduction. Even flesh tones appear accurate. However, high-contrast areas can cause problems. When we photographed a white crosshatched gate against a dark background, for example, errant white and yellow pixels appeared where light colors met dark ones. These digital artifacts were present in many photos, but we generally had to look closely to find them. Given the camera's top shutter speed of 1/175, action shots are out.

You have several options for controlling image quality and size. We preferred working with high-quality images because they're not as compressed as standard-quality ones and are therefore sharper. However, if you want the camera to hold more than 16 pictures, you can opt for as many as 32 standard-quality images, which are more compressed. Or you can mix and match image quality and store between 16 and 32 images. High-quality and standard-quality images are 640 x 480 pixels in size.

The QuickTake 150's new plastic close-up-lens attachment lets you take pictures from a distance of 10 to 14 inches. The lens snaps easily into place over the front of the camera and remains firmly anchored even if you happen to jostle it.

The lens includes a flash diffuser, so close-up objects don't appear washed-out, as well as a special viewfinder, which adjusts the field of view so that it closely matches the resultant photo. Both items worked well. We wish Apple would make

A close-up lens and beefed-up capacity make the Apple QuickTake 150 digital camera a better buy than its predecessor.

a similarly designed telephoto lens.

Bundled with the QuickTake 150 is the Apple PhotoFlash 2.0 image-enhancing and -cataloging software (see review, May '95, page 51). PhotoFlash supports AppleScript, and Apple includes several ready-made scripts in the package, one of which automates the transfer of photos from the camera to your Mac — once you've connected the camera to the Mac's modem or printer port. You can transfer photos more quickly, however, with the included control panel, which mounts the camera on your Mac's desktop and allows you to simply copy the photos to your hard disk.

The Bottom Line

The Apple QuickTake 150 can't produce magazine-quality photos, but its images are tailor-made for real-estate flyers, ID badges, on-screen presentations, and newsletters. And now that the camera can hold more images than before, graphic artists may want to use it in place of the instant cameras they use for shooting placeholder pictures. / Shelley Cryan

---

Apple QuickTake 150 ○○○○

Price: $739 (estimated street).

Pros: Provides near-instant computer access to color photos. Quick and easy transfer of images to computer. Sturdy and reliable close-up lens.

Cons: No telephoto lens. Images contain some noise.

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

Reader Service: Circle #403.

Global Village TelePort Platinum V.34

High-speed fax modem is not only fast but upgradable too.

ZIP ALONG the information superhighway at speeds of up to 28,800 bps with the Global Village Teleport Platinum V.34 fax modem. The Teleport Platinum features flash memory, which means you won't be stranded along the side of the road as developers finalize the V.34 standard. Moreover, the modem's sound design and $279 price tag seem to put it on a par with the top-rated Supra SupraFAXModem 288 (Mac). However, the initial release of the TelePort Plati-

The Global Village TelePort Platinum V.34 fax modem packs a lot of speed and reliability into a compact design.

num loses points for its temperamental behavior when working with Apple Remote Access, and its indicators are nowhere near as good as the alphanumeric panel on the Supra modem, which among other things, lets you know the speed of your connection.

Small, Smart, and Simple

Only 6.5 inches deep, 3 inches wide, and 1.3 inches high, the TelePort Platinum is smaller than a paperback. If you don't have an internal PowerBook modem, you might want to tuck a TelePort Platinum in with your luggage.

The TelePort Platinum keeps you informed of its status, with three indicators: one for power, one for connection, and one for activity. Global Village also gives you software that displays additional information in your menu bar — a bandwidth meter, for example, indicates, on a general level, how much data is being transmitted. However, the SupraFAXModem 288 has an

alphanumeric speed and status display that we thought was more useful.

When we tested V.34 modems for our June '95 "Mach-Speed Modems" article (page 84), most worked poorly, if at all, with other manufacturers' modems. However, the TelePort Platinum had no trouble connecting — and staying connected — with a variety of other modem makes, including the U.S. Robotics V.34 modem and the SupraFAXModem 288. It also worked flawlessly with several kinds of fax machines.

To test its data-connection reliability, we used the TelePort Platinum to make 119 calls to another modem, over seven types of phone lines. It connected 97.7 percent of the time, putting it nearly on a par with the most reliable V.34 fax modems in our "Mach-Speed Modems" article. But the first time we tried to connect to an ARA server, the TelePort Platinum failed to make the connection and was erratic at making subsequent connections. In one case, it took three tries to establish an ARA link between two Macs that were each using a TelePort Platinum. At press time, Global Village had not identified the cause of the problem.

The TelePort Platinum is among the most responsive V.34-class modems we've tested. In our speed tests, it managed to transfer 3,430 characters per second under ideal telephone-line conditions. It averaged 3,253 characters per second under a variety of conditions, placing it squarely in the range of the fastest V.34 modems we've tested.

Software Connections

The TelePort Platinum comes with ZTerm, a shareware terminal emulator that supports the Zmodem protocol and that lets you connect to noncommercial electronic bulletin boards and some Internet services. If you want to start surfing the World Wide Web or automate, say, log-on procedures, you'll probably have to supplement ZTerm with a good commercial program such as Aladdin Systems' SITcomm or Software Ventures' MicroPhone II.

If you receive faxes on your Mac, it's pretty much a given that most of them will

not be digital files but will instead be digitized images from paper fed through a fax machine. If you'd like to be able to turn those files into searchable, editable text, you'll love Global Village's OCR program, which comes bundled with this fax modem. It works seamlessly with the modem and GlobalFax software (also bundled), which can put all the recognized text from a fax image into either a plain-text format or, if you prefer, one of several word-processor formats, including Microsoft Word, MacWrite, and WordPerfect. Its recognition rate was on a par with that of top OCR programs such as Xerox's TextBridge: It made no mistakes recognizing a test letter we sent from a fax machine in high-resolution mode.

The rest of the software that comes with the modem has all the standard features. You can define groups and send a fax to several people, and you can create envelopes for transmitting pages created in several applications. When you type in your area code, the modem can ignore that area code in phone numbers when dialing out, an option that is useful if you use a database to fax and connect to local as well as long-distance numbers.

The Bottom Line

The TelePort Platinum is fast and reliable enough to put it near the head of its class in consumer-grade V.34 modems. And when and if V.34 actually becomes a firm standard, you'll be able to upgrade the modem's flash memory quickly and easily. However, if you connect to an ARA server regularly or if you'd like to see thorough speed and status information while you're connected, you'll probably be happier with the SupraFAXModem. / Stephen Satchell and H. B. J. Clifford

---

Global Village TelePort Platinum V.34 ○○○✷

Price: $279 (list).

Pros: Inexpensive. Fast. Flash memory. Includes Zmodem and well-integrated OCR program.

Cons: Had some difficulty making connections using ARA. Indicators not as thorough as the alphanumeric panel on the Supra SupraFAXModem 288.

Company: Global Village, Sunnyvale, CA; 800-736-4821 or 408-523-1000.

Reader Service: Circle #404.

Symantec C++ 8.0 for Power Macintosh
Development environment teams speedy compilers with new project tools.

COMBINING SPEEDY PowerPC-native compilers with a state-of-the-art project-manager interface, Symantec C++ 8.0 for Power Macintosh represents a significant overhaul of Symantec's long-standing development environment. A host of new and improved tools further enhance Symantec's product, which regains its position as a strong contender in the Mac-developer-tools arena.

Project Management

Symantec C++ 8.0 for Power Macintosh provides C and C++ compilers for building Power Mac applications. Its fast compilers are PowerPC-native and are key to improving the speed of application development. But equally important are tools that streamline the development process itself. The new Symantec Project Manager (SPM) uses the same graphical project metaphor as its predecessor, THINK C, but the SPM's interface is more consistent throughout and boasts more productivity-enhancing features than THINK C's.

To separate source files, libraries, resource files, and the like, SPM lets you create hierarchical groups and display them as folders within a project window — a useful visual tool for providing an overview of your project. The folders work just like those in the Finder — by clicking on small arrows, you can expand folders to view the contents.

The SPM's support for AppleScript and nested projects offers obvious advantages for organizing and automating large-scale development projects. And support for Macintosh Drag and Drop makes it easy to arrange entries and groups within a single project or among many projects.

The new Editor supports syntax coloring as well as the ability to display keywords in different styles — italic or bold, for example. You can split the Editor window into multiple panes that can be scrolled independently, so you can easily refer back to work you've already done. The window also provides two handy pop-up menus: one that lists source-file functions and user-defined markers and one that lists headers.

If you're wedded to a text editor other than Symantec's, you're probably not out of luck: Symantec allows the use of any external editor that comes with built-in support for the SPM. Another noteworthy feature of the SPM is the Class Browser, which lets you navigate through object-oriented code simply by pointing and clicking.

If you've used the THINK C debugger, you'll feel right at home with the debugger in the new release, which debugs only PowerPC-native code. The debugger is hierarchical, like the Finder, so you can collapse and expand data structures quickly and easily. But you'll need lots of RAM — for source-code debugging, the debugger relies on information provided by the SPM, so you need to run both during debugging sessions.

The SPM also supports Apple's Tool-Server and SourceServer. ToolServer support allows developers to use Macintosh Programmer's Workshop tools from within the Symantec environment; SourceServer support provides source-code control.

Version 8.0 provides PowerPC compilers for C++ and ANSI C. The C++ compiler includes support for templates but not for exceptions. Version 8.0 also provides tools that allow the inclusion of XCOFF libraries and finished resource files in projects as well as a compiler for Apple's resource language, Rez. Both compilers are fast and provide support for precompiled headers, which gives them an additional speed boost. Furthermore, the compilers report all found errors in one pass rather than stopping at each error individually.

The compilers' speed is due largely to effective use of available memory. However, the flip side of this speed advantage is a voracious appetite for memory. To use Symantec's environment effectively requires a Power Mac with at least 16 MB of memory for small projects and at least 24 MB for medium-sized and large projects.

Because the SPM and its compilers run only on Power Macs and generate only PowerPC-native code, development of 680x0 code must be done in the THINK C 7 environment, which ships on the same CD-ROM as version 8.0. That puts developers who need to build both a Power Mac version and a 680x0 version of an application in the uncomfortable position of having to switch from one environment to another. Metrowerks CodeWarrior users have it somewhat easier, since the user interfaces of CodeWarrior's 680x0 and Power Mac environments are virtually identical. To Symantec's credit, however, the state-of-the-art SPM interface is an advantage over Code-
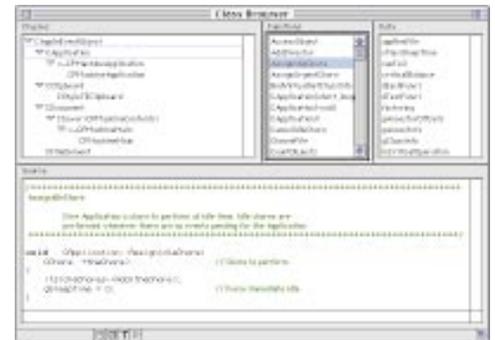
The Symantec Project Manager's Class Browser lets developers navigate through object-oriented code simply by pointing and clicking.

Warrior's interface, which closely resembles the timeworn THINK C environment.

The Bottom Line

Symantec C++ 8.0 for Power Macintosh is an excellent development environment for creating Power Mac applications. Its compilers are fast, and its well-designed project-manager interface is a boon for managing large projects. But be aware that Symantec's environment makes heavy demands on memory resources and that its new interface and modularity aren't currently available for development of 680x0 code. / Stephan Somogyi

---

Symantec C++ 8.0 for Power Macintosh ○○○○

Price: $499 (list).

Pros: Excellent project-management interface. Speedy compilers generate PowerPC-native code.

Cons: Requires hefty amount of memory. Power Mac and 680x0 environments have different interfaces.

Company: Symantec, Cupertino, CA; 800-441-7234 or 408-253-9600.

Reader Service: Circle #405.

Graphics Tools! / A multimedia-file browser that almost does it all.

KEEPING TRACK of all the files you need for multimedia production — graphics images, QuickTime movies, sound files, and text documents — is easier with a cataloger/browser. Graphics Tools! comes with the required basics, such as search capabilities, a low-end image-editing application, filters you can apply to cataloged images, and the ability to convert graphics files. However, its impractical screen-capture feature and appetite for RAM are frustrating.

The Visual Index

With Graphics Tools!, you create collections of files within a library. The program creates thumbnails of any files that are in a format it recognizes (text, QuickTime, sound, or almost any graphics format). When you double-click on a file, Graphics Tools! gives you a full-screen view of it (if it's a graphics image or text) or plays it (if it's a sound or a QuickTime movie). You can click on a variety of buttons in the command bar to add descriptions and find out where the source file is and what format it's in. The source files' media don't have to be mounted on the desktop to allow viewing of the files in Graphics Tools!. So among other things, using this program is a great way to catalog favorite images from CD-ROM graphics collections.

You can add items to your libraries in a variety of ways. If you select the Add Items command from the Collection submenu or click on the plus button in the command bar, Graphics Tools! presents you with an Open dialog box, where you find and select the image you want, from any volume mounted on your desktop. You can also cut, copy, or drag an image from one Graphics Tools! catalog and paste or drop it into another.

Although the ability to create an unlimited number of libraries — and collections within them — makes for a fabulous filing system if you're organized, the extensive search facilities of Graphics Tools! will come to the rescue if you're not. You can do a Boolean search, using as many as four criteria, to find files by name, location, file size, file type or creator, creation date, modification date, date added into a collection, library name, collection name, keywords, or a description you've added to the file. However, you can't select an image, such as a sand-and-sky shot, and ask Graphics Tools! to
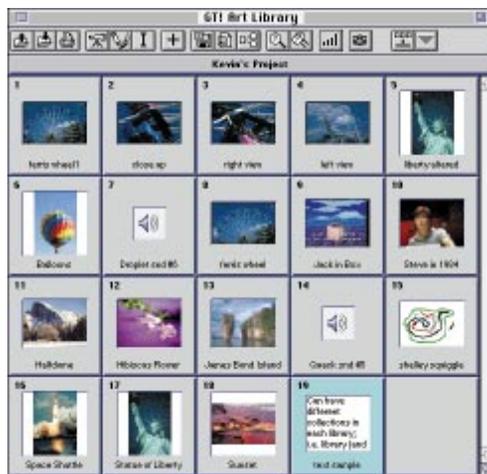
Whether your graphics images are TIFF or CGM, Graphics Tools! catalogs them for you, together with text, sounds, and QuickTime movies.

find all similar images — something Apple PhotoFlash 2.0 can do (see review, May '95, page 51).

The program comes with several Photoshop-compatible plug-in filters (including some samples from Kai's Power Tools), and you can apply them to several images at once. However, because Graphics Tools!, unlike PhotoFlash, doesn't have any direct support for scripting, it's not nearly as convenient for true batch processing as its competitor.

Instant Editing

Option–double-click on an item to edit it; Graphics Tools! will then launch either the application that created the item or an image-editing application you've selected as a default. For those who don't have an image-editing application, Microfrontier's Color It! — bundled with Graphics Tools! — will do the trick. It's a shame that the version of Color It! that comes with Graphics Tools! is outdated; you have to fork over an additional $50 for the current version.

Furthermore, running any RAM-hungry program, such as Adobe Photoshop or another high-end image-editing application, can be problematic if your Mac isn't packed with RAM. Graphics Tools! eats up 2 to 4 MB of RAM by itself and prefers more if you apply the plug-in filters to one of the cataloged images. Because System 7.x — which Graphics Tools! requires — can easily occupy 3 MB of RAM, you'll probably get frequent out-of-memory error messages if you run the program on a Mac that has 8 MB of RAM or less.

If you frequently exchange graphics files with DOS and Windows users, you'll be pleased with the variety of graphics formats (from TIFF, PICT, and Kodak Photo CD to EPS, CGM, WBM, and Targa) that Graphics Tools! recognizes and converts. In addition, it gives you JPEG, LZW, and Packbits graphics compression.

Graphics Tools! has a built-in screen-capture utility, but to use it, you have to have Graphics Tools! running. Consequently, you must remember to launch the program and have at least 2 MB of RAM free just to take a screen shot of your Finder window. Other capture utilities, such as Mainstay's Capture, are system extensions and are therefore less obtrusive and easier to set up and use.

The Bottom Line

Graphics Tools! is a terrific cataloger for a product in its price range; it features a great search engine and a complete image editor. We were disappointed, however, to find out that this image editor was outdated, and we frequently had to allocate 6 MB or more of RAM to Graphics Tools! to apply filters to a cataloged image. Furthermore, the screen-capture feature was so impractical that it was almost useless. / Shelley Cryan

---

Graphics Tools! 1.0.6 ○○○

Price: $169 (list).

Pros: Unlimited libraries and collections make it easy to organize files. Good search engine. Supports wide variety of Mac and Windows graphics file formats.

Cons: Outdated image editor. Impractical screen capture. RAM-hungry.

Company: DeltaPoint, Monterey, CA; 408-648-4000.

Reader Service: Circle #406.

Vision 3d 4.0 / Strata's modeling software gains Illustrator-style tools.

ILLUSTRATORS BRAVE ENOUGH to take the plunge into 3-D art have had to wrestle with complex software tools — until recently, that is. Today, several 3-D-modeling packages have begun to adopt the familiar look and feel of 2-D-illustration programs. One of the best is the latest version of Strata's Vision 3d, which now includes the Bézier-based 3d Sculpter as well as a new Boolean modeler and a new renderer.

Vision 3d 4.0 includes all the essential modeling features available in the previous version, plus the new 3d Sculpter, a feature of Vision 3d's more powerful and more expensive sibling, Studio Pro. 3d Sculpter lets you manipulate surfaces by using familiar Bézier control handles, making it easy to create smooth organic surfaces.

Vision 3d also boasts the same powerful Boolean modeler as Studio Pro does. To combine two or more 3-D objects, you use the Boolean modeler's Union, Intersection, and Subtraction operations, which work much like Adobe Illustrator's 2-D Pathfinder tools. The operations let you easily cut holes in surfaces or create complex sculpted objects such as a crystal-cut vase. The one drawback is that when you're performing the operations on multiple objects of the same shape, there's no way to distinguish one object from another in the object list and preview.

Although you can create similar effects with other programs by employing workarounds, you can't achieve the same shadow and surface quality as you can with Vision 3d's tools. In fact, no other program in this price range offers the quality and variety you get with Vision 3d's modeling tools.

But modeling tools are only part of the picture when it comes to producing good-looking 3-D images. You also need a top-notch renderer. Vision 3d 4.0 provides the same strong suite of quality rendering tools as the previous version, plus it includes a new resolution-independent renderer called RenderScript. The new renderer takes output from Vision 3d's Phong with Shadows renderer and creates Bézier regions that represent surface shading, including shadows and textures. The resulting file is in EPS format, so you can place it in any page-layout application and scale it.

But RenderScript has some limitations. You can't edit the EPS file after you've placed it in an Illustrator or FreeHand document. So, for example, you can't use Illustrator's Adjust Color tool to change the coloration of the file after rendering. Also, complex textures such as wood require lots of time and memory to render. All this is true for detailed surfaces as well. We recommend that you experiment with RenderScript before you decide to use it — it can produce good-looking images, but a bitmapped image with alpha channels may be just as useful.

Overall, we liked Vision 3d. The modeling tools produce excellent-quality 3-D images, the program is relatively easy to use, and the documentation is thorough and contains many examples. Compared to competing 3-D-modeling packages, Vision 3d holds its own. It provides better modeling tools than Ray Dream Designer 3.1, with the added plus of animation features, but keep in mind that Vision 3d costs about $400 more. The similarly priced Alias Sketch! 2.0 offers many of the same modeling features as Vision 3d, but it lacks true Boolean operations. Sketch!'s nonmodal modeling interface, however, is much easier to understand than Vision 3d's somewhat awkward modal one, particularly if you haven't worked with 3-D programs before.

The Bottom Line

Illustrators looking for a full-featured modeling and rendering package can't go wrong with Vision 3d. It offers robust modeling tools and excellent rendering, but like a brand-new pair of boots, it requires a little breaking in. / Sean J. Safreed

---

Vision 3d 4.0 ○○○○

Price: $695 (list).

Pros: Good modeling tools. Flexible, high-quality rendering options.

Cons: Modal interface. Large memory requirements for some operations.

Company: Strata, St. George, UT; 800-678-7282 or 801-628-5218.

Reader Service: Circle #407.

Pleiades Digital Storefront Pro / **Little voice-mail system packs a big sound.**

LOOKING FOR an inexpensive multiuser voice-mail system with call forwarding, fax-back capabilities, and good-quality 16-bit digital-audio playback and recording? Don't look any further than the $395 Digital Storefront Pro system. Although the software that comes with the Digital Storefront can't create the kinds of intricate nested hierarchies of announcements, call forwarding,

The Digital Storefront Pro's software makes it easy to set up a basic voice-mail system. The digital-audio announcements you store on your Mac's hard disk can each be as long as eight minutes.

and message handling that a corporate voice-mail system can, Pleiades' product offers more than enough features overall to allow small businesses to create professional-sounding voice-mail systems.

Vox Box

The hardware component of The Digital Storefront is a high-quality audio interface that connects to your analog phone and your Mac. Its software uses your Mac to play announcements and record incoming calls. You can set up various digital voice-mail boxes for yourself and your employees and also create voice-mail boxes to play back messages or reminders for important clients — traveling salespeople and the like. If callers have a touch-tone phone, they can dial their way into a basic hierarchy of three kinds of voice-mail boxes: standard mailboxes, which play and record messages; information mailboxes, which play messages but don't record; and fax-back mailboxes,

which use the bundled STF Technologies' FAXstf software to fax product literature and other types of documents to callers. You can access the system over an AppleTalk network, or you can dial in with a telephone and use the touch-tone buttons to manipulate messages and greetings. If you are using a PBX or a Centrex system, you can forward incoming calls to any other number.

Serial Shortage

Setting up the hardware is probably the most complex aspect of using The Digital Storefront. The box connects through one of your Mac's serial ports — a drawback if you already have a modem and a printer connected. The rather cheap-looking box and battery-operated Recoton HG535 speaker as well as the decent — but not first-rate — electret-condenser Sony ECM-F9 microphone give this sophisticated system an unfortunately low-rent look, so you almost certainly will want to slide them out of the way if you have clients visiting your office. Also, the cables supplied with the system are not quite long enough to let you move the box underneath a desk or into a closet but they are just long enough to look messy on a desktop. Figuring out how to fit the multiple hardware parts together can be confusing too.

Although the manual that comes with the system is rather spare, it is written clearly enough that setting up the software is relatively simple. The software engine, the Digital Storefront Manager, runs on the Mac connected to the Digital Storefront box. The manager plays the appropriate announcements for each selection a caller makes, records voice-mail messages and routes them to the appropriate voice-mail box, and faxes documents to callers as requested. The Digital Storefront Manager also lets you set the sound-output volume of your announcements and the number of phone rings callers will hear before the Digital Storefront box picks up the call. With this program, you can also set the quality you want to use for your digitized greetings and recordings: The better the quality, the better

the sound, but higher-quality messages require more hard-disk space. You can also set a maximum length for incoming messages. You can set up passwords for the system itself as well as for each of the voice-mail boxes.

Once you've set up your voice-mail system to allow callers to route their calls to selected employees or to access audio or faxed information, you can access the messages callers have left for you by using the Personal Digital Storefront access software. One of the great advantages of having this kind of voice-mail system on your Mac is that you can use it to see the voice-mail messages that have been recorded. You can search through them — before you listen to them — in a scrollable list that shows whether the message was recorded directly to your mailbox or forwarded to you; if the caller marked the message as urgent; the date the message was left; and who the message came from, if it came from another mailbox on your Digital Storefront system. You can also access your messages remotely by using any touch-tone phone.

The Bottom Line

If you own a small business, the Digital Storefront can give you an effective voice-mail system for a reasonable price. The 16-bit digital audio on your Mac sounds better than the relatively tinny audio of voice modems, which you use when you buy a software-only system such as Cypress Research's PhonePro. On the other hand, PhonePro does work with the Digital Storefront hardware, and if you need a more complex voice-mail system (with several nested hierarchies and multiple feedback options), you might opt to purchase PhonePro bundled with the Digital Storefront hardware. / Don Crabb

Pleiades Digital Storefront Pro 1.2.1 ○○○○

Price: $395 (list).

Pros: Easy-to-use, simple software. Digital-quality 16-bit audio. Fax-back capabilities.

Cons: Cheap-looking hardware components. Low-quality speaker and mediocre microphone. Connects through serial port.

Company: Pleiades Research, Los Angeles, CA; 800-737-8277 or 213-257-1710.

Reader Service: Circle #408.

APS DLT20 / Fast tape drive woos the digital-audio/video crowd.

DIGITAL-VIDEO and -audio pros measure files in gigabytes rather than megabytes. To transport those files to a postproduction studio, the pros have been stuck using fairly slow DAT (digital audiotape) drives. But APS has changed all that by delivering its innovative DLT20, a new kind of tape drive that's about four times as fast as a DAT drive. Its cartridges have almost three times the capacity of typical DAT cartridges.

The APS DLT20 uses 20-GB cartridges that cost $49.95 each. The drive is faster than other tape drives, because it writes multiple tracks simultaneously on tape that zips under the read/write heads at high speed. However, this technology makes the APS DLT20 inappropriate for network backup, which characteristically stops and starts as disk caches empty and refill. When you stop the DLT20, the tape continues streaming for a moment; when backup resumes after the pause, the DLT20 has to rewind to the point where it left off. This shuttling back and forth will prematurely wear out the drive, so you should use it to back up only very large contiguous files — such as QuickTime movies and soundtracks — that provide a fast, steady stream of data.

Using Dantz's Retrospect backup software, which is bundled with the DLT20, we backed up and restored a hard disk containing 918 MB of data. Eighteen of the ninety files were 30 MB or larger. The DLT20 drive completed the backup in 14 minutes, 54 seconds, achieving a transfer rate of 61.6 MB per minute; it took 15 minutes, 27 seconds to restore the data, achieving a transfer rate of 59.4 MB per minute. In contrast, backing up the disk to a DAT cartridge took an APS Turbo Python DAT drive 51 minutes, 14 seconds — a transfer rate of 17.9 MB per minute. It took the same drive 56 minutes, 14 seconds to restore the data — a transfer rate of 16.3 MB per minute.

Investing in a DLT20 tape drive is no small matter — almost $4,000, it costs over three times as much as a regular tape drive. And Retrospect doesn't work as well with the DLT20 as it does with other tape drives.

The Bottom Line

If you work with files too huge for SyQuest, Bernoulli, or Zip cartridges, nothing beats the 20-GB-per-cartridge capacity of the DLT20 — except for the 40-GB-per-cartridge capacity of a version expected in the near future. Make sure your service bureau supports the new tape drive. / Mark Frost

---

APSDLT20 ○○○☀

Price: $3,999.95 (list).

Pros: Fast. Tapes hold as much as 20 GB of data apiece.

Cons: Quirky with Dantz's Retrospect. Should not be used for network backup.

Company: APS Technologies, Kansas City, MO; 800-235-2753 or 816-483-6100.

Reader Service: Circle #409.

Xres / Fauve Software introduces a mixed bag of tools for compositing large image files.

WHAT SETS XRES APART from the competition? Speed, says its maker, Fauve Software. That's true, but only when you compare Xres' speed for editing high-resolution images with that of Adobe Photoshop or Fractal Design Painter. Compare Xres' speed with that of rival Live Picture, and Live Picture comes out ahead for many
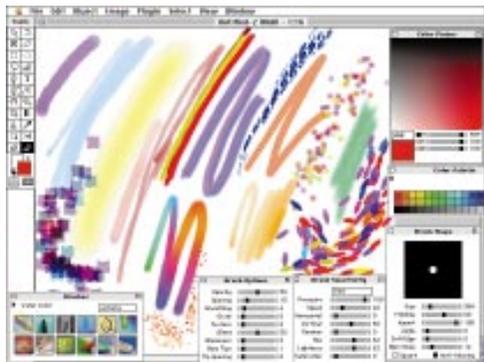
Editing high-resolution images is much faster with Xres than with Adobe Photoshop. The program also provides an excellent selection of painting tools — its natural-media and special-effects brushes are reminiscent of Fractal Design Painter's.

tasks. What *does* set Xres apart is its use of familiar Photoshop- and Painter-like tools, which make image compositing and editing simpler and more convenient than Live Picture's tools do.

Alike but Different

Although Xres and Live Picture don't look the same or work in the same way, they're based on a similar technology. To boost the speed of processing large PICT, TIFF, and Targa image files, each program first converts a file to a proprietary format that allows the program to load into memory only the image data required for the current magnification level. The programs can then perform quite nimbly.

Xres and Live Picture also wait until the final rendering process to apply image effects and editing operations to the actual pixels of the image. Until that point, each program stores editing operations in a parametric file that's applied to the original image data. This approach cuts down on the processing time as you're editing images. It's also a boon to production teams with members in various locations — the parametric files are relatively small and easy to transmit to members of the team, who can then apply them to the original data files.

In Xres, each image you create within the program or import exists as a separate floating object. Each object can have as many as 32 channels. An advantage of Xres over other image-editing programs is the ease with which you can manipulate the channels, controlling which are viewable and editable. For example, to turn a mask channel into a live alpha channel, you simply click on a check box in the program's Channels palette — there's no need to do an explicit "load channel," as there is in Photoshop. Furthermore, you can use more than one mask at a time without going through a time-consuming multi-step process, as you must do with Photoshop.

Xres comes with a variety of built-in filter effects, plus it supports third-party Photoshop plug-ins. Its flexible image-editing tools work a lot like those in Photoshop, so you won't experience the learning curve inherent in Live Picture and its unfamiliar tool set. We also liked Xres' painting and retouching tools, which are scaled-down replicas of Fractal Design Painter's excellent tools. However, painting at high resolutions with Xres is much faster than with Painter.

Also like Photoshop, Xres supports the RGB and CMYK color modes. In addition, the included UCR and GCR controls, which bring out detail in shadows and gray images, help make Xres acceptable for serious color prepress work. However, Xres' color-correction controls aren't on a par with Photoshop's — there's no equivalent of the Variations command, for example, and the Levels control has no midtone slider. Xres also lacks even the most basic distortion tools.

Familiar and flexible tools are Xres' strength, but the program also scores points for innovation. Support for multiple undos is a big plus — you can undo as many as 20 operations for each individual object. Of course, you'll need plenty of disk space if you want to take advantage of the maximum number of undos. And the Undo command is smart — edit object A, select object B and perform several operations, and then re-select object A, and Xres will remember the last operation you performed on object A. Click on object B, and the Undo command will work with the last operation performed on *that* object.

Another incredibly useful feature is Xres' ability to apply editing operations to multiple objects simultaneously, a capability you won't find in Specular Collage, Photoshop 3.0, Live Picture, or Fractal Design Painter. This feature works with color-correction tasks, filters, and all object-manipulation operations. Also, Xres directly supports the Light Source ColorTron color-measuring device, for improved color-reproduction accuracy.

Innovation and convenience aside, Xres suffers from some rough edges. Incredibly, you can't print from within the program — to print, you must place your images in a page-layout or illustration program or import them into Photoshop. Xres also lacks direct support for Photoshop 3.0 files, so it can't work as smoothly as it should with Photoshop. Additionally, you can't name objects, nor can you resize the program's Object palette, a shortcoming that severely hampers the management of documents that contain many objects.

We also encountered several repeatable bugs. There were problems with running several third-party Photoshop filters, and the histogram in the Levels dialog box sometimes disappeared. Xres is ravenous for scratch-disk space when processing large images, but frustratingly, you can't specify a secondary scratch disk. The documentation is sparse and weak, and there's no tutorial — a serious drawback for a program with the depth and complexity of Xres.

Version 1.1.1 boasts a big speed improvement over the initial release of Xres — we found that the program's current speed ranges from acceptable to fast. However, Live Picture is still faster at many operations, including screen redraw, and is much faster at zooming in on complex images.

Channels	view	edit	alpha	clip
RGB	✓	✓		
Red	✓	✓		
Green	✓	✓		
Blue	✓	✓		
# 4			✓	
# 5			✓	✓
# 6				
# 7			✓	
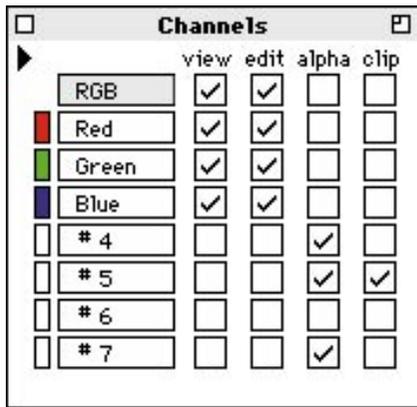
To ease the process of channel manipulation, Xres' handy Channels palette lets you simply click on a check box to control which channels are displayed and editable.

Xres requires at least a 68040 Mac, System 7, and 20 MB of RAM. However, for optimal speed, we recommend at least a 32-MB partition for the program. Of course, you'll get the best speed if you run the program on a Power Mac. Like Photoshop, Xres requires a large chunk of hard-disk space, especially if you want to take advantage of the handy multiple-undo feature.

The Bottom Line

For imaging professionals who frequently work with large image files, Fauve Software's Xres combines the flexibility and convenience of Photoshop with the speed advantages of Live Picture. However, for many image-editing tasks, it's not as speedy as Live Picture, and more important, there are several glaring holes in its feature set — Xres lacks support for Photoshop 3.0 files, and you can't print from within the application. Still, we think Xres shows a lot of promise — we hope that the next version will fill the gaps. / David Biedny

Xres 1.1.1 ○○○

Price: $795 (list).

Pros: Manipulates multiple objects simultaneously. Excellent high-resolution paint tools. Support for multiple undos for each object. CMYK support.

Cons: No printing facilities. Somewhat buggy. Weak documentation. Lackluster color-correction tools. No support for Photoshop 3.0 files.

Company: Fauve Software, San Francisco, CA; 800-898-2787 or 415-543-7178.

Reader Service: Circle #410.

MicroStation V5 for Power Macintosh
Bentley Systems' high-end PowerPC-native CAD package runs on steroids.

THE UNDISPUTED KING of high-end CAD programs has long been Autodesk's AutoCAD. But these days, Autodesk's commitment to the Mac market is questionable at best — the current AutoCAD Release 13 is not available for the Mac, and Autodesk isn't talking about any future Mac plans. Sensing an opportunity here, Bentley Systems has demonstrated its dedication to the Macintosh platform with the introduction of a PowerPC-native version of its high-end multiplatform CAD program. MicroStation V5 for Power Macintosh is not only feature-rich but it's also fast enough to blow by MicroStation V5 for Windows running on a Pentium-class PC.

Smart Cursor

As you'd expect of a $3,950 CAD package, MicroStation V5 for Power Macintosh provides a comprehensive tool set for both 2-D and 3-D CAD. With the release of version 5.0, Bentley Systems added several truly useful features. For starters, there's an intelligent cursor that automatically indicates key alignment points as you draw, making it a snap to draw aligned objects precisely and without any measuring.

Although MicroStation's interface remains decidedly un-Mac-like, it's vastly improved in version 5.0. Unlike previous releases, which suffered from a cluttered and confusing display, version 5.0 features redesigned and reorganized tool palettes that

give the program a cleaner look and make it more convenient to use. A GUI-preference setting promotes the program's multiplatform stance — you can opt for either a Mac, Windows, or Motif user interface (in addition to running on Macs, MicroStation runs on PCs running DOS or Windows and on a variety of workstation-class machines). However, the only difference we could discern when selecting these options was in the styling of the window title bars and dialog boxes. From a Mac perspective, we found the nonstandard Open and Save dialog box — which contains its own set of miniature pull-down menus — particularly annoying.

High-end CAD programs have always done a good job of handling the underlying geometry of a design, but historically they've done a poor job of rendering final output. As a result, CAD users frequently had to export their drawings to separate rendering applications for high-quality output.

In order to address this problem, MicroStation V5 for Power Macintosh features enhanced rendering capabilities that are well integrated with the core program. Rendering speed is improved, and antialiasing provides high-quality output. A good selection of tools lets you control such 3-D attributes as lighting, camera angle, surface texture, transparency, fog, and shading. If you require even higher-quality output,

however, you are able to export files in RenderMan RIB format to another rendering program.

In addition to the enhancements in version 5.0, MicroStation has several noteworthy features that have been added since the program's last major release. To meet the needs of high-end-CAD users, who frequently work in teams, MicroStation provides a reference-file feature that lets users on a network reference drawings stored on other network machines. When you reference a drawing, it's displayed as if it were residing on another drawing layer, so you can view it along with the drawing that's currently displayed on your screen. This feature allows several designers or architects to work on different aspects of the same design simultaneously.

Another sophisticated feature is MicroStation V5's support for parametric definitions, which allows you to define object dimensions by using either a variable or a geometric constraint. When you're ready for final placement of the object, you can assign a specific value in place of the variable or constraint.

We also liked the depth of MicroStation's support for complex splines and surfaces, which makes the program a good tool for detailed product design. Although you probably wouldn't use the program to design the next Boeing jetliner, the level of detail it supports makes it an excellent choice for designing products with highly stylized and free-form surfaces.

Additionally, Bentley Systems has beefed up the program's capabilities by adding associative cross-hatching and the ability to read and write binary AutoCAD DWG files (in addition to DXF). The latter feature is especially important for AutoCAD for Mac users who may be feeling that, given the uncertainty of that application's future, it might be time to consider switching programs. With MicroStation's support for DWG files, those users will be able to open existing AutoCAD files directly from within MicroStation. In our tests, we found that MicroStation V5 for Power Macintosh opened and converted AutoCAD files without a hitch.

MicroStation V5's feature set makes it a capable and powerful CAD tool, but what's most impressive is version 5.0's PowerPC-native speed. In informal tests, performing

Mac CAD users looking for an alternative to AutoCAD will want to consider Bentley Systems' speedy MicroStation V5 for Power Macintosh. For 3-D-design work, MicroStation creates high-quality rendered images complete with surface textures and shadows.
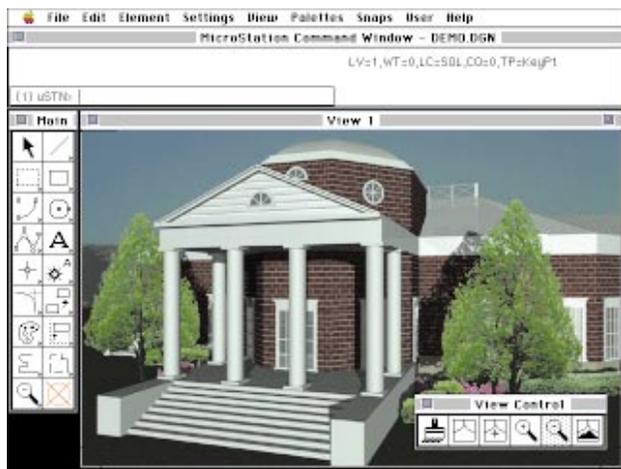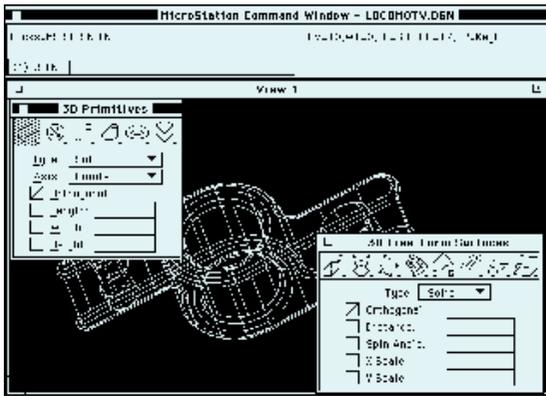
Powerful 3-D-surface-modeling tools are among the strengths of MicroStation V5 for Power Macintosh.

a variety of common CAD tasks, we discovered that the native version (running on a Power Macintosh 8100/110) was approximately 5 times as fast as the non-native version (running on a Quadra 800). For isolated CPU-intensive tasks, such as image rendering, the native version performed as much as 15 times as fast as the non-native version.

We also wanted to determine how the speed of the native version of MicroStation compared with that of the PC and workstation versions. Using the same informal tests, we found that the native version (running on a Power Mac) was decidedly faster than the Windows NT version (running on a variety of Pentium-class machines). Overall, native speed was 2 to 5 times as fast.

The native version also bested a low-end Digital Alpha and a Silicon Graphics workstation. The only workstation that consistently outpaced the Power Mac was a high-end Silicon Graphics machine equipped with impressive disk and I/O subsystems. We expect that the new generation of Power Macs, equipped with the PCI bus, will do much to eliminate this advantage.

The Bottom Line

With Autodesk's commitment to the Macintosh appearing uncertain at this point, Bentley Systems' MicroStation V5 for Power Macintosh represents a powerful and attractive alternative for high-end-CAD users. Architects who find themselves looking for a high-end CAD program should also consider ArchiCAD, which provides several excellent features specific to architectural applications.

Nevertheless, MicroStation V5 for Power Macintosh is the best high-end general-purpose CAD program you can buy. And with its glitch-free support for the AutoCAD DWG format, MicroStation makes it a no-brainer for AutoCAD users to make the switch. / Jim Anders ▲

MicroStation V5 for Power Macintosh○○○○

Price: $3,950 (list).

Pros: Impressive speed. Powerful 3-D-surface-modeling tools. High-quality output.

Cons: Awkward interface.

Company: Bentley Systems, Exton, PA; 800-778-4274 or 610-458-5000.

Reader Service: Circle #411.

Aladdin Desktop Tools / Timesaving utility package

IF YOU'VE EVER WISHED that Finder tools were more efficient and convenient, take a look at Aladdin's Desktop Tools, a motley collection of utilities that can streamline Finder-related tasks.

Speedy Copies. The Desktop Tools package consists of seven utilities. The centerpiece is SpeedBoost, which is based on the shareware program SpeedyFinder7. SpeedBoost works much like Symantec's CopyDoubler — it aims to reduce the time needed to copy or delete files. It can copy and delete in the background, letting you perform other Finder functions while it works, and it can also optionally copy only those files that are new or different from ones already at the destination location.

SpeedBoost has some helpful and timesaving features, but we found its speed enhancements somewhat inconsistent overall. On a Power Mac, SpeedBoost copied and deleted groups of files about 35 percent faster than the Finder, but on a 68030 Mac, it was typically slower than the Finder at copying files.

Presto Change-o. Among this package's more useful features is Magic Tools, which among other things, can automatically move an alias to its destination folder when you create it, so you don't have to open nested folders and drag the alias icon there yourself. With the Desktop Makeover utility, selecting an alias icon and pressing Command-Option-F automatically takes you to the alias's original file, so you don't have to go to the alias's Get Info window and click on its Find Original button.

With Desktop Printer, switching to a different printer is a snap: Rather than going to the Chooser, simply double-click on a printer icon, and when you print, the job will be sent to that printer. Alternatively, you can drag a document icon onto a printer icon to launch and print a document.

Direct Navigation. Desktop Shortcut lets you navigate directly to other folders and volumes in the Mac's Open and Save dialog boxes. These features are similar to those available in Now Utilities' Super Boomerang. However, we especially liked Desktop Shortcut's ability to display the contents of any StuffIt archive from the Open dialog box. Desktop Shortcut even lets you open individual archived files without having to decompress the entire archive first.

Rounding out the package are Desktop Viewer, a handy feature that lets you view a wide variety of documents before you open them, and Desktop Secure Delete, which overwrites files as you trash them so they can't be retrieved by a recovery utility such as Norton Utilities or MacTools.

Although most of the Desktop Tools suite performed as advertised, we weren't convinced that this was a must-have package. Although Desktop Tools and Now Utilities each contain worthwhile features not found in the other, budget-conscious users will find that Now Utilities has more bang for the buck. Still, Desktop Tools is off to a promising start, offering several utilities that are sure to enhance your productivity. / Ted Landau

Aladdin Desktop Tools 1.0 / **Price:** $89.95 (list). **Company:** Aladdin Systems, Watsonville, CA; 800-732-8881 or 408-761-6200. **Reader Service:** Circle #412.

Marketing Plan Pro / Analysis and control

MARKETING PROFESSIONALS and professors disappointed by the amateurishness of much business-planning software will appreciate Palo Alto Software's Marketing Plan Pro (MPP) for its sophisticated approach to creating a marketing strategy and its emphasis on ongoing analysis.

Conceptual Leap. MPP's conceptual leap over comparable programs is a result of its Strategy Pyramid, a model assuming that marketing strategy is built on concrete tactics and that tactics are built on specific, measurable programs. When you click on the pyramid in the opening screen of MPP, you are taken to another screen, where you enter your data into three columns: strategy, tactics, and programs. When you double-click on an item in the strategy column, you see related tactics; when you double-click on an item in the tactics column, you see related programs.

Programs then automatically appear as rows in a spreadsheet of sales-and-marketing expense budgets and sales forecasts. Columns might include monthly budget amounts or milestones. Although you can export, you can't import amounts from other software. You can leave space empty for information you're still researching.

Once you've entered your data, you can sort and select programs and display color charts and tables focusing on management responsibilities; sales plans; unit projections; expense summaries; or specific markets, products, or departments. The software automatically calculates your sales forecasts and compares sales with expenses.

Ongoing Analysis. MPP is based on Microsoft's FoxPro, which gives you the power of a full-fledged relational database, rather than a static spreadsheet-supplementing template, for conducting ongoing analysis. MPP's intuitive interface, straightforward help system, and clearly written documentation make this product easy to use, although even marketing experts will need to peruse the manual.

MPP represents an important improvement over other business-planning software packages, but it has some problems: You may need to allocate up to 8 MB of RAM to the resource-ravenous FoxPro engine, and we also found a conflict between FoxPro and Desktop Shortcut, a component of Aladdin Desktop Tools.

For the most part, however, marketing professionals will find the astute marketing management in MPP to be well worth the RAM — and the price. / Douglas Dominic

Marketing Plan Pro 1.01 / **Price:** $149.95 (list). **Company:** Palo Alto Software, Eugene, OR; 800-229-7526 or 503-683-6162. **Reader Service:** Circle #413.

ILLUSTRATION / MARGARET McMULLIN

The Print Shop Deluxe CD Ensemble / Desktop publishing for the family

WITH INCREDIBLE EASE, you can create newsletters, calendars, envelopes, greeting cards, certificates, and other basic designs, using Print Shop Deluxe and Print Shop Companion. Now Brøderbund has combined both programs, together with even more art and templates, on one CD-ROM for an estimated street price of less than $50.

Keeping It Simple. Both Print Shop and Adobe PageMaker can create nice family newsletters, but Print Shop Deluxe doesn't have the sophisticated features of professional page-layout applications. Instead, Print Shop Deluxe focuses on simplicity, and it does so well.

You decide what you want to create, be it a family newsletter, a calendar, or a business card. Then you choose a backdrop from a selection of backdrops and select a complementary layout that has headline, text, and graphics elements already in place. If you're more ambitious, you can use the basic tools in Print Shop Deluxe to designate where headlines, text, and graphics should go on the backdrop you've selected. To add text, simply start typing in a text field; to place a graphic, just double-click on a graphics field and, in the dialog box that appears, pick a Print Shop Deluxe picture. You can also align text and graphics; send objects to the background or foreground; and flip, scale, rotate, and frame any element on the page. You can do a mail-merge for your completed design by using the built-in name-and-address database or by importing tab-delimited text.
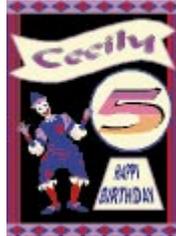
The new CD-ROM edition is bursting with goodies: over 1,600 EPS graphics (most of them in color), 73 TrueType fonts, 3,500 text effects, and hundreds of layouts. If you want to use Print Shop Deluxe pictures in other programs, you can use the Exporter application to convert Print Shop Deluxe graphics into EPS or PICT format. The current version is PowerPC-native and does not have the printing problems earlier versions had.

Disjointed Design. We were somewhat disappointed that Brøderbund didn't combine Print Shop Deluxe and Print Shop Companion into one program, as it did when it combined Kid Pix and Kid Pix Companion into Kid Pix Studio. You have to launch both programs in order to see all your options, and together, the programs demand more than 3 MB of free RAM. But for those who have been looking for a simple and inexpensive way to make their own greeting cards or stationery, The Print Shop Deluxe CD Ensemble is a great product for a bargain price. / Ken Gruberman

The Print Shop Deluxe CD Ensemble 1.1.2
○○○○ / **Price:** $80 (estimated street). **Company:** Brøderbund, Novato, CA; 800-521-6263 or 415-382-4400. **Reader Service:** Circle #414.

Material World / Global perspective

EVER WONDERED what daily life is like in Mali, Uzbekistan, or Iceland? StarPress Multimedia's Material World CD-ROM gives you an intimate look into the daily life of 30 families around the world.

A Family Portrait. At the heart of the program is the Big Picture, in which each family displays its most valuable possessions in front of its home. The contrasts are fascinating: The Kuwaiti family has four cars and a 45-foot-long sofa, while the Bhutanese family proudly displays its pig and wooden pitchfork.

From this point, you can look at any of four sections: Families, Countries, Questionnaire, or Lifestyles. The Families section introduces you to all family members through a photo album in which you get a peek at their culture and the nation in which they live.

Material World has a few flaws. Both RAM Doubler and virtual memory conflict with it. Also, the grainy video clips in the Families section don't contribute much. Nonetheless, if you're interested in a unique, personal way of exploring the diverse cultures of our world, Material World will not disappoint. / Kristin Balleisen

Material World 1.0 ○○○◑ / **Price:** $39.95 (estimated street). **Company:** StarPress Multimedia, San Francisco, CA; 415-274-8383. **Reader Service:** Circle #415.

OneWorld Combo
Telecommunication for the entire office

WHEN EVERYONE IN your office needs a capable fax modem that can handle ARA (Apple Remote Access) at an acceptable speed, you can invest in a single device that all can share: the Global Village OneWorld Combo. The OneWorld Combo lets users connect to online services and fax right from their desktop Macs. Remote users can sign on to the network through Apple Remote Access. You can connect the Combo to either LocalTalk or 10BASE-T Ethernet.

Two for One. The OneWorld Combo brings together the talents of two other OneWorld products, the OneWorld Fax and the OneWorld Remote Access Server (see "Dial-in Dynamos," January '95, page 94). All the OneWorld products have easy-to-use software, but both the OneWorld Remote Access Server and the OneWorld Combo have difficulty handling more than about three ARA call-in connections at a time.

The OneWorld Combo's versatility makes it an attractive option as a telecommunication server; however, the fact that it has only two telecommunication ports limits its usefulness in heavy-use environments. Each of the ports can dial out, fax, and handle ARA connects, but if you want to streamline the load, you can configure the telecommunication ports to specialize in one or two of the functions: For instance, you might set up one port to handle faxes and dial-out while the other port deals with ARA.

Like all the other OneWorld products, the OneWorld Combo is somewhat pricier than comparable telecommunication servers, but it's what you need if you're looking for ease of use and simplicity. / Shelly Brisbin

OneWorld Combo ○○○※ / **Price:** $2,099, including two V.34 modems (list). **Company:** Global Village Communication, Sunnyvale, CA; 800-736-4821 or 408-523-1000. **Reader Service:** Circle #416.

On Cue II Utilities 3.0 / On Cue, but off the mark

ORIGINALLY JUST a program launcher, On Cue now also has file-management and navigation features similar to those of PrairieSoft's DiskTop and Now Software's Now Super Boomerang (part of Now Utilities). However, the product isn't quite up to par with 1995-level expectations.

Hand-Me-Down. On Cue, which has passed through several hands over the years, is now distributed by ComputerEasy, a company whose lack of Mac expertise is apparent. The manual, for example, instructs you to note the contents of your AUTOEXEC.BAT and CONFIG.SYS files before you call for technical support.

Of the additions in the current version of On Cue, some are great, others ho-hum. We really like On Task, an application switcher (similar to the Task Manager in Windows) that lets you switch between running programs by using the keyboard and by using the mouse. SmartOpen, which lets you open documents from within any Open or Save dialog box, and On Disk, which — among other things — lets you get info on or trash documents by using buttons in its window, are also nice, but we find KeyLauncher, a command-line approach to launching files, foreign to the Mac ethos.

We simply didn't find this package, or its features, particularly compelling when there are more-robust and -versatile packages, such as Now Utilities, for your specific needs. / Gregory Wasson

On Cue II Utilities 3.0 ○○○ **/ Price:** $99.95 (list). **Company:** ComputerEasy, Tempe, AZ; 800-522-3279 or 602-829-9614. **Reader Service:** Circle #417.

Living Trust Maker 2.0 / Estate planning on your Mac

USING NOLO PRESS' Living Trust Maker 2.0 is a simple way to create a living trust, which lets you pass property to heirs without going through probate, a lengthy and often expensive procedure. Version 2.0 reflects changes in laws on property management for minors.

After an opening screen that reminds you to read the manual and make decisions about which property you want to pass on to whom, Living Trust Maker offers a thorough tutorial and a demonstration of its excellent online help system.

Plentiful Help. To help you create your trust, Living Trust Maker takes you through a series of screens that ask you to specify details such as the state you live in, trustees, beneficiaries, trust property, and the type of trust. There are several ways to get legal help in Living Trust Maker: For clear explanations, you can click on the ever present help icon in the lower left corner. When a new topic, such as how to choose a successor trustee, is introduced, Living Trust Maker automatically brings up a screen that offers more information on that topic. In addition, Living Trust Maker's manual is clear and thorough and even includes a discussion of the drawbacks of a living trust.

Overall, using Living Trust Maker 2.0 is a terrific and inexpensive way to plan and protect your family's estate. / Joseph O. Holmes

Living Trust Maker 2.0 ○○○○✹ **/ Price:** $79.95 (list). **Company:** Nolo Press, Berkeley, CA; 800-992-6656 or 510-549-1976. **Reader Service:** Circle #418.
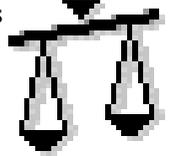
FolderBolt Pro / Dead-bolt your data

MANY MAC SECURITY applications require you to set up complicated hierarchies of users, groups, and privileges; Kent•Marsh's FolderBolt Pro lets you password-protect any folder on your Mac in a very simple way. You can have as many passwords as you have folders, and a user's access to various areas of your Mac is determined not by any privileges you've assigned but by what passwords you've chosen to disclose.

Security-Conscious. To keep prying eyes out of a particular folder, just Shift-click on the close box of the folder's window. A dialog box appears, asking you to specify a password for the folder and the level of protection you want to apply to it. FolderBolt Pro has a variety of protection options: You can bolt a folder (no one can get into it without the proper password, but aliases of files in the folder work), dead-bolt it (no one can access inside information without the proper password), restrict the access to read-only (others can read items in the folder but can't copy or modify them), or create drop folders (others can put things into them but can't see what's inside).

New with FolderBolt Pro is the write-only folder: Other users can modify files within a folder but can't delete or copy them. You can also create groups of folders and lock and unlock them with a single password. Also new is the ability to encrypt files, which previously required a separate Kent•Marsh product, CryptoMatic. You can encrypt a folder by choosing one of several encryption modes, which include several forms of the Data Encryption Standard (DES), including Triple DES.

Simple Encryption. FolderBolt Pro offers you many methods and levels of encryption, some accelerated for the PowerPC. You can even make self-decrypting archives, stand-alone files that decrypt themselves if the proper password is given. FolderBolt Pro also has a new administrator application for configuring multiple copies of FolderBolt Pro on networked machines.

FolderBolt Pro is a snap to use and is usually unobtrusive. However, Kent•Marsh released two incremental updates to fix serious conflicts and bugs in the six months after the product debuted; although we did not encounter any problems with the current version, we recommend that you back up your hard disk before installing the product. Furthermore, because FolderBolt Pro modifies your disk-directory file to work its magic, a disk-utility program such as Norton Utilities might try to "fix" your directory, with very unfortunate results. To prevent this, you need to read FolderBolt Pro's excellent manual carefully and follow the instructions to the letter. / Eric Taub

FolderBolt Pro 1.0.3 ♣♣♣ **/ Price:** $159.95; upgrade from FolderBolt, $39.95 (list). **Company:** Kent•Marsh, Houston, TX; 800-325-3587 or 713-522-5625. **Reader Service:** Circle #419.

ILLUSTRATION / MARGARET McMULLIN

Epilogue 2.0 / **PostScript perfection from any printer**

IF YOU'VE EVER tried printing PostScript files on a non-PostScript printer, the results were probably disappointing at best. PostScript-centric applications such as Adobe Illustrator and PageMaker, Macromedia FreeHand, and QuarkXPress generally print only a 72-dpi representation of your document on non-PostScript printers. Furthermore, clipping paths (cutouts from images, used for silhouetting objects) don't print properly on non-PostScript printers. Coming to the rescue is Epilogue 2.0, a full-blown Adobe PostScript Level 2 interpreter that works as a Photoshop plug-in and rasterizes any PostScript file into a continuous-tone or high-resolution bit-mapped Photoshop file.

Muscle Allocation. Epilogue, which uses a hardware copy-protection dongle, comes in two parts: the Epilogue RIP Server application and the Epilogue PS Photoshop plug-in. RIP Server handles all the PostScript processing and requires a minimum of 8 MB of RAM — and up to 14 MB of RAM for high-resolution jobs.

The PS plug-in appears as an Acquire option on the File menu and provides the user interface to Epilogue. When you choose it, an Open dialog box appears, in which you choose a PostScript file. Then you get the main Epilogue dialog box, where you set the size and resolution, choose the target color space, apply anti-aliasing, and rasterize. Rasterizing an 800K FreeHand file took 8.5 minutes with Epilogue on a Power Mac 8100/80; the same process done by a PostScript Level 2 dye-sublimation color printer took 7.5 minutes.

Users who had problems with the previous version may be skeptical, but Epilogue worked successfully with almost every file we ran through it, including multimegabyte FreeHand files and pre-separated, trapped QuarkXPress files. The only file it choked on had also defeated every PostScript printer we'd ever tried it on.

One of Epilogue's biggest advantages is that you can use it to crop PostScript files so you don't have to rasterize entire images. We found this particularly useful for creating a soft-edged drop shadow for type superimposed on an image in a layout, an effect impossible to achieve with a page-layout program.

Adding to Epilogue's usefulness is the fact that it helps you prepare your PostScript files for professional printing: If Epilogue can't handle them, your imagesetter probably can't handle them either. With Epilogue, you can also preview trapping and overprinting on-screen in Photoshop and import any PostScript vector art into Photoshop. At $895, Epilogue isn't an impulse buy, but it is reliable and practical, and on Power Macs, it's almost as fast as most hardware PostScript interpreters. / Bruce Fraser

Epilogue 2.0 ○○○○ / **Price:** $895 (list). **Company:** Total Integration, Palatine, IL; 708-776-2377. **Reader Service:** Circle #420. ▲

DO-IT-
YOURSELF
VIDEO

HERE'S HOW TO MAKE MOVIES ON YOUR MACINTOSH—EASILY AND AFFORDABLY.

BY JOSEPH SCHORR

T he typical amateur video is — how shall we phrase this? — rarely a work of cinematic genius. You set out, equipped with a camcorder and the best of intentions, to chronicle an important event. However, the result is often hours of jumbled, meandering footage, punctuated by poorly focused close-ups, bumpy tracking shots, incomprehensible audio, and those awkward stretches of complete blackness that happen when you accidentally hit Record while the lens cap is still on.

Now picture your video footage with the goof-ups edited out and with velvety-smooth transitions linking the scenes. Imagine artfully designed titles sliding into place before each new sequence and a buoyant musical sound track underscoring the action. Instead of the rambling, two-hour travelogue that has your friends squirming in their seats or the monotonous "talking head" presentation that has your business associates snoozing, you have a snappy 15-minute presentation that whizzes through the high points with all the flash and pacing of an MTV video. Best of all, envision yourself putting the whole thing together right on your Mac.

It's not only possible — it's also highly affordable. You can get impressive results without spending thousands of dollars on a high-end video-editing suite. Granted, even with today's fast Macs, sprawling hard drives, and QuickTime 2.0 (a system extension that gives your Macintosh the ability to create and manage video), you're not going to make *Gone with the Wind.* Moviemaking places huge demands on your Macintosh in terms of hard-disk space and processing speed. The 15-minute movie just described, for example, created at half-screen size (320 x 240 pixels) with a frame rate of 15 frames per second (as opposed to a television's full-motion 30 frames per second) could easily fill a 300-MB hard disk. A full-screen, full-motion version of the same movie would require nearly 2 GB of storage. And to obtain decent results at any frame rate and picture size,

EDIT FOOTAGE

SHOW IT OFF

VIDEO

you need a Macintosh that has at least a 68040 processor.

That said, if you have realistic expectations and a little patience, you can produce compelling movies on the desktop. To help you get your moviemaking start, we've put together this step-by-step guide to creating videos on your Mac. We'll tell you what you need to know to capture and edit video, add titles and special effects, and mix your own sound tracks — all without requiring the technical skills (or budget) of a video professional.

STEP 1: SETTING UP THE HARDWARE

The first step in any video production is to transfer the video you want to use in your movie from a camcorder or a VCR to your Mac. The video signal from your camcorder or VCR needs to be converted into digital form and fed into your Mac, a process called video digitizing or video capture. The hardware needed to pull this off depends on the specific Mac involved.

The original AV Macs — the Quadra 660AV and 840AV — are "video-ready," because they have built-in digital/analog-converter chips. They also have two sets of video-input and -output jacks — a pair for standard RCA-style (composite) video cables and another for S-video cables, which are necessary if your VCR or camcorder supports the superior-quality S-VHS or Hi-8 video signal.

Power Mac AV models are also video-ready, but they have only a pair of S-video jacks; you have to use adapter cables (which are included with the AV models) to use standard composite video. Standard Power Macs are *almost* video-ready. You can add the same video-input and -output options as the AV models have for less than $500 by installing an Apple Power Macintosh AV Card, a PDS video card that also includes 2 MB of RAM and supports 24-bit color on monitors of up to 17 inches.

None of the AV-equipped Macs have sound jacks, however. If you want to capture your video's sound track too — and you probably do — you also need to connect your camcorder's or VCR's audio-output jack to the Mac's standard audio-input jack. If your camcorder's or VCR's audio output is a standard RCA jack, you can get an adapter at Radio Shack for a couple of bucks for converting the RCA jack on your audio cable to the ⅛-inch miniplug needed for the Mac's audio input.

If you have a 630-series Mac or a Power Mac 5200/75 LC, tooling up for video capture is even easier. For less than $150, you can buy the Apple Video System, a video-input card that plugs in to the special video slot in those Macs and that provides a pair of jacks for composite-video and audio input. The Apple Video System does not, however, include jacks for the higher-quality S-video, nor does it capture video as effectively as the Power Mac's AV card — frame rates drop unacceptably low (below 10 fps) when you try to capture movies larger than 240 x 180 pixels. But the Apple Video System is inexpensive and easy to install, and it comes with Avid's VideoShop, a powerful software package for editing video clips.

For any other Macintosh that has a NuBus slot, you can install Radius' $700 Spigot II Tape digitizing card. (If your Macintosh has only a PDS, you're out of luck — no one currently makes a digitizing card that works in this slot.) As with the Quadra and Power Macintosh options, the Spigot II Tape comes with software that lets you capture video as QuickTime movies or grab still frames from live video. You can even use the software to capture video directly
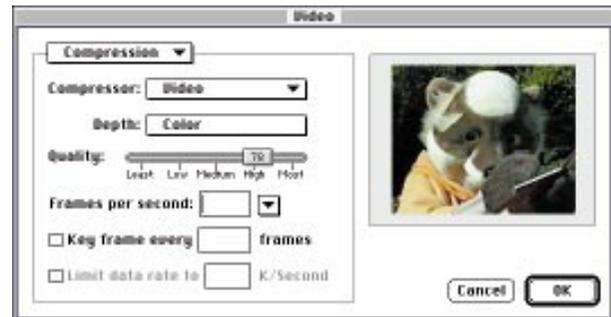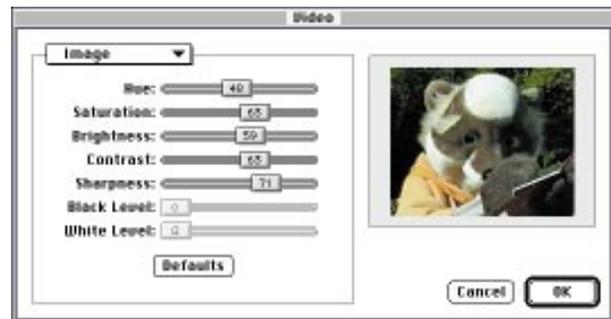
CAPTURING VIDEO:
Most programs that support video capture let you tweak the color balance, brightness, sharpness, and contrast of your source video (top). You can also pick a codec for capturing clips, and you can adjust compression settings (bottom).

into video-editing programs such as Adobe Premiere and Avid's VideoShop. And as with the Mac and Power Mac AV models, you need to connect your camcorder's audio-output jack to the Mac's standard input jack if you want to capture sound as well as images from videotape.

If you just want to get your feet wet as a QuickTime movie producer and are not ready to spend hundreds of dollars on a video-digitizing card or if your Mac doesn't support such a card, here's a superlow-cost option: use Connectix's $99 QuickCam, a 3.3-ounce, eyeball-shaped, no-frills video camera that plugs directly in to your Mac's modem or printer port. The QuickCam comes with intuitive, no-manual-needed software for capturing video in QuickTime format and grabbing still frames in PICT format.

The QuickCam is certainly limited — it records in grayscale, has a fixed-focus lens that isn't the sharpest on the planet, is equipped with a very low-quality microphone, and supports images no larger than 320 x 240 pixels. Since the QuickCam requires the Mac as a recording device, it can be taken "on location" only if it's hooked up to a PowerBook (which is actually what many QuickCam users end up doing). Still, you couldn't ask for a more painless and unintimidating introduction to Mac video production — once you've started toying with it, it's hard to resist the urge to keep capturing video all the time.

STEP 2: CAPTURING VIDEO

Regardless of which option you choose for capturing video, be prepared to experiment with the settings in your video-capture software. You'll need to balance movie size, frame rate, color bit depth, and compression technique in order to capture the best-quality

ROLL CREDITS:

Adding scrolling titles to your video is particularly easy with VideoFusion's QuickFLIX. Select a clip, and open the Titling dialog box to create anti-aliased titles.

You can make titles scroll up or down and vertically or horizontally across a clip, and you can preview the results before applying them.

SPLIT-SCREEN EFFECTS:

The powerful but confusing Film Editor window in Nuts Technologies' MediaFactory lets you create split-screen effects by tiling multiple clips within a single window. The multitrack timeline at the top of the screen shows a frame-by-frame view of each clip, and the Film Editor window displays how the clips will look when they're combined in the final movie.

video. Movies captured at anything less than 15 fps, for example, look choppy and cheap when played back, but you'll probably have to compromise on image size and color depth in order to coax an acceptable frame rate out of your digitizing hardware.

You'll also need to pick a *codec,* a compression/decompression scheme that QuickTime uses to compress each frame of video as it is being captured. QuickTime supports a variety of codecs, but not all work effectively on video data. The Apple Animation codec, for example, is great for computer-generated animation but isn't designed for analog video data. Generally, we ended up using one of three codecs: the Apple Video codec or the Radius Cinepak codec (both of which are included with QuickTime) or the codec supplied with the digitizing card we used for capturing video. Cinepak offers a high degree of compression, fast playback, and top-notch image quality, but it's slow when compressing. On the other hand, the Apple Video codec is faster but doesn't provide nearly the level of quality that Cinepak does.

We got our most consistent and satisfying results by limiting our movies to 240 x 180 pixels on a Quadra 630 and 320 x 240 pixels on a Power Mac 7100/66AV. In each case, we captured the video at a color depth of 16 bits and a frame rate of 15 fps, using the Apple Video codec. (For more tips on capturing video, see the "Making Better Movies" sidebar.)

If you must have true, full-motion video at full-screen or near-full-screen sizes and you can't afford a professional-level system, you have exactly one option: use an AV Mac fitted with Radius' $800 SpigotPower AV. The SpigotPower AV is a NuBus card that plugs in to a Power Mac 7100AV or 8100AV and that connects directly to the Mac's DAV (Digital Audio/Video) card. The SpigotPower AV doesn't

digitize your video — that task is still handled by the Mac's built-in digitizer. Rather, it handles all the video compression/decompression on its own hardware, greatly accelerating video capture.

Hardware-based compression lets you capture video at higher frame rates and at larger sizes than you can with software compression. Indeed, the results you get with a SpigotPower AV card are spectacular. On a Power Mac 8100, you can make movies in full 24-bit color that fill the screen with full motion and that play back fluidly without stuttering or dropped frames.

One caution: Video captured and compressed with the SpigotPower AV's hardware compression has to be played back with the SpigotPower AV hardware, or the results are terrible. If you're authoring a video that will be distributed to users of other types of Macs, you'll have to use software compression — a slower and less effective option — so that movies will play back smoothly on Macs not equipped with the SpigotPower AV.

STEP 3: EDITING YOUR VIDEO

Once you've captured a few clips to your hard disk, it's time to take the raw footage and shape it into a real movie. You'll want to hack out the flubs and place scenes in the appropriate sequence. It's time to assemble your snippets of video into a piece of real storytelling.

Video editing takes patience. Even a few seconds of video contains large amounts of data. Previewing the results after you've applied a couple of filters and transitions usually means waiting several minutes. It's not unreasonable to spend a full day or so on each *minute* of your finished video. If you're going all out on the special effects, it can take even longer.

Several QuickTime-video-editing packages are on the market,

ranging from Radius' basic and inexpensive QuickFLIX to the powerful and imposing Adobe Premiere. Whether low-end, midrange, or high-end, most packages take roughly the same approach to video editing: First you import your digitized video clips into the program, and then you sequence them by dragging them onto a "track" in which they appear along a frame-by-frame timeline.

Most video-editing programs provide several tracks along the timeline so that you can combine the audio and video information from multiple clips. You can, for example, mix the sound track from one clip with the video track of another. The multitrack system also allows you to add sophisticated transitions such as fades and wipes for switching from clip to clip.

The following overview of video-editing products highlights a product or two in each category and gives you a general idea of what capabilities you can expect:

Low-End but Highly Capable. The best — and one of the least expensive — of the low-cost editing programs is Radius' QuickFLIX ($149). The program's interface consists of three primary windows: a storyboard that displays thumbnails of all the clips comprising your movie, in sequence; a frame-by-frame timeline of the movie's video and audio tracks; and a playback window for viewing the assembled movie. QuickFLIX allows you to capture clips directly into the program from your digitizer and incorporate them into your project by dragging and dropping them onto the storyboard. Although QuickFLIX lacks sophisticated sound-editing features and doesn't have the flexibility and power of the more expensive editing programs, it provides a rich set of features. You are able, for instance, to stylize clips by applying color tints or reversing colors to produce negative images, and you can
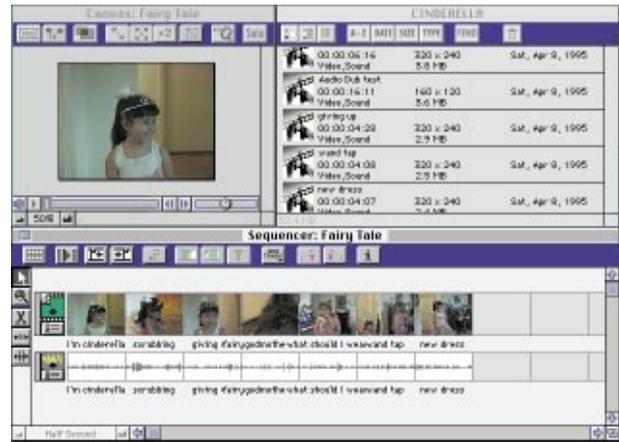
A CLASSIC EDITING PROGRAM:

The uncluttered interface of Avid's VideoShop provides push-button access to most of the commands you need. The Canvas window (top left) makes it particularly easy to add motion to clips and to preview portions of your work in progress.

apply preset transitions such as soft-edged wipes and cross fades.

Nuts Technologies' MediaFactory offers video-capturing and -editing capabilities similar to those in QuickFLIX, for about the same price ($199). In fact, its tools for applying Photoshop-like filters to movies, adding motion to clips (including rotation), and combining multiple clips into a single window are even more sophisticated than those in QuickFLIX. Its interface is not nearly as intuitive, however.

HOW TO MAKE BETTER MOVIES / 12 great tips for planning, shooting, and processing video

MAKE THE MOST OF YOUR MOVIES with a few straightforward preparations. From the moment you pick up your camcorder to the time you add the finishing touches, there's plenty you can do to make sure your movies look as good as possible. Here are 12 tips:

1. STORYBOARD YOUR IDEAS AHEAD OF TIME. Try to imagine what you want your final movie to look like before you start shooting video. With a firm idea in mind, you'll be better prepared to capture the images you need.

2. GREAT DIGITAL MOVIES START WITH GREAT RAW FOOTAGE. Videotape is cheap, so shoot lots of it — more than you think you'll need. You can always ditch stuff you don't like, but you can't capture clips you never shot.

3. USE A VARIETY OF SHOTS. Take close-ups as well as panoramas. Shoot the same scene from several angles. Especially remember to shoot long, establishing shots; they're great for introducing new sequences and make the perfect backdrops for titles.

4. USE A TRIPOD IF POSSIBLE. Bouncy camera work is almost unwatchable at 320 x 240 pixels. Even tiny, short QuickTime movies will look much better when shot with a tripod.

5. OPTIMIZE YOUR HARD DISK. Before you start to digitize your video, be sure to use a utility such as Central Point's MacTools to defragment your hard disk. In doing so, you'll get the optimal recording speeds out of your hard drive.

6. DEVOTE MAXIMUM PROCESSING POWER TO VIDEO CAPTURE. When capturing video, don't run other programs in the background. Turn off AppleTalk, and restart your Mac with the absolute minimum number of control panels and extensions loaded. (QuickTime must be loaded.)

7. CAPTURE VIDEO IN SMALL SNIPPETS. Make each shot from your raw footage a separate clip. When you're editing video, it's easier to open and manipulate small clips than to work with large ones that contain many scenes.

8. CHECK EACH CLIP AFTER IT HAS BEEN DIGITIZED. Make sure it looks clean and plays back smoothly; glitches in QuickTime compression routines sometimes introduce a frame or two of garbage. Remember, your edited movies will look only as good as your source clips.

9. CAPTURE YOUR VIDEO AT THE SPECIFICATIONS OF YOUR FINAL MOVIE. In other words, if you

want your final product to be a 16-bit movie sized at 320 x 240 pixels, capture your clips at those specifications. You can use programs such as Premiere and VideoShop to resize clips and convert bit depths later, but this is time-consuming and sometimes degrades resolution and playback quality.

10. CHOOSE THE CORRECT FRAME RATE. Video captured at 30 fps won't necessarily look smoother than video captured at 15 fps. If the flow of data at higher frame rates overwhelms your hardware, QuickTime will drop frames in order to keep up, resulting in very poor-quality video. In some cases, using high frame rates can result in a movie that looks worse than one output at a lower frame rate.

11. CAPTURE MOVIES IN 16-BIT COLOR. Movies captured in 16-bit color look almost as good as those captured in 24-bit color — yet they play back twice as smoothly.

12. DON'T OVERUSE EXOTIC SPECIAL EFFECTS. Too many wild page-turning-peeling-melting-spinning transitions can detract from your final movie. Simple cuts, wipes, and dissolves can be used very effectively. Save the special effects for a few key spots.
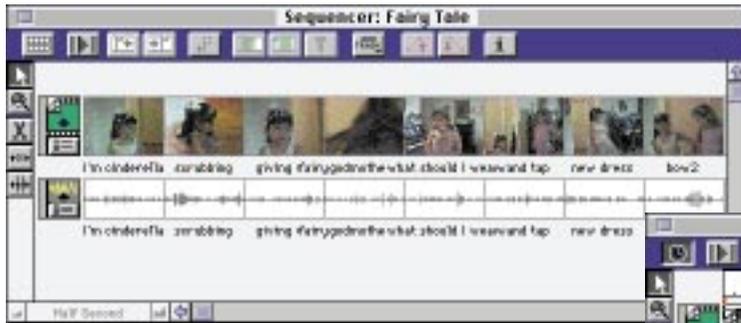
STORYBOARD VERSUS TIMELINE:
Avid's VideoShop lets you toggle between two views of your project. In Storyboard view (above), you see a representative thumbnail of each clip in the order in which it appears in the movie. In the Timeline view (right), you can view every frame (of audio and video tracks) and you can trim frames, add transitions, alter sounds, and apply filters and effects.

Multimedia Utilities ($99), from Motion Works International, is a suite of utilities that are good for QuickTime experimentation but not for serious moviemaking. The suite's simple editing program is handy for cleaning up clips by cutting out unwanted frames or reordering existing chunks of a clip. Other utilities include a movie-player application, an animation/painting program, a 16-bit-sound editor, and a utility that records screen activity on your Mac and saves the results as a QuickTime movie. Unlike QuickFLIX and MediaFactory, Multimedia Utilities does not include software for capturing video clips.

All these programs let you perform tasks that go far beyond straight cut-and-paste editing. MediaFactory, for example, allows you to create sophisticated split-screen effects, combining up to nine tracks in one scene for a checkerboard effect. QuickFLIX lets you layer clips and add motion to the layers, so you can create screen-in-screen effects. Multimedia Utilities offers a wide range of QuickTime-manipulation tools: You can place buttons on your QuickTime movies that allow you to play other movies and sounds when you click on them, and you can metamorphose one image into another.

Midrange, More Finesse. All the low-cost packages let you tackle big-time editing tasks — but not with a high degree of polish. They're good for tinkering but can prove frustrating if you're aiming for a more professional-looking result. A slightly higher-cost program such as Avid's VideoShop ($395) offers superior versions of the special effects that the lower-end packages offer, plus its interface is more polished.

Like QuickFLIX, VideoShop lets you toggle between storyboard and timeline views, and it supports unlimited audio tracks and video layers. You can arrange and trim clips, apply filters, and add transitions and specify how multiple video tracks will be layered in your movie. VideoShop's interface provides push-button access to many functions, such as adding new tracks, creating a new title, and applying fade-ins and fade-outs, and the product has more special-effects filters and transitions than any of the less pricey packages,

and those filters and transitions are also more refined.

High End, High Performance. Digital filmmakers looking for the most-precise video-editing tools will get more satisfaction from Adobe Premiere ($795), which offers dazzling special-effects filters, transitions, and highly flexible controls. Premiere lets you create complex effects that would be either very cumbersome or impossible to implement with other programs. For example, it lets you nest transitions so you can have, say, a cross fade between two clips occurring within a frame that is set within a third background clip.

Another enormous plus is Premiere's Make Miniature function, which automatically creates tiny, low-resolution versions of the clips you want to include in your movie. You edit your movie by using these clips — trimming scenes, applying transitions, and so on. This, of course, greatly speeds up the editing process. When the movie is done, Premiere intelligently swaps out the low-res clips for the originals, with all your editing decisions intact.

Despite some of its high-powered features, learning the basics of Premiere is not hard. It follows the same timeline model as the lower-end products, letting you load and arrange clips simply by dragging them into place on the timeline. Although it takes patience to master the subtleties of compositing video tracks, adding motion, and tinkering with varying levels of transparency between tracks, it's all fairly intuitive. We found that less expensive programs could crank out the cinematic effects we wanted but that Premiere usually produced the results with greater accuracy and speed.

STEP 4: ADDING SOUND

A well-edited sound track can make the difference between a good movie and one that's truly stunning. Adding musical underscoring, for example, can set the mood and pace for a story, binding your edited clips into a unified whole. A narrative voice-over can be a real enhancement too, especially if you're making a movie for educational or training purposes. Cleverly placed sound effects can turn an ordinary sequence into a hilarious one. With skillful editing, you can even chop out unwanted sounds that detract from video clips
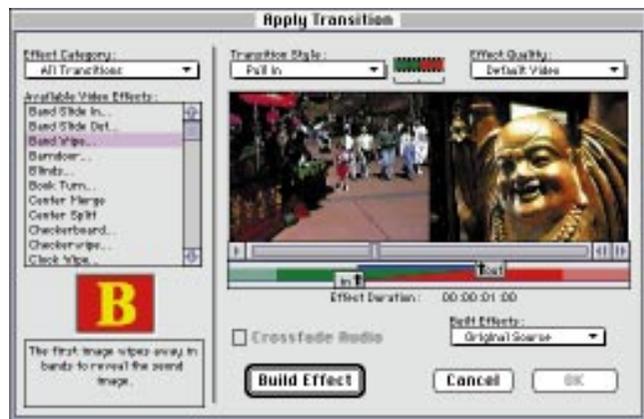
TWO APPROACHES TO TRANSITIONS:

To add a transition between two clips in Adobe Premiere (left), you drag the transition icon onto the T track of the Construction Window and then double-click on the transition tile to open the Settings dialog box, in which you can preview the results and adjust the settings. In Avid's

VideoShop (above), you select the frames in which you want the transition to appear and then click on the Apply Transition button to open the dialog box shown here. The transitions appear on the scrolling list at the left, and you can preview them in the playback window at the right.

— or strip out a movie's sound track completely and replace it with entirely new audio.

Most sound manipulation can be done with the video-editing software discussed earlier. In programs such as VideoShop and Premiere, movie sound tracks are displayed in separate audio tracks that run parallel to the video along the same frame-by-frame movie timeline. With sound and video stored in separate tracks, you can easily select and delete portions of the audio while leaving the video track untouched.

You can include multiple audio tracks in your movie. In doing so, you can combine sounds in one video clip with sounds from other clips (or from other sources entirely). Suppose the clip is a scene of your nine-year-old son's game-winning home run in the Little League championship. By using multiple audio tracks, you can mix the original sound track — the crack of the bat, the cheering crowd — with a musical fanfare on a second audio track and your own narrative on a third. When you output the final movie, all three audio tracks will blend into a single sound track.

The Mac supports sound files in several formats, among them AIFF (Audio Interchange File Format), Audio CD (for the compact discs you play on your stereo), and snd (the Mac's resource sounds). In addition, you can record sounds in QuickTime format — in essence, movies without video — with sound-editing programs such as Macromedia's SoundEdit 16. Many audio-clip collections offer sounds in a variety of formats, including QuickTime. Not all video-editing programs are equally adept at handling all these formats, though. Premiere can read all of them, but MediaFactory recognizes only AIFF sounds.

If you want to do more-elaborate audio editing — applying effects such as an echo to a sound, blending several sounds into one, or cutting and pasting snippets of sound into a new order — you'll need a specialized sound-editing package, such as Macromedia's SoundEdit 16. (Premiere has a handful of sound filters, but the number of effects is limited. Also, Multimedia Utilities includes

SoundMate, a stand-alone utility for editing 16-bit audio that includes some special sound-effects filters.)

SoundEdit 16 is a full-featured sound-editing program that supports eight sound formats and allows you to mix and blend sounds with great accuracy and high-quality results. With SoundEdit 16, you can change the overall pitch of a sound clip without changing its speed or you can change a sound clip's tempo without changing its pitch. You can make someone sound as if they're in a concert hall or speaking through the public-address system at Yankee Stadium. When you open a QuickTime movie clip, SoundEdit 16 displays the frame-by-frame video along with the sound itself (in sound-wave or spectrum form), so it's easy to find the exact point you want to edit in the sound track.

The program comes with a CD-ROM containing more than 300 sound effects you can use to augment existing sound tracks. If you're looking for an even wider (and wackier) range of sound effects to pop into your video clips, check out the CD-ROM edition of Nova Development's Kaboom ($50). It contains more than 1,000 ready-to-use sound clips, ranging from a man blowing his nose to an atomic explosion.

STEP 5: SHOWING OFF YOUR MOVIE

You've put together a movie. You've used transitions to weave scenes together, added titles, dropped in a few special effects, and added musical underscoring. It's time to show off your handiwork.

You can easily distribute your movie to other users for playback on their systems. (Remember, though, that slower Macs may drop frames, resulting in poor playback quality.) If your movie is small, you can send it to other users over a network. If it's larger, you can use Aladdin Systems' StuffIt Deluxe to split it into several files on several floppies that others can restore on their hard disks. Alternatively, you can play the movie for your audience from your Mac or project it, using an LCD panel.

Anyone can view the movie as long as they have a program that
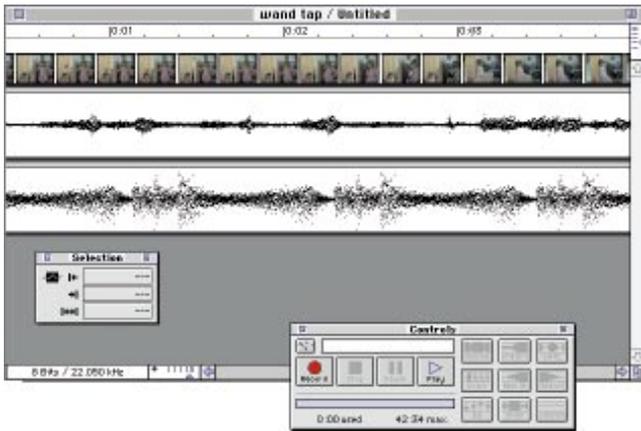
THE AUDIENCE IS LISTENING:
Open up a QuickTime movie with Macromedia's SoundEdit 16, and you can edit its audio track. You can cut and paste portions of the sound track, apply audio effects, fade sounds in or out, and add audio tracks recorded from other sources. In this example, the clip's original audio track is being combined with a musical track (visible on the bottom track) recorded in another program.

GOING INTERACTIVE:
You can combine movies to create interactive presentations that include still images, text, and music, using media-integration programs such as Gold Disk's Astound. In this example, a still shot from one video clip serves as a background for two smaller clips that play when viewers click on the appropriate buttons.

---

supports QuickTime playback. Popular programs such as Microsoft Word and ClarisWorks let you incorporate QuickTime movies into text documents. Even Apple's bare-bones SimpleText application can play back a QuickTime movie.

If you're more ambitious, you can integrate your movies into interactive presentations by using authoring programs such as Macromedia's Action or Gold Disk's Astound. Slide-presentation programs such as Microsoft PowerPoint also support QuickTime movies. With any of these programs, you can create a presentation that includes not only your movies but also still pictures (perhaps grabbed from your video clips), text, and sounds.

Finally, you can display your movie on a television or record it to videotape, so it can be played back with a VCR. To do so, you first need to convert your Mac's RGB video signal to the standard NTSC signal used by video equipment. On all AV Macs and AV Power Macs, this is a simple affair. All you have to do is connect the Mac's video-output jack to your television or VCR's video-input jack with a standard RCA-type video cable. You'll need a second cable to connect your Mac's sound-output port to the audio-input jack on your VCR or television. You also need to open the Monitors control panel and switch the output of the AV card so that it produces a television-compatible signal. With other Macs, you'll need an RGB-to-NTSC converter, such as Focus Enhancement's L-TV Pro ($299.99), in order to output your Mac's signal to a VCR or television. (The Radius Spigot II Tape card does have video output that lets you record to tape, however.)

Once the hardware is in place, you open your video-editing software and choose the Print to Video command. If you've connected your Mac to a television, your movie will play back in the middle of the television screen. If you've connected your Mac to a VCR, then not only will the movie play in the middle of your television screen but also, if you press your VCR's Record button, it will be recorded onto videotape.

Unless you've used very high-end equipment, the video you record to tape won't look nearly as smooth as your original footage — QuickTime compression will degrade the picture somewhat, and reduced frame rates will make the motion a bit less fluid. Then there's picture size: A 320-x-240-pixel QuickTime movie looks pretty decent on your desktop, but it will fill only half of a television screen.

Still, the result will be impressive, particularly considering the cost. And you'll be thrilled to see your own videos playing back on your television screen. You're making movies — real movies — on your Mac. ▲

Joseph Schorr is the resident Mac guru for a publishing company in Oregon.

DIRECTORY / vendors of video products tested

Adobe Systems
Mountain View, CA
800-833-6687
415-961-4400
415-961-3769 (fax)

Aladdin Systems
Watsonville, CA
408-761-6200
408-761-6206 (fax)

Apple Computer
Cupertino, CA
800-538-9696
408-996-1010

Avid Technology
Tewksbury, MA
800-949-2843
508-640-6789
508-640-1366 (fax)

Connectix
San Mateo, CA
800-950-5880
415-571-5100
415-571-5195 (fax)

Focus Enhancements
Woburn, MA
800-538-8865
617-938-8088
617-938-7741 (fax)

Gold Disk
Santa Clara, CA
800-982-9888
408-982-0200
408-982-0298 (fax)

Macromedia
San Francisco, CA
800-288-4797
415-252-2000
415-626-0554 (fax)

Motion Works International
Vancouver, BC
Canada
800-541-8068
415-541-9333
415-541-0555 (fax)

Nova Development
Calabasas, CA
800-395-6682
818-591-9600
818-591-8885 (fax)

Nuts Technologies
Santa Clara, CA
408-980-7800
408-980-7808 (fax)

Radius
Sunnyvale, CA
408-541-6100
408-541-6150 (fax)

Digital Dazzlers

For digital artists, special-effects software can make the difference between an unforgettable image and one that's just, well, ho-hum.

IMAGINE WHAT CEZANNE OR MAGRITTE might have created with a Macintosh and Adobe Photoshop. Granted, the great artists of the past did just fine with traditional tools — paintbrushes and canvas — but today's digital artists have, in addition to Photoshop, a virtually unlimited palette of special-effects programs at their fingertips. Whether you want to create striking still images or motion-picture masterpieces, you're sure to find the right combination of software tools that will unleash your creativity.

To help you sort through the wide array of special-effects programs currently available for the Macintosh, we've gathered them all together and organized them into four categories: Photoshop plug-ins, texture generators, QuickTime-movie-effects software, and morphing and warping tools. True, you'll find some overlap among the categories, but generally, the groupings help bring order to a crowded product field. We've rated each program and identified its strengths as well as any weaknesses, so you'll have an easier time selecting the right tools for your artistic endeavors.

BY DAVID BIEDNY AND SUSAN JANUS

PHOTOSHOP PLUG-INS

As the Mac's most popular image-processing program, Photoshop has, over the years, spawned a slew of plug-in programs that have vastly expanded its bag of tricks. The flashiest, of course, are those that take an ordinary image and transform it into something extraordinary. The plug-ins reviewed here also work from within a variety of other programs that support the Photoshop plug-in architecture, including Fractal Design Painter and Adobe Premiere.

Our all-time favorite among the plug-ins is the versatile **Kai's Power Tools,** HSC Software's collection of more than 35 filters that create special effects ranging from the traditional to the downright trippy. There's something for everyone in this package, so if you're just getting started with special effects or you can afford just one product, this is the one to buy. You'll find texture generators, fractals, noise effects, color gradations, and more.

KPT has an unusual interface, but it doesn't take long to figure out how it works. Once you do, the program makes the process of creating complex effects incredibly simple. We especially like Gradient Designer, with its real-time interactive tools for creating gorgeous-looking gradients, and Fractal Explorer, the most powerful fractal generator you'll find for the Mac. You don't have to understand math or type in numbers to generate colorful fractals. For wildly colorful effects, try using the color schemes you create with KPT's Gradient Designer in conjunction with the program's Fractal Explorer or Texture Explorer.

Another well-rounded but more classically oriented collection of artistic effects is **Adobe Gallery Effects,** which is available in Volumes 1, 2, and 3. Gallery Effects can make a photo look like a charcoal sketch or a drawing look like a watercolor. Each volume comes with 16 filters: Volume 1 includes a good selection of natural-media effects, such as Craquelure, Graphic Pen, and Spatter; Volumes 2 and 3 offer more-unusual filters, including Neon Glow and our favorite in the collection: Plastic Wrap, which makes your image look as if it is rolled in cellophane.

HSC's **KPT Convolver** is a special kind of plug-in tool. Its myriad of color and surface effects is pretty much standard Photoshop material, but what's different is that Convolver lets you view the effects of your image editing in real time *and* can apply multiple effects in one shot. With Photoshop, by contrast, you must wait as the program applies your effects one at a time. As a result, Convolver invites exploration and experimentation. It's a very intuitive tool for creating effects that require considerably more effort and planning in Photoshop.

Special effects in Xaos Tools' **Paint Alchemy** are generated by the application of unusual brush-stroke styles

BEJEWELED JOAN: To create this stunning *Joan D'ark* image, the artist doctored a scanned photograph with Adobe Photoshop and HSC's Kai's Power Tools. The ornate halo, sword, and armor were created using KPT's Gradient Designer in conjunction with Texture Explorer.

PHOTOSHOP PLUG-INS

TEXTURE GENERATORS
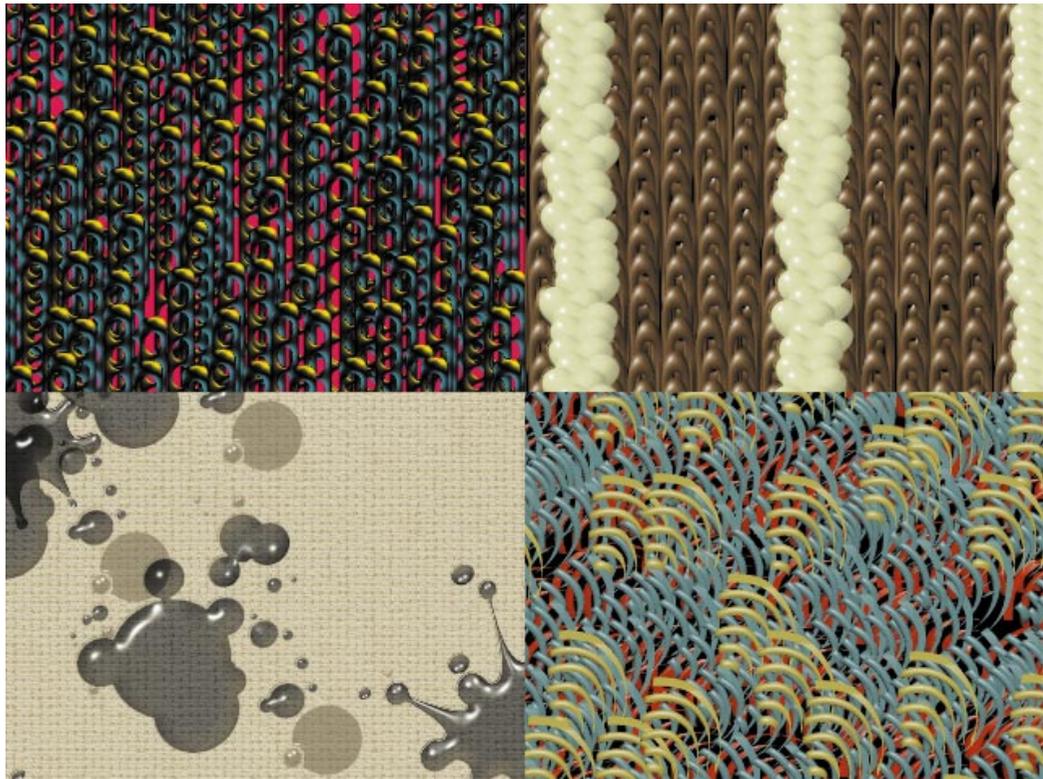
to an entire image or to selected areas within an image. The package comes with an ample supply of eye-catching preset styles, including Cotton Ball and Spatula, and you can also create your own custom brushes, using any PICT image. We came up with some very unusual results, for example, by using a brush we created from an Alien Skin Textureshop texture.

To vary the patterns created by a particular brush style, you control brush color, opacity, angle, and size. For even more variation, you can set brush styles to change according to the color and brightness level of the pixels within an image. For example, by linking the angle of a brush stroke to brightness levels, you can have Paint Alchemy apply strokes in one direction to dark areas and in the opposite direction to bright areas. For wildly unpredictable results, try randomly varying the angle, transparency, and color of your brush strokes.

There's more. You can animate Paint Alchemy's brush-stroke magic when you use Paint Alchemy from within Adobe Premiere, Adobe After Effects, or Equilibrium Technologies' Debabelizer. As brush-stroke attributes, such as angle and density, vary from frame to frame, your image will seem to take on a life of its own.

If Paint Alchemy is the Vincent van Gogh of the Photoshop-plug-in world, then Xaos Tools' **Terrazzo** is the Victor Vasarely. If you're familiar with the mathematical principle of symmetry, then you already have a pretty good idea of how Terrazzo works. The idea is simple, but the results are complex: Take any image, select an area within that image, and replicate the selection with a wealth of symmetry options. What you get is a gorgeous seamlessly tiled geometric pattern.

Terrazzo has 17 symmetry groups. Each varies both in the shape it uses to make selections and in the way it manipulates the pixels within selections to create unique patterns. When you're ready to apply your pattern to an existing image, you can also choose from a variety of modes that vary the way the pattern is applied — for example, Lighten mode applies only those pixels in the pattern that are lighter than those in your image. Terrazzo is an especially powerful tool for designing backgrounds, fabrics, and anything that calls for a kaleidoscopic pattern.

Alien Skin Software's **The Black Box** has one special-effects filter you won't find anywhere else. The Swirl filter makes your image look like van Gogh's *Starry Night.* But the Swirl filter aside, this collection gives you little more than what you get with Adobe Photoshop. Granted, by simply clicking on a button in Black Box, you can generate effects that require a bit of work in Photoshop. But overall, we found that the Black Box collection paled when compared to other packages reviewed here.

ICING ON THE CAKE: No other texture generator gives you the level of control over the texture-making process that Specular TextureScape provides. In this sample of four TextureScape textures created by Spanish artist Javier Roca, you can see how well the program handles not only realistic images, such as the chocolate icing, but also surreal creations.

TEXTURE GENERATORS

Scaly, spongy, satiny, or rough — software-generated textures can make your images look good enough to touch. We looked at all four of the texture generators available for the Mac — including KPT Bryce, best known for its 3-D landscapes. We found that although they all work in a similar fashion — by building dense rich textures, using layers of objects and effects — each has also carved out a special niche.

Most texture packages encourage playful experimentation, but if you're a graphics pro and you know what you want and how you want to create it, **Specular TextureScape** is tailor-made for you. Unsurpassed in the level of control it provides over texture composition, TextureScape lets you specify how shapes are repeated as well as their transparency, glossiness, bump height, and lighting. TextureScape also wins points with designers, because its patterns use layers of repeating PostScript shapes, allowing designers to use objects created with Adobe Illustrator or Macromedia Free-Hand as the foundation of their work.

Want to create a billboard-sized pattern based on a company logo? No problem — TextureScape textures are seamlessly tilable and resolution-independent, so you can render images at very large sizes without losing quality.

TextureScape lets you work with any number of layers, and it provides four light sources per layer. You control the direction, angle, and intensity of each light source. Because the PostScript shapes you work with are 2-D images, the program's lighting controls are essential to lending a 3-D appearance to your work.

Another plus is the ability to animate textures with a keyframe-based timeline. And TextureScape animations don't simply fade from one image to another; they *morph* between the layer parameters of each image, which makes for some interesting QuickTime effects.

Primarily for creating earthly, as well as unearthly, landscapes, HSC's **KPT Bryce** is a standout among 3-D-modeling and -rendering programs, because of its accessibility and ease of use. What's not well known, however, is that it also contains one of the most powerful texture generators you'll find for the Mac. HSC calls Bryce's "deep" texture engine its "secret area."

Bryce's complex texture-editing controls are all grouped into one window. To create a texture, you can combine as many as three layers of algorithmic effects — including fractal stone, liquids, and vortex noise — and distort them with an almost overwhelming variety of options.

But creating textures is only the beginning. By applying your textures to a simple object, such as a sphere or a cone, and then positioning Bryce's camera inside it, you can create a virtual world of rich textures. Learning to use Bryce's deep texture-editing tools isn't easy, but the results are unlike anything you can create with any other texture generator.

Virtus' **Alien Skin Textureshop** is aptly named — if you want to create a bizarre-looking skin to wrap around an invader from outer space, this is the texture package for you. And Textureshop is guaranteed to provide instant gratification; even if you've never used a texture generator before, you'll be amazed at how quickly you can churn out weird and wonderful-looking patterns.

Textureshop provides a good variety of preset textures; select one, decide how much or how little you want to vary it by moving a slider control, and click on the Mutate button. Textureshop quickly generates 15 variations. To further modify your favorite one, you can control lighting and pattern density. You can even export a grayscale bump map created from a Textureshop texture to another 3-D program and apply it to an image. When you render the image in the 3-D program, the

The van Gogh of special-effects software, Xaos Tools' Paint Alchemy can vary the type of brush style it applies according to the color and brightness level of the pixels within an image.

Xaos Tools' Terrazzo is based on the mathematical principle of symmetry. To create a pattern, you select an area within an image and Terrazzo will replicate it, using one of many symmetry options.

bump map carries over the three-dimensional quality of the original Textureshop bumpy texture.

Although using Textureshop may be frustrating if you're looking for a fine degree of control over the textures you create, its algorithms have generated some of the wildest textures we've seen. The program runs as both a stand-alone application and as an Adobe Photoshop plug-in filter.

Whereas Textureshop takes the prize for other-worldly patterns, **Adobe TextureMaker** is the master of down-to-earth organic textures. If you want to work with lapis lazuli, green marble, eucalyptus wood, fish scale, zebra skin, or fossil sandstone, for instance, TextureMaker is your best choice.

The package provides a slew of prebuilt textures that are excellent as is, but if you want to customize them, there are lots of tools for the job.

An added bonus is TextureMaker's built-in animation effects. Once you've composed a texture that's to your liking, you can apply effects such as Swaying Lights (your texture will look like the target of a nighttime LAPD helicopter search), Evolve (for a flamelike effect), and Push Through (one texture emerges from behind the foreground texture and replaces it).

QUICKTIME MOVIE EFFECTS

With the release of QuickTime 2.0 last year, Mac-based video took a quantum leap in quality. Movies were no longer scrunched into tiny postage-stamp-sized windows, and they played much more smoothly than before. Hand in hand with higher-quality video came a host of new QuickTime-movie-effects programs. Want to animate a drop shadow to create a 3-D effect? How about giving your movie the jitters so it looks as if it were made in the 1920s? In the programs described here, you'll find the tools you need in order to create these effects and many more.

The undisputed king of the hill for QuickTime movie effects is the powerful, and expensive, **Adobe After Effects.** Tailor-made for video professionals, After Effects generates results sure to please the most demanding Hollywood film mogul.

What makes After Effects so good at what it does is the wide range of effects it provides and the quality of its output. In essence, After Effects works much like Photoshop with animation capabilities. Just as with Photoshop, you work in a composition window rather than with a storyboard. You'll find tools for compositing (layering multiple movies) and for manipulating alpha channels to create masks, as well as for adding filter effects and animating effects over time. And animated effects don't have to be uniform — because the program lets you use multiple frames as markers, called keyframes, you can vary the speed of an effect, plus such properties as opacity and scale, from marker to marker — a very powerful tool. Create an animated

drop shadow, for example, that lends a 3-D effect to an image as the shadow's softness, direction, and color change.

Output quality benefits from After Effects' subpixel positioning and field rendering — playback is smooth, even for movies transferred to videotape.

Also like Photoshop, After Effects supports plug-ins. There's even an Effects Club — for $199 a year, Adobe makes available on America Online a new plug-in filter each month (for a total of 12 plug-ins).

For those who want to spend less money on a Quick-Time-effects program, Radius' **VideoFusion** is a good choice. It lacks the powerful multikeyframe capabilities of After Effects but offers several tools you won't find anywhere else. For example, you can colorize grayscale movies by applying a 256-color palette. Even more interesting is VideoFusion's ability to interpolate between two color palettes as a movie plays, so that you can take a grayscale movie and gradually "warm it up," using a palette of reds and yellows.

Best known for its ability to simulate natural media, **Fractal Design Painter 3** straddles the still-image and movie-effects categories. Previous versions of Painter introduced such still-image standouts as Glass Distortion, which makes it look as though you are viewing your image through a textured shower door or some other type of translucent distorted surface. The latest release adds tools for applying these distinctive effects to QuickTime movies. It also provides basic movie-compositing and cell-animation features.

To work its magic on an imported QuickTime movie, Painter separates it into individual frames and lets you apply any of its effects to a group of frames, which it calls stacks, or to each frame individually.

You can also create a frame stack of either empty image windows or sequentially numbered files, which makes Painter a good tool for creating cartoon animations. A plus here is the program's onion-skinning
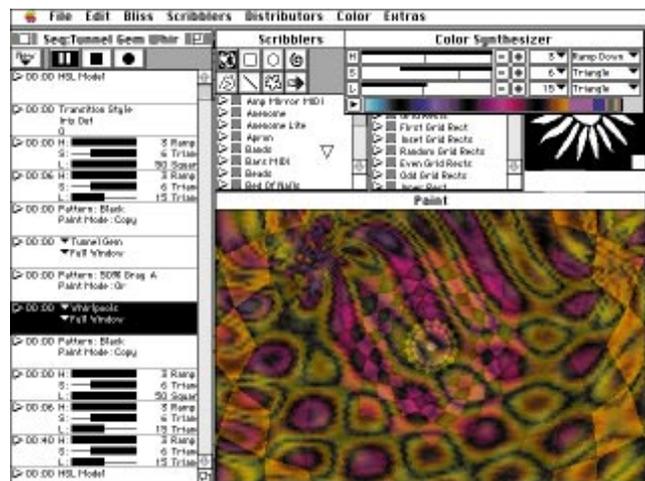
To appreciate the full effect of an animated painting created with Imaja's Bliss Paint, you really have to see the colors and patterns cycling.

LINKS: Fractal Design Painter is famous for its ability to transform images, using natural-media effects. Here, the artist has applied paint effects to a picture of a tractor tire. The latest Painter release features tools that let you apply the same kinds of effects to QuickTime movies and still images.

feature, which lets you view a sequence of frames through transparent layers — essential if you're using the image from a previous frame as the reference for creating the current frame image, as is often the case in cell animation.

Of all the animated special-effects programs we've seen for the Mac, Imaja's **Bliss Paint** takes the prize for the most "far out" effects. If you've frequented dance clubs in San Francisco or Los Angeles, you may have already "blissed out" on some of Bliss Paint's colorful animated paintings, which are projected onto screens as part of the show.

Bliss Paint paintings are psychedelic concoctions of glowing colors and pulsating patterns that bleed into one another as smoothly as ice melting into water. Truly mesmerizing. And the best part is that you can create your own animated paintings, although it takes some time to learn how.

The basic idea is that you build a sequence of paint-related events and Bliss Paint plays it to the screen as an animation. You can also save the results as a QuickTime movie. To build a sequence, you first choose brush types (Star Burst or Spiral Shell, for example), decide how you want them applied to the screen, and then select the colors you want the program's animated palette to cycle through as it applies the brushes to the screen. The number of possible variations is staggering, and the

amount of time you can spend gazing at the screen is, well, truly frightening.

QuickTime's premier digital-video-editing program, **Adobe Premiere,** also provides several noteworthy special-effects features. For starters, there are some standard Photoshop filters — distort and blur, for example — that you can animate by applying them over time, as well as several special filters — Backwards Video, Camera Blur, Ghosting, Mesh Warp, and Video Noise, for example — unique to Premiere. And then there are the transition effects — Premiere provides more than 60, including Checkerboard, Venetian Blinds, and Barn Doors.

Premiere also boasts professional-quality tools for superimposing, or playing one movie clip over another. When you superimpose one clip over another, Premiere lets you use a variety of options to create transparent areas in the top clip. For example, you can select a range of colors to be transparent or create mattes that block out areas in the image. By combining these techniques with Premiere's motion settings — panning, zooming, and rotating — it's possible to create some very sophisticated effects.

Two add-on packages for Premiere (these also work with Avid Technology's VideoShop) are Gryphon's **Dynamic Effects** and Elastic Reality's **TransJammer.** Although most of Dynamic Effects' filters are rather

MORPHING AND WARPING

routine, there is one very powerful filter that's unique to the Gryphon collection. The Tempus effect lets you create eerily distorted motion effects that make figures appear to twist and wind about themselves or other objects, as if they were made of rubber. To construct these effects, you use a grayscale image as a map for delaying, frame-by-frame, the pixel changes in a Quick-Time movie. Change delays are based on the position of each pixel relative to its counterpart in the grayscale map.

TransJammer, on the other hand, has little to offer. Including more than 100 transition effects, it seems like a good deal, but in the end, you just don't get your money's worth. About 20 effects are unique and useful; the remainder range from the silly to the gimmicky.

MORPHING AND WARPING

Derived from the word *metamorphosis,* morphing is the process of creating eye-popping effects by seamlessly transforming one image into another. A close cousin to the morphing tool is the warping tool, which is designed for distorting a single image. We've all seen the results of morphing and warping tools on TV — the man's face that gradually transforms into a chimpanzee's, for example, and the Mona Lisa who winks and smiles at you. Even if you've never used a morphing or warping tool before, you can create your own startling effects with a little effort. Here are two tips for creating good-looking morphs: Try to use two images that are similar in shape and position, and be sure to eliminate any superfluous background details in images before morphing.

Originally developed for Silicon Graphics workstations, **Elastic Reality**, from the company of the same name, brings a powerhouse of morphing and warping features to the Mac. The program really shines at morphing, offering the most-precise tools you'll find anywhere. In fact, Elastic Reality is the program of choice for professionals who require a very fine level of control over the morphing process.

To set up a morph between two images, you must first identify which areas in your start image are to morph into which areas in your end image. With the man and the chimpanzee, for example, you'd want the man's mouth to transform into the chimpanzee's. Elastic Reality lets you use Bézier curves to select these areas within images prior to morphing, which is what makes it such a precise tool.

The program also provides a graphical control in the form of a motion curve, which lets you set the rate at which a selected shape, or group of shapes, transforms into another — very powerful. What's more, you can create natural-looking or cartoonlike movement by varying the motion curve that describes the transformation. A straight linear curve describes a steady progression, and dips and bulges in the curve — created by simply clicking on parts of the curve — generate more-natural-looking results.

Once you've set up the morphing process, Elastic Reality takes over and creates all the images between your start and end images and lets you save the transformation as a QuickTime movie.

If you're new to the concept of morphing, you'll find Gryphon's **Morph** easier to learn and use than Elastic

Reality. For one thing, there are fewer controls to master. For another, it's easier to get started. With Elastic Reality, you must first set up a project and position the images you want to work with on three image rolls, which look like filmstrips. With Morph, you simply bring up your start and end images and begin making the selections that determine what features will be transformed.

The VALIS Group's **MovieFlo** is a top-notch collection of warping tools. With MovieFlo, images become putty in your hands, allowing you to create Daliesque objects or human caricatures. You might start with a photo of your best friend, for example, and click and drag on the nose to give it Jimmy Durante-style proportions. What makes MovieFlo warps look so good is that distorted areas blend in so naturally with the rest of the image. That's because MovieFlo isolates undistorted areas from distorted ones, so your friend's gigantic nose doesn't affect his mouth or eyes.

Creating simple warps with MovieFlo is easy, but you'll discover a fairly steep learning curve if you want to make use of the program's more complex tools. Support for alpha channels, multiple keyframes, and an unlimited number of layers makes MovieFlo a great tool for creating hilarious animations. You can overlay multiple movie and still images, use alpha channels to isolate elements within images, and warp each element separately. Take your friend's image, for example; overlay it with a QuickTime movie of a buzzing bee; create an animated warp that opens your friend's mouth; and have him swallow the bee while his eyes bulge out.

If you make a mistake, MovieFlo's infinite-undo capability lets you backtrack one step at a time through a single warping session or even through multiple sessions — an incredibly useful feature that you won't find in any other program.

IT'S A WRAP

When you think about it, the idea behind most special-effects software is pretty mundane. Whether you're talking about Photoshop plug-ins or texture generators, warping tools or QuickTime movie effects, all these programs work by applying an algorithm or a set of algorithms to an image. But the results are far from ordinary — in fact, they can be quite extraordinary, depending on the special-effects program you use and the skill with which you use it.

Today, Macintosh digital artists and cinematographers can choose from the richest selection of affordable special-effects software ever available — on any platform. Even novice users will find tools that are accessible enough to allow them to create eye-catching images the first time around. All you need, really, is a little imagination and a few million pixels. ▲

David Biedny has spent the last ten years creating special effects for everything from interactive kiosks and CD-ROMs to major motion pictures. Susan Janus is an executive editor at *MacUser.*

SPECIAL-EFFECTS SOFTWARE

RATING	PRODUCT	LIST PRICE	COMPANY
◑◑◑◑◑	Adobe After Effects	$1,995	Adobe Systems, Mountain View, CA; 800-833-6687 or 415-961-4400; 415-961-3769 (fax)
◑◑◑◑✳	Kai's Power Tools	$199	HSC Software, Carpinteria, CA; 800-472-9025 or 805-566-6200; 805-566-6385 (fax)
◑◑◑◑	Adobe Premiere	$795	Adobe Systems, Mountain View, CA; 800-833-6687 or 415-961-4400; 415-961-3769 (fax)
◑◑◑◑	Elastic Reality	$350	Elastic Reality, Madison, WI; 800-642-4122 or 608-273-6585; 608-271-1988 (fax)
◑◑◑◑	Fractal Design Painter 3	$499	Fractal Design, Aptos, CA; 800-297-2665 or 408-688-8800; 408-688-8836 (fax)
◑◑◑◑	KPT Bryce	$199	HSC Software, Carpinteria, CA; 800-472-9025 or 805-566-6200; 805-566-6385 (fax)
◑◑◑◑	KPT Convolver	$199	HSC Software, Carpinteria, CA; 800-472-9025 or 805-566-6200; 805-566-6385 (fax)
◑◑◑◑	MovieFlo	$549	The VALIS Group, Tiburon, CA; 800-825-4704 or 415-435-5404; 415-435-9862 (fax)
◑◑◑◑	Specular TextureScape	$199	Specular International, Amherst, MA; 800-433-7732 or 413-253-3100; 413-253-0540 (fax)
◑◑◑✳	Adobe Gallery Effects	$149	Adobe Systems, Mountain View, CA; 800-833-6687 or 415-961-4400; 415-961-3769 (fax)
◑◑◑✳	Adobe TextureMaker	$199	Adobe Systems, Mountain View, CA; 800-833-6687 or 415-961-4400; 415-961-3769 (fax)
◑◑◑✳	Alien Skin Textureshop	$99	Virtus, Cary, NC; 800-847-8871 or 919-467-9700; 919-460-4530 (fax)
◑◑◑✳	Bliss Paint	$80	Imaja, Albany, CA; 800-294-6252 or 510-526-4621; 510-559-9571 (fax)
◑◑◑✳	Morph	$149	Gryphon Software, San Diego, CA; 800-795-0981 or 619-536-8815; 619-536-8932 (fax)
◑◑◑✳	Paint Alchemy	$199	Xaos Tools, San Francisco, CA; 415-487-7000; 415-558-9886 (fax)
◑◑◑✳	Terrazzo	$199	Xaos Tools, San Francisco, CA; 415-487-7000; 415-558-9886 (fax)
◑◑◑✳	VideoFusion	$399	Radius, Sunnyvale, CA; 800-227-2795 or 408-541-6100; 408-541-5765 (fax)
◑◑◑	The Black Box	$89	Alien Skin Software, Raleigh, NC; 919-832-4124; 919-832-4065 (fax)
◑◑◑	Dynamic Effects	$199	Gryphon Software, San Diego, CA; 800-795-0981 or 619-536-8815; 619-536-8932 (fax)
◑	TransJammer	$99	Elastic Reality, Madison, WI; 800-642-4122 or 608-273-6585; 608-271-1988 (fax)

LISTING IS ALPHABETICAL WITHIN GROUPS OF EQUAL MOUSE RATINGS.

FAST DRIVES, LOUD
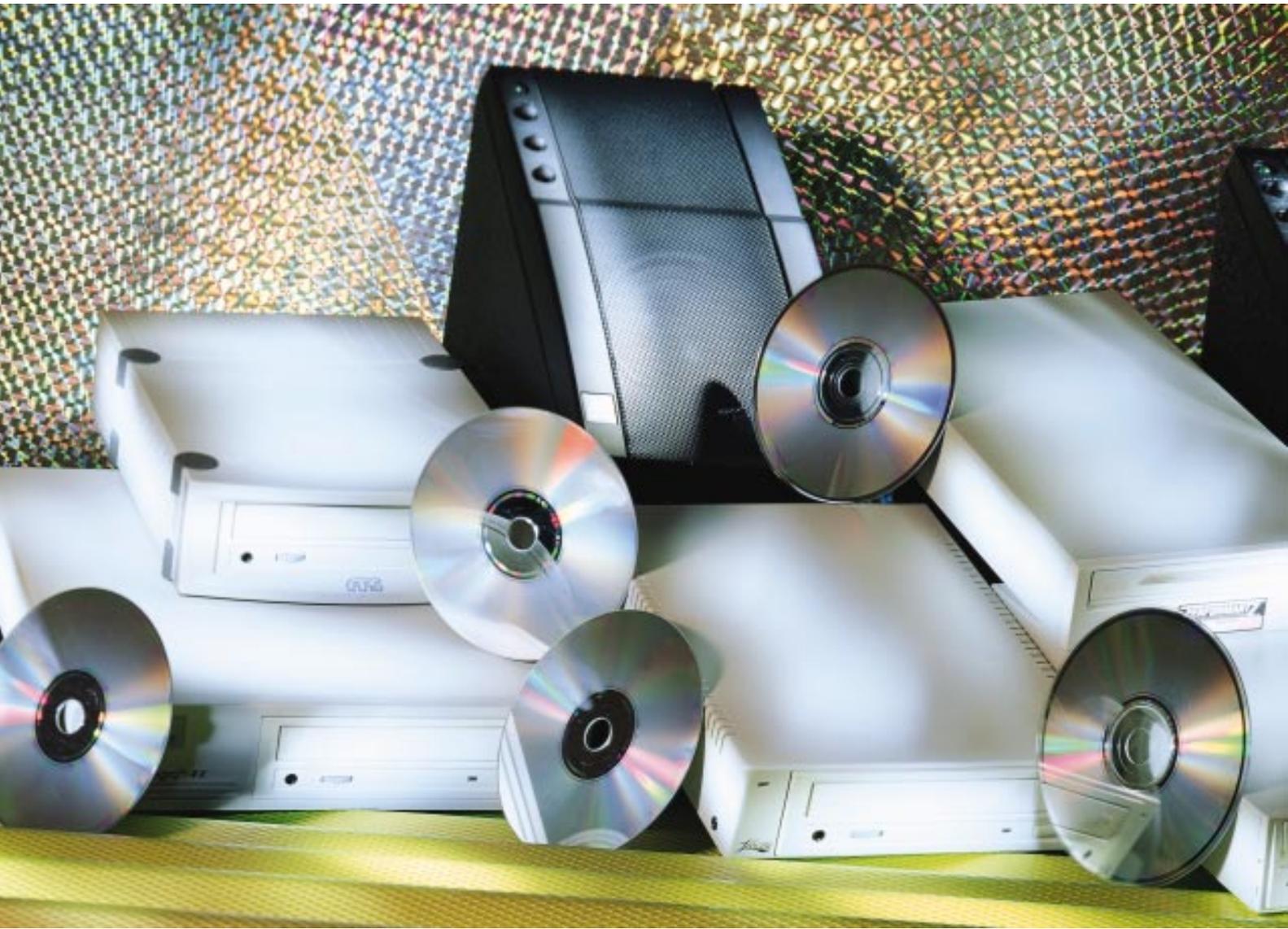
Rev up multimedia with high-speed
CD-ROM drives and hi-fi sound.

SPEAKERS

BY JIM SHATZ-AKIN

S HOPPING FOR A CD-ROM DRIVE? Welcome to the generation gap. CD-ROM drives are between eras: Double-speed (2x) drives, which have been standard issue in most Macintoshes for more than a year, will start their long ride into the sunset in the coming months, as quadruple-speed (quad-speed, or 4x) drives become the built-in standard on Apple Power Macs. What's more, CD-ROM drives rated at 6x have arrived on the scene, hinting at ever speedier future standards.

Will faster drives really boost performance when you use those sluggish older discs in your library? Should you pony up for a 6x drive, or with 2x drives doing a fine job with the thousands of CD-ROMs floating around today, should you skip the new models and shop for bargains as prices on 2x drives plummet?

In order to answer these and other questions about the latest crop of CD-ROM drives, MacUser Labs tested 24 drives — five 2x models, eleven 4x models, five 4.4x drives (which have motor speeds 10 percent faster than those of conventional quad-speed drives), and three 6x drives. We put these drives to work on three real-world-application tests as well as on our MacBench 2.0 CD-ROM Mix benchmark test. Recognizing that a good product requires more than raw speed alone, we also evaluated each drive's design, construction, and documentation and the company's customer support. You can see our findings

THE BOTTOM LINE

TRANSFER RATE — as in 2x, 4x, and 6x — doesn't tell the whole story about CD-ROM speed, and speed isn't all to look for in a drive. Speed in real-world tests, plus software quality, customer support, and price, should guide your decision. Here's how we rated the drives we tested.

✓ / OUTSTANDING   ✎ / ACCEPTABLE   ✎ / POOR

RATING	PRODUCT	PRICE	SPEED	SUPPORT	CASE
⬤⬤⬤⬤✳	**Apple AppleCD 600e Quad-Speed**	✎	✎	✎	✓

BEST BUY — Apple's upcoming desktop standard, the AppleCD 600e Quad-Speed (estimated street, $349), balances convenience with speed, and the company's outstanding manuals and improved customer support should give comfort to even the most nontechnical users.

RATING	PRODUCT	PRICE	SPEED	SUPPORT	CASE
⬤⬤⬤⬤✳	**APS T 3601**	✎	✎	✓	✎

BEST BUY — Affordable and fast, the APS T 3601 ($350 direct) topped the chart in our MacBench 2.0 CD-ROM Mix test and performed admirably in our application-based tests. A competitive price combined with excellent customer-support services turn this speedy drive into a true value.

RATING	PRODUCT	PRICE	SPEED	SUPPORT	CASE
⬤⬤⬤⬤	Liberty 115 CD 4X	✎	✓	✎	✓
⬤⬤⬤⬤	MacProducts Magic 3501	✎	✓	✎	✎
⬤⬤⬤⬤	MacZone Performantz Quad Speed	✓	✎	✎	✎
⬤⬤⬤⬤	Media Vision ReNO Portable CD-ROM Player	✓	✎	✎	✎
⬤⬤⬤⬤	NuDesign 4X	✓	✎	✎	✎
⬤⬤⬤⬤	Optical Access CD/Allegro 440	✎	✓	✎	✓
⬤⬤⬤✳	DGR 3501	✎	✎	✎	✎
⬤⬤⬤✳	DynaTek CDS 654	✎	✎	✓	✎
⬤⬤⬤✳	FWB hammerCD 6X Reader	✎	✓	✎	✓
⬤⬤⬤✳	MacProducts Magic 3601	✎	✎	✎	✎
⬤⬤⬤✳	MegaHaus Mac3601X	✎	✎	✎	✎
⬤⬤⬤✳	Mirror 4X CD-ROM Drive	✎	✎	✎	✎
⬤⬤⬤✳	Plextor 4Plex 256	✎	✎	✓	✎
⬤⬤⬤✳	Spirit Spin 4X	✓	✎	✎	✎
⬤⬤⬤	MegaHaus MacPX63CSX	✎	✎	✎	✎
⬤⬤⬤	MicroNet MBR-7	✎	✎	✎	✎
⬤⬤⬤	NEC MultiSpin 6Xe	✎	✎	✎	✎
⬤⬤⬤	PDQ Plextor	✎	✎	✎	✎
⬤⬤⬤	Spirit Spin 2X	✓	✎	✎	✎
⬤✳	Chinon CDA-535	✎	✎	✎	✎
⬤	MegaHaus MacSH254SX	✓	✎	✎	✎
⬤	Panasonic LK-MC509S	✓	✎	✓	✎

LISTING IS ALPHABETICAL WITHIN GROUPS OF EQUAL MOUSE RATINGS.

---

in a nutshell in "The Bottom Line." But read on for the sometimes surprising details and for a shopping guide to speakers that will set you on your ear (see the "Blasting on a Budget" sidebar).

Two, Four, or Six Times What?

The high capacity of CD-ROMs lets them store gobs of data that take great advantage of the Mac OS' multimedia capabilities. Historically, however, the one thing CD-ROM drives have lacked has been snappy speed. Users are constantly looking for ways to boost speed (of everything), so the promise of a new generation of faster CD-ROM drives has set hearts aflutter. As you'll see in our speed-test results, however, using a faster-class drive doesn't always translate into quicker playback. To understand why — and whether the latest crop of drives will rev up the discs in your library — it's useful to understand what factors contribute to speed in the CD-ROM realm.

Speed classes of CD-ROM drives — dual-speed, quad-speed, and so on — are expressed in terms of data-transfer rate: The first CD-ROM drives Apple shipped for the Mac transferred data to the Mac at a top rate of 150 kilobits per second (kbps). Subsequent generations of drives have had their speed expressed in multiples of that rate: 2x drives can transfer data at 300 kbps, and 6x drives can transfer data at 900 kbps, for example. (Note that all CD-ROM drives still slow to 150 kbps for playing audio CDs.)

Keep in mind that stated transfer rates are theoretical, best-case figures (think of EPA gas-mileage estimates). The real speed you'll see with your applications (and that we measure in our tests) is a function of three factors: drive-motor rotational speed, access time, and driver efficiency.

Rotational speed and access time are inherent in a given drive's *mechanism,* the sealed housing inside the drive case that contains the drive motor, its controller circuitry, and the laser and associated optics for reading CD-ROM data. Rotational speed — how fast a drive motor spins a disc — is directly proportional to how quickly the drive can move data in a continuous stream from a CD-ROM to the Mac's hard disk. Except for video clips or large Photo CD files, however, data on a CD-ROM is rarely read in long, continuous streams. It's often scattered around the disc, in multiple files at multiple locations — and that's where access time becomes important.

On a CD-ROM drive, accessing data entails four steps: looking up a target file's location in a disc directory, moving the laser-focusing optical head to that physical location on the disc and simultaneously adjusting the drive-motor spin rate to allow the head to read the data accurately, and reading the data once the block has moved into position in the laser beam. (CD-ROM data is organized in equal-sized physical blocks arranged in a

spiral that is divided into eight tracks, or bands, so the outer bands contain more blocks than the inner ones. Each block must pass over the laser at a fixed speed in order to be read accurately, so motor speed is adjusted on the fly to prevent blocks on outer bands from passing through the beam faster than those on inner bands.)

Despite using the same mechanisms, many of the drives tested had significantly differing speeds. These differences are attributable to the software drivers supplied with the drives and their ability to *cache* data efficiently. The driver software allocates a portion of your computer's system RAM for temporary storage of data taken from a CD-ROM. Because the Mac OS can retrieve data far faster from RAM than it can from disc, caching can boost data-retrieval speed significantly. Except for the Apple, Chinon, MicroNet, and Panasonic models, all the drives we tested shipped with drivers that create RAM caches. (Note: Don't confuse driver

Winners and Losers / *drawing the line between fast and slow*

A CD-ROM drive can never be too fast — but it can be too slow. To test each drive's speed, we ran it through a series of real-life trials. First, we timed how long each drive took to open a Photo CD image stored on a commercial clip-art disc (Digital Stock's Business and Industry collection), to find out how well the drive processes large, continuous streams of data. Next, we timed a word search in the Grolier Multimedia Encyclopedia, a test that indicated how quickly a drive is able to access random information. Finally, we timed how long each drive took to move from one page to another in an interactive book (Sumeria's Exploring Ancient Cities), to gauge the drive's overall speed.

In addition to our real-life tests, we ran our MacBench 2.0 CD-ROM Mix test on each drive. This test repeatedly performs a variety of tasks, using several popular CD-ROM titles. A high score on this test signifies a drive that offers efficient caching. MacBench 2.0 scores are relative to those of a Quadra 630 with a double-speed AppleCD 300i CD-ROM drive, which is assigned a score of 10.

We tested all the drives with a Power Mac 6100/66 and with their default driver settings. For all drives that shipped with version 1.5.1 or later of FWB's CD-ROM ToolKit, we also performed the tests with the Continue Caching option turned on. The drives are listed here in order of overall performance.

Photo CD Open
For this test, we timed how long it took to open a 2.3-MB Photo CD image. For a test in which a drive's rotational speed counts heavily, it's fitting that two 6x drives led the pack.

Encyclopedia Search
Drives that have fast access times excel at searching for information scattered randomly on a disc. We timed how long each drive took to find every instance of the word *electronic.*

Page Turn
To test a variety of factors that contribute to a CD-ROM drive's speed, we scooted from one page on a disc to another in an interactive book and timed how long it took to move between pages.

MacBench 2.0 CD-ROM Mix
The MacBench 2.0 CD-ROM Mix test highlights a drive's caching abilities. This test repeatedly transfers a variety of files from popular CD-ROM titles between the CD-ROM drives and the Mac.

	Photo CD Open	Encyclopedia Search	Page Turn	MacBench 2.0 CD-ROM Mix
	SLOWER	SLOWER	SLOWER	BETTER
Optical Access CD/Allegro 440	23.9	17.5	6.9	21.9
FWB hammerCD 6X Reader	22.6	18.1	7.9	22.2
Liberty 115 CD 4X	23.9	17.6	7.5	27.9
MacProducts Magic 3501	25.6	17.9	7.2	25.9
MegaHaus MacPX63CSX	25.7	17.9	7.4	27.5
✓**APS** T 3601	23.9	19.5	7.9	41.9
DynaTek CDS 654	23.5	20.2	7.7	34.9
MegaHaus Mac3601X	25.9	18.2	7.5	21.2
DGR 3501	25.9	18.3	7.5	19.6
NEC MultiSpin 6Xe	23.2	19.1	9.4	31.9
MacProducts Magic 3601	26.2	18.2	7.4	20.4
✓**Apple** AppleCD 600e Quad-Speed	24.2	18.6	10.2	18.9
PDQ Plextor	25.2	19.5	8.5	19.5
Plextor 4Plex 256	25.1	19.5	8.5	19.9
NuDesign 4X	24.4	20.4	8.8	16.2
Mirror 4X CD-ROM Drive	24.8	20.5	9.0	16.3
MacZone Performantz Quad Speed	27.7	18.1	8.5	21.6
Spirit Spin 4X	24.5	20.5	10.8	15.4
Media Vision ReNO Portable CD-ROM Player	25.8	22.6	8.5	12.4
MegaHaus MacSH254SX	32.4	29.9	14.4	12.9
Spirit Spin 2X	33.4	26.5	17.8	8.6
MicroNet MBR-7	37.4	24.5	15.9	9.7
Chinon CDA-535	52.7	22.1	12.2	11.1
Panasonic LK-MC509S	*	23.1	13.2	12.6
CONTINUE CACHING ON †				
Liberty 115 CD 4X	22.7	18.6	7.8	54.7
FWB hammerCD 6X Reader	22.8	19.6	7.9	45.4
Plextor 4Plex 256	23.9	20.3	8.4	37.1
PDQ Plextor	24.1	20.4	8.5	36.6
NuDesign 4X	23.3	21.0	8.8	32.7
Mirror 4X CD-ROM Drive	23.1	21.1	9.7	33.1
	0 30 60	0 15 30	0 10 20	0 30 60
	TIME IN SECONDS	TIME IN SECONDS	TIME IN SECONDS	SCORE

✓ MacUser BEST BUY
■ Best performer in each test.
*The Panasonic LK-MC509S could not open our Photo CD test image.
†Only drives that ship with FWB's CD-ROM ToolKit 1.5.1 or later have this option.

caches with 256K hardware caches. These memory chips — attached to the drive mechanism and used to store data as it is read from the disc, for quick handoff to the Mac OS — cannot be user-adjusted.)

Versions 1.5.1 and later of FWB's CD-ROM ToolKit driver give you the option of creating a disk cache to supplement the RAM cache: If you turn on the Continue Caching option in the driver, CD-ROM ToolKit will allocate 3 MB of space on your hard disk for storage of data from the CD-ROM. Data transfers from hard disks aren't as fast as those from RAM, but they're still much faster than those directly from CD-ROM. FWB warns that using this option can result in choppy QuickTime-movie playback, and our testing confirms this. However, use of
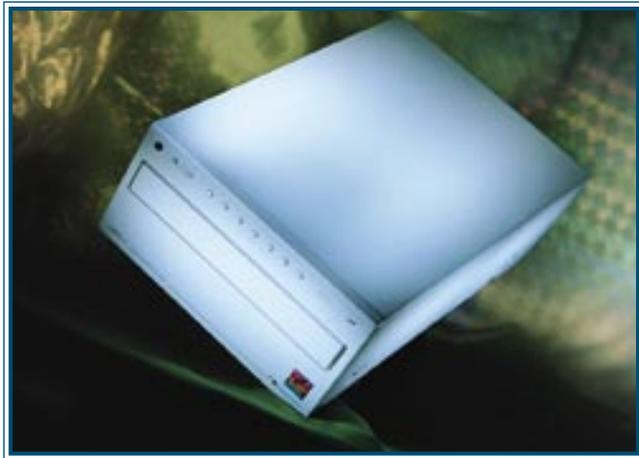
Different strokes for different folks — users who prefer fingertip convenience to high-speed data access will appreciate the MicroNet MBR-7's ability to mount up to seven discs simultaneously on the Mac desktop.

the Continue Caching option did boost performance by as much as 104 percent in our MacBench 2.0 CD-ROM Mix test, which is extremely caching-sensitive. (The Continue Caching option was turned off by default on the drives we received, but because it has such a dramatic effect, we also tested the drives that ship with version 1.5.1 or later of FWB's driver with this option turned on.)

The effectiveness of caching depends not just on the size of the cache the driver creates but also on the driver's efficiency in supplying data in appropriately sized chunks for the application software requesting the CD-ROM data. Adobe Photoshop, for example, requests data in relatively large chunks, whereas QuickTime-playing applications ask for data in tiny chunks. For optimal CD-ROM performance, a driver should be able to hand off chunks in the size appropriate for the particular application you're using and should be able to create a cache tuned to optimize that handoff process.

However, doing so is tricky because there's typically no way to know the chunk size a given application uses. FWB's CD-ROM ToolKit driver — supplied with the

FWB, DynaTek, Liberty, Media Vision, Mirror, Nu-Design, PDQ, and Plextor drives — and CharisMac's AutoCache driver — supplied with the DGR and MacProducts drives — provide menus that allow you to select among many popular applications so that the driver will use optimally preset data-chunk sizes. You can also set AutoCache's namesake autocaching feature to look at the data-chunk size of each CD-ROM application the driver encounters and adjust chunk size accordingly. (Using AutoCache is easier than selecting a custom setting for each application, but it's a bit slower than using application-specific settings.) CD-ROM ToolKit and AutoCache also let you hand-tweak cache-size settings for particular CD-ROMs and then save them as preference files on your hard disk. Although this alternative requires tricky tuning and *may* be more trouble than it's worth, once you've saved them, the settings will be used by the CD-ROM drive each time you load a given disc.

Casa Blanca Works' DriveCD driver, supplied with the NEC MultiSpin 6Xe, lacks title-specific cache- and chunk-size settings, but it automatically adjusts chunk sizes on the fly, depending on the application you're using. SuperCache, the driver supplied with the Optical Access CD/Allegro 440, also adjusts the cache (and helped the drive place first in two of our tests), but it doesn't let you make manual adjustments. On the other hand, the Spot CD driver, supplied with the MegaHaus drives, lets you adjust RAM-cache size, but it doesn't save settings.

Just Testing

To gauge how effectively each drive and its driver work together for typical tasks, we conducted three application-based tests. Opening a 2.3-MB Kodak Photo CD image from a commercial clip-art disc (Digital Stock's Business and Industry collection) provided a good measure of a drive's ability to process long, continuous streams of data, since photo images are read as single large files, in large chunks. Searching an electronic encyclopedia (the Grolier Multimedia Encyclopedia) for every instance of the word *electronic* tested the efficiency of a drive's data-access ability. And turning a page in an interactive book built with the popular Macromedia Director application (Sumeria's Exploring Ancient Cities) required the drives to access a new page file on the disc and then transfer it to the Mac for display on-screen.

In addition to conducting application-based tests, we also subjected the drives to our MacBench 2.0 CD-ROM Mix test suite, which gauges overall drive performance in a way that no single CD-ROM application can ordinarily do: By calculating how efficiently a drive can hand off multiple files of various types, in numerous chunk sizes, the CD-ROM Mix test replicates the data-transfer patterns of a variety of CD-ROM applications.

Read the Fine Print / a close look at what you're really getting — or not

Smart decisions are always based on solid research, so before you shell out the cash for the fastest CD-ROM drive on the market, take a gander at what your money is really buying you.

We've found that some small accessories can spare you huge headaches in the long run. Tray loading mechanisms avoid the hassles of bulky caddy devices and make inserting CD-ROMs as simple as listening to a CD by your favorite band. Additional AC outlets add value to any drive by cutting through the cable undergrowth that can spring up under your desk from multiple daisy-chaining. Extra outlets save space on your power strip. And don't overlook the warranties and money-back guarantees, which can keep you from losing your money — as well as your mind.

	LIST PRICE	ESTIMATED STREET PRICE	MECHANISM	SPEED	TRAY LOADING MECHANISM	AUXILIARY AC OUTLETS	SWITCHABLE TERMINATION	MONEY-BACK GUARANTEE	TOLL-FREE TECH SUPPORT	WARRANTY
❀ **Apple** AppleCD 600e Quad-Speed	$349	$349	MKE (proprietary)	4x	✓	✓		✓*	✓	1 year
❀ **APS** T 3601	$350	$350	Toshiba XM-3601	4.4x	✓		✓	✓	✓	1 year
Chinon CDA-535	$399	$349	Chinon CDS-535	2x		✓	✓	✓	✓	1 year
DGR 3501	$439	$399	Toshiba XM-3501	4x		✓	✓†	✓	✓	1 year
DynaTek CDS 654	$599	$499	Plextor PX-4XCS	4x		✓		✓	✓	5 years
FWB hammerCD 6X Reader	$849	$799	Plextor PX-6XCS	6x	✓			✓		1 year
Liberty 115 CD 4X	$549	$549	Toshiba XM-3601	4.4x	✓			✓		1 year
MacProducts Magic 3501	$379	$379	Toshiba XM-3501	4x		✓		✓	✓	1 year
MacProducts Magic 3601	$399	$399	Toshiba XM-3601	4.4x	✓	✓	✓†	✓	✓	1 year
MacZone Performantz Quad Speed	$298	$298	Toshiba XM-3501	4x				✓	✓	1 year
Media Vision ReNO Portable CD-ROM Player	$349	$290	Reno X2A	2x		✓	✓			1 year
MegaHaus Mac3601X	$379	$379	Toshiba XM-3601	4.4x	✓		✓	✓		1 year
MegaHaus MacPX63CSX	$619	$619	Plextor PX-6XCS	6x	✓		✓	✓		1 year
MegaHaus MacSH254SX	$289	$289	Sanyo CRD-254S	4x	✓		✓	✓		1 year
MicroNet MBR-7	$499	$450	NRC MBR-7	2x	✓		✓	✓*		1 year
Mirror 4X CD-ROM Drive	$349	$349	NEC CDR-511	4x				✓	✓	1 year
NEC MultiSpin 6Xe	$599	$589	NEC CDR-502	6x			✓		✓	2 years
NuDesign 4X	$399	$399	NEC CDR-511	4x				✓*		1 year
Optical Access CD/Allegro 440	$479	$449	Toshiba XM-3601	4.4x	✓		✓	✓	✓	1 year
Panasonic LK-MC509S	$399	$299	Matsushita 503		✓		✓		✓	2 years
PDQ Plextor	$499	$429	Plextor PX-4XCS	4x		✓		✓		1 year
Plextor 4Plex 256	$449	$405	Plextor PX-4XCS	4x		✓			✓	2 years
Spirit Spin 2X	$199	$179	NEC CDR-210	2x	✓	✓		✓	✓	1 year
Spirit Spin 4X	$299	$299	NEC CDR-511	4x	✓			✓	✓	1 year
❀ MacUser BEST BUY	*Varies with dealer.			†Optional.						

A high score on the CD-ROM Mix test signifies efficient caching.

In general, when we used default driver settings, our findings did little to recommend the 6x drives, which garnered top honors in just one of our four tests — the throughput-intensive Photo CD-open test. Even then, although the FWB hammerCD 6X Reader and the NEC MultiSpin 6Xe placed first and second, respectively, in the Photo CD-open test, neither beat the third-place 4x DynaTek CDS 654 by more than a fraction of a second. (Note that the Panasonic LK-MC509S failed this test entirely, being unable to open the Photo CD image.) The 4.4x drives, which all have a Toshiba XM-3601 mechanism, were winners on the remaining three tests: The Optical Access CD/Allegro 440 placed first in both the encyclopedia-search and the electronic-book page-turn tests, edging out the competition by fractions of a second, and the APS T 3601 drive dominated the MacBench 2.0 CD-ROM Mix test, taking a 20-percent lead over its closest rival, the 4x DynaTek CDS 654.

The 6x drives' solid, if unspectacular, speed-test results gave our veteran lab testers a sense of déjà vu: Back when they tested the earliest generation of quad-speed CD-ROM drives ("Built for Speed," December '94, page 76), they found that double-speed drives that had good drivers had an edge over their ostensibly faster competitors. They believed then, and surmise still, that driver developers need time to optimize their code to squeeze full speed out of new mechanisms. In addition, they point out that most of today's discs were mastered for optimal playback on double-speed drives.

Battle for the Cellar

Although no single class of drives dominated the top speed ranks, there was a clear trend at the other end of the scale, where four 2x drives vied valiantly with the 4x MegaHaus MacSH254SX for last place. This MegaHaus drive, the only drive we tested that had a Sanyo mechanism, finished dead last in the encyclopedia-search test and consistently joined the double-speed Spirit Spin 2X, MicroNet MBR-7, Chinon CDA-535, and Panasonic LK-MC509S drives in the bottom fourth of the field. The Media Vision ReNO Portable CD-ROM Player and its custom-tuned version of FWB's CD-ROM ToolKit driver

Blasting on a Budget
Speakers to jazz up your Mac.

UNTIL APPLE CREATES A SCRATCH-AND-SNIFF MAC, multimedia will be confined to sight and sound. In the past, the visual half of this bisensual media has been admirably addressed by 24-bit color and huge monitors, whereas the aural chores have been left to the Mac's single, puny speaker. No longer. Modern Macs feature stereo output and 16-bit sound. But, to really experience the *multi* in multimedia, you should invest in a pair of personal stereo speakers.

To help you in your search, we tested 12 personal stereo speaker sets you're likely to find at a computer outlet, electronics store, or mail-order house. We couldn't test every model you might pull off the shelf, including some quality, low-cost speakers from Acoustic Research, Altec Lansing, and Cambridge SoundWorks (see review, May '95, page 59), but we did round up a sample of several popular brands to start you looking in the right direction.

Excluding the pricey Advent Powered Partners AV570 speakers, which cost a whopping $399 per set, all the speaker sets we tested cost $200 or less, some much less. Most personal speakers were small in size as well as in price, petite enough to sit cozily next to your computer or hang off your monitor with the aid of brackets. All the speakers also contain special shielding that keeps them from causing the image on your monitor's screen to jiggle.

After noting these similarities, we plugged the speakers in, turned 'em up, and cocked a keen ear at them. We then turned them around to check for the kinds of add-on doodads that make a multimedia experience more convenient and enjoyable. Here's what we found.

The Sound of Music
Listen, and then look. When shopping for speakers to jazz up your Mac system, sound quality should be your primary concern. Our tests revealed that most of the speakers, except for the Advent Powered Partners AV570, can't handle a throbbing bass line. To add boom to these boxes, you need to include a larger external speaker called a subwoofer. Fortunately, because bass frequencies are nondirectional, you can place a subwoofer anywhere in the general vicinity of your computer — under the desk is ideal — and save that valuable tabletop real estate for a picture of your dog.

All bass aside, in our subjective listening tests, the Advent Powered Partners AV570 speakers were tops in sound quality; the Jensen JPS45 speakers ($149) ran a close second. Both sets of speakers boasted a well-balanced sound spectrum. Even better, these speakers, along with the Koss HD/100 units ($99.99), passed the Can You Tell Which Beethoven Symphony We're Blasting Across The Building? test; at high volume, their sound came across crisp and clear. The ViewSonic VS127 set ($149) and the Sony CSS-B100 and SRS-PC50 speakers ($129.95 each set) paled in comparison, falling short in both presence and power.

Toning Up
Many of the speakers we tested attempt to make up for poor bass response through tone controls. These are the little knobs and wheels that boost or cut the low and high frequencies. Although most personal speakers offer only a single control, we much prefer the more flexible systems that include separate bass and treble tuners. The Jensen JPS45 units, the Labtec LCS-1400 speakers ($179.95), and the NEC Audio-Tower Speaker System ($99) have just such dual controls. Coincidentally, they also feature balance controls that allow you to adjust the sound distribution coming from each speaker.

Speakers sporting a single tone control include the Monster Design MacSpeaker MS-1 ($199.95) and the Sony CSS-B100 and SRS-PC50 sets. Of these, only the Sony CSS-B100 speakers actually boost the bass frequencies. The others contain a control that filters the treble frequencies (making the high end brighter or duller).

Even less appealing than single controls are the inflexible preset boost buttons on the Koss HD/50 ($49.99) and HD/100 speakers. Although the Koss products turned out generally well-balanced tunes, the bass button substantially muddied the sound and the treble boost added an irritating hiss and seemed harsh. Apple, however, takes all the fun out of fine-tuning by offering no tone controls whatsoever on its AppleDesign Powered Speakers ($139) and Powered Speakers II ($85). Sometimes less is better, but not in this case.

You Gotta Have Connections
Unlike stereos, Macs offer audio aficionados only one sound-output jack to connect two speakers. Personal speakers get around this supply-and-demand problem by using various wiring schemes to split the Mac's stereo signal evenly between the left and the right speaker. Generally this involves a stereo RCA- or mini-plug input on one speaker and a similar mono-output jack to connect the two speakers. However, some unfortunate exceptions exist.

The AppleDesign Powered Speakers force you to connect both speakers with home-stereo cables. Similarly, the AppleDesign Powered Speakers II and the Koss HD/50 and Sony SRS-PC50 sets lock you in to using flimsy wires to connect the two speakers to each other by permanently attaching a wire to one of the speakers. Although this hardwiring scheme makes it impossible to lose the connecting cable, it also means you're handcuffed to whatever less than robust cable the manufacturer doles out. If you move your speakers around much, the cables may eventually break.

However, broken stereo cables don't compare to the nightmare you'll experience if anything happens to the five-pin cable that connects your ViewSonic VS127 speakers to each other. Replacements for these specialized cables can be extremely difficult, if not impossible, to come by.

Bigger than a bread box, the looming Advent Powered Partners AV570 speakers dwarf the Sony SRS-PC50 speakers in size — and in sound quality. Most personal speakers range comfortably between the two in both categories.

Jacks Are Better

When it comes to connectivity, the watchword is *convenience*. When you're setting up a speaker system that uses both the Mac's internal sound and sound from a device such as an external CD-ROM drive, it's nice if you can plug both the Mac and the drive directly in to the speakers, thus avoiding a trip to Radio Shack for stereo Y-cables. (Y-cables funnel sound to your speaker system through one wire that branches out to two sources.) Before deciding on a speaker set, check for an additional input jack that will allow you to plug in both your Mac and another sound source without employing a middleman. The Apple, Koss, NEC, Sony SRS-PC50, and View-Sonic systems each offer extra inputs.

Headphone jacks on the *front* of the speaker are also convenient. Why is location so important? Plugging headphones in cuts off the speakers' external sounds, so you might be plugging and unplugging your headphones frequently. A design — such as that of the Jensen, Monster Design, and NEC units — that forces you to paw your way blindly behind the speaker in search of the headphone jack is just plain stupid. Smart, full-frontal jacks reside on the Apple, Koss, Labtec, and ViewSonic systems. The Sony speakers wimp out, having no headphone jacks at all.

One final note on connections: Except for the NEC Audio-Tower Speaker System and the Advent Powered Partners AV570 speakers, the speakers we tested come with modular power supplies — known derisively in the electronics business as *wall warts.* Look for the least obtrusive of these, which place the blocky power adapter in the middle of the cable and a regular AC plug at one end. With this method, the wart doesn't occupy two or three outlets on a power strip.

A Time to Buy

When it comes right down to it, you should opt for the speakers that sound the best and fit within your budget. If you're torn between two great-sounding systems, decide which system offers the most audio control with the least amount of headache. In our testing, the Jensen JPS45 speakers blew past the competition in terms of sound quality and add-on features combined. But if you don't believe us, go see and hear them for yourself. / Christopher Breen

The dual bass and treble tuners that grace the front of the Jensen JPS45 speakers offer greater audio control and increased sound quality for true music lovers.

## Turn 'em Up or Tune 'em Out / *sound-quality tests*

Listen before you leap when scouting for new speakers, but also take a look at what you'll be hearing. We tested 12 systems to find out how consistently they reproduced sound over the varying frequencies that fall within the human hearing range (20 to 20,000 hertz). Our results are shown here, numbered from best to worst. The volume of each speaker at 1,000 hertz, where human hearing is most sensitive, is given the value 0. The volume at all other frequencies is shown relative to that value.

Test results show that better speakers follow the straight-and-narrow line. A perfect speaker would show a straight line from 20 to 20,000 hertz at the 0 level. In other words, bass and treble would sound equally loud, even though they're at opposite ends of the dial. Lines that stray above or below the 0 mark represent a respective increase or decrease in volume.
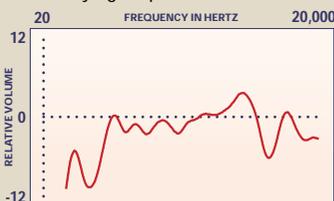
1 Advent Powered Partners AV570
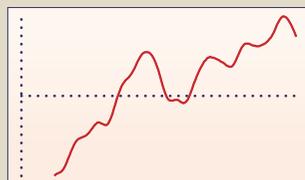
2 NEC AudioTower Speaker System

3 Jensen JPS45
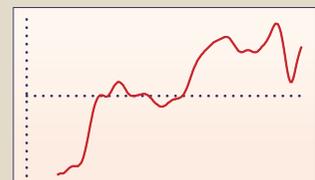
4 Labtec LCS-1400
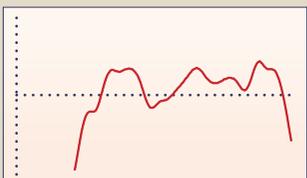
5 Apple AppleDesign Powered Speakers

6 Koss HD/100
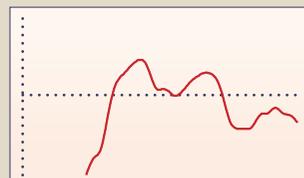
7 Apple AppleDesign Powered Speakers II
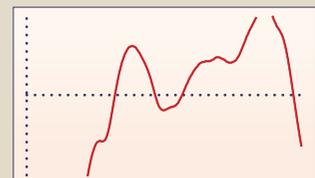
8 Koss HD/50
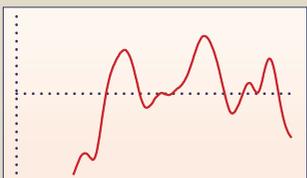
9 ViewSonic VS127
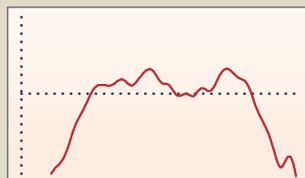
10 Sony SRS-PC50
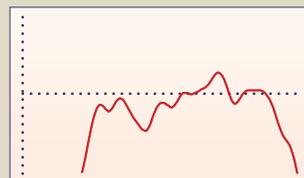
11 Sony CSS-B100

12 Monster Design MacSpeaker MS-1

proved that 2x drives shouldn't be consigned to the antique shop just yet: It dipped into the bottom quarter of the field on our cache-sensitive CD-ROM Mix and in the access-time-intensive encyclopedia-search test but ranked respectably in the middle of the pack in the other two tests.

Designs on Convenience

Although speed is the most important buying consideration with CD-ROM drives, remember that you'll be working (or playing) with your drive every day and convenience counts. Envision where you intend to place the drive, and make sure its controls will be easily accessible in that position. Test drives before you buy, noting any difficulty you have locating buttons, reading indicators, or inserting or removing discs. A small inconvenience today can grow into a long-term hassle over years of use.

Many vendors of CD-ROM drives claim that their drives are portable, but only the Media Vision ReNO Portable CD-ROM Player tested positive for true grab-it-and-go efficiency. Standard AAs or a rechargeable battery pack keep your player powered up away from your desk.

Once you're comfortable with the basic controls, there are a few additional items to look for. A headphone jack and audio jacks that allow you to connect to a stereo amplifier or powered speakers are handy for audio-CD playback and for using multimedia titles. An eject button that lets you retrieve discs when your computer is off (or crashed) is also useful. Every drive we tested, except the feature-poor (and sluggish) MegaHaus MacSH254SX, offered these essentials.

Top among the optional-but-great features is a motorized disc tray, which eliminates the need for caddies, always used with earlier-generation drives. (If you've invested in lots of caddies for your CD-ROM library, you may want to forgo this feature, but for us, caddy-lack meant a luxury drive.) Other pleasant extras include switchable termination, which eliminates the need for external SCSI terminator blocks, and an extra AC outlet on the case.

Special Cases

A couple of drives differed significantly from the standard desktop-box design. The MicroNet MBR-7 is a 2x drive with a special built-in disc changer that lets you insert seven discs into the drive and keep all of them mounted on your Mac desktop at the same time: Click on one of the disc icons, and the MBR-7 changer locates that disc and inserts it into the drive. It reads only one disc at a time, and we saw a noticeable lag whenever we selected a new disc, but it took far less time than swapping discs on a conventional player. The MBR-7 performed near the bottom in our speed tests, however, and setting its SCSI ID requires the use of DIP switches, which is annoying. But we really like the ability to keep frequently used discs, such as dictionaries and phone directories, available at all times. We hope to see this changer technology built in to a faster drive sometime soon.

Another unique design is available in the Media Vision ReNO Portable CD-ROM Player, the only truly portable drive we tested. It can run off four standard AA batteries or an optional rechargeable nickel-cadmium battery pack, and its player mechanism can be detached from its SCSI-connected base for use as a portable audio-CD player. (Even with the base attached, the ReNO player is compact enough to fit in a briefcase for portable use; its enormous AC power adapter weighs about as much as the drive itself, though.) The ReNO player comes with a good set of headphones, but its flimsy case didn't seem rugged enough for rough portable use. What's more, it has nonstandard SCSI-2-type connectors that require special cables for use on most systems; Media Vision supplies a 25-pin adapter cable, which is fine if you want to hook the ReNO player directly to a desktop system but which is less ideal for daisy-chaining to the 50-pin connectors on most other SCSI devices. A 30-pin PowerBook cable is available as an option from Media Vision.

Avoid Manual Labor

Setting up a CD-ROM drive isn't terribly difficult, even for adamant non-nerds, but for many folks, it's their first-ever installation of an external SCSI device, and that's naturally anxiety-inducing. That's why the documentation that comes with a drive is critical: A clear step-by-step hardware-setup guide, with Mac-specific photos and/or illustrations and a little SCSI background for the curious, is optimal. The vendor's tech-support number should also figure prominently in the guide's pages, for occasions when the good book isn't quite enough. The software manual should also be clear and should cover even esoteric driver functions clearly, with plenty of screen shots to help.

The manuals supplied by Apple, Mirror, and Spirit are especially approachable and easy to navigate, with good indexes and troubleshooting guides. At the other

extreme are MegaHaus' manuals, which are poorly organized and mix info for Macs and PCs in a confusing way, and Liberty's single-sheet hardware-setup guide, which offers little help to neophytes. FWB, whose CD-ROM ToolKit documentation is excellent, surprised us with a generic, outdated SCSI-device manual for the hammerCD 6X Reader.

Before you settle on the drive that has all the features you crave, consult the fine print on the warranty card and make sure the vendor will be there for you when you need a helping hand: A 30-day money-back guarantee helps guard against the rare lemon, and a generous warranty protects you against future failures. A one-year warranty is de rigueur these days, but things are improving: NEC, Panasonic, and Plextor offer a warranty of two years, and DynaTek earns kudos for offering a five-year warranty.

So Which One?

After scrutinizing these drives carefully and putting them through our battery of tests, we determined that 6x drives show a lot of promise but aren't ready — or necessary — for daily use, unless you need to open enormous files day in and day out. The data-transfer behavior of today's discs and the capabilities of current driver software don't take advantage of a 6x drive's massive throughput potential. That will undoubtedly change, and by then, you won't have to pay the current premium of about 50 percent for new-on-the-block technology.

The 4.4x drives, which all use a Toshiba XM-3601 mechanism, impressed us favorably with their speed in our series of tests. Among them, the APS T 3601 offers the best all-around value. Its Power Tools driver apparently limited its speed in the encyclopedia-search and the electronic-book page-turn tests, but it demonstrated superb caching ability in our MacBench 2.0 CD-ROM Mix test. And its price is competitive with the prices of slower, less feature-rich 4x drives. A close contender for our top honors is the Liberty 115 CD 4X, an impressive 4.4x drive that consistently wound up in the top fourth of our speed-test ranks. Its documentation is sparse, but if you need a desktop drive that can take some abuse — if you frequently travel with one to trade shows or meetings, for example — paying the extra price for its rugged metal case could be worthwhile.

The Apple 600e Quad-Speed also earns our recommendation for its balance of respectable speed, good features, and solid documentation. Apple will be using the internal version in the upcoming Power Macs, so if you're thinking of getting a new Power Mac, you can rest assured that one with a built-in CD-ROM drive will be a safe investment.

Finally, a couple of drives deserve honorable mention for addressing nonstandard user needs. The Media Vision ReNO Portable CD-ROM Player had only middling

Directory / vendors of products tested

CD-ROM DRIVE VENDORS

Apple Computer
Cupertino, CA
800-538-9696
408-996-1010

APS Technologies
Kansas City, MO
800-235-2753
816-483-6100
816-483-3077 (fax)

Chinon America
Torrance, CA
800-441-0222
310-533-0274
310-533-1727 (fax)

DGR Technologies
Austin, TX
800-347-8739
512-892-4070
512-892-4455 (fax)

DynaTek
Bedford, NS
Canada
800-267-6007
902-832-3000
902-832-3010 (fax)

FWB
San Francisco, CA
415-325-4392
415-833-4653 (fax)

Liberty Systems
San Jose, CA
800-774-5044
408-983-1127
408-243-2885 (fax)

MacProducts USA
Austin, TX
800-347-8739
512-892-4070
512-892-4455 (fax)

MacZone
Bellevue, WA
800-248-0800
206-603-2400
206-603-2500 (fax)

Media Vision
Fremont, CA
800-845-5870
510-770-8600
510-770-8648 (fax)

MegaHaus
Dickinson, TX
800-786-1185
713-534-2630
713-534-6580 (fax)

MicroNet Technology
Irvine, CA
800-800-3475
714-453-6100
714-453-6101

Mirror Technologies
Edina, MN
800-654-5294
612-830-1549
612-832-5709 (fax)

NEC Technologies
Boxborough, MA
800-388-8888
508-264-8000
508-635-4666 (fax)

NuDesign Engineering
Edina, MN
800-762-3531
612-832-5622
612-832-5709 (fax)

Optical Access
Woburn, MA
800-433-5133
617-937-3910
617-937-3950 (fax)

Panasonic
Secaucus, NJ
800-742-8086
201-392-4500
201-392-4792 (fax)

PDQ
Santa Clara, CA
800-737-7462
408-727-2600
408-727-2435 (fax)

Plextor
Santa Clara, CA
800-886-3935
408-980-1838
408-986-1010 (fax)

Spirit
Marlborough, MA
800-494-0499
508-787-1300
508-787-1301 (fax)

SPEAKER VENDORS

Advent
Lincolnshire, IL
800-477-3257
798-317-3700
708-317-3836 (fax)

Apple Computer
Cupertino, CA
800-538-9696
408-996-1010

Jensen
Lincolnshire, IL
800-323-0707
708-317-3700
708-317-3836 (fax)

Koss
Milwaukee, WI
800-872-5677
414-964-5000
414-964-8615 (fax)

Labtec Enterprises
Vancouver, WA
360-896-2000
360-896-2020 (fax)

Monster Cable Products
San Francisco, CA
415-871-6000
415-871-6592 (fax)

NEC Technologies
Boxborough, MA
800-388-8888
508-264-8000
508-635-4298 (fax)

Sony Electronics
Park Ridge, NJ
800-222-7669
201-930-1000
201-358-4058 (fax)

ViewSonic
Walnut, CA
800-888-8583
909-869-7976
909-468-3756 (fax)

speed in our tests, but it was by far the fastest 2x drive we tested and held its own with many of the 4x models. Its unique, portable design isn't for everyone and we don't recommend taking it to the beach for playing audio CDs, but consider getting one if you need an easy-to-carry drive. And if you're willing to trade speed for the convenience of multiple-disc access, consider getting a MicroNet MBR-7. ▲

Jim Shatz-Akin is a *MacUser* associate editor. Senior project leader Kristina De Nike supervised the testing for this report.

QUICK LABS

• Best-Yet Monitors • Stackable Hard Drives
• Superhigh-Resolution Printers

Conventional wisdom has it that hardware just keeps getting better. After three months of testing the newest printers, hard drives, and monitors, we can tell you that conventional wisdom generally holds. The group of products we tested for this month's Quick Labs includes a monitor that scored an all-time Quick Labs high for image quality and a hard drive that broke the Quick Labs record by scoring more than 9.0 on MacBench 2.0's Disk Mix test. We also evaluated a high-end, feature-rich printer that produces photographic-quality 1,200-dpi output — and at a price that many offices can afford.

But, alas, the news isn't all good — we found a couple of losers in the group of products we tested this month. In years past, these products might have fared well, but in these days of rising expectations, they just didn't make our cut. You'll find them noted in the individual sections, along with our reasons for disliking them, which include poor quality, poor price, or poor performance or a combination of all three.

TWO NEW WORKGROUP PRINTERS

We used to be satisfied with printers that offered 300 dpi. Not anymore. Now we want printers that can print 600 dpi and even 1,200 dpi, such as the two we tested this month.

In our tests, the 1,200-dpi Dataproducts Typhoon 8 produced perfectly smooth, crisp text, even with type as tiny as 6 points. Photographic images were stunningly realistic, with smooth grayscale ramps, rich blacks, and full shadow detail. The printer's impressive assortment of high-end features includes the ability to print full-bleed 11-x-17-inch images, a 250-sheet universal paper tray (a 500-sheet paper tray is optional), and a SCSI port for a hard drive. Serial, parallel, and LocalTalk ports are standard; Ethernet is optional, as is a PostScript fax modem. A nifty "virtual printer" feature lets you set up the Typhoon 8 as though it were several network printers — handy for offices in which various groups of users need certain settings for their print jobs.

The Lexmark Optra R (pictured) produced good grayscale output and superb text. The Optra R can print simple images at 1,200 dpi in its default configuration and complex images (such as grayscale photos) if you add 8 MB of RAM. Still, the Optra R's output at 1,200 dpi does not come close to that of a high-end printer such as the Typhoon 8. The Optra R can print on legal-sized paper and comes with a 200-sheet paper tray. Serial and parallel ports are standard; Ethernet is optional. An optional 40-MB hard drive can store fonts. Like most other workgroup printers, the Optra R can print from Macs and PCs over a network.

To test speed and output quality, we printed pages of text, line art, and grayscale graphics. We timed the printers producing a variety of documents, from simple files that print quickly to complex ones that print slowly, and weighted the results to reflect everyday usage.

REVIEWER / CHERYL ENGLAND TESTING / JIM GALBRAITH

✓ / OUTSTANDING ✐ / ACCEPTABLE ✐ / POOR	ESTIMATED STREET PRICE	RESOLUTION	WARRANTY	TEXT QUALITY	GRAPHICS QUALITY	PAPER HANDLING	SUPPORT	COMMENTS	PAGES PER MINUTE
Dataproducts Typhoon 8	$5,199	1,200 dpi	1 year	✓	✓	✓	✓	Feature-rich printer produces photographic-quality images.	
Lexmark Optra R	$1,800*	1,200 dpi	1 year	✓	✐	✐	✓	Best used as a 600-dpi printer. Disappointing output at 1,200 dpi.	

*Price as tested includes 8 MB of additional RAM.

This month's group of hard drives sports something for everyone — well, *almost* everyone. About the only thing you can't find is a hard drive that costs under $500.

La Cie's sporty Joule system (pictured) lets you stack many storage devices, such as hard drives, tape drives, and optical drives, in a tower. The base unit has a power supply and a hard-drive module. (You can get any storage device La Cie offers configured as a base unit.) Joule modules snap on top of the base unit, without extra cables. You can also get Joule modules with a portable dock that lets you move one hard drive from office to home. The only minus is that you can buy stackable components only from La Cie. You can daisy-chain peripherals to the Joule system, so if La Cie doesn't offer a storage device you want, you can attach another vendor's product.

The drives we tested from Spin and MaxConcept are stand-alone units, not systems. The Spin drives still come in a funky, curved case with a splashy purple bezel. The MaxConcept FH-M9050e is a large, heavy, shoe-box-sized 9-GB drive. The drives from both these vendors were well constructed, but those from Spin won our hearts, thanks to their great prices, fast speeds, and good software.

We tested drive speed by using MacBench 2.0. The results are relative to that of a 250-MB Quantum IDE drive in a Quadra 630, which has a score of 10.

REVIEWER / CHERYL ENGLAND TESTING / KRISTINA DE NIKE

✓ / OUTSTANDING ✎ / ACCEPTABLE ✎ / POOR	ESTIMATED STREET PRICE	FORMATTED CAPACITY	PRICE PER MEGABYTE	WARRANTY	CASE	SOFTWARE/ MANUALS	SUPPORT	COMMENTS	MacBench 2.0 Disk Mix Score
⬤⬤⬤⬤✷ **La Cie** 4300MB Joule FH Module	$1,599	4,097.9 MB	$.39	5 years	✓	✎	✓	The most cost-effective Joule-system module we received.	
⬤⬤⬤⬤✷ **Spin** Atlas 2GB	$1,099	2,048.3 MB	$.54	5 years	✎	✎	✓	A low price for 2 GB of storage. Comes in a small, light, colorful case.	
⬤⬤⬤⬤✷ **Spin** Atlas 4GB	$1,599	4,061.4 MB	$.39	5 years	✎	✎	✓	A basic drive with a great price and a splash of purple on its case.	
⬤⬤⬤⬤ **La Cie** 1000MB Joule HH Module	$899	1,049.5 MB	$.86	5 years	✓	✎	✓	Like the other Joule modules, this one includes a portable dock.	
⬤⬤⬤⬤ **La Cie** 2000MB Joule Base	$1,369	2,048.1 MB	$.67	5 years	✓	✎	✓	The base module of a sleek, stackable system.	
⬤⬤⬤⬤ **La Cie** 2200MB Joule HH Module	$1,309	2,101.2 MB	$.62	5 years	✓	✎	✓	Yet another in the Joule series — a stackable 2-GB module.	
⬤⬤⬤✷ **MaxConcept** FH-M9050e	$3,850	8,662.4 MB	$.44	5 years	✎	✎	✎	Big and slow, like most 9-GB drives, but a good price per megabyte.	

LISTING IS ALPHABETICAL WITHIN GROUPS OF EQUAL MOUSE RATINGS.

Scale: 0 — 5 — 10 BETTER

Today's best bargains are 17-inch monitors. This month we found two we liked — the Radius PrecisionView 17 (pictured) and the Princeton Ultra 17. The PrecisionView 17 offers superb image quality: sharp text and rich colors on a neutral grayish-white background. The Ultra 17's image quality isn't as top-notch as the PrecisionView's, but the text and colors it produces are easy on the eyes and the price is compelling. Both monitors have intuitive controls, although the PrecisionView has the edge in ease of use and completeness.

If you're looking for a high-end monitor, check out the Nanao FlexScan F2•21. This monitor boasts flexible, programmable controls you can set from either the front panel or an on-screen menu. We also liked this monitor's color-calibration software, Colorific. The FlexScan F2•15's controls are less flexible than those of its larger sibling, and the lower resolution makes text look less sharp.

Both the ViewSonic 17GS and the Goldstar 1727 scored relatively low in our image-quality tests. The ViewSonic 17GS might have earned more mice had its price been lower, but nothing could have upped the Goldstar 1727's rating in our estimation. Relatively poor image quality was topped by indecipherable on-screen, menu-driven controls that blinked off after only five seconds.

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

REVIEWER / CHERYL ENGLAND TESTING / MARTIN WONG

✓ / OUTSTANDING ✎ / ACCEPTABLE ✎ / POOR	ESTIMATED STREET PRICE	SCREEN SIZE	MAXIMUM RESOLUTION	WARRANTY	MANUALS	SUPPORT	CONTROLS	COMMENTS	IMAGE-QUALITY SCORE
⬤⬤⬤⬤ **Nanao** FlexScan F2•21	$1,975	21 in.	1,280 x 1,024 pixels	3 years	✎	✓	✓	Software for adjusting color makes this a great DTP monitor.	
⬤⬤⬤⬤ **Radius** PrecisionView 17	$950	17 in.	1,024 x 768 pixels	1 year	✓	✎	✓	A crowd-pleaser. Sharp text, rich colors, intuitive controls.	
⬤⬤⬤✷ **Princeton** Ultra 17	$600	17 in.	1,280 x 1,024 pixels	2 years	✎	✎	✎	Bargain hunters will like both the price and the image quality.	
⬤⬤⬤ **Nanao** FlexScan F2•15	$580	15 in.	1,024 x 768 pixels	3 years	✎	✓	✎	Great specs and reasonable image quality but awkward controls.	
⬤✷ **ViewSonic** 17GS	$795	17 in.	1,280 x 1,024 pixels	3 years	✎	✓	✎	Not a bad monitor, but you'll easily find better bargains.	
⬤ **Goldstar** 1727	$750	17 in.	1,280 x 1,024 pixels	2 years	✎	✎	✎	Blurry text and annoying controls. Look elsewhere.	

LISTING IS ALPHABETICAL WITHIN GROUPS OF EQUAL MOUSE RATINGS.

Scale: 0 — 1.0 — 1.7 BETTER

GET INFO / **Dataproducts** 703-648-0930 **Goldstar** 201-816-2000 **La Cie** 503-520-9000 **Lexmark International** 606-232-2000 **MaxConcept** 714-727-0377 **Nanao USA** 310-325-5202 **Princeton Graphic Systems** 714-751-8405 **Radius** 408-541-6100 **Spin Peripherals** 508-787-1200 **ViewSonic** 909-869-7976

PHOTOGRAPHY / JACKSON VEREEN

PAGE LAYOUT /

PageMaker Enters Second Decade

Version 6.0 taps color publishing as a key feature.

A DECADE AGO, Aldus PageMaker helped initiate the desktop-publishing revolution. On its ten-year anniversary, the venerable application (now owned by co-DTP revolutionary Adobe Systems) is looking to regain its position as the page-layout program of choice. Adobe PageMaker 6.0 offers a number of long-desired features that bring it to parity with QuarkXPress, such as multiple master pages, and some snazzy new ones, such as support for Kodak's Precision color-management system, direct import and sharpening of Photo CD files, and an HTML plug-in for preparing Internet files.

Design Enhancements. You won't see too many obvious changes in PageMaker 6.0, although its tool bar, which now appears vertically on the left side of the screen, contains two new tools: a magnifying glass and a polygon tool. But there are several nifty new features, such as the ability to use a PageMaker-drawn object (not text, alas) as a mask for graphics, which means you don't have to crop or keyline images. Its direct support and sharpening of Photo CD images is a great time-saver, and a hot link allows you to launch Photoshop by double-clicking on an image. Important additions to the Colors palette allow users to specify a color of None, quickly apply tints of existing colors to any object, and remove unused colors from the palette.

Layout Plaudits. In addition to allowing up to 256 master pages per document, PageMaker 6.0 sports several flexible new layout features — many of which were previously available only as plug-ins — such as user-definable grids and object grouping, locking, and alignment. Stacked objects retain their order even when lower layers are selected, and new commands allow you to send objects forward and backward one layer at a time. Nonprinting objects can be assigned to pages, making it easier to add production notes and indicate FPO images. After listening to user feedback, Adobe revived PageMaker's Table Editor for creating tables.

Publishing Pluses. Most of PageMaker's key new features fall in the area of color publishing. In addition to integrating Kodak's sophisticated color-management technology (which may prove to be more widely accepted than the EFIcolor solution built in to QuarkXPress), PageMaker also supports Pantone's Hexachrome standard, which allows HiFi Color printing in more than four process inks. RGB files can be converted into CMYK files within PageMaker. The much lauded TrapMaker Plug-in is built in to the program, and the Save for Service Bureau Plug-in helps prepare files for output.

Adobe is trying to differentiate PageMaker from rival QuarkXPress by staking out new territory for PageMaker. Online publishers will like the ability to convert PageMaker files to HTML, the language of the World Wide Web, as well as the ability to create Adobe Acrobat files via a new PDF Plug-in. Oh yeah: Version 6.0 lets you convert QuarkXPress documents into PageMaker 6.0 files. $895; upgrade from Version 5.0, $150. 800-628-2320 or 206-622-5500. / Pamela Pfiffner
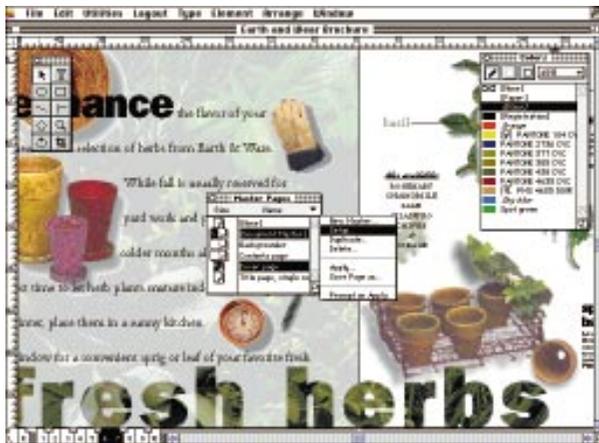
DISPLAYS /

Radius Revamps Big Monitors with Super Resolution

VIEWING COLOR IMAGES can be cramped even on a 20-inch display, but thanks to 1,600-x-1,200-pixel support on all Radius 21-inch monitors, you can work more quickly without panning or scrolling. Radius' new line of Super Resolution monitors includes the MultiView 21, PrecisionView 21, and PressView 21SR, each targeted at graphic artists who need lots of screen real estate.

For all-purpose work, the $2,199 Multi-View 21 offers a sharp .25-dot-pitch CRT with multiple resolutions, from 640 x 480 to 1,600 x 1,200 pixels, and on-screen controls for adjusting contrast, brightness, and the like.

For those who are in need of better color fidelity, the $2,749 PrecisionView 21 uses an aperture-grille CRT that supports higher-frequency display cards that provide a resolution of up to 1,600 x 1,200 pixels, resulting in a more stable picture.

For color professionals and Photoshop wizards, the $3,999 PressView 21SR offers all the features of the less expensive PrecisionView 21 model plus special software and hardware to calibrate the display for near-perfect color matching. With the PressView 21SR, Radius is now shipping an enhanced hardware-display calibrator and special Photoshop filters, for CMYK files, that create an accurate simulation of standard press results, including SWOP-standard output for coated and uncoated papers as well as 3M Matchprints. 408-541-6100. / Sean J. Safreed

SCANNERS /

Linotype-Hell's Scanning Gem

LONG SYNONYMOUS with professional prepress and publishing, Linotype-Hell is reaching down to the desktop with a new, affordably priced color scanner that's packed with color-savvy features.

Expected to cost less than $4,000, the Saphir scans in 30-bit color at an optical resolution of 600 x 1,200 dpi, with software interpolation to 2,400 x 2,400 dpi. Thanks to its built-in transparency unit, it scans transmissive art as large as 8.2 x 10 inches and reflective art as large as 8.3 x 11.7 inches.

The Saphir ships with an impressive array of software, including a PowerPC-native, pared-down version of Linotype-Hell's professional color-correction and -separation software. LinoColor Lite is compatible with Apple's ColorSync 2.0 color-management software — which Linotype-Hell helped develop — and is based on the universal CIE LAB color model, which helps ensure color consistency across various devices. Users can scan directly into CMYK or RGB format with LinoColor Lite or use its ScanLite plug-in for RGB scanning into Adobe Photoshop, the full version of which is bundled with the scanner. For greater productivity, Lino-Color Lite also supports batch scanning.

Users can automatically adjust images by using LinoColor Lite's Color Assistant feature or manually correct colors by specifying values for luminance, chroma, and hue — a more intuitive color model than RGB or CMYK, according to the company, although users can elect to correct in CMYK.

For even faster color matching, Linotype-Hell sells the MacCTU NuBus card for accelerating color transformations. Currently priced at less than $2,000, MacCTU will be available as a PCI card soon. 516-434-2000. / PP

GRAPHICS TABLETS /

Wacom Pens Scribe and Erase

DIGITAL PENS and graphic tablets make drawing on the computer a lot like the real thing, except that you can't flip the digital pen to erase your mistakes. But thanks to Wacom's new Erasing UltraPen and revised line of tablets, you can erase mistakes as quickly as you make them.

The Erasing UltraPen now ships with Wacom's line of ArtPad II and ArtZ II tablets, which range in size from 6 x 8 inches to 18 x 25 inches. What sets this pen (also sold separately for $90) apart is the addition of an eraserlike button at the end of the pen. When you flip the pen over, compatible painting and illustration software actually erases an area rather than creating a line or laying down color. In word processors or spreadsheet software, the eraser can select and delete text blocks in one stroke.

Wacom's ArtZ II tablets also support tilt sensitivity, something other tablets have had for a while. ArtZ II users can make better use of painting tools in programs such as Fractal Design Painter, which vary the shape of the brush tip on-screen as the pen tilt changes. The Erasing UltraPen's eraser also responds to the tilt of the pen, making erasing more accurate and natural.

Other new Wacom pens include hybrid models that contain actual ink nibs or pencil lead in their tips, so you can switch between sketching on paper and drawing on the computer. Also available are pens tuned for handwriting and point-and-clicking. All the pens are $125 each.

The ArtPad II has a retail price of $175. Prices for the ArtZ II series start at $389 for the 6-x-8-inch ADB model and go up to $2,450 for the 18-x-25-inch model. 360-750-8882. / SJS

The Photo Shop

FOR PHOTOSHOP NOVICES, making cool effects often means learning complex steps and channel operations. What you really want is a filter that can create the desired effect with easy-to-use sliders. Alien Skin's **The Black Box 2.0** does just that. The latest release includes better slider controls and interactive previews of effects for the original six filters (Drop Shadow, HSB Noise, Glass, Glow, Outer Bevel, and Swirl) and for

the four new filters (Inner Bevel, Carve, Cutout, and Motion Trail). For easier experimentation, most of the filters take advantage of layers in Photoshop 3.0. 919-832-4124. ♦ One of Photoshop's most used features is its masking capability. Artists who do lots of compositing in Photoshop will like Human Software's **AutoMask 2.0** Plug-in, which lets you quickly silhouette RGB or CMYK images by simply selecting a color and clicking on a button. The filter requires only 8 MB of dedicated RAM, which, considering Photoshop's appetite for RAM, makes using AutoMask an efficient option. $295. 408-741-5101. ♦ Applying all those cool filters is fun, but bringing Photoshop files into QuarkXPress means saving them in TIFF or EPS format first — and that means losing time and Photoshop 3.0's editable layers, among other things. Now the aptly named **Photoshop Import XTension** lets you import CYMK, RGB, and grayscale Photoshop files directly. It requires QuarkXPress 3.3. $79. Available from XChange (800-788-7557 or 303-225-2484). ♦ If you'd rather have a mini-Photoshop within QuarkXPress, check out PictureWorks' **ImageEditor.** This $249 XTension gives you tools found in most image-editing applications, such as the magic wand, eyedropper, smudger, and so on. It supports the TIFF, PICT, and Photoshop EPS/DCS formats. Any changes made to the preview file automatically update the source file. A separate $149 ImageEfxts XTension gives you Photoshop-like filters in QuarkXPress. Also sold through XChange. / SJS and PP

ESSENTIAL TECHNIQUES / BY BRIAN P. LAWLER

The Resolution Solution

Are you scanning your images at the right resolution? Here's how to find the best resolution for your projects.

DIGITAL IMAGES ARE ELASTIC. They can be made large or small and still work perfectly — within limits. The risk is in either enlarging *too much* or reducing *too much.* If you enlarge an image too much, it will be visibly pixelated. If you scale it too small, you're packing an excess of information into a space, with no visible benefit, wasting time and money. That's why you need to pay particular attention to the resolution of your images. You should scan or modify them to be the right size for the purpose.

But what's the right resolution at which to scan an image? And how do you know if a scanned image will look good printed at a given size?

Blame Prof. Nyquist

Determining the scanning resolution for an image is one of the more controversial aspects of desktop publishing. The oft quoted "2:1 rule" says that the resolution at which you scan an image needs to be *twice* that of your final line screen. If, for instance, you print at 133 lines per inch (lpi), you should scan images at 266 pixels per inch (ppi). Pretty straightforward, right?

But a breakaway faction of publishers has found an alternative to the hallowed 2:1 rule. You need to understand a couple of basic equations, but the results will be as good and the files will be dramatically smaller than those of images scanned by using the 2:1 ratio.

Where did this 2:1 rule come from, anyway? It can be traced to a theorem by Professor H. Nyquist, who worked on the mathematics of signaling systems in the 1920s. He found that the strength of a transmitted signal needs to be *no more than* twice the noise level to be effective. He was correct for *telegraphy,* but what about for printed halftones?

Let's examine the 2:1 "rule" for the ratio of pixels to halftone lines. For the purposes of this story, *lpi* refers to the frequency of the printed halftone line screen, and *ppi* refers to the scanning resolution. When it comes to scanning, the terms *ppi* and *dpi* (dots per inch) are frequently — wrongly — used interchangeably.

With a screen frequency of 150 lpi, using the 2:1 rule means that you should scan your image at 300 ppi. More important, the resulting file has an image with 90,000 pixels in each *square* inch. At that screen frequency, your imagesetter is drawing 22,500 dots in a square inch, so you have four times more data than your imagesetter draws. This represents an *oversampling* of information, but is there too much information or just enough?

Nyquist's theorem, when applied to halftones, results in extra work for the imagesetter *without significant improvement* in image quality. In practice, a lower-resolution image, with a modest amount of unsharp masking applied, is indistinguishable from a Nyquist-compliant one.

What level of oversampling is acceptable? That is, what scanning ratio gives you an image that does not consume too much disk space, network time, or imagesetter time but still yields good printed results?

The Resolution Test

To find out the answer, here's a test you can do yourself. Scan an image at a variety of oversample (scanning) ratios: 2:1, 1.75:1, 1.5:1, 1.25:1, and 1:1. Choose a screen frequency that's appropriate to your printing process. For sheet-fed offset printing, use 150 lpi. For newsprint, use 85 lpi. Web-fed glossy-paper publications such as this one typically use a screen frequency of 133 lpi. If you're unsure of the correct frequency, ask your print shop to tell you a value for a given process.

Every PostScript laser printer has a default screen frequency, but depending on the printer and the software, you may be able to change the screen frequency in the printer driver's dialog box or in the application itself. A reasonable screen frequency for a 300-dpi laser printer is 37.5 lpi; for a 600-dpi printer, it can be as high as 75 lpi (60 lpi is typical).

Almost all scanned images that are destined for print beg for sharpening with unsharp masking. For a given screen frequency, the higher the scanning ratio, the larger the file. The larger the file, the higher the percentage of unsharp masking (USM) that needs to be applied.

Now have your service bureau generate a test halftone from each image file, and evaluate the results without looking at which ratio applies to which halftone image. The results will surprise you — often images scanned at ratios significantly less than 2:1 look just fine (see figure 1). Best of all, images that are scanned at lower resolutions can have much smaller file sizes than their high-resolution cousins (see figure 2).

And smaller file sizes mean that you will save on disk space, network transfer time, and imagesetter time.

Doing the Math

Once you've decided which oversample ratio works for you, it's time to plug in the numbers. First decide the size of the final image and figure out the percentage of enlargement or reduction of the original image to fit the desired space. (To calculate the enlargement, divide what you want by what you have.) Then use the following formula for calculating the scanning resolution:

Q x lpi x $\%$

where Q is the oversample factor, lpi is the screen frequency, and $\%$ is the enlargement or reduction expressed as a decimal value.

Here's how it works for a 5-x-7-inch photograph: We've settled on a 1.5:1 ratio, so Q is 1.5. The job will be printed at 150 lpi. And we want to enlarge the photo to 9 inches vertically. In this case, we divide 9 by 7, to get an enlargement of 1.29 (129%).

Armed with these values for our three variables, we can now calculate the scanning resolution:

1.5 x 150 x 1.29 = 290.25 ppi

Round the result up to 291. Enter this value in the resolution dialog box in your scanner software (some scanner software lets you change the enlargement percentage, but leave it at 100%). Simple, no?

Calculating Size

What if you're working with images that have already been scanned, such as those from CD-ROMs, Kodak Photo CDs, or files supplied by clients? For such images, you need to figure out an appropriate size for the final image that works for a given screen frequency and acceptable scanning ratio. The equation has the same elements, but the math is modified, because you have no control over the scanning resolution. Of course, you can resample in Adobe Photoshop — that is, change the image's resolution in the Image Size dialog box. However, there is another way — you can change the dimensions of the image to make it better fit your layout and to reduce its file size.

If you know how big the final image will be, work out how many pixels will fill the given space in your layout. Use this formula to calculate the number of pixels:

Q x lpi x $inches$

where Q is the oversample factor, lpi is the screen frequency, and $inches$ is the width or height of the space in your layout. This formula works for all prescanned images but is particularly handy for Photo CD images, for which each image is available in five pixel sizes.

As an example, if your final image needs to be 9 inches high, the equation might be:

1.25 x 133 x 9 = 1,497 pixels

This tells you that using the 18-MB, 2,048-x-3,072-pixel Photo CD image would be overkill for this space. A better choice would be the 2.4-MB, 1,536-x-1,024-pixel version.

If, on the other hand, you want to know just how large you can make an image without degrading its quality, use this formula for calculating the width or height in inches:

$$\frac{pixels}{Q \text{ x } lpi}$$

where $pixels$ is the image width or height, Q is the oversample factor, and lpi is the screen frequency. This tells you the size, in inches, of the final printed image for a given oversample factor and screen frequency.

As an example, let's use a 2,048-x-3,072-pixel Photo CD image. We're planning to print this image in a full-page broadsheet newspaper ad (13.5 x 22 inches) in the local daily, which uses a screen frequency of 100 lpi. We select an oversample ratio of 1.25:1. In this case, the maximum width of this image for the described purpose is

$$\frac{2048}{1.25 \text{ x } 100} = 16.38 \text{ inches}$$

This width — 16.38 inches — easily works with the 13.5-inch page. Be sure to test the *other* dimension to be sure it is adequate for the layout space. (In this example, the resulting height is 24.58 inches, enough to do the job with some extra room for cropping.)

There are those who say that you can't use Photo CD images that large. Humbug! Digital images, from a Photo CD or another source, can be used in surprising ways with tremendous success. Try it yourself. Just remember: For best results, pay careful attention to issues of resolution and file size. ▲

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

---

figure 2

Resolution vs. File Size

Using a lower oversample ratio to set the scanning resolution (ppi) for a given halftone frequency (lpi) of an image yields smaller file sizes, often without a noticeable difference in printed-image quality. Compare these numbers for a typical 4-x-5-inch CMYK image.

85 lpi	133 lpi	150 lpi
1:1 OVERSAMPLE RATIO		
85 ppi	133 ppi	150 ppi
578K	1.40 MB	1.80 MB
1.25:1 OVERSAMPLE RATIO		
107 ppi	167 ppi	188 ppi
915K	2.23 MB	2.82 MB
1.5:1 OVERSAMPLE RATIO		
128 ppi	200 ppi	225 ppi
1.31 MB	3.20 MB	4.05 MB
1.75:1 OVERSAMPLE RATIO		
149 ppi	233 ppi	263 ppi
1.77 MB	4.34 MB	5.33 MB
2:1 OVERSAMPLE RATIO		
170 ppi	266 ppi	300 ppi
2.31 MB	5.66 MB	7.20 MB

figure 1 / **Overkill or just enough?** These five images were scanned at different oversample ratios and with different amounts of unsharp masking (USM) applied and printed at a 133-lpi halftone frequency. Which one looks best to you? From left to right: 1:1 ratio with 50-percent USM, 1.25:1 with 70-percent USM, 1.5:1 with 75-percent USM, 1.75:1 with 75-percent USM, and 2:1 with 100-percent USM.

## GRAPHICS HOW-TO / BY JANET ASHFORD

Textures from Type

Need a quick and cheap texture? Use filters to transform a grid of type into a richly colored background in Photoshop.

NEED A SOFT TEXTURE for a background? Finding a suitable, copyright-free image to scan and manipulate can be a real time sink. You can get around this problem by using Photoshop to create custom textures from scratch. Start with a simple character — in this instance, the slash (/). By layering grids of characters in contrasting colors and applying Photoshop filters to the image, you can produce a variety of rich textures that fit any job. This sample book cover, designed in Adobe Illustrator, uses a texture behind type.
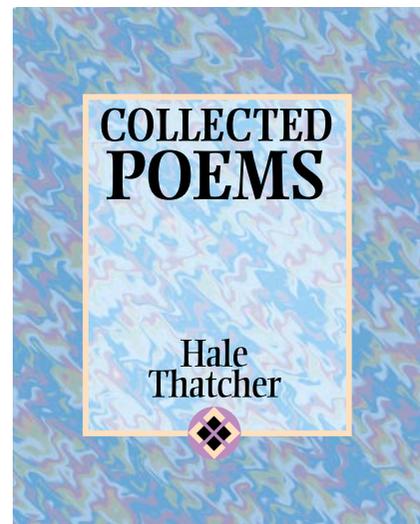
Janet Ashford is the coauthor, with Linnea Dayton, of Adobe Illustrator: A Visual Guide for the Mac *(Graphic-sha/Addison-Wesley, 1995).*

COLLECTED POEMS

Hale Thatcher
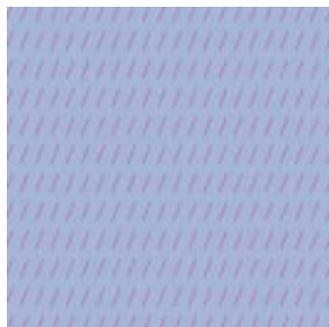
1. Begin with character. Open a new Photoshop document that is twice as large as the final size you need, to allow for later cropping and rotation. Fill the background with blue (Edit: Fill). Add the grid of slash characters by selecting the type tool and entering lines of slashes in the Type dialog box. Fill the characters with pink (Edit: Fill).
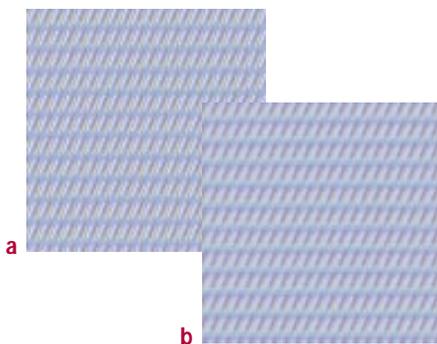
2. Add more color and blur. To achieve a richer look, click on the type tool twice more to add two more layers of colored slash characters, each offset from the others. Fill each layer with a different color (**a**). Apply Photoshop's Motion Blur filter (Filter: Blur: Motion Blur), using the default setting to blend the colors (**b**).

3. Getting the marbled look. To create the look of marbled paper, apply Photoshop's Ripple filter (Filter: Distort: Ripple) with the Large radio button checked and the ripple amount set to 225. To intensify the ripple and break up its horizontal grid, rotate the image 45 degrees clockwise and apply the Ripple filter again at the same settings as before. Finish the image by cropping out the nontextured areas.
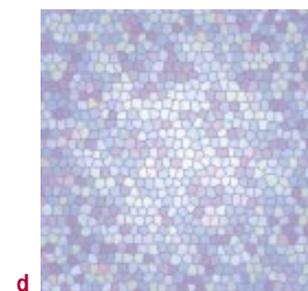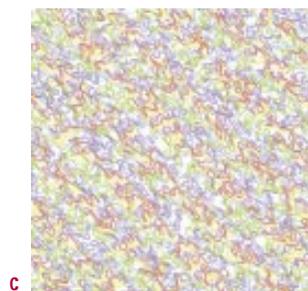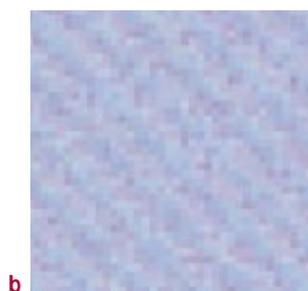
4. Playing with effects. You can experiment with applying several filters and commands to the image finished in step 3. The examples here are enlarged details. They show the results of using the Hue/Saturation option (Image: Adjust: Hue/Saturation), which shifted the hue from blues to reds (**a**); the Mosaic filter, which broke the image up into colored squares (**b**); the Find Edges filter (**c**); and the Stained Glass filter from Aldus Gallery Effects Collection, Classic Art, Vol. 3 (**d**). You can get even more varied results by using filters from packages such as Kai's Power Tools or Xaos Tools' Paint Alchemy. However, many of these filters work only on RGB and not CMYK images.

EXPERT TIPS / BY BOB SCHAFFEL AND CHUCK WEGER

Hop on the New Bus

Will the PCI bus in the new Power Macs improve your social life? Probably not, but it will make a big difference to those in graphic arts.

UNLESS YOU LIVE on the Klingon Homeworld, you know about the new top-of-the-line Power Mac, the 9500. You might be tempted to say, "Ho hum. Yet another Mac. So what?" You'd be wrong. This machine is the first in a line that promises to help solve the biggest problem we've had since the Dawn of Desktop Publishing a decade ago: bandwidth.

Bandwidth, put (very) simply, means the size of the pipe from point A to point B. The bigger the pipe, the faster data can be moved. And bandwidth on Macs has historically been limited by NuBus speed.

Until now, the Mac slots in to which you plug video cards, SCSI accelerators, and so on have been based on the NuBus standard. NuBus was the Mac's Achilles' heel as Apple strove for better Mac performance. Developed a decade ago, NuBus was properly matched to the speed of 680x0 processors. But when the PowerPC arrived, we had very fast processors running on top of an aging bus. Not much of a problem in the business or education fields, in which "big file" means a 750K spreadsheet — but if you process 30-, 50-, or 100-MB files for a living, the mismatch becomes a bottleneck.

This new generation of Macs discards NuBus in favor of something called PCI (Peripheral Component Interconnect). The PCI bus gives us a bigger pipe — more bandwidth. Because of the way this bus is implemented on the Macintosh, we get raw I/O speed anywhere from two to five times as fast as on a NuBus Mac (OK, OK, this isn't *completely* due to PCI; a bevy of underlying system-software changes helps too).

But speed isn't the only thing that's cool about PCI. It's also cheaper for card vendors to implement, and the PCI bus is becoming the standard for PCs, which means that there's a lot of volume production of PCI-related parts. Both of these factors translate into lower card prices for consumers.

The new Power Mac 9500 has six PCI slots. Six! Whaddaya do with that many slots? Consider the following:

Slot 1 holds an accelerated-video card. A big win here. Our tests indicated speedups of up to three times in areas such as Adobe Photoshop scrolling and QuarkXPress drawing.

Slot 2 holds a fast network card based on Fast Ethernet, ATM (Asynchronous Transfer Mode), or some other as-yet-undiscovered networking technology. We spend our whole lives waiting for file transfers from our machines to our servers, so this is another big win. And Open Transport, the Mac's new network architecture, should help make these fast networks easy to use.

Slots 3 and 4 hold a pair of Fast and Wide SCSI-2 cards, so you can have a souped-up RAID system. In our tests, using two FWB Jack-Hammer cards with a four-disk array, we found that I/O-intensive Photoshop operations on big files were almost twice as fast. Sure, using one SCSI-2 card and a two-disk array is more economical, but two cards operate together, making better use of the available PCI-bus bandwidth.

Slot 5 holds whatever card suits your work flow. Here's some flexibility. You might connect a scanner to your Mac via a high-end card such as a MacCTU from Linotype-Hell. Or you might hook your Mac to a big Scitex prepress system via National Instruments' GPIB card. Or you might be running a software RIP, such as Agfa's Cobra, which uses the Adobe PixelBurst accelerator card.

Slot 6 holds . . . nothing yet. At last, a spare slot! Or maybe not. We've learned over the years that technology continues to surprise us. So who knows what you might want to put in this slot? The next great image-processing accelerator? A secondary network card?

We've used up five of the six slots without even trying. And we haven't even talked about the mundane things many of us add to our Macs, such as a second monitor card.

Does this kind of configuration cost more? Of course. You have to weigh the cost of an item against its return. But since PCI cards are cheaper than NuBus ones, the cost justification may be a little easier for you.

What kind of graphic-arts tasks will benefit most from PCI? Anything for which I/O has been a bottleneck. This includes image editing, software RIPping, video-capture and playback, 3-D rendering, and more. And don't forget file copying!

How do we know all this? Full-disclosure alert: We've been doing in-the-trenches testing of this machine for Apple, but our conclusions are our own.

Bob Schaffel is technology director of the Professional Prepress Alliance. Chuck Weger is a consultant and publisher of the Photoshop Monitor *newsletter.*

NETWORKING

## Dayna Downsizes, Introduces 100BASE-T

THE DOWNSIZING TREND has hit Dayna Communications. Founded in 1984, the year the Mac was introduced, Dayna is one of the largest Mac-networking companies. In a major restructuring move involving layoffs as well as transfer of personnel, Dayna has spun off its wireless wide-area-networking technology and its remote-access products to form two subsidiary companies. The downsized Dayna will focus its efforts on LAN products — including Ethernet cards, hubs, and routers — and will serve as an OEM for products from the two subsidiaries.

The new companies, still unnamed at press time, have already begun operations. One will dedicate itself to developing wireless WAN products with technology obtained from Dayna. The other spin-off has taken over development and sales for the DaynaLINK remote-access server. (Current DaynaLINK for ARA users will receive support from Dayna during the transition period.) The subsidiary company will retain the DaynaLINK name for the current ARA (Apple Remote Access) product and plans additional remote-access offerings.

The restructured parent company, meanwhile, has announced a new line of 100BASE-T devices. Like the company's current Ethernet products, the BlueStreak line will be designed for small networks and workgroups. A NuBus card ($399) and a card for PCI Macs ($259) will switch between 10BASE-T Ethernet and 100BASE-T Fast Ethernet. Both were scheduled to ship in August, with 8- and 12-port hubs due soon after. Later in the year, Dayna will ship a 10/100-Mbps bridge for connecting 10BASE-T and 100BASE-T networks.

The parent company will also retain control of the DaynaCOMM Roamer line of wireless LAN products. These include a PCMCIA radio card for the PowerBook 540, a clip-on high-frequency-radio unit for other PowerBooks, and a LAN-access unit. 801-269-7200. / John Rizzo
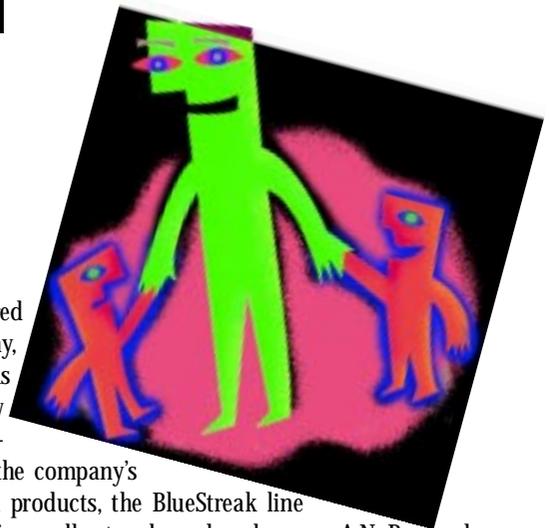
Manage and Maintain a Secure Mac Network

MAC SECURITY is nothing new for usrEZ (800-482-4622 or 714-756-5140), developer of the single-user applications ultraSECURE and ultraSHIELD. The company's latest offering, ultraCOMMAND, combines networkwide access control with network-management features.

ultraCOMMAND lets a network administrator control access to all the Macs on a network that are running either ultraSECURE or ultraSHIELD. (ultraSECURE provides triple DES encryption and sophisticated password management; ultraSHIELD is a stripped-down version of ultraSECURE.) Using ultraCOMMAND, an administrator can consolidate access management and can add or remove access privileges via the network.

ultraCOMMAND allows up to five levels of access to protected Macs, ranging from master administrator to user. This feature makes it easier to maintain security in large organizations with multiple managers. ultraCOMMAND administrators can prevent users from duplicating applications, create requirements for password length and content, and prevent disk initialization on Macs under ultraCOMMAND's control.

In addition, ultraCOMMAND incorporates several network-management features, including asset management and software distribution and tracking. Using the ultraSECURE or ultraSHIELD responder on each Mac, ultraCOMMAND can gather such information as Mac types, hardware and software configurations, and peripherals on the network.

Although it's not as sophisticated as full-featured software-distribution applications, ultraCOMMAND can deliver software or other files to networked Macs while compressing and decompressing the files. An administrator can apply updates based on criteria such as zone or type of Mac.

As are usrEZ's other security products, ultraCOMMAND is PowerPC-native. ultraCOMMAND sells for $958 with one ultraSECURE license and sells for $778 with an ultraSHIELD license. Multiuser licenses for ultraSECURE and ultraSHIELD are available separately. / Shelly Brisbin
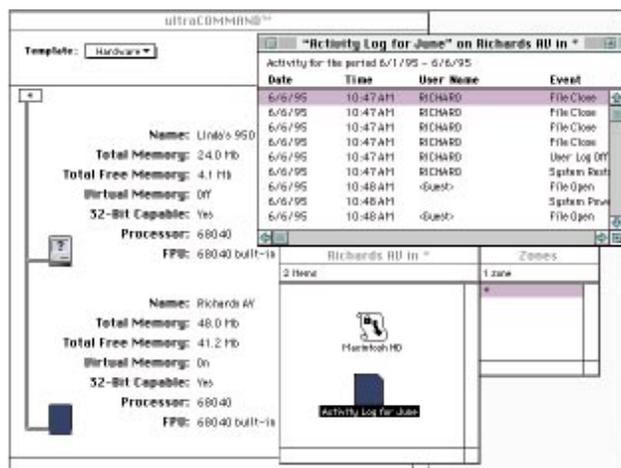
E-MAIL /
Macs to Achieve cc:Mail Parity

SECOND-CLASS CITIZENSHIP will be a thing of the past for Mac users of Lotus Development's cc:Mail. Macophiles can catch up to their Windows counterparts with cc:Mail 6.0 for Mac, from Lotus (617-577-8500), and a new third-party offering from Peloria Technology (818-840-0500). Meanwhile, Hewlett-Packard (800-637-7740) is using support for cc:Mail mobile client software to attract customers to its own e-mail offering.

Lotus is expected to ship a major revision of cc:Mail, including server software for Windows machines and client software for Macs and Windows machines, all in the fourth quarter. According to Lotus, the new software puts the Mac on a par with the Windows platform for the first time. New features in cc:Mail 6.0 for Mac include rules for automatic mail handling and the ability to add non-cc:Mail users to an address book. The new client software will also use System 7.5's Macintosh Drag and Drop, which means you'll be able to keep a list of addresses on the desktop and send mail by dragging a file over a group's icon.

You can get some of these advantages sooner with Peloria Technology's new Mac client software for Mail Scout Rules ($495 per cc:Mail post office for ten users), which ships in late August. Mail Scout Rules runs on a Windows-based server. Its automated rules include forwarding, autoreply, message scheduling, message sorting, and mail deletion. Mail Scout Rules can also send messages to pagers and indicate how many unread messages are waiting. A feature called automatic eback sends files in reply to incoming messages.

Support for cc:Mail client software has been a feature of Hewlett-Packard's OpenMail — a client/server e-mail system based on the X.400 standard — for some time. As part of its attempt to move customers from cc:Mail to OpenMail, HP is adding support for Lotus' mobile mail-client software, which allows Power-Book users to dial in to their e-mail accounts. But HP is also adding new mobile client software of its own for Mac and Windows laptops. The software allows travelers to read, reply to, and originate messages off-line. OpenMail Mobile Client also works with wireless networks, including RAM Mobile Data, GSM-based networks, and Cellular Digital Packet Data (CDPD) over McCaw Cellular's AirData network. Further information is available on the World Wide Web at http://www.openmail.external.hp.com. / JR

NETWORK MANAGEMENT /
Managing Nets via the Internet

WEB BROWSERS aren't just for surfing the Net anymore. A new breed of network-management software from Tribe Computer Works (800-778-7423 or 510-814-3900; sales@tribe.com) brings a World Wide Web interface to Tribe's remote-access server, thus making it possible for managers to maintain network devices by using a browser. Tribe hopes to sell other vendors on the idea of easy-to-use software that's common to all operating systems.

WebManage, which debuted in June with the TribeLink2, a two-port remote-access server, embeds http server software and HTML documents into the server's ROM. A manager can access WebManage with a Web browser over an IP network to monitor the server, configure ports, modify user accounts, and keep server logs. If trouble develops, the manager can send e-mail or an activity log to Tribe tech-support staff, who will use automated scripts to search for the source of the problem. Because it uses a Web browser (common to Macs, PCs, and UNIX systems), WebManage allows administrators to manage the server from any platform.

Tribe hopes to license the technology behind WebManage to other network-hardware makers, who can use it to create management applications for routers, hubs, and other devices. Writing applications in HTML and embedding them in the server hardware for use on any platform with an IP connection and a Web browser would cut development time and allow customization of management applications. Tribe plans to offer a developers' kit for this technology.

Other Tribe products will be upgraded later this year to support WebManage. WebManage requires Netscape 1.1N or a Web browser that supports tables. WebManage-equipped servers include a Netscape-browser license. / SB

Meetings in the Mail

MEETING SCHEDULING VIA E-MAIL tops the list of new abilities in **ON Technologies'** upgrade of **Meeting Maker XP.** With this Meeting Maker XP 3.0 feature, users can invite others to attend meetings by sending a meeting proposal to the recipient's Internet, CompuServe, or other e-mail address. The automated request contains all the information found in a Meeting Maker XP proposal window. Proxy capabilities have been extended in version 3.0, allowing users on another server to schedule meetings on behalf of a boss or coworker. Meeting Maker XP pricing begins at $79 per user for a ten-user package. Current users can upgrade to version 3.0 for $29 per user. 800-767-6683 or 617-374-1400. ◆ **Square One** (908-602-9100) has upgraded and renamed its Mac client software for Digital All-In-One and VMSmail collaboration and e-mail systems. **e•s•p mail,** formerly known as esperanto, is a graphical interface in the Digital world, and the new version adds a spelling checker and support for more terminal-emulation standards through the Communications Toolbox. ◆ For those whose connectivity needs are more mainstream, **Software Ventures** (510-644-3232; valet-info@svcdudes.com) has packaged several popular Internet-access applications into a bundle it calls **Internet Valet.** Like many similar offerings, Internet Valet includes MacTCP from Apple, MacPPP, Qualcomm's Eudora, and other applications. It also includes the company's own Communications Toolbox tool for making telnet connections, previously available only as part of the MicroPhone Pro telecommunications package. In addition, Internet Valet includes a trial account on the PSI (Performance System International) Internet service. $49.95. ◆ **Worthington Data Solutions'** new **R/F Terminal** uses radio-frequency (RF) signals to send data from a bar-code scanner to a Mac or PC. The $1,095 terminal can also be used to enter data directly. Information is transmitted from the handheld terminal to a base station ($695) connected to a computer via the serial port. Worthington is targeting the device at warehouse, inventory, and other environments where bar codes are used. 800-345-4220 or 408-459-9938. / SB

NET TOOLS / BY STEPHAN SOMOGYI

Internet Security, the Mac Way

Ready to get on the Net? A Mac-based server — and a few precautions — can keep your data safe and sound.

BELIEVE IT OR NOT, using a Mac as an Internet server is a great way to defend your data from misappropriation over the Net. If you want to maintain your peace of mind while providing e-mail, ftp, and World

Wide Web access, consider some Mac-based options. The TCP/IP networks that link UNIX-based systems are frequently accessible from many points around the Internet, as are the files stored on those systems. Access is easy because TCP/IP and services that use this suite of network protocols are preinstalled on most UNIX systems. By contrast, TCP/IP-based services on your Mac are there because *you* put them there. Using Macs as Internet servers and clients, you can avoid many security pitfalls that UNIX-system administrators face.

Two Accounts Are Better

SMTP (Simple Mail Transfer Protocol) server software running on UNIX machines is the source of many security problems for Internet sites, because the e-mail is so closely integrated with the rest of the operating system. UNIX user accounts and mail accounts, for example, are one and the same. If a mail account is compromised, so are the user's files and access privileges. AppleShare accounts, however, are completely separate from Mac e-mail accounts.

You can add SMTP-based mail to your Mac LAN with Glenn Anderson's freeware MailShare (ftp://grind.isca.uiowa.edu/mac/infomac/_Communication/_MacTCP/), a Mac-based SMTP and POP3 (Post Office Protocol, version 3) mail-server application. A MailShare server can exchange mail with any other SMTP-based server. Users retrieve their mail by using POP3 client software, such as Qualcomm's Eudora.

Another security issue for POP3 servers is passwords. Each time client software checks the server to see if new mail has arrived, it has to authenticate the client to the server by sending the user's account name and password. This means that user passwords are frequently sent over the LAN and are thus vulnerable to anyone with a network-packet sniffer. MailShare and Eudora support a security scheme called APOP (Authenticated POP), which allows a client to log on to a mail server securely *without* sending a password over the network. If you use APOP on the mail server, each user must use APOP-compatible client software.

Safe ftp

Making files available through ftp, whether via so-called anonymous ftp or via password-protected accounts on a Mac server, can be a lot like configuring an AppleShare server. In fact, AppleShare's access privileges and password encryption can be put to work with Peter Lewis' FTPd shareware (ftp://grind.isca.uiowa.edu/mac/infomac/_Communication/_MacTCP/mail/) to create an ftp server that is functionally indistinguishable from its UNIX-based relatives.

FTPd uses the passwords and access privileges — AppleShare or file sharing — defined by the Mac on which it's running. You can configure some options to allow a very high degree of access to files on the FTPd server as well as to files on other machines on the same LAN as the FTPd server. So you must take care to configure FTPd
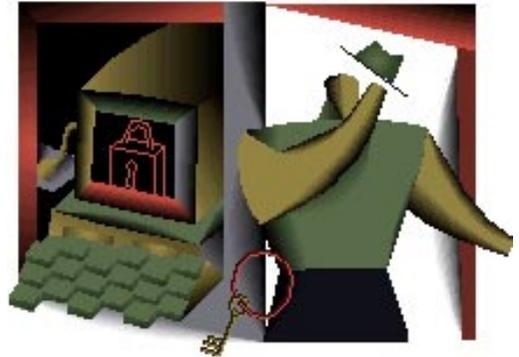
and the attendant AppleShare access privileges to prevent outsiders from obtaining more access to your files than you want.

Untangling the Web

Using a Mac as a World Wide Web server is a lot like providing ftp access. You place Web documents (HTML files and graphics) in folders on a server and fire up a server app such as StarNine's WebSTAR. WebSTAR does not use AppleShare to provide access to particular directories, limiting access to the Mac server via two security schemes. First, you can create *security realms,* which use URLs to assign users to groups and then use names and passwords to authenticate each user. Second, you can disallow access to Web files from certain IP addresses or ranges of addresses. Whether you set passwords or leave access freely available, no one can use WebSTAR to get at files stored outside the WebSTAR folder hierarchy.

Safe Haven

Despite the advantages Mac Internet servers provide, you can't get complacent. Just as you would with a file server on the LAN, make sure your Internet access privileges are well thought out — and that access is available only to those who need it.

Stephan Somogyi is a senior editor at Digital Media *and a* MacUser *contributing editor.*

ILLUSTRATION / JAMES O'BRIEN

MAC TO PC / BY JOHN RIZZO

Cross-Platform Myths Debunked

Are Mac users wimps? Is AppleTalk bad? Get the real story behind five Mac-to-PC myths that won't go away.

A MAC PARTISAN recently faxed me a copy of a memo put out by his employer's Mac-hostile MIS department. The memo recommended that this Northern California HMO dump all its Macs in favor of PCs.

Among the "facts" cited in support of this proposal were that Macs can't read PC files, can't be put on PC networks, and are completely incompatible with Windows. I won't mention any names (hint: this HMO has the same name as Germany's World War I leader and the round, poppy-seeded roll), but I hope its doctors are better informed than its MIS department. The latter's allegations were like the alligators in New York's sewers — completely mythical.

Myths about the Macintosh and its relation to the PC have been circulating ever since Steve and Steve rolled out the first 128K model in 1984. Back before Windows, my boss thought that he couldn't add peripherals to the Mac because it had no AUTOEXEC.BAT file. *The New York Times* once stated that the Mac had no graphical-interface software for the Internet. And a recent story in a magazine that will remain nameless said that System 7.5 had new "Windows 95-like" features, such as long filenames.

As an educated Mac user, it's your duty to spread the word — not that Macs are the greatest things since sliced bread (nobody likes a Mac fanatic) but that Macs aren't an inconvenience or a threat to PC users and that much of their common "wisdom" about Macs is wrong.

Myth No. 1: Mac files are impossible to work with.

This mantra is repeated every time a PC user sticks a Mac floppy disk into a PC's drive and gets an ABORT, RETRY, FAIL? message. This myth bugs me the most, because dealing with Mac files is one of the easiest cross-platform problems to solve. I've often written about how Mac users deal with PC files (the required software now ships with every new Mac); now here's what PC users need to do to read from and write to Mac files:

First, get the PC to recognize Mac floppies by installing one of a zillion simple utilities, such as MacSEE for DOS and Windows. This shareware utility is available on ZiffNet/Mac, on eWorld and on CompuServe.

Next, use Windows software to read the Mac files. Many PC applications (including Word, WordPerfect, and Excel) can read files created with the Mac version of the software. If you don't have a smart enough Windows app at hand, install a copy of Mastersoft's Word for Word or DataViz's Conversion Plus on the PC. File translation can get a little tricky with complex graphics files, but it's a piece of cake for word-processing, database, and spreadsheet files.

Myth No. 2: On the Internet, all platforms exist in harmony.

This is a myth that's bigger than the Mac, but it can mean frustration and bad press for Mac users. That's because, contrary to what the current hype would lead you to

believe, the operating system and the software you and your fellow Internet surfers are running *does* affect what you can do on the Net and with whom you can do it.

For instance, a PC user receiving an e-mail message from a Mac user may encounter strange characters, such as boxes (□) or letters where quotation marks should be. This is because PCs don't understand many of the Mac's so-called upper-128 ASCII characters — the characters, such as the em dash and the international characters, a Mac user can type by pressing the Option key.

If your communications software is
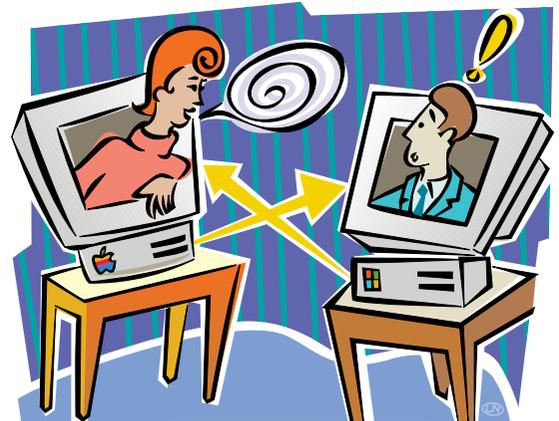
good, it won't let you use these characters. But if you access the Internet through gateways, using non-Internet applications that lack that safeguard, such as QuickMail or WordPerfect with PowerTalk, you'll have to remember not to use them or risk sending gibberish to your pen pals on the Net.

Enclosing files with e-mail, a feature long taken for granted on LAN e-mail systems, isn't a common practice on the Internet. If you do enclose files, they have a tendency to get messed up when moving among Macs, PCs, and UNIX machines.

If you need to send files over the Internet,

TCP/IP Made Easy / *Macs beat PCs*

Although AppleTalk is the Mac's native network protocol, using TCP/IP is simpler and less likely to cause problems on the Mac than it is on a Windows PC. Each Windows application you run requires its own protocol stack, which is accessed through system software called WinSocks. Mac applications, on the other hand, all communicate directly with the same stack, MacTCP.

TCP/IP on Windows PC

TCP/IP on Mac

Application — Application — WinSock — WinSock — Alternative TCP stacks — TCP — TCP — TCP — Ethernet drivers — Network hardware

Application — Application — MacTCP — Ethernet drivers — Network hardware
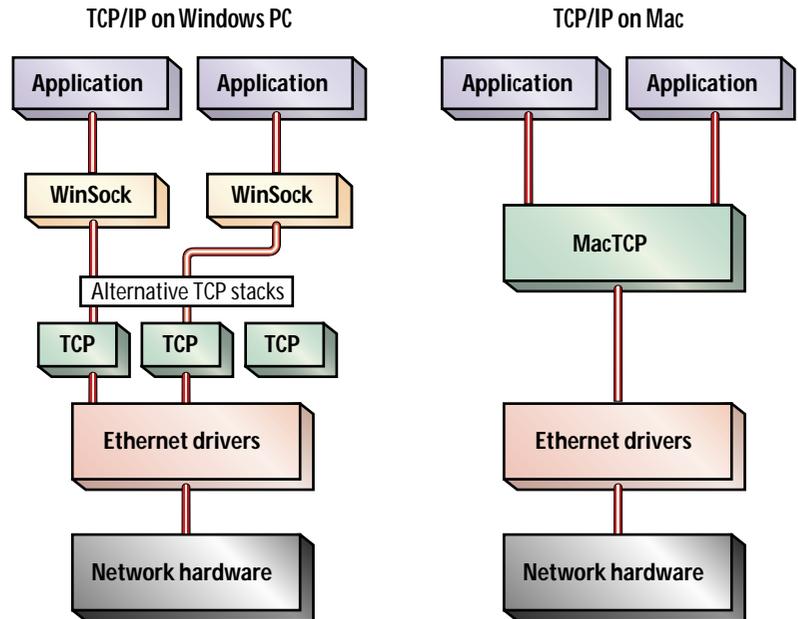
the best bet is for you and your e-mail recipients to use communications software that complies with a UNIX standard called MIME (Multipurpose Internet Mail Extensions). One such MIME-compliant application for the Mac is TCP/Connect 2.1, from Intercon Systems (800-468-7266 or 703-709-5500). MIME handles enclosed files of any type and also lets you use international font sets for communications that are truly global.

Myth No. 3: TCP/IP is better suited to PCs than Macs.

Because AppleTalk has been built in to the Mac for so long, it's easy to get the impression that TCP/IP is foreign to it. The fact is that TCP/IP, which now ships with every Mac, is easier to configure and get running on a Mac than on a PC.

Mac users also run into fewer problems in their day-to-day TCP/IP networking. On the PC, there are lots of different TCP drivers, some of which work with some applications and some of which work with others,

as well as an additional layer of software (see figure 1). All of this can make for a complex structure. On the Mac, all TCP/IP applications work with the Mac's TCP/IP drivers, which means that you can add just about any TCP client application you like without worrying about conflicts. If you like to try out various Internet apps, TCP/IP on the Mac is the way to go.

Myth No. 4: AppleTalk is bad.

You hear this line from network managers who want to keep AppleTalk off corporate networks. One of their supporting arguments is that the small packet size of AppleTalk makes it slower than TCP/IP. Small packets, the reasoning goes, mean more packets, and more packets make more network traffic. Sounds like a reasonable theory, except that one of the fastest networks, the 155-megabit-per-second ATM, uses packets smaller than those used in AppleTalk.

A related (and controversial) argument asserts that AppleTalk has to be slower,

because it's "chatty" — that is, it generates traffic even when no one is doing anything on the network. This is because AppleTalk was designed as a plug-and-play network: Servers and printers show up in your Chooser and routers find each other automatically, without someone having to type in addresses and setup data for each device. The devices do this by talking to each other over the network, in the process creating extra network traffic.

But if automation is such a bad thing for a network, why is TCP/IP gradually becoming more like AppleTalk? Standards committees have come up with dynamic addressing for TCP/IP with DHCP (Dynamic Host Configuration Protocol), which is basically a server-based version of AARP (AppleTalk Address Resolution Protocol). A proposed server-location protocol for TCP/IP is a server-based version of Apple's NBP and ZIP protocols.

Myth No. 5: Mac users are wimps.

This myth has its basis in another one: the belief widely held among Macintosh users that the Windows interface is hard to use. Sure, the Windows Program Manager and File Manager take more time to learn than the Finder, but users spend most of their time in applications, which are frequently identical on the Mac and the PC. Mac users who want to improve their image in the PC community would do well to bear this in mind.

In fact, it's the architecture of Windows, not the interface, that makes it harder to maintain. Much of the hassle people have when using Windows is caused by drivers — network drivers, video drivers, audio drivers, printer drivers, you name it. Incompatibilities abound: Change a Windows driver — which is often necessary if you do something radical such as install a new application — and you risk cryptic error messages and hours on the phone with tech support. On the Mac, however, most applications use the same drivers, many of which users never see. Changing a Mac's printer or Ethernet drivers is a simple matter of clicking on an icon in the Chooser or in the Network control panel.

But doesn't this comparative simplicity bolster the arguments of those who contend that Mac users are wimps? I don't think so.

Although there are numerous PC users who are quite capable of handling drivers and command lines, there are as many — or more — who know only their applications.

Reality Check

Consider a friend of mine. A DOS and Windows user for almost a decade, he frequently says that Macs are for wimps. Not

long ago, he resorted to recruiting me to install a sound card and drivers on his home PC. He had labored for hours and failed. Me — a Mac user for 11 years — I got it running in 20 minutes.

John Rizzo, formerly MacUser's *technical editor, is now a freelance tester and reviewer of Mac and PC products. You can post questions for him via ZiffNet/ Mac on eWorld.*

Cracking the *Error Code*

Ah, the mysterious error message, whose meaning eludes even some Mac experts. Here's insight into error messages and ways to make them disappear. / BY TED LANDAU
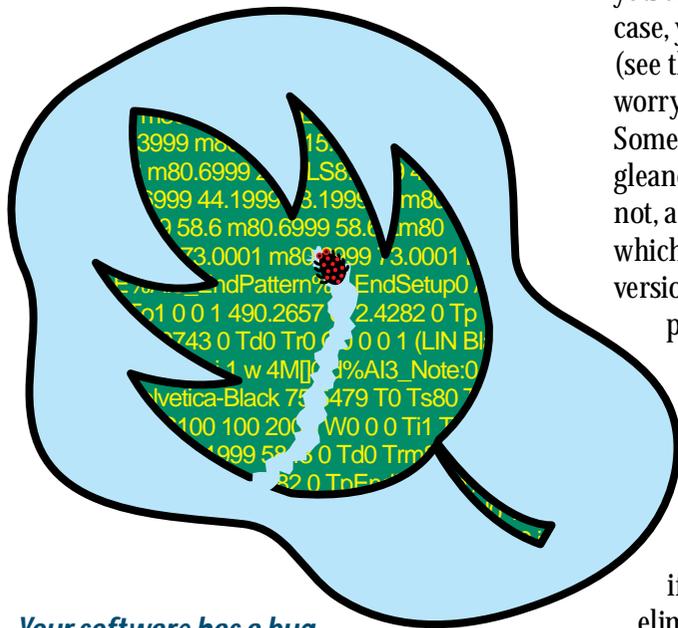
THE TYPICAL ERROR MESSAGE (say, "error of type 2" or that old favorite, "bad F-line") often seems about as meaningful as a chicken scratch. In fact, some types of messages won't get you any closer to solving your Mac's problem even if you do know what they mean. When that's the case, you can always try the standard set of fixes (see the "Combating Crashes" sidebar) without worrying about the message's meaning. Sometimes, though, useful knowledge can be gleaned from an error message. More often than not, a software bug is the source of your trouble, which means you have to wait for a bug-fixed version of that software to come out. Buggy programs, however, aren't always the problem, and even when they are, there are some measures you can take until a bug fix is available. Here are some of the more common error messages and the most likely way to combat their causes (refer to the "Combating Crashes" sidebar if the fix we suggest includes restarting, eliminating extension conflicts, repairing the hard disk, or reinstalling software):

Your software has a bug.

Common Codes

ID = 01, Bus error
ID = 02, Address error
ID = 03, Illegal instruction

Ignoring minor differences among them, these error messages almost invariably indicate a software bug. Here's what to do in specific cases: If a crash occurs at startup (while the Welcome to Macintosh message is on the screen), you probably need to find and eliminate an extension conflict.

If the crash or unexpected quit occurs while you're using an application, that application probably contains the bug (although the problem may still involve a conflict with some extension). Until you can get updated software, you should disable the program or the extension with which it's conflicting.

If the crash occurs even before the Welcome to Macintosh screen appears during startup, your Directory, disk-driver, or partition-map files may be corrupted. If repair utilities can't fix this, it's time to consider reformatting your disk. If even that fails, a hardware repair looms.

To avoid unexpected quits, it sometimes helps to allocate more memory to the application in question, although this fix is the least likely to work.

ID = 09, Line trap error
ID = 10, F-line instruction error

Again, a bug in the program code of an application or extension is the most likely cause of these errors. (Hey, no software's perfect.)

The F-line-instruction-error message most commonly appears when a program needs to access an FPU (floating point unit or coprocessor) but your Mac doesn't have one. However, it may appear even if you *do* have an FPU. There are two common causes for this. The first occurs if you're running a non-native application that requires an FPU on a Power Mac. Even though the Power Mac has an FPU, the Power Mac's emulator does not. Therefore, a program running in emulation mode can't get at the FPU.
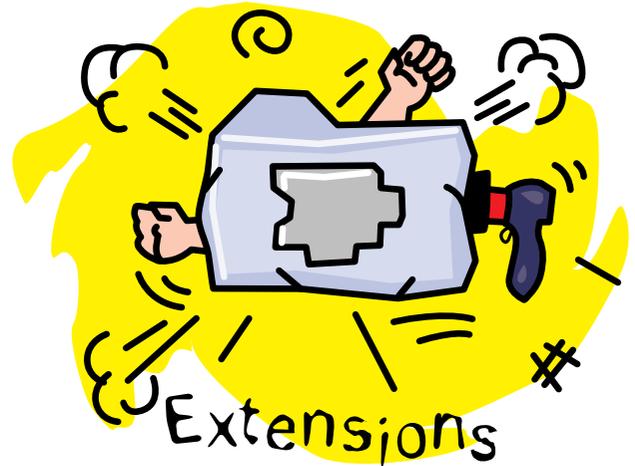
You have an extension conflict.

You have hardware damage.

A shareware utility called SoftwareFPU can help you around this dilemma by emulating the missing FPU (you can find the shareware on your favorite online service; see How to Reach Us if you want to get it from ZiffNet/Mac).

The second cause can occur in any program and has nothing to do with an FPU. It's an ambiguous error message. It might represent a bug in the software, or it might indicate a damaged file. Try reinstalling the software.

ID = 11, Hardware exception error
This error message is a catchall for any processor-related errors not covered by IDs 1 through 10 and indicates that your Mac doesn't know the exact cause of an error. This message is more common on Power Macs and typically results from corruption of the 68040 emulator as it loads into RAM. If you get the message while working on a Power Mac, simply restart to solve the problem. However, be prepared to go to the repair shop if the common fixes don't stop this error from occurring; you may have a hardware problem.

ID = 12, Unimplemented core routine
An unimplemented-core-routine error typically occurs when a programmer forgets to remove code used during the testing of an application. This code tells the program to look for a special type of software — a debugger. If you haven't installed a debugger on your Mac (and you probably haven't), your system will crash when you use the faulty program. Again, the only practical solution is to wait for the release of a fixed version of the program.

ID = 25, Out of memory
ID = 28, Stack ran into heap
Both of these messages imply that you've run out of memory. Increasing the memory allocation of the problem program or running fewer applications simultaneously may help.

Less Common ID Codes
For the remaining error messages numbered 15 or higher, a corrupted System file is a common underlying cause. Try replacing that file before proceeding to other possible fixes.

ID = -34, Disk is full
If freeing up space on your disk doesn't fix this problem, try repairing the disk by using Disk First Aid.

ID = -39, End of file
You'll need the help of disk-repair software for this one. If Disk First Aid doesn't work, try using MacTools or Norton Utilities. Also, replace the damaged files. If the problem persists, try rebuilding the desktop and doing a clean install of the system software. If all else fails, reformat the disk.

ID = -192, Resource not found
This message usually means an application

Your Mac ran out of memory.

is corrupted. It often pops up when you're trying to launch the app. Replace it and its preferences file.

Getting the Message
The mystery is unveiled — those official-looking codes and cryptic messages may make you think there's an exact cause behind an error, but they're less exact than they look. Since you can't always expect to get clear instructions by decoding them, you may want to repair your Mac by trying the solutions we describe. Most often, the cause of an error message is buggy software. It might be helpful to notify the software publisher, in case it's unaware of the problem or to see if an upgrade exists. ▲

Ted Landau is the author of the book Sad Macs, Bombs, and Other Disasters, *which he resisted mentioning in the sidebar.*

COMBATING CRASHES / *the four-step method*

WHENEVER YOUR SYSTEM CRASHES or a program unexpectedly quits, no matter what type of error message you get or whether you get one at all, there are some likely remedies.

Refer to the main article to see which of the following fixes you should try first and to see if there are fixes that aren't on this list. In many cases, you may have to try all of these tricks before you hit on the one that works.

1. Restart your Mac. After almost any system crash, you *have* to restart. The point is that restarting may turn out to be the solution to your problem. The error may never return. If it does, try another technique.

2. Check for extension conflicts. Extension problems are probably the single biggest cause of system errors. The standard conflict-checking technique is to disable all extensions by holding down the Shift key during startup. If the system error disappears, it's time to find out which extension was causing the error. For this task, I recommend investing in a utility such as Now Utilities' Startup Manager or Casady & Greene's

Conflict Catcher 3. They make diagnosing extension conflicts almost fun (well, at least bearable). Once you find the culprit, disable it and wait for the bug fix from the maker of the extension.

3. Repair the disk. Utilities such as Apple's Disk First Aid, Symantec's Norton Utilities, and Symantec's MacTools Pro tell you if you have a disk problem and then repair it.

4. Reinstall corrupted files. A program that consistently crashes is a sign of a corrupted file. Consider reinstalling the program. Don't forget to first delete the program's preferences file, so that those get reinstalled too. If all else fails, reinstall the system software.

Even if these tricks don't work, you don't have to admit defeat yet. Summon all your tenacity and get a book on Mac software-based repairs. It can give you a much longer list of solutions to try before you haul your Mac into the repair shop. (I would recommend a specific fix-it book by a specific author, but then, that might be construed as blatant self-promotion.)

MOBILE MAC / BY SHARON ZARDETTO AKER

Traveling Telecom Tips

Dialing sequences with 35 digits? No dial tones? Here's how to deal with some of the snags that can surface when you travel.

THE CHALLENGE OF telecommunicating from a foreign location (even if it's only the Ramada Inn a few towns away) may require giving your modem some specialized instructions for dealing with potential obstacles: calls that require long sequences of numbers and phones whose dial tone your modem isn't used to. You can also train your modem to save you money during hotel stays.

Calling-Card Savings

If you're staying in a place that applies a surcharge to any call billed to your room, you can save money by using a phone card to bill calls to your home (or, better yet, your employer's) phone bill. But it's not always obvious how to make your software dial up the correct sequence to get your telecommunication sessions billed to the card instead of to the room. And I can't give you the exact directions, because the sequence varies, depending on what phone company you're using to make the call, which one's receiving the call, and which one issued the phone card. I can, however, tell you how you can figure out the correct sequence.

First, analyze what happens when you make a voice call with the card. Keep track not only of the numbers but also of the lengths of the pauses between series of numbers you dial. Here, for instance, is the process for my AT&T card (the numbers have been changed to protect the innocent):

1. Dial 0, the area code, and the number you want to reach: 02015551234. Or, if the local long-distance carrier is not AT&T, dial 10288 to access AT&T and then 0, area code, phone number, with no wait in between: 1028802015551234

2. Wait for the tone and the AT&T acknowledgment to begin (about seven seconds).
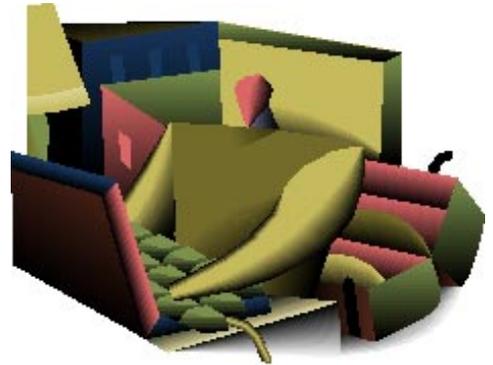
3. Dial the calling-card number: 1234561234.

4. Wait for the next acknowledgment (about five seconds).

5. Dial the personal identification number: 1234.

If the carrier is AT&T, the sequence looks like this: 02015551234 (wait seven seconds) 1234561234 (wait five seconds) 1234.

It's easy to translate that sequence into one the modem will understand, because each comma in a dialing string instructs the modem to wait for two seconds: 02015551234,,,,1234561234,,,1234

You may need more or fewer commas; do some experimenting to get the timing right.

POWERBOOK SECRETS / *have tools, will travel*

NO MATTER WHERE YOU'RE GOING, if you're going to go online, you'll need some hardware essentials. At the very least, you'll need a length of phone wire to attach your PowerBook's modem to whatever hookup the new location provides. An extension cord is important when you're telecommunicating, because a phone plug and a power outlet might not be in proximity to one another. But what do you need beyond these basics?

An RJ-11 *duplex adapter* lets you plug in both a phone and a modem to a single wall jack. A second length of phone wire, along with a *coupler* (also called a *splice adapter*), might help with the duplex setup, in case you need an extra-long phone wire.

If you're going to be "breaking in" to a phone or phone system, you'll also need such tools as a small flashlight; a small screwdriver; a razor blade; and, most important, an RJ-11-clip adapter, so you can hook up to wires that don't provide the standard, friendly RJ-11-clip interface. Finally, for international travel, you need the right connector for the phone system at your destination. TeleAdapt (the U.S. number is 408-370-5105) not only provides all the hardware you could possibly need but can also tell you what you need for wherever your destination might be. In fact, if you're traveling on short notice, the company will ship the necessities directly to your destination. / Rich Wolfson

ILLUSTRATION / JAMES O'BRIEN

PHOTOGRAPHY / LON CLARK

Crowded with Characters

That's all you need to do in many cases to use your calling card, unless you run into the problem I've had of using a sequence that's too long.

Telecom software, especially on the Mac, protects us from much of what goes on behind the scenes. All we do is type the number we want and choose our modem model from a pop-up list, and the software does the rest.

Although it's nice to be protected from un-Mac-like processes, advanced software can make it more difficult to deal with out-of-the-ordinary circumstances. For instance, the software can limit the length of a dialing sequence. In my example, the final number I came up with for the calling-card sequence is 32 characters long (including the commas), and my favorite program, CompuServe Navigator, accepts a maximum of 31 characters.

Luckily, you can redefine the length of a comma delay by using the command S8=x, where *x* is the number of seconds. A simple S8=5 means that I can rewrite my dialing sequence in CompuServe Navigator as 02015551234,,1234561234,1234 and stay within the 31-character limit. But where do you put the command in whatever software you are using? Poke around in your program's setup dialog boxes, starting with the one where you specify your modem model. Find some gobbledygook labeled *initialization* or *init string* that looks something like ATS0=0 X1 Q0 V1 &C1&D2 \N0&K4^M, and add S8=5 at the end.

Thanks to Michael O'Connor, Navigator's author, for suggesting this trick. He also points out that some modems can store phone numbers, including unusually long ones, in certain registers; if you refer to the register in a modem string, the modem dials the number stored there. That's another great way to deal with overly long numbers. You'll need to read your hardware's documentation to see if your modem is capable of this and to learn how to do it.

Manual Method

Just when I thought I had the procedure of using a calling card down, I ran into another glitch. In some cases, my sequence was still too long, even after I'd reduced the number of commas. For instance, adding the AT&T access code as a prefix for a particular number again leaves me with too many characters.

The workaround is one that can come in handy for many telecommunicating situations, and it involves carrying a little extra hardware with you. Using a *duplex adapter,* or *splitter,* and an extra length of phone wire, you can keep both the phone and the modem plugged in to the same line. (If you're of the always-be-prepared-for-anything school, a small "pocket" phone is handy for when the hotel's phone doesn't have a jack that works for this setup.) With a phone and a modem hooked up in parallel, you can have the modem dial as much of the number as it can handle while you're listening on the handset; when you need a few more numbers punched in, just punch them in yourself. You can then hang up the phone and let the modem take it from there.

Let the modem do the initial dialing, since it waits for a dial tone before it does any dialing. If you start with the manual dialing, the modem will never do its share.

Blind Dialing

The fact that modems wait for a dial tone seems perfectly reasonable until you're in a situation in which there's no dial tone or at least not the standard U.S. dial tone the modem's looking for. This can happen when you're traveling afar or just dealing with a local PBX phone system that's using something other than a standard dial tone.

To make your modem dial without waiting for the dial tone (this is known as blind dialing), you have to once again edit a modem string. Simply add the command X1 to the modem's initialization string. If the string has an X4 in it, you should replace the X4 with an X1; otherwise, add it anywhere in the string. Don't forget to reset regular dialing by including an X4 in the modem string when you're back in a place with standard dial tones.

America Online, which has one of the friendliest online interfaces around, makes editing modem strings particularly difficult. Enabling blind dialing with AOL

figure 1 / **To make your modem do blind dialing** (dialing without waiting for a dial tone) when you're using America Online, navigate to this window from the Finder and change X4 in the Configuration field to X1.

requires a few extra steps: Find the file in your Online Files folder that corresponds to your modem model; double-click on the file, and you'll get a Modem Configuration dialog box. It has a Configuration field that, in all likelihood, includes X4 in the string; change it to X1 (see figure 1); if there's no X4, just add X1.

Call Ahead

All these tricks for getting a call out aren't going to help if you don't know the number you want to call. If you're going to log on to your online service while traveling, plan ahead and get the local log-on number before you leave. It's easy to get phone numbers when you're still online at your home base; just find the member-services section of your service.

If you forget to get the number before you leave, it's still pretty easy. For CompuServe, for instance, you can log on in terminal-emulation mode at 800-FINDCIS (800-346-3247) and look up a local number. With America Online, it's even easier: Use the Find Local Number option on the menu on the initial log-on screen, and AOL will look up the number you need.

With either service, you're out of luck if you're outside the 800-number system. If you don't get the local access number before you leave the country, you'll be in the same pickle as a friend of mine who recently was forced to make some expensive calls from Hong Kong to CompuServe's Newark, New Jersey, access node.

Sharon Aker and Rich Wolfson are both hoping to run into telecommunications problems more often, because that would mean they're traveling more.

NET TRAVELER / BY MICHAEL SWAINE
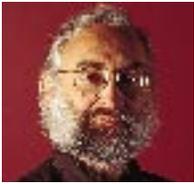
Interface the Music

Talk about it, read about it, even listen to it . . . you'll find a whole lotta music on the Internet.

YOU'VE JUST LOGGED ON to find Pearl Jam concert dates, but you soon find yourself sucked into a maelstrom of music sites. It seems as though every musician, every musical style, every way of thinking about music is represented on the Internet.

First, check out all the newsgroups in the alt.music hierarchy. (You'll probably find those tour dates in alt.music.pearl-jam.) From there, it's a short trip to an abundance of other newsgroups and mailing lists.

Myra Wong's List of Music Mailing Lists, at http://server.berkeley.edu/~ayukawa/lomml.html, will lead you to numerous lists devoted to an artist or a genre, where you can share your enthusiasm for Aerosmith (send mail to aerosmith-fans-request@dartmouth.edu, with "subscribe aerosmith-fans <your e-mail address>" in the body of the message) or Nanci Griffith (majordomo@world.std.com; "subscribe nanci") with the like-minded. Although lists and newsgroups are usually fan hangouts, rumors circulate that the subjects of discussions may be lurking. Sometimes artists do more than lurk: Roger McGuinn himself is said to contribute to the alt.music.byrds newsgroup.

There are lists for aficionados of a particular musical style, from acid jazz (listserv@ucsd.edu; "subscribe acid-jazz <your name>") to barbershop (bbshop-request@cray.com). There are lists dedicated to musical instruments, regional lists that announce when raves are happening, lists that tell you where to find music books (info@nor.com; "Subscribe - Music Books Plus"), and lists that notify you of radio concerts (radio-concerts-request@cs.albany.edu; "sub") and new releases (majordomo@cs.uwp.edu; "subscribe new-releases").

Music Pages. If you're seeking facts rather than conversation, turn to the Web. The Ultimate Band List, at http://american.recordings.com/wwwofmusic/ubl.html, will point you to an artist's or group's Web pages, FAQs, online lyrics, guitar tablature and chords, and places to download songs.

One of the coolest music sites on the web is HOMR, which attempts to discern your musical tastes based on your ratings of artists and groups and then recommends music you might enjoy (http://jeeves.media.mit.edu:80/homr/).

There are countless World Wide Web pages run by fans: You can pay homage to the King at the Elvis Home Page (http://sunsite.unc.edu/elvis/elvishom.html) and you can feed your technoneed at the Adrenalin Pages (http://www.cs.vu.nl/~epdouden/menu.html). Record companies, music venues, and radio stations are all establishing their own Web presence to promote artists and upcoming gigs. Sony Music features artists at http://www.sony.com/Music/MusicIndex.html.

You've talked, you've read — but music was meant to be *heard*. You can buy CDs and videos online at CD Now (http://cdnow.com/) or Compact Disc Connection (telnet://cdconnection.com, or telnet://cdeurope.com for imports).

Play Your Own Tunes. Maybe you're a performer. If so, you should know about the Usenet newsgroups for musicians and musician wannabes, such as the rec.arts.music-makers hierarchy.

If you're looking to break into the big time, it seems as though you've gotta have a Web page. And if you're curious about the price of fame, you should hop on over to http://www.Nashville.net/telalink/muswebprices.html to get a detailed breakdown of what one Nashville company will charge your group or label for the star treatment. Or you might prefer to read A Beginner's Guide to HTML, at http://www.ncsa.uiuc.edu/General/Internet/WWW/HTMLPrimer.html.

Tip of the Month

Here's some advice on dealing with music clips you've downloaded. SoundMachine is a fine freeware find that can play sounds stored in many, but not all, file formats. What SoundMachine can't handle is probably usable with SoundApp, another nugget of freeware gold. Both can be downloaded from ftp://archive.orst.edu//pub/mirrors/archive.umich.edu/mac/sound/.

Don't Know snd from S&P?

MacUser maintains a list of frequently asked questions (FAQs) about the Internet, *MacUser* itself, and this column specifically. Send mail to faq@macuser.ziff.com. *MacUser's* World Wide Web address is http://www.macuser.ziff.com/~macuser/. You can reach me at traveler@macuser.ziff.com.

BY CHRISTOPHER BREEN AND BOB LEVITUS

Help Folder

Internet safety for minors, how to deal with mysterious System Folder files, and what to do about uncooperative fonts.

Prurient Posts

Q. I'm having a debate with my parents over whether or not to get an eWorld account. I'm 13, and they're worried that people will send me nude pictures over the Net. I don't think that's possible. Can you clear this up?

Name and address withheld to prevent an ugly family dispute

CHRIS: What your parents say is technically true — people can send just about any kind of material they want over the Net. Of course, they'll get into serious trouble for doing so if you're underage or don't specifically ask for that material. I wouldn't worry about this, because when it happens, there are plenty of ways to stop it. Now please pass the magazine over to your parents.

Hi, folks. I'm pleased you're looking out for your child's welfare, but as much as I hate to be the cause of heated arguments over the dinner table, I think you're off base on this one.

First of all, allow me to allay your fears. I did a thorough search for smut on eWorld, and I can assure you that I didn't find a single text or graphics file that would be considered the slightest bit naughty.

BOB: I did a similar search and found that even the jokes and messages on the bulletin

boards were strictly G-rated.

CHRIS: eWorld has an official policy that reads, "You are expressly prohibited from posting on eWorld any unlawful, inaccurate, threatening, libelous, obscene, profane, sexually offensive, or objectionable material of any kind . . . . " Plainly put: e-World is as clean as a hound's tooth.

Other services such as AOL, GEnie, and CompuServe do carry nude "pinup" graphics files, but these files are clearly marked as intended for adults only.

BOB: I feel obligated to mention that anyone with full access to the Internet can find nude, uncensored pictures galore in newsgroups. But for now, if you limit your activities to eWorld, you're as safe as you can be.

CHRIS: At least until eWorld implements full Internet access.

So, yes, there's a certain amount of junk on the Internet that people will find objectionable, but there's a larger issue behind this. Online services give your child access to a wealth of information that no encyclopedia or city library can offer. It's up to you to weigh letting your underage charges have access to that world of ideas against shielding them from pornographic posts.

Maybe the solution is to have a look for yourself. Most online services offer several hours of free connect time just for exploring. I think you'll discover fewer potholes in the info highway than you feared.

Unclean Installs

Q. Right around the time I unsuccessfully attempted to install System 7.5 from CD-ROM, I came across three strange folders in

my System Folder: Installer Temp, Installer Temp 1, and Installer Temp 2. They contain copies of extensions and control panels I already have in my System Folder. How did these folders get there, and can I delete them?

Galen Burrell
via CompuServe

CHRIS: Bob, I'll need your help on this.

BOB: Huh? Oh no. Not that again. That trick never works.

CHRIS: This time for sure! Just tie this scarf over my eyes. That's got it — I'm ready.

Galen, we've never met, and I have never had occasion to divine the intimate details of your Macintosh system, am I right? Yet — while blindfolded — I can confidently say that you tried, with dire results, to install your system software not once, not twice, but thrice!

BOB: How *do* you do it? Can you bend spoons too?

CHRIS: I rarely reveal my psychic secrets, but in this case I believe it's warranted.

Although you may currently be having your doubts, the Apple Installer is looking out for your best interests. During the installation process, the Installer takes from your System Folder the items it intends to replace and tucks them away into a safe little Installer Temp folder. Once the installation is successful, the Installer expunges those duplicate items.

If, as in your case, the installation gets bungled, the Installer Temp file remains in the System Folder.

Check that you have your extensions and control panels in the proper place, and toss this muck.

BOB: I wouldn't even bother checking. Simply toss all three folders out, and keep on

trying to install System 7.5 until you get it right.

CHRIS: I'll stretch my voodooistic powers just a bit further: I'd bet dollars to doughnuts that you thought you'd booted from your CD-ROM when you tried to install your new system. Now suck in that lip, Mr. Pouty — starting from a CD-ROM isn't always easy. You've got to slip the CD-ROM into the drive while the Mac is booting up — sometimes the timing's tricky. Apple made it easier to do on the Power Macs and the Quadra/Performa 630 series. On these models, you can slip the CD-ROM into the drive, restart without ejecting that shiny disk, and hold down the C key until the Welcome to Macintosh message appears.

BOB: For other types of Macs, you may need to install System 7.5 from floppies. Wait — you don't have to go out and get System 7.5 floppies; you can create them by using your System 7.5 CD-ROM. Just copy the Disk-Copy disk images from your CD-ROM to floppies, and use them for installing.

Fitting Fonts

Q. I can't install or remove fonts from my System Folder (I'm running System 7). The only way I seem to be able to add or remove

fonts is to reboot with System 6 and use Font/DA Mover.

What am I doing wrong?

LaMont Goodman
Austin, TX

BOB: Font/DA Mover? How quaint! Well, LaMont, there are a couple of things you can try when you have this sort of trouble with fonts — or any extension or control panel, for that matter. The easiest is to free up some memory for your Finder. To do so, hold down the Shift key while you restart. This disables your extensions and control panels, which frees up memory for copying files.

CHRIS: I also think you have a memory problem, but perhaps it's of a different kind. LaMont, when you installed System 7, did you remember to install System 7 Tune-Up? Check in the About This Macintosh window, accessible from the Apple menu, to see if the system-software version is 7.0•. If you're missing the telltale bullet (•), you're out of tune. One of the things Tune-Up does for us is manage memory more efficiently.

BOB: Neither of those solutions worked? I was afraid of that. The problem could be a corrupted System file. The fix is easy but more time-consuming — you'll need to

perform a clean install. (If you don't know how to do a clean install, see Help Folder, April '95, page 120.)

CD-ROM Boot

Q. My CD-ROMs won't mount if I turn my CD-ROM drive on after I boot up my Mac. I prefer to leave the drive off until I need it, since I don't use it often. How can I get discs to mount?

Larry Kordon
Baltimore, MD

BOB: Even though you don't use it much, the simple solution is to turn the CD-ROM drive on when you start up your Mac. And it may be the only solution that works every time.

CHRIS: Now, Larry, you're talking to one of the world's preeminent cheapskates, but come on. Loosen up! The CD-ROM drive doesn't suck that much power out of your wall, and having AC flow through its components isn't going to cause undo strain on the unit. Bite the bullet, and turn the CD-ROM drive on first.

But if this violates some deeply held conviction, you can pick up a copy of FWB's CD-ROM ToolKit ($79 list) instead. This driver will attempt to mount a disc even if you turn

the drive on after the Mac has booted. You'll still have to open the CD-ROM ToolKit control panel to mount the disc and it won't always be successful, but you'll have a better shot at it than you have now.

Floppy-Repair Shop

Q. I moved the data from a bad installation floppy to my hard disk so I could repair it with Norton Utilities. But the repaired data won't fit back onto the floppy. Is there some way to make it fit?

Darin Spence
via the Internet

CHRIS: Let's start with the safe, simple — although least expedient — answer: Call the software company whose disk went bad, and ask it for a replacement. Even though you were able to copy the files to your hard disk and got the all's-well sign from Norton Utilities, the data still might be damaged. Any company worth its salt will roll over like a big furry dog and send out a new disk within a matter of days.

While you're waiting for your new floppy to arrive, there are a couple of things you can try in order to lever that folder back onto a floppy.

BOB: Here it comes again. The old rebuild-your-desktop trick.

CHRIS: Well, it's a darned miracle! You know, the other day my truck threw a rod and rather than taking it to the shop for an expensive repair, I waltzed into the office and rebuilt my Mac's desktop, and when I went back outside, my truck had a new engine and paint job. My breath was noticeably fresher too!

TIPS / Graphics

ILLUSTRATED CENTERPIECE

I sometimes need to align a piece of artwork with the center of the page in Adobe Illustrator. Rather than going through all the bother of making the correct calculations, I came up with this trick:

Select Cropmarks from the Object menu, and choose Make from the submenu. Immediately afterward, select Release from this same submenu. Behold — a selected rectangle that contains an anchor point in the center of the page. This anchor point is visible as a small x in the Artwork view.

Dominik Hoffmann
Madison, WI

It should make more room on your floppy too. To rebuild the floppy's desktop, just hold down the Command and Option keys while inserting the damaged floppy. This will clear out the little bits of data that sometimes accumulate on a floppy and eat up valuable space.

Barring that, you can pick up a copy of Chad Magendanz's Shrink-Wrap from your fave online service (see end of article if you want to get it from ZiffNet/Mac). This intensely groovy freeware utility lets you turn folders — as long as they're small enough to fit on a high-density floppy — into disk images. Once a folder has been converted, Shrink-Wrap can copy the image to a floppy.

BOB: The reason using ShrinkWrap is so slick is that before it puts a copy (or disk image) of data onto a floppy, it clears the floppy of junk that can accumulate and eat up space. In the case of a Finder copy, the method you described in your question, the floppy isn't cleared before the copying begins. "Shrinkwrapping" your data may make it fit on your floppy again.

Mighty Macros

Q. Why has the most superb macro maker ever made, Apple's elegant MacroMaker, disappeared completely? Do you know of any inexpensive alternatives that aren't complicated?

Paulo Almeida
Brazilian Embassy, Paris

CHRIS: Back in 1989, the bigwigs at Apple allegedly met in a smoke-filled pagoda during the Tokyo Macworld Exposition. During this meeting, it was determined that from that day forward, Apple would no longer release or support system software or utilities that could in any way be described by smart alecks in the Mac media as "funky."

Unfortunately, at that time, your beloved MacroMaker was notoriously wonky and was summarily booted from the system-software team.

So much for the history lesson. Regarding available macro-making utilities: If you
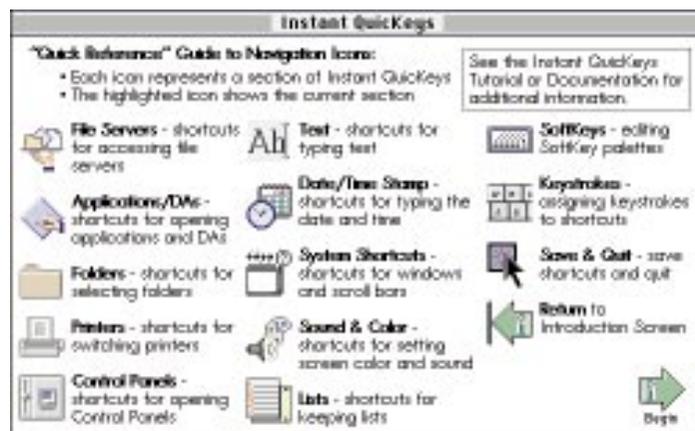
figure 1 / **You don't have to start from scratch** in building your macro collection. QuicKeys gives you the option of installing some prerecorded routines.

don't need the kind of power and flexibility you get in CE Software's QuicKeys or Affinity Microsystems' Tempo II Plus, I'd suggest Affinity's TempoEZ. It sports a simple interface, and although it doesn't support conditionals, it packs a pretty fair punch for the price ($79.95 list). Plus, if you crave more power, you can trade up to Tempo II Plus for another 50 bucks.

BOB: As always, I'm a huge fan of QuicKeys ($119 list). The latest version is easier to use, because it has the Instant QuicKeys option, which sets up tons of useful shortcuts automatically (see figure 1).

Once QuicKeys is installed, automating a task is usually no harder than turning on Record Sequence, performing the task, and saving the sequence.

I say no Mac should be without QuicKeys. But if you want to save the money, there's always the excellent but somewhat complicated $10 shareware KeyQuencer, by Alessandro Levi Montalcini. It's available in all the usual places (see end of article).

CHRIS: QuicKeys also gets my nod for ease of use. But for raw power, Tempo II Plus has a definite edge. This program can perform complicated tasks that QuicKeys can only dream of.

Also, we'd be remiss if we didn't mention AppleScript. No one claims that nonscripters will find it easy to use, but it's mighty mighty and it's free with System 7 Pro, System 7.1, or later versions.

You can find the shareware and freeware programs referenced in this article in the MacUser and ZiffNet/Mac areas on CompuServe and eWorld. See How to Reach Us for instructions on accessing ZiffNet/Mac.

Mac Can Cook

Get out of the kitchen and onto your Mac — that's where the hautest cuisine is happening these days.

BY VICTORIA VON BIEL

FORGET THE CUISINART. Don't even bother with the bread machine. The hottest kitchen gadget these days is your Mac — and you don't even have to sacrifice counter space to take advantage of its cooking skills. If you have a fast modem, a connection to the Net, a good recipe-management program, and a printer, you'll be all set.

The modem is for going online, where large numbers of foodies congregate in such places as CompuServe's **Cooks Online** ✿ (Go COOKS) and the Usenet group rec.food.cooking (which you can access through the Internet forums on CompuServe or America Online). If you're new to the online cooking world, I recommend visiting Cooks Online first. There you'll not only find an active group of food enthusiasts discussing everything from fat-free cooking to the world's most disgusting cuisines but you'll also have access to a huge library of recipes from users around the world.

If you have access to the World Wide Web, then an even bigger world of food opens up. My current favorite hangout is A List of Food and Cooking Sites (http://www.vuw.ac.nz/who/Amy.Gale/recipes/other-sites.html), which is run by Amy Gale, a New Zealander who has made it her life's work to link every Internet food site (including Usenet groups and ftp sites) in one Web page. She has also started The rec.food.cooking Album (http://www.vuw.ac.nz/who/Amy.Gale/rfc-album/index.html), a Web page — complete with photos and favorite recipes — that links other foodies and their home pages.

Online food lovers even have their own e-zine, the electronic Gourmet Guide, or eGG (http://www.2way.com/food/egg/index.html), which is published biweekly by 2 Way Systems. In it you'll find recipes, interviews, tips, and trivia.

Recipes for Success

The Mac's other great culinary talent is its ability to store and manipulate all your recipes. The great thing about keeping your recipes on a computer is that you can play around with quantities and ingredients to your heart's content. Need to figure out how to make lasagna for 50? With the right recipe manager on your Mac, it's no sweat. Need to know what you can cook, based on the meager contents of your pantry? Do a quick search in your recipe database, and you'll find the answer. Plus, if you're an organization junkie, which many computer addicts are, the mere act of inputting recipes into your Mac is

a very satisfying experience. It sure beats digging through a drawerful of yellowing clippings and oil-spattered recipe cards.

If I were to make one recommendation for a recipe database, I'd say go for **Mangia!** ● , from Upstill Software. It's a slick, well-designed program that provides you with sophisticated layout options and a powerful database of ingredients and cooking methods. It comes with 350 haute-cuisine recipes culled from the old *Cooks* magazine (recently reborn as *Cooks Illustrated*), and you can buy add-ons for seven more cookbooks,

ranging from *The Tassajara Recipe Book* to *Eat Smart for a Healthy Heart*.

Unfortunately, if you have a large collection of your own recipes, Mangia! doesn't offer you any way to automatically import files — you have to either type in everything or do some tedious cutting and pasting. Fortunately, Mangia has some built-in data-entry aids that speed up tasks such as entering the names and amounts of ingredients. Once you've entered all your recipes, the result is worth it. You can scale recipes to feed any number of diners, and you can create menus, recipe cards, booklets, and the like, in a variety of formats and typefaces. It also lets you manage the contents of your pantry — so you know what you have on hand — and create

shopping lists arranged by store section.

Mangia! does not have nutritional-analysis capabilities, which seems like an oversight, and you cannot import your files from or export them to a text format, which is a nuisance if you want to share recipes with the non-Mangia! world (your online buddies, for example). $35; add-on cookbooks, $10 to $20 each. 800-568-3696 or 510-526-0178.

My second choice is **MasterCook Mac** ❑ , from Arion Software. What MasterCook lacks in looks (it has a seriously ugly interface and few layout options for printing), it more than makes up for in power. Like Mangia!, MasterCook lets you create shopping lists and search for recipes by a variety of criteria. But it also includes a wine-list manager, a glossary of terms, recipe costing,
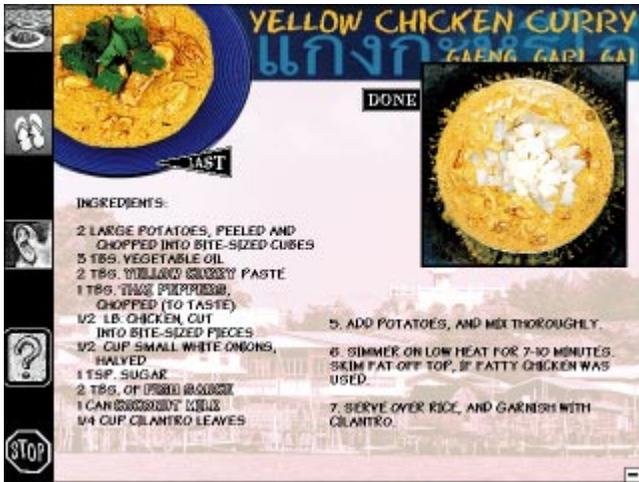
and excellent nutritional-analysis capabilities.

Arion has a big presence online: It operates an awesome bulletin board (with more than 10,000 recipes), at 512-327-9814. It also has a Web page (http://arion.com) and a mailing list, which lets MasterCook users exchange recipes. You subscribe by sending an e-mail message to mail-server@mind.org and typing SUBSCRIBE MASTERCOOK in the body of the message. $30. 800-444-8104 or 512-327-9573.

For those who prefer the format of a traditional cookbook, there are

several available on CD-ROM. I'm not yet convinced, however, that dumping a cookbook onto a CD-ROM is such a good idea. What I love about cookbooks is the same thing I like about novels: You can curl up and *read* them — something I have yet to do with my Performa 575. Of course, a CD-ROM

offers the promise of step-by-step video instruction and the ability to search for recipes by ingredient, but few CD-ROMs follow through effectively on these capabilities.

However, if you're intrigued by the idea of CD-ROM cookbooks, I highly recommend **Four Paws of Crab** ◆ ($45; Live Oak Multimedia, 510-654-7480), a multimedia tour of Thailand and its history and cuisine. This is an exquisitely produced CD with a handful of recipes and enough background to make you feel as though you've actually visited a Thai marketplace.

Another good CD-ROM is *Food & Wine*'s Wine Tasting: An Interactive Experience ($59.95; Times Mirror Multimedia, 800-747-1787 or 201-307-8866). This program actually teaches you how to taste and appreciate wines, starting with information on growing conditions, regions, and grape varieties and ending with an interactive tutorial (wine not included, unfortunately). It includes tasting notes for 48 good, moderately priced wines.

So log on to your Mac, download some recipes, open that bottle of wine, and get cooking. And as Julia would say, *bon appétit.*

The Two Dads

BY RIK MYSLEWSKI AND JIM SHATZ-AKIN

JIM: It's a deluge. I can't keep up.

RIK: Baby Bailey's diapers?

JIM: That too — but I'm talking about kids' software.

RIK: At least we're paid to endure the unending parade of talking bunnies — pity the parents who just want to do right by their kids.

JIM: Luckily, there's no shortage of sources you can turn to for advice.

RIK: But remember, folks, you can't believe everything you read . . .

JIM: . . . unless it comes from a dad.

RIK: And so, first things first: Parents, join **Club KidSoft** ◆ .

JIM: It's great. For about thirty bucks, you get four issues of a splashy magazine and four CD-ROMs filled with games, activities, and demos of the best in kids' software. You call a toll-free number, credit card in hand, to unlock the CD and transfer onto your hard disk a working copy of any program you decide to buy.

RIK: If you want a more thoughtful evaluation of kids' educational software, subscribe to Warren Buckleitner's *Children's Software Revue,* which comes out six times a year. It's crammed with interesting articles and solid kid-test-based software reviews.

JIM: The best single-volume guidebook to kids' software is the unfortunately named *That's Edutainment!* ✳*.* Its ratings of 100 top programs are well thought out, but toss the bundled CD-ROM — it's poorly designed and lacking in Mac demos.

RIK: I agree with most of its recommendations — except the praise of EA*Kids' infuriating Ping and Kooky's Cuckoo Zoo, which tops my all-time-turkey list.

JIM: Then you ought to avoid *KidWare,* a new book from Prima Publishing. It's hard to navigate, and Ping and Kooky are praised — even though great stuff such as MECC's Odell Down Under and Edmark's Thinkin' Things Collection 2 is ignored.

Children's Software Revue ⬤⬤⬤⬤✳

Price: $24 per year (six issues). A well-written newsletter that includes trend articles and intelligent capsule reviews organized by age and subject.
Company: Active Learning Associates, 313-480-0040.
Reader Service: Circle #421.

Club KidSoft Magazine and CD-ROM ⬤⬤⬤⬤✳

Price: $29.95 per year (four issues and four discs).
This bright, lively magazine plugs software by using fun noncomputing activities, and the CD-ROM includes demos, contests, kid artwork, and unlockable programs. Parents get a companion catalog. Extra activities on America Online.
Company: KidSoft, 800-354-6150 or 408-354-6100.
Reader Service: Circle #422.

KidWare: Parent's Guide to Software for Children, by Michael Perkins and Celia Nunez ⬤⬤✳

Price: $14.95.
A guide that's hampered by questionable choices, major omissions, wordy reviews, and no clear rating system.
Company: Prima Publishing, 916-632-4400.
Reader Service: Circle #423.

That's Edutainment!, by Eric Brown ⬤⬤⬤⬤

Price: $29.95.
This comprehensive introduction to kid's software includes eight meaty chapters on computers and education plus punchy reviews of 100 programs. CD-ROM offers a measly 11 Mac demos.
Company: Osborne McGraw-Hill, 510-549-6600.
Reader Service: Circle #424.

The Game Room

BY BOB LEVITUS

SIMULATION GAMES let you try on just about any hat you can imagine while seated in front of your Mac. The three we review this month deliver you to the land of make-believe but with varying degrees of success: SimTower lets you build a tower to the sky; WolfPack puts you at the helm of a WWII naval vessel; Theme Park may frustrate more than amuse as you try to build your own amusement park.

SimTower

Sim-ply Superb

OWN YOUR OWN PIECE OF LAND — and sky, if you can build a tower that high — with SimTower. In this "sim," you develop, build, and manage a tower. Beyond those parameters, the goal of SimTower is up to you to determine, since this is not a game you win or lose. Ostensibly, you want to build a five-star tower and lease out space for use as offices, condos, restaurants, movie theaters, hotel rooms, and so on. You start with a limited amount

GAME POINT

My favorite of the bunch is Sim-Tower, which I find elegant and addicting. If you like war games or the challenge of mastering a myriad of commands, WolfPack is also a good choice. Theme Park is a rough roller-coaster ride that needs repairs.

SimTower ○○○○

Price: $40 (estimated street).
Company: Maxis, Orinda, CA; 800-526-2947 or 510-254-9700.
Reader Service: Circle #425.

WolfPack ○○○ ✳

Price: $34 (estimated street).
Company: NovaLogic, Calabasas, CA; 818-878-0325.
Reader Service: Circle #426.

ThemePark ○○

Price: $45 (estimated street).
Company: Bullfrog Productions, San Mateo, CA; 800-245-4525 or 415-571-7171.
Reader Service: Circle #427.

of funding; it's up to you to use it wisely so that your tower will grow and you'll prosper. It's also up to you to keep your tenants and visitors happy by adjusting rents, improving elevator service, constructing desired amenities, and dealing with the occasional fire and terrorist attack.

Whether SimTower is as good as other Maxis offerings is being debated in game circles. Personally, I like the simplicity of this game compared to the complexity of others by Maxis. I was not disappointed to have mastered the game in less than an hour, since there's plenty of variety each time I play.

The game does have a few drawbacks. Users without Power Macs may find it frustratingly slow, and it has a few quirks that need fixing. For instance, you should be able to save preferences, have more options for viewing portions of the tower, and change rents for more than one room at a time. Despite those complaints, this sim is thoroughly enjoyable.

WolfPack

Full Speed Ahead

WOLFPACK IS INTRIGUING, because it's so complex. It gives you many choices (dozens at any given moment), so you can play for months without repetition. All those choices can boggle the mind, however.

It's WWII, and your job is to command either an Allied destroyer or a German submarine, in any of 70 missions that come with the game. When you're ready to really take command, the Mission Construction Kit lets you create your own missions.

If a battle gets too intense, the Auto Command mode can offer you some relief by letting you hand over control of your speed, heading, and depth to the "captain." Relieved of

those duties, you can concentrate on important stuff such as firing deck guns and torpedoes.

Although I quickly mastered the basics of SimTower, getting the hang of WolfPack took much longer. The well-written documentation and lifesaving keyboard-shortcut chart keep it from getting too confusing. But even after playing for a week, I didn't feel comfortable without having both nearby.

If you like war-oriented games or detailed simulations, put WolfPack on your shopping list.

Theme Park

Closed for Repairs

I THOUGHT I WOULD LIKE Theme Park. The premise is inviting: Build your own theme park, choosing the site, rides, food, sanitary facilities, and staff. And the opening movie is great. Alas, the fun stops there.

You can tell Theme Park started out as a DOS program by its disregard for Mac-interface conventions. Loading the program and getting into it far enough to find the tutorial is a guessing game. Once I did find the tutorial, it did not teach me how to play the game. The interface is ugly and hard to read, because it uses tiny bitmapped graphics. And you get some surprises when you use keyboard command equivalents. For instance, rather than executing a save,

Cheat Sheet

BY ROMAN LOYOLA

Tower Above the Rest
The tenants of SimTower aren't keen on twiddling their thumbs; they've got places to go and people to see. The key to a successful tower lies in keeping folks moving, and that means planning your elevators well.

• **Invest a good chunk** of change in elevator cars — the more you have, the more you can grow.

• **A good rule of thumb** is to have one elevator shaft for every two adjacent rooms.

• **Put your cars** where they're needed, keeping in mind that peak transit hours are in the morning, at midday (between 11 A.M. and 1:30 P.M.), and at quitting time. For instance, on the floors where there are apartments, it's a good idea to stagger cars in the morning. At around 5 P.M., have them waiting in the lobby for tower dwellers returning home.

• **SimTower tenants** won't use stairs that go higher than three floors above any lobby. Don't waste your money on stairs that go higher than that.

• **Regular elevator shafts** have a maximum span of 15 floors, including underground floors. Keep in mind that an underground garage counts as one of those floors.

Command-S invokes something called the Stock screen. There are no zoom or rotate commands, making construction unnecessarily difficult. Finally, the manual is full of small, uninformative illustrations.

All in all, the theme for this game is aggravation. ▲

Dropping the Ball, Again

IT WAS AROUND THE MIDDLE OF 1994 when I heard this from a leading maker of add-in video cards: "This is ALL off the

record. All hell is going to break loose in March of 1995, when Apple rolls out a line of PCI-bus machines based on the PowerPC 604. They will rock the market. We know because we're in on it! They're PReP machines without IBM's blessing. Apple gave up on waiting for IBM."

Wow. Was Apple getting aggressive again? This should be fun to watch, I thought. Then again, I'd keep hearing over the years about these kinds of things and nothing ever would come of them. Still, it seemed possible and logical. So I waited. Time passed. Finally, long after the March deadline, what did I get in the mail from Apple? The company's latest breakthrough: a 14.4-kbps modem.

I checked the shipping date on this modem. Yes, indeed, it was shipped in 1995, not years ago when 14.4 modems were developed. Then I got a call from a PR firm Apple had hired to promote this modem. A sweet voice on the other end of the phone asked if I was going to review it. I didn't have the heart to tell her that I'd had a 28.8-kbps modem hooked to my Mac for almost a year and to ask what I was supposed to do with this. Even my kids complain if I give them "the old 14.4 modems."

Admittedly a 14.4 modem will do the same job on CompuServe, Prodigy, and AOL as a 28.8 modem, since few services have upgraded to 28.8. But most BBSs have upgraded, and any user-to-user file transfer greatly benefits from 28.8, as you can imagine. Also anyone trying to go on the World Wide Web knows that 14.4 is just too slow. That's the irony of this modem and just about all of Apple's recent flubs. Apple doesn't view itself as a technology leader anymore. It's just making replacement machines and supplying its same old customers with newer machines as they come out. I'm not sure it even understands its customers. And after seeing this 14.4 modem, I wonder if it understands much of anything.

Apple blew the chance of a lifetime when Mosaic showed up and introduced the world to the wonders of the World Wide Web. It ran on a Mac and, for a short period, put the Mac in the driver's seat of a Ferrari on the Information Superhighway. Did Apple take advantage of this edge? Were there TV ads showing that a Mac could do something no PC could possibly do? Were there dog-and-pony shows about the Internet and Mac connectivity? Gee, the Mac even had a built-in Ethernet port! No PC had that. It made it easy to connect to ISDN via a network box and an ISDN adapter for amazing Internet access! Apple should have built the adapters for this access. Or licensed the Ascend 50. Or done *something!* Did Apple take advantage of the opportunity of a corporate lifetime? Nope. Over a year later, it shipped a 14.4 modem.

Meanwhile, Netscape (and a slew of others) came out with a browser for Windows, and now the PC once again reigns as the online-connection machine of choice.

Even if you look at the most loyal stronghold of Mac users — the graphics community — you'll discover that Apple seems clueless about serving them. I wonder if the company is even aware that it's won these people, much as the language M (formerly MUMPS) has locked up the health-care industry. Once you've got a market locked up, you must deliver the machines and technology that will keep that market locked up. So where is Apple's Mac with a read/write optical drive or a SyQuest drive built in? All these graphics professionals have to have a high-capacity removable-media drive so they can take their huge files to service bureaus. Does Apple fit into this picture someplace? What about the typical graphics shop, in which the Macs each use 60 to 100+ MB of main memory? If you use Photoshop to the max, you can easily require gobs of memory. Does Apple offer a reasonable price for such a system? Try to order a Mac from Apple with 64 MB of RAM. The same situation holds true for the hard-disk drive. Apple still offers minimal hard-drive capacities, while PC users nowadays expect a gigabyte for starters. On my PC, I use a 2.3-GB hard drive. My Mac has 500 MB. But I don't really need 2.3 GB on a PC, whereas a heavy Mac user does need that and more!

So, as I wait for the 604-based machines with the PCI bus and all the rest of the fast Macs of tomorrow, I stare at Apple's new 14.4 modem — a tribute to technology. Oh, and I also see that Apple has lost yet another point in total market share. Insiders all say that maybe these Mac clones coming out from various companies will revive interest. The Mac fanatics will tell you that superior technology will win out. Windows sucks, they all say. That may be true, but so what? Apple is hardly proving its case by dropping the Internet ball, failing to see its strengths, and then getting into the modem market with a 14.4-kbps device this late in the game.

As for the review of the modem, I think this column suffices.