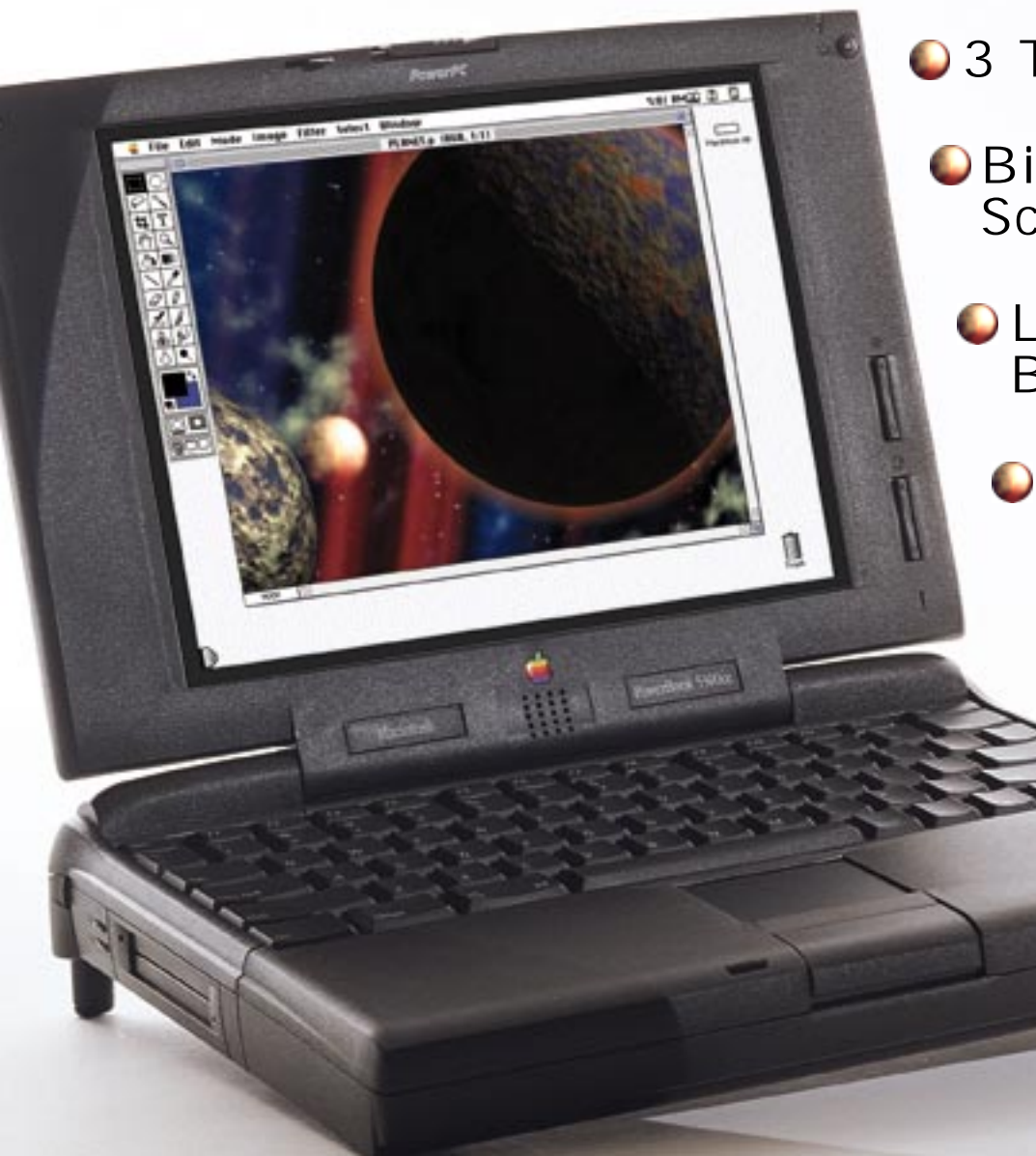


NOVEMBER 1995 / \$3.95

Mac User

ZD ZIFF-DAVIS PUBLISHING COMPANY

NEW! PowerPC PowerBooks



- 3 Times as Fast
- Bigger, Better Screen
- Long-Life Battery
- Wireless Networking

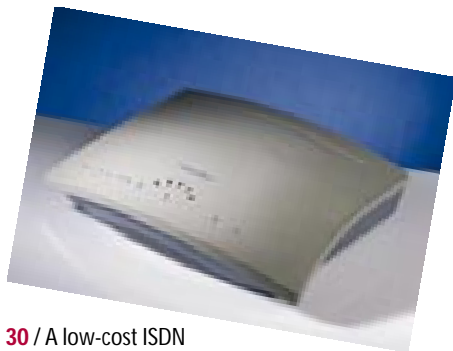
PLUS

Windows 95
Will Your Connectivity
Software Still Work?

Ultrafast Internet
Why You Need an
ISDN Connection Now

MacUser CONTENTS

NOVEMBER 1995 / VOLUME 11 NUMBER 11



30 / A low-cost ISDN Internet connection.

NEW ON THE MENU

Farallon Netopia Economical Internet. / **Power Computing PCI**, multiprocessing options. / **QuickTime**, **PlainTalk** New, improved, and native. / **ZMac Utility of the Month** T-Minus 10. / **Plus** Macintosh price index. / 30

COLUMNS

Letters Readers wail on Windows, click on clones, and sass our two dads. / 13

Maggie Canon Guest columnist Pamela Pfiffner examines Adobe's strengths. / 21

Andy Ihnatko Out of the closet. / 25

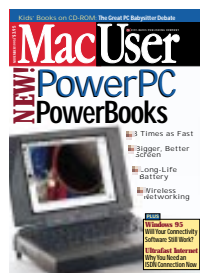
John C. Dvorak Barbarians and Bill Gates. / 210

How to Reach Us / 8

Product Index / 172

Advertiser Index / 176

Marketplace / 182



On the cover / Introducing the PowerBook 5300ce

Cover photo / Fred Stimson

Screen image / KPT Bryce

REVIEWS & QUICK CLICKS

Apple Macintosh Performa 5215CD Affordable, versatile, and elegantly designed, Apple's new home machine gets high marks. / 39

Authorware 3 Creating dynamic, interactive multimedia programs is easy with this versatile visual-programming tool. / 46

Personal MACLAN Connect 5.0 Peer-to-peer networking program allows file and print sharing between Windows-based PCs and Macs, without a server. / 49

Fractal Design Poser Bringing life to your figure drawings is a snap with this digital drawing tool that lets you manipulate lifelike 3-D mannequins. / 50

ClarisWorks 4.0 Elegantly integrated jack-of-all-trades program delivers almost everything you could possibly need. / 52

SmartSketch This draw program introduces a new approach: no layers, no Bézier curves — just draw. / 54

Pioneer DRM-624X Cutting-edge six-disc CD-ROM changer teams speed with convenience. / 56



PixelPutty Solo Budget-priced 3-D modeler offers a powerful mix of modeling, rendering, and animation tools in a single package. / 58

Now Up-to-Date & Contact 3.5 Top-notch PIM adds new QuickPads for quick and easy data entry. / 59

FrameMaker 5 Publishing powerhouse shines at long documents and supports multiple platforms and AppleScript. / 60

Ready, Set, Go! GX QuickDraw GX-supporting page-layout program lets you fiddle with your fonts. / 62

KPT Vector Effects Kai's newest offering lets you emboss, make shadows, warp objects, and create a slew of special effects swiftly and easily. / 65

FaceSpan 2.0 This AppleScript interface-design tool puts the power of scripting within reach of many more users. / 67

Passage to Vietnam This CD-ROM pushes the state of the art with its exquisitely presented story of Vietnam. / 67

Tamron Digital Fotovix IIIS-D Unusual microscope-like scanning device lets you quickly incorporate still-photo images into your multimedia presentations. / 68

Skyline/Satellite 1.1 Protocol-savvy network analyzer makes troubleshooting net problems easy — even for novices. / 69

SCSIShare Share SCSI devices over an Ethernet network. / 71

Desktop Labels Combination database and bar coder delivers the goods. / 71

Master Tracks Pro 6.0 Entry-level MIDI sequencing. / 73



39 / The all-in-one Performa 5215CD.



COVER STORY

POWERPC

Portables

Power Mac PowerBooks feature an array of technological delights and a competitive price.



THE NEW GENERATION of PowerPC-based PowerBooks features a modular design, new battery technology, full PC Card support, and wireless infrared communication. BY JIM SHATZ-AKIN / 74

FEATURES



Photo Opportunities

THE VISION of a filmless studio — with its attendant time, money, and environmental savings — is within sight. The vision is a little blurry, though, as our investigative report on the state of the art of digital cameras reveals. BY BRUCE FRASER WITH PETER ALAN GOULD AND STEPHEN JOHNSON / 82

ISDN: It Sounds Darn Nice

ISDN — IT'S SURPRISINGLY DOABLE NOW. Two to four times the throughput of today's fastest modems, over existing phone lines: Here's everything you need to know to make the move. BY HENRY NORR / 100

Quick Labs



PROBLEM: WE JUST CAN'T KEEP UP with all the great products introduced each month. Solution: Quick Labs, a monthly bulletin of lab results on the latest printers, monitors, and storage systems. / 106

DTP & GRAPHICS / 108

Online Publishing Seven steps to creating your own World Wide Web page. / 111

Graphics How-To Create a cool crossfade between two images by using this special technique. / 114

Expert Tips Tools and techniques for setting up a file-tracking system. / 117

NETWORKING / 118

Net Tools Securing your net and your data is a must. Here's how. / 121

Mac to PC A first look at Windows 95. / 123



HANDS ON / 126

The Universal In Box Is your e-mail out of control? / 126

Mobile Mac Sneak peeks at new products for PowerPC PowerBooks. / 131

Net Traveler Doing business in the MUD. / 135

Help Folder Bob and Chris answer all your questions. / 136

PERSONAL MAC / 140

Rock Around the Mac Rock and roll on the Internet and on CD-ROM. / 140



The Two Dads Does the Living Books series live up to its reputation? Two dads tell all. / 141

The Game Room Mental challenges that range from meditative to reflex-testing. Plus: Cheat Sheet. / 142

MacUser

Group Publisher

Chris Dobbrow

Editor-in-Chief

Maggie Canon

Editorial

Editor **James S. Bradbury**

Managing Editor **Nancy Groth**

Technical Director **Henry Bortman**

Executive Editors **Cheryl England, Susan Janus,**

Rik Myslewski, Pamela Pfiffner

Senior Editors **Karen J. Ohlson, Jim Shatz-Akin**

Senior Associate Managing Editor **Claire H. Breen**

Chief Copy Editor **Eva Langfeldt**

Associate Technical Editor **Rhoda Simmons**

Associate Editors **Carolyn Bickford, Shelly Brisbin,**

Nancy Peterson, Sean J. Safreed

Copy Editor **Jon Zobenica**

Assistant Editors **Kristin M. Balleisen, Nikki Echler,**

Roman Loyola, Jason Snell

Research Assistant **Rebecca Olson**

Contributing Editors **Sharon Zardetto Aker, David Biedny,**

Christopher Breen, Don Crabb, Bruce Fraser, Andy Ihnatko,

Ted Landau, Bob LeVitus, John Rizzo, Stephan C. Somogyi,

Michael Swaine, Gregory Wasson, Kelli Wiseth

Contributing Anti-Editor **John C. Dvorak**

Executive Assistant to the Editor-in-Chief **Teresa Campbell**

MacUser Labs

Group Labs Director **Jeffrey S. Pittelkau**

Associate Labs Director **Nathan Garcia**

Senior Project Leaders **Kristina De Nike, Jeffrey K. Milstead**

Project Leader **Rick Oldano**

Technical Specialists **James Galbraith, Martin Wong**

Lab Administrator **Chris Moreno**

ZD Labs

Director **Robert W. Kane**

Design

Art & Design Director **Lisa Orsini**

Senior Art Director **Diane Dempsey**

Art Production Manager **Jan McKenzie Rogers**

Technical Illustrator **Mark W. Sweeney**

Assistant Art Director **Stephani Finks**

Advertising/Sales

Advertising Coordinators **Jennifer Sawyer, Elizabeth Turney**

Sales Assistant **Colleen Dasher**

Production

Production Director **Carlos Lugo**

Production Manager **Jill Waldman**

Assistant Production Manager **Monique Risso**

Marketing

Group Marketing Director **Laurel Clark Skillman**

Group Research Director **Neil Karlin**

Marketing Manager **Renee Bula**

Sales Development Manager **Cheri L. McKeithan**

Marketing Coordinator **Stephanie Arnold**

Operations

Group Business Director **Bret A. Violette**

Group Business Manager **Mary E. Colbert**

Assistant to the Group Publisher **Lola Tanouye**

Assistant to the Group National Ad Director **Gina Michelucci**

Assistant to Account Representatives **Deborah Monaghan**

Online: ZiffNet/Mac

Director of Macintosh Services **Ben Templin**

Managing Editor **Scott Love**

Senior Editor **Mark Simmons**

Project Manager **Andrew Kim**

Associate Editors **Matthew Johan, Jodi Naas**

ZIFF-DAVIS PUBLISHING GROUP

Chairman and CEO

Eric Hippeau

Business Media Group

President

Ronni Sonnenberg

Executive Vice President

Claude P. Sheer

Vice President, Central Advertising Sales

Bob Bader

Vice Presidents

Don Byrnes, Al DiGuido, Dan Farber, J. Samuel Huey,

Michael Miller, Paul Somerson, Jim Stafford

Managing Director of Ziff-Davis Preferred Customer Program (ZDPC)

Lucy Wohltman

Director of Public Relations

Brenda Wheeler

Marketing and Development Group

President **Jeffrey Ballowe**

Vice President, Alliance Marketing **Janet Ryan**

Vice President, Business Development **Tom Thompson**

Vice President, Ziff-Davis Magazine Networks **Joe Gillespie**

Vice President, Marketing and Development Group **Herbert Stern**

Vice President, Marketing Services **Jim Manning**

Vice President, Corporate Research **Elda Vale**

Executive Directors, Magazine Networks **Ellen Atkinson,**

Anna Zornosa

Marketing Director, Ziff-Davis Magazine Networks

Michael Perkowski

Managing Director, ZDPC **Jeff Bruce**

Directors, Ziff-Davis Magazine Networks **Anne Fitzpatrick,**

Kelly Lowman, Scott Murphy, Alicia Saribalis

Vice President, Product Testing **Mark Van Name**

Director, ZD Labs **Robert W. Kane**

Director, ZD Benchmark Operation **Bill Catchings**

Ziff-Davis Publishing Company, Corporate

President, Business Media Group **Ronni Sonnenberg**

President, Computer Intelligence/InfoCorp **Bob Brown**

President, Consumer Media Group **J. Scott Briggs**

President, International Media Group **J. B. Holston III**

President, Marketing and Development Group **Jeffrey Ballowe**

Executive Vice President, Business Media Group **Claude Sheer**

Senior Vice President, Circulation **Baird Davis**

Vice President, Assistant to the Chairman **Tom McGrade**

Vice President, Central Advertising Sales **Bob Bader**

Vice President, Chief Financial Officer **Timothy O'Brien**

Vice President, Circulation Services **James F. Ramaley**

Vice President, General Counsel, and Secretary **J. Malcolm Morris**

Vice President, Human Resources **Rayna Brown**

Vice President, Planning **Darryl Otte**

Vice President, Production **Roger Herrmann**

Vice President, Technology **Bill Machrone**

Treasurer **Thomas L. Wright**

Chief Information Officer **Wellington Y. Chiu**

Executive Director, Licensing **Gertrud Borchardt**

Director of Public Relations **Gregory Jarboe**

In memory of **John J. Anderson** 1956 – 1989

and **Derek Van Alstyne** 1967 – 1989



Entire contents © 1995 Ziff-Davis Publishing Company, L.P. All rights reserved; reproduction in whole or in part without permission is prohibited. *MacUser* is a registered trademark of Ziff-Davis Publishing Company, L.P. *MacUser* is an independent journal, not affiliated in any way with Apple Computer, Inc.

How to Reach Us

MACUSER WANTS to hear from you. Send questions, tips, or complaints to *MacUser*, 950 Tower Lane, 18th Floor, Foster City, CA 94404; 415-378-5600. Send e-mail to letters@macuser.com (Internet) or 72511,422 (CIS). We cannot look up stories from past issues, recommend products, or diagnose Mac problems. 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 ZD Net/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-140496720. Canada Post International Publications Mail Product (Canadian Distribution) Sales Agreement No. 278521. POSTMASTER: Send address changes to *MacUser*, P.O. Box 56986, Boulder, CO 80322-

6986. Second-class postage paid at New York, NY 10016, and at other mailing offices.

ZD Net/Mac: MacUser Online

ZD NET/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 ZD Net/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. Written requests for permission should be addressed to Chantal Tucker, Ziff-Davis Publishing Company, One Park Avenue, New York, NY 10016, or faxed to 212-503-5420. **For price quotes on reprints, please call Ziff-Davis Reprints toll-free at 800-825-4237.**

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

Trashing Windows

WELL SPOKEN, MAGGIE CANON ("Trash Talkin'," August '95, page 21). I think the most important Mac advantage is operating-system reliability. The big difference between my Mac and the PC I use at work is that my Mac doesn't crash two or three times a week. I have rarely lost work on my Mac, but it's a common occurrence at work. Windows 95 is a radical departure from its predecessor, and I dread the day when my company decides it's time to take the Windows 95 plunge.

Recently I found a Web page that commented on the rest of the computer industry's struggles to keep up with Apple. It's true — too bad Apple doesn't let anyone know it.

Susan A. Forney
via the Internet

MAGGIE'S COLUMN WAS a well-needed parody and a breath of fresh air. The tone was so serious, however, that I have no doubt that some Mac users will end up being misinformed. No, Windows 95 does not "wipe out" the Mac's ease-of-use advantage, but let's set the record straight.

Windows 95's Install Wizard selects video drivers for the user. Users need not "figure out" which video driver to use during the install; they need only to inform the Install Wizard whether or not their PC has a network card in it. No "card or two" must be purchased to hook up "various peripherals." If users need SCSI, they buy a SCSI card. Windows 95 doesn't let programs

throw .INI files just anywhere; all .INI files are stashed in one directory.

Frederick Vorck, Jr.
via the Internet

I USED TO BE A Mac enthusiast, but I now mostly use PCs. I still love Macs, but Maggie Canon and many Mac people are missing the point.

After watching System 7.5 chug along on a Power Mac with 8 MB of RAM, I can tell you that an entry-level Pentium running Windows 95 and Microsoft Office 95 will be a hard package to beat: Snappy performance, ease of use, low cost — isn't that what you want?

Paul Davis
DAVISinLA@aol.com

WHY ALL THE FUSS about Windows versus the Mac OS? My daughter Ana is a lively 2½-year-old who regularly uses a Power Mac 6100 on her own without any assistance! She switches it on and double-clicks on her favorite programs, and off she goes.

I have yet to see a Windows system on which children (or uninitiated adults) can do anything like that without *any* training. Even experienced computer users like me can easily get lost in various DOS and Windows complexities.

Davor Pavuna
pavuna@eldpb.epfl.ch

PCI Praise

I JUST FINISHED your article on the new Power Mac 9500 ("The Power Macintosh 9500," August '95, page 68). This is one hell of an article. Whoever compiled it should get a raise. Yesterday.

Daiquiri St. John
daiq@primenet.com

WHILE RECENTLY SETTING up a Power Mac 9500, I went to plug in the monitor cable where I supposed the monitor input jack would be. I slowly realized that Apple hadn't put a video card of any kind inside the chassis of the computer. I found myself with a \$5,000+ machine sitting in front of



OPEN FOLDER

What a feeling. That was the response of many readers upon seeing Andy Ihnatko's reference to the theme from "Flashdance" in our August issue. "Thanks for mentioning that song, because it's now stuck in my head!" wrote Jeff Saxe via the Internet, lashing out in a crude attempt to exact revenge upon us all. "And try not to sing 'Muskrat Love' all day today!" A cruel blow, Jeff. We're lucky you showed mercy and didn't bring up the hottest spot north of Havana, "Copacabana."

Classic '70s hits were on our minds when William Bombardier's Internet message praising *MacUser's* comprehensive coverage arrived. William's e-mail signature, a 22-line ASCII text picture of an ancient Egyptian headdress, put us in the mood to hear Steve Martin's novelty smash "King Tut." We're betting that if Tut were alive today, he'd be using the same image in *his* signature file.

Exotic travelogues often include exciting destinations such as those pyramids found in Tut's old neighborhood. But it's hard to see your own home as an exciting locale. That explains the humorous reaction José Afonso Salcedo of Portugal had to July's Open Folder description of Portugal as "exotic." "Portugal is the least exotic place I can imagine. It's very quiet." We find that hard to believe, José, considering that Portugal is famous for ... cork.

An intriguing name can be enough to evoke feelings of excitement, which brings up a problem that reader Sam Kusnetz brought to our attention: "First the 6100, 7100, and 8100, now the 9500 — names that don't mean *anything*. What happened to good old names such as the LC or the Classic?" Strings of numbers can't beat a real name, but it's not as if models such as the *Ilci* and the *Ilisi* were much better. Although we disagree with Apple, Sam, that doesn't mean it's time to abandon ship: In times of trouble, Love Will Keep Us Together.

WRITE TO LETTERS

c/o MacUser
950 Tower Lane
18th Floor
Foster City, CA 94404
letters@macuser.com

All letters become the property of *MacUser*, and we reserve the right to edit any letters we print. Include a return address and a daytime phone number. If you write to us via e-mail, please specify whether you want your electronic address printed.

me, and I couldn't even hook up the monitor. The 9500's manual says the 9500 doesn't come preinstalled with a monitor card because Apple figured that users might want to add their own third-party video card. Now, call me crazy, but why couldn't users have simply removed the existing video card and put in a new one? Why did Apple do this?

Ben Jacobs-Swearingen
bfrink@mercury.netropolis.net

/ Since the 9500 is a high-end machine and since users of such machines usually add high-resolution accelerated video to their Macs, Apple decided to save them the cost of built-in VRAM that would probably go to waste. For those who want to buy a CPU with instant video support, one configuration of the 9500 is bundled with ATI's Xclaim GA video card. / CE

Power On

I'D HAVE TO AGREE with your review of the new Mac clones from Power Computing (August '95, page 37). I purchased one in May, and all I can say is that its performance is truly Mac-like at a relatively un-Mac-like price. If you had told me I'd one day be buying a clone, I'd have said you were crazy. And if you had said I'd be running UNIX on it, I'd have definitely said you were out of your head.

But that's exactly what I'm doing: running a Web server under Tenon InterSystems' MachTen UNIX on a Power Computing Power 100. Amazing.

George Rogic
via the Internet

Holy Letters, Batman!

YOUR FEATURE ON utilities was interesting ("The Ultimate Utility Belt," August '95, page 92), but I was saddened to see that all 13 of them were commercial products. I can think of two cases where freeware and shareware programs do as well as — if not better than — any of their commercial counterparts.

Take Disinfectant, John Norstad's freeware virus-protection program, for instance. Even when an undocumented virus is discovered, Norstad often publishes a free update faster than the makers of SAM and Virex. And programs that scan for virus behavior instead of specific viruses can become more of a hindrance than a help when it comes time to install new software. James

Thomson's freeware DragThing is as functional a launcher as Square One, and because it's an application instead of an extension, it sidesteps potential extension conflicts. It doesn't do hierarchical menus, but if I want those, I'll go with Apple Menu Options or Now Menus.

Let's not forget that the saving of money can be a utility in itself.

Marc LaFountain
lafountain-marc@scarolina.edu

/ We chose to focus on commercial products because commercial vendors often offer dependable support, thorough manuals, and other features that shareware authors may not offer. Of course, we do take time every year to highlight the best available shareware offerings, in our annual Shareware Awards; the most recent awards were in the October '95 issue (page 132). / CE

I ENJOYED YOUR utilities article and agreed with your observations, but one utility that didn't make your list should have. The utility is OptiMem RAM Charger, from Jump Development Group. This utility improves memory handling — applications get more memory allocated to them based on need rather than on just what's in the Finder's Get Info box. This utility works well in tandem with RAM Doubler, and it's one utility no Mac should be without.

William Rowe
browe@netcom.com

What's Up, Dock?

I ENJOYED Sharon Zardetto Aker's column about using stand-alone PowerBooks on the desktop as if they were Duos ("The Pseudo Duo," August '95, page 113). I've used my PowerBook 180 as my only computer for nearly two years, both in the office and on the road. On the road, the floppy drive is indispensable. In the office, there's a significant security benefit, because my computer is never left unattended on the desk overnight.

Not one of the four "essential" items you listed [monitor, keyboard, mouse, and video cable] is really essential — I do without all of them just fine — but you failed to mention the most essential item of all. I have an Asanté Mini EN/SC SCSI-to-Ethernet adapter that enables me to access my office LAN without a hitch. If you can't get on the LAN, a color monitor and enhanced keyboard don't give you much

more than a nicer game of Solitaire.

Steve K. Finlay
via the Internet

Booster Club

IN YOUR STORY on Mac speedups ("7 Speed Boosters," August '95, page 110), you say that "the sure way to ferret out the non-native extensions on your Power Mac is to use Conflict Catcher 3." Based on that statement, I bought the product, but I see no selection filter for native versus non-native. Am I missing something?

Todd Loheny
toddlo@interaccess.com

/ The Report System Patches preference in Conflict Catcher is the item you need to use. When you open Conflict Catcher 3 and click on the Report button, you get a list of items patched by startup files that shows whether those files are using PowerPC-native or 680x0 code. When 680x0-based code patches a native part of the system, it can really slow things down. / JS

IN "7 SPEED BOOSTERS," you say users should partition their hard disks, using Apple's HD SC Setup or another proprietary formatter, and put the system files on the outer partition for better performance. Apple's HD SC Setup won't do it — it gives you multiple partitions, but only one of them can be an Apple HFS partition. Furthermore, if you do use a third-party formatter to partition your hard disk, you can *never* use Apple's HD SC Setup on that disk again!

Carnie Littlefield
carniel@admin.stedwards.edu

Glider Groupies

YOU SAY THAT the "most radical change" in Glider Pro ("The Game Room," August '95, page 124) was the addition of the Room Editor, but the Room Editor existed as part of earlier versions of Glider. The Room Editor in Glider Pro, however, is much improved from the one in previous versions; it facilitates the building of houses and offers new options such as the ability to construct outside areas in which you can fly your glider.

Jason LeeKeenan
leekj@stu.ci.lexington.ma.us

/ You're right — I must have blocked out the bad memory of the old Room Editor. I agree with you that the new Room Editor rocks. / BL

GLIDER PRO IS “creative”? Puhleeze. It’s just another one of those games where the solution consists of figuring out what set of keystrokes the designer wants you to issue — except it doesn’t have the nifty graphics, animations, and weird noises that other games throw in. Although it’s slightly more entertaining than Microsoft Office, it’s just as useless. I’ve deleted them both from my hard disk.

Gary Bowen
 fcowboy@tantalus.clark.net

It’s Puzzling

WE APPRECIATE the favorable review you gave to Jigsaw Deluxe (The Game Room, August ’95, page 124). However, you complained that only two pictures were included. I’d like to point out that the street price of Jigsaw Deluxe is only \$20, compared to \$35 for the other two games reviewed in The Game Room.

Jigsaw Deluxe is available *with* pictures for \$35, but in order to help customers save money, it’s also available *without* pictures for \$20. That way, customers who want to use their own pictures are not forced to pay for ours.

Margie Kaptanoglu, Captain’s Software
 CaptSoftwr@aol.com

Hold On, Daddy-O

YOUR TWO DADS COLUMN, featuring two dads rating children’s software, seems a bit ill-conceived. My experience suggests that mothers are at least as likely to purchase educational software for their children, so it would be nice to have the opinion of a mother as a part of the column.

Also, I fail to see how two of your editors are qualified to write about educational issues as complex as child development simply because they happen to be fathers. There are countless experts in education who would seem to be more qualified to write such a column. These issues are far too complex to hand over to noneducators.

Joe Ranft
 joseph-ranft@uiowa.edu

/ We’ll ignore the sexism inherent in your assumption that mothers and fathers have different opinions about children’s software. Of more concern is your assertion that only academic experts can know what’s best for kids. Good children’s software requires more than sound educational theory; fine educators have developed many programs that bore

kids silly. We Two Dads base our evaluations on experience; observation; common sense; and the firm belief that when evaluating the proverbial omelet, you don't need a doctorate in chemistry to tell when the eggs are bad. / RM and JSA

A Vendor to Count On

I WAS QUITE INTERESTED in your review of Mathematica 2.2.2 (August '95, page 56), since I've been using Mathematica for some time. I agree with most of what you had to say, with a few exceptions. Mathematica is so powerful and has so many features that learning it is *far* from easy. To get up to speed, I had to buy and read several books covering Mathematica.

You also failed to mention that Wolfram Research has just about the best tech-support in the industry. Questions I sent via e-mail were answered in a few days and in great depth. I once received a memo several pages long explaining how Mathematica can be used to crunch numbers and then export them to another program to generate high-quality graphs. This sort of performance is so exceptional that it is worth mentioning.

Carlo Infante
71055.2241@compuserve.com

Color His World

YOUR AUGUST EXPERT TIPS column ("The Color Ruler," page 101) concerned affordable spectrophotometers. You mentioned two but gave no contact point for either vendor. Could you give us more information about Colortron and Digital Swatchbook?

David Brainard
via the Internet

/ We've written about Light Source's Colortron and X-Rite's Digital Swatchbook on several occasions, but to learn more about these revolutionary products, contact Light Source at 415-925-4200 and X-Rite at 616-534-7663. / PP

The Apple II Bites Back

DVORAK HAS a good mind for satire ("What If . . .," August '95, page 188), but sometimes his ignorance sneaks through. He keeps forgetting the Apple IIe when he mocks the Apple II. My IIe had 768K of RAM, a mouse, a 2,400-bps modem, a RAM disk, speech-synthesis capability, color, and built-in output to TVs and VCRs. It could use hard drives, 3.5-inch floppy

drives, and a GUI, and as John refuses to admit, it could type in lowercase too!

Andrew Moses
AMo3030@aol.com

MAYBE YOU SHOULD sell the last page before your back cover to one of your advertisers. Not only would it be more profitable but it would also probably be more informative to your readers.

Luc Desaulniers
nemesis@cam.org

Inspirational Andy

ANDY'S LAST COLUMN ("CD-Rummage," August '95, page 23) gave me real hope.

I'm a government employee. One day I'll be faced with the same dilemma facing many government employees — I'll be forced to get a real job. I may actually require a marketable skill or, worse yet, further education. But I see a brighter future.

By all indications, with *no* further training, I could be a feature columnist for a leading computer magazine. I was going to write up a few sample columns to send to editors, but I've decided to just make them up on the spur of the moment. That seems to work well for Andy.

Jeff Smith
via the Internet

IF ANDY EVER picks on Dave Brubeck again, I'll make him listen to Zamfir until his brains ooze out his ears.

David B. Schlosser
via the Internet

IS IT JUST MY IMAGINATION, or is Andy Ihnatko sounding more and more like Andy Rooney?

Shayne Decker
Decker8@eWorld.com

CORRECTIONS

The Apple Exchange Program, mentioned in "Power Macs: The Sequel" (October '95; page 84), is available only through Apple authorized dealers, not directly from Apple Computer. And don't bother calling the 800 phone number we listed either — unfortunately, it's wrong too.

30-pin SIMMs have only an 8-bit data path, not the 16-bit path reported in "DIMMs 'n' SIMMs 'n' Things" (August '95, page 76). As a result, 30-pin SIMMs must be upgraded in sets of four.



The Other Microsoft

EVERYBODY IS SO WORRIED ABOUT Windows 95 that they fail to realize that the real Microsoft of the Mac market is not

Microsoft at all — it's Adobe Systems. Sure, the company doesn't *seem* to have the same ruthless drive that fuels Bill Gates and Co., but Adobe dominates graphic arts and publishing, the multibillion-dollar industry that's synonymous with the Mac. And it wants more.

Look at the hard disk of any graphic artist or publisher. What do you see? Adobe Photoshop. Adobe Illustrator. Adobe PostScript fonts and printer drivers. If cross-media production is in the picture, you'll find Adobe Premiere as well. Adobe's strength isn't just in applications either. The PostScript programming language is the standard for the printers and image-setters used in the publishing industry. Like an operating-system provider, Adobe has the livelihood of scores of companies riding on its back.

Just how firmly entrenched is Adobe? Every year, we hear about some new program that may be the next Photoshop killer, but Adobe's image editor continues to reign supreme. Each revision of Macromedia's FreeHand ups the ante for Adobe Illustrator, but the latter is still in the lead. Even mighty Microsoft fears to tread into the graphics market. Many people forget that Adobe stared down Microsoft and won: In 1990, Microsoft introduced its PostScript killer, TrueImage. After a long series of advance briefings designed to undermine the competition, Microsoft abandoned TrueImage.

Recently Adobe has been preoccupied with empire building and filling gaps in its product line. The Aldus and Frame Technology acquisitions give Adobe a foothold in the page-layout arena on three platforms — Macs, PCs, and UNIX machines — but neither PageMaker nor FrameMaker is

poised to knock QuarkXPress from its current position atop the A-list. Adobe's investment in Netscape Communications gives the company a stake in the Internet too.

The Netscape alliance also gives a good indication of where Adobe is headed. Adobe recognizes that publishing is moving from paper and toward other media, such as CD-ROMs and cyberspace. Much as the PostScript language became the standard for paper-based publishing in the latter part of this century, Acrobat is being pushed by Adobe as the PostScript of the 21st century.

Unfortunately, the concept of a device-independent and — more important — media-independent way to create and distribute documents has been difficult to get across. Even though some companies are starting to use Acrobat for archiving documents and distributing advertising, they aren't doing it fast enough to make Acrobat the standard that Adobe would like it to be. Fortunately, Acrobat is taking off in an entirely different direction.

The Internet is finally giving Acrobat a place to hang its hat. Instead of having to post bland-looking documents in basic HTML on the World Wide Web, you can save documents with fully formatted text by using Acrobat. The first revision of PageMaker brought out under the Adobe umbrella lets you save files directly into Acrobat's Portable Document Format for immediate posting on the Net. And Adobe recently announced a new version of Acrobat that includes dynamic media, indexing functions, and better interactivity — all good news for Internet users.

Adobe is pushing Acrobat as the PostScript of the 21st century.

The logical progression for Adobe's current customer base is toward Acrobat and the Internet — but because no one is really making a lot of money from the Internet, Acrobat licensing won't turn into a steady revenue stream for a while. In the meantime, how does Adobe gain market share?

Follow the CPUs. The bulk of Macs are being sold into the SOHO (small office, home office) market, a customer base Adobe has traditionally ignored. There are recent indications, however, that Adobe recognizes the potential in these millions of users. Take, for example, its new PrintGear architecture (see this month's New on the Menu for more). Tired of losing

out on the low end to QuickDraw- and PCL-based printers, Adobe had to find a way to get to that market without cannibalizing PostScript. Is it too little, too late? PostScript-clone vendors have proven that you don't need the Adobe logo to offer good performance at competitive prices. With powerful PowerPC-based Macs becoming available to SOHO customers, dumb QuickDraw printers — for which the CPU does the processing — aren't shackling users with glacial print times anymore. We'll have to see if printer vendors can deliver what PrintGear promises — great performance for pennies.

Can Adobe make the transition from purveyor of high-end publishing products to mainstream-software titan? Stay tuned.

About a year ago, I wrote here that you shouldn't take your Mac with you on vacation. This year I'm following my own advice and turning this space over to Pamela Pfiffner, our executive editor for graphics and news. I hope you appreciate her insights into the graphics market, and I'll see you next month. — Maggie Canon ☞



Outing Your Mac

I TAKE ABJECT PRIDE IN THE FACT THAT my office/living space is often referred to as The Island of Unloved Computers by most

of the people who've had the chance to eyeball the scenery firsthand. Just as the Island of Unloved Toys in the holiday puppet-animation classic *Rudolph the Red-Nosed Reindeer* was populated by the castoffs of the international toy industry, the Worldwide Headquarters of Ten Thousand Nuns And Orphans Ltd. has long been a haven for the huddled masses of the computer industry.

(I'm sorry, but I must pause here for a brief interlude. Even as a tiny tot watching *Rudolph* for the first time, I was really bugged by the ending. I mean, imagine what it must have been like for the kids in that special. Like all good children, they'd been struggling to be good for 364 whole days and had come out on top — on the side of righteousness. And what's their reward? Patently defective merchandise that had probably been put on the Island of Unloved Toys for a very good reason, perhaps even upon threat of legal action by the Consumer Product Safety Administration.)

I've got a 1957 manual typewriter hastily refitted for use as a computer terminal (which I suspect was the inspiration for the terminals in *Brazil*). I've got an Exidy computer . . . one that also plays eight-track tapes. I've got a stealth-black Bell & Howell-model Apple II, a PDP-11, a notebook computer that runs only CP/M, modems the size of American Tourister luggage that transmit text a bit faster than you could by writing all the characters on baseballs and then throwing them at the destination, and a wide assortment of portable computers that weigh more than 40 pounds each. I've given a good home to these and dozens more, which is why I'm completely unqualified to write a column about disposing of unwanted and

out-of-date hardware. But I will all the same.

I'm not talking about upgrading or selling here (I covered all of that earlier — in the February '95 and June '93 issues, respectively). Too bad, your Mac Plus will never house a PowerPC 604 chip and you might conclude that there's little market for your underappreciated LC II. You have already purchased your Thoroughly Modern Mac, and your SE is lurking there under a pile of Peter Frampton albums in your closet. There are only two things you can resort to with your relics: either drop them from a daunting height or recycle them.

In the case of Peter Frampton, I urge the first option, of course, but I certainly wouldn't recommend that you do it to your Mac. I mean, that approach isn't anywhere near as cool as you might think. In the early late 80s, I conducted several experiments in this field — aided by insomnia, a 12-story building under construction (left unlocked) on my campus, and an Academic Computing Department with plenty of burned-out equipment for sale at four dollars apiece. You would think a jettisoned CRT would make a thrilling sort of "ssPOCKffff!" implosion sound, but nothing doing.

Recycling is a more promising avenue. First and foremost, if there's an old Mac nestled among the platform shoes in your closet, you're ignoring a pretty lavish haul of parts that can be used elsewhere. Its internal SCSI hard drive is the plum; most manufacturers of hard drives will sell you an empty

enclosure, containing three simple plug-in connectors, that is ready to accept your old mechanism. What's the point of having a 40-MB hard drive in this day and age? It's a Shirt-Tail Accessory, one that is designed to cover your behind. If your "real" hard drive goes south, you can always boot from an emergency disk and try to make everything hunky-dory. Forty megs is enough for a full System Folder, a full installation of more than one killer volume-

and data-recovery tool, and a bare-minimum installation of all of your most critical applications (in my case, just a word processor and ZTerm) besides. Just name this volume Lifeboat, and then disconnect the drive and stick it in the closet next to the Crock-Pot

to await its call to arms.

Memory is another thing people tend to just write off, because over the years, "standard" memory modules have gone through more physical modifications and changes in specs than Pamela Anderson. Fortunately, SimmSaver Technology (800-636-7281 or 316-264-2244) has a solution in the form of a \$59 memory module that allows a gang of old-style 30-pin SIMMs to work like a single modern 72-pin module. You might also look through your laser printer's technical manual to see if you can't find a home on its motherboard for some of your old SIMMs.

Of course, what most people think of when they hear the word *recycling* is a bunch of granola-snorting flower children splashing red paint on anyone wearing socks (I mean, the nearly ubiquitous curbside-recycling programs that have become so popular in recent years). It's

You would think a jettisoned CRT would make a thrilling sort of "ssPOCKffff!" implosion sound, but nothing doing.


surprising that computers have been around for so long without any real set of guidelines for how to dispose of their corpses responsibly. In fact, the variety of materials in your basic desktop PC is so wide that many municipal waste-disposal boards classify the stuff as hazardous. Of course, this is overkill. There are only two special safety issues associated with the disposal of a Mac: the CRT, whose phosphorus-coated glass causes cuts that stubbornly refuse to close (a safety issue for individual humans and not the planet as a whole, but worth knowing about nonetheless), and the battery. PowerBook batteries are nasty little buggers. The old lead-acid types (found in the Portable and 100 models and in "plate"-type external accessories) are an obvious hazard, as the melted briefcase of a friend transporting a defective battery attests, but the other varieties are also causing great debate about what those heavy metals do when they find their way to the water table. The same concerns are being raised about the lithium cells soldered into every shipping desktop Mac. None of these batteries

belongs in a landfill; Apple urges all of you to take them to your friendly Apple dealer for disposal. If that sucker is leaking, not even Apple wants to touch it: Call your local sanitation department for guidance. About the battery, your marriage, tax problems . . . an unusually wise breed of people is the American sanitation community.

When we talk about recycling a *functional* Mac, of course, we're not really talking about chucking one in the trash. My 1993 advice about putting your unwanted hardware into the waiting arms of your local library or school system still sticks, but I'll add the suggestion that you also take the time to make sure it's all loaded up with software — legal copies, please — and ready to roll for a specific task. If you really want to build up good karma, donate a few hours of your time every month to keeping the hardware running and giving folks what might be their first introduction to the Mac. Wear a clean shirt.

Since that column ran, though, a great many clearinghouses have been set up for the purpose of placing working equipment

with schools, nonprofits, and the disadvantaged. There are many area programs in place, but the three biggest national organizations are East-West Development (617-542-2345), which sends hardware wherever it can help foster democracy; Non-Profit Computing (212-759-2368), which places hardware with groups and individuals mainly on the East Coast; and the Computer Recycling Center (415-428-3700), which sticks to the West Coast for the most part. The Computer Recycling Center's Web page (<http://www.lick.pvt.k12.ca.us/misc/crp/crp.html>) also contains pointers to other computer-recycling programs.

And of course, there's always the option of converting your classic Mac into a fish tank by using my Macquarium™ plans, but I'm sure everyone's sick to death of hearing about that. So instead, let me make a blatant plug for something else: *Andy Ihnatko's Colossal Waste of Bandwidth*, which you can reach through the *MacUser* Web page, at <http://www.zdnet.com/~macuser/>. 

MacUser columnist Andy Ihnatko can be e-mailed at andyi@world.std.com.

NEW ON THE MENU

NETWORKING /

Farallon's Netopia Vision

New ISDN router provides low-cost Internet access for schools and for small-office networks.

IT LOOKS LIKE it's waiting for the Mother Ship to come and retrieve it, but the Farallon Netopia is firmly grounded in the needs of the earthbound: It provides a low-cost way to connect schools and businesses to the Internet via ISDN.

Despite its flashy look, the Netopia is still a piece of networking hardware, albeit one whose street price is expected to be less than \$1,000 for some configurations. It's an ISDN router that lets local networks connect to the Internet at speeds of up to 128 kbps, more than four times as fast as a V.34 modem. ISDN is a technology that allows local telephone companies to use the copper phone lines already installed in most buildings as digital conduits with maximum speeds much higher than those of the analog lines used by conventional telephones and modems.

The Netopia is easy to set up and manage — it includes an integrated BRI and NT-1, two items that are necessary if you want to

make ISDN connections. And once the Netopia has been set up (Farallon will even configure the Netopia for you for an extra charge), you just connect it to your local network via AUI Ethernet, 10BASE-T Ethernet, or even LocalTalk.

Then, as soon as it's connected to a local Internet service provider via the built-in MultiLink PPP (Point-to-Point Protocol) software, your network can be on the Internet. TCP/IP addresses are automatically set up with DHCP, the Dynamic Host Configuration Protocol.

And in case of trouble, the Netopia can be configured via a phone call — it has a PCMCIA slot, ready for a PC Card modem to be installed if the need to reconfigure the system arises.



Farallon is offering three variations on the Netopia: the Netopia 630 (around \$800), aimed at small offices, offers Ethernet connectivity for up to five users; the Netopia 640 (around \$1,000), which targets larger office networks, offers Ethernet access for an unlimited number of users; and the Netopia 650 (around \$1,200), aimed at schools that have AppleTalk networks, offers both Ethernet and LocalTalk Internet access for an unlimited number of users. 510-814-5100. / Jason Snell

Adobe Gears Up New Print Technology

THE POSTSCRIPT LANGUAGE is many things, but dirt cheap is not one of them, at least when it comes to desktop printers licensed by Adobe Systems. As a result, Adobe has watched the low end of the market slip away as more of its OEM partners sell "dumb" QuickDraw-based printers instead of selling "smart" PostScript-equipped printers. Now the company is fighting back with a low-cost printer technology designed to grab a piece of the small-business and home-office markets.

Adobe's new PrintGear technology fills the gap between PostScript and QuickDraw — and takes a shot at Hewlett-Packard's PCL. PrintGear consists of a software interpreter on

the CPU and a low-cost 50-MHz processor in printer hardware. The software compiles raster-image data such as text and bitmapped graphics into simple image objects. The compiled data is sent to the printer controller, which handles the complex task of converting code into printable dots on the fly. Because the print files are small, Adobe says, they're quickly and easily sent over sluggish LocalTalk networks. A 16-MHz coprocessor maintains printer-resident page-description languages (PDLs) and handles such duties as automatic language and port switching.

Adobe says a PrintGear-equipped printer can print pages at close to its rated speed. Files

such as an Excel spreadsheet may print faster on a PrintGear printer than on a PostScript one.

PrintGear is not designed to handle EPS graphics or complex PostScript files common in the high-end publishing market (PrintGear printers output an Illustrator file by printing its preview image, à la QuickDraw today), nor does PrintGear support device independence. Drivers unique to each printer must be resident on the host computer to print.

Adobe says several manufacturers will release monochrome PrintGear laser printers over the next few months, with color printers to come later. Expect PrintGear printers to cost between \$299 and \$999. PrintGear has a core set of 77 fonts, many of them fun display faces. 415-961-4400. / Pamela Pfiffner

Power's Low-End Punch

Multiprocessing, PCI options wait in the wings.

THE PROMISE OF MAC CLONES has been cheaper Mac OS systems, and now companies are starting to deliver. You still can't buy a PowerPC-based system with 16 MB of RAM, a 2-GB hard-disk drive, and a quad-speed CD-ROM drive for under a thousand bucks — at least not yet — but we're getting there.

Take Power Computing's latest price cuts, for example. Its Power 100 (the rough equivalent of an Apple Power Mac 8100/100) in a stripped-down version with 8 MB of RAM and a 365-MB hard drive (no CD-ROM drive) is now just \$1,699, a drop of \$700. Other Power 100 configurations have also declined in price, although not quite as drastically.

Power is targeting Apple's new entry-level 7200/75, the lowest-end model of Apple's new Power Mac line, which also lists for \$1,699. The 7200/75 sports a higher-capacity hard drive (500 MB) than the Power 100 system and includes a quad-speed CD-ROM drive. The Power 100 lacks the new PCI bus that Apple has in all the new Power Mac models, using instead the older NuBus standard. But Power's machine has a faster processor (a 100-MHz 601, versus the 7200/75's 75-MHz 601) and a 256-MB Level 2 cache, both of which give the Power 100 a speed advantage over the 7200/75. And Power systems ship with keyboards and a big software bundle, which Apple's new Macs don't. It's a toss-up.

Aside from price cuts, clone vendors have yet to announce their responses to Apple's new PCI-based models. But our spies at Power Computing have uncovered a few choice tidbits about what the company has in store.

As we reported last month, Power will deliver mixed PCI/NuBus systems, as well as all-PCI systems, by the end of 1995. These systems will preserve users' investment in pricey NuBus cards while the users switch to the higher performance and lower

cost of the new PCI cards.

Power plans to distinguish its PCI offerings from Apple's with several cool options. First, Power Computing will offer MP — that's multiprocessing, for those of you who haven't read *Acronym News* lately — in a big way. As previously reported, DayStar

Digital is aiming its Genesis MP systems at the highest of the high end, offering four high-speed 604s in a 9500-style box and with a high-end price tag (\$15,000) to match. Power, however, is investigating MP for the masses — say, four low-cost, low-power 603s on a processor card, offered as an option on any of its new systems.

Then there are PCI cards that Apple has



BUSINESS TOOLS /

FileMaker Gains New Relations in Version 3.0

RELATIONAL DATABASES have a reputation for being impossible for average users to set up and master, requiring SWAT teams of trained experts for installation and customization. That's why Claris' FileMaker Pro database program is so popular with its users — it's easy to program and maintain. But FileMaker has lacked the powerful lookup capabilities of relational database programs such as ACI US' 4D First. No more.

After making vague announcements early this year, Claris is finally taking the wraps off its relational version of FileMaker Pro. Expected to ship in late November with a street price of about \$200, FileMaker Pro 3.0 offers one-to-many and many-to-one relationships among records. For instance, a project database you've created can relate to a separate database of individual tasks and all of its related data as well. But FileMaker Pro 3.0 also retains the lookups of previous versions, so you have access to existing data.

The benefits of the relational FileMaker are, according to Claris, faster data queries, smaller file sizes, and

yet to offer users of PCI-based Power Macs, such as a FireWire connector and an MPEG decoder.

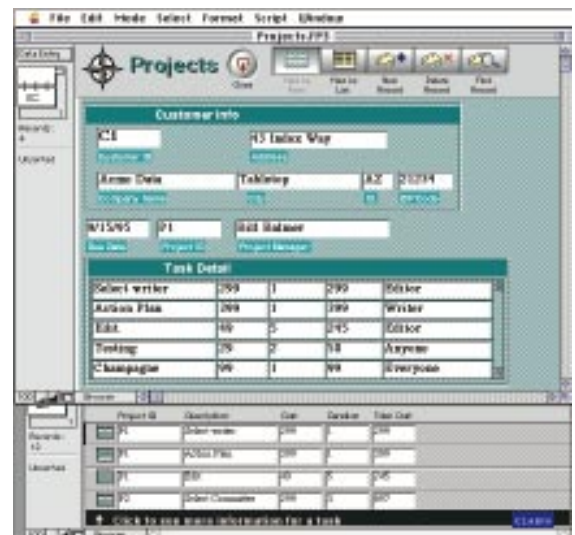
As reported here in March '94 (page 40), FireWire is a new high-speed serial bus slated to replace SCSI as the connection of choice for storage devices. It's faster than SCSI and enables hot-swapping of peripherals. Apple's been talking about it for years but seems incapable of dragging it from the R&D basement and offering it to Mac customers. Look for Power to offer FireWire as an option on PCI-based systems.

Expect to see an optional MPEG-decoder PCI card as well. Many of the latest CD-ROM titles are using MPEG encoding to deliver higher-quality video content. To date, MPEG cards are available from Apple only in its Performas. Other options in the works: a 28.8-kbps modem-on-the-motherboard, multiple serial ports, a pre-installed RAID array — all possible additions to Power's future systems.

Apple may have established itself as the front-runner with its latest round of Power Macs, but Power Computing is very much in the race. / Henry Bortman

reduced data redundancy. Active assistance will step users through the creation of relational databases.

The new version will also sport a button bar for managing records, and a text ruler will appear in the Browse mode. For all you mailing-list junkies, FileMaker Pro 3.0 will support mailmerge. 408-987-7000. / PP



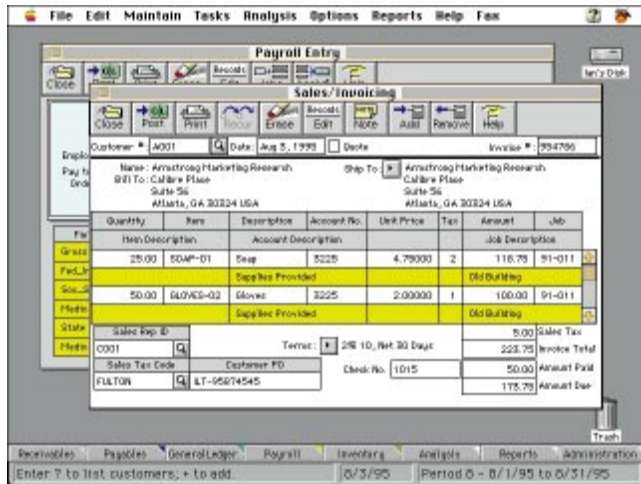
MONEY /

The Quicken and the Spread

Intuit, BestWare, Peachtree vie for a piece of the pie chart.

WHY DID MICROSOFT want to fork over \$2 billion for Intuit? For a clue, take a look at the latest version of Quicken. The days when Intuit's flagship product just balanced your checkbook are long gone. But nipping at Intuit's heels are BestWare's M.Y.O.B. 6.0 and Peachtree Software's Peachtree Accounting for Macintosh 2.5, both of which offer full-featured accounting for home and office.

Quicken 6. Quicken 6 is designed to serve as the front end for *all* of its



users' financial transactions, from banking to investment management. To that end, Intuit has signed up 19 major banks that will work with the company to enable customers to perform financial tasks online, turning each Quicken-equipped personal computer into a home-based virtual automated-teller machine.

Other notable features of Quicken 6 include a significant speed increase (it's now PowerPC-native), a completely new Apple Guide help system, and a much needed overhaul of the investment-management interface.

For the first time, Intuit is selling a deluxe CD-ROM edition of Quicken for Macintosh. The CD-ROM adds some multimedia

razzle-dazzle in the form of QuickTime tips and financial advice, as well as an all-new home-inventory feature. \$40; Quicken Deluxe 6, \$59.99. 800-624-8742 or 415-322-0573.

M.Y.O.B. 6.0. Hot on the heels of the release of QuickBooks Pro, from Intuit (see New on the Menu, September '95, page 32), comes BestWare's M.Y.O.B. 6.0. The product that set the stage for ease of use in accounting software, M.Y.O.B. has been updated to provide stronger job-management features, an expanded report writer, and more how-to information for more-experienced users. In addition, M.Y.O.B. is now PowerPC-native; BestWare claims that speed has increased as much as 40 percent over the older version. Some key job-management features include the ability to link reimbursables to particular customers, carry projects over to the next fiscal year, and the ability to analyze budgeted versus actual expenses. \$70 without payroll; \$140 with payroll; upgrade, \$30; \$15 rebate for Quicken users. 201-586-2200.

Peachtree Accounting for Macintosh 2.5. Rather than adding tons of new features, Peachtree Software has completely rewritten Peachtree Accounting for Macintosh so that the program now has a true graphical interface, a simplified setup process, new tutorials and online help, and more than 60 templates. It's now easier for users to access the different parts of the program, just by clicking on the file-folder tabs that line the bottom of the screen. The program still maintains the same basic feature set as the older version, including its double-entry accounting base and its multiuser capabilities. \$99; upgrade, \$79. 770-564-5700. / James Bradbury and Cheryl England

WORD PROCESSING /

WordPerfect Hits the Net

JOINING THE RUSH to the Internet is version 3.5 of WordPerfect, which adds support for the World Wide Web to the venerable word processor.

Web Smarts. Topping the list of new features is WordPerfect's newfound Net savvy — the program can now save files in HTML (the HyperText Markup Language, the lingua franca of the World Wide Web), complete with hypertext links created within WordPerfect. Users create "bookmarks" containing URLs (Uniform Resource Locators) and embed them in a document. When that document is converted to HTML, the bookmarks are automatically converted into hypertext links. To let users view their HTML creations, WordPerfect is bundling Netscape Communications' Netscape Navigator Web browser with WordPerfect 3.5.

Term-Paper Boon. Also new to WordPerfect 3.5 is a feature that's sure to be loved by college students everywhere — Make It Fit, a command that automatically adjusts margins, font size, line height, and spacing in order to make a document fit on a specified number of pages. Other new features include the built-in ability to speak selected passages, using Apple's PlainTalk text-to-speech technology; improved envelope printing; and a Templates menu, which allows instant access to document templates provided by WordPerfect. \$189; upgrade, \$89. 800-451-5151 or 801-225-5000. / Jason Snell

MACUSER/ZMAC UTILITY OF THE MONTH



Launch Your Mac into Orbit

NOW YOU DON'T even need to be around your Mac in order to get it to do your dirty work. ZMac's T-Minus 10 is an application that lets you configure hot keys and hot spots that can automatically launch anything in the Finder that's double-clickable. And since its timer function lets you run programs even when you're fast asleep, T-Minus 10 can work in tandem with AppleScript to completely automate your Mac. Because T-Minus 10 is a fat-binary application, Power Mac users will discover that their Macs are sleepwalking at warp speed.

Created by Mark Krenek, ZMac's T-Minus 10 will be available on September 30 exclusively from ZD Net/Mac, on CompuServe (GO ZMC:MACUSER) and eWorld (Shortcut: MacUser). / Scott Love

Apple Pumps Up QuickTime, PlainTalk

Updates mean better movie quality, recognition.

SMALL CHANGES IN version numbers can mean big benefits, as is the case with Apple's new system-software enhancements, QuickTime 2.1 and PlainTalk 1.4.

QuickTime 2.1. In this version, Apple adds support for sprites, or character animations, which appear in arcade games such as Mario Brothers. Now developers can use QuickTime to reliably play back such animations without having to write their own software for optimal playback speed or for sound synchronization.

Speaking of sound, QuickTime 2.1's Sound Manager 3.1 is now native for the PowerPC and includes support for several audio-compression formats, including IMA, a standard for 4:1 compression of CD-quality audio without loss of fidelity.

QuickTime 2.1 is available online at <http://quicktime.apple.com> for \$9.95 or through APDA (716-871-6555) — the price from the latter source wasn't set at press time.

PlainTalk 1.4. With the latest version of PlainTalk, Apple is getting closer to delivering natural-language interaction on the Mac.

For users of PowerPC-based computers, the new speech-recognition extension offers better voice interaction. The Speakable Items utility lets you place items in a designated folder to enable the Mac to respond to the names of these items.

Also, you can now use the Push to Talk option to make the Mac listen only when you press a user-defined key. In a smart addition, Apple has added a command that lets you know what words PlainTalk can respond to.

Developers can also take advantage of the speech recognition of the Power Mac through a new toolbox. Later this fall, Reality Bytes will ship HAVOC, a multiplayer simulation that users can control through specific voice commands such as Stop or Faster, enhancing the playability and interaction of the game. Several other game and education-title developers are hoping to incorporate speech technology.

PlainTalk 1.4 ships on the System 7.5.2 CD-ROM for Power Mac 7500 and 8500 owners. A free upgrade for users with a PlainTalk microphone is available via [ftp](ftp://ftp.info.apple.com) at [ftp.info.apple.com](ftp://ftp.info.apple.com) or through CompuServe and eWorld. 408-996-1010. / Sean J. Safreed



Sleek, Svelte, and Cellular Communicator

IN A TRANSFORMATION worthy of Oprah Winfrey or Tom Arnold, Air Communications' Air Communicator 14.4-kbps cellular phone/fax modem is back — slimmer, lighter, and boasting new talents and fewer hang-ups.

The new Air Communicator follows last year's nifty-but-not-quite-ready-for-prime-time product of the same name. New features include voice-mail and fax storage in the phone itself and a proprietary error-correction technology. But the most obvious improvement is reduced bulk: It's now the same size as many portable cell phones.

The Air Communicator's chief advantage — AirTrue, a patent-pending error-correction scheme — may be invisible, however. Unlike conventional cell phones, the Air Communicator listens in on the signals that cellular network sites send to each other to anticipate and cope with signal interruptions that cause other cell phones to hang up, according to Air.

The Air Communicator comes in two configurations: The 12-ounce Lite version (\$695 list) gets about 90 minutes of continuous talk time per NiCd-battery charge and stores as much as 2.7 minutes of voice-mail messages or 6 fax pages. The Executive model (\$995 list) weighs in at 9.9 ounces, gets about 100 minutes of talk time per charge with its lithium ion battery, and stores up to 16 minutes of voice messages or 37 fax pages. The Executive ships with a car power-adaptor base that allows for hands-free use during driving. 800-247-3282 or 408-749-9883. / Jim Shatz-Akin

with real-time mixing and volume control during playback. The software now takes advantage of more of the power built into the Vincent hardware, for faster video production. \$8,995. The Whole Deal package is \$18,990. Platinum-support members can upgrade from the NuBus to the PCI version for about \$3,000. 508-460-1600. / JSJ

DIGITAL VIDEO /

Professional Video Arrives on PCI Bus

DIGITAL-VIDEO PRODUCERS looking for a PCI card for video production can now turn to Data Translation's Media 100, version 2.5. Currently the only video-production system for the entire

Power Mac PCI-based series, the Media 100 includes such features as Betacam SP input, real-time effects, and eight-track audio mixing.

The Media 100's hardware component, now dubbed Vincent, is a single PCI card, rather than two NuBus cards. Vincent incorporates the same 68030 processor and 40-MHz DSP for audio mixing and video effects as the NuBus version but with new integrated components that support Betacam SP input.

Data Translation has updated the software as well. There's a spate of enhancements in version 2.5, including ColorFX, for altering colors in a video on the fly (on optional configurations), and support for up to eight audio tracks



PRINTERS /

Lilliputian Color

Petite printers output at home and on the road.

YOU DON'T NEED a big desktop — or a big budget — to have a color printer. Now you can print photo-realistic color images and business graphics with these pint-sized printers from Fargo Electronics and Hewlett-Packard.

Fargo FotoFun! Dye-sublimation printers that print images with photographic quality generally cost thousands of dollars. Now Fargo Electronics has introduced a tiny



sub-\$500 printer that produces photo-realistic images. This 9.5-x-4.25-x-7.5-inch printer can produce a print of up to 4 x 6 inches — equivalent in size to snapshots from a traditional photography lab — in just 2.5 minutes.

The QuickDraw printer's resolution is 203 dpi. It uses special coated media that measure 4 x 7.7 inches. The FotoFun!'s print ribbon lays down three colors (CMY) and then a final clear coat that protects the image from ultraviolet light. Media and ribbon for 36 prints cost \$35. For \$40, a

heavier stock is available for 36 postcards. Fargo is also offering a photo kit for coffee cups — your mug on a mug — which includes everything you need to make four photo mugs for \$30. 800-327-4622 or 612-941-9470.

HP DeskJet 340. Measuring just 12.2 x 2.6 x 5.6 inches, HP's DeskJet 340 is designed for use with laptop computers, but the \$299 inkjet printer doubles as a diminutive desktop device. For printing on the road, the DeskJet 340 has a built-in 30-sheet paper feeder; a 60-sheet feeder (\$89) is available for desktop printing. A \$29 connector kit is required to hook up PowerBooks or desktop Macs to the printer.

The DeskJet 340 is also capable of wireless printing via an infrared adapter (\$29) that plugs into the parallel port. This means that Apple's latest, infrared, PowerBooks can beam pages to the printer from up to 3 feet away — that is, they will when the appropriate IRDA-compatible infrared drivers ship.

The DeskJet 340 ships as a monochrome printer that prints 3 ppm at 600 x 300 dpi, but the optional ColorKit (\$49) turns it into a three-color printer capable of printing .5 ppm at 300 x 300 dpi. In addition to an AC adapter, the DeskJet 340 uses two rechargeable batteries that can print 100 pages per charge. 800-752-0900. / Pamela Pfiffner



GAMES /

Sequel Carnage

PC-GAME ENTHUSIASTS have given Mac users grief for not being able to play id Software's DOOM. Mac users have replied by showing off Bungie Software's high-energy game Marathon. Now not only is DOOM available to Mac gamers but also a sequel to Marathon is appearing on the horizon.

DOOM II. Ported to the Mac by Lion Software, DOOM II (\$50) offers everything the PC version does, including the ability to play custom levels created by other DOOM fanatics. And this port is no slowpoke — our lab tests showed that DOOM II runs just as fast on an 80-MHz Power Mac as it does on a 100-MHz Pentium-based PC. 800-238-6622 or 203-949-0381.

Marathon 2: Durandal. Bungie's sequel continues the plot of the original game and adds even more network play features. Now players can either work cooperatively across a network to complete the actual adventure or participate in new network games with objectives more interesting than simply blasting anything that moves. Sporting 16-bit graphics and sound, Marathon 2 will also show off outdoor environments, new weapons, and a wider viewing range. A release date hadn't been determined at press time. 312-563-6200. / Jason Snell and Roman Loyola

CD-ROMS /

Huh, Huh . . . Cool Discs, Man

WHAT'S YOUR BAG? Pop culture? The strange and supernatural? Contemporary world history? The following CD-ROMs will satisfy your range of intellectual needs.

Bad Day on the Midway. Take a walk on the weird side with Innscape's Bad Day on the Midway, the latest collaboration from illustrator/ animator Jim Ludtke and San Francisco cult band The Residents. Like their Freak Show CD-ROM, this disc revisits the "curiosities at the carnival" theme, but with a twist: You must solve a murder without meeting a similar fate. While sleuthing, you interact with fascinating characters, listen to original music from The Residents, and navigate through 3-D environments. This ain't no Cirque de Soleil. \$50. 800-693-3253.



Our Times. Based on the best-selling book of the same name, Vicarious' Our Times is a virtual "walk through history," complete with thousands of images; over two hours of narration by James Earl Jones; and an interactive time line, which takes you step by step through the past 95 years. You can also read an essay on environmentalism by Stephen Jay Gould, admire the paintings of Frida Kahlo, or find out Sophia Loren's *rea*/birthday. \$70. 800-465-6543 or 415-610-8300.

Virtual Stupidity. Sure to bring you back to the here and now are MTV's ultimate slacker icons, Beavis and Butt-head. In the new CD-ROM game entitled, appropriately enough, Virtual Stupidity, from Viacom New Media, you must help the head-banging duo impress their hero "Todd" and join his gang for adventures that include Principal McVicker, Earl, and Van Driessen. Along the way, you'll watch music videos (complete with stunning nuggets of wisdom from our heroes). Uhhhh . . . cool, Beavis. \$65. 212-258-6000. / Kristin Balleisen

NEW & NOTABLE

HARDWARE /

Panasonic PowerDrive² and Plasmon PD/CD. Able to read CD-ROM as well as optical media, these drives give users compatibility with existing CD-ROMs while providing them with removable-storage capabilities (see *New on the Menu*, March '95, page 27). Both drives can act as regular quad-speed CD-ROM drives and can also read from and write to 650-MB phase-change optical discs. Internal, \$895; external, \$995; 650-MB disc, \$59. Panasonic, 800-742-8086 or 201-348-7000; Plasmon, 800-445-9400 or 408-956-9400.

▼ **La Cie VIP Scan.** This tiny scanner is designed to read business cards. Bundled optical character recognition (OCR) software recognizes text on business cards and then links it to an address book; Now Software's Now Contact comes free with the scanner. \$199. 503-520-9000.

Adtron SDDS. This SCSI-based system lets Macs use hard drives, flash RAM, and other items that are in the PCMCIA-card format. The 3.5-inch SDDS supports Type I, Type II, and Type III cards. Internal, \$350; external, \$425. 602-926-9324.

Polaroid Polaview 105. Sporting 24-bit color and a motorized 1.6-to-1 zoom lens, this polysilicon active-matrix LCD projector weighs 23 pounds; is powered by a metal-halide lamp; and supports multiple video inputs, including NTSC and PAL formats. A backlit remote control is also included. \$9,495. 800-816-2611, ext. 970.

Samsung 17GLsi. Along with a maximum resolution of 1,152 x 870 pixels, this 17-inch multisync monitor offers on-screen, one-touch controls. \$999. 800-933-4110 or 201-229-4000.

Dayna BlueStreak. The BlueStreak family of networking products takes advantage of the high-speed networking protocol Fast Ethernet. The BlueStreak 10/100 NuBus (\$325) and PCI (\$225) cards can automatically switch between 10-Mbps and 100-Mbps speeds. The BlueStreak 10BASE-TX Hub (\$1,799) is an unmanaged 12-port hub. 801-269-7200.

SOFTWARE /

DragStrip 2.0. Improving on the Finder, this utility gives users the ability to launch programs, open files and folders, and run scripts from buttons located on floating palettes.

Version 2.0 of DragStrip adds AppleScript support, pop-up folders for moving and copying files, and many new display options. \$60; upgrade from version 1.0, \$20. Natural Intelligence. 800-999-4649 or 617-876-4876.

DiskGuard 1.5. The new version of this disk-security package adds support for the IDE-based drives found in some Macs, folder-level security, and System Folder protection, as well as an After Dark-compatible password-protected screen saver. \$80; free upgrade for users of version 1.0. ASD. 909-624-2594.

Mission Code: Millennium. This educational CD-ROM brings kids into a futuristic world in which they command a time machine. Zipping back through history, players are given 16 "missions" to place historical objects back in their correct time period. Players are helped along by animated robots and live-action actors. \$35. Virtual Entertainment. 617-449-7567.

Paparazzi! If viewing the celebrity pictures taken by Hollywood photographers isn't enough for you, there's always this CD-ROM-based game. In *Paparazzi!*, you take the role of a tabloid photographer, following simulated stars and catching them in compromising positions. And if you're good at this game, maybe there's a career awaiting you at the *Weekly World News*. \$50. Activision. 310-473-9200.

Homes and Interior Design. This set of 3-D objects is geared for home designers who use Specular's Infini-D application. *Homes* (\$129) is a collection of four 3-D home models. *Interior Design* (\$65) is a collection of more than 50 furniture objects for populating 3-D homes. Replica Technology. 716-337-9621.

ModelOffice Letters. Businesspeople who don't have the time or the desire to write letters, memos, or speeches can mine these three packages for source material or use them as templates. *Model BusinessLetters* (\$69) features 400 ready-to-use letters and memos. *Model SalesLetters* (\$69) contains 300 sales letters. *Model Speeches* (\$89) includes 150 speeches. Each program contains a searchable database and a built-in word processor that can export text as plain ASCII or as RTF files for import into

the word processor of your choice. *ModelOffice*. 800-801-3880 or 512-302-3888.

◀ **Art Screens: The Impressionists Collection.** Fine art comes to your monitor with this screen saver, which features 40 impressionist paintings by artists such as Cézanne, Gauguin, van Gogh, Monet, and Renoir, as well as 20 musical excerpts from composers such as Chopin and Liszt. \$27. Trident Software. 703-243-0303.

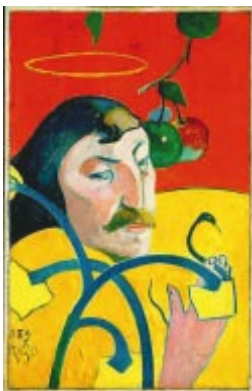
MACINTOSH PRICE INDEX

THE UNITED COMPUTER EXCHANGE index reflects average sales prices of new and used Macs as of July 31, 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)		• \$450
Classic II (4/40)		• \$375
Color Classic (4/80)		• \$600
LC III (4/80)		• \$375
Performa 475 (4/160)		• \$675
Performa 550 CD (5/160)		• \$700
Performa 575 CD (5/250)		• \$950
IIsi (5/40)		• \$300
IIci (5/80)		• \$575
IIfx (8/160)		• \$650
Quadra 605 (4/80)		• \$500
Quadra 610 (8/160)		• \$650
Quadra 630 (4/250)		• \$750
Quadra 650 (8/230)		• \$1,350
Quadra 660AV CD (8/230)		• \$1,100
Quadra 700 (8/230)		• \$1,000
Quadra 800 (8/230)		• \$1,700
Quadra 840AV CD (8/230)		• \$2,200
Quadra 900 (8/230)		• \$1,500
Quadra 950 (8/230)		• \$1,900
Power Mac 6100/60 (8/250)		• \$1,000
Power Mac 6100/66 CD (8/350)	\$1,799	\$1,450
Power Mac 7100/66 (8/250)		• \$1,600
Power Mac 7100/80 CD (8/700)	\$3,049	\$2,400
Power Mac 8100/80 (8/250)		• \$2,400
Power Mac 8100/100 CD (16/1GB)		• \$3,400
Power Mac 8100/110 CD (16/2GB)	\$5,299	\$4,100
PowerBook 145B (4/80)		• \$700
PowerBook 150 (4/120)	\$999	\$700
PowerBook 165 (4/80)		• \$950
PowerBook 165c (4/80)		• \$1,100
PowerBook 170 (4/40)		• \$900
PowerBook 180 (4/80)		• \$1,400
PowerBook 180c (4/80)		• \$1,600
PowerBook 520 (4/160)	\$1,399	\$1,200
PowerBook 520c (4/160)	\$1,899	\$1,600
PowerBook 540 (4/240)		• \$1,700
PowerBook 540c (4/320)	\$2,999	\$2,500
Duo 250 (4/200)		• \$1,200
Duo 270c (4/240)		• \$1,700
Duo 280 (12/240)		• \$1,600
Duo 280c (4/320)	\$3,379	\$2,400

• = discontinued model

For more pricing information on these and other models, call 800-755-3033 or 404-955-0569, or find it on ZD Net/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.



REVIEWS & Quick Clicks



Apple Macintosh Performa 5215CD / Stylish new multimedia Mac comes chock-full of built-in features for home users.

WE'RE PRETTY JADED here at *MacUser* — we look at scores of the latest and greatest Mac products every month, so it's hard to really impress us. But when we sifted through all the nifty features built into Apple's new all-in-one PowerPC Performa 5215CD, we got excited. With its well-thought-out design and wonderful multimedia and telephony features, this is *the* Mac to buy if you're looking for a computer for the home or for a college-bound student. Priced at about \$2,000 — and that price includes everything you need, including software — the new Performa is also relatively easy on your wallet.

TV Generation

When you first see the Performa 5215CD from a distance, you may think you're looking at a television set. The smartly styled case encloses a built-in monitor

and stereo speakers; a tilt/swivel stand lets you easily adjust the angle of the screen. The new Performa is nicely compact too — measuring about 17 inches high, 15 inches wide, and 16 inches deep, it's an easy fit on the family-room table or on a college-dorm desk. The computer weighs in at 47 pounds and comes with a keyboard and a mouse.

Because everything is built in — basic features for the model we reviewed include a 15-inch monitor, a 1-GB hard drive, a 4x CD-ROM drive, and a 14.4-kbps internal fax modem — setting up the Performa is a study in simplicity. Plug in three cords — one for power, one for the keyboard, and one for the modem — and you're in business. If you're a computing neophyte, there's plenty of hand-holding to help get you started — an animated tutorial does a

great job of teaching all the basic Mac skills.

The new Performa is equipped with a 75-MHz PowerPC 603 processor. It comes with System 7.5 and a disappointing 8 MB of RAM, but you can easily expand the RAM to a maximum of 64 MB. For do-it-yourself types, Apple has made adding memory to this machine a snap — simply remove the plastic cover on the rear of the machine, pull out the motherboard, and install additional SIMMs. Tracks assist you in guiding the motherboard back into place when you're done.

The ports on this Performa are what you'd expect — SCSI, ADB, printer, modem (if you don't opt for the internal model), and sound-in and sound-out. For more money, you can also opt for a video-input card, a TV-tuner card, a graphics card (for a second monitor), and any one of the many LC PDS cards now available. There are also plenty of bundled CD-ROM titles and software to sweeten the deal, including ClarisWorks, eWorld, WealthBuilder, Quicken, and a variety of games.

Please Leave a Message

But the best part of the Performa's array of built-in goodies is the telephony features. The model we reviewed comes with a built-in Global Village TelePort Gold IIv internal voice and fax 14.4-kbps modem and Global-Fax and Cypress Research's MegaPhone software preinstalled on the hard disk. MegaPhone is a complete telephone package that turns the Performa 5215CD into a full-duplex speakerphone and digital answering machine. Easy-to-use dialing, message-handling, and contact-list software is included as well. To dial a number, simply type it into MegaPhone's window and click on a button. When you hang up, MegaPhone automatically prompts you to enter the contact information for the number you just dialed. Incoming and outgoing messages are stored on your hard disk — a one-minute message occupies about 1 MB of hard-disk space.

MegaPhone's voice-mail capabilities include several nifty options — you can have the system autodelete previously played

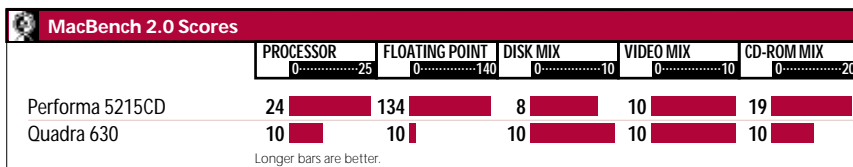
REVIEWS RATING KEY

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



Performa Performs / Apple's home Mac is fast . . . enough

The new Apple Macintosh Performa 5215CD isn't the zippiest Power Mac you can buy, but it's faster overall than a previous Apple offering for home users and schools — the Quadra 630 — and is plenty fast enough for running mainstream applications such as ClarisWorks. The Performa's built-in 4x CD-ROM drive offers an obvious speed advantage over the 2x drive of the Quadra 630.



messages after a specified number of days, for example, and you can have MegaPhone record messages while you work on other tasks — most of the time. Because the Mac's operating system is not truly multi-tasking, MegaPhone is dependent on how well other active applications get along with it. In our tests, MegaPhone had no trouble answering calls and recording messages while we were running ClarisWorks, but when we were playing PowerPete (one of the bundled games), MegaPhone wasn't aware of incoming calls until we quit the game.

The Performa's microphone and built-in speakers are what power MegaPhone's speakerphone capabilities. Sound quality for both listening and speaking is quite good, pretty much on a par with the quality you get when listening to sound files from applications and CD-ROM titles. But don't set your expectations too high for audio CDs — the speakers have a disappointing tinny quality for music.

Put to the Test

When it comes to features and design, the Performa 5215CD clearly rates a rave review. But what about performance? How fast is the machine? How good is the quality of its display? To answer these questions and more, we ran a series of formal and informal tests on the new Performa and found it to be an all-around able performer. To run our tests, we installed an additional 8 MB of memory in the machine, for a grand total of 16 MB.

We first wanted to see how the new Performa's speed compares with that of a Quadra 630 — an older, 680x0 Mac also aimed at home and student users. We ran the four primary MacBench subsystem tests — Processor, Floating Point, Disk Mix, and

Video Mix — as well as the CD-ROM Mix. We found that the Performa's 75-MHz PowerPC 603 processor has all the processing power its target audience will ever need. The Performa's processor clearly outpaced the Quadra 630's, although we found the new machine's built-in video to be no faster than the Quadra's. Measuring drive speed, we found that the Performa's 1-GB Quantum IDE disk drive was actually slower than the Quadra 630's 250-MB Quantum IDE drive, but the new Macintosh is still faster overall.

In application-specific tests, we ran the latest PowerPC-native versions of Microsoft Word, Excel, and PowerPoint on the new Performa and again compared the results with those of the Quadra 630 running 680x0 versions of the same software. The results were very similar to those of the MacBench tests — processor-related tasks, such as large Excel macros and global search-and-replace in Word, were marginally faster with the Performa. However, the Performa's speed for scrolling in Word and PowerPoint was dead-even with the Quadra's. And it was no surprise that, with its slower drive, the Performa was slower at doing Finder copies than the Quadra.

The Performa's 4x CD-ROM drive outperformed the Quadra's 2x drive by a wide margin, but speed is only one of its advantages. The drive's electronics are fully integrated with the Performa, so you can control volume by using buttons on the front of the machine — a handy feature. In addition, the Performa ships with the latest Sound Manager software, which lets you individually adjust volume for system-alert sounds and audio-CD playback.

The Performa's built-in 15-inch color display boasts excellent quality for the price.

The machine's video circuitry supports several resolutions, including the Mac-standard 640 x 480 pixels at thousands of colors and 832 x 624 pixels at 256 colors. PC-standard resolutions, from 640 x 480 pixels (VGA) to 800 x 600 pixels (VESA), are also supported. We would have liked to see more video memory in the Performa, which would allow it to support millions of colors at 640 x 480 pixels and thousands of colors at 832 x 624 pixels. However, that would have added significantly to the base price of the system. Unfortunately, VRAM is not expandable. You can, however, add a graphics card for a second, external monitor if you want higher resolutions or more colors. But keep in mind that such a card would occupy the slot designed for Apple's optional low-cost \$299 MPEG Media System — a card that supports full-motion, full-screen video for the growing line of MPEG CD-ROM titles.

The Bottom Line

Affordable, versatile, and elegantly designed, Apple's Performa 5215CD is certainly not the speediest Power Mac on the block, but its PowerPC 603 processor makes it plenty fast enough to run ClarisWorks and other mainstream applications at a respectable pace. Moreover, the Performa's compact design and simple three-cable connection scheme make it a great fit in the family room or dorm room. Built-in telephony features — combined with microphone, speakers, and CD-ROM drive — are icing on the cake. If you've been waiting for the perfect home machine, get out your check-book — you won't find anything better for the price. / Jeffrey S. Pittelkau

Apple Macintosh Performa 5215CD ★★★★★

Price: \$1,999 to \$2,299 (list), depending on configuration.

Pros: Affordable. Excellent all-in-one design. Complete software and CD-ROM bundle. Low-cost MPEG video-card option.

Cons: Built-in speakers sound tinny with audio CDs. MegaPhone application doesn't answer phone and take messages when certain games are running. Comes with only 8 MB of memory.

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

Reader Service: Circle #401.

Authorware 3 / Macromedia's powerful visual-programming environment gains hypermedia features.

MORE SOPHISTICATED THAN Pierian-Spring's Digital Chisel but not as complicated as the procedural-programming-oriented Macromedia Director, Authorware strikes a perfect balance for educators and trainers who need to create computer-based interactive multimedia materials. Now owned by Macromedia, Authorware 3 can interact with Director movies and applications and has a slew of new improvements in its multimedia capabilities.

Drag-and-Drop Scripting

To create an interactive program with Authorware — whether it's a lesson with a follow-up quiz or a presentation on ergonomics — you begin by dragging icons from the tool palette and dropping them onto Authorware's flowline, a simplified flowchart. The program provides 13 icons in all, each representing a command that triggers a generic action, such as playing a movie, running an animation, or performing a calculation. When you drop the icon onto the flowline, a dialog box pops up and you can customize the action: For instance, you can have a specific QuickTime movie play when the user clicks on an icon. Once you learn what each icon can do and get used to the way Authorware's flowlines work, the process is no more difficult than doing page layout or video editing, even though you are literally programming.

The flowline model is as elegant an approach to visual programming as you'll find anywhere, and it effectively forces good

modular design on you. For instance, the window containing the flowline doesn't scroll, so it's impossible to string together so many icons that you can't see at a glance what's going on. This doesn't limit the size of your application; instead it forces you to create a branching, rather than a linear, application. You can branch out from any icon to add additional flowlines.

You can label each icon, and version 3 lets you colorize icons, which helps you visually organize your designs. To simplify things, Authorware gives you only six colors — a better approach would be to let the user rather than the program set the number of available colors.

A major new feature in Authorware 3 is its hypermedia functionality, which lets users navigate to areas that aren't on the flowline. For instance, Authorware 3 now supports the use of hot text, which you could use to link to a glossary you created separately from the flowline.

To create links, drag the new Framework icon onto your flowline. Doing so will pop up an environment similar to HyperCard's. This includes a Navigate palette, with which you can create links that, for example, let your users search on text or jump to the first, last, next, previous, or recent "card."

Authorware 3 has a slew of other tweaks and enhancements, especially in the variety of media formats it supports. It can now handle 16-bit, 44-MHz sound — straight from a CD-ROM player — as well as AIFF, WAV, and PCM sound files from Windows

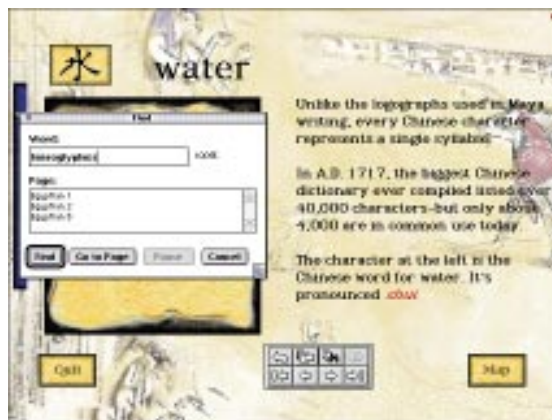
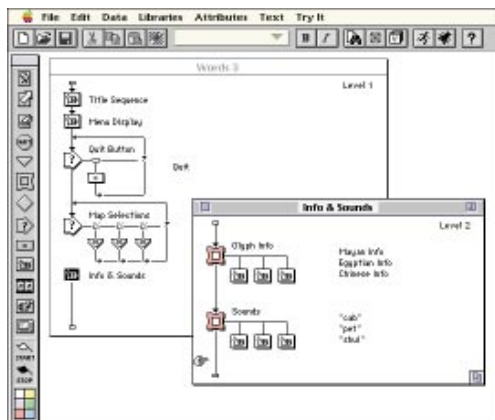
and Mac programs. You can include PICS, Director, Movie Editor, and QuickTime movies. Authorware does not support QuickTime VR, and any graphics you use must be in PICT format.

Authorware has been a cross-platform Windows/Mac program for a long time. The previous version let you convert the programs you created for Windows-based PCs to Macintosh format — version 3 also enables you to convert Mac programs to Windows format.

You can now import or paste RTF text into the programs you create with Authorware. Text retains all its style information, such as font, size, and color. When you import the text, its style is automatically added to a list of styles so you can keep the same style throughout your program. You can also create new styles by modifying existing ones.

Authorware can use XCMDs and XFCNs written for HyperCard and Director. You can also do limited conventional programming in Authorware. Drop the calculation icon onto the flowline, and you can write small chunks of Authorware procedural code that get executed when the program reaches the calculation icon in the flowline. The calculation icon now handles if-then and repeat structures and some new variables and functions. As the program runs, you can watch the values of these variables in the Trace window, which you open by clicking on the bug icon in the tool bar.

Authorware does not support AppleScript, but it does support Director's Lingo programming language indirectly through the TellLingo icon. For instance, you can use the TellLingo icon to send any Lingo expression to a Director movie and get the results back in your Authorware program.



New navigational features in Authorware 3 let application builders create links in flowlines (left) that take users to supplementary information such as the hypertext page shown here (right).

Authorware now includes nearly 1,000 pieces of clip art on a CD-ROM, including background patterns, bullets, sliders, and buttons you can use in your presentations.

To create Authorware programs, you need a 25-MHz 68030 or more powerful Mac, System 7, 8 MB of RAM, and 40 MB of free disk space. Authorware programs will require a lot of disk space and memory, so plan on your users having at least a 68020 Mac LC or a more powerful Mac with System 6, 4 MB of RAM, and at least 10 MB of hard-disk space plus any appropriate hardware. For example, Authorware supports playing clips from any of dozens of models of videodisc players.

Authorware 3 programs are dramatically faster than the ones created with earlier


versions of Authorware, notably in displaying graphs and executing decision loops, even though Authorware 3 and its programs are not PowerPC-native.

The largely rewritten documentation is excellent, with good advice on instructional design. The program comes with helpful online tutorials and an extensive, albeit Windows-like, help system. There are also quite a few small sample applications that were useful — we would have liked to see a few examples of larger Authorware programs as well.

The Bottom Line

If you can master a few programming basics, you'll be pleased with the power and usefulness of Authorware 3. With the new

navigational functions and greater support for digital movies, you'll be able to create programs that are even more dynamic and interactive than what you could create in the past. / Michael Swaine

Authorware 3 

Price: \$4,995 (list).

Pros: Superb, controlled visual-programming environment. Great support for animation and interaction. End-user applications are faster than those created with earlier versions.

Cons: Some programming knowledge required for best results. Authorware applications require generous disk space and memory. Not PowerPC-native.

Company: Macromedia, San Francisco, CA; 800-288-4797 or 415-252-2000.

Reader Service: Circle #402.

Personal MACLAN Connect 5.0 / Easy cross-platform networking.

THE FINAL PIECE of Miramar Systems' cross-platform puzzle comes with the latest release of the company's Personal MACLAN Connect networking software. Version 5.0 now lets Windows-based PCs mount Mac-network volumes and print to AppleTalk printers over a variety of PC networks, just as the previous version allowed Macs to do with PC drives and printers over AppleTalk.

long Mac filenames and folder names appear truncated in standard DOS 8.3 format. However, Windows users can view complete filenames and folder names, as well as icons, by choosing the File Properties option in Windows File Manager. In addition, the new print-client software lets Windows machines print to AppleTalk printers, using standard Windows drivers.

Personal MACLAN's AppleTalk implementation uses Miramar's new Windows 32-bit Virtual Device Driver, which is both fast and memory-efficient. Personal MACLAN also supports Windows ODI and NDIS network drivers, which allow PCs to run on multiple networks simultaneously. That means you don't have to remove the PC from a Windows for Workgroups, NetWare, or other PC network in order to connect it to your AppleTalk network.

When Personal MACLAN is installed on Windows machines, it's so well designed that users don't realize they're accessing a foreign system. Windows users access Mac shared folders through the File Manager in Windows 3.1 or the Explorer in Windows 95. Mac users have it even easier — they access PC directories and printers via the familiar Chooser.

Personal MACLAN's File Server software uses standard AppleShare network privileges, including passwords and lockouts. PC users set access controls for all or part of

their PC's hard disks, using Personal MACLAN's Console. The Print Server software allows Mac users to print to any PostScript printer available to a PC, including those attached directly to the PC or to a PC network. Print Server also spools print jobs from Mac as well as PC users. Mac users can also print to non-PostScript PC printers if they have a printer-language translator, such as GDT's PowerPrint software. Our only complaint is that file and print sharing, as well as client and server tasks, are each in a separate window.

The Bottom Line

Personal MACLAN Connect 5.0 is perfect for small businesses and workgroups that want to share files, CD-ROM drives, tape drives, and printers among networked PCs and Macs. Priced at an affordable \$199 for each PC, it's simply the best AppleTalk-for-Windows product you can buy. / John Rizzo



Full bidirectional file and print sharing for networks with PCs and Macs is Personal MACLAN Connect 5.0's forte.

As a peer-to-peer networking program, Personal MACLAN Connect allows file and print sharing between Windows-based PCs and Macs, without a server. The program runs only under Windows and connects to Macs via AppleTalk.

New to version 5.0 is the Windows AppleShare client software, which lets Windows-based PCs access AppleTalk services. An AppleShare button lets PC users assign a Windows-drive letter, such as E:, to a Mac-network volume. To Windows 3.1 users,

Personal MACLAN Connect 5.0 

Price: \$199 (list).

Pros: Affordable full bidirectional file and print sharing for mixed Mac/PC networks. Fast, memory-efficient driver. Supports Windows ODI and NDIS network drivers.

Cons: Separate windows for file sharing and print sharing, as well as for client tasks and server tasks.

Company: Miramar Systems, Santa Barbara, CA; 800-862-2526 or 805-966-2432.

Reader Service: Circle #403.

Fractal Design Poser / Flexible digital mannequins give both novices and pros a leg up on figure drawing.

DRAWING THE HUMAN BODY can be a challenge, even for experienced artists. If you need to use human figures in your designs but you're struggling with figure drawing in 2-D- and 3-D-graphics programs, Fractal Design Poser can help. Poser's simple-to-use tools let you create an infinite supply of malleable lifelike 3-D mannequins.

Masters of Movement

When you first launch Poser, the program displays an outlined male figure standing with its arms outstretched. You can change it into a female or classical mannequin and view it in several modes, including wire-frame, flat-shaded, and silhouette. You can also scale height by physical development, from an infant to a perfectly proportioned adult. Like an artist's mannequin, the Poser figure has only 17 parts, so you can't control individual fingers and toes, although you can choose from five hand positions — taut, fist, relaxed, pointing, and flat.

Thanks to its simple figure-positioning tools, Poser is among the easiest-to-use 3-D-modeling tools you can find. It uses an inverse-kinematics system that re-creates the system of joints in the human body. So when you pull your figure's hand down, using your mouse, the arm follows; if you pull it farther, the torso bends.

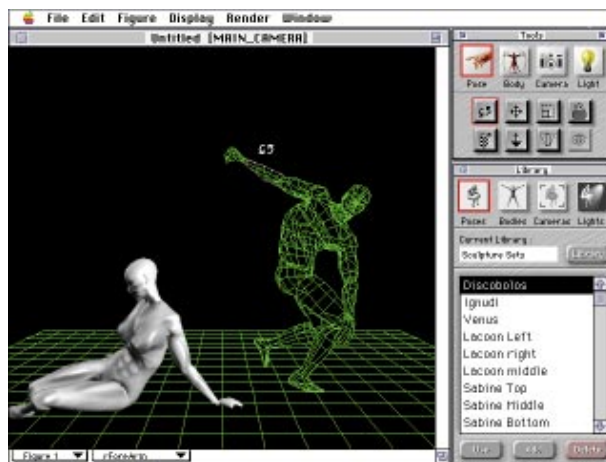
You use the selection of body tools in the Tools palette to resize the figure proportionally. With the translation tool, you can turn the drawing so that you can work on it at another angle and make other adjustments.

You position individual body parts by using the Pose tools, in the Tools palette. For instance, you can use the rotation tool to bend the torso to one side and the twist tool

to rotate the torso about the center of the figure. You can taper or rescale each body part, so, for example, you can turn the upper arms into body builder's biceps or taper the torso to create a lithe dancer.

You can also use numeric and sliding controls to fine-tune each tool. Any changes you make in one limb can be applied to the other by use of the Symmetry options, on the Figure menu.

Poser's library has a nice selection of premodeled poses as well as settings for



Creating complex figures is relatively simple with Fractal Design Poser's elegantly designed positioning tools.

body shapes, cameras, and lighting. The poses include jumping and leaping poses as well as the classic model poses you would find in any figure-study book. You can add settings to and delete them from the library.

Let There Be Light

Poser lets you use as many as three light sources in rendering your figure — you can vary each light source's position, intensity, and color. As you move a light around your figure, its color adjusts in near real time.

Poser's renderer smoothes your figure, and there are user-definable texture maps for color and bump. The texture maps adhere to the figure like a bodysuit, which makes it easy to add a superhero costume or a bathing suit to your figure but impossible to give it a good business suit.

Although applying the textures is easy,

most artists will probably want to use a simple smooth rendering with a corresponding alpha channel. They can trace or paint over the figure in Adobe Photoshop or Fractal Design Painter. The quality of the renderings is decent in both the Fast and the Clean mode, but Poser renders figures so quickly that you probably won't need to use the Fast mode, especially on a Power Mac.

You can open Poser images in 2-D in any program that supports the PICT format. Poser also exports rendered 3-D figures in DXF or RIB (RenderMan Interface Bit-stream) format. The inverse-kinematics and texture information is not exported, so you can't reposition the body parts once you've imported the figure into a 3-D program. Textures also don't carry over. A future version should support Apple's 3DMF format for 3-D data, which will at least preserve the texture information.

As practical as Poser is for artists who want to use the human form in digital art, most artists will use it in conjunction with other programs. You can't do keyframe animation in Poser, and the figures you create are nothing more than artist's mannequins, so you can't create facial expressions or hand gestures. Occasionally, you can see stretching or faceting in the surfaces. In the next release, we'd like to see the ability to create smoother figures with greater surface detailing. It's also difficult to select the body part you want if you position several figures together.

The Bottom Line

If your work calls for human figures but you're all thumbs when it comes to drawing arms and legs, check out Poser. Its simple interface makes it a valuable tool for easily creating virtually any type of figure you need. / Sean J. Safreed

Fractal Design Poser 1.0

Price: \$199 (list).

Pros: Easy-to-use. Figures move like artist's mannequins. Figures can be reshaped. Good lighting and rendering.

Cons: Can't adjust figure details, such as fingers and facial expressions. Awkward with multiple figures.

Company: Fractal Design, Aptos, CA; 800-297-2665 or 408-688-5300.

Reader Service: Circle #404.

ClarisWorks 4.0 / Claris spruces up its jack-of-all-trades business software with enhanced style and database features.

AS THE UNDISPUTED KING of the integrated-software category, ClarisWorks has long delivered a Swiss-army knife of features in an impressively well-integrated and compact package. The latest release isn't a major rewrite, but the addition of key style-

ruler. The software has several default styles, and of course, you can create your own and add them to the palette.

In addition, you can now divide documents into sections and specify different formatting for each section — a great feature if you're preparing a report or thesis. You can change the number of columns, the page numbering, and header and footer text on a section-by-section basis. You can even choose to place headers and footers on either left or right facing pages.

In version 4.0, ClarisWorks' outliner has been integrated with the word processor rather than appearing as a separate mode. For a quick way to create bulleted or numbered lists, you can apply an outline style to text selections. Also, you can finally get a word count for a selection of text, as well for an entire document, although this feature worked as slow as molasses for us.

One feature inexplicably omitted and sorely missed, however, is drag-and-drop editing.

In addition to the word processor, two other modules boast welcome improvements. The database module now includes a FileMaker-like list view, called Fast-Report, that creates and saves custom searches, sorts, and reports. Several new field types have been added, including a flexible name field that holds first and last name in a single field. The program automatically sorts by the first letter in the last name, but you can also opt to sort by the first word in the field.

The spreadsheet module now sports a Fill Special option, which automatically fills cells in date, time, or number sequences. Here, too, however, drag-and-drop editing was conspicuous by its absence. For finer control over graphics, ClarisWorks' graphics module now supports free rotation of objects by 1-degree increments.

Other noteworthy additions include basic instructions for creating HTML documents for the World Wide Web, a 500-image clip-art library, and three new ClarisWorks

Assistants — the Home Finance Assistant, the Certificate Assistant, and the handy Mail Label Assistant (50 Avery-label formats are included).

ClarisWorks is an elegantly designed program. Its modules are so well integrated that you can open and edit a word-processing, spreadsheet, database, or graphics frame from within any type of document (except telecommunications, of course). There's still room for improvement, though.

Simply changing the default font in the word processor, for example, is a multistep operation that requires you to create a stationery document in the System Folder. It's surprising that you can't directly import FileMaker Pro files, Excel 5 spreadsheets, and Word 6 documents. Perhaps worst of all, ClarisWorks 4.0 can't save in version 3.0 format (Claris promises backward compatibility with version 3.0, plus filters for Excel 5 and Word 6, by the end of this year). AppleScript support is finally included, but only in a basic way. Last, the telecommunications module, the weakest component of ClarisWorks since the beginning, remains essentially unchanged. Continuing to lack Zmodem support, it's appropriate only for rudimentary telecom tasks.

One caveat for owners of 68000-based Macs — ClarisWorks 4.0 requires at least a 68020 processor and System 7.0 or later.

The Bottom Line

With version 4.0, ClarisWorks further solidifies its lead in the integrated-software category. Although none of its modules can do everything a corresponding stand-alone application, such as Excel or FileMaker Pro, can do, ClarisWorks 4.0 does most things very well. Except for the telecommunications module, it's probably all the application most folks will ever need. / Joseph Holmes



Enhanced word-processing features in ClarisWorks 4.0 include a quick and easy way to format just about anything — including paragraphs and graphics — by using floating palettes.

sheet and database features, plus a good number of minor enhancements, makes ClarisWorks 4.0 even more of a joy to use than previous versions.

Although you won't find sophisticated features such as customizable menus and indexing in ClarisWorks' word processor, it's nearly on a par with stand-alone applications. Without a doubt, it's powerful enough to serve many users as their one and only word processor. And ClarisWorks' small footprint (it requires only about 1 MB of RAM and 10 MB of disk space for a normal install), paired with its snappy performance, offers obvious advantages over gargantuan Microsoft Word and other beefy programs, especially for users watching their RAM and disk weight.

Rightly so, then, the most-ambitious enhancements to ClarisWorks 4.0 are in the word processor. ExpressStyle, Claris' slick implementation of universal style sheets, lets you quickly and easily format text, outlines, and paragraphs (finally!) — as well as spreadsheets and graphics — using a floating palette or a pop-up menu in the

ClarisWorks 4.0

Price: \$129 (list).

Pros: Elegantly integrated modules. Full-featured but simple-to-use word processor. Small RAM and disk footprint. Snappy performance.

Cons: Lacks drag-and-drop editing. No backward compatibility with ClarisWorks 3.0.

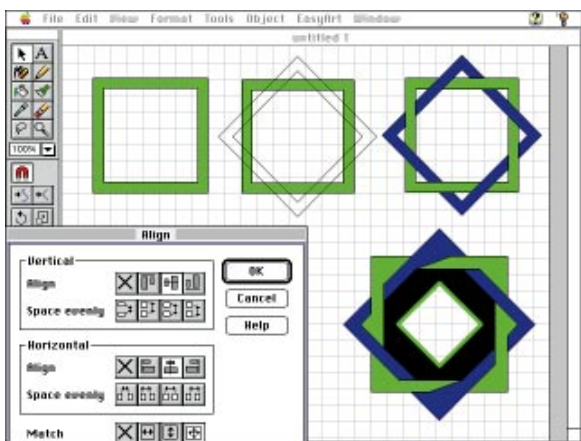
Company: Claris, Santa Clara, CA; 800-544-8554 or 408-727-8227.

Reader Service: Circle #405.

SmartSketch / Innovative graphics program lets you draw on-screen as easily as with pencil and paper.

ADVANCED DRAWING PROGRAMS such as Adobe Illustrator and Macromedia FreeHand boast impressive features, but you have to fuss with Bézier curves, layers, and other sophisticated tools. Now SmartSketch, a new program from FutureWave, presents some of these same high-end

And just like its counterpart in Illustrator, SmartSketch's brush tool turns your strokes into filled paths. But unlike other draw programs, SmartSketch assumes that you don't want to work in layers. A SmartSketch page is a single layer. If you draw one object on top of an existing one, Smart-



Creating a complex design that overlaps and combines shapes is remarkably easy with FutureWave's SmartSketch, which doesn't require you to work in layers or learn the fine art of using Bézier-curve tools.

features, but with a unique twist: The program's interface makes drawing with your cursor as intuitive as drawing with pen and pencil.

A Guiding Hand

To create lines and shapes in SmartSketch, you simply draw them with the pencil or the brush tool. Any lines you make with the pencil tool are instantly converted into paths, as they are with Illustrator's pencil tool. But SmartSketch goes one step further: You can turn on shape recognition and autosmoothing, so if you sketch a shaky square or a wobbly circle, SmartSketch will form it into a perfect geometric shape. In the same way, it will automatically straighten and smooth jagged or uneven lines and curves. If you like using primitive-shape tools, you can configure the pencil tool to create circles or squares. The pencil tool is even intelligent enough to combine lines you draw on top of each other into a single path.

Sketch modifies both to create a new shape. For instance, in any other program, if you draw a circle and then draw a diagonal line across it, you have two distinct shapes, one on top of the other, unless you use a filter to combine them after you've drawn them. In SmartSketch, if the circle and the line are the same color, the program will automatically combine them into a single shape as soon as you've finished drawing the diagonal line. If the circle and the line are different colors, the line will slice the circle into two filled arcs on either side of the line. If you prefer to keep your shapes inviolate, you can

select them and place them into their own Group layer, where they won't be modified by objects from other Group layers. Alternatively, and more simply, you can lock selected objects to keep them from being moved or transformed by other objects.

Other SmartSketch features adopt some of the fluidity of paint programs and are intoxicatingly easy to use. For instance, you can drag the eraser tool over any object to erase a swatch of color, just as you can in a paint program. But when you've finished erasing, SmartSketch actually changes the shape of the objects. For instance, if you divide an object with a line of erasure, SmartSketch turns the object into two separate shapes. You can also use a lasso or rectangle tool to select only certain parts of objects to modify — although this feature isn't anything new for paint programs, it has been unheard of, until now, for drawing programs.

You also have control over how your paint strokes interact with your drawing. You can

paint on every surface of your page, of course, but you can also confine paint strokes to the inside of existing objects, to objects of the same color, or to selected parts of objects.

Once you've created objects on your page, simply click on the line or curve you want to modify and drag to reshape it — you don't have to worry about confusing off-line control points. Experienced illustrators will miss the extreme precision they get with Bézier points, but average artists will be more than happy with SmartSketch's approach.

Smooth Simplicity

SmartSketch has other endearing features as well. It has automatic anti-aliasing, for smoothing objects. You can kern and track type and break it apart into editable shapes. You can rescale objects, and there's an impressive array of alignment options. You can import and export PICT, DXF, and Illustrator 88-format EPS files. You can also create multipage documents, which appear on-screen as notebooks. And SmartSketch comes with tons of ready-to-use clip art.

SmartSketch is impressive in its first release, but there are several items on our wish list. We'd like to be able to use gradient colors and fills, and response to pressure-sensitive styli would be welcome as well. Most important, we'd like a PowerPC-native version — which FutureWave has promised for later this year. We'd also like transparency options for SmartSketch's brushes.

The Bottom Line

Novice users will be well served by SmartSketch's delightful mix of simplicity and sophistication. But even veteran Illustrator and FreeHand users may find SmartSketch a useful time-saver for object-combination operations. / Eric Taub

SmartSketch 1.0

Price: \$69.95 (list).

Pros: Intuitive interface for drawing. Inexpensive. Shape recognition, autosmoothing, and anti-aliasing. Objects interact to form new shapes.

Cons: Not PowerPC-native. Lacks support for enhanced features such as graduated fills.

Company: FutureWave Software, San Diego, CA; 800-619-6193 or 619-637-6190.

Reader Service: Circle #406.

Pioneer DRM-624X / CD-ROM changer teams speed with convenience.



THE FIRST TO introduce a CD-ROM changer to the computing world, Pioneer is first again with the Pioneer DRM-624X, a six-disc CD-ROM changer that boasts the fastest mechanism you can find in a changer.

The \$795 Pioneer DRM-624X is more expensive than other disc changers, such as the seven-disc Nakamichi MBR-7, but its 4.4x mechanism is faster. True, you *can* buy a drive with a faster mechanism, but none currently comes packaged in a multidisc changer. The Pioneer changer is clearly an investment in the future: As quad-speed drives become popular, more CD-ROM developers will take advantage of their speed.

If you own a Pioneer six-disc CD player for your car or home, you'll be pleased to know that the Pioneer changer uses the same cartridge magazine. A clear plastic panel in the magazine's front shows which disc is in use. You can buy extra magazines

and organize titles into sets of six.

We encountered a problem common to some other CD-ROM changers when mounting multiple discs on the desktop simultaneously. When you insert a magazine, the changer's software caches the directory for each disc into RAM and mounts an icon for it on the desktop. With only one drive mechanism, you can use only one CD or CD-ROM at a time. When Apple's system software periodically updates the desktop and encounters icons for the discs that aren't in use, the Pioneer changer switches discs for no apparent reason. But you can opt to get rid of all the icons on your desktop, *except* the one that represents the disc you're using, and add a pull-down selector menu to your menu bar that contains a list of all the available but inactive discs. When you pull down the menu and select a new disc, its icon replaces the one on your desktop.

We don't recommend sharing the Pioneer

changer over a network — when two users on the network try to access different discs, the changer gets tied up. The other disappointment is Pioneer's audio-CD software, which doesn't let you build a playlist of songs on various CDs.

The Bottom Line

The Pioneer DRM-624X offers the fastest CD-ROM mechanism available in a changer. Although current CD-ROMs can't take full advantage of its speed, you'll be among the first to tap into next-generation CD-ROM technology. / Kristina De Nike

Pioneer DRM-624X

Price: \$795 (list).

Pros: Fastest mechanism available in a disc changer. Uses same disc magazine as Pioneer stereos. Handy pull-down selector menu.

Cons: Can get hung up changing discs. Disappointing audio-CD software.

Company: Pioneer New Media Technologies, Long Beach, CA; 800-444-6784 or 310-952-2111.

Reader Service: Circle #407.

PixelPutty Solo / Feature-rich low-cost 3-D modeler boasts unique animation tools.

AT A FRACTION of the cost of competing programs, the \$399 PixelPutty Solo packs a 3-D modeler, a renderer, and an animation system into one program. And PixelPutty is the only program that currently offers a built-in inverse-kinematics system that lets you easily create realistic animations.

Different Perspective

Like most other 3-D programs, PixelPutty lets you view your object in four windows: a camera view and front, side, and top views. But PixelPutty's interface is unconventional by Mac standards. The view windows don't have titles or scroll bars. And in place of iconic tool bars, PixelPutty has a vertical row of labeled buttons. The top six buttons each represent a group of commands — View, Control, Reshape, Shape, Keyframe, and Utilities. When you click on

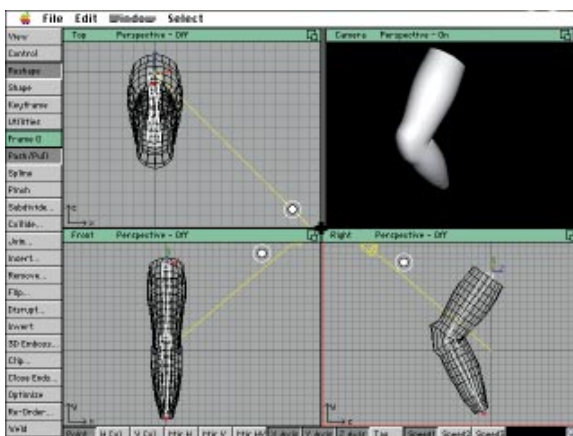
a button, the program displays the corresponding group of commands. For example, clicking on the Shape button brings up commands for creating 3-D objects. A counter showing the current frame of your animation separates the top buttons from the command group.

The new interface conventions are easy to get used to, but the program's problems aren't. For instance, window updating doesn't always work. Changing the position of an object in one window doesn't necessarily update the object's position in the other views. And sometimes, after you've been using the program for a while, it no longer lets you zoom or pan in a window; you have to quit and restart to be able to zoom and pan again.

PixelPutty gives you extraordinary power for creating and manipulating curved shapes. In addition to giving you standard 3-D shapes such as cylinders and cubes, it also gives you everything you need to bring

your objects into the third dimension, including lathing, lofting, and extrusion in one dimension and along a path.

Once you've created your object, you can use PixelPutty's Reshape tools to stretch, squish, and distort it. Although PixelPutty isn't the only 3-D program with point-by-point control, its tools are easier to use by far than its competitors'. The basic Push/



With its impressive inverse-kinematics feature, PixelPutty Solo lets you easily model, render, and animate jointed models that boast incredibly realistic motion.

Pull tool, for one, lets you select a point or group of points in the 3-D mesh and drag in any direction. Other nice features are the Collide tool, which lets you add the surface of one object to or subtract it from another. PixelPutty can also create holes in objects when you render with Pixar's RenderMan. The Disrupt tool randomly distorts the mesh surface, and the 3D Emboss tool uses a grayscale PICT image as a displacement map on your mesh. For added control, the Flex dialog box lets you define how many points adjacent to the edited points will be affected by the changes.

On a more sophisticated level, you can create a jointed frame, called an Inverse Kinematics (I-K) Chain, within your object. For instance, if you build the frame for an arm with wrist and elbow joints, bending the wrist up and pushing it in will bend the elbow and can even flex the upper part of the arm to imitate a bulging biceps.

PixelPutty's animation system doesn't

provide any sort of timeline or sequencer interface, so you have to keep track of what you're doing on paper. You move between keyframes by pressing the Shift and Control keys and clicking and dragging either to the right, to advance, or to the left, to go back. You can create complex motion by using the Path command to force an object to move along a particular path. Sadly, without a sequencer, using some of PixelPutty's more advanced features — such as the Look At command, which lets you specify that two objects always face each other — becomes very complicated. Position, Scale, Rotation, Spline, Twist & Taper, and Mesh distortions can all be animated, but it's difficult with the PixelPutty interface.

PixelPutty's built-in renderer leaves much to be desired. It doesn't provide texture-mapping and produces artifacts when rendering some shapes, so the renderings are of average quality, at best. The program has excellent support for Pixar's RenderMan, which we recommend using instead.

PixelPutty's impressive feature set is compromised by bugs, quirks, and inconsistencies. For example, sometimes keyframe information relating to the camera gets transferred from one animation to another and you have to quit and restart the program to remove this information. And there are no 2-D primitive shapes and no quick flat-shaded view for basic previews of your objects.

The Bottom Line

Serious as well as new users will be pleasantly surprised by how many high-end features PixelPutty Solo provides. But be forewarned: The program's rough edges demand a lot of patience. Still, you won't find as many powerful modeling and animation features in any other single package — and certainly not at PixelPutty's price. / Ben Long

PixelPutty Solo 1.5

Price: \$399 (direct).

Pros: Sophisticated point-by-point editing tools. Thorough, high-end feature set. Inverse kinematics. Excellent RenderMan support.

Cons: Buggy. No animation timeline. Lackluster rendering engine.

Company: The Valis Group, Tiburon, CA; 800-825-4704 or 415-435-5404.

Reader Service: Circle #408.

Now Up-to-Date & Contact 3.5 / Now polishes its powerful PIM.

JUGGLING PHONE CALLS, appointments, contacts, and to-do lists can be a daunting task, even with software assistance. With this in mind, the folks at Now Software have released an interim upgrade to their calendar and contact-manager software — available as two separate packages or as the Now Up-to-Date & Contact bundle — that makes it easier than ever to keep all those balls in the air.

The handiest addition to Now Up-to-Date & Contact is the new QuickPads, notepad windows you can call up with a hot key or select from the Apple menu. Using QuickPads is the most efficient way we've seen to manage phone calls, appointments, and to-dos — without running either Now Up-to-Date or Contact.

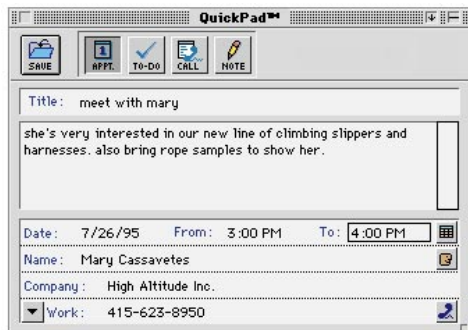
You can type in notes as you're talking on the phone and have multiple QuickPads open at a time. Any appointments you type

mark to-dos as In Progress or Done and prioritize items by simply dragging them to a higher or lower location in the list.

Another noteworthy enhancement is banners that can wrap from one week to another. You can now also see banners in calendar views other than just the month view. And if you use the program's excellent group scheduling features on your network, you'll notice a new in-basket icon in the tool bar that notifies you when you've been asked to attend a meeting.

A welcome addition to Now Contact is a more flexible way to enter comments in the Detail view. Before, you had only a separate note window to work with and, when you closed the window, you could see only the title of your note in Detail view. To view the contents, you had to double-click on the note icon. Now you can type comments directly into a special field that can hold as much as 32K, or you can import the contents of a text file into the window. To make sure the comments field can be accommodated, you can easily resize it by clicking and dragging.

Our only gripe about Now's PIM is that the calendar program has fixed dialog boxes for group scheduling. They make it hard to see your calendar when you're trying to make scheduling decisions.



New QuickPads make it faster and easier than ever to get contact and appointment information into Now Up-to-Date & Contact.

in appear in your calendar automatically, and notes on phone conversations are relegated to the specified contact in your contact file. And the QuickPads are smart — they streamline the process of data entry by anticipating your intentions. QuickPads know to create an appointment when you type the word *meet*, for example, and they search your contact file for the appropriate contact as soon as you type the first name.

If you're a conscientious list maker, you'll welcome the new split window in the calendar views that provides a separate area for your to-do list alongside your calendar. And version 3.5 provides more options for managing your list than before. You can now

The Bottom Line

The crowded PIM arena has thinned out over the past year or two, but Now Up-to-Date & Contact has continued to improve, despite the lessening competition. Version 3.5 provides new options for customizing the calendar and contact manager to work the way you do. It's a top-notch PIM that remains at the head of its class. / Susan Janus

Now Up-to-Date & Contact 3.5

Price: \$149 (list).

Pros: Flexible contact-management and calendar features. Smart data-entry aids.

Cons: Fixed dialog boxes for group scheduling.

Company: Now Software, Portland, OR; 800-722-5963 or 503-274-2800.

Reader Service: Circle #409.

FrameMaker 5 / Frame's versatile publishing powerhouse goes the distance on any platform.

THE PREMIER long-document-publishing program for the Mac, FrameMaker is now in its fifth iteration. The latest version features new page-layout features, AppleScript sup-

lengthy documents, a process that chokes most other page-layout programs.

Although FrameMaker 5 is still not an ideal tool for design-intensive documents such as brochures and advertisements, it has some new, welcome page-layout features. It now supports the wrapping of text around graphics — you can wrap text around either a rectangular bounding box or an object's clipping path. You can also specify how much of an offset you want between the graphic and the text.

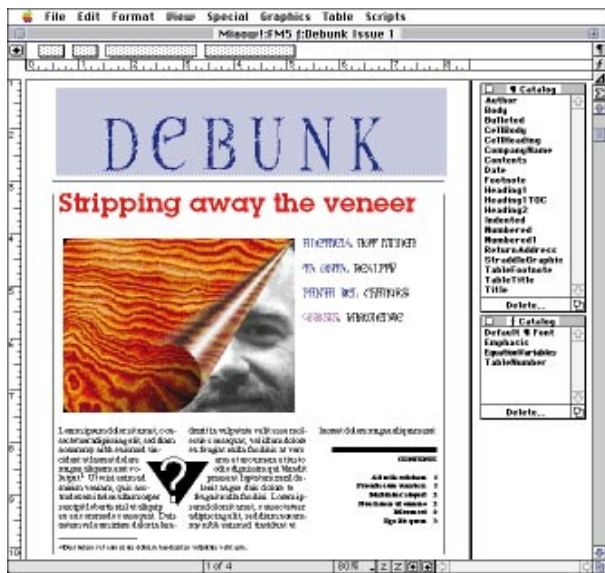
But more impressive is how FrameMaker handles straddling paragraphs, tables, footnotes, and anchored frames across multiple columns. FrameMaker's straddle feature is paragraph-based. You simply select the element you want placed across a column or columns and click on the desired straddle setting in the

document distribution. FrameMaker is loaded with hypertext savvy for creating hypertext links, both within a document and between documents.

FrameViewer doesn't require you to make any changes to your FrameMaker document for others to view it, but you have to do some postprocessing to publish the document in other online formats, such as HTML, for World Wide Web pages; Adobe Acrobat's Portable Document Format (PDF), for distributing electronic manuals; or Microsoft WinHelp RTE, for the built-in online help system in the Microsoft Windows operating system.

FrameMaker now supports importing by reference, Frame's easier-to-use alternative to Apple's publish-and-subscribe. For instance, if you regularly use boilerplate text, such as your licensing agreement, for user manuals you create, you can mark the boilerplate text as reference text. If, as you're working on the manual, the boilerplate text is updated, FrameMaker automatically updates it in the manual as well as in any other documents that use it. This handy feature can also be used to set up a simple database-publishing system that uses data exported from a database program, such as FileMaker Pro.

FrameMaker has an unparalleled degree of cross-platform compatibility for Mac OS,



New layout features in FrameMaker 5 make it easy to create footnotes, headlines, and even graphics that automatically straddle multiple columns.

port, and enhanced portable- and online-document-distribution options. An ongoing strength is seamless compatibility with the Windows and UNIX versions of Frame.

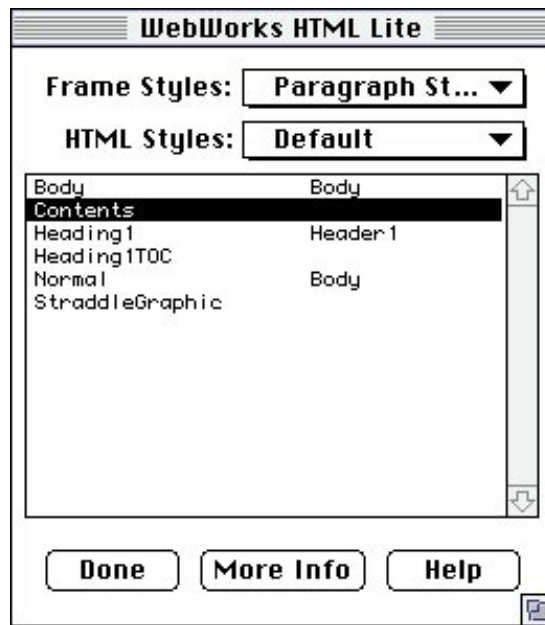
FrameMaker uses the familiar frame-based approach of QuarkXPress, but what sets it apart is its powerful cross-referencing tools; its ability to automatically update variables; a superb integrated table editor; autonumbering; and a host of other high-end features tailor-made for managing long documents, especially those that are more than a thousand pages.

High-end word processors such as Microsoft Word and desktop-publishing programs such as Adobe PageMaker have adapted some FrameMaker features but generally without FrameMaker's depth. For example, you can use design templates with any of these programs, but only FrameMaker allows you to apply or import only specific aspects of a template, such as character formats, to another document. And FrameMaker whizzes through reformatting

Paragraph Designer dialog box. Both QuarkXPress and PageMaker, in contrast, force you to use an awkward work-around: You have to create a separate frame or text block that won't flow along with the rest of the text if it's edited.

FrameMaker continues to lack the hard-core typographical tools — hyphenation tables, custom kerning pairs, and automatic drop caps — that make QuarkXPress a favorite with professional designers.

The freely distributable FrameViewer enables others to view, search, and print FrameMaker documents without having to run the FrameMaker application. This makes FrameMaker the perfect program for online



You can map FrameMaker formats to HTML codes to convert a FrameMaker document into a Web page for online distribution.

Windows, and UNIX users. You can work with a document on a Macintosh one day; continue working on it, using a Windows machine, the next day; and then send the file to a coworker who uses a UNIX workstation the next day, without ever having to worry about conversion hassles. FrameMaker 5 will even warn you if in saving a file on the Mac, you use a name that isn't allowed on a UNIX or Windows system. And this version includes an extensive collection of graphics filters for all three platforms, so even placed graphics won't cause problems as you move a document between operating systems.

But just because FrameMaker is a cross-platform program, this does not mean that you have to put up with the conventions and shortcomings of PC- and UNIX-application interfaces. FrameMaker takes advantage of many Mac-specific features. For example, you can write and store AppleScript scripts in the Scripting menu, although you can't record your actions.

However, FrameMaker's interface is not without its idiosyncrasies. You still have to dive through layers of dialog boxes and submenus to execute some common tasks. For example, if you want to count the words in your document, you have to go to the Document Reports command, on the Utilities submenu, on the File menu, and then double-click on WordCount in a scrolling list of reports.

To add insult to injury, FrameMaker's anemic WordCount command is unable to give you the word count for a selection — only for the entire document. It's too bad Frame didn't at least provide an AppleScript script for this, which would have been a truly useful example of FrameMaker's AppleScript support. Instead of dealing

with these problems and others, Frame seemed content simply to colorize the QuickAccess bar.

The Bottom Line

Thanks to its high-end feature set, Mac-friendliness, and reliable performance, FrameMaker continues to be the premier Mac program dedicated to long-document

publishing. Although its interface could stand a face-lift and it still won't win over typography and design mavens, we recommend it to anyone who needs to produce books, manuals, and other long documents.

Adobe has announced plans to acquire Frame Technology. If the acquisition goes through, FrameMaker should have a dynamic future. / Gregory Wasson

FrameMaker 5

Price: \$895 (list).

Pros: New sophisticated page-layout features, such as paragraph-based text straddles and text wrapping. Superb cross-platform compatibility. Supports AppleScript.

Cons: Interface needs streamlining. Lacks some high-end typographical-design features, such as customizable kerning pairs.

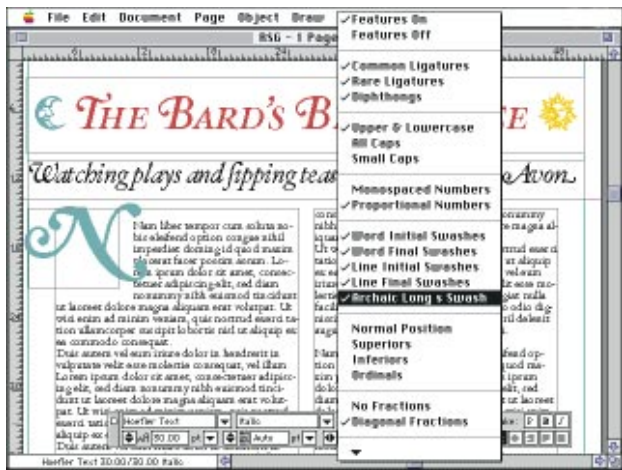
Company: Frame Technology, San Jose, CA; 800-843-7263 or 408-975-6000.

Reader Service: Circle #410.

Ready,Set,Go! GX / Manhattan Graphics debuts QuickDraw GX features for page layout.

AS THE FIRST page-layout program to embrace Apple's QuickDraw GX architecture, Ready,Set,Go! GX aims to differentiate itself in the competitive page-layout-software arena. We were curious to see what

you turn on or off in a special font menu. With some fonts, such as Matthew Carter's Skia, a style option brings up slider bars that enable you to control the weight and width of selected text.



An unwieldy interface compromises Ready,Set,Go! GX's QuickDraw GX-based typographic richness.

Ready,Set,Go! GX would tell us about Apple's new graphics architecture. We've been told, for example, that GX fonts are intelligent and have built-in typographic features, such as fancy swash characters, old-style numerals, and proper fractions. QuickDraw GX-savvy applications are supposed to automatically interpret these font instructions, so you can enable these features at the click of a button. QuickDraw GX also supports advanced graphics and printing features, such as drag-and-drop printing from the desktop.

Font Fiddling

Font fiddlers will like RSG! GX, which ships with five GX fonts to get you started. But you must truly enjoy fiddling to appreciate the program's typography features.

GX fonts are chock-full of the special characters you'd normally buy in expert sets as well as the stylistic variations found in multiple-master fonts. Just like regular TrueType or Type 1 fonts, each typeface may have several weights and styles — bold, italic, and so on — and each one can contain any number of whizzy effects, which

because the menu doesn't stay active after you've made a selection, you have to reopen it and rescroll for each attribute you want to select. Even more frustrating, there are no visual indicators that tell you exactly which Hoefler Text characters have a swash alternate, for example, or, in the case of Apple Chancery, what distinguishes Flourishes Set A from Flourishes Set B. Finding the right characters is simply trial and error. Adding to the confusion, the same typographic feature can vary wildly from one font style to another and its effect may change when you use it in combination with another option.

To be fair, the crudeness of the implementation isn't entirely Manhattan Graphics' fault. Apple didn't give the company much to work with — every QuickDraw GX-savvy application we have seen uses the same interface.

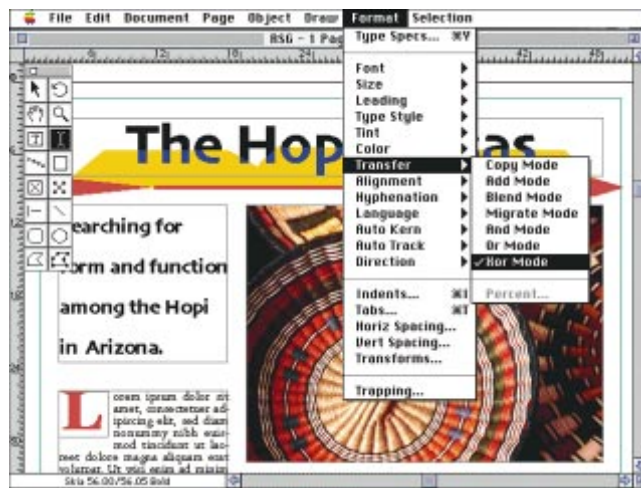
Still, RSG! GX's new typographic features could be much improved by the addition of a floating palette that let you enable several font variations at one time. A Key Caps-like utility for QuickDraw GX fonts would be useful as well, as would a GX-savvy type-cataloging utility that provided specimen sheets of each feature individually and in combination.

QuickDraw GX Graphics

RSG! GX also supports QuickDraw GX graphics features such as transfer modes for text, lines, and fills. Transfer modes — Add, Blend, Migrate, and Xor (a Boolean operation), to name a few — let you control how an object's color interacts with the color of the object beneath it. Although transfer modes are touted as being useful for creating transparencies and color blends within your page-layout program, we weren't terribly impressed. There's little feedback on what results you're getting in each mode, and the documentation isn't very helpful. We also found it annoying to have three Transfer menus.

RSG! GX has some drawing features unique to page-layout programs, thanks to QuickDraw GX. You can create open or closed quadratic Bézier paths, add or subtract points, change the shape of joins, and bind text to paths. The latter is a fun feature, but unfortunately, bound text isn't editable. And after binding text to a path, the original text box remains on-screen, rather than disappearing automatically.

The QuickDraw GX printing capabilities



Transfer modes in the latest version of Ready,Set,Go! GX let you combine and overlap colors in unusual ways. Here, we were able to split colors across letters.

of RSG! GX are much as expected. You can create desktop icons for commonly used printing devices. To print from the Finder, you simply drag your document to the printer icon. QuickDraw GX also lets you select paper trays, print up to 16 reduced pages on a single sheet, set print times, mix page sizes and formats in the same document, and more. You access most of these features — including application-specific ones such as crop marks, overprinting, and halftone line screens — from RSG! GX's Print and Page Setup dialog boxes.

One caveat: If you do not already have System 7.5, you'll have to acquire the QuickDraw GX System 7.5 extension (it's a four-disk install!) yourself to take advantage of RSG! GX's QuickDraw GX features. Surprisingly, the extension doesn't ship with the program.

Although QuickDraw GX support is the most important enhancement in RSG! GX, there are some other features — both old and new — worth mentioning. Like QuarkXPress, RSG! GX uses a frame-based model for page layout, with different frames for text and graphics. The new version adds a welcome preference that saves you mouse clicks by automatically providing the right tool for the type of frame you've created — a cursor for adding text, for example, if you've dragged out a text frame.

Among the program's niftier features are plenty of choices for irregularly shaped text boxes, controls for hung punctuation, and automatic grid creation. When you're drawing lines, you can edit arrowheads on the fly. RSG! GX also has good trapping and color-separation controls, and Manhattan Graphics offers free, unlimited tech support.


In the final analysis, although RSG! GX's feature set does indeed rival that of the market leaders, the program's interface is

its Achilles' heel — menus are overly long, and there are simply too many floating palettes.

The Bottom Line

Although the first version of Ready,Set,Go! shipped before PageMaker, the program has long labored in the shadow of both PageMaker and QuarkXPress. With this latest

QuickDraw GX release, RSG! attracts the limelight once again.

However, the fact remains that RSG! has never been readily adopted by the publishing and prepress communities. And taking a chance now on the unproven QuickDraw GX technology will not get RSG! GX into PostScript-based service bureaus any faster. / Pamela Pfiffner 

Ready,Set,Go! GX 7.0.3

Price: \$395 (list).

Pros: Extensive typographic controls. Bézier-path creation. Desktop printing. Affordable price. Free, unlimited technical support.

Cons: Awkward interface. QuickDraw GX not included with the program.

Company: Manhattan Graphics, Hartsdale, NY; 800-572-6533 or 914-725-2048.

Reader Service: Circle #411.

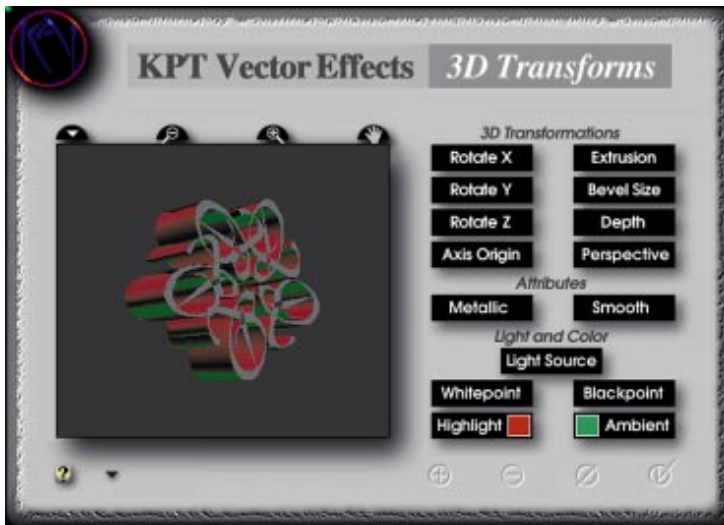


KPT Vector Effects / Filters for dazzling drawing

FILTER EVEN GRAPHICS PROFESSIONALS can spend a lot of time creating certain effects — such as 3-D extrusions, embosses, and warps — in Adobe Illustrator and Macromedia FreeHand. But now you can replace hours of trial and error by using KPT Vector Effects, a powerful set of 13 filters for these leading Macintosh draw programs, from the makers of Kai's Power Tools and KPT Convolver.

Once you have given KPT Vector Effects a spin, you may find yourself wondering how you ever got along without many of the filters it provides. For instance, the 3D Transforms filter extrudes your drawing's outlines along a three-dimensional plane. You can then add lighting effects, apply a metallic surface, rotate the object in 3-D space, and adjust beveling — all with impressive speed and results.

Unbound Experimentation. KPT Vector Effects lets you emboss, make shadows, warp objects, and create a slew of other effects easily. Before you commit any changes to your artwork, you can experiment to your heart's content in the preview window.



For those times when you're not quite sure of the particular look you're after, most of the Vector Effects filters have several presets you can rely on, and you can create and save your own. Vector Effects also has several terrific special-effects filters that produce Photoshop-like results.

The KPT Vector Distort filter enables you to apply a myriad of warping effects to objects, allowing you to create a fish-eye-lens effect similar to that produced by Photoshop's Spherize filter, for example, as well as a variety of other wild-looking distortions. We were also partial to the KPT ShatterBox filter, which "breaks" an object apart to create anywhere from a few to hundreds and hundreds of pieces.

For anyone who would like to add flair to an illustration, KPT Vector Effects not only saves time but also delivers truly stunning results. / William Harrel

KPT Vector Effects 1.0 / Price: \$199 (list). Company: HSC Software, Carpinteria, CA: 805-566-6200. Reader Service: Circle #412.


FaceSpan 2.0 / AppleScript made easy

NOW UNBUNDLED from Apple's AppleScript kits, FaceSpan lets you put your own interface on scriptable programs such as Microsoft Excel. At its basic level, FaceSpan lets you design user interfaces. You can do most of this by dragging and dropping interface objects onto a project window. By default, your projects will adhere to Macintosh Human Interface guidelines and act like Mac apps.

Since FaceSpan includes an AppleScript editor, you can craft complete applications, from a simple backup utility to a complex arcade-style game. Applications you create require the 400K FaceSpan extension, which you can distribute with your applications royalty-free.

You can also use FaceSpan to integrate several applications into one united, task-centered interface. For instance, you can create a FaceSpan application that, when you click on a button, tells Photoshop to apply a filter to an image, sends the image to PageMaker for placement in a document, and then tells a different FaceSpan application to publish the result on your LAN.

Smooth Scripting. FaceSpan has several features that make scripting less daunting. FaceSpan's AppleScript editor puts AppleScript handlers, properties, and window items into pop-up menus, so you don't have to write your scripts entirely from scratch. You can also cut and paste script fragments from the four dozen example scripts provided, plug in generic references to any AppleScript object or command by cutting and pasting code from a dictionary window, and have the program record your actions in an application as a script. This AppleScript editor, a big improvement over Apple's, is a rock-solid performer that's a pleasure to use. / Michael Swaine

FaceSpan 2.0  / Price: \$199 (list). Company: Software Designs Unlimited, Chapel Hill, NC; 800-322-3772 or 214-578-6700. Reader Service: Circle #413.




Passage to Vietnam / Exploring a faraway world

A MAGNIFICENT ACHIEVEMENT in terms of its interface, graphics, and content, Passage to Vietnam exquisitely captures the Southeast Asian nation.

Explore at Will. Featuring the work of Rick Smolan and 70 other photojournalists, Passage to Vietnam uses a unique 3-D interface tool called the Quebe. You can explore the CD-ROM in a linear fashion or use the Quebe to skip around. Clicking on the side of the Quebe labeled Passages brings up an interactive desk; clicking on anything on the desk, such as the cellular phone or a contact sheet, will transport you to a corresponding section. If you click on the Virtual Galleries contact sheet, you can view the best photos by four acclaimed photographers; if you click on the Interactive Editing Sessions contact sheet, you can try being a photo editor.

Passage to Vietnam has six chapters, which use photos and video and audio clips to illustrate cultural contrasts. The River Life chapter shows a Vietnam that depends on waterways for transportation; the Vietnam of the Street Life chapter whizzes into the 21st century on mopeds. You'll be dazzled by the stunning visuals and honesty of this vast CD-ROM, one of the best we've seen. / Kristin M. Balleisen

Passage to Vietnam  / Price: \$39.95; book and CD-ROM bundle, \$59.95 (list). Company: Against All Odds Productions, Sausalito, CA; 415-331-6300. Reader Service: Circle #414.

Tamron Digital Fotovix IIS-D / Scanning direct to screen

IF YOU CAN GET USED TO its unique look and controls, the Tamron Digital Fotovix IIS-D 24-bit-color scanner may be just what you need to quickly incorporate still-photo images into your video presentations.

The IIS-D looks like a high-tech microscope, and its hardware controls are different from those on most slide scanners. You adjust the iris, zooming, and focus controls by turning rings around the lens — a process somewhat like adjusting a microscope — and set RGB levels with a joystick. You can make fine adjustments with these controls, but doing so requires a delicate touch. Reinforcing its purpose as a scanner for on-screen images only, the IIS-D has input and output video ports for hooking it up to a VCR. To connect to your Mac, it uses a SCSI-2 connector and comes with a 25-to-50-pin cable.

Sizing Up the Resolution. You can't really adjust the resolution with the IIS-D: Everything is scanned at screen resolution, 72 dpi, in any size up to 640 x 480 pixels.

The IIS-D ships with its own stand-alone scanning application, which has slider controls for red, green, and blue levels and for sharpness, hue, brightness, color, and contrast. The software doesn't have any controls — such as a gamma curve — for midtones, nor does it do any type of automatic adjustments. If you have Photoshop, you can simply use the software as a Photoshop plug-in for the scanner.

The software's interface is, on the whole, easy to use, but it does have its share of quirks. The program doesn't quit when the scan begins, so its window obscures the scan. But it *will* quit without warning if you're using it as a Photoshop plug-in and you decide to cancel in the middle of the scan.


We had to tinker a lot with all the settings and use trial and error, scanning and readjusting several times, to get the best images. We wished the controls had default settings we could have used as a starting point.

Close Timing. We compared the IIS-D scanner with the Nikon CoolScan by scanning a color slide containing a color ramp and a range of flesh tones. The IIS-D scanned the slide in 16 seconds at 72 dpi, and the CoolScan took 17 seconds to scan it at 300 dpi. Predictably, the CoolScan's 300-dpi scan looked better on paper, but the IIS-D wasn't meant for printed output and its scan looked good on-screen.

The IIS-D is obviously designed for multimedia-software development and video, and for that, it fills the bill — even though its software and hardware interface could use some improvement.

/ Roman Loyola



Tamron Industries Digital Fotovix IIS-D  / Price: \$1,900 (estimated street). **Company:** Tamron Industries, Port Washington, NY; 800-827-8880 or 516-484-8880. **Reader Service:** Circle #415.

Skyline/Satellite 1.1 / Network stethoscope

USING SKYLINE, YOU CAN FIND OUT what's going on with your network without having to become a protocol expert. This network-management package not only scans your network but analyzes it for you as well.

Protocol Primer. Skyline analyzes and displays bar graphs of network data collected by its bundled companion product, Satellite. The graphs are easy to manipulate — most of the operations require only pointing and clicking.

Skyline can tell you which protocols are running and how much network bandwidth each one is taking up, which is helpful for troubleshooting tasks such as checking on network overloads and setting limits on usage. Skyline identifies over 850 LAN and WAN protocols, including the AppleTalk, NetBIOS, DECnet, TCP/IP, and NetWare protocols (including IPX and NCP).

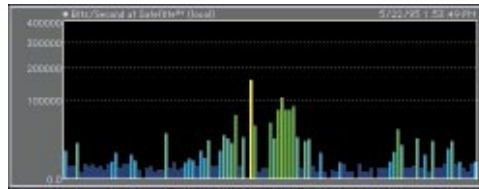
You can use Skyline's reports to analyze the normal traffic on your network and find deviations from the norm. You can even use Skyline to figure out the amount of bandwidth used by network-management tools, including Skyline itself. Other reports give you the traffic by each node, including routers, or by protocol.

Information Courier. Satellite has alarms that notify you if network conditions exceed limits you've set. An alarm can set off a sound, send you a message on your computer, or call your pager.

You can have multiple copies of Satellite running on different network segments. A single copy of Satellite can connect to other

copies of Satellite running across routers and even on networks in different locations via ARA connections.

Skyline requires its own Ethernet port, so if Satellite is on the same machine as Skyline, you can get away with only one Ethernet




port but you won't be able to run any network applications, such as file sharing. If you have Skyline and Satellite on separate Macs, you'll need two Ethernet ports on the

Mac with Satellite — one for Satellite and one for AppleTalk, which Skyline uses to communicate with Satellite.

We tested Skyline running on both a Power Mac and a 680x0 Mac, on networks of different sizes. The only problem we ran into was when we tried to run Skyline and Satellite together on a machine with 8 MB of RAM. Skyline doesn't handle low-memory situations elegantly and crashed several times after it displayed low-memory error messages.

However, we give Skyline high marks because it makes it easy to get useful information about your network — even if you're not terribly technical. / John Rizzo

Skyline/Satellite 1.1  / Price: Skyline console and one copy of Satellite, \$795 (list). Company: The AG Group, Walnut Creek, CA; 800-466-2447 or 510-937-7900. Reader Service: Circle #416.



SCSIShare / Share that scanner

WE'RE USED TO SHARING PRINTERS and logging on to file servers, but SCSI peripherals such as scanners are usually single-user affairs. Stalker Software's SCSIShare puts these and other SCSI devices onto networks for all to see.


Stalker retooled its first implementation of this technology, ScanShare, to use SCSI, rather than scanner, drivers and has thus expanded the range of devices you can reach.

SCSIShare is a control panel you install both on the Mac that's connected to a SCSI device you want to share and on the networked Macs that need access to the peripheral. Within the control panel, you set up which devices are to be shared and what the password for accessing each device will be. One of the Mac's seven SCSI-device addresses must be available to accommodate the shared device on the guest machine.

Remote Control. Remote users can access shared peripherals by creating virtual SCSI devices in SCSIShare. Once the shared device has been activated, network users can use it just as they would on a local Mac. If more than one person at a time tries to use a shared device, SCSIShare sends a "busy" notification to the second user.

Stalker recommends using SCSIShare on Ethernet networks, since LocalTalk is too slow for all but the smallest file transfers.

/ Shelly Brisbin

SCSIShare 2.0  / Price: \$89 (list). Company: Stalker Software, Mill Valley, CA; 800-262-4722 or 415-383-7164. Reader Service: Circle #417.


Desktop Labels / Speedy delivery

DESKTOP LABELS TAKES THE DRUDGERY out of bulk mailings. This bargain-priced program speeds up the dirty process of getting information out to customers and clients by combining a database, a label maker, and a bar coder.

Simplify Your Life. Created for small businesses and home-based users, Desktop Labels is far easier to use than its closest competitors, MySoftware's MyAdvancedMailList and MyAdvanced-LabelDesigner. The searchable and filterable database is simple; it can be split or merged with other databases and sorted into three user-defined categories.

When it comes time to create your label, you can use a pre-formatted design and clip art or easily incorporate your own design. The Label palette lets you sketch and add color and/or a pattern. There is also a great import/export function: Simply cut and paste drawings you've created in other applications (as long as they're PICT or EPS images) and then print them onto virtually any kind of label. Our only complaint is a minor one: It's somewhat difficult to manually enter several lines of text onto a label.

Desktop Labels goes the final mile with its bar coder: When you're ready for mailing, POSTNET bar codes speed letters and packages to their destination. / Rebecca Olson

Desktop Labels  / Price: \$25 (estimated street). Company: MacSoft, Minneapolis, MN; 800-229-2714 or 612-559-5140. Reader Service: Circle #418.



Master Tracks Pro 6.0 / Vintage MIDI sequencing

SEVERAL YEARS AGO, Master Tracks Pro was one of two choices if you wanted a professional MIDI sequencer. But as new, more powerful sequencers appeared and the competition kept adding features, Master Tracks failed to keep up.

The latest release of Master Tracks Pro doesn't return it to the big league of MIDI sequencers: The program still doesn't have now-standard features such as a notation view, note resolution higher than 240 parts per quarter note, and online help. On the other hand, at a list price of just under \$150, it's inexpensive enough to attract entry-level and semiprofessional MIDI musicians.

Suave Simplicity. Master Tracks still has an easy-to-understand interface. The main window, the Track Editor, shows you your song and is right next to the control faders. When you double-click on one of the measure boxes in the Track Editor window, you get the Step Editor window, in which you enter and edit the notes of your song, using notation that looks like the dots on a piano roll.

As with previous versions of Master Tracks, you can place your tune into the program by either selecting and clicking or typing in notes. Now you have two more ways of getting your music into the sequencer: You can click on notes on an on-screen piano keyboard, or you can use the QWERTY keyboard as if it were a MIDI keyboard. As with a MIDI keyboard, you can enter the notes in both step time and real time.

If you take advantage of Master Track Pro's use of the QuickTime

Musical Instruments extension, the program's Built-In Synth option will play your sequences by using QuickTime's General MIDI sounds, so you don't have to have an external MIDI instrument to hear your song in the appropriate arrangement. Unfortunately, Built-In Synth isn't appropriate for hearing your tune as you play it, because the notes you play on your QWERTY keyboard or on the on-screen keyboard have a long triggering delay.

The Price Is Right. Entry-level and semiprofessional MIDI musicians



who don't need all the latest and greatest features in sequencers will get a lot of bang for the buck with Master Tracks Pro 6.0. But even with the support for MIDI Machine Control, OMS, and SMPTE that Master Tracks offers, professional MIDI musicians shouldn't toss their feature-packed MIDI programs in favor of this comparatively stripped-down program — unless they need a slim program to plunk onto their PowerBooks. / Christopher Breen

Master Tracks Pro 6.0 🍌🍌🍌🍌 / Price: \$149 (list). Company: Passport Designs, Half Moon Bay, CA; 800-443-3210 or 415-726-0280. Reader Service: Circle #419. 📧





POWER PC

Portables

APPLE BRINGS POWERPC SPEED — AS WELL AS
NEW POWER FEATURES — TO ITS PORTABLE LINE.

If, as Henry Kissinger once said, “Power is the great aphrodisiac,” you’d certainly be excused for feeling all tingly at the prospect of Apple’s newest portable computers. By itself, the mingling of PowerPC technology and PowerBook design in two of the three new models sounds like a fantasy come true; even the new entry-level 68LC040-based model promises mouth-watering PowerPC-upgrade potential. Stir in a host of new technologies — many of them crossovers from the PC-compatible market — and you may find yourself craving a new PowerBook. The array of promised delights is staggering: full support for PCMCIA peripherals, wireless infrared-based communications, the ability to leave your floppy drive behind if you don’t need it (or to replace it with a variety of alternative peripherals), and new battery technology that promises to double the length of your work sessions.

In the end, however, our encounters with the new PowerBooks left us feeling impressed but less than fully satisfied. For all their prowess and their competitive pricing (the lowest-priced PowerPC-equipped PowerBook starts at \$2,199, and an entry-level 68LC040 system costs \$1,649), the new PowerBooks started to seem like just more faces in a crowd. A number of their new features are matched by PC notebook computers (and have, in fact, been available on PC-compatibles for years), and the new PowerBooks even *look* more like PC notebooks than previous products. Maybe we simply can’t shake our fixation on the gorgeous (but admittedly overweight) PowerBook 540c. Maybe we’ve been spoiled into expecting PowerBooks to be groundbreaking. Although the new models *are* a feast for the senses — and the wallet — the earth never quite moved for us.

When they ship in late September or early October, the new PowerBooks will replace all of Apple’s older models. Two of the three

PHOTOGRAPHY / STEVEN UNDERWOOD

BY JIM SHATZ-AKIN

just-announced models — the subnotebook PowerBook Duo 2300c and the all-in-one PowerBook 5300 — are *Power Mac* PowerBooks. They usher in a new strain of low-cost, power-efficient PowerPC processor, the 603e, which was designed specifically for portable use and runs at either 100 MHz or a speedy 117 MHz. The third model, the PowerBook 190, delivers the same 33-MHz 68LC040 speed of today's fastest PowerBooks — plus the promise of a future upgrade to the 603e — in a system that was designed and priced for entry-level buyers. All three new models also require yet another version of system software — System 7.5.2, which works only with these PowerBooks.

Apple hasn't merely updated the PowerBooks' processors, however. The new Duo boasts a larger screen than the Duo 280c, which it replaces, and it adopts the popular (and newly enhanced) trackpad pointing device. The all-in-one models offer a wide range of new technologies, including lithium ion (LiIon) batteries; PCMCIA peripherals (which are now known as PC Cards); wireless networking and communications based on infrared light; and an "expansion bay," which allows you to remove the floppy drive to lighten your load or swap in a variety of alternative devices. This flexible design lets you mix and match system components easily and ensures that you don't have to carry (or pay for) hardware you don't need. (For more information on what each PowerBook contains, see the "Sorting Out the Options" table.)

POWER MAC PORTABILITY

The biggest news with the new PowerBook line is the arrival of PowerPC technology in the form of the 603e. At long last, the PowerBook line is benefiting from speed increases similar to those the desktop Macs have seen since the debut of the 601. The 5300-series machines are significantly faster than previous PowerBooks, with the 5300ce being fast enough even for on-the-road graphics professionals (see figure 1). Although the Duo 2300c is potentially as fast as computers in the 5300 series, our tests revealed that a slow hard drive and poor video response drag down its speed. Apple claims that the final shipping Duo 2300c will, however, have a faster hard drive.

Although the 603e performs similarly to the 604, it is a different chip entirely. The 603e was engineered from the ground up for use in portables and differs from other PowerPC chips in several key ways: It's smaller than its cousins, the 601 and the 604; its overall power draw is about 75 percent lower than that of the 604; and it includes a series of new power-management features. In addition to

the Sleep mode, familiar to all PowerBook users, the 603e has two more reduced-power modes that are transparent to users: Nap and Doze, which, unlike Sleep, cause only the 603e chip (not all the PowerBooks' components) to power down. Besides having these power-saving modes, the 603e can selectively power down its own subsystems if they are idle, without waiting for the entire chip to be idle.

THE DUO 2300C has slick new technology, but when you get down to it, we've seen most of it before.



FEATURES INSPECTION

The latest PowerBooks have more going for them than just their chips, however. A good way to size up the new goodies in the PowerBooks is to simply look them over — and an obvious place to start is with the screens.

For the first time, one model (the 5300) will ship with four screen-configuration options: The basic 5300 has a 9.5-inch dual-scan passive-matrix screen that supports 16 shades of gray at a resolution of 640 x 480 pixels. The 5300cs comes with a 10.4-inch dual-scan passive-matrix screen that supports 256 colors at 640 x 480 pixels. The 5300c offers a 10.4-inch active-matrix screen that delivers thousands of colors at 640 x 480 pixels. And finally, for the first time, Apple has produced a PowerBook that uses an IBM PC screen-resolution standard — the 5300ce boasts a 10.4-inch active-matrix color screen that supports thousands of colors at 600 x 800 pixels (Super-VGA).

The Duo 2300c has an active-matrix color screen similar to the one on the 5300c. The 190 has the same grayscale screen as the 5300, and the 190cs has the same passive-matrix color screen as the 5300cs. Apple will offer screen upgrades for purchasers of 190- and 5300-series PowerBooks, although it had not determined pricing at press time.

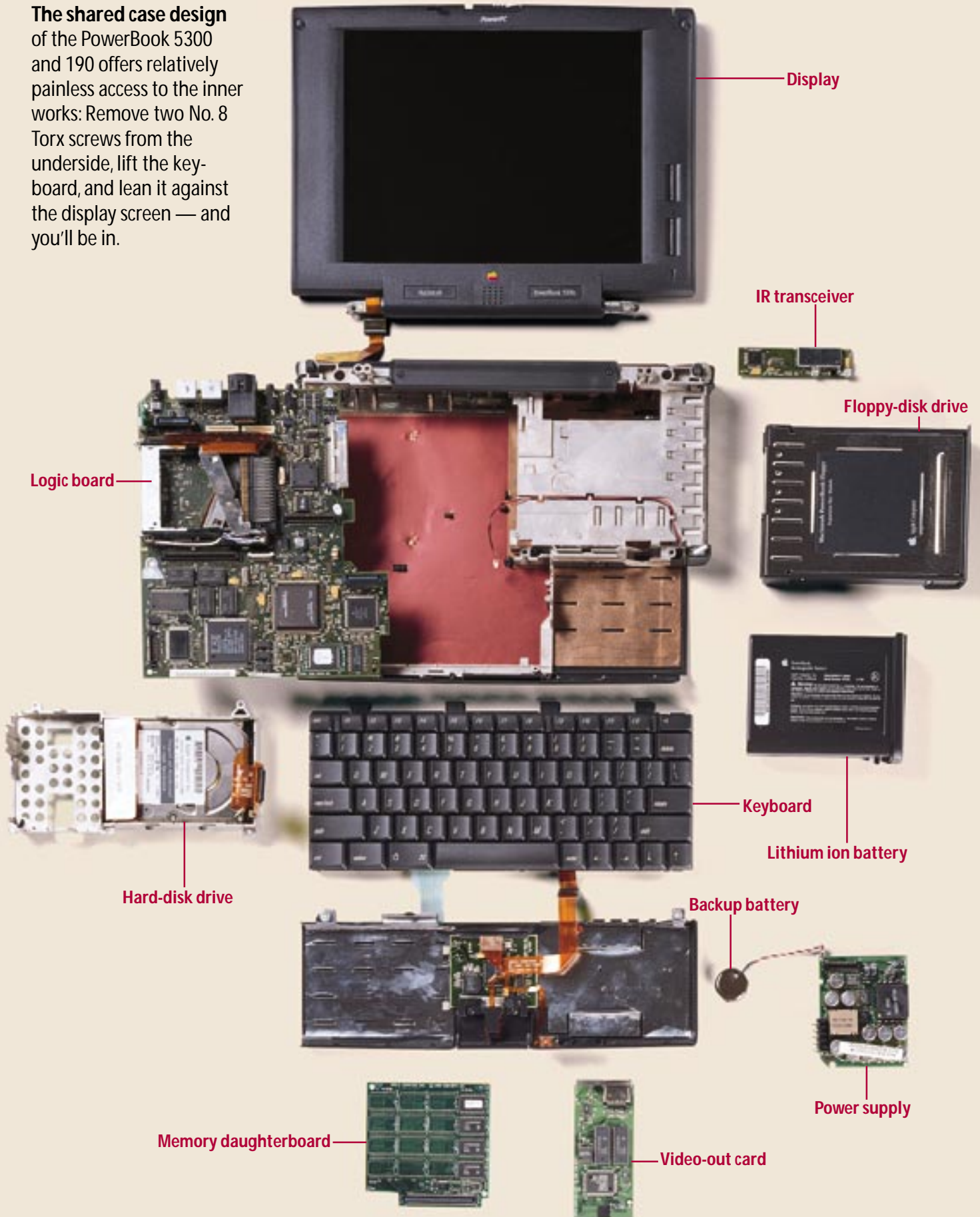
Moving past the screens in order to examine the rest of the new PowerBooks' cases, you see that the Duo 2300c differs in appearance only slightly from the Duo 280c — and with good reason. Aside from its speedy PowerPC, only one new feature stands out on the newest Duo — it sports a trackpad pointing device instead of a trackball. The electronic pointer, which lacks mechanical parts, looks just like the one introduced with last year's PowerBook 500 series, but the Duo 2300c's trackpad is a little better than the original. It lets you double-click by tapping the trackpad itself (the adjacent button still works for this too) — something many users of the original trackpad were disappointed they couldn't do.

(Buyers of the 5300-series PowerBooks may be similarly disappointed: The enhanced trackpad will be supplied with the Duo 2300c and the 190 series but not with the flagship 5300 series. Anticipating strong demand for the 5300 series and still smarting from shortages that followed last year's launch of the 500-series PowerBooks, Apple began manufacturing 5300s before the new trackpads were available in quantity. If you're willing to wait a few months before you buy your 5300, you may be rewarded with a silent upgrade to the enhanced trackpad — although Apple is making no promises.)

Apart from having the trackpad and the new PowerPC, the Duo 2300c is identical to the Duo 280c: It has the same bright, sharp 9.5-inch active-matrix color screen (a grayscale version of the Duo 2300c is not available); the same Type III NiMH (nickel metal


OPEN 'BOOK / under the hood of the 5300 and 190

The shared case design of the PowerBook 5300 and 190 offers relatively painless access to the inner works: Remove two No. 8 Torx screws from the underside, lift the keyboard, and lean it against the display screen — and you'll be in.



UPWARDLY MOBILE/upgrade step by step

THE ENTRY-LEVEL POWERBOOK 190 and the high-end PowerBook 5300c share a common modular design. This means that for the first time ever, you can upgrade the lowest-cost PowerBook incrementally until it equals a full-featured 5300c. (You can't upgrade to the top-of-the-line 5300ce, because Apple isn't selling an upgrade to the Super-VGA display. And upgrading doesn't get you the 5300c's lightweight polymer case, but it gets you all of its functions and features.) Here's how to do it — and how much each step costs:

	PowerBook 190 (4/500) ESTIMATED STREET PRICE:	\$1,649	
+		PowerBook Logic Board Upgrade (includes 8 MB of soldered-on RAM) ESTIMATED STREET PRICE:	\$1,199
+		Video-Out Upgrade Kit ESTIMATED STREET PRICE:	\$149
+		IR Upgrade Kit ESTIMATED STREET PRICE:	\$49
+		PowerBook Rechargeable Lithium Ion Battery ESTIMATED STREET PRICE:	\$199
+		PowerBook 10.4" Active-Matrix Color Display Upgrade Kit ESTIMATED STREET PRICE:	\$1,599
=	TOTAL UPGRADE COST:	\$4,844	
	PowerBook 5300c (8/500) ESTIMATED STREET PRICE:	\$3,699	

hydride) batteries; and the same internal 14.4-kbps Apple Express Modem II that shipped with the Duo 280c. The Duo 2300c is compatible with the same Apple Duo Dock II and mini docks (from Apple and third parties) that worked with the Duo 280 series. This is all slick technology, but when you get down to it, we've seen most of it before. We find ourselves wondering if the four-generation-old Duo design has finally run its course.

NEW CASE, NEW STUFF

By contrast, a glance at the new all-in-one PowerBooks reveals a great deal that's new. The machines in the 5300 and 190 series look different from all other PowerBooks except each other. Taking a cue

from the 7000-series desktop Power Macs, the 5300 and 190 series have a common case design. What sets them apart is the components packed into (or missing from) the basic setup.

The look-alike models are made of different materials: The 5300s' cases consist of a carbon-free polymer designed to provide low weight but high strength and shock absorption; the 190s are made of more-pedestrian plastic. Aside from this, the cases are identical, and the logic boards inside are nearly identical as well. (The logic-board design of the 190 series is actually slightly more advanced than that of the 5300 series: The power supply of the 190s is soldered onto the board, rather than attached via a separate connector. The connector adds a modicum of extra weight to the 5300s.) In fact, except for the case, you'll be able to turn any 190 into any 5300 — other than the 5300ce — through upgrades, although upgrading won't be cheap (see the "Upwardly Mobile" sidebar).

The new all-in-one cases are a shade darker than those of the 500 series, and the organic curves of the 500 series have given way to a somewhat boxier look in the 5300 and 190 series. Gone are the stereo speakers that flanked the upper corners of the 500 series' screens; a single speaker sits beneath the center of the screen, and an integrated microphone dimples the bezel to the right of the screen. We do miss the lo-fi stereo speakers when playing Doom, but at least the new PowerBooks still include 16-bit-stereo output, so you can connect them to a sound system for presentations. Yet there are bigger differences: A closer peek at the case reveals unfamiliar openings, latches, and panels that hint at new capabilities.

PC CARDS ON DECK

On the left side of the case of the 5300 and 190 series is a small door that conceals a built-in slot for PCMCIA cards, or PC Cards — credit-card-sized plug-in peripherals that have been standard on PC-compatible notebooks for years. Unlike the halfhearted implementation Apple offered last year, with the PCMCIA Expansion Module for the PowerBook 500 series, the new slots are fully compliant with industry-standard PCMCIA specifications. This means that beyond the handful of specially designed storage devices and modems the old expansion module supported, the new all-in-one PowerBooks support the full range of PC Cards — including a variety of modems, networking adapters, wireless-communication cards, and data-storage modules — now widely available for PCs. Mac-specific drivers will be required for these devices, and Apple is working with major Mac and PC vendors to ensure a large supply. In addition to the flash-memory and modem cards already available for the PowerBook 500 series, new offerings include Type II cards from Global Village and MegaHertz (a longtime PC vendor) that combine 28.8-kbps modems with Ethernet adapters and include a plug-in module from Dayna that turns the PowerBook into a cellular speakerphone. (Check out our Mobile Mac section for information on PC Cards and other third-party offerings as they become available.)

Spin the new all-in-one PowerBooks around to reveal the back panel, and you'll find a plastic door protecting an array of familiar ports — ADB, SCSI, serial, audio-in/headphone, audio-out, and video-out. (The Ethernet and modem ports available on the PowerBook 500s are gone, with the idea that users who need those functions can easily use PC Cards instead.) The video-out port

looks the same as on earlier-generation PowerBooks, but unlike on those models, it's connected to an upgradable video card, not the logic board: The 5300-series PowerBooks ship standard with a card that supports 256-color output to an external monitor at a resolution as high as 832 x 624 pixels (the Mac standard for 17-inch display systems). Third parties such as Newer Technology plan to ship upgrade cards that support more colors and/or higher resolutions. The card will fit into the empty PDS (processor-direct slot) of the PowerBook 190s; for the 5300 series, the card replaces the one Apple includes. Newer Technology estimates that its card will cost \$350 to \$400.

LOOK MA, NO WIRES

Next to the port array on the 5300 models, you'll see a red plastic lens. This is not a brake light for the PowerBook: It's an IR (infrared) transceiver you can use for wireless communications. The transceiver, which is available as an upgrade option for the 190 series (\$49), sends and receives beams of invisible light that carry data between PowerBooks. The transceiver lets you set up a wireless LocalTalk network of PowerBooks for sharing files.

For connecting to hardwired networks — for example, to share files with desktop Macs or to use printers or other peripherals that are connected to your office's network — you'll need to equip your desktop Macs with Farallon's AirDock. The AirDock is an infrared pod that connects to desktop Macs. Because the AirDock uses the same communications protocols as the PowerBook IR modules, it can give wireless-PowerBook users access to printers, servers, and other network resources.

Apple is also shipping a new application, IR File Exchange, on all infrared-equipped PowerBooks. IR File Exchange provides a simple, wireless way to swap data without having to go to the trouble of setting up file sharing, privileges, or passwords. It works like this: When you launch the IR File Exchange application, a window containing icons that represent the other users who are within range of your PowerBook and who are running their own copies of IR File Exchange appears on your PowerBook's desktop. To transfer data from your PowerBook to another Mac equipped with an IR transceiver, you simply drag files onto the target icon. A progress bar appears as the files are transmitted.

If the transmission is interrupted (when someone walks between the PowerBooks, for example), the IR File Exchange software behaves intelligently. An interruption of a few seconds is simply tolerated, causing a pause in the transmission


but requiring no action on your part. If the interruption is longer than a few seconds, however, then IR File Exchange will flash a dialog box that instructs you to make sure your PowerBook is pointing

THE RED PLASTIC LENS on the 5300 models is not a brake light for the PowerBook: It's an IR (infrared) transceiver.



FIGURE 1

PLENTY OF SPEED / PowerPC gives PowerBooks a boost

 **The wait has paid off.** The PowerPC 603e used in the PowerBook 5300-series machines gives them a definite speed boost over Apple's previous top-of-the-line PowerBooks. The 5300ce is especially fast, due to its processor's 117-MHz clock speed.

The low-end machines, the PowerBook 190 and 190cs, performed as we expected. They held their own in the productivity tests but stuttered in our MacBench 2.0 tests. These low-cost PowerBooks are based on the 68LC040, which does not include an FPU.

We were, however, disappointed that the PowerBook Duo 2300c couldn't keep pace with any of the 5300-series machines. In fact, for our productivity tasks, the Duo 2300c ran at the same speed as the Duo 280c, which it

replaces. Apple claims that the Duo 2300c will ship with a faster hard drive than the one we tested, but even so, we don't expect to see tremendous speed gains in the shipping product.

The productivity-tasks scores indicate how much faster a product ran than the reference machine, a PowerBook 540c, which is assigned

a score of 1.0. The productivity-tasks test suite consists of a variety of tasks in Microsoft Word, Excel, and PowerPoint and the Finder. MacBench 2.0 scores are relative to those of a Quadra 630 with an IDE hard drive, which is assigned a score of 10 for each test. Products are shown in order from high-end to low-end.

	MacBench 2.0 Scores				Productivity Tasks
	PROCESSOR 0.....35	FLOATING POINT 0.....180	DISK MIX 0.....10	VIDEO MIX 0.....12	Application Tests 0.....2
PowerBook 5300ce	33	168	7.2	10	2.0
PowerBook 5300c	30	163	7.2	10	1.4
PowerBook 5300cs	30	163	6.8	9	1.4
PowerBook 5300	30	162	6.8	11	1.5
PowerBook Duo 2300c	28	158	5.0	8	1.2
PowerBook 190cs	9	1	8.4	6	1.2
PowerBook 190	9	1	9.0	8	1.4
REFERENCE MACHINES					
PowerBook Duo 280c	9	1	4.6	10	1.2
PowerBook 540c	9	1	4.4	7	1.0

Longer bars are better.

POWERBOOKS

at the target machine. After a minute, the file transfer ceases and the dialog box disappears, but if you leave the IR File Exchange application open, it will resume the transfer as soon as it's in range of the recipient's computer. When you receive a file, it appears on your desktop (or wherever else you choose) in a folder called, for example, From Jane Doe. Because IR File Exchange is smart enough to ensure that each sender is associated with only one folder, you don't wind up with same-name files from various colleagues accidentally overwriting one another.

The PowerBook IR transceivers are low-power and unidirectional, so sender and receiver must be no more than about 6 feet apart and the IR transceivers must be pointed at one another for communications to work. Despite these limitations, the infrared capability makes it easy to swap messages or create small, ad hoc network workgroups. The IR capabilities should get much more interesting sometime next year, when Apple promises to bring the PowerBook transceivers into compliance with the IRDA (Infrared Device Association) specification for hardware communications, which was incomplete when Apple finalized its transceiver design. The IRDA standard will allow compliant devices — expected to include televisions, VCRs, PDAs, and computers — to communicate or exchange data. Apple intends to provide an IRDA upgrade in software for all purchasers of IR-equipped PowerBooks.

EXPANDING POWER

Completing our walk around the case of the 5300 and 190 series, we reach the right-side panel, which reveals a plain-looking floppy drive and a battery cover. A closer look reveals that this is actually one of the most intriguing facets of the new PowerBook design: A latch on the PowerBook's underside releases the floppy drive so you can slide it out of its enclosure. An immediate benefit of this design is the ability to travel light: If you don't need to use floppy disks, you

can replace the drive with a featherweight caddy that holds PC Cards.

But the real value of the enclosure — dubbed the expansion bay — is that it allows you to replace the floppy drive with any of a variety of peripherals that communicate with the PowerBook across an IDE (Internal Drive Electronics) interface. Apple and other vendors plan to sell hard drives that fit into the bay; these drives will be larger and cheaper than the ones currently available as PC Cards. Third-party vendors have also announced a variety of expansion-bay devices. Among the most intriguing are a tiny (3.5-inch) 230-MB magneto-optical drive from Fujitsu and an auxiliary internal battery and an infrared wireless modem from VST.

Despite an impressive number of announced devices that will fit into the expansion bay, one of the biggest disappointments about the new PowerBooks concerns a device that won't fit: a CD-ROM drive. Apple has declared that power-usage considerations and size requirements made it impossible to include CD-ROM drives in the new PowerBooks, even though a growing number of PC-compatible notebooks are offering built-in CD-ROM drives (which admittedly draw lots of power and add undesirable bulk). Indeed, the expansion bay is too narrow to accommodate a 120-mm-wide CD-ROM disc, but the prerelease manual supplied with the PowerBooks we tested mentioned a CD-ROM option that apparently never came to fruition.

Adjoining the expansion bay on the right side of the all-in-one PowerBooks is the battery compartment, which accommodates two types of look-alike batteries. The 190s ship with batteries based on the same NiMH chemistry that Apple has used before in the 100- and 500-series PowerBooks and the Duos. These NiMH batteries are bulkier than any earlier-generation PowerBook batteries, owing to Apple's decision to build the batteries around power cells that are larger but less expensive than the ones it has used before. Apple

SORTING OUT THE OPTIONS / comparing the new PowerBooks

	PowerBook 190	PowerBook 190cs	PowerBook 5300	PowerBook 5300cs
Estimated street price	\$1,649 (4/500) \$1,849 (8/500)	\$2,199 (8/500)	\$2,199 (8/500)	\$2,799 (8/500) \$3,499 (16/750)
Processor	68LC040	68LC040	PowerPC 603e	PowerPC 603e
Processor speed	33 MHz	33 MHz	100 MHz	100 MHz
Maximum RAM	64 MB	64 MB	64 MB	64 MB
Screen size (diagonal)	9.5 inches	10.4 inches	9.5 inches	10.4 inches
Screen type	passive-matrix	passive-matrix	passive-matrix	passive-matrix
Screen color	grayscale	color	grayscale	color
Maximum bit depth	4 bits	16 bits	4 bits	16 bits
Video resolution	640 x 480 pixels	640 x 480 pixels	640 x 480 pixels	640 x 480 pixels
Maximum video-out resolution	NA [†]	NA [†]	832 x 624 pixels	832 x 624 pixels
Maximum video-out bit depth	NA [†]	NA [†]	8 bits	8 bits
Audio-out capability	16-bit stereo	16-bit stereo	16-bit stereo	16-bit stereo
Weight	6.0 pounds	6.3 pounds	5.9 pounds	6.2 pounds
Battery type	NiMH	NiMH	Lilon	Lilon
Infrared transceiver	no [†]	no [†]	yes	yes
PC Card support	yes	yes	yes	yes

*Apple Express Modem II (14,400-bps data/9,600-bps fax).

[†]These capabilities available via hardware upgrades.

[‡]Requires Duo Dock for these capabilities.

estimates that users will average about two hours of use per charge from the NiMH cells — or roughly the same life they're used to with previous-generation NiMH batteries.

The 5300-series batteries generate power from lithium ion (LiIon) chemistry. Although they're the same size and shape as the 190s' NiMH batteries, the LiIon models weigh about 1 pound less and are expected to last roughly twice as long on a charge. Apple predicts that with any type of screen, users will get about four hours of useful life from the LiIon batteries if they take care to conserve power. That estimate tracks well with an informal test we conducted using a LiIon-equipped 5300c: A Macromedia Director presentation, which kept the PowerBook 5300c hard drive spinning continuously, ran for more than three hours when we used the default Better Conservation setting in the PowerBook control panel.

When the batteries finally do run out, you'll appreciate a new feature Apple has thoughtfully built into the new all-in-one PowerBooks. An internal backup battery allows you to "hot swap" your main batteries without shutting down. This advance means that you'll be hearing Mac startup chimes a lot less frequently on cross-country airline flights. Another handy feature of the new batteries is a row of four LEDs that serves as a "fuel gauge." When the batteries are fully charged, all four LEDs light up; they blink out in turn as the power drains. This means that travelers who carry extra batteries no longer need to use sticky notes to tell the spent ones from those that are charged.

When it's time to replenish them, the new batteries will, of course, recharge in the PowerBooks when the machines are plugged

into AC power. Apple won't supply external chargers, but a number of third-party options — including a dual-purpose charger from VST that can tell NiMH and LiIon batteries apart and that can charge each appropriately — were promised to appear on store shelves at the same time as the new PowerBooks.

ONE BIG disappointment about the new PowerBooks concerns a device that won't fit: a CD-ROM drive.



BUT DO WE LOVE THEM?

The introduction of the PowerPC to the PowerBook line is good reason for business users to be pleased. In addition, the new design shared by the PowerBook 5300 and 190 models brings PowerBook users an unprecedented degree of flexibility: The expansion bay and PC Card slots let you carry only the types of peripherals you need and only when you need them. And IR-based communications will simplify file synchronization and data transfers for many users. For graphics professionals, engineers, and 3-D animators, the PowerBook 5300ce is a viable choice, thanks to its

speedy 117-MHz PowerPC 603e and its high-quality active-matrix display.

Although these advances are an admirable boon for confirmed Mac users, the new PowerBooks aren't likely to share their predecessors' success at luring mobile PC users to the Mac camp. Unlike earlier generations, the new PowerBooks do not raise the bar significantly in terms of processing muscle or CD-ROM playback. PC Cards add flexibility, but they've been available on PC notebooks and subnotebooks for years — as have active-matrix Super-VGA displays. IR communication is nifty, but at least until IRDA compliance is achieved, it won't offer any advantage to non-Mac users. Built-in CD-quality sound capability, which was a PowerBook innovation a generation ago, is now standard on many PC portables. Even the processing prowess of the PowerPC is matched in IBM's high-end ThinkPad notebooks, which also boast a host of new multimedia features: jacks for input from camcorders or VCRs, an integrated CD-ROM drive, and even an optional built-in camera for instant videoconferencing. Of course, that machine costs nearly \$10,000 fully loaded, and IBM probably won't sell a large number of them.

The new PowerBooks are designed to have broader appeal and are priced for mainstream buyers. Although this may make good sense for Apple's business, we're sorry to see the company relinquish its role as innovator among portable-computer vendors. ☹️

When not covering PowerBooks, senior editor Jim Shatz-Akin may be found eating power breakfasts, strumming power chords, and avoiding Power Rangers. Associate lab director Nathan Garcia and senior project leader Jeffy Milstead performed the testing for this report.



Perform the same tests as MacUser Labs by using your own copy of MacBench 2.0, available online on ZD Net/Mac. See How to Reach Us for instructions on accessing ZD Net/Mac.

PowerBook 5300c	PowerBook 5300ce	PowerBook Duo 2300c
\$3,699 (8/500) \$4,499 (16/750)	\$6,499 (32/1GB)	\$3,499 (8/750) \$4,499 (20/1GB/modem*)
PowerPC 603e	PowerPC 603e	PowerPC 603e
100 MHz	117 MHz	100 MHz
64 MB	64 MB	56 MB
10.4 inches	10.4 inches	9.5 inches
active-matrix	active-matrix	active-matrix
color	color	color
16 bits	16 bits	16 bits
640 x 480 pixels	600 x 800 pixels	640 x 480 pixels
832 x 624 pixels	832 x 624 pixels	NA [§]
8 bits	8 bits	NA [§]
16-bit stereo	16-bit stereo	8-bit stereo
6.2 pounds	6.2 pounds	4.8 pounds
LiIon	LiIon	NiMH
yes	yes	no
yes	yes	no

PHOTO

O *pportunities*

DIGITAL PHOTOGRAPHY HOLDS OUT THE
PROMISE OF A FILMLESS FUTURE,
BUT DO TODAY'S CAMERAS DELIVER?

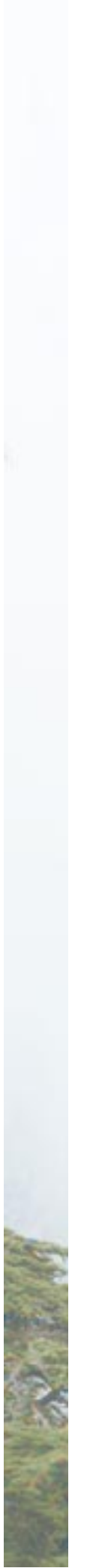
By Bruce Fraser with Peter Alan Gould
and Stephen Johnson

For electronic publishers, digital cameras sound like the best thing since sliced bread. No more waiting for film processing and worrying about the irreplaceable film leaving your hands. No more time and money spent on scanning and on telling the scanner operator what you want. Instead, you capture a pure digital image ready for editing. If you think this sounds too good to be true, you're right. In our hands-on exploration of the current state of the art in digital cameras, one word came up over and over again: *compromise*.

On the one hand, we found ourselves continually amazed at what we could do with digital cameras. On the other, we found the cameras a continual source of frustration and disappointment, with a few notable exceptions. Even these weren't free of compromises, but we knew their limitations up-front.

We looked at three types of digital cameras: studio cameras (\$5,000 to \$36,000), which need a host computer to function and which generally don't have built-in image storage; field cameras (\$11,000 to \$28,000), which store images in the camera and operate as stand-alone units, free from a Mac; and the new breed of consumer cameras (less than \$1,000), which combine filmless technology with point-and-shoot simplicity. In all, we looked at 16 cameras that let you bring images into your Mac (see the features table for each category).

Each of these types is designed for a certain purpose and subject





Snapshots from the edge: Stephen Johnson took this photo of the Golden Gate Bridge with a Dicomed Digital Camera Back, a scanning back that captures very high-resolution images. Its long exposure times can result in some interesting special effects. Johnson, an acclaimed landscape photographer, is using digital cameras to photograph America's National Parks for his upcoming book *With a New Eye*, to be published in 1997.


THE BOTTOM LINE

DIGITAL CAMERAS are not for everyone, and unfortunately, most are still too expensive for you to just try them out on a whim. Studio photographers not only have more choices than their mobile counterparts but have a wider range of quality to choose from too. Today's field cameras show lots of promise, but they all entail compromises, indicating that these are evolutionary devices. The consumer cameras point the way to an all-digital future but are limited by low resolution and meager in-camera controls. In rating these cameras, we compared similar camera types and like technologies.


+ / OUTSTANDING ● / ACCEPTABLE - / POOR

RATING PRODUCT PRICE IMAGE QUALITY SOFTWARE EASE OF USE


STUDIO CAMERAS

	★★★★½ Leaf DCB II	+	+	+	+
The three-shot Leaf DCB II is a workhorse for color work with static subjects and even for monochrome live-action shots. Its sophisticated software lets you produce great images quickly, with a minimum of fuss. Note, however, that with any scanning back, studio lighting is a major issue.					
★★★★½	Dicomed Digital Camera Back	+	+	●	+
★★★★	Kodak Professional DCS 465 Digital Camera Back	●	+	●	●
★★★★	Phase One PhotoPhase	+	+	●	+
★★★	Leaf Catchlight	-	●	+	+
★★½	Leaf Lumina	+	-	●	●
★★½	Sony DKC-5000 (CatsEye)	-	-	●	●
★★	KanImage GA Camera System	-	-	-	-

FIELD CAMERAS

	★★★★½ Kodak Professional DCS 460 Digital Camera	●	+	●	+
The only field camera we can recommend without many <i>ifs</i> and <i>but's</i> is the DCS 460. Color artifacts present occasional problems, but you can lessen their impact with postproduction work. The Nikon N90 camera body is convenient to use.					
★★★★½	Kodak Professional DCS 420 Digital Camera	+	●	●	-
★★★★½	Kodak Professional EOS-DCS 5 Digital Camera	+	●	●	-
★★★★½	Nikon E2s Digital Camera	●	●	●	●

CONSUMER CAMERAS

	★★★★½ Kodak Digital Science DC 40 Camera	+	●	+	●
The DC 40 produced the best images (although <i>least objectionable</i> might be a better term), with a lot of help from smart software that even novices can use. But the runner-up, the Casio QV-10, was a seductive little toy, thanks to its features and ease of use.					
★★★★½	Casio QV-10	+	-	+	+
★★★½	Apple QuickTake 150	●	-	-	●
★★	Logitech FotoMan Plus Mac	+	-	-	-

LISTING IS ALPHABETICAL WITHIN GROUPS OF EQUAL MOUSE RATINGS.

matter, so we engaged in several photo shoots. For the studio cameras, we set up a tabletop still life containing a wide tonal range, including bright highlights, deep shadows, and saturated colors. Field cameras are designed for real-world situations such as those that are covered by photojournalists, so we took the field cameras out to photograph San Francisco in all its foggy glory. As we did with their instant-camera counterparts, we employed the consumer cameras for taking spontaneous snapshots, indoors as well as outdoors.

After looking at the raw image data, we did what any professional would do: We color-corrected the images in Adobe Photoshop. All the images needed correction. In each image, we chose a point that was supposed to be neutral — in this case, the center of the *O* in a Rice-A-Roni box — and adjusted the color balance to make it neutral. The only other corrections we made were contrast adjustments and unsharp masking.

BEHIND THE CAMERA

Studio, field, and consumer are convenient categories, but there's another way of differentiating the cameras that's just as important. The term *digital camera* actually covers several different kinds of devices, each with its own strengths and limitations (see the "Instant Images" sidebar). These differences cut across the product categories.

Scanning-back cameras work the same way as do most scanners. A scanning head containing a linear CCD (charge-coupled device) array travels across the image area, building the image up one row of pixels at a time. This is the only digital-camera technology that is able to produce very high-resolution images, but exposure times run to minutes, which makes scanning backs unsuitable for shooting moving objects (although the results *can* be interesting, as evidenced in Stephen Johnson's photograph of the Golden Gate Bridge).

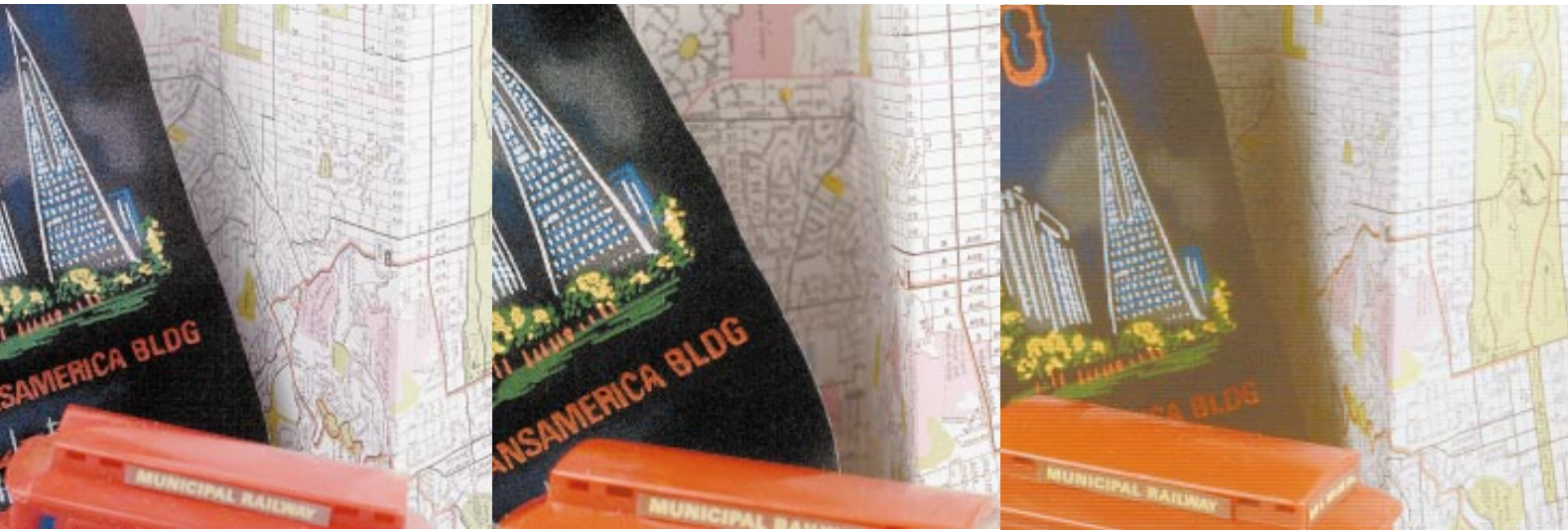
The bigger problem is that they can't use conventional photographic lighting, which produces a very bright but very brief flash of light. Instead, you need continuous light — lots of it if you want any depth of field — from a continuous, flicker-free source, which uses a lot of electricity and can produce formidable amounts of heat. As a result, scanning backs may be unsuited to heat-sensitive subjects, such as lipstick, delicate fabrics, and numerous foods. Additionally, the photographer is forced to rethink the lighting. But because the digital image serves as a Polaroid print, it is possible to check the lighting immediately.

Three-shot color cameras use a two-dimensional *area array* to capture a subject. Area arrays are much more expensive than linear arrays and have much lower resolution. Each element in the array contributes a single pixel to the image. Exposures are made at photographic speeds, so you can use conventional strobe (flash) lighting, but you need to make three separate exposures — one each through red, green, and blue filters — to create color images. This means that you can't shoot moving objects in color, although you can shoot them in black-and-white.

One-shot color is the Holy Grail of digital imaging. In theory, a one-shot color camera acts exactly like a film camera. Similar exposure times mean that no special lighting is required, and unlike the other digital-camera types, one-shot color devices are able to

DIGITAL CAMERAS

Studio cameras: All the scanning backs require a lot of special flicker-free lighting, and the less than optimal amount used here affected the depth of field. Even so, the Dicomed Digital Camera Back (A) held shadow detail in the map and captured subtle color gradations on the velvet backdrop. The Phase One PhotoPhase (B) had slightly lower maximum resolution and appeared to have less dynamic range than the Dicomed camera. The low-cost Leaf Lumina (C) caused color streaking throughout the image and had color-balance problems, especially in the shadows.



A High resolution

B Good detail

C Color-balance problems

handle live action. Sounds great? Again, you'll encounter some compromises.

There are a couple of fundamental ways of getting one-shot color. *Calculated-color cameras* employ a *striped array*, a CCD area array that has red, green, and blue filters applied directly to the array. Each of the elements in the array captures a single color, and the raw capture is subsequently interpolated in software to produce a file of the same resolution as the array. Each RGB pixel in the final image is "calculated" from a red, green, or blue one in the raw capture. Calculated-color cameras are vulnerable to producing weird image artifacts: All the ones we looked at produced them to some degree.

Three-array cameras, which represent the second approach to one-shot color, use three area arrays in the camera and split the incoming light into red, green, and blue components, directing one component to each of the three arrays. In theory, because each colored pixel is made up of real data from one red, one green, and one blue sensor, this approach should yield higher image quality than the calculated-color method. But the three-array design is expensive, and packing three arrays and the optics necessary to split the light into its red, green, and blue components while maintaining registration among the color channels presents an engineering challenge. The only three-array camera we tested, the Sony DKC-5000 (CatsEye), didn't live up to the theoretical promise.

STUDIO CAMERAS

Studio photography is the most mature market area for digital cameras, and the eight studio cameras we tested included representatives of the technologies just described. Most studio digital cameras aren't *cameras* at all; they consist of a digital-capture element that replaces the film holder attached to a traditional film camera, the cost of which is not included in the digital camera's price. Studio

photography lends itself to the use of a digital device better than does field photography, because you can control the lighting and the subject. It also offers obvious paybacks. You don't have to use a Polaroid camera to check lighting, you save money on film and processing, and you don't have to wait for the film to be processed to see if you got the shot you needed — simply check the image on your computer — so you can shoot many fewer images than you might on a typical film shoot.

That's a good thing, because digital cameras generate masses of data. In our test of studio cameras, we kept only the shots we knew were the best we could get. Even with only 5 shots per camera (40 images total), we ended up with well over a gigabyte's worth of images. Even with our souped-up Power Mac 8100, we found it tedious to open, edit, and organize all of these images. File tracking and cataloging would quickly become major issues in a production setting, no matter what type of digital camera you use.

Three of the studio cameras we tested — the Dicomed Digital Camera Back, the Leaf Lumina, and the Phase One PhotoPhase — were scanning backs. The Lumina uses a dedicated camera body that takes Nikon lenses, whereas the PhotoPhase and the Dicomed Digital Camera Back are film backs that work with any 4x5 view camera or, if you have the correct adapter, with some medium-format cameras. Although their capabilities differ widely, they all require strong, continuous light — and plenty of it. The KinoFlo flicker-free fluorescent lights we used in the studio weren't really up to the task — we had to sacrifice depth of field to get acceptable exposures. In a production environment, you need either huge numbers of high-frequency fluorescent lights or several kilowatts of hot lights, such as HMIs.

Strict lighting requirements and the inability to capture moving subjects are a couple of the major drawbacks of scanning-back cameras, but their primary advantage is high resolution. The

DIGITAL CAMERAS

PhotoPhase and the Dicomed camera are each able to create files that are larger than 100 MB, big enough for just about any conceivable purpose, up to and including producing images for display on billboards.

The Lumina's images had color problems that required a great deal of postproduction work. Specular highlights had obvious color fringes, and we noticed pronounced streaking along the scanning head's path of travel. On the plus side, the Lumina is one of the least expensive studio cameras available and it gave us greater depth of field with a limited amount of light than did the other two scanning backs. The images are usable for midrange print work and some industrial applications for which color accuracy is not the most important consideration.

The PhotoPhase did a much more respectable job, holding high-light detail well. The images required only minimal editing to achieve the appropriate contrast and neutral balance. The in-focus areas were sharp, with no trace of undesirable artifacts and no tendency to bloom on specular highlights. The PhotoPhase camera's

application software allows you to save camera settings and reuse them, sharpens images on the fly, and hooks directly into Agfa's FotoTune color-management system for automatic RGB-to-CMYK conversion.

The Dicomed camera gave stunning results, even with lighting limitations, producing wonderful detail and subtle color nuances that escaped the competition. The accompanying software offers fine control over the camera but does not have any postcapture image-editing features.

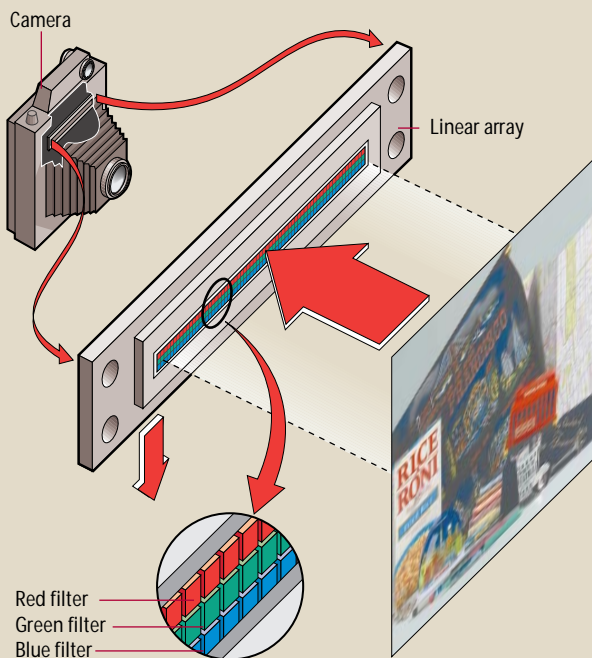
Our only three-shot color entry, the Leaf DCB II, produces color by taking three separate exposures through red, green, and blue filters mounted in a motor-driven filter wheel. As a result, it can't capture live action in color, but it does produce stunning black-and-white portraits with live subjects.

The DCB II has the best software of the studio cameras by far. Most of the cameras capture 12 or more bits per color internally but downsample to 8 bits (24 bits total) on output. The DCB II captures 14 bits per color and sends all 42 bits of data to its own application,

INSTANT IMAGES / how digital cameras capture color

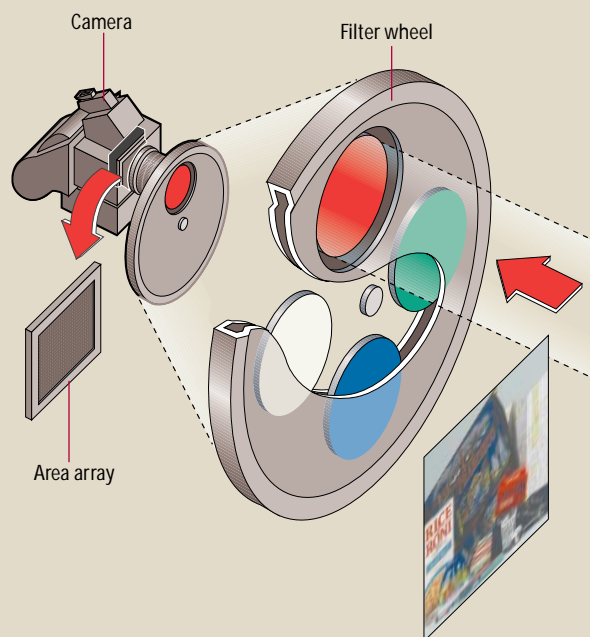
SCANNING-BACK CAMERA

A linear CCD array with three embedded color filters (a trilinear array) captures image data one row of pixels at a time, one each for red, green, and blue. Because each pixel in the image is made up of true-red, -green, and -blue data, colors are more accurate than with other technologies. A trilinear array can contain many photosensitive elements, so image resolution can also be much higher. But the scanning time for each image can be several minutes, making this type of camera unsuitable for photographing moving objects or for working with strobe lighting.



THREE-SHOT COLOR CAMERA

An area CCD array captures color image data through a rotating filter wheel attached to the camera, with one exposure each for red, green, and blue. As with a scanning-back camera, this technique allows each image pixel to consist of true-red, -green, and -blue data. But unlike a linear array, an area array has limited dimensions that affect resolution. Because it requires three separate exposures, it's inappropriate for moving subjects, but it does work with strobe lighting.





A Overall good quality

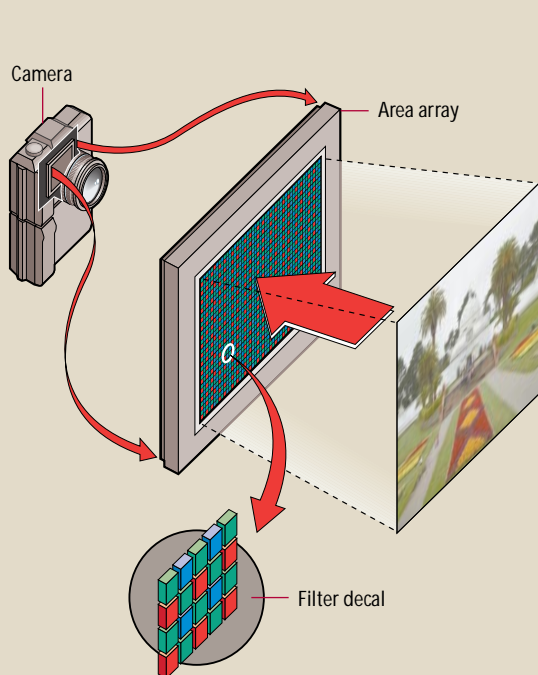
B Excellent shadow detail

C Poor saturation

Studio cameras: The three-shot Leaf DCB II (A) had the best combination of image quality, color rendition, lighting flexibility, and ease of use. The one-shot Kodak Professional DCS 465 Digital Camera Back (B) had excellent shadow detail and only a hint of artifacts on the highlights in the bowl of the spoon. The KanImage GA Camera System (C) produced weirdly saturated colors — especially in the shadows — that no editing in Photoshop could eliminate, despite KanImage's claims to the contrary.

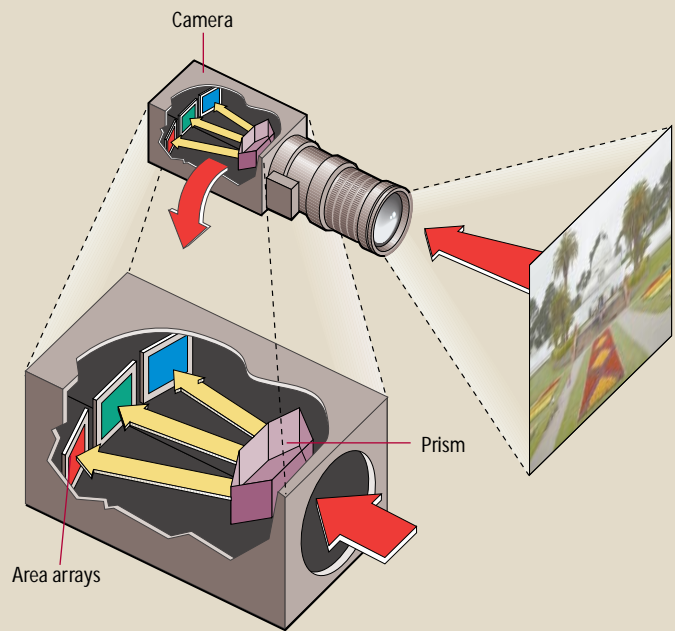
ONE-SHOT, ONE-ARRAY COLOR CAMERA

Like three-shot color, the one-shot, one-array technique, also known as calculated color, uses an area array. But the array does not capture color image data through a filter; instead, a decal containing red, green, and blue filters is on the CCD's surface. Image data for each pixel is captured in only one of the three colors — for instance, red. To add the right proportion of green and blue, the software interpolates the color data from adjacent pixels. This calculation in software can cause artifacts in images; if a fine detail falls on only one CCD element, there's no color information to be gained from the adjacent pixels. Because only one exposure is required, one-shot cameras offer real-time image capture.



ONE-SHOT, THREE-ARRAY COLOR CAMERA

Containing three area arrays and a prism that directs light to the arrays, some cameras use a single color per array. Others combine a calculated-color area array containing red and blue filters with two additional area arrays with green-only filters (our eyes are more sensitive to green) — only two colors have to be interpolated, so these cameras are less prone to artifacts than their one-array cousins. Three arrays mean more color information, but at a higher cost per pixel, and these cameras generally have lower resolutions.



STUDIO CAMERAS / features compared



Dicomed Digital Camera Back



KanImage GA Camera System



Kodak Professional DCS 465 Digital Camera Back



✓ Leaf DCB II



Leaf Catchlight

List price	\$22,500	\$36,000	\$27,995	\$27,995	\$35,995
Type of sensor	trilinear array	area array	area array	area array	area array
Maximum resolution	6,000 x 7,520 pixels	3,072 x 2,020 pixels	2,036 x 3,060 pixels	2,048 x 2,048 pixels	2,048 x 2,048 pixels
Camera type (compatible models)	film back (any 4x5 camera, most medium-format cameras)	dedicated	film back (Hasselblad, Mamiya RZ/RB)	film back (Hasselblad, Mamiya, Fuji 680, Sinar)	film back (Hasselblad, Mamiya, Fuji 680, Sinar)
Color capture	one-pass scan	one-shot color	one-shot color	three-shot color	one-shot color
Internal bit depth	36 bits	36 bits	36 bits	42 bits	42 bits
Output bit depth	24 bits	24 bits	24 or 48 bits	24 or 48 bits	24 or 48 bits
Storage	internal 1-GB hard drive	host computer	PC Card (Type III)	host computer	host computer
Images stored	7 full-resolution, 31 half-resolution	depends on host	56 (340-MB card)	depends on host	depends on host
Equivalent film speed	ISO 100 – 400	NA	ISO 80	NA	NA
White-balance options	fully adjustable plus automatic	precapture	postcapture	automatic	automatic
Lenses (supplied/compatible)	none/any that fit host camera	none/any C-mount	none/any that fit host camera	none/any that fit host camera	none/any that fit host camera
Software supplied	Dicomed 2.0, BetterLight 1.7	Daguerre, Photoshop plug-in	Photoshop plug-in	DCB/Catchlight 3.0	DCB/Catchlight 3.0
Company	Dicomed Burnsville, MN 800-888-7979 612-895-3000	KanImage Long Island City, NY 800-969-2676 718-482-1800	Eastman Kodak Rochester, NY 800-235-6325 716-724-4000	Leaf Systems Westboro, MA 508-836-5500	Leaf Systems Westboro, MA 508-836-5500

✓ MacUser BEST BUY

in which you can set black and white points, do a neutral balance, and apply a contrast curve. The combination of the excellent data captured by the camera and the efficient software makes it easy to produce great images very quickly. Add the fact that you can use conventional strobe lighting, and you've got a system that can start generating income almost immediately — a plus that makes the DCB II our pick in this category.

Compared to the DCB II, the Leaf Catchlight, Leaf's entry in the

one-shot color category, was frankly disappointing. Leaf has made much of the fact that the Catchlight uses a patented color mask over the CCD, containing four colors (instead of the usual red, green, and blue) in order to provide better color and cause fewer artifacts.

For the still-life shot, the Catchlight simply fell apart, producing conspicuous color fringes and poorly aliased edges everywhere. We felt that it was unfair to judge the portrait-oriented Catchlight on the basis of our still-life setup, so we additionally shot a series of

VIRTUAL FILM / using PC Cards with digital cameras

COMPACT AND STURDY, PC CARDS (formerly called PCMCIA cards) seem like the ideal choice for storing images in digital cameras. That's why the Nikon E2s Digital Camera and the Kodak Professional Digital Camera series (the DCS 420, EOS-DCS 5, DCS 460, and DCS 465) all use them. But when we started working with the cameras, we quickly found that not all PC Cards and readers are the same. The PC Card drive in the Nikon E2s couldn't read the PC Card hard disks used in the Kodak DCS 420, and the optional PC Card drive in the Apple PowerBook 540c couldn't read the Nikon flash-memory PC Cards, and so on. The Mac-PC Manager control panel, which mounts the cards on the Mac's desktop, is equally picky. So how to get images from a camera to your Mac?

Fortunately, we discovered Microtech's \$775 Digital PhotoAlbum drive, a two-slot card reader that accommodates one flash-memory PC Card (Type II) and one hard-disk PC Card (Type III) or two flash-memory PC

Cards. The unit occupies two SCSI ID slots, which must be adjacent. Once you've set it up, it handles just about any kind of PC Card. It let us mount cards from the Kodak DCS and Nikon cameras simultaneously, with absolutely no fuss.

Microtech also sells a line of flash-memory PC Cards under the name Digital FlashFilm, in 5-MB (\$266), 10-MB (\$650), 20-MB (\$1,100), and 40-MB (\$1,761) capacities. Microtech's 170-MB hard-disk PC Card sells for \$650. We used a 40-MB Digital FlashFilm card in the Kodak DCS 420 and EOS-DCS 5 as well as in the Nikon E2s. FlashFilm cards are slow, however. If you don't need fast-burst continuous-shooting capabilities, using Digital FlashFilm cards is an attractive choice. Microtech is also working on a portable version of the Digital PhotoAlbum, for previewing images in the field. These cards offer an inexpensive way to make sure you always have a spare roll of virtual film in your camera bag. 203-468-6223.



Leaf Lumina



Phase One PhotoPhase



Sony DKC-5000 (CatsEye)

\$4,999	\$23,470	\$15,100
trilinear array	trilinear array	three area arrays
2,700 x 3,380 pixels	5,000 x 7,142 pixels	1,520 x 1,144 pixels
dedicated	film back (any 4x5 camera, most medium-format cameras)	dedicated
one-pass scan	one-pass scan	one-shot color
36 bits	36 bits	30 bits
36 bits	24 bits	24 bits
host computer	host computer	host computer
depends on host	depends on host	depends on host
NA	ISO 400	ISO 100 – 800
manual	automatic	automatic
none/any Nikon-mount lens	none/any that fit host camera	optional/half-inch 38 bayonet mount, microscope adapter, Nikon SLR adapter
Photoshop plug-in	Phase One software	Photoshop plug-in
Leaf Systems Westboro, MA 508-836-5500	Phase One U.S. Northport, NY 800-972-9909 516-757-0400	Sony Electronics Montvale, NJ 800-472-7669 201-930-7796

portraits. It handled the softer details of the portraits better than it did the hard edges of the still-life shot, but we still found the overall image soft and unsaturated, with the same tendencies toward color bleeding, including an unattractive instance of lipstick color bleeding onto teeth. The color bleeding rules this camera out for doing a lot of fashion photography — patterned fabrics didn't hold up well at all.

The Catchlight requires you to perform a separate processing step to interpolate the color data. You can't tell by looking at the raw image whether or not the processed one will contain objectionable artifacts, so you have to wait another eight minutes to find out if a shot is usable.

Another one-shot color studio camera, the Kodak Professional DCS 465 Digital Camera Back, gave us an altogether more positive experience. It too produced some artifacts — random speckles of orange and blue, which we've come to identify as the Kodak signature artifacts — but they were relatively slight and you can eliminate them by hand in Photoshop or by using a custom filter that is included with the PowerShop DSP accelerator, from Adaptive Solutions (800-482-6277 or 503-690-1236). Anyone who is considering the purchase of a DCS 465 or DCS 460 should also consider getting a PowerShop card: It not only runs the custom filter but also accelerates image acquisition from the camera and lets you bring the image into Photoshop's 48-bit color space. Kodak should bundle the PowerShop with each DCS 465 and 460 it sells. Once we'd run the PowerShop filter to remove artifacts, the DCS 465's images needed

only minor tweaks for neutral balance and contrast.

The only one-shot, three-array camera available for testing, the Sony DKC-5000 (CatsEye) is basically a three-array video camera converted for still use, and accordingly, this low-resolution device lacked dynamic range. A bigger problem was that focusing it was almost impossible. The only feedback is from a small video monitor (you can hook up Sony's external video monitor, but that's a poor substitute for an optical viewfinder). It holds images in memory, so you can shoot a bunch of photos and shoot over the ones you don't like before acquiring them in Photoshop. The color balance wasn't bad, but given its shortcomings, we have to characterize the CatsEye as a once interesting product whose time has come and gone.

Our final studio-camera contestant, the KanImage GA Camera System, is an interesting hybrid. It uses an area array but increases the resolution by vibrating a glass wedge in front of the sensor so that several images are captured and subsequently merged into one higher-resolution image. Unfortunately, this combines the worst features of one-shot color cameras and scanning backs — relatively low resolution and exposure times too long for conventional strobe lighting.

The KanImage camera produced the worst images of all the studio cameras, with insufficient dynamic range and lurid oversaturation that defied our best attempts to correct it. No matter what we did, we wound up with strong greenish-blue shadows. More light may have made its flaws less obvious, but it wouldn't have made them go away. Like the Sony CatsEye, the KanImage camera has had its moment in the sun.

FIELD CAMERAS

The hottest area of digital photography right now is field cameras, and traditional camera vendors are scrambling for position. In some ways, the field cameras look and feel most like their analog counterparts. Three of the cameras we tested integrate 35mm camera bodies with digital backs. The fourth, the Nikon E2s Digital Camera, was codeveloped by Nikon and Fuji as a handheld digital camera. Additionally, two of the studio cameras, the Dicom camera and Kodak's DCS 465, have their own storage and are hence capable of untethered operation in the field. But instead of using the DCS 465 for our field work, we used the Kodak Professional DCS 460 Digital Camera, which has the same electronics as the DCS 465 but in a more convenient, 35mm body.

The field cameras we tested were one-shot color cameras that used striped arrays. The hottest competition was among the midrange "megapixel" cameras, which capture somewhere between 1 and 1.5 million pixels per image. We looked at three cameras in this range, the Kodak Professional DCS 420 Digital Camera, the Kodak Professional EOS-DCS 5 Digital Camera, and the Nikon E2s Digital Camera. We had mixed feelings about all three — they seemed awesome one moment and awful the next.

The two midrange Kodak cameras we tested are very similar. The differences result from differences in the Nikon N90 and Canon EOS-1 camera bodies, on which they're based. The Nikon-versus-Canon debate rages unchecked in photographic circles, so Kodak offers cameras to partisans of each platform. We found that the two cameras behaved similarly, except that the Canon-bodied EOS-DCS 5 consistently produced a green color cast and the Nikon-bodied

A *Excellent overall quality*



B *Artifacts and color casts*



C *Artifacts and color casts*



D *Uneven sharpness*



DCS 420 produced a magenta cast of almost exactly the same strength. A Kodak representative explained that the difference is due to the different lookup tables in each camera.

The sensor in each camera occupies a much smaller area than the 35mm film for which the camera bodies were originally designed, and this changes the behavior of the cameras in important ways. It more than doubles the effective focal length of your lenses, so a wide-angle lens becomes a short telephoto. The 28mm lens shipped with the cameras provides the same coverage as a 70mm lens does on film. It also reduces the image area to a small rectangle in the center of the viewfinder, so you have to learn to compose the shot in that much smaller area.

When we used these cameras over a four-day period in San Francisco, in weather conditions ranging from foggy and overcast to clear and sunny, we also learned that the small array size played havoc with the in-camera metering on both cameras. The camera bodies are state-of-the-art SLR (single-lens reflex) cameras with sophisticated built-in metering that provides excellent exposures on film, but they just aren't well matched to the CCD. Part of the problem is that the array seems closer to an equivalent film speed of ISO 80 than the rated ISO 100. Also, even though you can change the ISO number on the DCS 420, it reverts to ISO 100 after each shot, and the EOS-DCS 5 simply doesn't allow you to set a film speed of less than ISO 100. On cloudy days, the in-camera metering gave us images that were underexposed by about one-and-one-third f-stops, whereas on sunny days, the images were underexposed by about half an f-stop. These cameras were also much more prone to producing artifacts than their higher-resolution siblings, the DCS 460 and 465.

Our biggest problem with these two cameras was that even after four days of intense shooting, we still had no idea whether we'd get a good exposure when we clicked the shutter. In fairness, learning the quirks of film takes a long time too, but a state-of-the-art SLR gives you a lot of help along the way. With these digital sensors, the in-camera metering just isn't reliable.

Using the Nikon E2s was a very different experience. Designed from scratch as a digital camera, it had accurate metering and the image area occupied the whole of the clear, bright viewfinder. It offered the same kinds of controls as those on Nikon's high-end 35mm SLR cameras, such as the N90, plus a white-balance selector, a quality selector (which lets you store images uncompressed or with four levels of JPEG compression), and a sensitivity selector that toggles the equivalent ISO rating between ISO 800 and 1600.

The camera has an internal optical system that allows you to use standard Nikon lenses. The lens stays wide open, and the camera's internal optics control the aperture. Lenses with a minimum aperture of f4 or smaller caused vignetting — a noticeable darkening of the image around the edges — so you can't use just *any* Nikon lens.

Field cameras: All the field cameras had some artifacts (see inset images). After we edited the images in Photoshop, to minimize artifacts, the best field camera stood out. Even on a cloudy day, the resolution and tonal range of the Kodak Professional DCS 460 Digital Camera (A) far surpassed those of the Kodak Professional DCS 420 Digital Camera (B), the Kodak Professional EOS-DCS 5 Digital Camera (C), and the Nikon E2s Digital Camera (D).

FIELD CAMERAS / features compared



Kodak Professional DCS 420 Digital Camera



Kodak Professional EOS-DCS 5 Digital Camera



✓Kodak Professional DCS 460 Digital Camera



Nikon E2s Digital Camera

List price	\$10,995	\$11,995	\$27,995	\$18,995
Type of sensor	area array	area array	area array	area array
Maximum resolution	1,012 x 1,524 pixels	1,012 x 1,524 pixels	2,036 x 3,060 pixels	1,280 x 1,000 pixels
Camera type (compatible models)	dedicated (has Nikon N90 body)	dedicated (has Canon EOS-1 N body)	dedicated (has Nikon N90 body)	dedicated
Color capture	one-shot color	one-shot color	one-shot color	one-shot color
Internal bit depth	36 bits	36 bits	36 bits	30 bits
Output bit depth	24 or 48 bits	24 or 48 bits	24 or 48 bits	24 bits
Storage	PC Card (Type III)	PC Card (Type III)	PC Card (Type III)	PC Card (Type I)
Images stored	225 (340-MB card)	225 (340-MB card)	56 (340-MB card)	5 full-resolution, 84 compressed (15-MB card)
Equivalent film speed	ISO 50 – 400	ISO 100 – 400	ISO 80	ISO 800 or 1600
White-balance options	postcapture	postcapture	postcapture	automatic or manual
Lenses (supplied/compatible)	none/any Nikon	none/any Canon EF	none/any Nikon	none/Nikon 6mm – 800mm
Software supplied	Photoshop plug-in	Photoshop plug-in	Photoshop plug-in	Nikon Image Browser
Company	Eastman Kodak Rochester, NY 800-235-6325 716-724-4000	Eastman Kodak Rochester, NY 800-235-6325 716-724-4000	Eastman Kodak Rochester, NY 800-235-6325 716-724-4000	Nikon Melville, NY 800-526-4566 516-567-6355

✓ MacUser BEST BUY

You really need one with an aperture larger than f4; in other words, you'll need one that is more expensive.

The Nikon E2s uses high-speed flash-memory PC Cards (Type I PCMCIA) for in-camera storage rather than hard-disk PC Cards (Type III PCMCIA), which the Kodak cameras use, and unlike the Kodak cameras, it has no facility for connecting the camera to a Mac, so you have to use a PC Card reader to load images into your computer (see the "Virtual Film" sidebar). Flash-memory cards are more expensive than hard-disk cards, and the 15-MB Nikon cards hold only five uncompressed images, so the cost of storage with the Nikon camera adds up quickly.

Images we obtained from the Nikon E2s were disappointing. Nikon tries to eliminate the artifacts that plague the Kodak cameras by having an optical filter inside the camera. It has succeeded, but the net result is very soft images that have sharp edges in high-contrast areas. You can bring back some crispness by applying lots of unsharp masking in Photoshop, but this exaggerates the already sharp edges. It's a difficult condition to correct.

The auto white-balance feature did a good job of handling mixed light sources, such as window light and incandescent lamps, but it sometimes behaved oddly in daylight. For example, we took two shots from exactly the same spot, one facing east and the other facing west, and got a strong yellow cast in the east-facing shot and a slight blue cast in the west-facing one. In most cases, the color from the Nikon camera was good — it seemed to have better discrimination among reds than the two comparable Kodak cameras — but with some images, it was difficult if not impossible to fix the color balance. In several ways, we found the Nikon E2s a bigger

letdown than the Kodak cameras, if only because, at first glance, it seemed to promise so much more.

After we experienced the ups and downs of the megapixel cameras, using the Kodak DCS 460 was a welcome change. It uses the same Nikon N90 body as the DCS 420, but its larger array eliminates many of the problems of the less expensive Kodak cameras: The in-camera metering is accurate, the image area occupies almost the entire viewfinder, and the effective focal length of the lens increases only slightly.

The DCS 460 isn't completely free of Kodak's signature orange and blue artifacts, but they occur less frequently and are less obvious than with the smaller-array cameras. The images also benefited from use of the Adaptive Solutions PowerShop card and custom filter. Basically, as long as we forgot about its price, the DCS 460 was a pleasure to use, and we obtained some great images.

You might be skeptical about using a scanning back as a field camera. But coauthor Stephen Johnson, a professional photographer, uses the Dicomed Digital Camera Back for most of his landscape work. (In fact, the developer of the Dicomed Digital Camera Back, Michael Collette, actually designed and built the camera for landscape photography). Johnson believes that this camera's huge dynamic range, superb color rendition, and high resolution allow it to capture nuances of color and tone that are unattainable with film. After a lot of hands-on testing, coauthors Bruce Fraser and Peter Gould, as well as our editors and art staff, became believers too.

In the field, we ran the Dicomed camera from a PowerBook 540c and used software that was developed by Collette and that offers a number of conveniences — such as automatic dark-current

DIGITAL CAMERAS

BEFORE *Hard-to-correct saturation* AFTER



BEFORE *Easily corrected color balance* AFTER



Consumer cameras: These before-and-after images reveal the differences underlying the Apple QuickTake 150's and the Kodak Digital Science DC 40 Camera's apparent similarity. The corrected QuickTake 150 image (top) was the product of a lot of Photoshop work, but correcting the DC 40 image (bottom) with its own software took only two mouse clicks.

balancing, 36-bit capture, and in-camera cropping — that will probably find their way into Dicomed's software eventually.

Having a PowerBook out in the field has several advantages. You can perform a 30-second prescan, which gives you a preview image and a histogram you can use to check whether you've captured the dynamic range of the scene correctly. *Every* digital camera, not just the studio cameras, should offer a histogram display — short of looking at the image afterward, checking it is the only way to tell whether or not you've captured the shadows and highlights. The sun produces plenty of light, so image capture in the field is much faster than in the studio — a full-resolution capture takes approximately 2.5 minutes.

Given a color PowerBook with sufficient RAM, you can open a file in Photoshop on the spot and verify that you've captured the image the way you wanted to. This approach to photography may seem to be targeted at a niche market, but in truth, *all* the cameras we looked at have fairly small applications. There's no such thing as a general-purpose digital camera — at least, not yet.

CONSUMER CAMERAS

The action is also heating up at the consumer end of the market. Although still far from inexpensive, a new generation of digital cameras that have three-figure price tags is attempting to bring

digital imaging to a much wider audience than before. We looked at four cameras: the Apple QuickTake 150, Casio QV-10, Kodak Digital Science DC 40 Camera, and the grayscale-only Logitech FotoMan Plus Mac.

After spending time with these cameras, we can say that if image quality is a concern, you're better off spending your money on a modern point-and-shoot 35mm film camera — a *really* good one costs \$300 — and transferring the images to a Photo CD disc. The appeal of the consumer digital cameras is the speed and ease with which you can bring images into your computer and — dare we say it? — a love of gadgetry for its own sake.

The Apple QuickTake 150 and the Kodak DC 40 share an obvious family resemblance — both were designed by Kodak — but the differences all favor the Kodak camera. Both cameras are primitive affairs, having the same feature set you expect with a 1960s point-and-shoot camera. They're "focus free," with a minimum focus of around 4 feet. (Apple offers a snap-on plastic "close-up lens" that we'd characterize as a cruel joke, and both cameras accept some third-party lenses.) Each has a built-in flash that blasts subjects in the 4-to-8-foot range, blowing out highlights, and neither has shutter or aperture controls to worry about. The DC 40 has exposure-compensation controls, but all you can do with them is bracket your exposures, since you get no feedback that lets you decide when to use them. You point the camera and release the shutter, and what you get is what you get.

Both cameras use lots of JPEG compression, which you can't turn off — boy, do we wish you could. At first glance, the raw QuickTake 150 images look a little better than the slightly larger raw DC 40 images, but all suffer from color casts. The DC 40 images are easier to correct than the QuickTake 150 images, with their oversaturation and blown highlights. The key difference is in the software that ships with the cameras.

Apple's PhotoFlash software provides slider controls that let you adjust brightness and contrast, color balance, and sharpness, but you need considerable color-correcting expertise to get even half-way decent results. If you have that expertise, you'd be better off using Photoshop. Kodak's PhotoEnhancer lets you choose menu items with names such as Cloudy, Sunny, Indoor, and Flash and then proceeds to correct the color balance automatically. The software has its limitations, but it's much more usable for novices than Apple's — it's very unusual for us to find Kodak's software beating Apple's for ease of use!

The Casio QV-10 is a very different kind of camera — it's 1990s all the way. It doesn't produce better images than the Apple and Kodak products do (in fact, the images are noticeably worse), but it does some nifty things that the others don't. And it's a lot more fun to use.

About the size of a small, modern point-and-shoot camera, the Casio QV-10 has a color LCD on the back instead of an optical viewfinder. You use the display to compose the shot and choose your exposure settings. Because the lens housing rotates vertically, you can use the LCD as a waist-level finder. And despite the camera's ISO 100 rating, its film-speed equivalence in low-light situations seems more like ISO 1600, obviating the need for a flash. These features make it great for shooting candid snapshots. Your subjects will think you're playing a video game instead of taking their picture.

CONSUMER CAMERAS / features compared

Apple
QuickTake 150Casio
QV-10✓Kodak Digital
Science DC 40 CameraLogitech
FotoMan Plus Mac

	Apple QuickTake 150	Casio QV-10	✓Kodak Digital Science DC 40 Camera	Logitech FotoMan Plus Mac
List price	\$739	\$999	\$995	\$399
Type of sensor	area array	area array	area array	area array
Maximum resolution	640 x 480 pixels	480 x 240 pixels	756 x 504 pixels	496 x 360 pixels
Camera type	dedicated	dedicated	dedicated	dedicated
Color capture	one-shot color	one-shot color	one-shot color	one-shot grayscale
Internal bit depth	24 bits	24 bits	24 bits	8 bits
Output bit depth	24 bits	24 bits	24 bits	8 bits
Storage	1-MB flash memory	2-MB flash memory	4-MB flash memory	1-MB DRAM
Images stored	16 high-quality, 32 standard	96	48 high-quality, 99 standard	32
Equivalent film speed	ISO 85	ISO 100	ISO 84	ISO 200
White-balance options	daylight or strobe (automatic)	automatic	none	none
Lenses (supplied/compatible)	fixed-focus, with close-up/Kaidan	fixed-focus with macro position/none	fixed-focus 42mm/any 37mm screw-mount	fixed-focus 64mm/any 37mm screw-mount
Software supplied	Apple PhotoFlash 2.0, QuickTake control panel	Casio QV-Mac	PhotoEnhancer	Digital Darkroom, ScanMan 2.3
Company	Apple Computer Cupertino, CA 800-767-2775 408-996-1010	Casio Dover, NJ 800-962-2746 201-361-5400	Eastman Kodak Rochester, NY 800-235-6325 716-724-4000	Logitech Fremont, CA 800-281-7717 510-795-8500

✓ MacUser BEST BUY

To let you see what you've captured, the camera also has a play-back mode that allows you to display the stored images on the LCD. Now *that's* instant gratification. You can also hook the camera up to a television or a VCR and play back the images on TV, where they look great. The digital files look much worse, with brutal amounts of JPEG compression — each file is compressed to 24K — and heavy demands for tonal correction.

The Casio QV-10 probably isn't useful for reproducing images for print beyond postage-stamp size, but we can certainly envisage uses with Web pages on the Internet or for presentations with a TV monitor, since you can also upload images from disk to the camera. In terms of handling, size, and the features it offers, it seems 20 years ahead of the other cameras in the category. It just doesn't produce very good images yet, but it's so seductive that within minutes

of picking one up, you'll want it anyway, for the things it *can* do.

The Logitech FotoMan Plus was one of the earliest consumer digital cameras, and its age is beginning to show — the plug-in that ships with it is for the defunct Aldus Digital Darkroom. It produces small, grainy grayscale images that may be

used in a pinch for small-sized output at low resolution, but it's very primitive compared to the other cameras. The most infuriating aspect of the FotoMan Plus is that you don't really know when you've taken a shot. You do hear a beep about ten seconds later, when it's finished storing the image.

CONCLUSION

Digital photography is still in its infancy. All the cameras we looked at probably have *some* useful application, although some cameras are more versatile than others. And you'll see the market get even more crowded in upcoming months, as vendors such as Sony, Ricoh, Agfa, ScanView, and MegaVision introduce new products. In some areas, a digital camera can save time and money, but you must be aware of the device's limitations and make sure both your subject matter and your output process can work within those limitations. For the vast majority of uses, film has a clear lead and will almost certainly be with us for years to come. Digital capture has immense potential, and we hope to see more of that potential being tapped the next time we look at digital cameras. ☞

Writer Bruce Fraser is an avid amateur photographer and coauthor of *Real World Photoshop* (Peachpit Press). Studio photographer Peter Alan Gould is photography editor and Photoshop-meister at *PC/Computing*. Digital landscape photographer Stephen Johnson is the coauthor of *The Great Central Valley* (University of California Press) and *Making a Digital Book* (Stephen Johnson Photography).



So you want to see more images? Check out ZD Net/Mac and *MacUser's* Web page online. See How to Reach Us for instructions on how to access ZD Net/Mac.



Consumer cameras: The Casio QV-10 is a great little gadget for taking snapshots, but the image quality is better geared for on-screen viewing than high-resolution output. Shown are coauthors Bruce Fraser, Stephen Johnson, and Peter Alan Gould.

It Sounds Darn Nice ISDN

HERE'S HOW TO GET **ULTRAFAST**
CONNECTIONS TO THE INTERNET
— OR TO OTHER USERS.

By Henry Norris

EVER SINCE ISDN — the Integrated Services Digital Network — was defined more than a decade ago, wags have joked that the acronym really means something I Still Don't Need. It Sounds Darn Nice, they say, but It Still Does Nothing. In recent years, though, the reality has been changing.

Users are starting to realize that ISDN can be a cost-effective solution to a variety of communications challenges: moving huge graphics and multimedia files between service bureaus and customer sites; giving telecommuters quick access to the corporate network; and speeding access to the World Wide Web. The regional Bell telephone companies are finally getting the message: They're offering the service in more locations, slashing tariffs, and learning to explain to their customers what the technology is all about. Today, in fact, you could say of ISDN that It's Steadily Developing Nationwide.

The companies that make the hardware you need in order to put ISDN on your desktop are responding too: They're delivering new products, trimming prices, and making installation easier. Companies that have Mac backgrounds, such as Farallon Computing and 4-Sight — and even Apple — are jumping into the ISDN market, and other vendors are starting to pay more attention to Mac users. Altogether, It's Surprisingly Doable Now.

Be prepared, however, to invest some time and effort in planning; setup; and, more likely than not, debugging. The jargon is daunting, the choices are many, and interoperability isn't guaranteed. In short, Investigation's Still a Dire Necessity and Installation's Still Depressingly Nerdy. But this primer can at least help you understand and evaluate the options the experts lay out.

QUESTION 1: What Is ISDN, Anyway?

Without getting into all the geeky details, ISDN is a set of protocols that make it possible to implement a wide range of digital communications services over the twisted-pair copper wire that links most homes and offices to the worldwide telephone grid. ISDN's advantage over conventional voice, fax, and modem communications lies in its digital nature. Although most of the backbone that carries telephone traffic around the world has been digital for years, in the U.S., the last link — the connection between the user's equipment and the phone company's switches — normally continues to carry information in analog form (sounds, in a word). That limits both flexibility — how many things you can do at once with a single line — and performance — how quickly you can transfer data.

By making communications digital from end to end, ISDN breaks through the analog bottleneck. When all data is in digital form, even a conventional copper-wire hookup has enough bandwidth to carry on several jobs at the same time: The standard ISDN setup for small offices and homes provides two separate logical channels for user-generated data plus a separate channel for control signals between your site and the phone company's switch. This means that with one ISDN line, you can receive a fax through one channel while surfing the Net through another or you can chat with Aunt Sally in Peoria while downloading the file of the month from ZD Net/Mac. (In ISDN jargon, this kind of entry-level installation is called a basic-rate interface, or BRI; the two channels available for your data are bearer, or B, channels, and the control line is the delta, or D, channel. The next step up in bandwidth, called a primary-rate interface, or PRI, provides 23 B channels and 1 D channel.)

Eliminating the need for an analog modem also makes data transfers faster. Although state-of-the-art V.34 modems can push through up to 28.8 kbps of data, ISDN is designed to handle 64 kbps bidirectionally — on *each* B channel. (In California and some other areas, each B channel is limited to 56 kbps, because of how Pac Bell handles signaling among switches, but that should soon change.) For large data transfers, many ISDN devices can combine the two B channels, for an effective rate of 128 kbps (112 kbps in California). In real life, of course, some of this goes for overhead, but that's true for conventional transfers as well as for ISDN; likewise, with both technologies, data compression can increase effective throughput.

A key feature of ISDN, in contrast to competing technologies such as leased lines or frame relay, is that it works on demand: Your connection is activated only when you need it, so you pay only for the time you're online. (Some phone companies and Internet providers, however, offer 24-hour-a-day ISDN service plans, even though the technology was really designed for intermittent connections.)

Someday ISDN bandwidth will look puny, but the Next Big Thing is likely to involve expensive new technology and/or fiber-optic cabling all the way to your doorstep. The beauty of ISDN, especially from a cost point of view, is that it uses the existing phone grid, including the copper wiring that runs right to and through your home or office. (Hooking up ISDN is often referred to as "installing a new line," but unless your current lines are maxed out or in unusually poor condition, you won't need new wiring; "installation" usually means just tuning up your current connections.)



QUESTION 2: Does ISDN Replace My Phone Line?

It's up to you. With the right hardware, you can use an ISDN line for voice and fax communications plus computer data. All you need (unless you want expensive phones or fax machines designed for ISDN) is to make sure your ISDN adapter has at least one RJ-11 jack (see the "Hardware Checklist" sidebar); then plug in your phone or fax machine, and you can use either over ISDN. If you disconnect one or more of your phone lines, the money you save may quickly cover the cost of your ISDN hardware. (And you'll get a slew of new telephony features, with support for up to eight devices on one line.)

There are good reasons, though, to consider leaving at least one conventional line in place. It often takes some time to get a new ISDN connection running smoothly, and you probably don't want to depend on it for all your communications needs during the shake-down phase. Even when it's running smoothly, one ISDN line may not suffice: If you're talking on one channel and surfing the Net on the other, someone trying to send you a fax will get a busy signal. Finally, there's a safety issue: If the power goes out, a conventional phone will normally keep working but your ISDN line will go dead.

QUESTION 3: Are There Restrictions on What I Can Connect to via ISDN?

No, you can call any number — be it voice line, fax machine, Apple Remote Access server, online service, BBS, or Internet provider — over an ISDN line. But — and here's a critical point that's often misunderstood — *you can make a true ISDN connection, with the resulting performance boost, only when the service you are calling also has ISDN.* If the service at the other end does not have ISDN, all you are doing is using an ISDN B channel to carry a digitized version of the analog signals your modem generates. In other words, if you're running a prepress service bureau and exchanging Photoshop files with your clients seems to take forever, even with V.34 modems, having ISDN at your end alone isn't a solution — you'll need to make sure your major customers also get it. And if you want to speed up graphics-rich Web pages, you may have to switch Internet service providers if yours doesn't offer ISDN.

With online services, the picture is more complicated. At this writing, none of the major services offers direct access via ISDN, but CompuServe and America Online have announced plans to do so by the end of 1995. Check with the service you use to find out when your city will get the service and how much it will cost.

QUESTION 4: How Much Speed Will I Really Get from ISDN?

Compared to an analog modem, ISDN is extremely fast: Just a single B channel offers about twice the throughput of a V.34 modem; if both channels are working on the same file transfer, you'll have

more than four times the bandwidth of the speediest dial-up connection.

It's important, however, to keep the proper perspective: 128 kbps, the maximum bandwidth for a standard ISDN BRI connection, still falls well short of even LocalTalk speeds (theoretically, 230 kbps). A speed of 128 *kilobits* per second translates into a speed of 16 *kilobytes* per second, or 960 kilobytes per minute. (If you are in California, you should reduce these numbers by one eighth.) In other words, ISDN's *maximum* transfer rates are well under 1 megabyte per minute.

And then there's real life: If your ISDN adapter is one of the numerous models that aren't able to bond the two B channels together or if you are using an external adapter on a Mac that doesn't have a GeoPort, cut those rates in half. If you're running ARA, you can expect some extra overhead that will slow you down further. If you're surfing the Net, remember that no amount of bandwidth at your end is going to solve the problem of overloaded servers and routers: Jumping to a new location still takes time, and your Web browser may come to a screeching halt with a graphic half drawn if the server you're connecting to is busy dealing with other users' requests.

In short, if you're someone who thinks that digital communications means downloading huge files in seconds or watching full-screen movies in real time, you're in for a disappointment. But if you put fantasy aside and compare ISDN with any other communications technology available today affordable for home or small-business use, it looks very good indeed. One easily overlooked benefit, by the way: Establishing a connection over ISDN, including a password log-in, normally takes less than five seconds — and you don't have to listen to the squeals and moans of mating modems.

QUESTION 5: How Much Does It Cost?

Installation fees, monthly service charges, and metered call rates for residential and small-business ISDN service vary widely by region, and they're changing fast, so you'll have to check with your local phone company (see the "Resources" sidebar). California's Pac Bell appears to be setting the pace: For home users, all but \$34.75 of the installation fee is waived if you keep the service two years; monthly charges are only \$24.50; daytime local calls cost 4 cents for the first minute and a penny per minute thereafter, but they're free outside business hours. For long-distance ISDN calls, your choice of

carriers may be limited and the rates higher than you're used to; if you plan to do a lot of long-distance dialing, check carefully in advance.

If you want to tap into the Internet, you'll also need to sign up with a service provider that offers ISDN access in your area. Since most providers are not yet up on ISDN, you won't have as many choices as you do for a 14.4- or 28.8-kbps dial-up account and you may end up paying higher rates. But most providers that do offer ISDN don't charge a huge premium: Typical rates are on the order of \$30 per month for 30 hours of usage.

The largest up-front expense is the ISDN interface for your Macintosh. Here as well, the prices are dropping, but as of this writing, in the middle of 1995, you can figure on paying a *minimum* of \$400 for an adapter. And remember that options costing two or three times as much may actually be more cost-effective in the long run.

Some phone companies now have specially trained ISDN service reps who can offer advice on your hardware and service options; the Internet service provider you plan to work with may also be helpful. But if you're having trouble getting a straight story, or if the reps you talk to keep suggesting ISA cards no matter how often you say "Mac," or if you want to implement advanced telephony services such as fax-back, you may want to factor a consultant's fee into your budget. Don't go to just any computer or communications consultant, though — you need someone who knows both the Macintosh and ISDN. Alternatively, if you have little time or interest in fiddling with communications technology, you may want to consider a turn-key system, such as one offered by 4-Sight. You'll pay a substantial

premium, but in exchange you'll get an integrated package, including special software, and some place to turn if — and when — problems arise.

QUESTION 6: What Are My Hardware Options?

Basically, you have three kinds of hardware to choose from, with several options in each category. Each alternative has pros and cons, depending on your needs and your budget.

External Serial-Port Device. The simplest and least expensive hardware to install is an external box, known in ISDN jargon as a terminal adapter, or TA, that attaches to a serial port on your Mac and to your ISDN wall jack. This device looks and (from the user's point of view) acts like a conventional modem; some vendors even call it a *digital modem*, although technically that term makes no sense. Popular models include the 3Com Impact (formerly known as the QuickAccess Remote) and the Motorola BitSURFER. By the time you read this, Apple may have joined the fray with an ISDN pod for the GeoPort, the high-speed serial port in the Quadra AV family and most Power Macs.

The most obvious advantage of a TA is price: less than \$500 and headed lower. Another benefit is simplicity: Because it looks like a fast modem to your software, you don't need special software — existing telecom applications and drivers such as MacPPP should work, although you may have to fine-tune your modem-initialization strings. (You'll need a special script for ARA. 3Com includes one; Motorola does not.) Finally, a serial-port adapter offers plenty

HARDWARE CHECKLIST / tips for buying gear

DON'T EXPECT TO SHOP FOR ISDN equipment the way you do for most Mac products. You won't find it on the shelves at a dealer's or even in the pages of a mail-order catalog. Your best bet is to check with your phone company's ISDN marketing group, with ISDN-savvy Internet service providers in your area, or with local consultants and value-added resellers. These sources often offer hardware at a healthy discount if you sign up for their services.

In any case, it doesn't pay to select your hardware in isolation. Because ISDN is a complex technology offering a variety of implementation options, you can't take interoperability for granted. In fact, many ISDN service providers and corporate IS departments maintain a list of compatible products, and they may refuse to support any product not on the list. Still, at some point, you will need to choose among products. Here are five questions to ask:

- **Is an NT-1 built in?** Every ISDN line requires a device called a network terminator, or NT-1, as an interface between the line and local equipment. Some TAs and routers have an NT-1 built in; others don't. When considering a device that doesn't, be sure to factor in the cost of adding an external NT-1 — about \$200.
- **Does the device have one or more RJ-11 connectors?** Most TAs and cards have at least one RJ-11 connector, but most routers have none. If you want to use your ISDN line for voice calls, faxing, and modem connections to non-ISDN sites, you will need these connectors for your analog equipment, unless you buy an external NT-1 with connectors of its own. (Another option: Both IBM and Motorola make terminal adapters that have

conventional modem capabilities built in; if you get one, you won't need a connector for your old modem.)

- **Is the device able to combine the two B channels of an ISDN BRI interface?** This enables you to turn the two channels into one large pipe for large file transfers, a process known variously as multilinking, inverse multiplexing, or bonding. The importance of multilinking is sometimes exaggerated; after all, 64 or even 56 kbps is ample bandwidth for most purposes. Besides, doubling your bandwidth may cost extra, since phone companies and Internet providers treat each channel separately; for their purposes, you're using two minutes of service for every minute you have both channels open. Still, it's nice to have multilinking available if you need to download a huge file in a hurry.
- **Does the device support MPP?** Until recently, most ISDN devices did not offer multilinking. Other devices implemented proprietary bonding technology, so whether they worked depended on the equipment installed at the other end of the line. Earlier this year, however, an Internet task force hammered out a new standard, multilink PPP, that should ensure interoperability. It's still in testing at this writing, but look for it in new devices.
- **Does the device have flash-ROM firmware?** Flash ROM makes it possible to upgrade your unit with new software — a much cheaper and more convenient approach than replacing ROM chips. Some developers, however, support updating only from PCs. Make sure that the developer provides a utility that can update the ROM from Mac software on disk or via an online service.

of flexibility: You can easily hook one up to any Mac (including a PowerBook) or PC.

On the negative side of the ledger, this device requires a serial port — a problem if you have a LocalTalk network or printer and a conventional modem for calls to non-ISDN sites (not to mention a Newton, a Connectix QuickCam, or a Visioneer PaperPort). Installing a serial-port card can solve the problem, but at a cost of \$200 to \$300. You can also use an A/B switch, which costs as little as \$20, but having to remember to flip a manual switch to use your expensive digital equipment can be frustrating. In addition, if *both* ISDN B channels are bringing data to the Mac simultaneously, the serial port may become a bottleneck.

Internal Adapter Card. Instead of the serial port, an internal adapter uses the computer's expansion bus to transfer data between the Macintosh and ISDN. Several companies manufacture NuBus ISDN cards and more are expected for the PCI bus, but no ISDN cards are available for PDSs (processor-direct slots). An internal card has three primary advantages: It saves you space on your desk; it avoids the risk of encountering serial-port bottlenecks; and it lays the groundwork for future multicard setups, such as a videoconferencing system built by linking ISDN and video-capture and -compression cards.

Using a card has disadvantages, though: A card is not easily transferable to a new machine. It requires special software drivers, with the attendant risk of bugs and conflicts. And, at least in the NuBus era, a card has been more expensive than an external device — the most common card, the Planet II, from SIT/SAGEM (formerly Euronis), costs \$800 to \$1,000.

Ethernet Router. The alternative is to employ a router to connect ISDN and an Ethernet network. The big advantage of this approach is its transparency. You don't need special software or hardware in your Macintosh — just standard network drivers with either an Ethernet card or a built-in port; the router takes care of the ISDN communications. In terms of user experience, if a terminal adapter (external or internal) feels like a fast modem, router-based ISDN feels like a direct TCP/IP connection (albeit slower than what you may be accustomed to at work or on campus). The Internet becomes an extension of your LAN: Just click on a URL in Netscape Navigator or tell Eudora to check your mail, and in seconds you're racing down the information highway. Routers additionally provide maximum speed, because communications protocols and (in several models) on-the-fly data compression are implemented in hardware and Ethernet provides plenty of bandwidth, even to older Macs.

At first glance, cost appears to be the biggest disadvantage of the router approach: Prices for stripped-down models have only recently dropped below the \$1,000 mark, and full-featured units such as Ascend Communications' Pipeline 50 and Combinet's Everyware 2000 list for more than \$1,500. For a single user, that adds up to a stiff premium. But if more than one person at your site requires ISDN access, the picture looks very different, since everyone on a LAN is able to share the same hardware and ISDN line at no additional cost (although your Internet provider will probably charge more for providing multiple IP numbers). If the alternative is

RESOURCES / getting more info

IT'S BOUND TO HAPPEN — you'll have questions galore and you'll need more information. Where to go next? Here are the best sources we've found:

- **Dan Kegel's ISDN page.** This site (<http://www.alumni.caltech.edu/~dank/isdn>) consists of a well-organized collection of links to hundreds of sites providing information about ISDN technology, products, and services.
- **The Usenet newsgroup for ISDN.** Members of the group, at comp.dcom.isdn, maintain a multipart FAQ (frequently asked questions) file on ISDN.
- **CompuServe.** To reach CompuServe's ISDN forum, type GO ISDN.
- **Bellcore, the telephone industry's central research organization.** Although your local phone company's customer-service representatives may be clueless about ISDN, Bellcore supports both a Web page (<http://www.bellcore.com/ISDN/ISDN.html>) and a toll-free national ISDN hot line (800-992-4736) with detailed information about ISDN availability around the country.
- **Your regional Bell operating company.** Most of the Bell operating companies also have 800 numbers for ISDN information: Ameritech (800-832-63282), Bell Atlantic outside NJ (800-570-4736), Bell South (800-428-4736), NYNEX (800-438-4736), Pac Bell (800-995-0346 or 800-472-4736), and Southwestern Bell (800-792-4736).
- **Intel.** Call 800-538-3373, and ask for extension 208. Intel has lots of good, free information on ISDN equipment, pricing, and availability.

separate adapters and lines for three or more users, a router is actually a bargain.

There are two caveats, though. First, configuration procedures and documentation for routers tend to be aimed at network administrators rather than at ordinary mortals. If you're in the latter category, you should arrange to have your administrator or Internet provider talk you through the setup process. Second, most routers do not have RJ-11 ports for connecting phones, fax machines, or analog modems to your ISDN line. If you hope to replace your standard lines and do all your telephony over ISDN, installing a terminal adapter may be a better bet. (This situation may be changing: The latest router from Ascend, the Pipeline 25x, provides two RJ-11 ports, and some other vendors are expected to follow suit before too long.)

QUESTION 7: What Else Should I Know?

ISDN Is Surprisingly Doable Now — but only if you plan ahead. We've heard quite a few horror stories from folks who have jumped onto the ISDN bandwagon without doing all their homework. After investing significant sums of money and time, many of them simply gave up. To prevent this, be sure to figure out what services and hardware you need and how much they'll cost you. Make sure your telephone company can support your chosen hardware. Above all, plan to spend time troubleshooting your connection. Armed with realistic expectations, solid information, and a well-designed plan, you should be able to get ISDN up and running in your home or office. ☒

Henry Norr is editor emeritus of *MacWEEK*.



QUICK LABS

• Mix-'n'-Match Hard Drives • Big-'n'-Small Monitors • 1,200-dpi Printers

What's in a name? Fireballs, Magic IBM Ultrastars, Trailblazers, and PowerMax are just a few of the product names that are sprinkled throughout this month's Quick Labs. Sometimes a name can reflect a product's performance — but if you look at our results, you'll find that at other times, a name doesn't say it all.

This month's workgroup printers sport more-conventional names and offer conventional, albeit powerful, features, such as the ability to print full-bleed 1,200-dpi images on tabloid paper. For prepress use, be cautious about the type

of images you plan to use. Each printer has its strong points — be it for line art, text, or grayscale images — but neither does a perfect job on everything.

The hard-drive group provides a good design showcase. Cases range from homely to splashy. The drives also vary in capacity from 520 MB to 5 GB, so there's a nice selection from which to choose.

This month's batch of monitors includes 15- and 21-inch models. We found that the 21-inch monitors we tested offer a good value for desktop publishers, but one of the 15-inch monitors . . . well, just check out our results.



TWO NEW WORKGROUP PRINTERS

We tested the NewGen ImagerPlus 12xf (pictured) and the GCC Elite XL 1208, a pair of workgroup printers capable of printing 1,200 dpi on 11.9-x-19.5-inch paper. The ability to print on oversized paper is essential for creating full-page images, with crop and registration marks, on ledger paper.

We liked the no-muss, no-fuss setup of the GCC Elite XL 1208. A single cartridge contains both the toner and the photoconductor drum. Installation is just a matter of shaking the cartridge, removing the protective seal, and sliding it into the printer. The 250-sheet universal paper tray includes built-in width

and length guides that let you switch from tabloid- to letter-sized paper in a matter of seconds. The Elite XL 1208 comes with 24 MB of RAM, 35 PostScript fonts, and automatic emulation switching. Line art is sharp, but grayscale images have less contrast than we like.

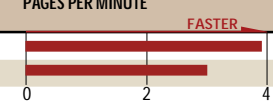
By contrast, setting up the NewGen printer is frustrating. The toner and photoconductor drum are two separate units, and the toner spills easily. The 250-sheet paper tray includes one removable plastic spacer for each paper size supported. Spacers that aren't in use must be removed and stored. We think that most

people will quickly misplace them. The ImagerPlus 12xf comes with 40 MB of RAM, 60 PostScript fonts, and automatic emulation switching. It can also print directly on plates. In our tests, grayscale output was excellent but the printer dropped some lines.

To test speed and output quality, we printed text, line art, and grayscale graphics. We timed the printers producing a variety of documents and weighted the results to reflect everyday usage. We used documents that represented a workgroup environment in order to reflect real-life conditions.

REVIEWER / ROMAN LOYOLA TESTING / JIM GALBRAITH

+ / OUTSTANDING ● / ACCEPTABLE - / POOR	ESTIMATED STREET PRICE	RESOLUTION	WARRANTY	TEXT QUALITY	GRAPHICS QUALITY	PAPER HANDLING	SUPPORT	COMMENTS	PAGES PER MINUTE
●●●	\$5,400	1,200 dpi	1 year	●	●	●	●	Good printer for offices that need tabloid-sized output.	3.5
●●●	\$4,500	1,200 dpi	1 year	●	●	●	●	Not the bargain it seems. Best for prepress only.	2.5





EIGHT NEW HARD DRIVES

This month, you'll find drives with flashy cases, plain cases, sturdy cases, and cases made for toting. And you'll find drives with prices in the range of \$299 to \$2,250.

The boxy drives from Other World Computing (pictured) look plain-vanilla when compared to the colorful, curvy drives from Spin. But thanks to their affordable pricing, the Other World Computing drives should prove

popular. The APS Q 4.0 is an all-around good drive — great price, sturdy case, and excellent manuals. The MacProducts Magic drive sports a peppy IBM mechanism that turned in above-average speeds.

The removable mechanisms in the MaxConcept RLPS2000E and the La Cie Joule drives are small enough to fit in a fanny pack. Your destination must have the right chassis to

access the drive — the La Cie drives are part of the Joule system, and the MaxConcept removable drive requires an RLPS chassis identical or similar to the one it comes with.

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 / ROMAN LOYOLA 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
★★★★	\$1,499	4,091.6 MB	\$.37	5 years	+	●	+	The best all-around performer of this bunch.	~9.5
★★★★	\$349	808.3 MB	\$.43	3 years	+	●	+	A Joule module about the size of a paperback novel.	~6.5
★★★★	\$489	1,039.8 MB	\$.47	3 years	+	●	+	Another module for the streamlined, stackable Joule system.	~6.5
★★★★	\$2,250	5,066.9 MB	\$.44	5 years	●	●	●	Good performance and an attractive price per megabyte.	~7.5
★★★★	\$399	1,039.8 MB	\$.38	3 years	●	-	●	Back-to-basics case design lacks active termination.	~6.5
★★★★	\$299	808.4 MB	\$.37	3 years	●	-	●	Laser-printed manual is four sheets long.	~6.5
★★★★	\$1,456	2,045.5 MB	\$.71	2 years	●	-	●	Removable mechanism instantly provides 2 gigs to go.	~6.5
★★★	\$319	517.8 MB	\$.62	2 years	●	●	+	Costly, considering what you can get if you spend a few more dollars.	~6.5

LISTING IS ALPHABETICAL WITHIN GROUPS OF EQUAL MOUSE RATINGS.



FOUR NEW COLOR MONITORS

This month we tested two 21-inch and two 15-inch monitors. The large-screen, 21-inch monitors are good choices for desktop publishers who need plenty of room to work — especially since they support resolutions of about 1,600 x 1,200 pixels. The Radius PrecisionView 21 has a complete set of easy-to-use on-screen controls for making image adjustments. The RasterOps SuperScan Mc 21's controls aren't as elegant as those of the PrecisionView 21, but each button is clearly

labeled. The monitors ran neck and neck in our image-quality tests.

The two 15-inch monitors scored higher in our image-quality tests than the 21-inch models — but be aware that maintaining focus and sharpness is technically more difficult on larger monitors, so 21-inch monitors tend to score lower than smaller models. The PowerMax 15T (pictured) provided sharp text and good color quality. Its nine controls let you make a range of adjustments,

and you can store your settings. The Goldstar 1527 has a clumsy control panel, and we found its image quality relatively disappointing.

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

REVIEWER / ROMAN LOYOLA TESTING / MARTIN WONG

+ / OUTSTANDING ● / ACCEPTABLE - / POOR	ESTIMATED STREET PRICE	SCREEN SIZE	MAXIMUM RESOLUTION	WARRANTY	MANUALS	SUPPORT	CONTROLS	COMMENTS	IMAGE-QUALITY SCORE
★★★★	\$2,299	21 in.	1,600 x 1,200 pixels	1 year	+	●	+	A nice DTP monitor with good image quality and great controls.	~1.2
★★★★	\$449	15 in.	1,280 x 1,024 pixels	3 years	-	●	+	Nice price, nice image quality, nice controls — nice monitor.	~1.1
★★★★	\$1,999	21 in.	1,600 x 1,280 pixels	3 years	●	●	●	Another good DTP monitor. Controls require a delicate touch.	~1.1
★★★	\$450	15 in.	1,280 x 1,024 pixels	2 years	-	●	-	Plenty of other 15-inchers for you to consider besides this one.	~1.0

LISTING IS ALPHABETICAL WITHIN GROUPS OF EQUAL MOUSE RATINGS.

GET INFO / APS Technologies 816-483-6100 GCC Technologies 617-275-5800 Goldstar 201-816-2000 La Cie 503-520-9000 MacProducts USA 512-892-4070 MaxConcept 714-727-0377 NewGen Systems 714-641-8600 Other World Computing 815-338-8658 PowerMax 503-232-9903 Radius 408-541-6100 RasterOps 415-969-1100 Spin Peripherals 508-787-1200

ILLUSTRATION /

FreeHand Packs Photoshop Punch

Version 5.5 runs filters, sports in-line graphics.

BLURRING THE LINE BETWEEN the world of bitmapped graphics and that of vector objects, Macromedia FreeHand 5.5 offers a spate of enhancements, including the ability to run Adobe Photoshop-compatible filters on placed images and convert vector objects to bitmapped objects with a click of a button.

Photoshop filters open a world of graphic options to FreeHand users. You can apply third-party filters such as HSC Software's KPT Convolver or Xaos Tools' Paint Alchemy to any placed TIFF or EPS graphic in FreeHand 5.5. The latest version can also convert any group of objects into a bitmap, with output options such as selectable resolution and anti-aliasing for use in multimedia titles, presentations, and image-editing programs. These enhancements make bitmapped

objects nearly equal citizens to vector objects within FreeHand.

Speaking of equality, FreeHand 5.5 can treat any vector object as an in-line graphic in a text block. Uses for this might be placing initial caps in a text block or, as with text, binding in-line graphics to a path.

FreeHand 5.5 includes other small enhancements such as a file converter for reading (but not writing) Acrobat PDF files and speed improvements that allow files to open as much as 200 percent faster and that make redraws noticeably snappier. This version is optimized for the new 604-based Power Macs.

Shipping with FreeHand 5.5 is a new CD-ROM packed with 500 fonts from URW and 10,000 clip-art images from T/Maker. \$595; upgrade from 5.0, \$79. 415-252-2000. / Sean J. Safreed



FreeHand 5.5 supports Photoshop Plug-ins such as Kai's Power Tools, from HSC Software.

ACCELERATORS /

PowerShop Boosts Photoshop Speed

PHOTOSHOP STILL TOO SLOW? If your new Power Mac 9500 leaves you drumming your fingers while it processes filters on 100-MB files, Adaptive Solutions' PowerShop accelerator for Adobe Photoshop may be the answer.

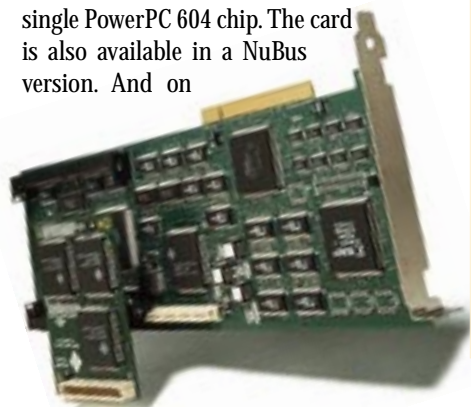
Available now for the PCI bus, the card has four 16-digital-signal-processor chips, for a total of 64 DSPs that crunch through Gaussian blurs and color-space conversions in a matter of seconds. The PowerShop card accelerates functions to make them three to five times as fast as the Power Mac 9500's single PowerPC 604 chip. The card is also available in a NuBus version. And on

NuBus-based Macs, the card ran functions 8 to 20 times as fast as the unaccelerated machines. These are serious time savings for Photoshop jockeys.

The PowerShop package accelerates the entire suite of bottlenecks in Photoshop, including imaging functions such as rotation and resizing and the full suite of blur and sharpen filters. Furthermore, the card accelerates Photo CD decompression, JPEG

compression, and image transfers from Kodak's high-end digital cameras. The company is also investigating the feasibility of using the PowerShop card to speed up painting and other retouching tools in Photoshop and filters in Adobe Premiere.

With a street price of \$3,000, the PowerShop isn't for dabblers, but it will likely pay for itself in no time if you spend hours each day in Photoshop. 503-690-1236. / SIS



Bitstream Snags Envoy

THE BATTLE FOR FONT SUPREMACY in electronic publishing is in full swing. Version 1.0 of Novell's Envoy portable-document product was hampered, because it couldn't match the font fidelity of documents that used Adobe's competing format, Acrobat. Now Novell is plotting an Envoy comeback, with two companies hoping to offer the font solution that will make Envoy a stronger player in the digital-document field.

TrueDoc. Novell has licensed Bitstream's TrueDoc technology (DTP & Graphics, June '95, page 92) for use in the next version of Envoy. Out of the box, Envoy will use TrueDoc to generate high-quality, anti-aliased text from font information stored in small Portable Font Resources embedded in an Envoy file.

MiniFont. Tumbleweed Software has licensed Ares Software's MiniFont technology for use as part of Tumbleweed Publishing Essentials, its high-end package that adds extra functionality to Envoy (see DTP & Graphics, October '95, page 115). Like TrueDoc, MiniFont generates high-quality anti-aliased text from small font-descriptor files. Tumbleweed hasn't yet said whether both MiniFont and TrueDoc will be a part of the standard Publishing Essentials package, but since Novell has chosen TrueDoc over MiniFont for inclusion in the Envoy package, MiniFont may have a hard time gaining a foothold against TrueDoc. Bitstream, 416-239-4801. Ares, 415-578-9090. Novell, 801-429-7000. / Jason Snell



Extensis XTends QuarkXPress

GOING AGAINST THE FLOW seems to be a trademark for Extensis, a company that made its mark developing for the nascent Adobe PageMaker Plug-in market rather than the more lucrative QuarkXPress XTension arena. Now with QX-Tools, Extensis is taking on well-established XTension makers such as A Lowly Apprentice Productions, whose Kitchen Sink competes directly with QX-Tools.

Like Extensis' PageTools for PageMaker, QX-Tools consists of ten general productivity enhancers rather than specialty tools. The centerpiece of the collection is QX-Bars, customizable tool bars with user-defined buttons that give you instant access to any QuarkXPress function. Another time-saver

is QX-Viewer, which presents thumbnail proxies of your pages so you can see at a glance what's on each page.

Some Extensis XTensions streamline critical QuarkXPress operations. QX-Layers lets you assign items to layers and quickly reorder them. QX-Scaler resizes any number of text boxes, graphics, and rules.

Several XTensions add new functionality to QuarkXPress. QX-Filters allows you to run Photoshop-compatible filters within QuarkXPress (Extensis supplies a dozen filters, such as Emboss, Despeckle, and so on). QX-Styles lets you create and apply styles down to the character level. QX-Dingbats displays symbol and picture fonts in a floating palette; clicking on the symbol enters it in the text. QX-Print lets you print discontinuous pages and provides other print-specific functions.

To pull it all together, QX-Manager lets you choose which XTensions to load or disable at startup, and QX-Tips and Tricks presents you with a tip of the day from QuarkXPress expert David Blatner. \$149. 503-274-2020. / Pamela Pfiffner

ANIMATION /

Ray Dream Opens Animation Studio

LIKE WORKING IN A real animation studio, using an integrated application means you don't have to poke around in other programs to find what you need. The new Ray Dream Studio offers 3-D modeling and animation in four integrated modules: Designer, Animator, Dream Models, and Extensions. These components offer enticing features such as inverse kinematics and spline-based deformations in an inexpensive package. The latest incarnation of Designer helps you design your 3-D scene with a new Scene Wizard that assists in setting up indoor, outdoor, and studio environments — great for newcomers to 3-D. Studio also ships with more than 500 textures and shaders.

Once the scene is set up, you can animate objects in a standard scoring interface. You can link objects by using inverse kinematics to define the motion of characters from the inside out and constraints to define how one object reacts to another. This system makes it easy to

create skeletal systems that define natural motions such as the flapping of a bird's wings. You can even simulate a bulging muscle with Studio's deformation features.

To complete the package, Ray Dream includes 500 textured models that are editable and can be easily dropped into a scene to add to an animation. Several extensions in the package add special rendering effects such as disco lights and layered fog. \$499; upgrade from 3.0, \$149. 415-960-0766. / SJS



Ray Dream Studio users can create character animations with the spline-based modeler and animation timeline.

PostScript Posthaste

TEARING YOUR HAIR OUT over PostScript printing problems may be a thing of the past with new utilities that let you view, soft-proof, and print PostScript files in a flash. * **Transverter Pro 3.0** is the latest update to TechPool Software's PostScript software that converts files from vector formats such



as generic EPS to Illustrator or from EPS to PICT. Version 3.0 lets you open Adobe PDF files for editing in your favorite illustration package. It also converts PostScript Level 2 files into raster images with variable anti-aliasing, allowing you to manipulate the files in Photoshop or check for printing problems. For PostScript files with embedded fonts, Transverter converts text to outlines in saved EPS files so that anyone receiving the file need not have the proper fonts to edit the file. \$395. 216-382-1234. * **PSExpress**, from Productive Intelligence, accelerates the process of converting large EPS or DCS files to PostScript code, which can then be downloaded to any output device. PSExpress' Desktop OPI utility can save a small EPS file (with a preview) that you can use to place and crop an image while the large scan remains at the service bureau, where it's automatically substituted at print time. \$249. 818-541-0231. * Sending huge files around a network doesn't require specialized hardware. **FileBlaster** software, from Torque Systems, uses standard drivers and your existing Ethernet, 10BASE-T, or FDDI network to send files between Macs at rates of 25 to 80 MB per minute. Transfers to Sun and SGI workstations are also supported. \$125. 415-424-1010. * And sending files to the service bureau is a lot easier with Microbeam's **ASAP!** file-transfer software. Using ASAP! software and standard modem protocols, vendors set up an ASAP! site and then distribute a free sender to their clients. To send a job, you simply drag the file onto a desktop icon. ASAP! compresses files, tracks files sent, and attaches instructions. \$695; Windows sender, \$395. 800-879-2727 or 813-546-2727. / SJS and PP

ONLINE PUBLISHING / BY TONYA ENGST

A Do-It-Yourself Web Page

Creating a hypertext home on the Internet doesn't require high-priced designers and lots of overhead — all you need is patience.

THE WORLD WIDE WEB is all the rage, and the best thing about it is that you don't need to hire an expensive consultant, programmer, designer, or typographer in order to put up your first Web site. Making a home page

on the Web is surprisingly easy, as we'll show you in this seven-step tutorial.

Before you begin, you'll need to assemble your tools. To create your Web page, you'll require a word processor or a text editor (for background information about Web tools and HTML, see "From the Web Press to the Web," October '95, page 117) and a Web browser such as Netscape Communications' Netscape Navigator or EInet's MacWeb. To make your Web site available to the world, you'll need an Internet provider to host your page (see "Making the Internet Connection," May '95, page 66).

STEP 1: Order Tupperware Tags

A Web document consists of text marked up with HTML (HyperText Markup Language) tags. Pairs of HTML tags bracket blocks of text, affecting all the text located between them. View this arrangement as a series of containers, one inside another: An `<html>` container encloses the entire home page. Inside it are two main containers: `<head>` and `<body>`. The `<head>` tags enclose descriptive information, such as the title of your document, and the `<body>` tags

enclose everything else. So the first step in starting up a home page is getting these basic containers in order — you can use uppercase or lowercase letters for the tags (see figure 1a).

STEP 2: Check Your Work

As you create a home page, regularly check out how it will look on the Web. Save your file as a plain-text (ASCII) file with a name that ends in `.html`. Then drag that file onto the Netscape Navigator or MacWeb icon. In our example, you'll see "My Home Page" in the browser's title bar and "Welcome!" at the top of the window (see figure 1b).

STEP 3: Add Topic Headings

Like every element of your file except items that go inside the `<head>` tags, headings go inside the `<body>` tags. For example, below "Welcome!" you might type the headings that appear in figure 2a.

The `<h1>` tag stands for *heading 1* and is for main topics, `<h2>` is for secondary topics, and `<hr>` stands for *horizontal rule*.

After typing the headings, save your text file again and load it into your browser. The

`<h1>` headings should look more important than the `<h2>` headings. `<hr>` will appear as a horizontal line (see figure 2b).

STEP 4: Add Content

Of course, a home page is cozier with content. And you can use HTML tags to give your text added style by using boldface, italics, and special characters, as in figure 3a. Here's what this accomplishes:

- Use the `` and `` tags to make text strong and emphasized. For the most part, strong text is bold and emphasized text is italic. These are called *logical* styles — although you can use *physical* styles such as `` and `<i>` to make text bold or italic, logical styles are preferred on the Web.

- Since the Web can't handle special characters such as curly quotes and diacritical marks, you'll need to include some special-character tags. These are the items that start with an ampersand and end with a semicolon. Since HTML reserves the use of straight double quotes for special commands, use the `"` tag to represent double quote marks. In our example, we used the `ö` tag to represent the *ö* in *Schrödinger*. (A list of special-character tags is available on the Web.) And never use curly quotes in your HTML documents.

- Web browsers ignore carriage returns in lines of text, so type `<p>` to put paragraph breaks in the appropriate places.

STEP BY STEP

figure 1a

```
<html>
<head><title>My Home Page</title></head>
<body>
Welcome!
</body>
</html>
```

figure 1b

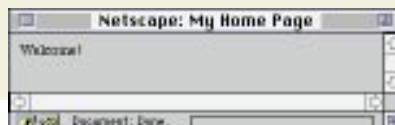
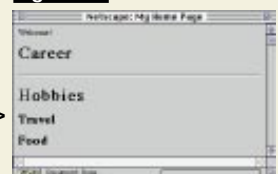


figure 2a

```
<h1>Career</h1>
<hr>
<h1>Hobbies</h1>
<h2>Travel</h2>
<h2>Food</h2>
```

figure 2b



■ Use `` tags to create an *unordered* (bulleted) *list*, and then populate that list with ``-tagged *list items*. You can use `` to make an *ordered* (numbered) *list* instead.

Check this HTML in your browser to see how it looks (see figure 3b).

STEP 5: Add a Hypertext Link

On the World Wide Web, links make the world go round. By adding an external link, you enable viewers to jump to another page.

To make a link, you must know the URL (Uniform Resource Locator) of the page you are linking to. To add a link, you will need to add tags to the text that mentions the DTP Internet Jumplist (see figure 4a).

This HTML uses an `<a>` (anchor) tag, with a Hypertext Reference, or `href`, attribute. The `href` attribute is followed by an equal sign and then the URL, in straight double quotes. In your browser, "DTP Internet Jumplist" will appear highlighted (in figure 4b, it's colored and underlined), indicating that it contains a hypertext link.

It's even simpler to create links to other HTML files you've created. If a file named `music.html` is in the same folder as your current HTML document, you can link to it by entering the filename, instead of an entire URL, after your `href` attribute: `My music page`.

STEP 6: Insert Graphics

Since graphics are part of the Web's appeal, let's add an image to the home page. Convert an image to GIF format, the standard format for online images, and give it a name ending in `.gif`. If you're using Photoshop, you'll have to convert your image to Indexed Color mode before saving it. Folks who do not have Photoshop can use the shareware program `GraphicConverter` or the freeware `clip2gif`, available in most online shareware archives.

Say we've put a graphic called `cat.gif` into the folder that contains our home page. We can now use HTML to add the image to our page, right after the text about Schrödinger's cat (see figure 5a).

Now save the document, and view it in a Web browser. The image should appear on the same line as the text "Schrödinger's cat" (see figure 5b). We've used the ``, or image, tag to select a source image file. You can adjust the way the photo aligns with your text by setting `align=` to `bottom`, `middle`, or `top`. And thanks to our `alt` attribute, Web browsers that don't support graphics will display the phrase "My cat." instead of our image.

STEP 7: Upload Your Page

When you've finished creating your page, it's time to upload it to your provider's Web server. Ask your service provider for more

information on how to transfer the files and where to put them to make them available for public consumption.

Where to Go from Here

Once you've created a rudimentary Web page, you'll probably be thirsty to learn new tricks to make your pages look even better. Here are some starting points:

■ Try to create a file using more of the basic HTML tags and see how they appear in your Web browser.

■ Imitation is a good way to learn HTML. To see the HTML behind your favorite Web pages, use your Web browser's View Source command. Note how other authors use HTML, and if you see a formatting trick you like, try to emulate it in your documents.

■ Check out our sample home page at http://www.zdnet.com/~macuser/mu_1195/home.html. Feel free to copy its HTML into your home-page document.

■ For more info on HTML, try the home page of Apple's Internet-authoring mailing list, at <http://abs.apple.com/apple-internet/authoring/>, or the Usenet newsgroup `comp.infosystems.www.authoring.html`.

An HTML version of this article is available at http://www.zdnet.com/~macuser/mu_1195/pub1.html.

Tonya Engst is coeditor of TidBITS, the online Macintosh weekly. She is the author of Create Your Own Home Page (Hayden Books, 1995).

STEP BY STEP

figure 3a

I'm a `desktop publisher`. My friends think I'm a "techie," but I'm not. I `often` get help from the DTP Internet Jumplist Web site.

```
<p>Recent jobs:
<ul>
<li>rice boxes
<li>soup cans
<li>book covers
<li>portrait of Schr&ouml;dinger's cat
</ul>
```



figure 3b

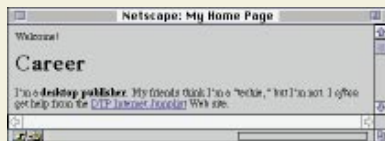


figure 4b

figure 4a

the `DTP Internet Jumplist` Web site.

figure 5a

```

```

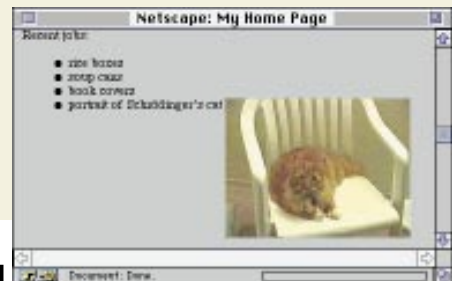


figure 5b

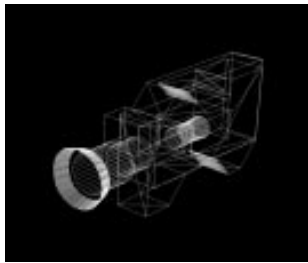
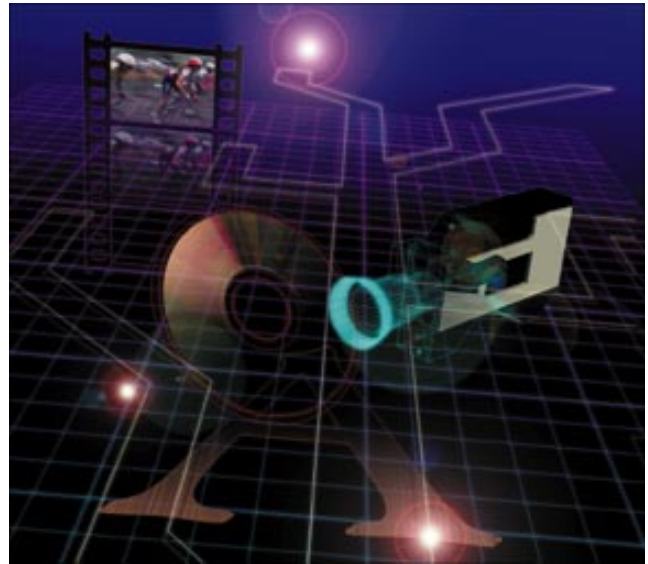
GRAPHICS HOW-TO / BY JANET ASHFORD

Cool Crossfades

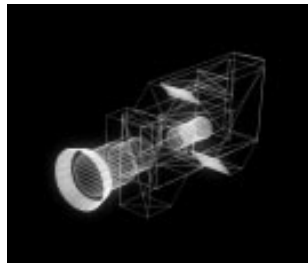
Make a smooth transition between any two images with a mask containing a gradation.

CREATING A SPECIAL EFFECT for a book cover, John Odam, of Del Mar, California, used Strata StudioPro to build a simple model of a video camera and two renderings: a wire-frame image and a solid-model image. He combined the two images in Adobe Photoshop by pasting the solid-model image into the colorized wire-frame image through a mask, producing a smooth crossfade from the wire-frame image to the solid image. The camera image was composited with other images for the cover illustration of *Communications Media and the Information Society* (Wadsworth).

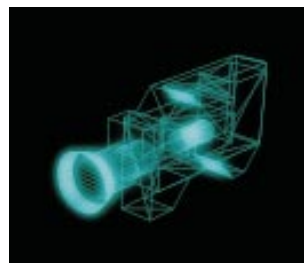
Janet Ashford is the coauthor, with Linnea Dayton, of Adobe Illustrator: A Visual Guide for the Mac (Graphic-sha/Addison Wesley, 1995).



1. Preparing the wire frame. Odam starts by rendering a wire-frame image of the camera in Strata StudioPro. He opens the wire-frame image in Adobe Photoshop and inverts it (Image: Map: Invert), converting it from a black-on-white image to white-on-black, to suit the rest of the composition.



2. Making it glow. He copies the wire-frame image into a new channel (Channels Palette: Duplicate Channel), applies a Gaussian blur (Filter: Blur: Gaussian Blur) with a setting of 12 pixels, and increases the contrast (Image: Adjust) to +60. Loading the new channel as a mask, he adjusts the levels (Image: Adjust: Levels) so that the midpoint reads 2.5 and the black output level is 60.



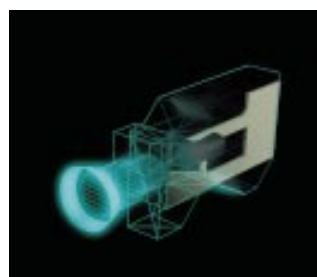
3. Converting to color. After converting the image from grayscale to RGB (Mode: RGB), Odam selects the red channel (Command-2), uses the Select All command (Select: All), and fills it (Edit: Fill) with black. The resulting image contains only green and blue, making a bright-cyan wire frame.



4. Outlining the mask. Now Odam uses the solid rendering of the video camera from StudioPro as a template for creating a graduated mask. He selects the white area with the magic-wand tool and inverts the selection (Select: Inverse). He then pastes the selection into a new channel (Channels Palette: New Channel) and fills it with white. Duplicating the channel (Channels Palette: Duplicate Channel) preserves the camera selection.



5. Creating the crossfade mask. With the camera outline selected, he drags the blend tool across it to create a gradation from black to white. Returning to the wire-frame image, he loads the mask (Load Selection) into the image from channel #5 of the solid-model image.



6. Crossfading the images. Returning to the solid-model image, Odam selects the camera (Load Selection: Channel #4) and copies and pastes it into the wire-frame image (Edit: Paste Into). The resulting image is a crossfade of the solid-model and the wire-frame images.

EXPERT TIPS / BY BOB SCHAFFEL AND CHUCK WEGER



Backing Up Is Hard to Do

It's 10 P.M. Do you know where your files are? Keeping backup copies of your files is a good idea, but finding them again is tricky.

BACK IN THE DAYS when page layouts and art were stored on film (you can remember if you shut your eyes tightly), it was relatively easy to file and locate things. Films for Job No. 1234 were on this shelf, those for

Job No. 6789 were on that shelf, and so on. With the advent of all-digital production, that filing system went out the window.

These days, a simple four-page brochure may require dozens of files, among them page layouts, EPS line art, TIFF scanned images, screen and printer fonts, and word-processing documents. Lose any one of those files, and you have a Big Task ahead of you, re-creating the job.

So what do you do? Make copies of everything by backing up your hard disk. But backing up files without having a tracking system for finding where you put them is frustrating and difficult, like putting your lucky penny into a fishbowl with thousands of other pennies.

In a production environment, files are stored at several levels: online, near-line, and off-line. *Online* files are those currently on your hard disks or your file servers' disks. If you're neat and organized, online files are pretty easy to track.

Near-line files are those you've removed from an active hard disk but that need to be readily available because you'll use them again soon. You might store these on SyQuest or Bernoulli cartridges, optical discs, or removable-shuttle drives.

Finally, *off-line* files are those you don't need to access frequently; you store these on slower, less convenient (and less costly) devices, such as tape or recordable-CD-ROM drives. Files stored off-line are often compressed or encoded to save space.

Subcategories of online, near-line, and

off-line files are backup or archive copies. *Backup* files are copies stored on separate media, basically for disaster insurance. *Archive* files are copies you keep either for posterity (making permanent records of your documents) or for pickups (re-using graphics or copy in future documents).

Another wrinkle is *version control* — that is, tracking files that have updated content but the same names and possibly various locations on the disk or network. Watch out for duplication: having the same files/folders on your hard disk and on others' disks or on your server. Duplicates waste space; worse, they can lead to mistakes (I edit my copy, and you edit your copy — which is the correct version?).

How do we keep track of all this? Right now, there isn't a good, unified solution. Find File (in System 7.5) and Find Pro (its shareware equivalent) keep track only of online volumes. Utilities such as File Genie Pro, from Duet Development (408-559-3838), and Virtual Disk, from Continuum Software (503-848-7112), each catalog the contents of removable media when you eject a disc or a cartridge, but they don't yet help with server situations. Alessandro Levi Montalcini's shareware utility List Files, available on most online services, lists the contents of any disk volume or folder; to search the list, import it into a

database such as Claris' FileMaker Pro.

Getting more sophisticated, you can use full-fledged image-cataloging applications, such as Adobe Fetch and Canto Cumulus. The powerhouse in this category is Cumulus; it can quickly and automatically catalog a whole volume full of files of many types. But Cumulus and all other programs of its type lack the ability to decode what's inside archive files, such as those created by Dantz's popular Retrospect utility.

At the very high end, several companies are building sophisticated image catalogs, using Oracle or Sybase databases on UNIX servers. These are usually too rich for the average Mac shop, however.

The big problem in all this is movement: How do you tell your cataloging tool that you've moved a file or folder unless you use that tool itself to perform the move? Cumulus lets you manually update the database, but we'd like an automatic updater. We need the Ultimate Finder, one that manages files from the outside (by external attributes such as name, modification date, and so on) and the inside (by examining file contents), saving lists of online, near-line, and off-line volumes.

The whole file-management problem promises to get worse, not better, as documents composed of many subparts proliferate. Advice for now? Stay organized, make a tracking system by using a simple database — or even paper and pencil — and stick to it religiously. Eternal vigilance is the price of digitocracy. ☞

Bob Schaffel is emerging-technologies consultant for R. R. Donnelley & Sons. Chuck Weger is a consultant and publisher of the Photoshop Monitor newsletter.



NETWORKING

NETWORK BACKUP /

Dantz Revs Retrospect

SMART POWERBOOK BACKUP and support for complex backup strategies top the list of new features in Retrospect 3.0 (\$249; upgrade, \$49.95) and Retrospect Remote 3.0 (ten-pack, \$449 with Retrospect, \$249 without), from Dantz Development (800-225-4880 or 510-253-3000). The new version also adds support for several new backup devices.

When configured as a "backup server," version 3.0 continuously polls the network for items needing backup — such as PowerBooks that reconnect after being off-line — and then schedules the backups according to administrator-specified guidelines. Guidelines might include giving priorities to certain groups of users or Mac models.

Version 3.0 adds support for several complex backup operations, including tape rotation, the use of multiple tape drives within a single backup cycle, and user-initiated remote backups. In addition to traditional backups (in which information is stored in a single Retrospect file), version 3.0 supports duplicates — copies of a volume or folder in the Finder format, that is. This feature makes it possible for users who have a copy of Retrospect on their individual Macs



to synchronize two disks or folders.

Dantz has redesigned Retrospect's interface in version 3.0 to simplify tasks such as the scripting of backups. The new EasyScript option takes users through a series of questions about the backup they want to perform. The Retrospect 3.0 scripting system also supports AppleScript and Apple events.

To give users more choice in backup devices, Dantz has added support for high-capacity SyQuest drives, Iomega Zip and Jaz drives, and several new tape drives and loaders. In addition, a software add-on (price unavailable at press time) that is expected four to six weeks after version 3.0 ships will let Retrospect 3.0 users back up data to writable CD-ROMs. / Shelly Brisbin

MAC TO UNIX /

Cross-Platform Tools Change Hands

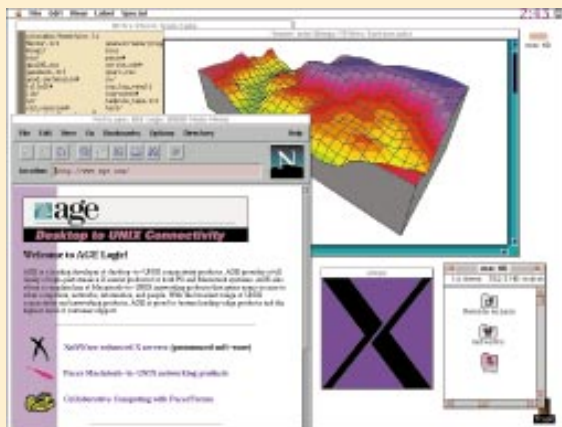
FANS OF UNIX ON THE MAC, take note: Some current Mac X Windows server-software packages and terminal emulators are changing hands. Apple has turned over development of its MacX server software to AGE Logic (800-742-5243 or 619-755-1000), which has renamed the product XoftWare for Mac OS (Apple will continue to sell the product under the MacX name). White Pine Software (800-241-7463 or 603-886-9050), another vendor of UNIX-connectivity software, is expanding its product line and distribution reach by acquiring the France-based About Software.

AGE's XoftWare for Mac OS is PowerPC-native and offers support for X Windows version X11R5 plus some X11R6 extensions, such as R6 fonts and colors. Other new features include automated host log-in; support for Apple's Communication

Toolbox; and remote log-in via SLIP, PPP, and ARA. The software is Open Transport-compliant and sells for \$295 (or \$395 if bundled with PacerTerm terminal-emulation and Internet-access software).

Apple, which will market the software under the name MacX 1.5, says that it won't be competing with AGE for X Windows server-software business. AGE plans to market XoftWare primarily to corporate sites, and Apple will pursue educational and other markets.

White Pine Software's goal in acquiring About Software is to incorporate the latter company's terminal-emulation technology into its own terminal-emulation and UNIX-connectivity products. About Software's 5PM terminal emulators have been available but not well known in the U.S. / SB



E-MAIL SYSTEMS /

E-Mail Goes Cross-Platform

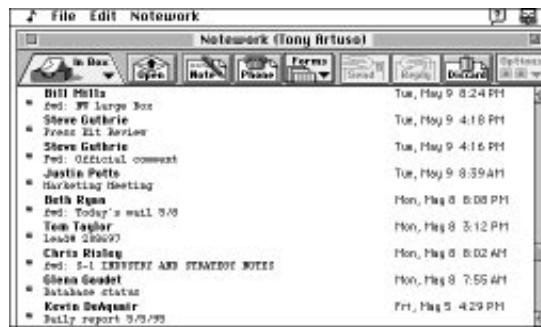
THESE DAYS, E-MAIL OFTEN NEEDS to cross platform boundaries — as ON Technology and SoftArc have confirmed by shipping cross-platform versions of e-mail-related software products that used to be single-platform. The Power Mac is also getting native e-mail support in this round of releases.

Crossing over to the Mac side, ON Technology (800-767-6683 or 617-374-1400) shipped its first Mac client software for Notework, a simple e-mail and phone-messaging system for Novell NetWare networks. Notework 4.0 now also has Windows for OS/2 and Windows NT client software, and the server software has been enhanced to support up to 1,200 addresses per server and 50,000 addresses total. However, the price of entry for Mac OS and Windows systems differs considerably: The Notework Macintosh System Pack (containing the necessary server and administration software) is \$995; in contrast, the Windows system pack is only \$199. Client software for ten Mac or PC users is \$590.

ON has also added Mac client software to its more feature-laden e-mail product for NetWare, DaVinci eMail 3.2. DaVinci Macintosh Remote (\$239 per user) uses Apple Remote Access (ARA) for remote communications.

In the area of Macintosh crossovers to the PC side, SoftArc (800-364-1923 or 905-415-7000) has released Windows server software for its

FirstClass e-mail and bulletin-board system. FirstClass Server for Windows and FirstClass Server for Macintosh (five-user license, \$495) are completely interchangeable. Each of the servers can have Mac as well as Windows clients over IPX or TCP/IP networks, and the Mac client and server software can also run over AppleTalk networks.



SoftArc has also been busy making the Mac client and server software for FirstClass PowerPC-native. Version 2.7 of FirstClass Client for Macintosh (available for free when you log onto SoftArc's FirstClass bulletin board, at 905-415-7070) offers faster sorting and graphics and is available for 680x0 Macs as well as Power Macs. FirstClass Server for Power Macintosh (five-user license, \$495), the industry's first PowerPC-native e-mail server software, is scheduled to ship in December and will support Open Transport, Apple's new networking system software. / John Rizzo

INTERNET SERVERS /

Internet Server Combos Coming

EVERY TIME YOU TURN AROUND, there's a new Mac-based Internet server-software product. New offerings from Delphic and NetWings emphasize multiple services within one software package. Meanwhile, Apple has joined the Internet chase by acquiring a popular mail application.

If you're looking for the most complete Mac-based Internet server software around, check out NetAlly 1.0, from Delphic Software (909-792-7932; <http://www.delphic.com/>). NetAlly includes ten modules: DNS (Domain Name Server), NNTP (Network News Transfer Protocol), FTP (File Transfer Protocol), mail (SMTP and POP3), World Wide Web, BootP, and several others. The full package sells for \$1,995, but you can also buy the application with only some modules turned on (modules are priced from \$295 to \$495) and add others as needed. A future release will include a Listserv module for managing mailing lists; those who buy version 1.0 of the full package will receive this module for free when it is released.

Another Mac-based server-software combo comes from NetWings (510-656-1962; <http://www.netwings.com/>). NetWings 1.0 is based on ACI US' 4th Dimension database (not required to run NetWings) and includes Web server software as well as SMTP/POP and listproc server software for mail management. Prices begin at \$1,495 per server-software package, with quantity discounts available.

Hoping to build on software that already has a following in the Macintosh Internet community, Apple has acquired Glenn Anderson's popular and well-respected MailShare, a free-ware SMTP/POP3 server-software package — until recently, MailShare was the only Internet mail server software available for the Mac. The company has not yet announced plans for marketing the software.

The new offerings from Delphic and NetWings join stand-alone Web and mail server-software packages from companies such as StarNine and InterCon Systems, whose products shipped last summer. / SB

Affordable FDDI

HIGH PRICE TAGS for NuBus FDDI cards — generally above \$2,000 — have kept many Macs off fiber-optic networks. Now there's a cheaper option for Macs equipped with PCI slots. Both **Spectra Systems** (800-821-9501 or 770-410-7803) and **Rockwell Network Systems** (805-968-4262) offer PCI FDDI cards for \$795. Rockwell also offers a fault-tolerant PCI FDDI card for servers; it's priced at \$1,795. * Speed's the thing in modems too. **U.S. Robotics** (800-877-2677 or 708-982-5010) has upgraded its **Courier V.Everything** modem to support transfer rates of 33.6 kbps. The new speed threshold should be approved as an amendment to the ITU's V.34 standard sometime next year, but USR is ready now. You can download the free, software-based upgrade from [ftp://www.usr.com/pub](http://www.usr.com/pub). * **Spider Island Software** (714-453-8095) has upgraded **Mail Server**, the server-software portion of its **TeleFinder** BBS, to support mail transfers over the Internet via SMTP (Simple Mail Transfer Protocol). Mail Server 2.0 also supports MIME (Multipurpose Internet Mail Extensions). With this upgrade (free to current TeleFinder owners), users can exchange mail and files via the BBS or the Internet. * As faster networks come online, prices for 10BASE-T Ethernet products continue to drop. **Farallon** (510-814-5000) has reduced the prices of its **Starlet** hubs and AAUI transceivers by 7 to 28 percent. The best deal? A ten-pack of AAUI transceivers has dropped to \$375 from \$520. * For those who are surrounded by Macs, PCs, and Sun workstations and wish they could access them all from one keyboard/mouse/monitor setup, **Cyberx** (205-430-4000) offers two options: the multiplatform **Commander 1xP** and **4xP** peripheral-sharing devices. The desktop model, the 1xP (base price, \$595), lets you connect as many as 4 computers to one set of input devices designed for any of the platforms, and the industrial model, the 4xP (base price, \$795), lets you connect as many as 12. \$185 per port for each connected computer. * The latest member of the **Grouper** family of wireless products, from **Digital Ocean** (800-345-3474 or 913-888-3380), is a pen bar-code scanner (\$1,599 with a Grouper Wireless Communicator and inventory software) that delivers data to a Newton MessagePad via a spread-spectrum RF link. The scanner's software downloads data to the Newton and then into a FileMaker Pro database. / SB

NET TOOLS / BY MITZI WALTZ

Plug Network-Security Holes

Files and devices on your network are vulnerable to mischief and mistakes. These tips and tools will keep your data safe.

YOU'VE GOT A LAN, but do you have a plan? Your network may be a conduit for snoops and resource abusers, many of whom work in your own office. Here are some typical security breaches and a few ways

you can protect your data and the network.

Passwords and common sense are your first line of defense against intruders. Insist that everyone in the office use passwords to protect e-mail accounts and servers. Some remote-access and file servers allow an administrator to force users to change passwords frequently, for added security. Enforcement is easy if you manage a file server: No one can reach it without a password. Don't activate any network-based accounts without passwords. To further instill security consciousness, provide your users with guidelines for "safe computing" — such as not using names, Social Security numbers, or other easy-to-guess passwords and not leaving passworded applications and volumes open and unattended.

Viruses represent another kind of security breach. They can be transmitted along with files across a network or via floppy disks. Network-based products such as Virex Administrator, from Datawatch (508-988-9700), assure that you have universal coverage. Managers can remotely install Virex on all networked Macs and can scan for infection as needed.

Guarding Shared Resources

Do you suspect that the mail clerk is secretly printing his Roller Derby fanzine on your high-dollar dye-sub printer? Are employees playing Marathon on the Internet, preventing legitimate users from accessing a network modem for work purposes? You can restrict access to network devices by

using software tools such as MacAdministrator, from Hi Resolution (800-455-0888 or 408-257-2151). If you want to leave access open but keep tabs on one or more problem users, you can use MacAdministrator to log network-device use. If you use AppleTalk routers to segment your network, you can lock users out of entire zones (and the network devices located there) where they have no business. You might move imagesetters or other expensive resources to a single zone that's accessible by only a few users.

You can monitor file servers for security leaks or simply track which machines are up and running. Server Tools, from Santorini Consulting (800-851-7824 or 415-563-6398), for example, includes utilities that notify an administrator when there have been several failed log-ins to a server account, keeps track of how long it has been since passwords were last changed, and raises alarms when servers crash.

I Didn't Mean to Share That

Since many people use file sharing instead of or in addition to storing files on a server, plenty of office data available on the network is often out of your control. Often, users share more of their hard disks' contents than they intend. Work with users to keep confidential data out of shared folders or on a well-protected server. Nok Nok and Nok Nok A/S (for AppleShare servers), from The AG Group (510-937-7900), can identify guests by name and track sharing activity.



Thwarting Snoops

Passworded network data isn't very safe if intruders can walk up to a Mac and double-click their way into confidential files. Hard-disk-security products such as FolderBolt Pro with Cryptomactic and NightWatch II, from Kent•Marsh (713-522-5625), or FileGuard and DiskGuard, from ASD Software (909-624-2594), place passwords on local volumes and folders and can encrypt data. FolderBolt's MacSafe administrator and Norton DiskLock Administrator, from Symantec (800-441-7234 or 503-465-8484), let a network manager remotely lock folders on users' Macs.

The Corporate Spy

If sensitive corporate data is at stake, you may need to up the ante, adding DES encryption. RSA Secure, from RSA Data Security (415-595-8782), and ultraSECURE, from usrEZ (800-482-4622 or 714-756-5140), add Defense Department-style encryption to disks, folders, and files. The RSA package lets administrators distribute decryption authority to a large group of users, each of whom must agree to decrypt the data. usrEZ's ultraCOMMAND lets an administrator enforce ultraSECURE encryption around a network. ☞

Mitzi Waltz is a Portland, Oregon-based writer. Her first book, The Internet International Directory, was published by Ziff-Davis Press this summer.

MAC TO PC / BY JOHN RIZZO



Mac Meets Windows 95

A first look at Windows 95 shows the new PC operating system to be a big step forward for Windows users, a small step back for Mac/PC connectivity.

BY NOW, YOU MAY HAVE HEARD that you don't need your Mac anymore. "Throw away that Power Mac 9500," the folks at Microsoft say. "Windows 95 is here!" According to the powers behind the Great Northwestern

Hype Machine, Windows 95 is a technical achievement akin to the one that brought Neil Armstrong's Kevlar boots in contact with lunar dust.

If the brouhaha is getting to you, relax — you're not missing much. Now that Chicago/Win 4/Win 95 is finally here, we can see that although it's no *Apollo 13*, it's still far from the perfect operating system. And in spite of Microsoft's best efforts, Windows 95 is still not as easy to use as the Mac OS.

You may, however, have to connect your Mac to it, and that brings us to what Mac users will see as the immediate problem with Windows 95, which is that many of the best Mac-to-Windows connectivity products don't yet work with it. In theory, Windows 95 is compatible with all Windows 3.1 software. In practice, some software either doesn't work or runs poorly, particularly when the software is a network application not designed by Microsoft.

So before you succumb to the hype, get a few of the facts that aren't included in those expensive commercials.

A Mac View of Windows 95

On a superficial level, Windows 95 is very Mac OS-like. You can drag files to the desktop, create aliases (called Shortcuts), and drag text from an application window to the desktop to create a file. Spend some time with Windows 95, though, and you'll find that things aren't quite up to a Mac user's standard.

For instance, Win 95 doesn't provide as

straightforward a view of what's on your hard disk as the Mac OS does. As in Windows 3.1, there are still two ways of viewing what's on the disk. Windows 95's innovation is simply to offer new ways to get at these views. The Start button now gives you access to the group icons of Windows 3.1's Program Manager, and the DOS/File Manager directory view is now accessible via three sources: the Windows Explorer (Win 95's version of the File Manager); the Disk icon, which you access by clicking on the My Computer icon; and the MS-DOS Prompt window. Likewise, simple tasks tend to require more steps than on the Mac. Emptying Windows 95's Recycle Bin — to cite a well-known example — is a two-step process (for more on Windows 95's shortcomings, see "Trash Talkin'," August '95, page 21).

What Windows 95 has that System 7.5 doesn't is preemptive multitasking, a feature also found in UNIX; OS/2; Windows NT; and in next year's Copland (System 8), from Apple. Preemptive multitasking allows multiple applications each to reside in its own memory space, so that when one crashes, the system keeps running. The Windows 95 version of preemptive multitasking is limited, though — it works only with applications written with the Win32 API, not with today's 16-bit apps.

DOS Legacies

The reason for this "semipreemptive" multitasking is that Windows 95 still contains remnants of 16-bit DOS and Windows 3.1 code, which Microsoft kept to ensure compatibility with existing Windows applications — and which perpetuate the limitations of the older operating systems.

One such remnant is a routine known as USER.EXE, which displays windows and sends messages between applications. USER.EXE has a 64K memory limit — if an

application uses up the 64K, it crashes. Remnants on the user-management side include the old DOS configuration files, CONFIG.SYS and AUTOEXEC.BAT, plus SYSTEM.INI and WIN.INI. A new database called the Registry

keeps some of the information from .INI files in one central place and is supposed to make editing .INI files a thing of the past. However, the Registry works only with new software for which the developer has chosen to use the Registry APIs.

You can usually ignore .INI files — unless you're deinstalling software manually, a task that's just as much fun in Windows 95 as it was in Windows 3.1. When I tried to remove all traces of an application that was causing error messages in Windows 95, the procedure included searching for and deleting files from the Explorer and the Startup folder as well as removing lines of code from AUTOEXEC.BAT and SYSTEM.INI by hand.

Connecting with Windows 95

Unfortunately, deinstalling Windows 3.1 software by hand is something you may have to do if you use one of the current Mac-



to-PC applications that doesn't yet run under Windows 95. Here's the scoop on the best Mac-to-PC packages and how they work with Windows 95:

Personal MACLAN Connect 5.0. Miramar Systems' AppleTalk-based Mac-to-Windows file- and print-sharing application doesn't work in Windows 95, which can't load the AppleTalk stack. If MACLAN Connect was

installed under Windows 3.1, it won't crash Windows 95 but it will cause error messages — and the deinstaller doesn't run in Windows 95. Miramar plans to release a Windows 95-compatible version this fall.

AppleShare for Windows 1.0. The current version of Apple's file-sharing client software doesn't work with Windows 95, and neither will the next version, expected later

this year. Apple is planning a Windows 95 version for spring 1996. As with Personal MACLAN Connect, the deinstaller feature won't remove the old version, so plan ahead.

DataViz's Conversion Plus. This Mac-to-PC file-translation utility is the Windows version of MacLinkPlus. You can use the Conversion Plus 3.0 file translators in Windows 95, and you can access a Mac floppy disk from within the utility. However, if you want to mount Mac floppy disks in Windows 95, you'll need the new version of Conversion Plus, expected by October. In that version, Mac floppies will behave just as PC disks do and will display the full names of Mac files.

Farallon's Timbuktu Pro for Windows 1.0. This package, which communicates by using TCP/IP protocols, works with Windows 95, but in only one direction: You can remotely control a Mac from within Windows 95, but you can't control Win 95 from your Mac. At press time, Farallon was planning to ship a fix (version 1.1); it should be available now.

Apexx PCTalk and EtherChain adapters. The PCTalk parallel-port-to-LocalTalk adapter (available from Apexx in a bundle with MACLAN Connect 5.0) does not yet work with Windows 95. However, the PCTalk will work with Miramar's Windows 95 version of MACLAN Connect, as will the EtherChain, a parallel-port-to-Ethernet connector (the EtherChain works with current Windows 95 NDIs and ODI network drivers).

Who Gets the Last Word?

With PC-software vendors salivating at the thought of selling new Windows 95-savvy applications to 70 million PC users, you haven't heard the last of the hype. As a Mac user, you won't be able to beat the forces Microsoft has rallied, so be prepared to join them — as soon as connectivity packages catch up to the latest OS. But remember, it won't be too long before Copland widens the gap between Mac and PC with new ease-of-use, automation, and customization features; better preemptive multitasking; and possibly even better stability than Windows 95. And where operating systems go, connectivity software follows. Of course, Microsoft still has Cairo, its next version of Windows NT, to promote. But then, Apple has Gershwin up its sleeve. But then . . . oh, forget it. It's time to go play Myst. ☹

John Rizzo, formerly MacUser's technical editor, is a freelance tester and reviewer of Mac and PC products.

The UNIVERSAL IN BOX

If e-mail is coming at you from all directions, save yourself some time and aggravation by directing as much as you can to one mailbox.

BY SHELLY BRISBIN

IT BEGAN SIMPLY ENOUGH. You got an e-mail box when you started your current job. Then you decided to get an account on CompuServe or another online service. Later, the office got an Internet connection. Before you knew it, you had more electronic-mail boxes than you could shake a mouse at and you were spending all your time retrieving your messages.

What to do? *Consolidate.*

The Basics

E-mail accounts can be divided into three types: LAN (local-area network), such as QuickMail and Lotus Notes; Internet; and commercial online, such as CompuServe and America Online. They aren't created equal in terms of software usability or cost, and each has a different way of exchanging messages with the outside world. Your first task is to figure out which account you'll use for your primary mailbox or whether to go with a fourth option — software, such as Claris EMailer, that collects mail from several different mailboxes. Here are the pros and cons for each system, to help you figure out which one can serve you best.

LAN-Locked

If your office already uses LAN mail, a LAN mailbox is probably the most convenient one available, since you're continually connected to the flow of mail. Although it's easy enough to get mail from coworkers on your network, getting mail from people on the Internet or online services is another matter. To exchange mail with the outside world you need *gateways* — software that lets e-mail jump the boundary between a LAN mail system

and the Internet or commercial online services. A gateway is usually installed on the office mail server and managed by your network administrator. If you're not sure what gateways are available to you or how to use them, ask your administrator.

You don't have to rely on your administrator for gateways if you use Apple's PowerTalk. Gateway companies such as StarNine Technologies (800-525-2580 or 510-649-4949) make personal gateways — gateways you can install yourself on your own Mac. StarNine's gateways let you exchange or forward mail from the Internet, Microsoft Mail, and QuickMail. Each gateway costs about \$50. Be aware, however, that the selection of mail-handling software for use with PowerTalk is limited. At press time, the only mail-reading software for PowerTalk was AppleMail, which comes with System 7.5. STF Technologies, however, announced plans to produce a more sophisticated PowerTalk mail reader in early 1996.

Net Mail

You don't need gateways to use an Internet account as your primary mailbox. With an Internet connection and the right addresses, you can reach people who use all sorts of mail systems.

One of the most compelling reasons to centralize your mail in your Internet account is the variety of software options you have for managing mail. By using an Internet account, you can get sophisticated features that commercial online and LAN mail software don't have, such as advanced mail filtering. Most Internet mail readers also make sending enclosed files a snap

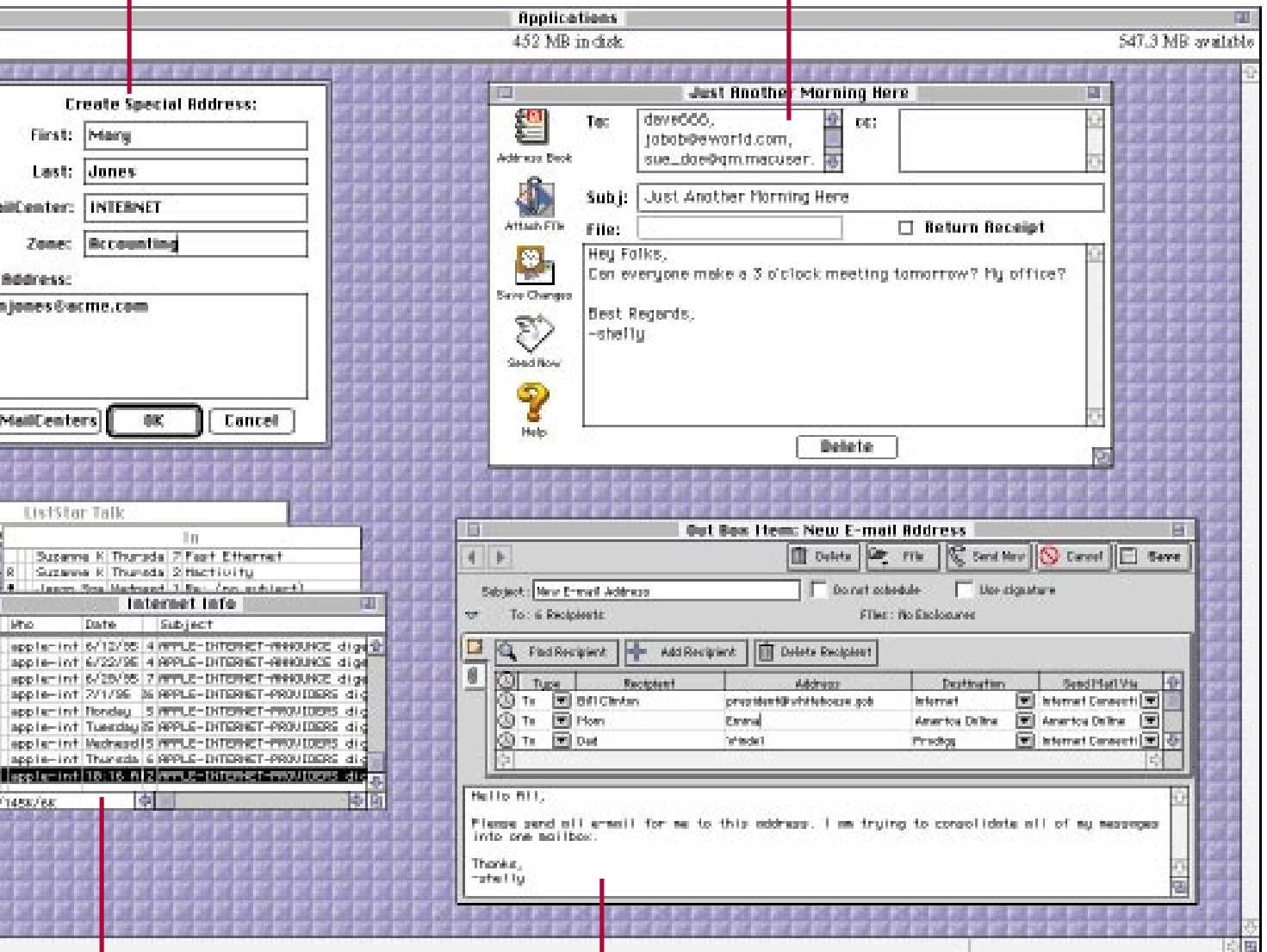


LAN MAILBOX

Often this is the most convenient central mailbox, as long as you have connections to other services.

ONLINE MAILBOX

Often the hardest on your pocketbook.



INTERNET MAILBOX

Eudora, Internet mail software, specializes in handling loads of mail. It lets you filter mail into separate folders.

INTERNET/ONLINE COMBO MAILBOX

Emailer software retrieves your mail for you from almost any type of mailbox.

(see the "Enclosed Please Find..." sidebar).

If you've purchased an Internet account for personal use, you can forward mail to the office or vice versa. (Of course, you'll want to check company policy before you start consolidating mail this way.)

Getting mail from commercial online services is simple too — just ask those you correspond with to send your mail to your Internet address. To send mail out to online services from your Internet mailbox, all you need to do is modify the recipient address by adding

a service's domain name to the recipient's user name. For example, you could use your Internet account to send a message to British royalty on eWorld by sending it to PrincessDi@eworld.com. (We can't guarantee she'll answer.)

Getting mail into your Internet mailbox from your LAN mailbox is also possible, but it may not be worth the hassle. Some LAN mail software, such as QuickMail (version 3.0 and later) and Lotus Notes, allows you to do it. Notes requires you to redefine rules — not a slight

Enclosed Please Find . . . / attaching files to e-mail messages

BEFORE YOU DECIDE which of your mailboxes is the one you want to have handle the bulk of your mail, one factor to consider is whether or not you need to send attached files often. If you do, stick with the Internet — it makes it easy to send and receive attachments.

Although it's trickier to send attachments over other services, it's quite possible if you know these rules:

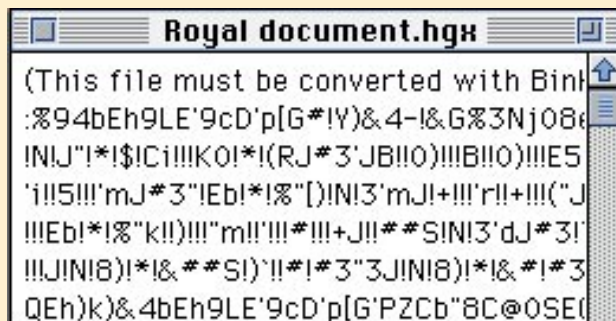
1. Encode the easy way. Whenever you send an attachment over the Internet, you must convert it into a *text* file to send it (BinHex is the standard text format for Mac files; uuencode is the cross-platform standard). If you're on the receiving end, you'll need to decode the BinHex file to turn it back into a Mac file. Conversion is simplest if you use MIME (multipurpose Internet mail extensions)-compliant mail software, such as Qualcomm's Eudora, because it does the conversion for you transparently.

If you aren't fortunate enough to have MIME-compliant software, you'll have to do the conversions yourself. (If you receive mail in your commercial online mailbox, you can count on having to convert it, because commercial online services do not use MIME-compliant software.) To convert a received file, first save it to disk and then open it and erase the header information. Finally, decode it by using a program such as Stuffit Expander (shareware; available online). It's not hard to identify a file that needs to be decoded, because messages in BinHex format are unintelligible (see figure at right). To encode a file to send over the Internet, use a program, such as BinHex4 or DropStuff (also

shareware), that can convert files to BinHex.

2. Reunite split files. Unfortunately, eWorld and America Online split mail messages and attached files that are larger than around 32K. (CompuServe does not split files.) To read a split message, you have to reassemble it, by cutting and pasting all the BinHex information to merge it into a single file, and then decode it.

3. Take a shortcut. Claris EMailer offers some help by doing file conversion for you. When it retrieves a file from a commercial online service, it decodes the file by the time you see it. About the only thing it can't convert is a split file.



If you receive a file that looks like this, it means you need to decode it with a program such as Stuffit Expander.

undertaking. QuickMail is friendlier about setting up a forwarding process, leading you through a series of windows. But even after you've done this setup, replying to mail forwarded from a LAN mailbox requires a couple of extra steps. It may be easier to maintain two mailboxes than to forward every bit of your mail to your Internet mailbox.

E-mail Online

An online account is the right universal mailbox only if you don't have Internet access or a LAN mail system at work. One reason that this is our last choice is because using a commercial online service for mail is usually more expensive than the other choices. CompuServe and Prodigy, for instance, charge you for every message you send or receive via the Internet.

Another reason commercial online services are our last choice is that your choice of mail-handling software is so limited. Although CompuServe Information Manager does give you some advanced features, such as the ability to search for addresses in your address book, you'll have a harder time finding the features you need in commercial online software than in Internet and LAN software.

If you do opt for an online mailbox as your primary one and have several online-service accounts, choose the one with the best mail interface and the most reasonable price.

E-mail Nirvana?

Using a universal mailbox usually means telling everyone you correspond with to send mail to you at a single address. That may not always be practical. For instance, people may respond to a message you've posted on an online service or from an Internet account that isn't your universal mailbox. You may also want to use secondary accounts to deflect some mail from your main mailbox. Trouble is, you still need to log into all of your accounts from different applications — or do you?

This is where Claris EMailer, another type of mailbox, comes in. It's the only Mac software (at least as of this writing) that retrieves your mail from any online service or the Internet and puts it into one mailbox.

EMailer would be the ultimate universal mailbox but for one problem — it can't retrieve mail from LAN mailboxes (this may change in the future). If you have a LAN mail system, you'll still have to monitor two mailboxes, for now.

The Ultimate Decision

If you're still not sure which type of mailbox is the optimal one to make central, one final way to narrow the choices is to determine what type of user you are and then find the software and service that best suit that type of user.

A LAN mailbox is practical for those who get most of their mail from coworkers on an office network. If you have access to gateways to the mail services you use, you can get all your mail into just one location.

An Internet mailbox is best for those who don't have a LAN mailbox and for power users who want a choice of mail-handling software. If you get a large amount of mail regularly, you may find yourself in one of those camps. Internet mail software offers powerful filtering features for sorting your steady stream of messages.

EMailer is a good choice for those who get e-mail from multiple services. If you've had no success getting all the people you correspond with to use a specific address or you prefer using more than one address, EMailer can simplify things, since it retrieves mail from almost any mailbox. ☞

Shelly Brisbin is a MacUser associate editor who is thinking of having an e-mail intravenous drip installed in her arm.

MOBILE MAC / BY SHARON ZARDETTO AKER



A New Deck of Cards

Third-party products for the latest PowerBooks are inspired by what the new models have — as well as by what they're missing.

IF YOU'RE THINKING about getting one of the latest PowerBooks, you're probably also wondering just what else you can buy to go along with it. This latest round — the PowerBook 5300 and 190 series and the Duo 2300c

— has early and enthusiastic support from third-party vendors. Most, of course, are enamored of the possibilities presented by the PCMCIA slots and the expansion bay in the 5300s and the 190s. Part of what you'll find to go in those open spots is what's missing from the new PowerBooks: internal modems and Ethernet support. The other choices range from various types of storage devices, video-capture, and infrared products to battery-recharging and memory products.

Although it's easy to predict the type of products that will soon be available to equip your new PowerBook, it's not so easy to say exactly how much they'll cost; the date they'll be available; or even, in some cases, the product name. Let's take a sneak

peek at the new products, keeping in mind that some of the details may very well change.

Mo' Better Storage

Pop the floppy drive out of that space on the right side of the 190- and 5300-series PowerBooks, and you've got an empty expansion bay ready to be filled with the item of your choice. One of the most likely candidates is some sort of storage, because we always need more.

Although you may be waiting to see if that little wunderkind the Iomega Zip drive (a small and inexpensive drive that uses 100-MB removable cartridges) makes its way to the bay, there are options available *this* year that may fit your needs even better.

At the top of the list is Fujitsu's \$500 Dynamo 230 Portable, a magneto-optical (MO) drive that reads from and writes to 128-MB and 230-MB MO cartridges. With internal drives getting bigger, MO drives of this size make great backup devices.

If you want to slap that old standard — a hard-disk drive — into the expansion bay, you will probably have several brands to choose from before many more months go by. Among the first out of the gate are drives from VST Power Systems. Because of a clever modification VST made to Apple's standard slide-in unit for the bay, you can actually fit VST's 1.2-GB drive into the



POWERBOOK SECRETS / installing memory in a 5300

IT DOESN'T GET EASIER THAN THIS — opening the PowerBook 5300 and installing RAM is simply a matter of removing the keyboard and locating the right slot. You don't even have to detach any cables. Arm yourself with the only two tools you need — an antistatic wrist strap and a Torx 8 screwdriver — and follow these steps:

1. Work in a static-free environment (no carpets and little humidity) if you can, and wear your wrist strap while you work.

2. With the PowerBook lid closed, take out the battery.

3. Turn the PowerBook upside down, and remove the three screws across the center of the case's bottom.

4. Turn the PowerBook right side up, and open it out as flat as you can.

5. Remove the keyboard by prying up its front edge, lifting it and pulling it forward slightly. Be careful of the attached ribbon cables.

6. Without detaching any of the keyboard's ribbon cables, set the keyboard carefully on the PowerBook's screen.

Now you can see the memory slot on the left side of the newly exposed area near the palm rest. Whenever you install memory, be particularly careful, given that the pins in the slot are quite delicate.

/ Rich Wolfson



expansion bay. The company additionally makes 540- and 810-MB drives that fit into the bay.

Modems and Mo'

Put together what the 5300s and the 190s *have* (PCMCIA slots) and what they are *missing* (internal-modem capability), and what do you get? PCMCIA-based modems.

You'll no doubt find a slew of modem PCMCIA cards available before the end of the calendar year, but there are three brands in particular I'd like to mention here. (I'd also like to mention that everyone's tired of saying "PCMCIA"; the accepted nomenclature is "PC Card," even if that conjures up the other kind of computer Mac loyalists may prefer to avoid.)

First, there's Global Village's modems. The company is offering three Type II PC Card modems: the 14.4-kbps PowerPort Gold (under \$200); the 28.8-kbps PowerPort Platinum (around \$350); and the 28.8-kbps PowerPort Platinum Pro (under \$600), which includes an Ethernet connection you can use simultaneously with the modem. Each modem comes with PC Card-enhancement software, which allows "enhanced hot-swapping." That means you can remove the card even while your modem software is running — in case, for instance, you need to grab some information that's stored on another card.

Dayna Communications, known for its networking products, is also offering a PC Card modem, called the CommuniCard Plus, that includes an Ethernet connection. It comes in a 14.4-kbps version (\$415) and in a 28.8-kbps version (\$450).

The other PC Card modem of note is the AIRplex, from VST. What's so special about it? For about \$600, you get a modem card with a piggybacked infrared (IR) module and a base IR transceiver. That gives you a wireless phone connection from your PowerBook to the transceiver. Since the infrared module uses a signal that's good for up to about 50 feet, you can wall-mount the transceiver and let all PowerBooks in the room with IR capability take turns using it.

Networking: Ether and Other

So far, I've mentioned Ethernet capability only in conjunction with modem PC Cards, but you can get PC Card-based Ethernet support without the modem too. Dayna

Communications and Farallon make cards that enable wired or wireless networking.

Farallon's AirDock, with its AirPath software (about \$70), is an intriguing example of the infrared variety. You hook up a "pod" to the serial port and the ADB port on a desktop Mac and let your IR-equipped PowerBook talk to the desktop Mac through it. The AirPath software lets the PowerBook connect to the desktop Mac's AppleTalk or Ethernet network as well as exchange files with that Mac. The IR signal is line-of-sight — good for about 6 feet.

Focus Enhancements is offering yet another Ethernet option for yet another slot, the video-card slot (which is actually a thinly disguised processor-direct slot, or PDS), in the new PowerBooks. The LapisColor MV16-EN (\$399) is a 10BASE-T Ethernet adapter and a 16-bit-video-out card that goes in the PowerBook 190- and 5300-series machines. Focus will offer the card without the Ethernet adapter as the LapisColor MV16 (\$299).

Charge!

VST has long offered one of the best external batteries (the ThinPack) and battery-utility software (PBTools) for the PowerBook, so it's no surprise that the company is offering battery-related products for the latest models. There are two external rechargers: one for lithium ion (LiIon) batteries and one that handles both LiIon and nickel metal hydride (NiMH). The combo recharger (around \$250) is a blessing for PowerBook 190 owners who have to start out with a NiMH battery but want to switch to LiIon later.

In addition to the rechargers, VST has come up with a clever AC adapter, temporarily named the Expansion Bay AC Adapter, for the expansion bay of the 5300

and 190 series. You can dump the standard power cord and its "brick" of an adapter and use VST's slide-in unit, which then plugs into a standard outlet. If you need the expansion bay for a floppy drive or other device, you can use VST's adapter externally. The target price is \$200.

What's Up, Dock?

What does it take to give a Duo 2300c the capabilities of the new all-in-ones? Well, for starters, you need one Type III or two Type II PC Card slots, a SCSI connector, a floppy-drive connector, an ADB port, and audio-in and -out — so you need the PC Card MicroDock, from Newer Technology. The dock also gives you an Ethernet connection and 16-bit color-video output. Talk about one-stop shopping. (Newer also makes memory chips for each of the new PowerBooks and a video card that gives the PowerBook 5300 series 16-bit color for external video.)

Picture This

Videoconferencing on your PowerBook, using a PC Card to get video input? Intelligence at Large is bundling its conferencing software, BeingThere, with Quadrant's PC Video Input PC Card for under \$700 to give you videoconferencing ability. The burning question in my mind about this package: Will the collaboration tools that let you mark up a networked document window also let you draw mustaches and beehive hairdos on your colleague's video images?

New Models, New Buzzwords

OK, repeat after me: "PCMCIA. PC Card. Expansion bay. IR. Wireless." They'll be part of your computing vocabulary in no time. ☞

Sharon Aker and Rich Wolfson are contemplating which of the new PowerBooks would best complement their family of seven Mac models.

Directory

Dayna Communications

Salt Lake City, UT
801-269-7200

Farallon Computing

Alameda, CA
510-814-5000

Focus Enhancements

Woburn, MA
800-538-8866
617-938-8088

Fujitsu Computer Products

San Jose, CA
800-626-4686
408-432-6333

Global Village Communication

Sunnyvale, CA
800-736-4821
408-523-1000

Intelligence at Large

Philadelphia, PA
800-425-7638
215-387-6002

Newer Technology

Wichita, KS
800-678-3726
316-685-4904

Quadrant International

Wayne, PA
800-700-0362
610-694-7600

VST Power Systems

Concord, MA
508-287-4600

NET TRAVELER / BY MICHAEL SWAINE



Meeting in the MUD

Once a venue for fantasy/role-playing games, MUDs, MOOs, and MUSEs are now environments for collaboration in education, business, and research.

YOU'RE IN A COLD, DANK ROOM — the kind of room only a game designer could love. The floor is littered with cast-off swords and amulets dropped by a thousand game-obsessed college sophomores. The

smell of burnt CPU cycles pervades the space. Through the archway ahead, you see new environments for collaborative work, and through the casement window, you glimpse innovative models of education.

You have entered the world of MUDs, Internet-based games in which players explore an imaginary environment by typing commands such as “go north” and “examine scroll.” Against all logic, these MUDs have become popular locations for business meetings and electronic classrooms.

Beyond D&D. Initially, MUDs were just fantasy/role-playing games, in which players scored points by solving puzzles and killing monsters. Many still are (you can learn about game MUDs in the [rec.games.mud](http://rec.games.mud.newsgroup) newsgroup hierarchy).

But MUD means *multiuser dungeon* (or *dimension*, today). Many people can play a MUD simultaneously, and when two players are in the same *room*, they can interact by typing phrases to one another. It's this possibility for social interaction that has lifted MUDs above their roots in gaming, leading to today's social MUDs, in which the game has (almost) disappeared and the interaction is the whole point.

Meeting in the MUD. Telnet to MediaMOO at telnet://guest@purple-crayon.media.mit.edu:8888, and observe media researchers at work. Stumble upon a MUD-based educational conference, and watch participants show slides, hold up signs, wink, and stand up to stretch. More and more, researchers and educators are deciding to

take their meetings in MUDs.

You can use a Telnet application to access MUDs, although MUD-specific applications, called clients, are better for this purpose. You can get NCSA telnet at [ftp://ftp.ncsa.uiuc.edu/Telnet/Mac/](http://ftp.ncsa.uiuc.edu/Telnet/Mac/). Two Mac MUD clients, MUDWeller and Mudling, are available from [ftp://ftp.math.okstate.edu/pub/muds/clients/misc](http://ftp.math.okstate.edu/pub/muds/clients/misc).

MUDs are seeing use in business, where their immediacy and their informality make them good places to get things accomplished. Meeting Space, from World Benders (wb-info@worldbenders.com), sets up a MUD for business communications. And by letting businesspeople create and use MOOs (MUDs, object-oriented) at its Internet site, Metaverse (<http://io.com/io/metaverse/>) rents virtual office space to virtual corporations.

But why MUDs rather than, say, e-mail or workgroup software? Because MUDs work. When the system administrators at Northeastern University wanted to set up a system to coordinate complex activities among members of their workgroup, they compared various methods: telephone, e-mail, newsgroups, Internet Relay Chat, walkie-talkies, and MUDs. They concluded that no other method met their needs as well as using a MUD. MUDs are real-time, multiuser, and unobtrusive; they produce a record of conversations; and they are extensible.

Collaborative Construction. Extensibility, the ability to add new features, is really possible only if you use a MOO or a MUSE (multiuser

simulation environment). These variations on the MUD theme allow the collaborative construction of simulated environments. Even without snazzy graphics, these simulations can often feel startlingly real.

That's what happens to kids in Cyberion City (it's part of MicroMuse, at telnet://guest@michael.ai.mit.edu), where museums and exhibits are meant to be hands-on educational experiences in cyberspace.



Other educational experiments are afoot in the MUD: Diversity University, at telnet://moo.du.org:8888, is the beginning of an attempt to construct a real university online.

Tip of the Month

Returning to conventional cyberspace, here's a tip for making addresses more useful. When you include a URL in an e-mail message, a newsgroup post, or your signature file, leave spaces before and after it. That way, others can use ICeTee (included with Peter Lewis' Internet Config package at [ftp://amug.org/info-mac/comm/tcp/](http://amug.org/info-mac/comm/tcp/)) to command-click-launch the URL.

Don't Know a MUD from a MUG?

MacUser maintains a list of frequently asked questions (FAQs) about the Internet, *MacUser* itself, and this column specifically. Send mail to faq@macuser.com. *MacUser's* address on the World Wide Web is <http://www.macuser.ziff.com/~macuser/>. You can reach me at traveler@macuser.com. ☺

TIPS / Word Processing

SETTING THE TABLE

Have you ever created a table at the beginning of a Word 5 document and then tried to insert some text before it? You can't unless you know this trick:

Select the first cell and insert a page break by pressing Shift-Enter. This puts the table on page 2. After typing the lines of text you want above the page break (and the table), delete the page break.

Eugene Cohen
Chicago, IL

BEAUTIFYING ROTATED TEXT

Rotated text in WordPerfect prints on a QuickDraw printer at screen resolution, 72 dpi. Using ClarisWorks' Painting module (you can also do this with other paint programs), here's a way to produce vertical text that doesn't print as an ugly bitmap:

Set the document resolution to that of your printer. Choose the Text tool, and create a text box large enough for the words you want to write. Type and format your text.

Next, use the Selection Rectangle tool to surround the text. Then

BOB: Well, yes and no. Yes, the files may still be on your hard disk. And yes, there's a chance some are 100 percent recoverable (see figure 1). But I wouldn't bet on it.

Here's how the Mac handles trash: When you trash a file and then empty the Trash, the Mac makes a note to itself saying, "The space where that file once existed is now available for reuse."

Although the Mac doesn't actually delete your file at that time, it may at any time — during a save or a copy or the creation of a temporary file, for instance — write new information to the space on the hard disk where that file is temporarily stored. As soon as this happens, the file becomes essentially unrecoverable.

CHRIS: "Essentially" meaning there's a teensy-weensy chance that you can reclaim small scraps of that file's data with Norton Disk Editor (provided that it's a text file), but for all intents and purposes, the file is little more than a painful memory.

BOB: If you ever accidentally trash a file, the sooner you run UnErase, the more likely you are to recover it.

Windows Widower

Q. I work with three different Macs; each has a different number of monitors connected to it, and the size of the monitors varies. The problem is that when I swap a file between machines, I can't always find the file's windows, because they were saved to a location that's off-screen for my current

Mac. How can I find these windows?

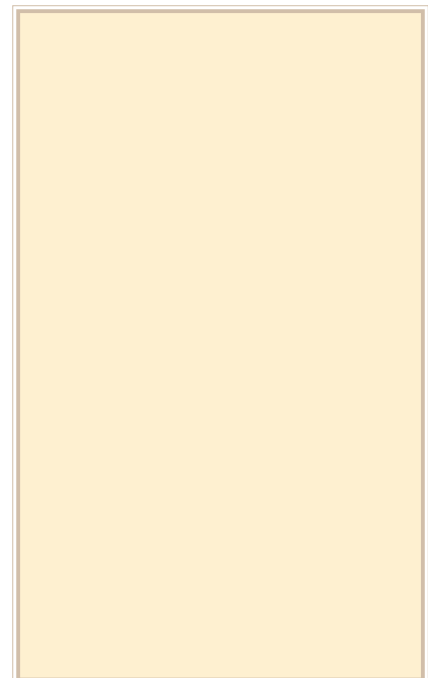
Jean-Pierre Baselis
via CompuServe

CHRIS: You could, I suppose, try to develop tidier work habits and always save files with the upper left corner of the window placed directly beneath the Apple menu. But I sense that this isn't exactly the answer you were looking for.

So instead, I'll recommend Alessandro Levi Montalcini's \$5 shareware program DragAnyWindow (you can find it online; see end of article). With this control panel installed, you can make windows leap to the location of your cursor. Or you can invoke a user-defined keystroke to place any active window, from any location, smack-dab in the middle of your screen. Another cool feature you'll get for your five bucks is the ability to drag dialog boxes that can't normally be budged, such as the Save and Open dialog boxes.

BOB: I've always skirted this dilemma by using QuicKeys' "zoom window" shortcut. A quick tap of the F14 key, and the active window zooms to the front and center of the monitor du jour.

Of course, QuicKeys is much more expensive than DragAnyWindow, but it's more powerful too.



Saved by Word 6?

Q. Whenever I save a document in Microsoft Word 5, the Save dialog box always seems to open to a folder unrelated to the original file. Is there any way to get Word to default to a particular folder?

Jan Strnad
via CompuServe

CHRIS: Why, of course!

One solution is to upgrade to Word 6.01. The poet Longfellow might explain this procedure as, "Under the spreading Tools menu, the Options command stands; Dumpty dumpty dumpty doo, hiddledee piddledee hands." Oh heck, I can't work the rhymes out, so I'll just give it to you straight: In Word 6, go to the Tools menu, choose Options, click on the File Locations tab, go to File Types and then to Documents, and finally click on the Modify button to change the default location for saved documents.

This is a nice improvement over Word 5, which doesn't let you select a default folder at all, but don't upgrade just to get this feature. There's a cheaper and better way:

Download a copy of Default Folder, yet another cool shareware utility from St. Clair Software (my, they've been busy). This

doodad allows you to assign separate default folders for each and every one of your applications. It also places pull-down menus in Open and Save dialog boxes to let you quickly navigate to recently used folders, back to the default folder, or to any mounted disks. To top it off, you can also trash files, create new folders, and modify type and creator codes — all from within the Open and Save dialog boxes. Not bad for 25 bucks.

BOB: Why does it seem like I'm the one who's always recommending the more expensive solutions? Hrumph. In this case, my solution of choice is Now Software's Super Boomerang. As of version 5.0.1 of Now Utilities, Super Boomerang works flawlessly with Word 6.

It does what Default Folder does, but it also lets you navigate to specific files or folders, using keyboard shortcuts (see figure 2). And don't forget that you get the other eight excellent Now Utilities components along with Super Boomerang for less than \$100.

Mac History Lesson

Q. When the system batteries went dead in many of the 300 LCs I manage, I noticed that all the system dates reverted to 8/27/56. It must be a significant date. What happened on August 27th of 1956? I know it wasn't James Dean's death; that was in '55. Was it Steve Jobs' birth date?

Larry Booz
Windsor, PA

BOB: This one took quite a bit of research. I sent out dozens of e-mail messages offering a free T-shirt to whoever provided the correct answer first. Before moving to the bonus round, let's look at a few of the incorrect answers:

A well-known former Apple evangelist who shall remain nameless claims, "8/27/56 was the then state-of-the-art IBM mainframe configuration: 8 mbytes of RAM, 27 mbytes of hard disk, and 56 COBOL programmers. The thinking was that if the LC batteries died, people would gain great appreciation for how far personal computing has progressed because of Macintosh."

CHRIS: Sounds reasonable, if a little obscure.

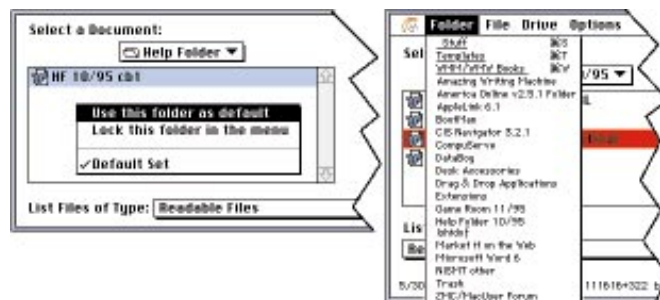


figure 2 / **Make saving files as easy** as it should be, by using a program such as Default Folder (shareware, left) or Now Utilities' Super Boomerang (right). Each lets you set up a default folder for saving files, so you do less navigating in the Save dialog box. Super Boomerang also lets you navigate with keyboard shortcuts.

I think Mr. Kawa— I mean, the gentleman, deserves a shirt.

BOB: Peggy Kilburn, organizer of Macworld Expo, opined, "That was a very historic day in New York — during the 7th-inning stretch, each member of the Brooklyn Dodgers baseball team stunned the fans and made headlines by suddenly launching into a rousing version of 'Hot Cross Buns' on the violins stealthily and speedily supplied to them by the bat boys. Immediately following, it was baseball as usual, causing each observer to believe they had just hallucinated. The impromptu concert was led by Casey Stengel, who was Steve Jobs' godfather; hence the significance to Apple Computer."

CHRIS: Whoa! Hold on a minute! Ix-nay on the T-shirt for this one. *Everybody* knows that "da bums" played Milwaukee on the 27th in *Milwaukee* (final score: Brooklyn 6, Milwaukee 3, with Bessent taking the win, for a 1 and 2 record). Honestly, Peg, what kind of nincompoops do you take us for?

BOB: The correct answer was supplied by several people almost simultaneously — it's the birth date of Ray Montagne, the Apple engineer and programmer who has been designing and looking after the software for the CUDA microcontroller (the chip that controls PRAM and ADB on the LC and other models). 📧

Bob LeVitus is the director of evangelism for Power Computing. The poet Longfellow might have described Christopher Breen thusly: His brow is wet with honest sweat, / He earns whate'er he can, / And looks the whole world in the face; / For he owes not any man.



You can find the shareware and freeware programs referenced in this article in the MacUser and ZD Net/Mac areas on CompuServe and eWorld. See How to Reach Us for instructions on accessing ZD Net/Mac.

TIPS / Now Utilities' Super Boomerang

A NEW WAY TO FIND FILES

Here's a nice shortcut for locating a file that doesn't appear on the Recent Files list but is in the same folder as a file that is on that list. If you hold down the Shift key when selecting a file from Super Boomerang's Recent File menu, instead of the file opening, an Open dialog box appears. It shows the contents of the folder containing the file you've selected. Now you can select the file you want without having to navigate through folders to find it.

MORE CONTROL OVER STARTUPS

Super Boomerang's Auto-Resume feature makes your Mac relaunch applications and documents that were open when it last crashed or was shut down or restarted. If you have that feature turned on (in Super Boomerang's Preferences dialog box) but find that occasionally you want to skip Auto-Resume on restart, just click the mouse or press any key as the Finder loads at startup.

Michael Casdorph, Tech Support
Now Software

Rock Around the Mac

You can do your rocking around the clock if you've got your Mac ready to roll.

BY KRISTIN BALLEISEN



I WILL NEVER FORGET THE DAY I BECAME A RABID FAN. My seventh-grade boyfriend gave me his copy of U2's *War* as a love offering. Until then, my interest in music was limited to whatever was on the "cool" radio stations. Sure, I'd bought albums (remember Men at Work?), but no one artist had lit my fire. That all changed the day I slipped *War* onto my underused turntable. Suddenly I was first in line for shows, spending precious baby-

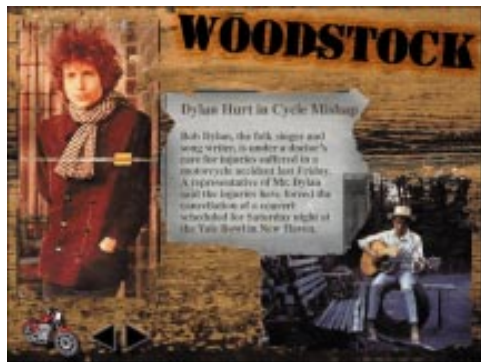
sitting funds on tickets, albums, and the posters that soon wallpapered my room. My obsession continued through college, waning only when Bono began donning gold lamé in live performances.

I'm betting you're a Rabid Fan too. Who is it? The Pretenders? The Beatles? Milli Vanilli? Whatever your pleasure, all you need is a Mac (preferably with at least a double-speed CD-ROM drive and Internet access) to find kindred spirits and maybe even get a little closer to your performer of choice.

CD-ROMing All Over

If you're willing to shell out an average of \$50, an interactive CD-ROM can provide experiences that any Rabid Fan will covet. Check out your local software store, or consult *MacUser's* October '95 issue (page 109) for a listing of the best new music CD-ROMs. Some classics include Peter Gabriel's **Xplora 1** (★★★★; \$59.95 list), from MacPlay (800-736-5738 or 714-553-6655) and the Residents' **Freak Show** (★★★★½; \$49.95 list), from Voyager (800-446-2001 or 212-431-5199). *Xplora 1* gives you an in-depth look at Gabriel's *US* album, including plenty of music and video. *Freak Show* is more of an interactive adventure under a dysfunctional big top, with enough music of the Residents to keep their fans happy.

One newer CD-ROM that has set a new standard for classic-rock fans is Bob Dylan's **Highway 61 Interactive** ▲ (★★★★; \$59.95 direct), from Graphix Zone (714-833-3838). This program will



delight fans of the legendary singer/songwriter, whose career has spanned three decades. The main menu is an interactive collage: Click on a coffee cup to go to a Greenwich Village coffee shop and hear Dylan tunes such as "Man on the Street" and "Tangled up in Blue" on a virtual jukebox. Coolest Rabid Fan feature: several alternative versions of Dylan's classic "Like a Rolling Stone."

If performance art is more your speed, you should definitely block out a good chunk of time to traverse the strange world of Laurie Anderson in Voyager's **Puppet Motel** (★★★★; \$39.95 list). From the opening screen, this CD-ROM is a nonlinear explore-a-thon in which you can conceivably never go to the same place twice. Hang out in a virtual motel room (complete with a pink vibrating bed), or watch

videos in the Green Room with Laurie's ventriloquist dummy. In case you get stuck, Voyager's Web page (<http://www.voyagerco.com/>) has tips for some of this CD-ROM's more problematic puzzles.

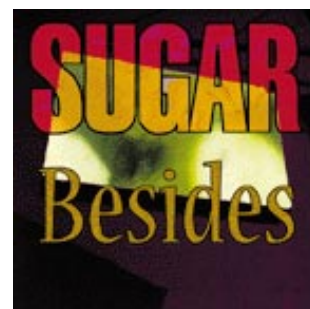
Exploring and interacting are all fine, you Rabid Fans may be saying, but how about something for both the CD-ROM drive and the audio player? Sarah McLachlan's **The Freedom Sessions**, distributed by Arista and available in local music outlets, is an Enhanced CD, an abbreviated audio CD whose first track contains multimedia information accessible by CD-ROM drives. You can choose to go to a list of McLachlan's albums and either listen to the audio or view video clips. The biggest drawback to Enhanced CDs is that you have to remember not to play the data track on your audio-CD player — the result is decidedly unmusical and can even damage your speakers.

CD Plus, a brand-new standard, solves that problem by allowing CDs to contain computer-accessible

content that's invisible to audio players. The first commercially available CD Plus disc, **Besides** ▼, by the Power Mac-totin' group Sugar, is a full-length (more than 70-minute) audio CD that *also* contains a complete QuickTime music video. Stick it into your CD player, and it's a regular CD (with no weird data track). Put it into your Mac's CD-ROM drive (assuming that you have the latest Apple CD-ROM extension), and it's a volume on your desktop. The multimedia content is a bonus — kind of like the hidden messages people used to find in vinyl spinout grooves. Sugar's record label, by the way, is Rykodisc, one of the most tech-savvy companies in the music biz — check out its Web page at <http://northshore.shore.net/~rykodisc/>.

Get Down Online

If your favorite artists aren't yet in your software store, you can rest



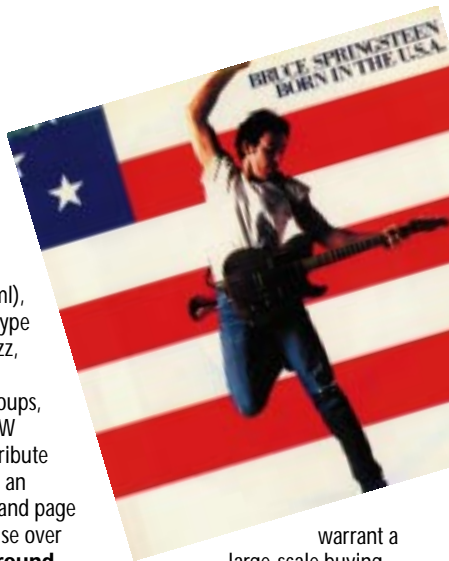
assured they are well represented online. The first place to stop off is the **Ultimate Band List** (<http://american.recordings.com/wwwofmusic/ubl/ubl.shtml>), where you can search by type of music (rock, country, jazz, techno, and so on) and by resources (Usenet newsgroups, mailing lists, FAQs, or WWW pages). You can even contribute with your own link to, say, an obscure Dave Matthews Band page in Outer Mongolia. Or, cruise over to the **Internet Underground Music Archive (IUMA)** ▼ (<http://199.2.25.200/IUMA-2.0/home.html>) to discover hundreds of unsigned bands from all over the world, ranging from

Scotland's Alza Cannon to San Francisco's Aqua Velvets.

If indie bands aren't your cup of tea, you'll want to check out **Warner Brothers'** Web site (<http://www.iuma.com/Warner>). You can find out what's new on the site and who's on tour and hear audio clips from acts such as R.E.M., Neil Young, Van Halen, and

Madonna. Another good site is **Geffen's** (<http://geffen.com>), which most recently sported a glimpse of its compilation of vintage 80s hits as well as featured artists White Zombie, Peter Gabriel, and the Stone Roses.

When you're ready to buy some actual music, be sure to check out the fantastic **CDnow!** online music store. Want to see Jimi Hendrix's entire discography? No problem: Simply do a search by artist, and you'll get a list of all of Hendrix's albums, including imports. CDnow! is also home to the All-Music Guide (AMG), which provides everything from album reviews to band biographies. To purchase an album, you simply click on its price to place the album in your virtual shopping cart (the service supports Netscape Secure mode for credit-card transactions), and your CDs should arrive within two to six working days. Even if your financial situation doesn't



warrant a large-scale buying extravaganza, CDnow! is a great place to browse.

If you're a true Rabid Fan, you'll definitely want to check out the Usenet newsgroups specifically dedicated to your band of choice. Consult the Ultimate Band List to see if one exists, check out the "local culture," and then feel free to argue the merits of one album over another to your heart's content. Some rock newsgroups with lots of action (read: tons of posts) are **rec.music.beatles**, **rec.music.gdead**, and **rec.music.phish**. In a recent week, the latter group (originally a mailing list) had over 1,800 posts from devoted Phish Phans discussing killer jams and offering tapes to trade.



The Final Cut

So, if your love for Pink Floyd requires more than the occasional reunion tour, you're probably not alone — in fact, at last count, alt.music.pink-floyd had 100 current posts. All you have to do is turn on (your Mac), hook up (that Internet connection or that CD-ROM drive), and rock out (I assume you know how to do that). Oh, and if you run into Bono online somewhere (it could happen), let him know that a nice polyester blend would work much better with his complexion. ☹

The Two Dads

BY RIK MYSLEWSKI AND JIM SHATZ-AKIN

RIK: When Carey and Rox first turned off the TV to start playing on our Mac, I was jazzed. Now I'm not so sure.

JIM: You'd rather they watched cartoons?

RIK: Sometimes it's hard to tell the difference, like with Living Books: Seven-year-old Rox is addicted to them.

JIM: I don't blame her. They're full of fun things to do — clicking on characters, watching animated surprises . . .

RIK: Just because Rox enjoys **Just Grandma and Me** ▲ or **Arthur's Teacher Troubles**, does that make them good for her? She's also big on *Looney Tunes*, but Elmer Fudd's no role model.

JIM: Living Books are more than cartoons. They read themselves, and they let kids explore and discover stuff on their own.

RIK: They're not as interactive as they could be, though. **The Berenstain Bears Get in a Fight** ▼ has long animations during which all a kid can do is sit and watch — Saturday morning, redux.

JIM: But "Arthur" and "Grandma" offer much better content than Saturday-morning fare.

RIK: Let's talk content: My ten-year-old, Carey, hates Berenstain's cutesy, pink-bowed Daughter Bear, and I'm not too hot on doofus Daddy Bear either.

JIM: Carey's too old for the Berenstain Bears. Have her try out the poems in **The New Kid on the Block**.

RIK: I'll just buy her the book, thank you.

JIM: But Living Books can do things books can't. The upcoming **Dr. Seuss's ABC** improves on the book by adding clever animations and pronouncing words. And all the other Living Books include built-in bilingual versions.

RIK: Books can be bilingual too — and you can read them under the covers with a flashlight or under a tree in the backyard.

JIM: Younger kids can't read for themselves. The Mac's no parent, but it *can* tell stories.

RIK: A kid's Mac should be used to teach skills and to inspire creativity, not just to entertain.

JIM: You're tough.

RIK: I'm a dad.



Living Books: Arthur's Teacher Troubles

Ages: 6 – 10.
Price: \$39.95 (estimated street).
Kids will enjoy discovering that even shy young aardvarks can successfully navigate the embarrassments and potential pitfalls of grade school.
Company: Living Books, Novato, CA; 800-397-4240 or 415-382-7818.
Reader Service: Circle #420.

Living Books: Berenstain Bears Get in a Fight

Ages: 3 – 8.
Price: \$39.95 (estimated street).
The well-known bear clan stars in this predictable morality tale about settling sibling squabbles; overlong animations limit read-along value.
Reader Service: Circle #421.

Living Books: Just Grandma and Me

Ages: 3 – 8.
Price: \$39.95 (estimated street).
This first-ever Living Book set high standards, with clever animations that enliven Little Critter's tale of visiting the beach with Grandma.
Reader Service: Circle #422.

Living Books: The New Kid on the Block

Ages: 6 – 12.
Price: \$39.95 (estimated street).
Although these animated poems are pleasantly silly enough to amuse little kids and inventive enough to interest preteens, they're hampered by limited interactivity.
Reader Service: Circle #423.

The Game Room

BY BOB LEVITUS

HAVE YOU EVER WONDERED what sort of game Kwai Chang Caine (of *Kung Fu*) would have played if he'd owned a Mac? I have, and I came up with three games that you'll find range from meditative to reflex-testing. *Ishido* and *Triazzle* require concentration and cunning to progress through the seemingly endless supply of challenges. *ClockWerx* tests not only the sharpness of your mind but also the quickness of your reflexes. The strength of all three games is that you spend only seconds learning to play them but hours learning to master them. So boot up, Grasshopper.

Ishido

Meditation on Fun

PUT ON YOUR ROBE, assume full lotus position, and get ready for a thought-provoking game — *Ishido*, unavailable for a few years, is back. We oohed and aahed in a 1989 *MacUser* review over *Ishido*'s beautiful and realistic-looking graphics. Nothing about the game has changed, except that it's now compatible with System 7.

The object of the game is to put all 72 tiles from your "pouch" onto the board, which has 96 squares. Sounds easy, but there's a catch — each tile must match, in color or symbol, all adjacent tiles. Space



gets tight quickly. If you succeed in clustering five tiles together (in the shape of a cross), you'll get a special message from the all-knowing Oracle of Stones, not to mention extra points.

The graphics are impressive. The tiles look real, and you can choose from a variety of tile and board designs or design your own. Three scoring systems allow you to measure your prowess.

GAME POINT

If you like a challenge without the frenzy of a fast-action game, you'll enjoy both *Ishido* and *Triazzle*. Also notable are their outstanding graphics.

ClockWerx requires more finger twitching than the other two. Get this game only if you have too much time on your hands, because you'll find yourself playing it again and again.

Ishido ⚔⚔⚔

Price: \$30 (estimated street).
Company: MacPlay, Irvine, CA; 800-462-2752 or 714-553-6655.
Reader Service: Circle #424.

Triazzle ⚔⚔⚔

Price: \$20 (estimated street).
Company: Berkeley Systems, Berkeley, CA; 800-344-5541 or 510-540-5535.
Reader Service: Circle #425.

ClockWerx ⚔⚔⚔

Price: \$28 (estimated street).
Company: Spectrum HoloByte, Alameda, CA; 800-695-4263 or 510-522-3584.
Reader Service: Circle #426.

Triazzle: Rainforest Edition

Chirps, Croaks, and Cheers

THE SMART THING about computerizing a regular old jigsaw puzzle is that you can add ambiance and challenge to the game. That's exactly what Berkeley Systems did with *Triazzle*.

The ambiance of *Triazzle* on the Mac includes lush forest scenes with animated creatures and the pleasant sounds of frogs croaking, crickets chirping, and rain dropping.

Learning the game is simple — it's a jigsaw puzzle — but solving the puzzle isn't so simple. All the pieces are the same size and shape



— triangular. And they look alike — lots of greenery and a couple of insects, turtles, or frogs. When you find the one correct spot for every puzzle piece, the creatures come to life and wiggle, fly, or hop away. Given the 15 difficulty levels, you'll have many hours of hair-pulling, teeth-gnashing fun.

My only complaint was that there wasn't a wider variety of critters; I got a bit bored with the same old ones.

Triazzle on the Mac isn't much more expensive than the cardboard version, but it's much more fun. And a portion of what you pay goes to tropical-conservation groups.



ClockWerx

Finger Twitcher

BACK IN 1993, Callisto released a game called *Spin Doctor*. I liked it a lot and still play it occasionally. Imagine my delight when, upon unwrapping *ClockWerx*, it turned out to be a reincarnation of *Spin Doctor*, with spiffed-up background graphics and enhanced sound.

Fortunately, the new publisher, Spectrum HoloByte, didn't mess with the game play. You maneuver your clock hand from dot to dot, gathering bonus dots and avoiding spikes, oil globs, explosives, and enemy clock hands. Guns, triggers, and bullets also show up to thwart you when you graduate to the upper difficulty levels. I've never come close to making it

Cheat Sheet

BY ROMAN LOYOLA

Ishido

- You get a bundle of points whenever you create a five-tile cluster. One good strategy for building these clusters is to put tiles that are identical — matching in *both* color and symbol — adjacent to each other.

- To learn winning strategies, sit back and watch your Mac play a few games. To do so, put *Ishido* in solitaire mode, by choosing Solitaire from the Game menu and checking the box next to #1 Computer when the Solitaire Game dialog box comes up.

Triazzle

- Take as much time as you need when previewing the puzzle. Preview time doesn't count against you.

- You get a limited number of hints about where puzzle pieces go. Hints work best when you use them early in the game.

- If you have a difficult time getting started, use the hints on adjacent spaces. That way you can create a starting block to work from.

ClockWerx

- Success in *ClockWerx* takes good planning. Plan your moves before you start, since timing doesn't begin until after you've made your first move.

- An oil glob will follow you if you touch it. When this happens, lead it to a spot where it won't hinder you for a little while — into a corner, for example — and quickly backtrack. If your timing's right, you can lead oil globs to bombs and blow them away.

through all 100 screens on all four levels.

If your fingers are fast and you have the willpower to walk away from an addictive arcade game, *ClockWerx* will work for you. 🖱️

Bob LeVitus is a MacUser contributing editor and Power Computing's director of evangelism.



Barbarians at the Windows

FAT AND BORING — THAT'S WHAT THE Mac has become. During the past decade, I've watched the Mac community devolve

from a bunch of jazzed-up fanatics into a staid bunch of conservative do-nothings. Now, with the release of Windows 95, we're about to witness the final death throes of the old empire.

Windows 95 is like a barbarian horde ready to sweep down from the rainy steppes of the Pacific Northwest. It's the most aggressive new product ever to come from the most aggressive computer company ever to exist. And its No. 1 target is the Mac.

I've been writing about this confrontation ever since my first glimpse of Windows 95, but my previous observations were based on scant use and beta code. That's over. I have long since installed the full-release version of Windows 95, and I use it routinely.

Believe me, I have no interest in helping the Microsoft juggernaut run wild, but run wild it will do — for the rest of this year and deep into the next. I cringe as I say this, since for the past year, I've watched in disgust as one observer after another has predicted that this would happen, based solely on Microsoft hype and bluster. I preferred to wait and see what would actually ship. Now that the plain reality of Windows 95 can be added to the incredible hype Microsoft has generated, it's safe to say that we're about to witness a software phenomenon. The result will be a dream come true for Microsoft shareholders.

Unfortunately, Apple shareholders are more likely to get a nightmare. Apple's traditional stronghold has been the graphics community. This is not a market; it's a niche — and with the Windows 95 battering ram poised at the gates, it wouldn't last long either if Microsoft decided to target it. Apple's only real hope is that Microsoft might spare

certain niche markets in order to keep the Justice Department off its back.

More important, however, Apple risks losing new users as well as the education and home markets. Windows 95 is already aggressively looting the home and new-user markets. If Apple ends up with only the graphics and school markets, developer interest in Macs will wither and Apple civilization as we know it will be unable to survive. The Dark Ages of the PC will have arrived.

What to do? What to do? Maybe it's time for Apple to start over from scratch. I'd like to see a complete replay of the original Macintosh revolution of 1984. Too bad Apple has run out of the weird magic that allowed the Mac to come into the market with 128K and no software and be a success! I honestly believe that this exact scenario could have been replayed with the PowerPC, but Apple decided to manage the transition to Power Macs as though they were a 68040 upgrade and IBM was too scared to do anything with the chip except continue its use in the company's RS/6000 workstations. Fact is, nobody has the guts to do anything daring, because too much is at stake.

On top of that, Apple has taken to worshipping the false idol called market share. Apple has been losing market share in computers for years and years. This gauge of success assumes that all computers do the same things and that Macs are just another type of

PC. Macs should be spun off this list, because it just doesn't apply. Although it's true that the Mac has a lot of crossover applications with the PC universe, it's hardly the same as a PC! Apple needs to give up on the me-too mind-set and reestablish the Mac as something unique. Otherwise, even though Mac sales continue to increase, the Mac will still be perceived by the larger crowd of PC mavens as a loser!

Why? Because it's ceding overall market share to Pentium-based machines.

Decline and Fall

There's no shortage of theories about the decline of the Apple empire. Apple kept the Apple II alive too long when the Mac was the perfect home/school machine all along. Apple has dropped the ball with its developers by failing to deliver them new machines and the kind of aid they got in the mid-'80s. And don't get me started on Apple's failure to license its operating system until Bill Gates' horde was already galloping into view.

Then again, maybe this is all part of a maturing process that can't be stopped no matter how much moaning and groaning we do. Let me finish by just reminding Apple of a unique sales pitch it once had. It used to compare the huge amount of ink (free press) that it received to its sales. The disparity was phenomenal — evidence that the Mac's influence far exceeded its market share. Maybe Apple should compare the amount of press it now gets with that received by Microsoft (a much smaller company).

Listen carefully, and you can hear the hoofbeats. 🐎

