

STAR RATINGS: OVER 400 PRODUCTS RATED

MACWORLD

THE MACINTOSH® MAGAZINE

May 1993 \$3.95 Canada \$4.95

Apple's New Servers

Apple Takes On Novell

SPECIAL REPORT

Color Printers

27 Models Compared

25 Monitors Tested

Top Values in Monochrome Displays

Plus:
PowerBook
Notes



To get the most out of this box,



Now that you've had the good sense to put a Macintosh[®] in, may we suggest something sensible to put in your Mac:

The Microsoft[®] Office. The essential tool set designed to work the way you do.

What exactly does that mean? It means you get four of the most functional business programs ever to light up a Mac screen, all in one specially priced box.

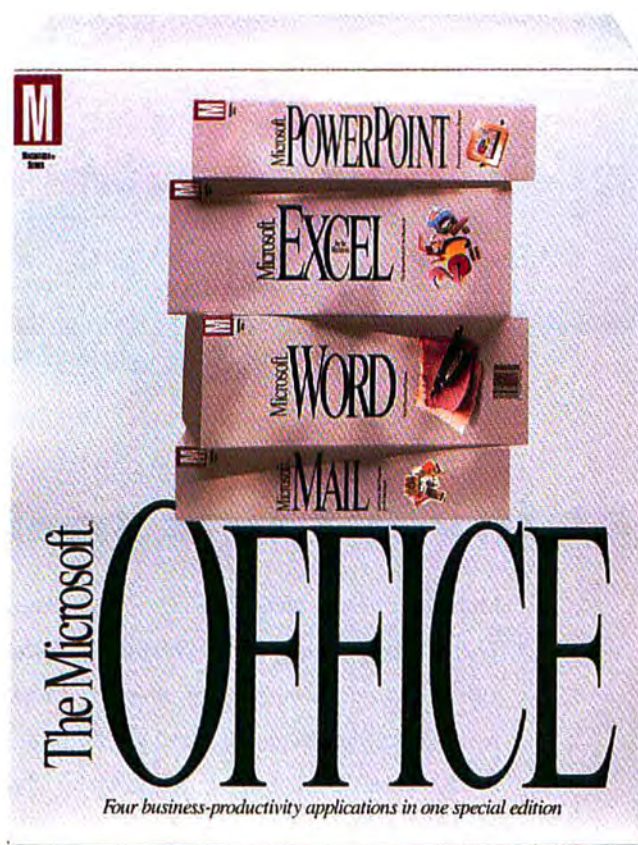
There's Microsoft Word, software

that helps you accomplish everyday tasks with ease (perhaps that's why it's the most popular word processor around).

Microsoft Excel, the spreadsheet that makes calculating, charting and other powerful functions possible with just the click of a mouse.

Microsoft PowerPoint[®], the program that lets you create truly impressive slides, overheads and audience handouts.

you need to get this box.



And Microsoft Mail*, the friendly, efficient route for office communications.

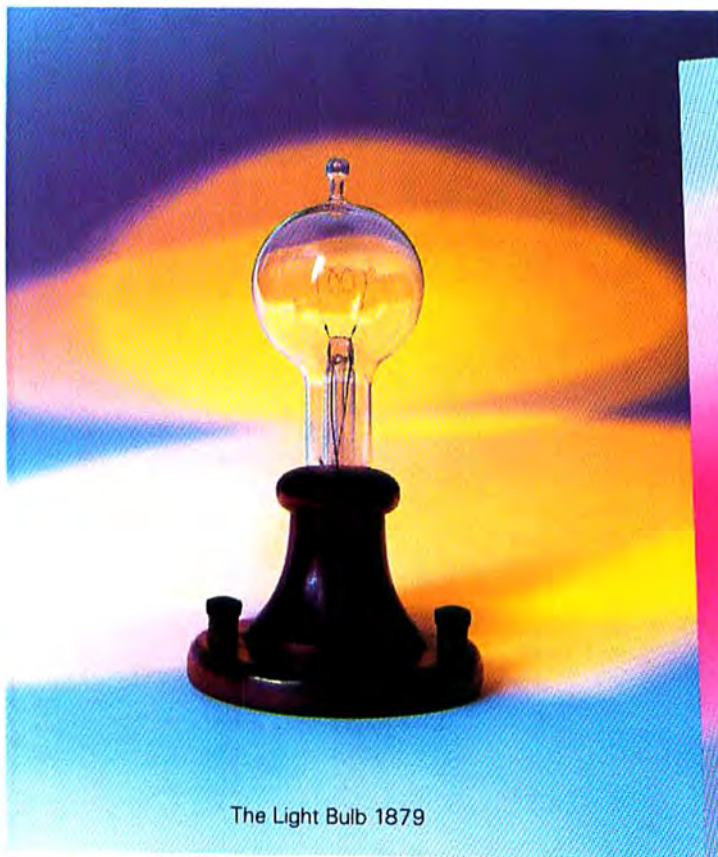
All four have been thoughtfully designed, with features like outlining in Microsoft Excel and Word, style sheets, shared user dictionaries, mail integration and templates.

Which may explain why each of these applications is a leader in its category. And what's more, the price for The

Microsoft Office has never been better. So now that you have the computer that has everything going for it, get it everything it needs to get going.

For more information, give us a call at (800) 426-9400. Or stop by your Microsoft reseller today.

Microsoft
Making it easier



The Light Bulb 1879



Aspirin 1899

The best inventions make you won

MultiSpin™ from NEC.

Thanks to pioneers like Thomas Edison, you don't remember what it was like to read by candlelight. And thanks to NEC's MultiSpin™ CD-ROM readers, you won't be able to remember a time when you couldn't transfer

data at a rate of 300 KB/second.

We revolutionized CD-ROM.

NEC was the first company to successfully bring dual-speed technology to market, and now has a complete family of readers designed to fit your needs. From our external MultiSpin 74 and internal MultiSpin 84, to our lightweight, portable MultiSpin 38.



The Refrigerator 1913



NEC MultiSpin CD-ROM Reader 1992

der how you ever lived without them.

Built for the future.

All of our readers support Kodak's Multisession Photo CD™ technology, so you can view photographs on

CD and work with those images on your computer. All are SCSI 2 compatible, which increases compatibility across multiple platforms.

In 1985 NEC redefined monitors with the invention of MultiSync® technology. Now there is MultiSpin. The technology that has redefined CD-ROM readers.

And both the MultiSpin 74 and 84 have a 256 KB continuous flow cache that allows them to transfer encyclopedias of

data at high speeds and play back video without any pauses in motion. And the MultiSpin 38 gives you the power of portability. Best of all, they all come with a two-year warranty. Multimedia's never been so easy.

What's more, all of them are QuickTime™ compatible and meet the Multimedia PC (MPC) standards for Multimedia computing. Once you



check out the high-performance CD-ROM readers from the pioneers of

MultiSpin technology, you'll find everything else about as primitive as traveling by horse and buggy. To find out more, call 1-800-NEC-INFO (in Canada 1-800-343-4418).



Or, via fax, call NEC FastFacts™ at 1-800-366-0476, request #23766.

Because ↑ is the way you want to go.

NEC

Contents

MACWORLD THE MACINTOSH® MAGAZINE MAY 1993

BUYING GUIDE: COLOR PRINTERS

How to Buy a Color Printer.....90

BY JIM HEID Choosing the right printer to meet your color-output needs is more challenging than ever. Our overview of the latest color-printing technologies will make you an educated buyer.



On the Cover
APPLE BREAKS INTO
THE SERVER
MARKET WITH THREE
NETWORK SERVERS—
THE CENTRIS 610,
THE QUADRA
800, AND THE
QUADRA 950—EACH
WITH A
SOUPED-UP VERSION
OF APPLESARE
INSTALLED.
PAGE 64. (PHOTO BY
MARK JOHANN.)



Ink-Jet.....94

BY JIM HEID Looking for economy in color output? Macworld Lab tests ten solid and liquid ink-jet printers and finds some surprisingly good results.



Thermal-Wax.....100

BY JIM HEID These midrange printers now offer plain-paper output, enhanced speed, and lower prices—making them much more appealing for office environments. Macworld Lab tests nine models.



Dye-Sublimation.....106

BY JIM HEID As our tests of eight models show, dye-sub printers are still the only choice for high-quality desktop publishing; fortunately their price tags have finally come out of the stratosphere.

FEATURES

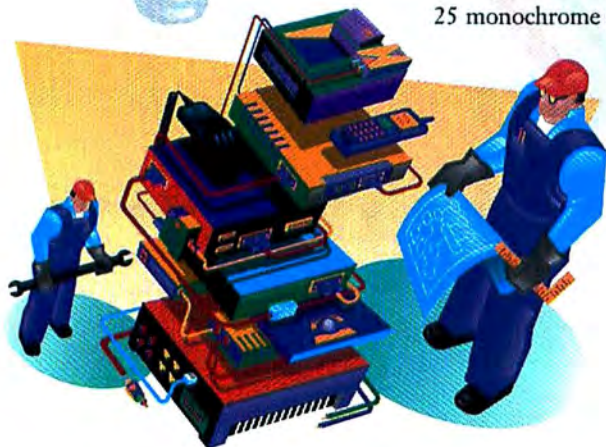


Here's Looking at Monochrome Monitors.....112

BY ROBERT C. ECKHARDT Macworld Lab rounds up the usual suspects: 25 monochrome and gray-scale monitors—from 12-inch landscape to 21-inch two-page displays—to find the brightest faces in a sharp-looking crowd.

Building an Expandable Network.....120

BY DOUGLASE WELCH With problem-solving tips on five areas of network design, our step-by-step guide will get you well on your way to a smoothly running network.



REVIEWS

- 128 Kal's Power Tools Volume I, 1.0**
Photoshop plug-ins
- 129 WriteMove II**
Portable printer for PowerBook
- 130 RapidTrak 1.0.1**
Hard drive formatter
- 132 FastCache Quadra**
Cache card for the Quadra
- 132 Lightning Effects II and ThunderStorm**
Photoshop acceleration boards
- 136 Comet CG 1.0.3**
Video-titling software
- 139 Andrew Tobias' TaxCut for Macintosh; MacInTax**
Personal tax-preparation software
- 140 MacProject Pro**
Project management
- 142 SuperATM**
Font-substitution utility pack
- 144 SpreadBase 1.0.1**
Data-analysis program
- 146 WealthBuilder 2.0**
Financial-planning software
- 146 TimesTwo 1.0.1**
Automatic disk-compression utility
- 148 AccuZip6 1.5.2**
Mail-list management
- 150 MacPhase 1.2**
Scientific data visualization
- 150 EISToolKit 2.0**
Executive information system
- 152 The UnMouse**
Input device
- 152 DEClaser 1152**
PostScript laser printer
- 154 TimeVision 1.0**
Personal scheduler and organizer

- 154 Comprehensive Review in Biology**
Biology test review on CD ROM
- 156 Theorist 1.5**
Symbolic mathematics software
- 156 DiskFit Direct 1.0**
Backup utility
- 158 DayMaker 2.0**
Time-management software
- 158 RightWriter for the Mac 5.0**
Writing tool
- 160 Tree**
Tree-drawing software
- 160 itthink 2.2.1**
Dynamic-systems modeling
- 162 CPM Graphic Tutor 1 & 2**
Training software
- 162 Expert Home Design**
Interior-design software
- 164 Monkey Island 2: LeChuck's Revenge**
Adventure game
- 164 Star Trek: The Screen Saver**
Screen saver
- 166 Data Desk 4.0**
Statistical analysis
- 166 Algebra**
Math tutorial
- 168 LapTrack For the Mac 1.0b**
Time and expense accounting
- 168 L-TV**
NTSC interface board
- 174 Who Killed Sam Rupert**
Murder-mystery game
- 174 Sherlock Holmes, Consulting Detective, Volume II**
CD ROM detective game



Page 112



Page 64



Page 64



Page 64

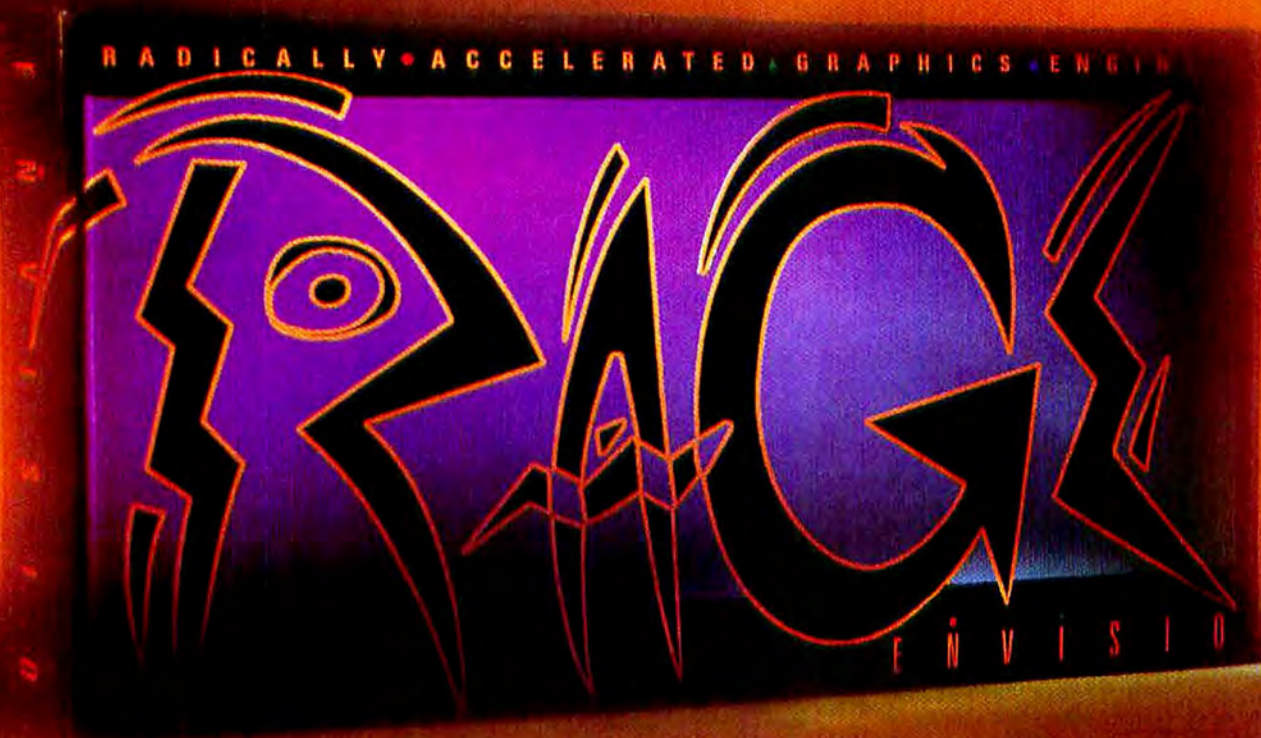
DEPARTMENTS

- 20 How to Contact Macworld**
- 23 MacBulletin**
- 25 State of the Mac**
BY ADRIAN MELLO
Grading the new Macs
- 29 Letters**
- 37 The Iconoclast**
BY STEVEN LEVY
Virtual butlers, elves, and secretaries
- 45 Conspicuous Consumer**
BY DEBORAH BRANSCUM
The case of DigitalFilm
- 61 Lab Notes**
BY MARK HURLOW
- 64 News**
BY DAN LITTMAN AND TOM MORAN
- 177 The Desktop Critic**
BY DAVID POGUE
Fiction on CD ROM
- 181 New Products**
- 187 How To/Quick Tips**
BY LON POOLE
- 195 How To/Getting Started**
BY JIM HEID
File formats
- 205 PowerBook Notes**
BY CARY LU
Modem maneuvers
- 215 Star Ratings**
- 308 Best-Sellers**



May 1993, Volume 10, Number 5 Macworld (ISSN 0741-8647) is published monthly by Macworld Communications, Inc., 501 Second St., San Francisco, CA 94107. Subscription rates are \$30 for 12 issues, \$60 for 24 issues, and \$90 for 36 issues. Foreign orders must be prepaid in U.S. funds with additional postage. Add \$18 per year for postage for Canada and Mexico subscribers. Add \$69 per year for foreign postage to all other countries. Second-class postage paid at San Francisco, California, and at additional mailing offices. Postmaster: Send address changes to Macworld, P.O. Box 54529, Boulder, CO 80323-4529. Editorial and business offices: 501 Second St., San Francisco, CA 94107, 415/243-0505. Printed in the U.S.A.

RAGE.



\$2499

RAGE, 24-bit graphics & application accelerator

RAGE has it all!

Macintosh Graphics Accelerator Comparison	RAGE	Thunder II Light	PrecisionColor 24X	BlasterOps 24XL
33 MHz RISC Processor	✓	-	-	-
QuickDraw Acceleration	✓	✓	✓	✓
On-the-fly resolution switching	✓	✓	✓	✓
31" display support	✓	✓	✓	✓
G-World support	✓	✓	-	✓
Pin & Zoom	✓	✓	-	✓
Photoshop Acceleration	✓	✓	-	-
16-bit QuickTime mode	✓	-	✓	✓
Accelerates text	✓	✓	-	-
Text modes accelerated	8	6	-	-
CopyBits modes accelerated	6	2	1	1
Price	\$2,499	\$3,699	\$1,099	\$2,499

When SuperMac introduced the Thunder/24 card, they set a new standard for graphics acceleration: high performance, high price. • So when Envisio set out to design a new graphics card, we knew it had to be in Thunder's performance league, without the heavy price tag. • Introducing RAGE™. RAGE is Envisio's Radically Accelerated Graphics Engine that delivers explosive QuickDraw acceleration and expandable application acceleration. At the heart of RAGE is a 33 MHz RISC processor. It provides radical increases in real-world throughput because

OUTRAGE.



\$3699

SuperMac Thunder II Light

Thunder/24 box pictured. Thunder II Light was not available.

RAGE accelerates most QuickDraw operations, not just a few laboratory benchmarks. (Believe it or not, some other cards don't even accelerate the drawing of text! See chart.) ■ But RAGE goes beyond QuickDraw acceleration by accelerating specific applications. RAGE's RISC-based design makes accelerating applications as easy as adding system extensions, called Expert™ modules. Our Expert module for Adobe PhotoShop accelerates the most frequently used functions and filters, and comes bundled with every RAGE. • And as you'd expect, RAGE supports displays up to 21", has G-World and block-mode transfer support, and has hardware pan and zoom and on-the-fly resolution switching. ▲ Visit your local Envisio dealer today for a RAGE demonstration.

E N V I S I O

2640 PATTON ROAD • ST. PAUL MINNESOTA 55113 • TELEPHONE 612 628 6288 FAX 612 633 1083 APPLE LINK: ENVISIO

Circle 256 on reader service card

AnthroCart®



LOTS OF SIZES
AVAILABLE

HOLDS 150 LBS.

ADJUSTABLE

OVER 40
ACCESSORIES
TO ADD



Call for a free catalog:
800-325-3841

6:30 AM - 5:00 PM, PST, M-F

Anthro Corp. • 3221 NW Yeon St., Portland, OR 97210 • (503) 241-7113 • FAX: (503) 241-1619

AnthroCart®



MOBILE

ADJUSTABLE

INCREDIBLY
STRONG

LIFETIME
WARRANTY



Call for a free catalog:
800-325-3841

6:30 AM - 5:00 PM, PST

Anthro Co. • 3221 NW Yeon St., Portland, OR 97210 • (503) 241-7113 • FAX: (503) 241-1619

MACWORLD

PRESIDENT/CEO AND PUBLISHER	James E. Martin
MACWORLD COMMUNICATIONS, INC.	
ASSISTANT TO THE PRESIDENT	Terri Edelman
CHIEF OPERATING OFFICER	
MACWORLD MAGAZINE	Colin Crawford
ASSISTANT TO THE COO	Yuen Yeh
PRESIDENT/CEO	
A+ PUBLISHING DIVISION	Paul Boulé
PRESIDENT/COO	
MACWORLD CD ROM PUBLISHING VENTURES	Dan Orum
VICE PRESIDENT/BUSINESS DEVELOPMENT	Lindsay Davidson
DIRECTOR OF FINANCE	Vicki Peilen
DIRECTOR OF HUMAN RESOURCES	Shelly Ginenthal
DIRECTOR OF INFORMATION SYSTEMS	Walter J. Clegg
CORPORATE BUSINESS MANAGER	Christina W. Spence
ACCOUNTING/OPERATIONS MANAGER	Pat Murphy
ACCOUNTING/FACILITIES MANAGER	Michelle Reyes
SENIOR FINANCIAL ANALYST	Madeleine Buckingham

MACWORLD is a publication of International Data Group, the world's largest publisher of computer-related information and the leading global provider of information services on information technology. International Data Group publishes over 190 computer publications in 58 countries. Thirty million people read one or more International Data Group publications each month. International Data Group's publications include: ARGENTINA'S Computerworld Argentina, Infoworld Argentina; ASIA'S Computerworld Hong Kong, PC World Hong Kong, Computerworld Southeast Asia, PC World Singapore, Computerworld Malaysia, PC World Malaysia; AUSTRALIA'S Computerworld Australia, Australian PC World, Australian Macworld, IDG Sources; AUSTRIA'S Computerwelt Oesterreich, PC Test; BRAZIL'S Computerworld, Mundo IBM, Mundo Unix, PC World, Publish; BULGARIA'S Computerworld Bulgaria, Ediworld, PC World Bulgaria; CANADA'S Direct Access, Graduate Computerworld, InfoCanada, Network World Canada; CHILE'S Computerworld, Informatica; COLOMBIA'S Computerworld Colombia; CZECH REPUBLIC Computerworld Czechoslovakia, PC World Czechoslovakia; DENMARK'S CAD/CAMWORLD, Communications World, Computerworld Danmark, Computerworld Focus, Computerworld Uddannelsen, LOTUS World, Macintosh Produktkatalog, Macworld Danmark, PC World Danmark, PC World Produktguide, Windows World; ECUADOR'S PC World; EGYPT'S PC World Middle East; FINLAND'S Mikro PC, Tietoviikko, Tietoverkko; FRANCE'S Distributique, Golden, InfoPC, Languages & Systems, Le Guide du Monde Informatique, Le Monde Informatique, Telecoms & Reseaux; GERMANY'S Computerwoche, Computerwoche Focus, Computerwoche Extra, Computerwoche Karriere, edv aspekte, Information Management, Macwelt, Netzwerk, PC Welt, PC Woche, Publish, Unit; HUNGARY'S Computerworld SZT, PC World; INDIA'S Computers & Communications; ISRAEL'S Computerworld Israel, PC World Israel; ITALY'S Computerworld Italia, Lotus Magazine, Macworld Italia, Networking Italia, PC World Italia; JAPAN'S Computerworld Japan, Macworld Japan, SunWorld Japan; KENYA'S East African Computer News; KOREA'S Computerworld Korea, Macworld Korea, PC World Korea; MEXICO'S Compu Edicion, Compu Manufactura, Computacion/Punto de Venta, Computerworld Mexico, MacWorld, Mundo Unix, PC World, Windows; THE NETHERLANDS' Computer! Totaal, LAN Magazine, Lotus World, MacWorld Magazine; NEW ZEALAND'S Computer Listings, Computerworld New Zealand, New Zealand PC World; NIGERIA'S PC World Africa; NORWAY'S Computerworld Norge, C/world, Lotusworld Norge, Macworld Norge, Network, PC World Ekspres, PC World Norge, PC World's Product Guide, Publish World, Student Data, Unix World, Windowsworld, IDG Direct Response; PANAMA'S PC World; PERU'S PC World; PEOPLE'S REPUBLIC OF CHINA'S China Computerworld, PC World China, IDG Shenzhen, Electronics International, IDG HIGH TECH New Product World, Consumer Electronics New Product World; PHILIPPINES' Computerworld, PC World; POLAND'S Computerworld Poland, PC World/Komputer; PORTUGAL'S Macin; ROMANIA'S Infocub Magazine; RUSSIA'S Computerworld-Moscow, PC World, Networks; SLOVENIA'S Monitor Magazine; SOUTH AFRICA'S Computing S.A.; SPAIN'S Amiga World, Autoedicion, Computerworld Espana, Comunicaciones World, Macworld Espana, Network World, PC World Espana, Publish, Sunworld; SWEDEN'S Attack, ComputerSweden, Corporate Computing, Lokala Natverk/LAN, Lotus World, MAC&PC, Macworld, Mikrodatorn, PC World, Publishing & Design (CAP), Datalingenjoren, Maxi Data, Windows; SWITZERLAND'S Computerworld Schweiz, Macworld Schweiz, PC & Workstation; TAIWAN'S Computerworld Taiwan, Global Computer Express, PC World Taiwan; THAILAND'S Thai Computerworld; TURKEY'S Computerworld Monitor, Macworld Turkey, PC World Turkey; UNITED KINGDOM'S Lotus Magazine, Macworld, Sunworld; UNITED STATES' AmigaWorld, Cable in the Classroom, CD Review, CIO, Computerworld, Desktop Video World, DOS Resource Guide, Electronic News, Federal Computer Week, Federal Integrator, GamePro, inCider/A+, IDG Books, InfoWorld, InfoWorld Direct, Laser Event, LOTUS, Macworld, Multimedia World, Network World, NeXTWORLD, PC Games, PC Letter, PC World, Publish, SunWorld, SWATPro, Video Event; VENEZUELA'S Computerworld Venezuela, MicroComputerworld Venezuela.

Does this remind you of your system folder?



Are you the sort of person who accumulates fonts, DAs and sounds as though they were going out of style?

If you are, then your system folder is as crowded as this closet.

And almost as organized.

Which is no great problem, as long as you don't mind scrolling through menus that disappear off the bottom of your screen.

But if you think scrolling is for Ancient Greeks, it's time you did what over 250,000 people have done before you.

Get out of the closet. And get into Suitcase.

Suitcase is the award-winning utility that makes it easy to sensibly organize and promptly access your rapidly growing collection of fonts, DAs, FKEYs and sounds.

Which means you can spend more time using them and less time—a lot less—rummaging around looking for them.

You'll also spend a lot less time accessing new fonts from within applications—especially if you have System 7.

Because System 7 still makes you quit and re-start your applications before you can use a fresh font.

Suitcase doesn't.

And System 7 hasn't got a clue about which fonts you were

using during your last session.

Suitcase does. And loads them for you automatically the next time you switch on your Mac.

You can pack each suitcase with just a single font or as many as 800 of them, up to 64 DAs or any

number of FKEYs and sounds.

You can also group suitcases into sets, then summon all the luggage that belongs with a particular project at the click of a mouse.

Tips are optional. But here's one for those who have neither the time nor the patience for resolving font ID conflicts.

Get Suitcase. It eliminates them. Along with a lot of wasted disk space.

That's right, Suitcase compresses your screen font and sound files by as much as 60%.

It even lets you park your screen and printer fonts on a server for all to share, making each disk on the network that much more spacious.

Like all Fifth Generation products, Suitcase is backed by our one-year money-back guarantee

and our vaunted 24-hour toll-free customer support.

Finding out more about Suitcase is also toll-free. So pick up the phone and dial 1-800-477-8212.

Ask for Housekeeping.

Aachen

Adrian

Avant Garde

Baskerville

Berkeley

Bodoni

Bookman

Caledonia

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago

Chicago



FIFTH GENERATION SYSTEMS, INC

Outside U.S. & Canada
call: (414) 494-4422/23

Circle 135 on reader service card

YOU'RE ABOUT TO MAKE THE PRESENTATION OF YOUR LIFE—TO A MAJOR PROSPECT WHO DOESN'T KNOW YOU, YOUR FIRM OR YOUR PRODUCTS. YOU BETTER HAVE THE RIGHT TOOLS.

The same old dog-and-pony-show just won't cut it.

It isn't what you've been saying, it's how you've been saying it—and, in this case, how you say it just might separate you from the competition.

So you remember hearing about this unique program that enables just about anyone with a Macintosh® or Windows™ PC to replace static, uninspired overheads with a persuasive, multimedia presentation.

You know that's exactly what you need to do. And Macromedia™ wants to help you do it.

PRESENTING ACTION!® FOR WINDOWS AND MACINTOSH.

This could change everything.

Unlike other presentation software, Action! was built from the ground up to help you create dramatic on-screen presentations with video, animation,

voice-overs, music, sound effects, motion, graphics and text.

Yet, Action! uses the same metaphors as traditional slide-based presentation packages, so you won't have

to learn everything all over again.

In fact, you can take any presentation created in Harvard Graphics, PowerPoint, Persuasion or Freelance and add impact with Action! All of which means you won't lose the time and effort you've invested in other programs.

So, whether you start with an existing slide-based presentation, one of our professionally designed templates, or a blank Action! scene, there's no easier way to express your ideas with all the drama of multimedia.

Since we've also included a sampling from our ClipMedia™ library of sounds, graphics and animations, you'll be making noise with your very first Action! production.



HOW TO MAKE A MOVING PRESENTATION.

It's tough to move an audience with a dull performance. Fortunately, you won't have that problem with Action!

Graphic elements fly on and off the screen. Text enters where and when it's needed to make a point. Scenes change smoothly with colorful, creative transitions.



Charts generated from spreadsheets and hot-linked into Action! come to life with motion and animated effects. And QuickTime®, Video for Windows™ or Indeo™

movies communicate ideas clearly and powerfully.

Because involving an audience is the best way to convey your message, we've also made it easy to add interactivity. In fact, anything on the screen can serve as an interactive button to control the flow of your presentations.

LIGHTS, CAMERA, THIS MUST BE ACTION!

You can't involve an audience you can't reach. Which is why Action! provides so many ways to deliver your ideas.

You can play your presentations on a notebook, laptop or desktop computer and—for delivery in group settings—connect them to a standard color monitor, LCD projection panel, projection video or large screen monitor.



Action's Content List, Scene Sorter and drawing tools are familiar to anyone who's ever used slide-based presentation programs, while the powerful multimedia tools, including the Timeline and Control Panel, are even easier to master.

“Action! may do for the multimedia PC what Pagemaker did for desktop publishing. (It's) a must for anyone who needs to throw together presentations with minimum effort and maximum punch.”

Computer Shopper, January 1992

“Of the multimedia-integration programs now available, Action! gives you the richest selection of features and is one of the easiest to master.”

MacWorld, February 1993

“(Action!s) greatest strength is that it allows regular businesspeople to apply multimedia as they see fit.”

PC/Computing, December 1991



Action! 2.5 for Windows offers many exciting new features, including data-driven motion charts with DDE links, as well as support for the newest digital video formats.

Action! is a registered trademark, and ClipMedia, Macromedia and the Macromedia logo are trademarks of Macromedia, Inc. All other registered marks and trademarks are the property of their respective companies. ©1993 Macromedia, Inc. All rights reserved.

Of course, you can also print to paper when you need to produce a hard copy leave-behind.

You can even *present* without being present. That's because both the Mac and Windows versions of Action! include runtime players that allow you to distribute presentations or demos via floppy disks and over networks. And with the addition of an inexpensive video card, you can print to video and play your presentation on any VCR.

FOR EVERY ACTION! THERE'S A REACTION.

The best way to learn about Action! for Windows or Action! for Macintosh is to try them for yourself.

So call 1-800-945-9063 for more information and a copy of our \$9.95 Interactive Demo Disk. (Outside the US and Canada, please fax 415-626-0554 or call 415-252-2000 and add \$15 [US] for shipping and handling.) Then get your own full copy of Action! and create the presentation of your life.

Because all you need are the right tools.



TOOLS TO POWER YOUR IDEAS.

YOU HAVE YOUR POWERBOOK™

YOU'RE AT YOUR HOTEL.

THEY HAVE DOS PRINTERS.

YOU NEED TO PRINT NOW!

YOU NEED **POWERPRINT™**

Now you can print from your Macintosh™ to over 1,000 DOS printers.

PowerPrint provides you with everything you need to print on almost any PC compatible printer. Using our cable-and-software package, you can access just about any other laser, inkjet or dot matrix printer. So whether you are in the office, at home or on the road, you can now print documents on printers that were useless to you before.

Why pay hundreds of dollars on a new printer when all you need is PowerPrint for under \$150? Call 800-663-6222 to place your order or talk to our technical staff about your printing needs.

PowerPrint Features Include:

Support for dot matrix, inkjet, & laser printers.

Both software and cable.

Compatibility with System 7™, TrueType™, Adobe Type Manager™, A/UX®, etc.

Support for most portable printers including Hewlett Packard DeskJet Portable® & Canon BJ-10ex®.

Built-in spooling, reduction, enlargement, custom paper sizes, etc.

No need for external power supplies.

Now introducing PowerPrint/LT™!

PowerPrint/LT enables Macs to use PC compatible printers on any LocalTalk network. PowerPrint/LT comes with all necessary hardware, adapters and software.

GDT Software, Inc.
4664 Lougheed Highway
Suite #188
Burnaby, BC
Canada V5C 6B7

800-663-6222
604-291-9121
604-291-9889 (fax)
AppleLink:GDT.MK

All product names are trademarks or registered trademarks of their respective holders.

PowerPrint™

THE MACINTOSH PRINTING SOLUTION™

Circle 42 on reader service card

MACWORLD

EDITOR-IN-CHIEF

Adrian Mello

EDITORIAL

SENIOR EDITOR/DEPARTMENTS	Deborah Branscum
SENIOR EDITOR/FEATURES	Cheryl England
SENIOR EDITOR/REVIEWS	Carol Person
LAB MANAGER	Lauren L. Black
DIRECTOR OF EDITORIAL OPERATIONS	Jane Lagas
SENIOR ASSOCIATE EDITOR/FEATURES	James A. Martin
SENIOR ASSOCIATE EDITOR/FEATURES	Charles Piller
ASSOCIATE EDITOR/DEPARTMENTS	Cathy E. Abes
ASSOCIATE EDITOR/FEATURES	Elizabeth Dougherty
ASSOCIATE EDITOR/FEATURES	Galen Gruman
ASSOCIATE EDITOR/LAB	Mark Hurlow
ASSOCIATE EDITORS/NEWS	Dan Littman, Tom Moran
ASSISTANT EDITORS/REVIEWS	Marjorie Baer, Wendy Sharp
ASSISTANT EDITOR/NEW PRODUCTS	Cameron Crotty
ASSISTANT EDITOR	Suzanne Courteau
ASSISTANT EDITORS/LAB	Matthew R. Clark, Tim Warner
EDITORIAL ASSISTANTS	Jim Feeley, Joanna Pearlstein, Gideon Yaffe
ADMINISTRATIVE ASSISTANTS	Lyn Taylor, Marisa DeFay
ASSISTANT TO THE EDITOR-IN-CHIEF	Susan P. Grant-Marsh
CONTRIBUTING EDITORS	Robert C. Eckhardt, Erfert Fenton, Jim Heid, Steven Levy, Cary Lu, Joe Matazzoni, Deke McClelland, Tom Negrino, David Pogue, Lon Poole, Steve Roth, Charles Seiter, Suzanne Stefanac, Franklin N. Tessler, Bruce F. Webster

INTERNATIONAL EDITORS

Alan Jones, Australia, 011 61 2 439-5133;
Marianne Fajstrup, Denmark, 011 4536 44 28 00;
Jean Cassagne, France, 011 33 1 49 04 79 00;
Stephan Scherzer, Germany, 011 49 89 3 60860;
Giulio Ferrari, Italy, 011 39 2 58 011660;
Osamu Honma, Japan, 011 81 03 5276-0541;
Shin Cho, Korea, 011 82 2 579-8031;
Paul Molenaar, Netherlands, 011 31 23 354554;
Bernhard Steen, Norway, 011 47 2 647 725;
Alvaro Ibariez, Spain, 011 34 1 319 4014;
Fredrick Landergren, Sweden, 011 46 8667-9180;
Roger Bataillard, Switzerland, 011 41 1 55 1077;
Cemal Balci, Turkey;
Peter Worlock, United Kingdom, 011 4471 831-9252

COPY EDIT AND EDITORIAL PRODUCTION

MANAGING EDITOR	Charles Barrett
ASSISTANT MANAGING EDITORS	Luis A. Camus, Ruth Henrich
SENIOR COPY EDITOR	Katherine L. Ulrich
COPY EDITORS	D. Jacqueline Kan, Paul M. King, Felicity O'Meara
PRODUCTION EDITORS	Lisa Brazieal, Doreen Engelmann

ART AND DESIGN

DESIGN DIRECTOR	Dennis McLeod
ART DIRECTOR	Joanne Hoffman
SENIOR DESIGNER	Leslie Barton
SENIOR DESIGNER/INFORMATIONAL GRAPHICS	Arne Hurty
ASSOCIATE ART DIRECTOR	Kent Tayenaka
ASSISTANT ART DIRECTOR	Sylvia Benvenuti
DESIGNER	Hae Yuon Kim
ASSOCIATE DESIGNER	Tim Johnson
DESIGN ASSOCIATES	Belinda Chlouber, Martha Katt

First the Knoll Brothers created Adobe PhotoshopTM...

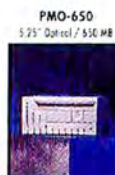
"The new Pinnacle Optical drives are
excellent companions to Photoshop."
John Knoll

"The PMO-650 is the ideal storage
device for large images."
Thomas Knoll



...and now they store it on Pinnacle Optical Hard Drives.

(Mom would be proud.)



(800) 553-7070



Trademark Owners: PMO-130, PMO-650, PMO-10GB, PMO-20GB, PMO-60GB, PMO-93GB and Pinnacle Micro are trademarks of Pinnacle Micro, Inc. © 1993. Adobe Photoshop is a trademark of Adobe Systems, Inc. which may be registered in certain jurisdictions.

PINNACLE MICRO

19 Technology • Irvine, CA 92718 • U.S.A. • Int'l (714) 727-3300 • Fax (714) 727-1913

THE OPTICAL STORAGE COMPANY[®]

Circle 238 on reader service card

MOTHER NATURE
WILL FOREVER CHANGE
THE GRAND CANYON.
FOTOFLOW™ WILL
FOREVER KEEP IT
THE SAME.

Change may be part of nature, but it shouldn't be part of color desktop publishing.

Now Agfa introduces FotoFlow, a color management family of products

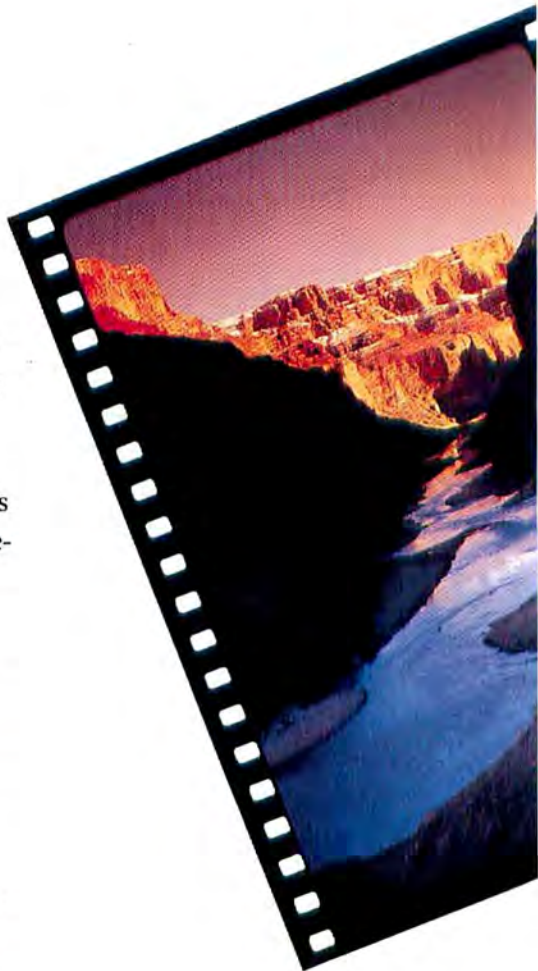
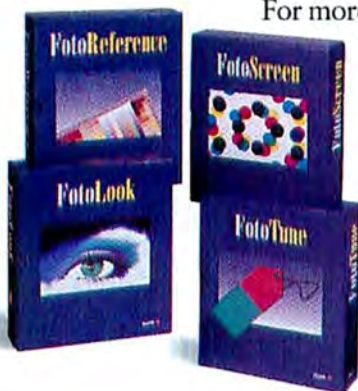
that's device-independent and designed to automatically deliver consistent color throughout every step of your open desktop system.

FotoFlow automates the translation of colors from one device to another, guaranteeing color fidelity from input to output. Which saves you time and increases productivity.

The secret to consistent color is FotoFlow's four powerful modules. FotoTune™ lets you easily define the color characteristics of each device (input, monitor, storage, output, even other color management systems) and accurately transfers color images from one device to another. FotoLook™ turns your Agfa RGB scanner into a CMYK scanner "on-the-fly" and automates the scanning process. FotoReference™ includes IT/8 reference targets as a universal standard providing accurate color data measurement. And FotoScreen™ turns your Agfa output device into an electronic camera.

For more information on this productive color management system, and to receive a free IT/8 reference target poster, call 1-800-685-4271 today.

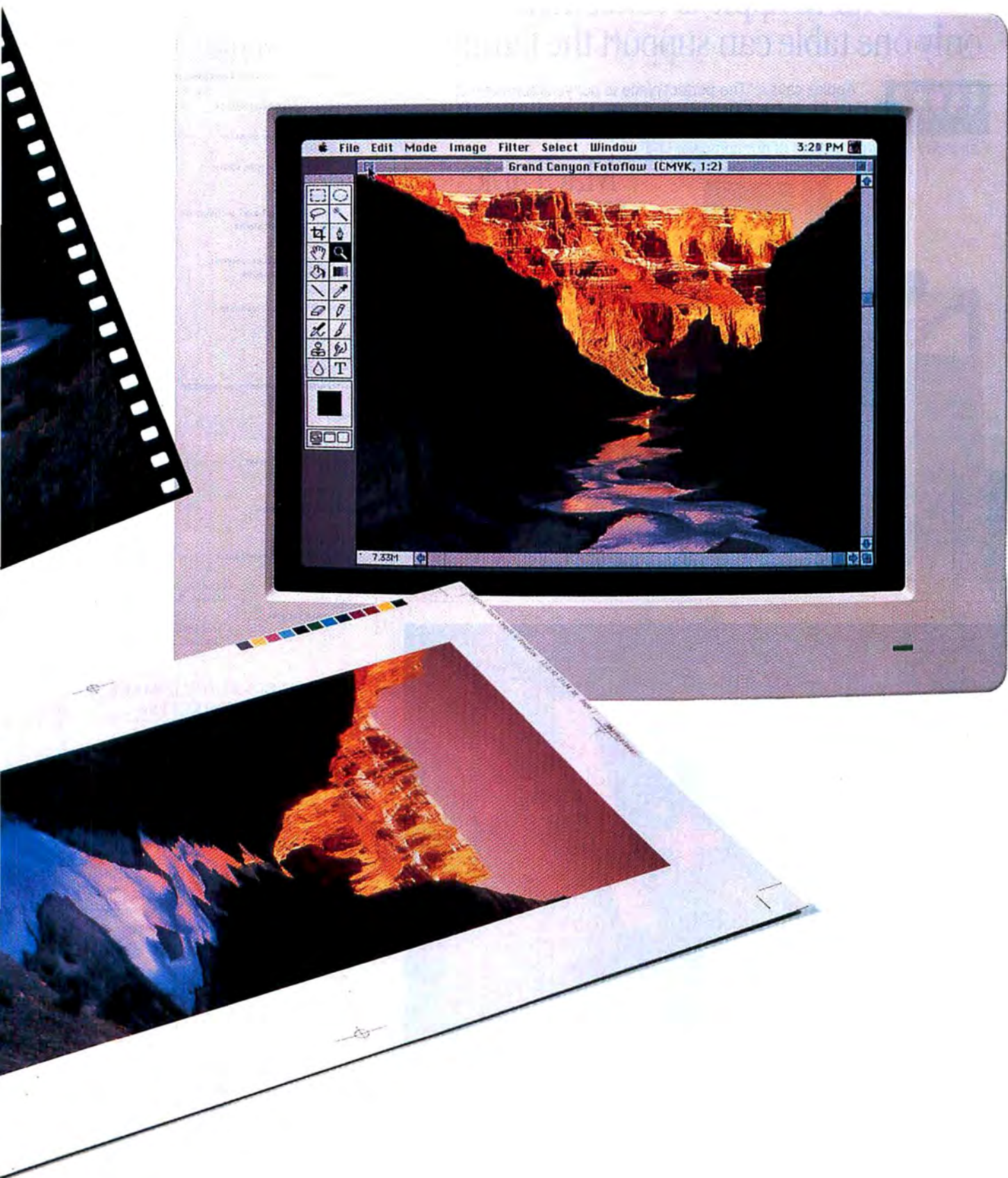
Because the one thing that surpasses the ever-changing wonder of nature is the never-changing color quality of FotoFlow.



AGFA 

The complete picture.

AGFA and the Agfa rhombus are registered trademarks of Agfa-Gevaert AG. FotoFlow, FotoTune,



FotoLook, FotoReference and FotoScreen are trademarks of Agfa-Gevaert N.V., Mortsel-Belgium.

Circle 83 on reader service card

As far as Apple is concerned, only one table can support the family.



Apple® calls it "The perfect place to put your computer to work." It's sturdy, ergonomic and carefully designed around Apple's modular footprint to fit the Mac family *plus* peripherals. Call today for a free catalog of our complete line.

MacTable®
800-722-6263
or 206-481-5434 in WA state



ScanCo

P.O. Box 3217, Redmond, WA 98073-3217

MacTable design is patent pending.
MacTable is a trademark of Scandinavian Computer Furniture, Inc. Apple is a trademark of Apple Computer, Inc.

CRUNCH

PowerPad™ turns your PowerBook into a numeric powerhouse, with powerful features other key pads can't match:

- Interchangeable "+" and "enter" keys
- New desk accessory, 10Key Tape, updates the traditional paper tape
- Extra ADB port for adding a mouse or other input device
- 24-inch detachable cable
- 15 function and 4 cursor keys
- Hard cover protects keys

It's the number cruncher's dream.
For your nearest PowerPad dealer, call
Sophisticated Circuits at (800) 827-4669.



POWER



POWERPad

© 1992, Sophisticated Circuits, Inc.
Phone: (206) 485-7979, FAX: (206) 485-7172
PowerPad is a trademark of Sophisticated Circuits.
PowerBook is a registered trademark of Apple Computer, Inc.

Circle 237 on reader service card

MACWORLD

ADVERTISING SALES

VICE PRESIDENT/DIRECTOR OF ADVERTISING SALES	Shannon Dolan (415/243-0505)
ASSOCIATE ADVERTISING DIRECTOR	William P. Peck (415/243-0505)
NORTHWEST REGIONAL MANAGER	Linda Holbrook (415/974-7440)
NO. CALIFORNIA (SAN JOSE, SOUTH)	Cherie La France (415/243-0505)
SALES ASSOCIATE	Tami Fielteau
NO. CALIFORNIA (WEST BAY), WASHINGTON, WYOMING, WESTERN CANADA	Regina T. Salaices (415/978-3155)
SALES ASSOCIATE	Edward Ramirez
NO. CALIFORNIA (EAST BAY, MARIN), IDAHO, MONTANA, OREGON	Suzanne Young Saluti (415/978-3262)
SALES ASSOCIATE	Debbie Burnett
SOUTHWEST REGIONAL MANAGER	Nancy Coy (714/250-1307)
SO. CALIFORNIA	Cathi T. Bledsoe, Jill Nightingale
SALES ASSOCIATE	Rachel Gillis
EASTERN/MIDWEST ADVERTISING MANAGER	Bill Thompson (201/967-1350)
MIDWEST/TEXAS	Lisa Ladle (708/827-4477)
SALES ASSOCIATE	Stacey Holman
MID-ATLANTIC/SOUTHEAST	Annette Osnos (201/587-0090)
SALES ASSOCIATE	Cathy Langhaar
NEW ENGLAND/FLORIDA	Joan Flynn (508/879-0700)
SALES ASSOCIATE	Susan Cardoza
MANAGER DIRECT RESPONSE SALES	Beverly Schneider (415/978-3138)
ACCOUNT MANAGERS	Wendi A. Smith (415/978-3117), Marsha Bowers (415/974-7413)
MAIL ORDER	Niki Stranz (415/978-3105), Carol Johnstone (415/978-3152), Shannon Smith (415/974-7414)
MACWORLD SHOPPER	

INTERNATIONAL SALES AND MARKETING

DIRECTOR OF MARKETING AND COMMUNICATIONS	Kimberlee A. Luedde
PROMOTION MANAGER	Lisa McKeon
ACCOUNT MANAGER	Christine Wong (415/978-3160)

MARKET RESEARCH

VICE PRESIDENT/DIRECTOR OF RESEARCH	Gary L. Rocchio
RESEARCH ANALYST	Peter Summersgill

MARKETING

VICE PRESIDENT/MARKETING AND CIRCULATION	Lindsay Davidson
MARKETING AND CIRCULATION ASSISTANT	Deirdre Dugan
EDITORIAL PROMOTION MANAGER	Anne Nichols
SALES DEVELOPMENT MANAGER	Fred Waugh

CIRCULATION

SINGLE-COPY SALES DIRECTOR	George Clark
SUBSCRIPTION MANAGER	Lori Hitchcock
NEWSSTAND SALES MANAGER	Martin Garchar
SUBSCRIPTION PLANNING MANAGER	Elizabeth Jensen
SUBSCRIPTION MARKETING MANAGER	Susanna Camp
SUBSCRIPTION ASSISTANT	Kelvin Gee

PRODUCTION

VICE PRESIDENT/DIRECTOR OF MANUFACTURING	Anne Foley
PRODUCTION MANAGER	Cynthia Mazzola
BILLING INFORMATION MANAGER	So Fong Yip
ASSISTANT PRODUCTION MANAGER	Arlene Crosland
PRODUCTION ASSISTANT	Gary Silverstein

THE WORD PROCESSOR EVERYONE'S BEEN WAITING FOR

Introducing MacWrite® Pro. The all new version of the essential Macintosh word processing program.

From memos and letters to newsletters and brochures, MacWrite Pro gives you all the tools you need to create stunning documents that deliver real impact in a matter of minutes.

You can format long documents using sections featuring columns of different sized widths and even their own multiple headers and footers.

Add frames for text, graphics, tables or notes anywhere you like. Resizing margins or columns is as simple as clicking and dragging your mouse.

You can save styles for automatic formatting of both characters and paragraphs. And use floating text, tool and style palettes for one-click access to all the tools you need.

MacWrite takes on a new life in MacWrite Pro. Now anyone can create dazzling, impactful documents like this one in a matter of minutes.

Import graphics and wrap text around them. Share live text and graphics using Publish & Subscribe. Even read and save your documents in Word, WordPerfect and many

other Macintosh and PC word processing formats. And much more.

Order today. At a price like this, there's no reason to wait.

\$69

Upgrade



Insert
MacPaint®,
PICT, EPS®
or TIFF
images

Place text,
graphics, table
or note frames
anywhere on
the page.

Additional Features	MacWrite Pro
One-step presentation tables	X
Text notes and sound messages	X
Character tracking	X
Multi-lingual spell checking	X
Auto-save and auto-backup	X
Word count and other document statistics	X

• This document was created in MacWrite Pro. Surprised? Don't be. •

Upgrade or Trade Up Today. Call 1-800-544-8554.

CLARIS®

Simply powerful software.™



MacWrite Pro

Macintosh word processing with impact.

MAC DIRECT

Monitor Special

Sampo 19" Color ..\$1298

- Two Page displays
- Perfect for DTP & CAD/CAM
- Include Interface cards

Trinitron 20" Color ..\$1998

Full Page Display.....\$398



14" SONY Trinitron.....\$428

- SONY 1302 for the Mac LC.



16" SONY Trinitron...\$1098

- Plug compatible with the Quadra
- Plug compatible with the CI, SI and LC at 640x480

SAMPO 19" Color System 1298.00



Sampo 19" 8 Bit Color System\$1298.00

24 Bit Color System\$1998.00

Mono System\$698.00

Grey Scale System\$998.00

- The SAMPO is a high quality dual page display without the high cost!
- Includes 1 bit, or 8 bit Bit Video board and cable
- 2 page display supports all Mac IIs, the SI, SE-30, SE and the LC

Trinitron 20" Color System

8 Bit Quadra compatible\$1998.00

24 Bit System with RasterOps 24Li\$2898.00

- RasterOps 8x1 board available for all Macs
- The Trinitron-20 is a 20" monitor incorporating Sony's patented technology and one of our best buys! True Trinitron color at a great price!
- Includes 8 bit or 24 Bit Video board and cable
- 2 page display supports all Mac IIs, the SI, SE-30, and the LC



20" Trinitron System

- 8 Bit Quadra system\$1998
- With 24 Bit interface\$2898



14" Sampo Color.....\$378

- Plug compatible with the IISI, CI, and the LC

Samsung 300 Upgradeable to 1200 dpi RISC based PostScript printer

SAMSUNG 300 dpi Printer\$1298.00

1200 DPI Upgrade (Available in May)\$998.00

- Incredible 1200 dpi upgradeability allows for future growth
- SAMSUNG is one of the worlds largest electronics companies!
- Includes PostScript and PCL-5 compatibility
- Intensely fast Intel i960 RISC processor

UMAX 600 DPI Color Scanner

Umax UC-630 With PhotoShop.....\$1098.00

Umax UC-840 With PhotoShop.....\$1298.00

Transparency/Slide Scanner Option.....\$728.00

Automatic Document Feeder.....\$498.00

- Rated four mice by MacUser (Dec '91) • Rated fastest by MacUser (Dec '91)
- "Boasts the highest vertical resolution..." "Umax produced the best images..." "excel(s) in speed and color accuracy" MacUser

Umax UC-1200S With PhotoShopCALL

Transparency/Slide Scanner Option.....\$798.00

- Incredible 1200 dpi scanning res. recognizes 1 billion colors internally
- Single-pass design increases scanning speed
- Includes Adobe Photoshop

Umax 600DPI Greyscale With Typereader OCR

Software, Ofoto and Publish It,\$898.00

- An incredible OCR package with over \$1000 in software alone,

Scanner Special

Umax UC-630.....\$1098

With Photoshop

- Rated 4 Mice by MacUser
- Rated Fastest by MacUser
- 8 1/2 x 14 Scanning area

Umax UC-840.....\$1298

With Photoshop



MAC DIRECT
Specialists in Mac Storage

60 East Chestnut - 145, Chicago, IL 60611
Visa, Mastercard, Amex, COD, Telecheck Approved Checks, Gov., Corp., Univ., P.O.s welcome. All new drives, preformatted with latest stable system software. Factory warranty. Bracket, cables and software included. 30 Day Money back Guarantee covers drive products only. Return Authorization number required for returns. Prices, terms and availability subject to change without notice.

800-621-8462

Hours: 8:30 - 8:00 CST,
Saturdays 10:00 - 4:00
Technical Service and
Order Tracking (8:30-5:00)
312-664-8225

Fujitsu Specials

520mb Internal.....\$898
1.2Gig Int.....\$1388
2.4Gig Int.....\$2498

- MacWorlds Editors Choice
- 5 Year Warranty
- MacWorlds fastest Gig!

MAC DIRECT

Specialists in Mac Storage

Conner The Drive That Apple Uses



For 2 years Conner has been one of Apples largest hard drive suppliers!

Conner Drives

	Internal	External
C 42 MB 3.5" LPS, 2 yr warr, 150,000 MTBF	\$178	\$228
C 85 MB 3.5" LPS, 2 yr warr, 150,000 MTBF	\$208	\$258
C 120 MB 3.5" LPS, 2 yr warr, 150,000 MTBF	\$258	\$318
C 170 MB 3.5" LPS, 2 yr warr, 150,000 MTBF	\$298	\$368
C 212 MB 3.5" LPS, 2 yr warr, 150,000 MTBF	\$378	\$448
C 540 MB 3.5", 8.5 ms, 4500 RPM, 2 yr Warr,	\$898	\$978

These new Conner drives are so reliable, that Conner has been one of Apples largest suppliers of drives. The 150,000 hours Mean Time Between Failure and the incredible speed of the 540 are just two reasons to buy a Conner.

Fujitsu Drives

	Internal	External
330 MB 3.5" 9ms, 5yr warr, 200,000 MTBF	\$848	\$898
425 MB 3.5" 9ms, 5yr warr, 200,000 MTBF, MacWorlds Editors Choice!	\$898	\$948
520 MB 3.5" 9ms, Fast SCSI, 5yr warr, 200,000 MTBF	\$898	\$968
1.1 Gig 3.5" 8.5ms, MB per sec transfer, 5yr warr, 300,000 MTBF,	\$1798	\$1898
1.2 Gig 5.25" 11.5ms, 5yr warr, (MacWorlds Fastest Gig)	\$1388	\$1478
2.06 Gig 5.25" 11.5ms, 5yr warr, (5,400RPM & Fast SCSI)	\$2348	\$2448
2.4 Gig 5.25" 11.5ms, 5yr warr, (5,400RPM & Fast SCSI)	\$2498	\$2598

Mean Time Between Failure is the average life expectancy of a drive.

The Fujitsu PicoBird 4 Drives 520, 425, & 330mb



Fast and Reliable!

The NuDesign 3.5" Optical MacWorlds Editors Choice



Optical Drives

NuDesign 3.5" 256mb Optical\$1798

NuDesign 3.5" 128mb Optical\$998

- MacWorlds Editors Choice! Nov. '92
- "Fast, inexpensive, good technical support, easy to use this is a rare combination of qualities for a storage device" (MacWorld)
- Includes cartridge

Ricoh 600mb HyperSpace..\$2598

- 28ms access time
- 1mb per sec transfer
- Read write reliable storage
- Includes cartridge
- Great for archiving, color scans, etc.

Toshiba 3.5" 1230mb & 877 mb CD ROM

	Internal	External
Toshiba 1230mb 3.5"	\$1398	\$1498
Toshiba 877mb 3.5"	\$1198	\$1298

- 12.5ms Average Seek Time • 256k cache • SCSI-2
- Internal for CI, Mac II, Quadra

Toshiba 3301.....\$538

- Includes driver CD carrier and cables
- 325ms access time
- MacWorld and MacUsers Highest Rated!

Quantum Drives

	Internal	External
42mb 3.5"	\$208	\$278
85mb 3.5"	\$228	\$298
127mb 3.5"	\$298	\$368
170mb 3.5"	\$338	\$388
240mb 3.5"	\$448	\$518
525mb 3.5"	\$998	\$1048

Toshiba 2.5" 213mb PowerBook drives

213mb 14ms PowerBook compatible drive\$698

- Put over 200mb into your PowerBook!
- The fastest and largest PowerBook drive available today
- Available with an external battery powered case for your standard 2.5" drive.

SyQuest Removables

44MB Removable.....\$388.00
88MB 5110c.....\$598.00

- 5110c reads and writes 44mb cartridges
- Both Drives include Cartridge
- 2 Year Warranty
- 19ms Access time

NuDesign DAT Drives

NuDesign Dat 2.1Gig capability
With SoftBackup\$998
With Retrospect.....\$1098

NuDesign 5.0 Gig Compression Dat
With SoftBackup\$1398
With Retrospect.....\$1498

800-621-8462

Hours: 8:30 - 8:00 CST, Saturdays 10:00 - 4:00
Order Tracking (8:30-5:00) 312-664-8225

Circle 58 on reader service card

The NuDesign DAT



NuDesign Dat 2.1 Gig capability
With SoftBackup\$998
With Retrospect.....\$1098

- Up to 2.1 Gig per tape
- Our best buy ever on DAT I
- Up to 10 mb per minute backup time
- Available with a complete version of Retrospect

60 East Chestnut - 145, Chicago, IL 60611
Visa, Mastercard, Amex, COD, Telecheck Approved Checks, Gov., Corp., Univ., P.O.s welcome. All new drives, preformatted with latest stable system software. Factory warranty. Bracket, cables and software included. 30 Day Money back Guarantee covers drive products only. Return Authorization number required for returns. Prices, terms and availability subject to change without notice.

M.Y.O.B.

New Low Price
Only \$199

Powerful, Easy-To-Use Accounting!

M.Y.O.B. Captured Every Industry Award in 1992...



PC WORLD BEST BUY "An easy-to-use, robust accounting solution, M.Y.O.B. has all the answers for any small business."



MAC USER EDITOR'S CHOICE "M.Y.O.B. is a program of surprising depth that will grow your company. No other small-business accounting package is this user-friendly."



WINDOWS MAGAZINE 100 "Tailored for small business needs, M.Y.O.B. is a full-featured program with an intuitive interface for users unfamiliar with accounting terminology or processes."



HOME OFFICE COMPUTING EDITORS' PICK "M.Y.O.B.'s well-designed interface makes using the program much easier than using any of its' competitors. M.Y.O.B. was designed for people who aren't accountants."



PC MAGAZINE EDITOR'S CHOICE "M.Y.O.B. offers a good balance between usability and functionality. It is designed around the revolutionary idea that business systems should go beyond accounting tasks and help people manage their business."



MAC WORLD WORLD CLASS Second consecutive year M.Y.O.B. received this prestigious award given by the people who buy products; by people who are not influenced in any way, other than by the excellence of the product.



PC COMPUTING BEST VALUE "M.Y.O.B. is a full-featured accounting system in an easy-to-use package. Its flexibility, reporting features and To-Do-List make it the best program."



MAC USER "M.Y.O.B. gets even more intuitive and easier to use. If you run a small business, M.Y.O.B. should be at the top of your purchase order list."



MAC WORLD EDITORS' CHOICE "I'd recommend Teleware's M.Y.O.B. Work-Flow diagrams guide you through all necessary business tasks."

Only M.Y.O.B. can offer all these unique features:

- Customizable Forms
- Flexible Reporting
- Changeable Entries
- Cash Flow Forecasting
- Job Tracking
- Import and Export
- Password Protection by Window
- Electronic Card File
- Getting Started Section
- Extensive On-Line Help

**Doesn't your business deserve the best?
Don't delay! Visit your software dealer today!**

M.Y.O.B.

Macintosh or Windows™ versions available.

For additional product information via FAX:

1-800-227-5638 Ext. 542

(Have your FAX number ready.)

OR "Try Before You Buy" Fully-functional
Demo Disk available for \$5

1-800-322-6962

TELEWARE • 300 Roundhill Drive
Rockaway, NJ 07866 • 201-586-2200

TELEWARE

Windows System Requirements: IBM/compatible 286 or better, 2 megabytes RAM, Hard Drive, Mouse, EGA or better Monitor, Windows 3.0 • Macintosh System Requirements: Mac Plus with at least 1 megabyte of memory; System 6.0 or later; hard drive with 2 megabytes of free space.

MACWORLD

HOW TO CONTACT MACWORLD

SUBSCRIPTION SERVICES

For subscription service questions, call 800/234-1038, 800/288-6848, 303/447-9330, or 415/267-1743, or write Subscriber Services, P.O. Box 54529, Boulder, CO 80322-4529. For dealer inquiries, call 800/999-1170.

MACWORLD ON AMERICA ONLINE

Macworld subscribers can contact Macworld editors online via the Macworld area on America Online. The area features reviews, news, new-product announcements, version information, a database of products, and Macworld-sponsored message boards and conferences. Several of our editors log on regularly. To obtain a free America Online software kit, call 800/227-6364, extension 5254.

MACWORLD IN MICROFORM

Macworld is available on microfilm and microfiche from UMI, 300 N. Zeeb Rd., Ann Arbor, MI 48106-1346; 313/761-4700.

BACK ISSUES OF MACWORLD

Write to: Back Issues of Macworld, c/o Snyder Newell, Inc., P.O. Box 7046, San Francisco, CA 94120-9727; \$6 per issue (\$20 overseas). Prepayment in U.S. funds necessary. Make checks and money orders payable to Macworld Magazine.

MACWORLD EDITORIAL

MAIL OR COURIER Macworld Communications, Editorial Dept., 5th floor, 501 Second St., San Francisco, CA 94107; 415/243-0505.

AppleLink: Macworld1

CompuServe: 70370, 702 Fax: 415/442-0766

LETTERS TO THE EDITOR All written comments, questions, and suggestions regarding any aspect of the magazine are read by our editor. We reserve the right to edit all submissions; letters must include your name and address. Direct all correspondence (by mail or electronically) to: Letters to the Editor.

QUESTIONS AND QUICK TIPS Direct questions or tips on how to use Mac computers, peripherals, or software (by mail or electronically) to: Quick Tips, Lon Poole. Please include your name and address.

CONSUMER ADVOCATE Been burned? Really steamed? Direct your concerns (by mail or electronically) to: Conspicuous Consumer, Deborah Branscum.

NEW PRODUCTS AND UPDATES Direct press releases and product announcements (by mail or electronically) and shrink-wrapped software upgrades (by mail or courier) to: New Products Editor.

BUG REPORT AND TURKEY SHOOT Wanna squish 'em? Hearing gobblers? Mail in nominations with description of problem, copies of correspondence with vendor or telephone contact notes (if any); and your telephone number, mailing address, and T-shirt size. Remember: Turkeys are flaws in conception or design, while bugs are defects or flaws in execution.

REPRINTS AND PHOTOCOPY PERMISSION Permission will be granted by the copyright owner for those registered with the Copyright Clearance Center (CCC) to photocopy any article herein—for personal or internal reference use only—for the flat fee of \$1.50 per copy of the article or any part thereof. Specify ISSN 0741-8647 and send payment directly to the CCC at 27 Congress St., Salem, MA 01970. Address requests for reprint orders and for permission to copy editorial for other purposes to: Reprints and Permissions, Editorial Dept.

WRITING FOR MACWORLD Please do not send us unsolicited manuscripts. If you're interested in writing for Macworld, send a stamped, self-addressed envelope along with a request for our writer's guidelines. Direct (by mail) to: Writer's Guidelines, Editorial Dept.

FOUNDER

David Bunnell

FOUNDING EDITOR

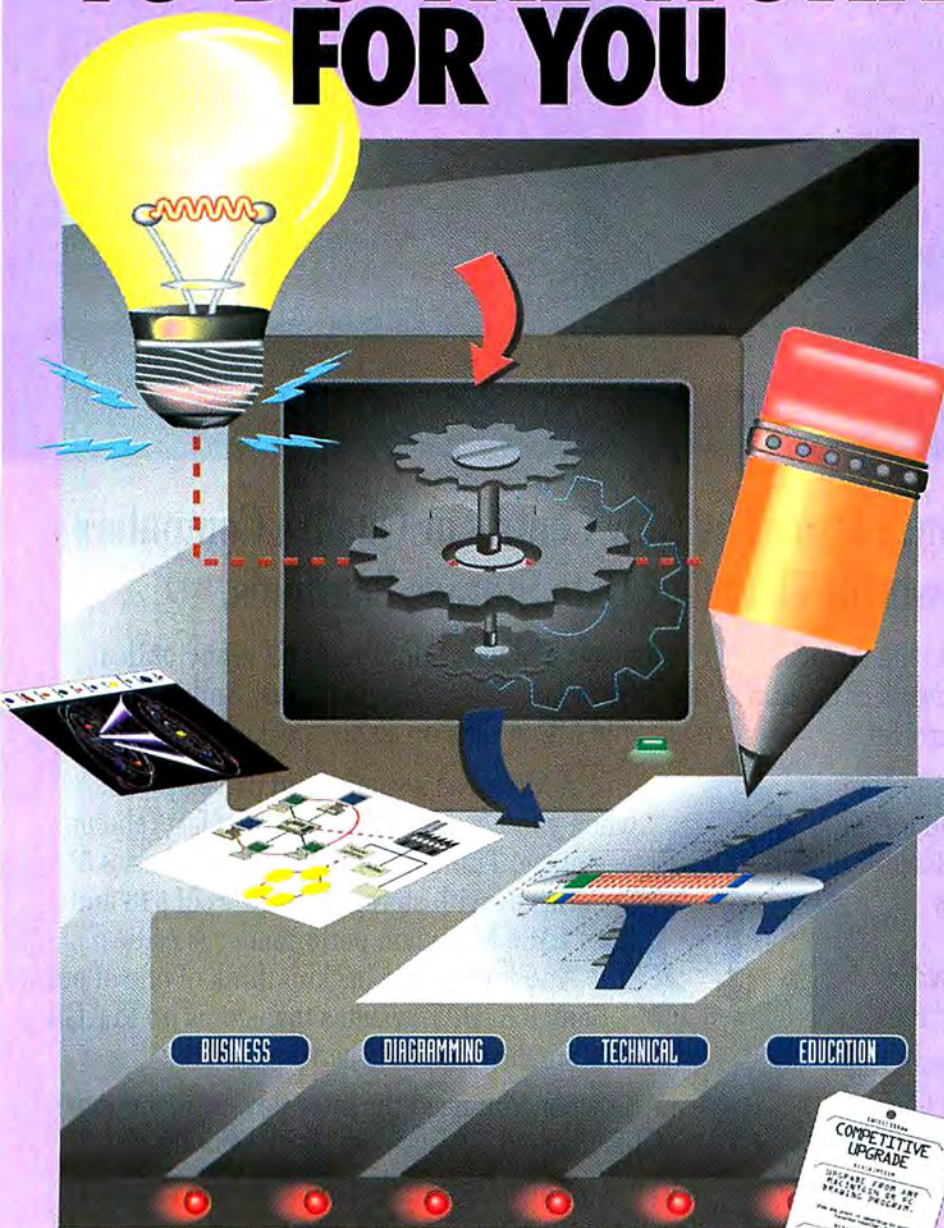
Andrew Fluegelman 1943-1985

Macworld is a publication of Macworld Communications, Inc. Macworld is an independent journal not affiliated with Apple Computer, Inc. Macworld, Macworld Interactive, Macworld Shopper, MW, MW Lab, Desktop Critic, Quick Tips, Art Beat, and Conspicuous Consumer are registered trademarks of International Data Group, Inc. APPLE, the APPLE LOGO, MAC, and MACINTOSH are registered trademarks, and MAC-LETTER and POWERBOOK are trademarks of Apple Computer, Inc. Printed in the United States of America. Copyright © 1993 Macworld Communications, Inc. All rights reserved. Macworld is a member of IDG Communications, the world's largest publisher of computer-related information.



Circle 84 on reader service card

THE ONLY DRAW PROGRAM SMART ENOUGH TO DO THE WORK FOR YOU



Corel Draw can't do it.
Canvas can't do it.
MacDraw can't do it.



Only Aldus® IntelliDraw™ provides smart tools that actually do much of the drawing work for you. For example, the Symmetricon™: you draw one side of a symmetrical object, while IntelliDraw draws the other(s) — instantly.

Features like these give you the control to change an entire drawing by altering just one element:

- "Clonable" master objects so that one changes many
- Automatic and continuous alignment/distribution
- Automatic size and angle matching
- Perspective reshaping with the Connectigon™
- "Sticky" connector lines for effortless diagramming
- Flip Books for instant visualization

IntelliDraw saves you the time and tedium of doing the work yourself.

This powerful assistance lets you step up to the next level of drawing, concentrating more on *ideas* and less on execution. If you can visualize it, you can draw it in IntelliDraw.

You can open, browse through, work on and present your IntelliDraw documents either in  Windows or on the  Macintosh.

Make the smart move to IntelliDraw with this competitive upgrade offer: suggested \$99. See your favorite dealer for a \$200 savings off the suggested retail price.



Why wait? Put IntelliDraw to work for you.

1992
- FINALIST -
PC Magazine Award
for Technical Excellence



GRAPHICS APPLICATIONS
Aldus IntelliDraw, Version 1.0
Aldus Corporation

ALDUS® IntelliDraw™

Aldus and the Aldus logo are registered trademarks, and Connectigon, IntelliDraw and Symmetricon are trademarks of Aldus Corporation. Macintosh is a registered trademark of Apple Computer Inc. Windows is a trademark of Microsoft Corporation. Other product and corporate names may be trademarks or registered trademarks of other companies, and are used only for explanation and to the owners' benefit, without intent to infringe.

For FREE literature, call
1-800-888-6293, ext. 2.



Think MicroNet...



...For the Highest Performance From The New Centris or Quadra Computers Nothing's More Powerful Than Our Data Storage Solutions.

If you're looking for power-matched data storage solutions for Apple's powerful new Centris or Quadra computers, we invite you to think MicroNet.

Think of our RAVEN-040 disk arrays for the Quadra 950 when you need up to 5,560 MB of unbelievably fast storage. With 9.2 MB/sec sustained transfers and reduced access time of 5 ms, it's no wonder that our RAVEN-040 was the MacUser Eddy Award winner for the Best Storage Product of 1991.

What's more, the RAVEN-040 uses both high performance SCSI ports of the Quadra 950, leaving all five NuBus slots open for other devices.

Our rewritable optical and SyQuest removable cartridge drives fit neatly inside the Centris 610, 650,

Quadra 800, and 950. MicroNet's 3.5" Sony optical drive has a fast access time of 38 ms. And it lets you store 128 MB of data on a shirt-pocket-size diskette.

Think of MicroNet's single hard drive systems when you need up to 2,780 MB of fast reliable storage. Think of our 6,300 RPM, 8 ms, 3.5" drives with storage capacities of 518 and 1,186 MB when performance is critical. And for reliable backup think of one of our Sony 3.5" DAT systems that stores up to 8 GB on a single 4 mm data cartridge.

So when you need the most powerful and most reliable data storage systems, think MicroNet.

Call our Sales Department today for the name of a Reseller near you. 1-714-581-1540.



MicroNet Technology, Inc.

20 MASON • IRVINE, CA 92718 • TEL: (714) 837-6033 • FAX: (714) 837-1164
AppleLink: MICRONET.SLS • Compuserve: 76004,1611

RAVEN-040 is a trademark of MicroNet Technology, Inc. All other trademarks are property of their respective owners.

Circle 113 on reader service card

MacBulletin

LATE-BREAKING NEWS

SuperMac Buys E-Machines' Line:

SuperMac (408/245-2202) and E-Machines have signed a deal in which SuperMac will take over E-Machines' product line and gain control of the E-Machines brand name. SuperMac says it will service and honor warranties on E-Machines' products. E-Machines has concentrated on midsize, medium-cost monitors, while SuperMac has specialized in high-end monitors. E-Machines plans to regroup as a research and development house.

E-Mailing the White House:

The White House is accepting E-mail addressed to the president at CLINTON PZ on America Online, and at 75300,3115 on CompuServe. White House staff ask that E-mail messages carry a clear description in the Subject field and a street address, since responses are sent by regular mail. America Online has established an area called From the White House (in the News and Finance area under Departments) that includes complete transcripts of the president's speeches, public meetings, and press conferences.

Apple Reclaims HyperCard:

Apple has taken over the software construction kit HyperCard from the company's software subsidiary, Claris. Apple plans to upgrade HyperCard, market it as a developer's tool, and integrate it with AppleScript in some way. Claris (408/727-8227) will support users of HyperCard, now at version 2.1, until Apple ships a new version.

Third-Party Docking Stations:

SuperMac is now shipping two E-Machines-brand docking stations, the PowerLink Presenter and the

PowerLink DeskNet. The \$499 PowerLink Presenter supports 8-bit color on TVs, LCD projectors, SVGA displays, and Mac monitors. It also includes a floppy drive connector, an ADB port, and a sound-output port. The \$699 PowerLink DeskNet incorporates full-speed Ethernet, supports 8-bit color on Mac or SVGA monitors, and has a SCSI port, floppy drive connector, and all the same connectors as a Mac II.

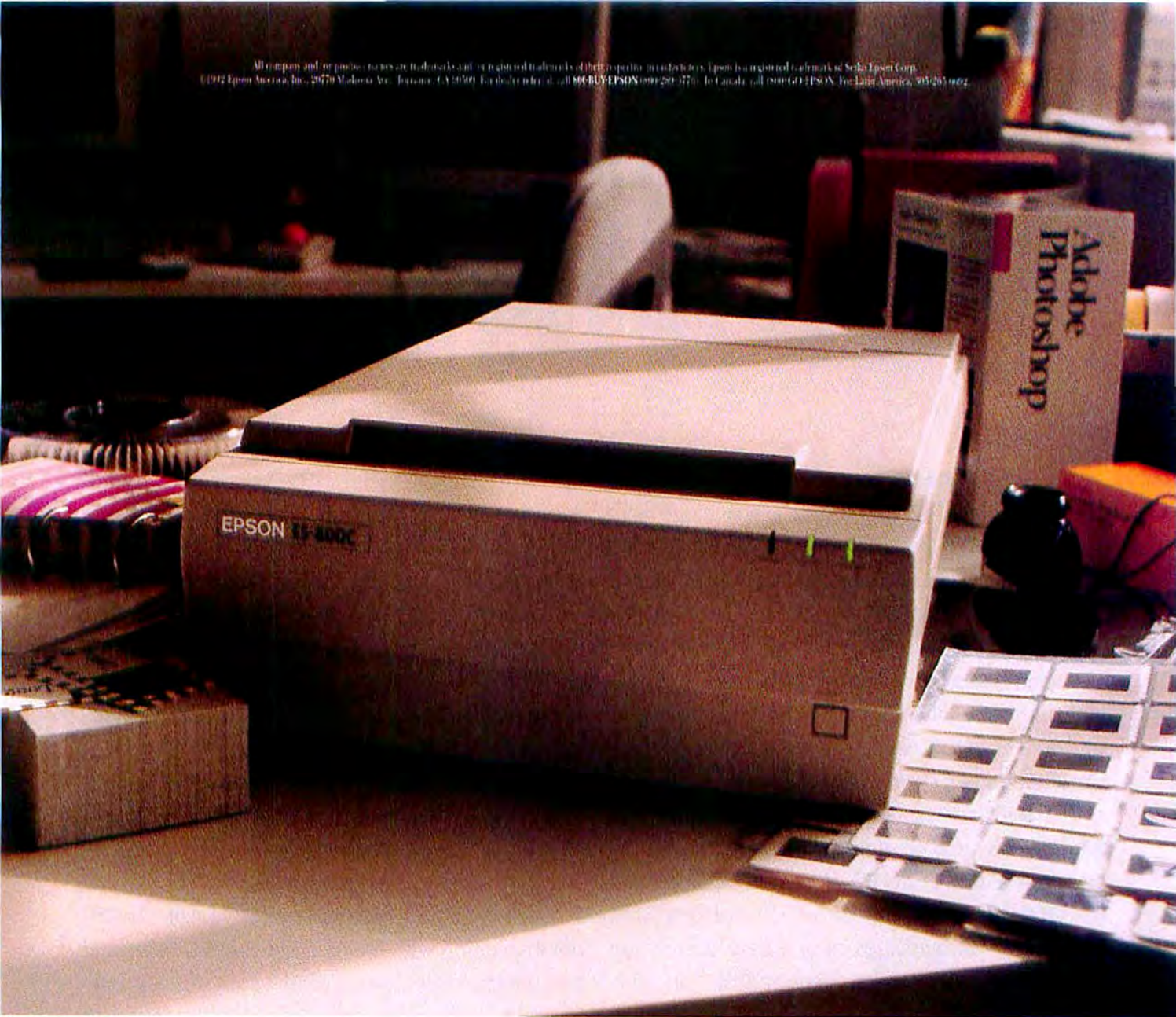
More Disk Compression:

Alysis (415/566-2263) is expanding its compression-utility line with eDisk. The \$149.95 utility resembles Stac Electronics' Stacker: eDisk compresses the contents of an entire disk drive, instead of individual files, without interfering with the Mac file manager's normal procedures. Users can set eDisk's compression level to make a disk drive appear to double, triple, or quadruple in size. Alysis could not say at press time if eDisk would require reformatting a drive at installation.

WordPerfect Acquires Grammatik:

WordPerfect (801/225-5000) acquired Reference Software and its grammar checker, Grammatik, just as Reference was releasing Grammatik version 5 and several new products. WordPerfect says the \$99 Grammatik 5's improved linguistic engine suggests more accurate changes and flags fewer false errors. Version 5 has a 100,000-word spelling checker and can quit checking a document part-way through and later resume where it left off. Other new products from WordPerfect include the Random House Webster's Dictionary and Thesaurus College Edition, also \$99. **m**

All company and/or product names are trademarks and/or registered trademarks of their respective manufacturers. Epson is a registered trademark of Seiko Epson Corp.
©1992 Epson America, Inc., 29770 Madroña Ave., Torrance, CA 90509. For dealer referral, call 1-800-BUY-EPSON (399-289-3776). In Canada, call 1-800-661-EPSON. For Latin America, 905-265-0002.



High resolution color scanners. New from Epson.

Epson® introduces eyes for your Macintosh® — complete with everything you need to start scanning immediately. Both the 600C and 800C models feature 24 bit, one-pass and three-pass scanning. Both come bundled with full versions of Adobe® Photoshop™, so you can manipulate all the images you capture.

You get Caere® OmniPage® Direct OCR TryPack, to help you scan in text. You get a PIM, cable, and all you need to make your scanner a desk accessory.

We offer an add-on transparency unit, which gives you the flexibility to scan slides. A document feeder attachment for both

models. And of course it's all protected by Epson's one-year warranty.

Drop by your computer store soon and take a look or call 1-800-289-3776 and ask for representative 75 for more information. Just don't be surprised if you end up with a scanner.

EPSON®



Desktops



Scanners



Dot Matrix



Lasers



Notebooks

A New Mac Lineup

BY ADRIAN MELLO

HAVE YOU EVER SEEN THAT video where Michael Jackson's face is transformed into several entirely different faces? Then you know what morphing is. Morphing is computer graphics' latest visual trick for intriguing audiences. But a more important kind of morphing has been going on, as well—the morphing of the Mac. In the last six months, Apple has completely revamped the Macintosh product line. The changes are so broad and so rapid, it's as if we were watching the Mac product line change before our very eyes. Apple has changed nearly every product in its line, from the Classic to the Quadra. A whole new midrange lineup replaces the venerable Mac II series. The recent introduction of the color PowerBook 165c, along with the introduction of the Duo 210 and Duo 230, increases the number of shipping PowerBooks to six. On top of all this, Apple has introduced the Performa series through mass-market channels and redesigned most of its peripherals. Remarkably, this proliferation of models has been accompanied by large price decreases.

By any standard, these sweeping changes are an incredible accomplishment. Apple is introducing a broad variety of products with aggressive pricing and letting users choose which computer is best for their work. Apple deserves credit for its willingness to let customers decide what they want. With so many new choices, the big question facing potential buyers is which machine is best for their needs. Last issue *Macworld* covered each new Mac in great detail. This month, I'll grade each new Mac on how well suited it is for its position in the lineup. The grade is not intended as a definitive overall rating but as a quick take. Thorough reviews will have to wait until we can get our hands on shipping units.

A New Classic

THE MOST CONTROVERSIAL CHANGE in the new Mac lineup is the Color Classic. I give Apple points for adding color to a compact Mac, for vastly increasing the convenience of its expansion drawer, and for having the courage to offer a bold new cabinet design that retains most of the

character and virtue of the previous compact Macs' small footprint and all-in-one design. The original Mac is the only desktop personal computer that feels like it has a personality. You may or may not like the new compact design, but it does have personality, and it adds valuable features.

On the downside, the machine is still slow and a little too expensive for its assigned role in the Mac product line. I would have liked the new Classic better if it had been designed around the LC III architecture to revitalize the compact design's performance. Even with the addition of color, a compact Mac ought to cost closer to \$1000. If I were on a tight budget I would still stretch for the LC III with its superior performance and larger monitor. The Color Classic is an interesting alternative, but it needs a tune-up before it's ready to assume its role in the lineup with aplomb. I give this one a C.

The PowerBook 165c

IN ADDITION TO ADDING COLOR TO the Classic, Apple has broken through the PowerBooks' monochrome barrier with the PowerBook 165c. However, on first viewing, I didn't like the color quality of its screen. And neither did any of the other *Macworld* editors who saw it. Passive matrix color just isn't good enough for the Mac. It's clear that Apple wants to meet its customers' demand for a color PowerBook, but this feels like too much of a compromise in screen quality. If you don't absolutely need color, the gray-scale active matrix screen of the PowerBook 180 is a much more appealing display than that of the 165c. Take a look and judge for yourself, but I give the 165c a D solely on the basis of its disappointing screen technology.

The LC III

THE MOST SIGNIFICANT change in the Mac product lineup is that business users can now buy systems with reasonably brisk performance for under \$2000. Only a few months ago I suggested in this space that Apple should offer a business-level machine for under \$2000. Instead of having no

choices at that level, you now have three: the Centris 610, the Mac IIvx, and the LC III. Although the IIvx was introduced several months ago, I include it because it has undergone a tremendous price reduction and because Apple considers it part of the new Centris series. Each of these models offers specific advantages. The Centris 610 is fast, the Mac IIvx is expandable, and the LC III is inexpensive. For me, the LC III is the pick of the litter.

Of all the new Macs, the LC III can't be beat in terms of sheer value. It provides the most sensible balance of price, performance, and expansion for today's computing requirements. It's true that a year or two from now the LC III won't seem quite so frisky, as software makes ever-increasing performance demands. But by then you're likely to have even more appealing price/performance choices from Apple. I give the LC III an A.

The Centris 610

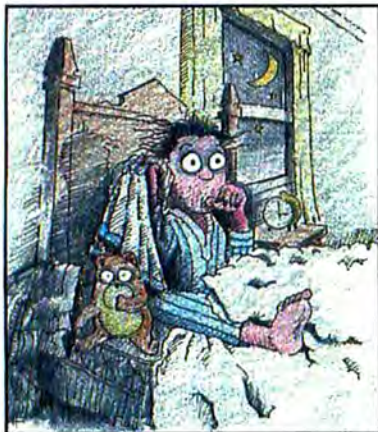
THE CENTRIS 610 HAS ABOUT THE SAME price/performance ratio as the LC III, and about the same expandability. You pay several hundred dollars more, but you get your money's worth in extra performance. Most people will want to save the money and opt for the LC III. I suspect that most users who are looking for the additional performance the 610 provides will also want more expansion capability—not just more slots but also greater availability of options from third parties. The problem

with third-party options is that the 610 doesn't accept standard-size NuBus boards. Hopefully, third-party companies will help overcome this limitation and others, such as the lack of a floating-point math chip, by announcing more add-in products for the 610. The 610 makes most sense from one perspective—the need for future performance to handle increasingly large and onerous software. If you plan to adopt the newest software versions and you don't want to deal with the bother of trading up to a faster Mac or adding an accelerator, the 610's extra performance

continues



*The
Centris 650
and the
LC III get
an A*



Guess who didn't backup with DiskFit?

What's a good night's sleep worth?
A night free from worry. Knowing
that your precious data is safe from
disaster. Safe from power surges,
malfunctions and viruses. Safely and
neatly stored in DiskFit's backup disks.
DiskFit is the easiest and most efficient
way to back up your Mac. In fact,

it's the backup software designed solely
for the Mac. So it's smart. Friendly.
Fast. Simple to use. And necessary.
That is, if you like to sleep
at night.

DiskFit Direct™
DiskFit Pro™



To go forward, you must back up

Dantz Development Corporation 1400 Shattuck Avenue, Berkeley, CA 94709 510-849-0293

Circle 26 on reader service card

Have you heard about the new Apple Catalog? We've saved one for you.



Apple® will give you free delivery on
everything from a PowerBook™ to a mug.
And most items will arrive the next
business day*. Just call toll-free
1-800-795-1000, ext. 510, 24 hours a day,
7 days a week. Or you can send this ad to:

The Apple Catalog
One Apple Plaza
P.O. Box 9001
Clearwater, FL 34618-9001

Name _____

Address _____

City _____ State _____

Zip _____ Phone No. () _____

Ext. 510



*1993 Apple Computer, Inc. Apple, the Apple logo, and Macintosh are registered trademarks of Apple Computer, Inc.
PowerBook is a trademark of Apple Computer, Inc. Offer good while supplies last. Good only in the United States. Allow 1-2 weeks for the Apple Catalog to arrive.
*Items ordered Saturday and Sunday will be delivered Tuesday. Items valued at under \$25 will not arrive the next business day.

may pay off down the road. I give the
Centris 610 a B.

The Mac IIvx

I'M LESS CONVINCED OF THE LONG-
term value of the Macintosh IIvx. If you
really plan to use the expansion capability
of the IIvx, you will be investing in expansion
boards and peripherals. As you do
this, the cost of your base machine be-
comes a smaller percentage of the total
system cost. Also, internal expansion op-
tions often demand more CPU perfor-
mance to support their added capability.
It makes less sense to invest in such op-
tions as a 24-bit graphics board and a
video capture board if your system doesn't
offer some growing room in terms of per-
formance. For this reason I recommend
that users seriously consider the more ex-
pensive Centris 650 if they want a truly
expandable system. However, if you can't
pay the extra price of the 650 but you need
the expandability today, the IIvx is an ad-
equate alternative. I give it a C.

The Centris 650 and the Quadra 800

APPLE INCLUDES THE CENTRIS 650 AS
part of the midrange Macintosh lineup.
Depending on how you look at it, the
Centris 650 is either at the high end of the
midrange or at the bottom of the high
end. Either way, the 650 has the right
combination of performance and expand-
ability for most business power-users. Af-
ter the LC III, the Centris 650 provides
the best set of features for the price in
Apple's new desktop lineup. If you are
looking for an expandable desktop system
that can grow with your needs for some
time, the 650 is the right choice. The
Centris 650 gets an A.

At the true high end, the Quadra 800
is the best Mac for most production en-
vironments. This includes color prepress,
engineering, rendering, and other high-
end graphics applications. This impressive
level of performance is more typically as-
sociated with the workstation market than
the business market at large. The Quadra
800 is roughly equivalent in performance
to a Quadra 950 but costs less and is more
compact. Most production users need the
power but not the vast expansion capabil-
ity of the 950. With the 800 Apple is of-
fering this performance for a substantially
lower price than ever before. The Quadra
800 is a good choice for many production
users, so I give it a solid B.

All in all, Apple's designers are doing
an excellent job with CPUs. Apple contin-
ues to offer more choices and apply lower
prices to its entire product line. Let's hope
Apple continues successfully morphing
the Mac. **m**

THE FASTEST WAY TO PUT 25 GB ON A SINGLE TAPE.



The CY-8500 can store up to 25 GB on a single tape, at speeds of up to 90 MB per minute, completely unattended.

How? With hardware data compression that can boost capacity by up to five times.

No other 8mm tape drive can match the capacity, speed, and price-performance of this best-selling drive.

ADVANCED. You'll never be left in the dark. A bright, backlit status display gives you the command under execution, transfer rate, compression ratio, amount of tape remaining and more.

Our *data compression* option is the fastest available. And it's switch selectable, so you can still read and write standard tapes. Locate and restore files quickly and easily with our *accelerated file access* option. Add *data encryption* to control backup and restore operations through the use of encoded card keys.

FLEXIBLE. The CY-8500 is plug compatible with virtually every computer system. Rack mounting options, dual drive configurations and a variety of cable lengths ensure a seamless fit into your computing environment. And as storage needs grow, you can upgrade to our ten tape library, capable of managing between 25 GB and 250 GB—all without manual intervention.

RELIABLE. A sophisticated Error Correction Code yields a bit error rate of less than one in 10^{17} —the best in the industry. A MTBF rate of 60,000 hours ensures reliability.

Each turnkey subsystem features a 12-month warranty that includes technical support from our experienced in-house engineering groups.

Everything you want in a backup subsystem is available right now.

Call today for information at

(804)873-9000

Circle 188 on reader service card

TRUE PLUG COMPATIBILITY

Alliant	McDonnell
Alpha Micro	Douglas
Altos	Motorola
Apollo	NCR
Arix	NeXT
AT&T	Novell
Basic-4	OS/2
Concurrent	PS/2
Convergent	Parallel Port
DataGeneral	PC 386/ix
DEC 3100/5000	PC MS-DOS
DEC BI-Bus	PC Xenix/Unix
DEC DSSI	Pertec
DEC HSC	Plexus
DEC Q-Bus	Prime
DEC TU/TA81	Pyramid
DEC Unibus	Sequent
Gould/Encore	Silicon
HP	Graphics
IBM AS/400	STC
IBM Mainframe	Stratus
IBM RISC/6000	Sun
IBM RT	Texas
IBM S/38	Instruments
ICL	Unisys
Intergraph	Wang
Macintosh	and more

**CONTEMPORARY
CYBERNETICS**

Rock Landing Corporate Center • 11846 Rock Landing
Newport News, Virginia 23606 • Fax (804)873-8836

NO SPEED LIMITS

Lightning fast
24-bit color and
image processing

Prices starting
at \$3,699

Thunder II
Upgrade Kits
for existing
Thunder users.

2,600%
QuickDraw
acceleration

24-bit color

Screen sizes:
up to
1360 x 1024

HDTV version:
up to
1920 x 1080



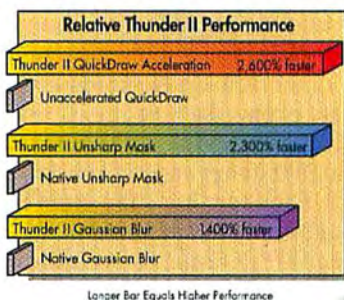
THUNDER II DELIVERS LIGHTNING FAST 24-BIT HIGH-RESOLUTION COLOR IMAGES ON A SINGLE CARD.

The high end for desktop color just shifted into overdrive and instantly created a new standard for image processing.

Only Thunder II™ combines lightning fast 24-bit color QuickDraw™ acceleration with high-performance image processing on a single card.

Now you can fly through huge QuarkXPress® documents, Adobe Photoshop™ files, Kodak Photo CD images.

Fill large color screens 1152 x 870 to 1360 x 1024 and even the biggest screen, HDTV, 1920 x 1080 with blinding speed.



Kodak Photo CD™ Access, Kai's Power Tools™, Storm Technology's PicturePress®, and SuperVideo™ are included, FREE! With Thunder II Upgrade kits, existing Thunder users can upgrade fast and easy without using another slot.

For your nearest Authorized Reseller, call **800-334-3005**.

For information via fax, call SuperFacts® 800-541-7680.

With Thunder II,
the sky's the limit.



SUPERMAC™
The SuperSource for Color

© 1993 SuperMac Technology, Inc. All rights reserved. SuperMac, SuperMac Technology, Thunder and SuperVideo are trademarks and SuperFacts is a service mark of SuperMac Technology, Inc. Adobe Photoshop is a trademark of Adobe Systems Incorporated, which may be registered in certain jurisdictions. Kai's Power Tools is a trademark of HSC Software. Kodak Photo CD is a trademark of Eastman Kodak Company. QuarkXPress is a registered trademark of Quark, Inc. PicturePress is a registered trademark of Storm Technology, Inc. All other brands or product names are the trademarks of their respective holders.

Circle 88 on reader service card

Letters

MAY 1993

If Apple Won't Fix It, It Ain't Broke

I RECENTLY HAD A MOST UNPLEASANT experience with my PowerBook 170. A crack appeared in the lower-left corner of the screen after the computer, packed in a Kensington padded carrying case and strapped to the backseat of a luxury sedan, accompanied me on a trip.

A technician at a local authorized Apple repair shop decided that the repair (\$1498) was not covered by the Apple one-year warranty. The reason given was that since cracks involving the lower-left corner of the screen had so far not been reported to occur spontaneously, the computer had been "abused." At no time did I drop, bump, kick, beat, or otherwise abuse my PowerBook! There were no signs of external or internal damage other than the cracked screen.

I feel that I have been treated unfairly by Apple. Several phone calls to customer representatives in Cupertino have met with little sympathy.

*Gunter K. von Noorden
Houston, Texas*

I'M A PUBLIC SCHOOL TEACHER. I saved for months, and finally purchased a PowerBook 140 and was thrilled. However, about two months after I purchased it, one trackball button malfunctioned. The next day, the back cover panel fell off. Then, a few days later, the display malfunctioned. Alarmed, I took it to the Apple dealer who called a few days later to say that they had found a crack in the screen. They then accused me of dropping the PowerBook! I always kept it in a protective case and was very careful with it. My grades, tests, and a whole semester's worth of documents were on that machine and I would not have endangered it. After vigorously defending my innocence, I was told that repairs would cost \$790 plus \$90 for labor. That is a month's pay for me! I was also informed that the cover panel and button were not covered, as it

was assumed that they were also damaged when it was "dropped."

I'm writing this as a warning to my fellow schoolteachers who may still have warm feelings toward Apple as our benevolent partner in education.

*Matt Federoff
Tumacacori, Arizona*

Apple says PowerBook owners having problems with their computers should call the PowerBook repair line (800/767-2775), which will ask a series of questions to help diagnose screen damage and help analyze whether the PowerBook has actually been misused, in which case repairs would not be covered under warranty. Readers should know that Apple says a very small number of PowerBooks were affected early on by a variation in the manufacturing process that tended to cause the displays to crack in a specific corner. Has this been a problem for you? Please write and let us know.—Ed.

Half a Tone, Onward

THE NUMBER OF GRAY LEVELS available for a graduated tint has a direct relationship to whether the tint will have banding in it ("Halftones Demystified," February 1993).

Although it is true that PostScript Level 1 addresses only 256 levels of gray, there is no mysterious reason why PostScript Level 2 will address more. Many more levels of gray are necessary to produce long, smooth gradations that have a small percent of change.

*Gordon Hutchinson
Gray, Tennessee*

I spoke with Peter Fink, author of *PostScript Screening: Adobe Accurate Screens* (Adobe Press, 1992; distributed by Hayden Books), to confirm the 256-gray-level limitation. While it's true that PostScript Level 2's internal color engine can work with more than 256 gray levels, its halftoning machinery still resolves that information into 256 gray levels when it creates halftones. It's possible to produce long, graduated tints sans banding, as has been demonstrated

continues

PROBLEM:

Monitor Radiation

SOLUTION:

NoRad Shielding



ELF ProTech

- First and only external ELF magnetic radiation suppressor
- Absorbs up to 70% of ELF magnetic radiation all around the monitor

NoRad Shield

- Blocks all electric and high-frequency magnetic radiation—more than any other screen
- Ends glare, reflections, static

NoRad UltraGlass

- Most radiation protection available from a glass filter
- Superior optical clarity, ends glare

**Call now to find out how
you can limit your
exposure to VDT radiation.**

1-800-262-3260

NoRad

1549 11th St. Santa Monica, CA 90401
(310) 395-0800 FAX: (310) 458-6397

Circle 309 on reader service card

by thousands of publications. But how to do it, well, that's a subject for a whole other article.—Steve Roth

CORRECTIONS

Printer Perceptions

IN "WORKGROUP PRINTERS" (JANUARY 1993), you mention that the customized LaserWriter driver extensions that come with several printers are incompatible. This remark requires clarification.

My company has been licensing these extensions to printer manufacturers for a few years, and in the early versions we licensed, the user could have support for only one printer at a time. More recently, we have been licensing software that was designed to support networks of printers from multiple manufacturers.

What the author discovered was that the software that supports QMS printers is the older version and is incompatible with the others. The newer, compatible version has been licensed to Data-products, Compaq, Epson, Genicom, NewGen, and Texas Instruments. QMS is now considering upgrading its software to be compatible.

Marty Joel
Perceptions Unlimited
Calabasas, California

Printer Homage

YOU, IN YOUR INNOCENCE, AWARDED the HP LaserJet 4M printer only four stars (*Reviews*, February 1993)! Jaw sagging in astonishment, allow me to explain how you err greatly.

I am an advertising graphic artist/designer. In November 1992, I purchased a LaserJet 4M for nearly one-sixth the cost of my \$12,000 NewGen 840e (800 by 400 dpi). I added a single 4MB SIMM, and I have never been so overwhelmed by a laser printer. If you awarded six stars, this machine would warrant them.

Bill Horton
Santa Barbara, California

Look Ma, No Docs

MICHAEL HAZEN WROTE THAT HE was pleased to find out he could save \$150 [the price of the HyperCard Developer's Kit] by setting the user level of his bundled HyperCard to scripting (*Letters*, February 1993). The Developer's Kit comes with some very good reference manuals and extra developer-oriented stacks. I can't imagine doing serious development work without them. I'm sure that every software package would be cheaper without documentation, but as they say,

In the March *Letters* Microsoft's customer-service number should have been 800/426-9400.

In March *News* APS Technologies' number should have been 816/478-8300.

In the March review of *Publish It Easy 3.0*, Timeworks' phone number should have been 708/559-1300.

In the March feature "Midsize Hard Drives" we inadvertently left *Saturae's Pro 500* out of the Editors' Choice "Best Bargain" category. The *Pro 500* drive is fast, reasonably priced, and includes excellent technical support.

The correct number for the BCS Mac bulletin board is 617/864-0712 (Conspicuous Consumer, March 1993.)

"If you think education is expensive, try ignorance."

Also, a response to Joel Alvin Christine and his comparison of the Performa 600 and the IIsi. The IIsi offers an excellent compromise in weight-size versus performance, and the Performa 600 is the ugliest Mac ever made. Joel can have a Performa 600 if he wants one, but I'll be happy with my IIsi until something clearly better comes along.

Laurence Harris
via CompuServe

Remotely Interesting

IN "REMOTE POSSIBILITIES" (JANUARY 1993), you recommended that a purchaser not buy features like V.42bis and MNP 5 because ARA contains data compression. But V.42bis and MNP 5 are hardware-based compression and will work on top of the software compression of ARA. Also, there are very few (if any) modems at 9600 bps or 14,400 bps (the speeds you recommend) that do not come with these compressions.

John C. Sagebiel
Reno, Nevada

DAVID POGUE MENTIONS THAT voice/modem line switchers can be purchased through "various electronics mail-order catalogs." Could you please suggest some sources.

Scott Marshall
via Internet

Try Damark (800/788-7001) or check your telephone book for a local Radio Shack.—Ed.
continues

Works On Any Mac!

Looking For A Fast, Accurate, Color Video Frame Grabber?

Check Out The New SCSI 'Eyes!



ComputerEyes/RT

- Accurate, Real Time, 16 Million Color Video Frame Grabber
- SCSI Device Works On Any Macintosh - SE/30, LC, IIsi, Mac II, Quadra, PowerBook
- Excellent User Software
- Captures From Any Camcorder Or VCR - Composite and S-Video Inputs
- Supports All Common Mac Image File Formats
- Supports QuickTime for Capturing Video Animations!
- ComputerEyes/RT - \$599.95 Monochrome Version Also Available - \$249.95

Also Check Out The New Low-Cost TelevEyes Mac-to-TV Converter - Just \$299.95!

See Your Dealer Or Call For More Information And Free Demo Disk

Digital Vision, Inc.
270 Bridge St., Dedham, MA 02026
(617) 329-5400 (800) 346-0090

Circle 242 on reader service card



Gogh Crazy.

Presenting New CA-Cricket Draw III.

Friends, artists, Mac users...lend me your ears.

The world's hottest, most affordable drawing software has arrived: New CA-Cricket® Draw III.™ And we've packed it with today's most powerful features. Eleven Bezier-based, object-oriented drawing tools. Floating color windows

that allow you to select from RGB, HLS, CMYB & gray-scale color models. A dazzling new fountain fill tool. Masking and hole-cutting capabilities. A ruler-based text processor. Plus the ability to import PICT, EPSF, Scrapbook and MacPaint files.

And don't forget about our other powerful and easy-to-use Mac solutions: CA-Cricket® Presents,™ CA-Cricket® Graph,™ and ACCPAC® Simply Accounting.™

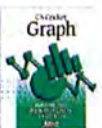
Dial 1-800 CALL CAI today for more product information or for the nearest dealer.

But you'd better hurry.

Because they're gogging like crazy.

© Computer Associates International, Inc., One Computer Associates Plaza, Islandia, NY 11788-7000.

COMPUTER ASSOCIATES
Software superior by design.



"Vincent Van Cricket". All artwork done in CA-Cricket Draw III by Jim Jackson, winner of the inaugural CA-ImageNation Contest. Dial 1-800 CALL CAI for contest rules and more information.

Circle 10 on reader service card

SO HOT



We **ROCKED** the Macintosh® and Windows™ paint markets with version 1.2. NOW we've loaded up our latest, Fractal Design Painter® version 2.0, with more realism and more surrealism, more control and more out of control. It is like no other application in history. Painter—the natural-media™ paint application.

Painter's brushes now include hot new scratchboard tools, an airbrush that actually spatters, and the Cubist brush. Cool new effects allow you to apply lighting from single or multiple spotlights, apply a textured glass distortion, marbleize and more. Type 1 and TrueType™ fonts can be imported.

Fractal Design

Painter 2.0

All the photo-retouching basics are now built-in: photo-compositing, advanced magic wand selections and color separation.

We've made Painter even easier to use with tear-off tools, snap-to and adjustable grid paper, quick access window controls, visual previews and straight line tools.

Don't wait; contact your local dealer or call Fractal Design Corporation at 408-688-8800.

Fractal Design Painter 2.0.
So Hot. So Cool.

SO COOL



FRAC-
TAL
DESIGN
CORPORATION

© 1993 Fractal Design Corporation. All rights reserved. Fractal Design is a registered trademark and Painter is a trademark of Fractal Design Corporation. All other trademarks are the property of their respective owners. Fractal Design Corporation • P.O. Box 2301 • Appleton, CA 95021 • 408-688-8800

Circle 190 on reader service card

LETTERS

Cursor Reverser

WHY DOES THE MACINTOSH HAVE the arrow cursor pointing to the upper left-hand corner of the screen? My sister, who is a southpaw, commented that it would be nice if the arrow were to point to the upper right.

James Rodriguez
West Covina, California

Rumor has it that on the PowerBook, the arrow points toward the corner in which the pixels will malfunction. Desktop lefties can try Lefty, a shareware INIT (available through BMUG, 510/549-2684) or change the arrow themselves with ResEdit.—Ed.

New, Not Improved

I WISH YOU WOULDN'T FOLLOW Apple's propaganda line of characterizing System 6 as "less capable" than System 7 (*Getting Started*, February 1993). System 6 allows me to use less RAM, less disk space, run older software, and turn Multi-Finder off whenever I want.

Bruce Long
Tempe, Arizona

Questions, Questions

CAN YOU GIVE ME SOME LOGICAL explanation as to why I received my January 1993 issue of *Macworld* on November 20, 1992?

Mary Ann Stearns
Toledo, Ohio

The top ten reasons the January issue came early:

10. Elves.

9. We thought the feature on color management was essential for a color-coordinated holiday.

8. No, honest, you really got the November issue. It just says January on the cover.

7. Management replaced a broken coffee maker with an espresso machine and nobody noticed until an overcaffeinated designer freaked, grabbed a stapler, and held the art director hostage for two days.

6. So we can send you those heartfelt subscription renewal messages on time.

5. A power surge advanced every calendar program in the building one month.

4. Fanatic subscribers demanded "Another issue now, man!"

3. New Macs and a recent Ethernet upgrade have brought back the giddy magic of picking up a mouse and changing the world.

2. Our "365 Words a Year" desk calendar refills came early, terminally confusing the staff.

1. Just another day's work for our scrupulously efficient U.S. Postal Service.

Actually, most monthly magazines predate their covers by a month for newsstand sales. Stearns re-

ceived her issue early because we mailed the January issue on November 18 in anticipation of the Thanksgiving holiday and because Toledo is near our printing press in Waseca, Minnesota. Truth is stranger than fiction.—Ed.

Work It On Out

FINALLY A REVIEW OF MICROSOFT Works 3.0 that tells it like it is (*Reviews*, February 1993). I did a review of it for my user group's newsletter, and when another Mac magazine published its review and gave it a 4 out of 5 critters rating, I thought, "What program did they get that I didn't?"

I demoed the new version for some students in my night classes and we counted aloud as version 3.0 took almost seven seconds to paste a 16-word sentence three times. Seven seconds! $\$-V$, $\$-V$, $\$-V$. Seven seconds later it finished. Granted, it was on an SE, but to say MS Works 3.0 is sluggish is like saying the Titanic took on a little water.

James Gates
Harrisburg, Pennsylvania

I UPGRADED FROM WORKS 1.0 ON MY Mac Plus to 3.0. What a mistake! The speed is slow beyond imagining and Microsoft should have to refund all money ever paid to them for Works! There should be a lemon law like in autos!

Dick Norick
via CompuServe

Desktop Criticism

DAVID POGUE'S COMMENTS ON DiskQuick are wrong (*The Desktop Critic*, January 1992). I have used DiskQuick for several years without experiencing any of the negatives he mentioned. Even under System 7 I have not had the problem of "ghost" disk icons or of tripping up and stopping. (That was an occasional problem under MultiFinder and System 6.)

Furthermore, DQ has an export function, which I use all the time, since I prefer to keep my floppy disk catalog in FileMaker. This also works fine under either System 6 or 7.

Alan Ullman
via CompuServe

ALTHOUGH IN SEVERAL PLACES IN his January column David Pogue touts his thoroughness, he completely missed FileList+ 1.0b20. It doesn't do labels, but it does just about everything else on which he rates the programs. It is also continues

MoviePak
presents

THE EDITING ACES

Part of the crew of the Editing Aces Suite is the Video Expander II that offers high quality output and full genlock capabilities in either NTSC or PAL.

The Editing Aces Suite really takes off with Adobe Premiere™ 2.0, a \$695 value, and MediaGrabber video capture software.

RasterOps invented video on the Mac® and Apple® used it to get QuickTime® off the ground. So call us today to become a QuickTime Editing Ace.

CALL TO BECOME
A QUICKTIME EDITING ACE
1-800-SAY-COLOR

Featuring
**Full motion
Full screen**
NOW SHOWING IN 24-BIT TRUE COLOR
ALL WITH 16-BIT, CD QUALITY SOUND (with MediaTime)
Only by RasterOps



The Editing Aces Suite features MoviePak, the RasterOps® solution for full-motion digital video recording, full-screen playback, and print-to-tape capabilities. All in a single slot solution for any Macintosh® from the IIci to the Quadra®. MoviePak even offers the widest range of compression in the industry.

The suite also includes MediaTime, with 24-bit real-time digital video and graphics display, and 16-bit CD quality sound - a RasterOps exclusive.

RASTEROPS®
THE ART & SCIENCE OF COLOR™
2500 WALSH AVE., SANTA CLARA, CA 95051 FAX: 408.562.4065

©1993 RasterOps Corporation. Adobe Premiere is a trademark of Adobe Systems Incorporated which may be registered in certain jurisdictions. All other brand and product names are trademarks or registered trademarks of their respective holders. MoviePak is compatible with currently available RasterOps video graphics cards. Older versions may require an update. For additional information, please call 1-800-SAY-COLOR.

highly customizable. Since I don't care about labels, I find it a superior product to MacLibrarian, which I looked at after reading his effusive praise.

I help run mac.archive.umich.edu, one of the largest Macintosh File Transfer Protocol sites on the Internet. Our archive is conveniently hierarchically arranged—all disk catalogers (including seven you neglected to mention) are in `/mac/util/diskfile`. I'm not claiming that these are all good catalogers, but they're all available, and in one place. We are accessible from AOL and CIS through our mail server; send a message to mac@mac.archive.umich.edu with any subject line and the single word **help** in the body of the message for instructions.

Jonathan Brecher
brecher@busc.harvard.edu
via Internet

Unbearable Heaviness of Being

AFTER YEARS OF WAITING FOR A genuinely portable Macintosh computer, the Duo has finally arrived. For those of us for whom portability means having to carry our computers on our

shoulders most of the time, and not just to and from the car or plane, weight adds up very quickly.

While we may look forward to buying some of the add-ons and accessories, weight is always one of the crucial factors in our selection. Reviews that fail to list this information leave us critically uninformed. Please make it a standard policy to include weight, as well as dimension and international current information, in all your reviews of portable equipment.

Jeffrey C. Olson
Seattle, Washington

Harsh Words

MAYBE STEVEN LEVY COULD TRY writing reviews without racist comments ("The 1992 Macintosh Game Hall of Fame," December 1992)? According to him, "clever Muscovites" endowed Wordtris with "music only a Ukrainian peasant could love." Come now! Substitute your favorite ethnic minority for "Ukrainian peasant" and how will that sound?

Oleh S. Ihnytskyj
Edmonton, Alberta, Canada

Needs Fulfilled, Desires Realized

AS A COMPUTER LITERACY TEACHER of eighth-grade students, I found Steven Levy's "The Rap on Software Piracy" (*The Iconoclast*, January 1993) to be both a hoot ("Chicka-chicka, scratch! scratch!") and an affirmation of reality—kids do indeed copy like crazy.

Of particular interest to me was the SPA's offer of its free rap video, but I do not know how to contact the SPA.

Mary Roberts
Humble, Texas

The Software Publishers Association can be reached at 1730 M Street NW, #700, Washington, D.C. 20036-4510; 202/452-1600. —Ed.

Letters should be sent to *Letters*, *Macworld*, 501 Second St., San Francisco, CA 94107; via fax, 415/442-0766; or electronically to CompuServe (70370,702), MCI Mail (294-8078), America Online (Macworld), or AppleLink (Macworld1). Include return address and daytime phone number. Due to the high volume of mail received, we can't respond personally to each letter. We reserve the right to edit all letters. All published letters become the property of *Macworld*. **m**

"The Best Mac Desk Ever."



• Ergonomic • Adjustable Height • Strong • Many Configurations

FREE CATALOG!

CALL TOLL FREE (800) 688-2446

agio
BEAVERTON, OREGON

503.690.1400
FAX 503.690.1444

VAR INQUIRIES WELCOME
AGIO Europe 011 41 62 631 026
AGIO Japan 011 81 3 5563 0436



Seeing the obvious isn't always enough.

Dangerous exceptions. Lurking trends. The herd of ordinary statistics programs can't see them.

Defend yourself with Data Desk — the only software designed for Exploratory Data Analysis.

Call now for a free Mac test flight. Because what you don't see can hurt you.

Data Desk.
607-257-1000

Ireland: (353) 1 766 929 Sweden: (46) 8 25 07 10 Australia: (61) 6 257 6873

Data Desk is a registered trademark of Data Description, Inc.

Circle 108 on reader service card

STATISTICA/Mac

NEW rel. 3.0

STATISTICA/Mac™ A complete statistical data analysis system with hundreds of presentation-quality graphs integrated with all procedures. In-depth, comprehensive implementations of: *Exploratory techniques; Descriptive statistics; Frequency tables; Large selection of nonparametric tests; Stepwise multiple regression methods with extended diagnostics; General nonlinear estimation (with predefined or user-specified models); Logit/Probit analysis; General implementation of ANOVA/ANCOVA/MANOVA/MANCOVA (designs of practically unlimited complexity, repeated, nested, incomplete, random, changing covariates, contrast analyses, post-hoc tests, custom designs); Discriminant function analysis statistics; Canonical analysis statistics; Time series modeling techniques with forecasting; Factor analysis with rotations; Cluster analysis (incl. hierarchical, k-means, and 2-way joining); General survival/failure time analysis (incl. life tables, group comparisons, and regression models); Distribution fitting (a large selection of continuous and discrete distributions); Curve and surface fitting and smoothing (incl. spline, DWLS, NEXP, and others); and much more.* Manual with comprehensive introductions to each method and step-by-step examples (Quick Start booklet explains all major conventions); balloon help. ■ Extensive data management facilities: a super-fast spreadsheet of unlimited capacity with formulas (and Publish and Subscribe); merge/split files; "double identity" of values (numeric/text); BASIC-like data transformations programming language; Import/Export data and graphs from/to Excel, MacSS, CSS and other formats. ■ Graphs integrated with all procedures (e.g., click on a correlation coefficient to produce the corresponding scatterplot and other graphs; click on a variable in the descriptive statistics table to produce a histogram and other graphs; click on an interaction effect in the ANOVA table to see a plot of interaction). ■ Large selection of 2-dimensional graphs: *Histograms (incl. multiple, clustered breakdowns, overlaid functions); Scatterplots (incl. multiple, weighted frequency, smoothed, function fitting); Multiple line and Range plots; Trend plots; Standard deviation plots; Data sequence diagrams; Contour plots; Box-and-whisker plots; Column plots; Bar graphs; Double pie charts; Scrollable dendrograms; Two-way joining plots; Curve fitting plots; Distribution comparison plots; Range plots; Probability plots; Amalgamation plots; Factor space plots; Casewise outlier and residual diagrams; ANOVA interaction plots; Multivariate (multiple) matrix plots; exploratory Draftsman plots with histograms; and many other specialized plots.* ■ Large selection of 3-dimensional graphs: *3D surface plots (with data smoothing procedures, color or gray-scale shading, and projected contours); 3D scatterplots; 3D block scatterplots; 3D axis (space) plots; 3D spectral plots with adjustable planes; 3D line/ribbon plots; 3D sequence block plots; 3D histograms; 3D surface-smoothed frequency plots; and 3D range plots ("flying boxes").* ■ All 3D plots displayed in true perspective, feature interactive real-time rotation facilities (incl. continuous rotation). ■ Extensive graph customization options: all structural aspects of graphs (axes, scaling, patterns, colors, sizes, styles, regions, perspective, rotation, fitted functions, etc.); MacDraw-style tools with specialized "objects"; hi-res graph and artwork embedding; page layout/preview; dynamic rulers; Publish and Subscribe graph links. ■ All output displayed in Scrollsheets™ (dynamic, internally scrollable tables: all numbers can be instantly converted into a variety of on-screen customizable, presentation-quality graphs). ■ All Scrollsheets can be saved into data files and used for input, or exported. ■ Flexible facilities to perform analyses on specific subsets of data. ■ Extremely large analysis designs. ■ Unlimited size of files. ■ Extended precision. ■ Unmatched speed (e.g., on a Mac IIx, arbitrary rotation of a surface with 1,000 points takes 1 second; correlation matrix 50x50 with 100 cases—less than 3 seconds; transposing a 5,000 data points file—less than 2 seconds). ■ Full support for System 7 ("savvy") incl. "Publish and Subscribe," Apple events, balloon help, "drag and drop," 32-bit, Quadra cache, etc. ■ Price: \$595.

Quick STATISTICA/Mac™ A subset of STATISTICA/Mac. ■ All basic statistical modules of STATISTICA/Mac (*Basic and Descriptive Statistics; Frequency tables; Exploratory data analysis; Nonparametrics; Distribution Fitting; Stepwise multiple regression; ANOVA/ANCOVA*). ■ Manual with comprehensive introductions to each method and step-by-step examples (Quick Start booklet explains all major conventions). ■ All data management facilities of STATISTICA/Mac. ■ All graphics facilities of STATISTICA/Mac (including interactive rotation of all 3D graphs, extensive on-screen graph customization facilities). ■ Price: \$295.

DOS versions also available (can exchange data with Macintosh versions): STATISTICA/DOS™ \$795; Quick STATISTICA/DOS™ \$295.

Domestic sh/h \$7 per product; please specify type of computer with order; 14-day money-back guarantee.



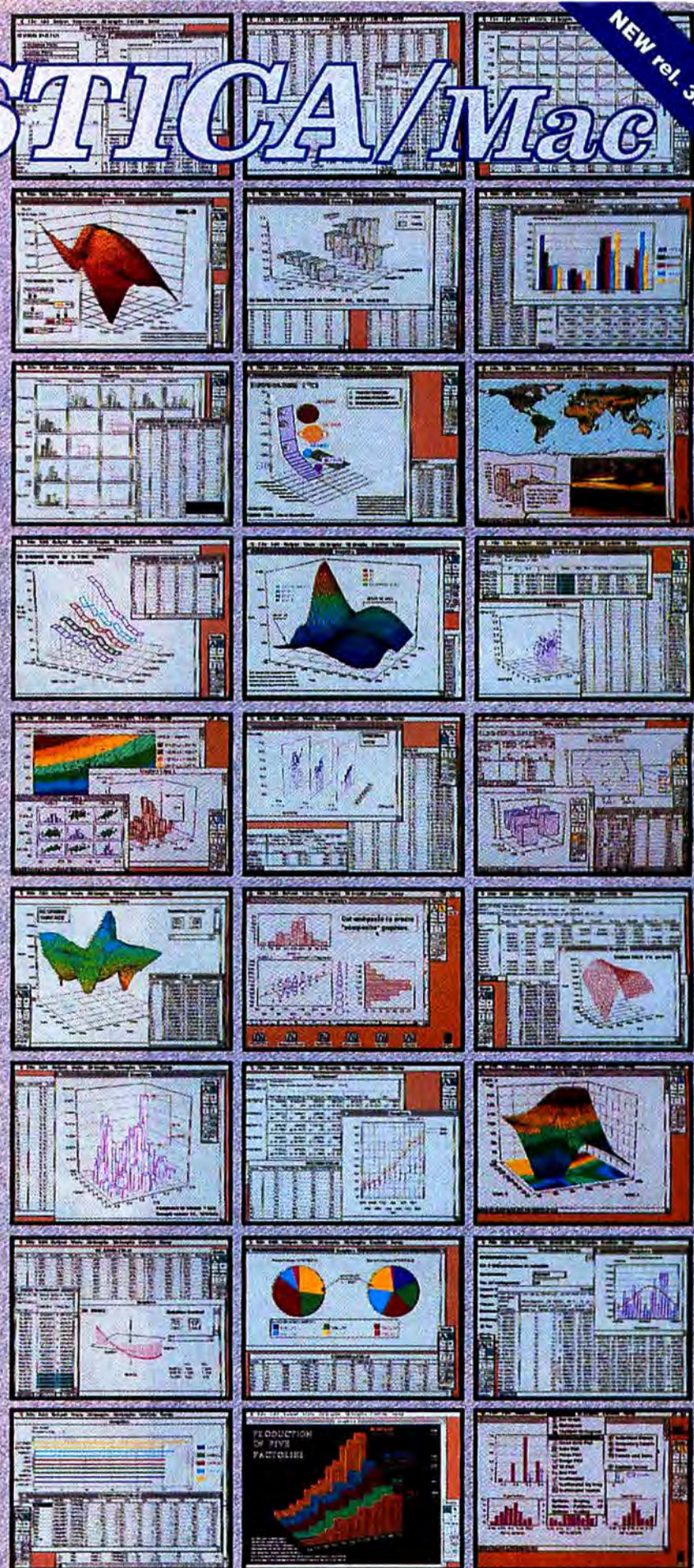
StatSoft™

2325 E. 13th St. • Tulsa, OK 74104 • (918) 583-4149
Fax: (918) 583-4376

Overseas Offices: **Statsoft of Europe** (Hamburg, FRG), ph: 040/4200347, fax: 040/4911310; **StatSoft UK** (London, UK), ph: 0462/482822, fax: 0462/482855; **StatSoft Pacific** (Melbourne, Australia), ph: (03) 663 6580, fax: (03) 663 6117; **StatSoft Canada-CCO** (Ontario), ph: 416-849-0737, fax: 416-849-0918; Available From: **CORPORATE SOFTWARE** and other Authorized Representatives Worldwide; Holland: MAB Jussling, 071-230410; France: Version US (1) 40590913; Sweden: Akademi Data 018-240035; Hungary: P&D Soft KFT 185-6868; Belgium: TEXMA 10 61 16 28; South Africa: Online 12 663-4500; Japan: Three's Japan, Inc. 03-3770-7600

CSS, StatSoft, STATISTICA/Mac, STATISTICA/DOS, and Scrollsheet are trademarks of StatSoft, Inc.; Macintosh, Mac IIx, Excel and MacDraw are trademarks of their respective companies.

Circle 99 on reader service card



GET ORGANIZED! THE MACINTOSH WAY

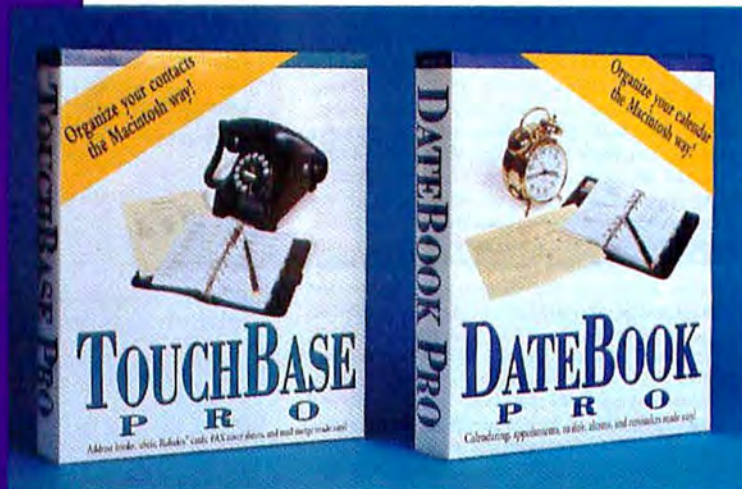
ALL NEW!

THE AWARD WINNERS JUST GOT BETTER. **TOUCHBASE** AND **DATEBOOK** HAVE TURNED **PRO**. FINALLY, WHAT YOU HAVE BEEN WAITING FOR — A CONTACT MANAGER THAT PROVIDES POWER AND EASE OF USE AND A TIME MANAGEMENT PROGRAM THAT HAS THE FLEXIBILITY TO TRACK ALL YOUR DAILY ACTIVITIES. BEST OF ALL, **TOUCHBASE PRO** AND **DATEBOOK PRO** ARE TIGHTLY INTEGRATED TO PROVIDE YOU WITH THE BEST IN PERSONAL INFORMATION MANAGEMENT. AVAILABLE FOR STAND ALONE OR NETWORK USE!

TO GET YOUR COPY OR UPGRADE
JUST CALL

 **1-800-367-8911**

OR VISIT YOUR FAVORITE
SOFTWARE DEALER



A FEW THINGS YOU CAN DO WITH TOUCHBASE PRO

- MANAGE YOUR CONTACTS EASILY
- CREATE LETTERS WITH A BUILT-IN LETTER WRITER
- DIAL YOUR TELEPHONE AUTOMATICALLY
- PRINT ADDRESS BOOKS, LABELS, & ENVELOPES
- KEEP FILES CURRENT WITH FILE RECONCILIATION

A FEW THINGS YOU CAN DO WITH DATEBOOK PRO

- KEEP TRACK OF YOUR APPOINTMENTS & TO DOS
- POST MEMOS TO YOUR CALENDAR
- PRINT CALENDARS: POPULAR FORMATS & WALL CHARTS
- SET ALARMS AND REMINDERS TO JOG YOUR MEMORY
- FUN ICONS & BANNERS PERSONALIZE YOUR CALENDAR



5990 SEPULVEDA BOULEVARD
VAN NUYS, CA 91411

☎ 818-780-2220 FAX 818-780-2666

Circle 318 on reader service card

MW5

Let Your Agents Do the Walking

BY STEVEN LEVY

HAS YOUR INFORMATION run amok? Are perfectly delectable data files and documents growing the digital equivalent of hairy green mold because they are tucked into obscure corners of your hard drive? Do you have to perform endless repetitive tasks just to keep your desktop in order? Are there all sorts of file manipulation that you would like to do but don't, because doing it would be an incredible hassle? Are you having problems arbitrating irreconcilable differences between your various computers? Do you feel there are fascinating nuggets of information you are missing by not cruising databases? Are you sick of novels about lawyers?

If you answer affirmatively to all the above except the last (which I tossed in to test reading comprehension), then you are ready to welcome the latest concept in computing: intelligent agents. The term is confusing, since agents are usually people who talk on the phone a lot, casually drop Tom Cruise's name, and tell you the check is in the mail. But intelligent agents are different from that sort of agent in several ways: (1) they are software programs, (2) they work in the background, and (3) they don't take a percentage.

A good definition of agents was provided by the moderator at a recent MIT conference that billed itself as the first symposium to address the subject. "An intelligent agent," he said, "is a semiautonomous computer program that can learn who you are and what you want—like a good British butler." (This moderator, incidentally, was an actor costumed as a butler supposedly named Reeves—very funny, but you had to be there.)

Presumably, agents will be our assistants in assimilating the imposing glut of information that makes our lives miserable. As Reeves put it, "people need less information, not more, [and] the quality and content of that information must be monitored and controlled in such a way that one can conveniently get on with one's life."

Secret Agents

SOUNDS GOOD, HUH? THE BEAUTY OF it is that after a presumably painless period

of educating an agent on its duties, *almost nothing is thereafter required of the user*. Any software agent worth its salt is somewhat autonomous. A mind-reading butler! A better analogy might be a horde of mythical elves who infiltrate your house under cover of darkness and clean up the joint, not even requesting gratuities. Wouldn't you like a team of those elves paratrooping nightly into your hard drive, straightening out your folders and backing up your files? Better still, envision a squadron of elves searching America Online, Usenet, and the electronic version of the *New York Times*, identifying messages and articles of interest, and gathering those nuggets in a file that greets you when you sit down at the Quadra in the a.m.

Can you stand another analogy? A private secretary! Like "My Little Margie" in C++ clothing, your agent will know you as well as—or better than—you know yourself and will use this knowledge to keep your data-based affairs in order. Nicholas Negroponte, the head of MIT's Media Lab, is particularly enchanted with this concept. He outlined the following situation to the symposium. Someone asks for the most recent letter sent to Negroponte by person A. His current response is to push a button on his intercom and ask his flesh-and-blood assistant to retrieve the letter from his files. "But what if that request wasn't to a person, but an agent?" he asked the gathering rhetorically. "In both cases I would be delegating it to an expert—on me."

This expertise will best be employed in gathering useful information and screening out the useless stuff. When performing the latter task, agents will "know" which people you are eager to hear from, and which you want no part of. (Agents will also understand that on certain subjects, you are willing to hear from those ordinarily blacklisted via your bozo filter.) This sort of discrimination will apparently be performed by General Magic's recently announced Telescript protocol for communications, and Apple has made a big deal of announcing that its Newton

personal information devices will also be agent-driven.

The act of gathering information is more challenging for agents. Gigabytes of data lurk in various servers around the world, only a phone call away. Undoubtedly hidden in this massive digital haystack are appealing needles—maybe a factoid or perhaps a figure that will transform your entire existence, if only you saw it! But who has time to look through a haystack?

Agents do. Being software constructs, they have no hobbies of their own, and never visit the dentist. Sometime soon, according to the true believers, these agents will spend their days combing the nets for the sorts of things that interest you. They will even make educated guesses on the sorts of items that you haven't expressed a preference for, but probably would have, if you'd thought of it. How will they do this? Well, a Media Lab researcher named Pattie Maes has come up with an ingenious scheme to allow agents to make uncanny inferences about our reading habits. She has been launching entire populations of agents from her Macintosh, having them scour the backwaters of Usenet for items of potential relevance, and then selecting the most successful agents as stock for a subsequent generation of agents. In other words, she is literally breeding intelligent

agents. Genetically speaking, locating the tastiest information is a matter of life and death for these software beings. The ultimate recipient of this vital struggle is the user, who will automatically receive a digest of news items he or she can use.

There's something utopian about the idea of agents, designed to pamper us with customized clerical services while never burdening us with problems of their own. One speaker at the MIT confab referred to the use of agents as "zipless computing" (to be discussed, no doubt in a future Erica Jong novel, *Fear of Filing*). Indeed, Nicholas Negroponte's talk was dubbed "The continues



*Virtual
butlers, elves,
and
secretaries
in
your Mac*

Apple and a higher standard

Introducing the LaserWriter[®] Pro 600 and 630 printers from Apple.

Never before have workgroup printers this affordable produced this level of output.

Offering you true 600-dot-per-inch resolution, they deliver more than four times



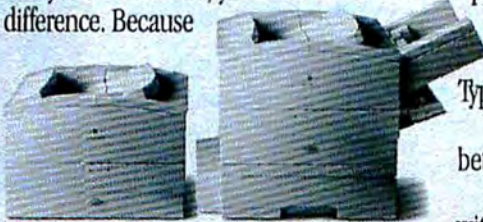
The LaserWriter Pro 600 and 630 feature PhotoGrade, an Apple breakthrough allowing you to print up to 91 levels of gray—that's 35% more grays than with our award-winning LaserWriter IIg.

Intelligently adjusts the size and position of every dot in relation to neighboring dots, allowing you to print up to 91 levels of gray at 300 dpi.

That's equivalent to a 1,000-dpi printer costing mountains more.

The result is noticeably sharper details and the ability to reproduce the subtle tones of gray in black-and-white photographs.

But even when you don't integrate photos into your documents, you'll still notice the difference. Because

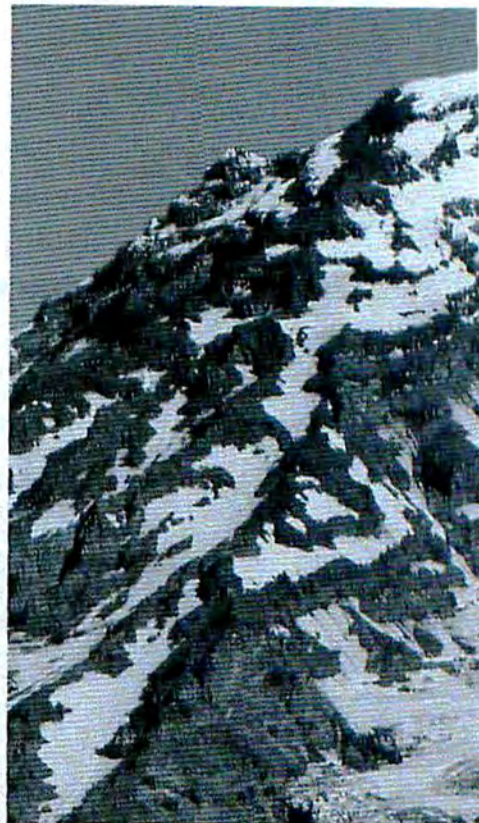


Both LaserWriter Pro models come with two paper trays and a host of paper-handling options, including a 500-sheet feeder and a 75-envelope feeder.

the definition of comparably priced 300-dpi printers.

Both models incorporate an Apple breakthrough in gray-scale printing called PhotoGrade.[™]

A process that intel-



Apple's FinePrint[™] technology gives your text and line art cleaner edges and smoother curves. So your TrueType[™] and PostScript[™] Type One fonts have never had more impact.

Any way you look at it, your work looks better coming out of a LaserWriter Pro.

Two paper trays come standard, along with an array of options including a 500-sheet feeder and a 75-envelope feeder for a total paper-handling capacity of 850 sheets.



© 1993 Apple Computer, Inc. All rights reserved. Apple, the Apple logo, LaserWriter, Macintosh and "The power to be your best" are registered trademarks, and FinePrint, PhotoGrade and TrueType are registered trademarks of Hewlett-Packard Company. Windows is a registered trademark of Microsoft Corp. "J.D. Power and Associates" 1992 Computer End User Satisfaction Study. Printers. Study conducted

nounces of laser printing.

able to move even the largest, most complicated image files and print them at speeds rivaling any RISC-based printer.

And if you happen to work in a mixed environment, both LaserWriter Pro models fit right in. They support PCL page description language and can easily accept jobs from Macintosh* and Windows-equipped computers simultaneously.

They also provide you with something that no other printer in the world can: Apple's renowned plug-and-play simplicity.

LaserWriter Pro 630 vs. HP LaserJet 4M

Price:	\$2,529*	\$2,999*
Gray levels:	91	51
Macintosh fonts:	64 TrueType	None
	35 PostScript	35 PostScript
PPM:	8	8
Ethernet:	Built in	Optional
RAM:	8MB	6MB

In fact, Apple® LaserWriter printers were recently ranked highest in Overall Laser Printer Customer Satisfaction by J.D. Power and Associates.* Outranking Hewlett-Packard.

To see why, visit your authorized Apple reseller for a full demonstration.

You'll find that the LaserWriter Pro has the power to elevate your work to a level ordinary printers can only aspire to.

The power not just to look your best. The power to be your best.*

You can also select and switch paper trays right from your computer and print a letter, complete with second sheet and envelope, without ever leaving your desk.

No other printer in the industry allows you to do so much so easily for so little.

For high-performance networks, the 630 features built-in Ethernet. So you'll be

The new LaserWriter Pro series from Apple.

are trademarks of Apple Computer, Inc. Adobe, PostScript and the PostScript logo are trademarks of Adobe Systems Incorporated, which may be registered in certain jurisdictions. Hewlett-Packard, LaserJet and PCL are trademarks of Hewlett-Packard Company. *Manufacturers' suggested retail price. Actual output size 8 1/2" x 11". This ad was created using Macintosh personal computers and Apple LaserWriter printers.

Best Interface Is the Lack of It." Think of it—instead of dealing with desktops and dialog boxes, one need only lean back in a digital Barcalounger while agents do the dirty work!

Trust Me

TO BE SURE, THERE IS PLENTY THAT agents won't do. We will still be stuck with the heavy mental lifting. (Note to my editors: Agents will never write this column. Budget accordingly.) But we can look forward to liberation from certain tedium—the filing, the tidying up, the taking-out of the digital garbage, the screening of electronic mail. This is really going to happen. As Apple Fellow and professional visionary Alan Kay told the MIT symposium, "Agents are happening whether we like it or not." And he wasn't alone in this assessment.

So what's not to like about agents? Kay himself, while emphasizing that he generally supported the movement toward agents, confessed to worries about society becoming overly reliant on them. It is possible, he said, for agents to become "a prosthetic for a person's illiteracy, which is what much of multimedia is all about." Kay's fear in this case is that

agents, by automating tasks that we previously performed ourselves, will distance us from the instructive reality of those tasks—much in the same way that learning arithmetic with a digital calculator prevents one from truly understanding the mathematical process.

But to me, there's a much more essential issue involving agents. When you delegate a task, either to an administrative assistant, a butler, or a brother-in-law, you do so with the expectation that your surrogate won't screw up. While we have well-established criteria for making judgments on the reliability of fellow humans—and can usually take solace in the fact that if they fail us we can fire them, or at least yell at them—the same cannot be said of software agents. How deeply are we willing to rely on them? Would we allow them to perform duties essential to our jobs? Our lives?

I got a tiny taste of this trust issue not long after I began playing with a new program called Magnet. This application is sold by its creator, No Hands Software, as the first intelligent agent for the Macintosh. Tony Stayner, the company's president, has very cannily poised his Belmont, California, business in the center of the

Next Big Thing in software. He also knows how to talk that talk.

"Magnet is like a personal assistant inside your computer," says Stayner. While he admits that the Magnet agents are crude compared with those to come, he assures me that the agents provided in the application are genuine. "If you give them a set of instructions once, they will perform them reliably—probably forever."

Fatal Attraction

MAGNET IS A WELL-DESIGNED PROGRAM, and I found setup quite easy. Soon I was busily constructing my first agents, or magnets, to perform housekeeping tasks on the shabby digital edifice of my data. One of the first things I asked Magnet to do was organize some capture files from my online sessions on the Internet. I had been following an ongoing newsgroup called cipherpunks (the name comes from their rebel stance concerning cryptography). Since I had been following the thread for several months, I had dozens of files; unfortunately I had not been carefully saving them to the same file, and the files are now dispersed all over my

continues

INTRODUCING THE LABEL PRINTER THAT DOES IT ALL.



Finally there's a label printer that handles all your labeling needs. LabelWriter® II Plus prints more label sizes, and holds bigger label rolls, than any of its competitors.

This remarkable printer comes with easy-to-use software that lets you print labels at any time, without interrupting your main programs. You can combine text and graphics to produce custom labels.

Print address labels with the POSTNET bar code for more accurate mail delivery. Or print entire mailing lists directly

from your favorite programs – up to 350 labels in just 25 minutes. There's even a built-in bar code generator.

LabelWriter II Plus handles 1 1/8" x 3 1/2" labels in white, clear or yellow, as well as 2 1/4" x 4", 3.5" disk, and video-cassette labels. It is compatible with ATM® and TrueType®. An AppleTalk® option is also available.

Call 1-800-426-7827, ext. 184 for more information.

Tel: 203-661-9700 Fax: 203-661-1540 ©1993 CoStar Corp.

**CO
STAR®**



LABEL VIDEOCASSETTES



LABEL PACKAGES



LABEL OFFICE ITEMS



LABEL DISKS

Circle 196 on reader service card

When It Comes To CD-ROM, We're for Multiple Choice.



Chinon's Complete Family Of Quality CD-ROM Drives.

Chinon has just the CD-ROM drive you need—from basic to state-of-the-art.

The 431 series offer unbeatable price/performance in an entry-level drive.

The 435 series drives are fully MPC and Quicktime compatible, with a 64KB data buffer and single-session Photo CD capability. They are multimedia performers that won't bust your budget.

The new 355 series of 3½" drives are XA compatible, and will read Sony DataDiscman discs, audio 3½" CD's, or any new software written in the 3½" format.

Our exciting new 535 series drives earn their place at the top

of the line. They offer dual speed performance, are multisession Photo CD and XA compatible, and have a huge 256K data buffer. Double doors and a sealed mechanism protect your data from dust.

All Chinon drives have a reputation for rugged construction and rock-solid reliability. And Chinon quality always comes at a very competitive price. So call today for the reseller nearest you—and make the right multiple choice.

CHINON

The Drive to Succeed

Chinon America, Inc., 615 Hawaii Avenue, Torrance, CA 90503 Toll-free (800) 441-0222 In California (310) 533-0274

Sony and Data Discman are trademarks of Sony Corporation

Circle 64 on reader service card

hard drive. So I set up a magnet that would locate all the documents with the word *punk* in its file name, and place them in the file named *punk list* that I'd originally set up as a central repository, and which at that time held about 35 files. (I guessed that probably another dozen were somewhere else on the drive.) I instructed the program to dispatch this task every day at noon.

This was done in the late morning. Not long after, I drove to town to eat lunch. When I returned, I checked my Mac to make sure the agent had properly done its duty. I stepped down the hierarchy to the file I'd originally named *punk list* and opened it. To my astonishment, it was empty. Approximately 3MB of information, gathered over two months, had disappeared.

I frantically opened up folders in a futile search for the missing files. Eventually, I did a search with On Location, and to my great relief, the program found the capture files, 46 of them. Where? In the Trash folder.

What happened? As best I can surmise, when I instructed the agent which folder to place the files in, I had capitalized the first letter of the word *punk*, while

the actual file used a lowercase *p*. At the noon hour, my agent had efficiently gathered the files in question, and then searched for the destination folder. But it could not find a perfect match. As with human assistants, the response to this conundrum was a key in determining continued employment. A person facing this dilemma might have realized that the difference between an upper- and lowercase *p* was irrelevant, and would have placed the files in the folder anyway. A less enterprising person would have at least left the files where they were and read a magazine until my return. Only an idiot—or a software program—would have shrugged its virtual shoulders and tossed the files in the trash can.

Needless to say, I performed a complete backup before further testing Magnet, which did prove useful in performing simple tasks like gathering recent work into a single folder containing my current jobs, and synchronizing files so that I had the most recent versions of documents on both my desktop Macintosh and my PowerBook. But I felt compelled to check up on my agent after every spin of the hard drive. A shadow of mistrust had darkened the relationship

between my agent and me.

But don't worry, I'll get over it. The idea of agents is simply too good to discard over a few megabytes of files trash-canned in error. As Alan Kay said, agents are inevitable, and I eagerly look forward to the day when agents prepare my daily news digest, answer my electronic mail, and automatically send nasty computer-generated letters to the nasty computer-generated letters sent to me by collection agencies. ("I'll have my agent call your agent.")

But before that day comes, allow me to indulge in a bit of uneasiness. After all, the more we entrust to agents, the more things can go wrong. Still, I may be overreacting. After all, I am supremely confident that the meticulously careful people who write and test our software will make 100 percent certain that these agents will not presume to perform any tasks beyond them, especially in areas that might lead to data loss, missed electronic messages, or mishaps in the air-traffic control system.

Yeah, right. **m**

STEVEN LEVY's most recent book is *Artificial Life: The Quest for a New Creation* (Pantheon, 1992).

COULDN'T MAKE IT TO THE MACWORLD EXPO SAN FRANCISCO? GET IT ON INTERACTIVE CD FOR ONLY \$29.95!

- ☐ Over **60 QuickTime™ Movies** from hardware and software developers highlighting **Hot Products** at the Macworld Expo San Francisco.
- ☐ A **Complete Listing of All Developers** participating at Macworld Expo including detailed **Company and Product Information**.
- ☐ An **Interactive Show Guide** to the Expo Conference and Keynote Sessions.

System requirements: A QuickTime-capable Macintosh, 13" or larger color monitor, 5mb of RAM, System 7.0 or later, and a Macintosh-compatible CD-ROM drive. QuickTime is a registered trademark of Apple Computer Inc.



MACWORLD EXPOSITION CD ORDER FORM

- Yes! Please send me the Macworld Exposition CD for the **SPECIAL LOW PRICE OF \$29.95.**

Name _____
Company _____
Address _____
City _____
State _____ Zip _____
Telephone _____
☐ Payment Enclosed
☐ Check ☐ MC ☐ Visa
Card # _____
Expiration Date _____
Signature _____

Complete and mail with payment to:

Macworld CD Ventures
P.O. Box 105443
Atlanta, GA 30348-5443

Foreign orders add \$12.50. MA, NJ, CA, and IL residents add applicable sales tax.

To Order Call 800-821-1177 (x113)
Fax Orders Call 415-543-3984

Circle 302 on reader service card

SCOTT WATSON'S

White Knight®



11

THE WORLD'S MOST POPULAR TELECOMMUNICATIONS PROGRAM FOR THE APPLE MACINTOSH II

White Knight is the successor to the legendary Red Ryder telecommunications program, and the winner of 11 major awards domestically and internationally. The 270+ page user manual is geared to all levels of experience. There are many tutorials and step-by-steps for beginners and plenty of "meat" for more experienced users. This is the program that everyone is raving about, and for good reason.

"White Knight is probably the best communications program on the market, combining technical sophistication, flexibility, user-friendliness and a bargain basement price - \$139. It deserves more than an unqualified recommendation. It should be a mandatory buy for anyone with a Macintosh and a modem. Watson is a former writer-editor and the manual is the best read I've seen in computer documentation."

**COMPUTER COMMENT,
UNITED PRESS INT'L.**

White Knight has been designed with one ultimate goal - to get the job done with a minimum of fiddling. It offers the kind of power associated with products costing hundreds of dollars more, but is easier to learn and more flexible. Even the user interface is customizable to an extraordinary degree. There's no more searching for the "perfect" program because you set it up the way you want it. A FREE copy of Okyto (a revolutionary Mac-to-Mac file transfer program) is included with each White Knight package.

White Knight is the perfect, low-cost solution to your telecommunication needs.
Write or call us for a free brochure and dealer referrals.

The FreeSoft Company

105 McKinley Road ■ Beaver Falls, PA 15010
Phone: (412) 846-2700 ■ Fax: (412) 847-4436

Circle 3 on reader service card

Deliver presentations on screen
including QuickTime movies

Store frequently used typesyles
and instantly recall them as desired

Shortcuts give you
pushbutton access to all
of your frequently used
commands

New Pictogram, High-Low-Close
and Combination chart types

The New ClarissWorks 2.0. You Won't Be Able To Keep Your Hands Off It.

Automated database
entry increases productivity
and ensures accuracy

Watch text automatically
wrap itself around your graphics

Presenting an entirely new version of the best-selling integrated software for Macintosh. ClarissWorks™ 2.0 gives you new tools for outlining, color painting and presentations. Plus over 300 new word processing, spreadsheet, charting, database, graphics and communications features. All in one program that's still under 600K. Comes with a 30-day money back guarantee. Upgrade today. Once you try it, you won't be able to put it down. **CLARIS®** Simply powerful software.™

Illustrate your point with
256 colors and 32 gradient fills

\$99* Upgrade. 1-800-544-8554.

See every keystroke
by clicking Show Invisibles

Integrated Outliner with 7 standard
formats organizes your thoughts

Pull down a menu
and select from over 50
pre-set Avery labels

*Offer valid in U.S. only. Proof of previous
ClarissWorks ownership required. Call for our \$129
competitive upgrade. ©1993 Clariss Corporation.
All rights reserved. Clariss is a registered trademark and
ClarissWorks and Simply powerful software are
trademarks of Clariss Corp. Macintosh is a trademark
of Apple Computer, Inc. Source Code 100031

From Hype to Reality: A Case Study

BY DEBORAH BRANSCUM

THIS IS THE STORY OF HOW one company developed, marketed, and shipped a significantly flawed product in a new area of Macintosh technology—and what that says about the industry as a whole. The company did many things right—especially in its prompt, honest attempt to satisfy early customers. It also did several things wrong, notably in its misleading advertising and unrealistic product specifications.

Of course the company is scarcely alone in that regard, so perhaps the most telling part of this story is how it illustrates common industry practices. Which makes this a tale of Everyvendor and a lesson in Modern Marketing.

Problems Surface

ON NOVEMBER 23, 1992, SUPERMAC Technology announced it was shipping DigitalFilm, "a video production system that makes professional preproduction compositing and postproduction editing possible right from the Macintosh desktop," according to a press release. SuperMac claimed DigitalFilm was comparable to editing systems costing \$100,000 or more.

Aimed at video professionals, the \$5999 board package won raves from beta testers, according to company officials, who announced the technology in 1990. The press release says DigitalFilm "turns desktop video into a professional tool capable of saving hours of time and hundreds of thousands of dollars in offline—and even online—editing suites." Ads for DigitalFilm had a David-and-Goliath slant, visually contrasting a professional editing suite against SuperMac's hardware-and-software bundle, which the company called a studio in a box.

Beta testing began in October 1992; volume shipments took place in December. By Christmas, SuperMac had received bug reports both from DigitalFilm owners and from a reviewer for *MacWeek*. (*Macworld* did not receive a board for review.) The customer complaints were few but fierce, and included beefs about the board itself: problems with Adobe Pre-

miere, the editing software that comes with the board; problems with configuration issues; and problems with QuickTime, according to Jay Torborg, vice president for engineering and product development.

In January, SuperMac confronted the issues head-on. A team of engineers was sent to Los Angeles, Chicago, and New York to visit customers and see their problems in the field. The company also brought a corporate client and his computer system from Dallas to SuperMac's headquarters in Sunnyvale, California, to trace his problems—which SuperMac couldn't duplicate.

The company made some interesting discoveries. Quadras don't actually turn off all the way when you shut them down. So a small percentage of DigitalFilm boards in a small percentage of Quadras "wouldn't reset properly when you turned the machine back on, because the voltage didn't go low enough," says Torborg. Moreover, the problem affected only systems that used 17-inch monitor settings. RAM turned out to be tricky, too. "In the Quadras, the refresh interval is not fast enough to refresh standard-power 16MB DRAMs," says Torborg. Third-party companies make 16MB SIMMs, and last fall it wasn't widely known that Quadras need low-power 16MB SIMMs to avoid system crashes with some applications.

The company also discovered that DigitalFilm's original specification sheet was inadequate in listing system requirements and optimistic in the benefits it promised. As it turned out, DigitalFilm boards demanded a Quadra and a hard drive with a speed of 5400 rpm in order to function well. Memory requirements were greater than SuperMac specified, maximum compression rates were lower, and there were other problems as well.

On February 1, SuperMac went public by sending a letter signed by company president and CEO Michael McConnell to the estimated 200 Digital-

Film owners. The letter announced that DigitalFilm 1.1 was scheduled to be released in March and would solve several flaws, including improper audio-video lip synchronization; the appearance of dropped frames during playback; system crashes during compression or input of so-called noisy source material, and restart problems for Macs connected to 17-inch monitors.

SuperMac should be commended for promptly recognizing the situation. The company halted general shipments as it worked to revamp the product. The frame-dropping problem was because of QuickTime and not SuperMac's fault. But until Apple fixes the problem, SuperMac plans to provide a Premiere export module as a workaround, so playback will be smooth. But wait, there's more: SuperMac has pledged to invest close to half a million dollars in adding five field engineers and additional in-house tech staff to support DigitalFilm and future video products. The engineering department is expanding its test facilities. SuperMac is offering full refunds to any dissatisfied customers. And people who bought DigitalFilm early on can receive CoSA After Effects, a \$1295 digital-compositing package, at no charge.

What Went Wrong

DESPITE SUPERMAC'S BEST INTENTIONS, it sent out a lemon when it shipped DigitalFilm. Where did the company go wrong? Several users I spoke to said the company simply shipped the board too early and without adequate testing. Torborg denies that a longer testing period would have made any difference, and says some beta testers had the product for well over a year. He does say the company didn't have an optimal beta test group, and the sophisticated beta testers didn't find the problems that less-experienced video hands did.

Part of the flap over DigitalFilm is due to different
continues



*Lessons
for consumers
from a
buggy product*

Is your Mac acting in

1991 & 1992 Macworld World Class Award Nominee for Best Customer Support-Software. Since 1984, the original Mac mail-order source.

We have thousands of products to choose from, and carry only the very latest versions. For items and/or versions not yet released at press time, we've indicated the expected availability dates as supplied to us by the manufacturers. Also, unless indicated by (CP), all software is not copy-protected.

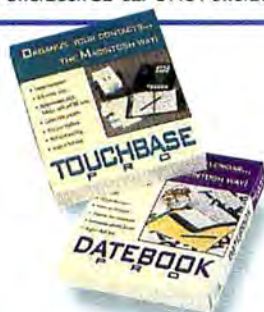
Most software today is System 7 compatible. For specific features of System 7.1, please ask your salesperson when placing your order. Also, our new System 7.1 Video w/Don Crabbe, is just \$9 (2244) or free when you order Apple's System 7.1 for \$79 (1074).

Companies participating in the 30- or 60-day Money Back Guarantee program are highlighted with a ★. If you are not satisfied with your purchase of any MBG item, call us for an authorization and return it with all of the original packaging/reg. card within the guarantee period for a refund check (or credit on your credit card.) We reserve the right to limit quantities on returns.

Corporate Accounts welcome. Bids and P.O.'s accepted. Please call 800-800-3333 for information.

POWERBOOK MEMORY, DRIVES, CASES

- ★ **Applied Engineering ... 30 day MBG**
- 8799 PowerBook Auto Adapter \$69.
- 8800 PowerBook Battery Charger..... 105.
- Datalink PB..... ea. 499.
- Asanté Technologies, Inc.**
- EN/SC-BNC or 10/T for PBooks... ea. 339.
- Battery Technology, Inc.**
- 7562 Battery for PowerBook 140-170 62.
- ★ **Claris Clear Choice ... 30 day MBG**
- 11204 Power to Go 60.
- ★ **Dayna ... 60 day MBG**
- 5396 DaynaPORT SCSI Link PB (BNC) 299.
- 5360 DaynaPORT SCSI Link PB (10-BASE-T) 299.
- ★ **Dove Computer ... 30 day MBG**
- 5383 DoveFax PB 2.0.3 99.
- FWB, Inc.**
- 5567 hammerPB80 ... 449. 5568 PB120.. 549.
- ★ **Global Village ... 30 day MBG**
- 7720 PowerPort/Silver.. 369. 7710/Gold. 429.
- ★ **I/O Design Cases ... 30 day MBG**
- 8121 PowerBook SL 52. 8113 PowerBook EX 59.



- ★ **After Hours Software ... 30 day MBG**
- 7411 TouchBASE Pro and DateBook Pro Bundle—Organize life. Completely integrated to manage contacts, calendars, appointments & to-dos quickly and easily. Macworld Editors' Choice for Personal Information Manager..... \$89.



- ★ **Kensington ... 30 day MBG**
- 1118 Compact PowerBook Case 36.
- 10421 Deluxe PowerBook Case w/TouchBASE 75.
- 9585 Executive PowerBook Case 125.
- 5976 NoteBook Keypad 79.
- MASS Microsystems**
- 6313 1" Portable Drive Granite Case (120 MB) 499.
- NEC**
- 6577 CDR37 Portable CD-ROM Drive 439.
- ★ **Palomar Software ... 30 day MBG**
- 9576 On The Road 1.0 62.
- PowerBook Cables (various)**
- ★ **Prometheus ... 30 day MBG**
- 10934 Pro Modem 144i 259.
- ★ **PSI Integration, Inc. ... 30 day MBG**
- 5320 PowerModem 155. 6961 Pow.Mod. II 235.
- 7798 PowerModem III..... 329. 7786 IV.... 425.
- Sigma Designs**
- 6939 Power Portrait (granite case)..... 679.
- ★ **Sophisticated Circuits ... 30 day MBG**
- 7425 PowerPad..... 79. 7419 w/QuickKeys. 119.
- ★ **Symantec ... 30 day MBG**
- 1199 Norton Essentials for PowerBook..... 87.
- ★ **Targus ... 60 day MBG**
- 1305 Universal Notebook..... 69.
- 6037 Premier Leather Case 169.
- Utilitron, Inc.**
- 3012 PowerSwap 25.
- ★ **Zoom Telephonics ... 30 day MBG**
- 10737 FaxModem PBK 92.

DAILY BUSINESS ACCOUNTING, DATABASES, SPREADSHEETS, WORD PROCESSING

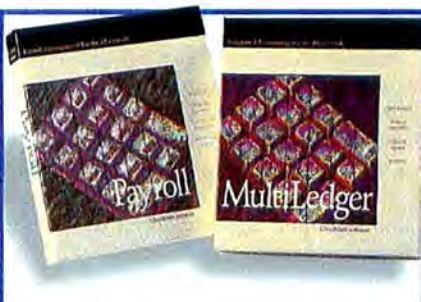
- A Lasting Impression**
- ResumExpert or Cover Letters ea. 48.
- ★ **Aatrix Software ... 30 day MBG**
- 8914 PayCheck 49. 8079 Hil Finance..... 79.
- Abacus Concepts**
- 7106 StatView 4.0 439.
- ★ **Aclus ... 30 day MBG**
- 5618 4th Dimension 3.0 575.
- ★ **Advanced Software ... 30 day MBG**
- 8051 InTouch 2.0 55. 9049 DocuComp II 99.
- ★ **After Hours Software ... 30 day MBG**
- 1352 TouchBASE Pro 3.0 (Apr. '93) 49.
- 3314 DateBook Pro 2.0 (Apr. '93) 49.
- 7411 TouchBASE Pro & DateBook Pro Bundle 89.
- 1977 TouchBASE/After Dark/Quicken Bundle 89.
- Amaze, Inc.**
- 3582 The Far Side Daily Planner 2.0 39.
- ★ **Attain Corporation ... 60 day MBG**
- 8465 IN CONTROL 2.0 85.

★ MDS Drives ... 60 day MBG

MDS Removable SyQuest Drives—Come complete with one cartridge and all the software you need for low-level formatting of cartridges, selecting interleaves for fastest data access, defining partitions, and initializing them in either Mac or A/UX formats. There's also disk caching and volume password protection. Also includes a 2 year warranty and **Hard Disk Toolkit Personal Edition**. A great value!

- 5533 MDS 44 with free AutoDoubler \$439.
- 5532 MDS 44 with free Norton Utilities... 439.
- 5534 MDS 88 with free AutoDoubler 539.
- 5535 MDS 88 with free Norton Utilities... 539.
- 10591 MDS 88c with free AutoDoubler 649.
- 10589 MDS 88c with free Norton Utilities.. 649.

- ★ **Avery ... 60 day MBG**
- 7446 MacLabel Pro 1.5 48.
- ★ **Banner Blue ... 30 day MBG**
- 3548 Org Plus For Macintosh 1.0..... 125.
- ★ **Baseline Publishing ... 30 day MBG**
- 8881 Thunder 7 1.5.2 55.
- Broderbund Software**
- 3608 MacUSA ... 29. 3356 MacGlobe..... 34.
- ★ **CheckMark Software ... 60 day MBG**
- 5863 MultiLedger 3.0 225. 5862 Payroll 5.0 169.
- Chena Software**
- 1594 Fair Witness 1.2 185.
- ★ **Chipsoft ... 30 day MBG**
- 8059 MacInTax 49. 3916 w/Quicken Bundle 59.
- ★ **Claris ... 30 day MBG**
- 3903 ClarisWorks 2.0. 199. 3531 Resolve 169.
- 3836 FileMaker Pro 2.0 268. 4752 Upgrd ... 89.
- 1745 MacProject Pro 399.
- 11202 MacWrite Pro (Mar. '93) 169.
- Contact Software**
- 7636 ACT! 249. 10317 ACT! Comp. Upgrd. 91.
- ★ **Design Science ... 30 day MBG**
- 10769 MathType 3.0 125.
- ★ **Dow Jones ... 30 day MBG**
- 1942 Market Analyzer Plus 2.04 225.
- ★ **Expert Software ... 30 day MBG**
- 5234 Expert Writer 1.0 29.
- ★ **Helix Technologies ... 30 day MBG**
- 1077 Helix Express 299.



- ★ **CheckMark Software ... 60 day MBG**
- 5863 MultiLedger 3.0—Easy-to-use, integrated accounting software selected as a Macworld Editors' Choice (11/92)..... \$225.
- 5862 Payroll 5.0—Complete payroll management which also works with M.Y.O.B.. 169.

a way you don't like?



★ **Apple Computer ... 30 day MBG**
 3008 *Apple Font Pack*—Collection of 43 superb TrueType fonts can improve the look of *all* your communications, from word processing and spreadsheet documents to presentations and faxes. Reqs. System 7 **\$74.**

★ **Inspiration Software ... 30 day MBG**
 11269 *Inspiration 4.0* 159.
 ★ **Intuit ... 30 day MBG**
 2507 *Quicken 3.0* 42.
 ★ **Lotus Development ... 30 day MBG**
 3606 *1-2-3 Mac 1.1* 289. 3604 *Upgrade* 95.
 ★ **MECA ... 60 day MBG**
 2796 *Managing Your Money 5.0* 32.
 3004 *Tax Cut '92* 44.
 ★ **Microlytics ... 60 day MBG**
 6461 *WordFinder Plus 4.02* 39.
 7820 *Random House Encyclopedia 1.0* 68.
 ★ **Microsoft ... 30 day MBG**
 2884 *Works 3.0*... 155. 8173 *Upgrade* 79.
 3669 *Excel 4.0*... 295. 5237 *Upgrade* 125.
 4902 *Word 5.1*... 295. 1503 *Upgrade* 125.
 5454 *The Microsoft Office 3.0* 475.
 ★ **Niles & Associates ... 30 day MBG**
 4602 *EndNote 1.5.1* 85. 8010 *Plus 1.2.1* 142.
 ★ **Nisus Software**
 11189 *Nisus Limited Flag Edition* 238.



Teknosys
 5203 *Help!*—Configuration problem solver improves Mac's efficiency & prevents crashes. Artificial intelligence detects conflicts, incompatibilities, improperly installed files, damaged & duplicated files, etc. **\$88.**

★ **Nolo Press ... 30 day MBG**
 4228 *Personal RecordKeeper 3.0* \$29.
 2981 *WillMaker 4.0* 35. 1204 *Living Trust* 43.
 ★ **Now Software ... 30 day MBG**
 1793 *Now Up-To-Date 65*. 2366 *(10 pack)* 519.
 ★ **Palo Alto Software ... 60 day MBG**
 6975 *Business Plan Toolkit 4.0* 75.
 11199 *Sales and Market Forecasting Toolkit*... 75.
 ★ **Pastel Development ... 30 day MBG**
 1785 *DayMaker 2.0* 79.
 ★ **Peachtree ... 60 day MBG**
 9584 *Accounting for Macintosh 2.0* 119.
 9588 *Insight Accounting 4.0* 299.
 ★ **Portfolio Systems ... 30 day MBG**
 7992 *DynoPage 2.0* or 6916 *Dynodex* ea. 49.
 ★ **Power Up ... 30 day MBG**
 7696 *Calendar Creator 1.01* 48.
 7694 *Address Book Plus* 67.
 1760 *PowerRunner Bundle* 95.
 ★ **ProVUE ... 60 day MBG**
 4582 *Panorama II* 239.
 ★ **Reality Technologies ... 30 day MBG**
 6929 *WealthBuilder 2.0* 94.
 ★ **Round Lake Publishing**
 LetterWorks, SALES or LEGAL ea. 45.
 ★ **Shana Corporation ... 30 day MBG**
 8810 *Informed Manager* 99.
 7692 *Informed Designer* 149.
 10832 *Informed Foundation* 299.
 ★ **Symantec ... 30 day MBG**
 3422 *More 3.1* 265.
 ★ **SYSTAT ... 30 day MBG**
 1230 *FASTAT 2.0* 399. 1231 *SYSTAT* 699.
 ★ **TechWorks ... 30 day MBG**
 7736 *Spiral 1.0* 72.
 ★ **Teleware ... 30 day MBG**
 7616 *M.Y.O.B. 3.0*... 109. 9239 *Upgrade*... 59.
 ★ **TIMESLIPS ... 30 day MBG**
 1701 *LapTrack*... 52. 2986 *Timeslips III*... 194.
 ★ **T/Maker ... 30 day MBG**
 7664 *WriteNow Workshop Bundle* 89.
 ★ **Vertical Solutions ... 60 day MBG**
 5886 *FastLabel*... 55. 3235 *MacLabelPak*... 85.
 ★ **WordPerfect ... 60 day MBG**
 3800 *WordPerfect 2.1.2* 279. 4711 *Upgrd.* 75.
 10773 *WordPerfect Works 1.2* 149.
 ★ **Wordstar ... 30 day MBG**
 6984 *Correct Grammar 3.01* 49.
 3554 *American Heritage Dictionary 1.0* 55.
 10277 *The Correct Bundle (4 programs)* 99.

GRAPHICS & DESIGN PUBLISHING, PRESENTATIONS

★ **Abracadata, Ltd. ... 30 day MBG**
 9990 *Design Your Own Home - Architecture*,
 9992 *Interiors* or 9994 *Landscape*... ea. 48.
 ★ **Adobe Systems**
 10167 *Adobe Dimensions* 93.
 10289 *SuperATM*... 89. 10423 *Upgrade* 49.
 Adobe *Type Library (Vol. 1-330)* call
 6957 *Adobe Type Reunion 1.0.3* 41.
 6053 *Plus Pack 2.0*... 118. 6098 *TypeAlign* 61.
 4145 *Adobe Premiere* 429. 3199 *Upgrade* 149.
 8171 *Adobe Illustrator 3.2 (w/Dimensions)*... 368.
 5001 *Streamline*... 119. 6644 *Photoshop*... 548.
 ★ **AGFA**
 7971 *AgfaType CD-ROM* 69.
 ★ **Aldus ... 30 day MBG**
 6674 *Aldus Personal Press 2.0* 99.
 2461 *Aldus Gallery Effects 1.01* 128.



★ **Microsoft ... 30 day MBG**
 5454 *The Microsoft Office 3.0*—Increase office productivity with the latest versions of *Excel*, *Word*, *PowerPoint*, and *Microsoft Mail* (includes licensing for one workstation for use with your existing Microsoft server)..... **\$475.**

10176 *Fetch*..... 199. 7541 *IntelliDraw* 194.
 3506 *SuperPaint 135*. 4751 *Persuasion* 325.
 1330 *FreeHand 3.11* 394.
 7088 *PageMaker 5.0 (Apr. '93)* 579.
 ★ **Altsys**
 1983 *EPS Exchange 89*. 1195 *Fontographer* 258.
 ★ **Apple Computer ... 30 day MBG**
 3008 *Apple Font Pack* 74.
 ★ **Ares Software ... 30 day MBG**
 8878 *FontMonger 1.5 (Apr. '93)* 93.
 ★ **Broderbund Software**
 3572 *Kid Pix 1.2*... 34. 7293 *Companion*... 23.
 1427 *Print Shop*... 35. 6281 *TypeStyler 2.1*... 126.
 ★ **Claris ... 30 day MBG**
 2518 *MacDraw Pro* 275. 8007 *Claris CAD* 599.
 ★ **Claris Clear Choice ... 30 day MBG**
 11203 *Brushstrokes* 95.
 ★ **ColorAge (formerly Custom Applications)**
 8037 *Freedom of Press Light 3.03 (17 fonts)*... 84.
 ★ **Computer Associates**
 1668 *Cricke! Graph III* 119.



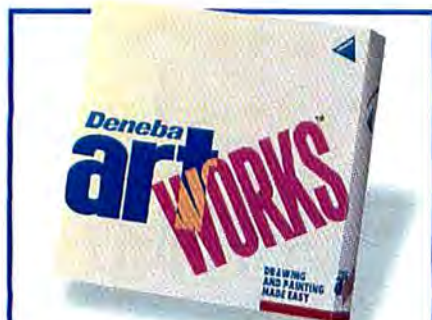
★ **Attain Corporation ... 60 day MBG**
 8465 *IN CONTROL*—1992 *MacUser* Editors' Choice Award for *Best Organizational Tool*. The new standard. The only product to manage activities as outlines, prioritized lists, and calendars!..... **\$85.**



MacConnection®

14 Mill Street, Marlow, NH 03456 603-446-3333 FAX 603-446-7791

Give us a chance



★ **Deneba Software ... 30 day MBG**
11055 *artWORKS*—A fun, flexible package with advanced drawing power and a full set of 24 bit painting and image editing features. Deneba *artWORKS* features breakthrough memory handling and support for third party filters.. \$99.

- ★ **DeltaPoint ... 60 day MBG**
3558 *DeltaGraph Professional 2.0* 199.
- ★ **Deneba Software ... 30 day MBG**
11055 *artWORKS 99*. 3227 *Canvas 3.0.4* 259.
- ★ **Expert Software ... 30 day MBG**
4870 *Expert Color Paint, 1737 Landscape, 8619 Home, or 1731 Office Design* ea. 29.
- ★ **Fractal Design**
1068 *Sketcher 1.0* 93. 10402 *Painter 2.0* 265.
- ★ **Gryphon**
4202 *Morph 1.1* 95.
- ★ **Letraset ... 30 day MBG**
4709 *LetraStudio 139*. 6300 *FontStudio..* 359.
- ★ **Light Source**
3733 *Ofoto 2.0 (Mar. '93)* 275.
- ★ **Lingulst's Software ... 60 day MBG**
2569 *Cyrillic II 99*. 2641 *Laser Hebrew* 89.
- ★ **Macromedia**
7651 *Action! Mac 349*. 7441 *SwivelPro* 479.
3450 *SwivelMan 596*. 7653 *MacroModel* 999.
- ★ **Manhattan Graphics ... 30 day MBG**
4990 *Ready, Set, Go! 5.14* 219.
- ★ **Microsoft ... 30 day MBG**
2878 *PowerPoint 3.0* 295. 10065 *Upgrade* 125.
2565 *Project 3.0* 445. *Upgrades* call
- ★ **Postcraft International**
2210 *Effects Specialist 2.0* 89.
- ★ **Quark**
7612 *QuarkXPress 3.1* 549.



MicroMat Computer Sys. ... 30 day MBG
3732 *MacEKG II 2.0.5*—1992 *MacUser's* Editors' Choice Award Finalist for *Best Protection Program*. Provides in-depth knowledge on what makes your Mac tick. Able to isolate/diagnose intermittent failures..... \$89.

- ★ **Specular International ... 30 day MBG**
4962 *Infini-D 2.0* \$699.
- ★ **Strategic Mapping**
10767 *LOCAL EXPERT* 82.
- ★ **Synergy Software ... 30 day MBG**
6617 *KaleidaGraph 2.1.3* 149.
- ★ **Timeworks ... 30 day MBG**
11196 *Publish It! Easy & Color-It DTP Pack* .. 199.
- ★ **T/Maker ... 30 day MBG**
ClickArt (*bitmapped*).. 34. or (*EPS*)... 55.
- ★ **Virtus Corporation ... 30 day MBG**
4488 *WalkThrough 1.1.3* 309.

PROGRAMMING UTILITIES, HYPERCARD, SECURITY

- ★ **Abbott Systems ... 30 day MBG**
2515 *Calc+ 1.0..* 36. 5236 *CanOpener 2.0* 59.
- ★ **Aladdin Systems ... 30 day MBG**
7410 *StuffIt SpaceSaver* 34. 6740 *Deluxe* 65.
- ★ **ALSoft ... 30 day MBG**
9808 *MasterJuggler 25*. 9807 *DiskExpress II* 45.
5204 *ALSoft Power Utilities 1.0.2* 62.
- ★ **Alysis Software ... 30 day MBG**
2687 *SuperDisk! 66*. 1608 *More Disk Space* 56.



★ **Logical Solutions ... 30 day MBG**
With 7th Heaven & Chameleon, System 7 springs to life! Utilities change your Mac into what it should be; fast, colorful & easy to use.
10169 *7th Heaven 2.5* \$67.
11191 *Chameleon* 39.

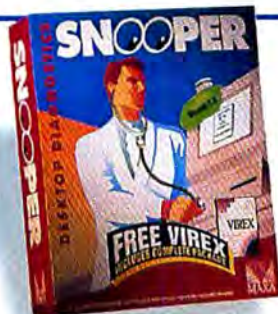
- ★ **Apple Computer ... 30 day MBG**
1206 *At Ease 1.0* 44.
1074 *System 7.1...* 79. 3413 *MultiPack* 369.
- ★ **QuickTime Starter Kit 1.0** 105.
- ★ **Atticus Software ... 30 day MBG**
9120 *Super 7 Utilities* 64.
- ★ **Berkeley Systems ... 30 day MBG**
5737 *After Dark 2.0w* 28. 2196 *Bundle* ... 39.
3392 *Star Trek: The Screen Saver* 34.
- ★ **Casa Blanca Works ... 30 day MBG**
1593 *Drive 7 2.3* 49.
- ★ **CE Software ... 60 day MBG**
1727 *CalendarMaker 31*. 8024 *QuickKeys2* 89.
- ★ **Central Point ... 30 day MBG**
10595 *Safe & Sound 1.0* 37.
- ★ **Mac Anti-Virus 49**. 5041 *MacTools* 105.
- ★ **Claris ... 30 day MBG**
8734 *HyperCard Development Kit 2.1* 139.
- ★ **Claris Clear Choice ... 30 day MBG**
11205 *Retrieve It* 60.
- ★ **Connectix ... 30 day MBG**
8441 *CPU* 49. 10765 *Virtual 3.0* 49.
10764 *CPU/Virtual 3.0 Bundle* 59.
- ★ **Coral Research**
7310 *TimeLog* 62. 7309 (*10 Pack*) 399.
- ★ **Dantz Development ... 30 day MBG**
9115 *DiskFit Direct 1.0* 29. 3393 *Pro* 72.
5255 *Retrospect 147*. 7945 *Remote 2.0* 264.



★ **Dantz Development ... 30 day MBG**
7945 *Retrospect Remote 2.0*—1992 *MacWEEK* Diamond Award Winner. Powerful backup software for Mac networks. Provides automatic, centralized backup & archiving. Supports compression, encryption, & verification..... \$264.

- ★ **Datawatch ... 30 day MBG**
4803 *Virex/Mac or 8561 911 Utilities* 62.
- ★ **Delta Tao Software**
10755 *WonderPrint* 36.
- ★ **Fifth Generation ... 30 day MBG**
4287 *PYROI 4.01* 27. 3955 *Suitcase 2.1* 53.
7404 *DiskDoubler 52*. 4838 *AutoDoubler* 58.
- ★ **CopyDoubler 39**. 7704 *Public Utilities* .. 98.
- ★ **SuperLaserSpool 3.0** 99.
- ★ **FWB, Inc.**
7929 *Hard Disk ToolKit Personal Edition 1.3* 49.
2999 *Hard Disk ToolKit 1.3* 125.
- ★ **ICOM Simulations**
6296 *Intermission..* 27. 3731 *OnCue II* 63.
- ★ **Inline Design ... 30 day MBG**
1744 *Icon 7* 31.
9843 *Inline Sync 1.0* 79.
- ★ **INITPicker** 49. 10731 *PBTtools* 62.
- ★ **Redux 1.63** .. 49. 1740 *Deluxe* 92.
- ★ **Insignia Solutions**
7552 *RapidTrak* 58.
- ★ **Kent Marsh Ltd. ... 30 day MBG**
9513 *FolderBolt 71*. 1839 *NightWatch II* 89.
- ★ **FolderBolt/NightWatch II Bundle** 129.
- ★ **KyZen Corporation ... 30 day MBG**
10173 *UP Diff 1.0* 125.
- ★ **Leader Technologies ... 30 day MBG**
10272 *PowerMerge 1.0* 79.
- ★ **Logical Solutions ... 30 day MBG**
10169 *7th Heaven 2.5* 67. 11191 *Chameleon* 39.
- ★ **MAXA Corporation ... 30 day MBG**
10772 *Snooper 2.0 (software only)* 129.
- ★ **Snooper 2.0 HW & SW Kit** 179.
- ★ **MicroMat Computer Sys. ... 30 day MBG**
3732 *MacEKG II 2.0.5* 89.
- ★ **Nine to Five Software ... 30 day MBG**
2020 *9 to 5 Office 19*. 9767 *Reports 2.5* 125.
- ★ **Now Software ... 30 day MBG**
6925 *Now Utilities 4.0* 84. 8471 (*10*) 775.
- ★ **Palomar Software ... 30 day MBG**
8210 *PLOTTERgeist 2.1* 249.
- ★ **Symantec ... 30 day MBG**
5176 *AntiVirus for Mac (SAM) 3.5* 64.
- ★ **AntiVirus for Mac 3.5 (SAM) Upgrade** ... 24.
- ★ **Norton Utilities for Mac 2.0 95.**
- ★ **THINK Reference 89**. 2688 *THINK C 199*.
- ★ **Teknosys**
5203 *Help!* 88.
- ★ **TGS Systems ... 60 day MBG**
6667 *Prograph 2.5* 299.
- ★ **Thought I Could ... 30 day MBG**
4843 *Wallpaper 37*. 10839 *More Wallpaper* 25.
- ★ **UserLand Software**
4753 *Frontier 2.0* 185.

to shed some light.



★ **MAXA Corporation** ... 30 day MBG
10771 *Snooper 2.0 Hardware & Software Kit*—Hardware diagnostic performs over 250 tests on your system's hardware. Snooper runs benchmarking tests, includes an emergency diagnostic boot disk & more! **\$179.**

LEARN & PLAY FOREIGN LANGUAGES, TRAINING, GAMES

★ **Abbott Systems** ... 30 day MBG
9578 *Kaleidoscope 1.0* 25.
ActiVision
1039 *Shanghai II* 29.
1134 *Lost Treasures of Infocom Vol. I* 40.
2470 *Lost Treasures of Infocom Vol. II* 29.
★ **AMTEX Corporation** ... 30 day MBG
2517 *TRISTAN Pinball* 33.
★ **Baseline Publishing** ... 30 day MBG
7785 *Talking Moose 4.0.2* 22.
Broderbund Software
9059 *Arthur's Teacher Trouble* 41.
Carmen Sandiego Series (CP) ea. 29.
8285 *Where/World Carmen Sandiego Deluxe* 47.
Buena Vista Software
1711 *Heaven and Earth* 34.
★ **Carina** ... 30 day MBG
7761 *Voyager II, the Dynamic Sky Simulator*.. 99.



Microtek Labs, Inc.

5438 *ScanMaker II*—The ScanMaker II and IIx offer you a very affordable way to capture 24-bit color or 8-bit gray-scale images at up to 1200 dpi **\$929.**
5441 *ScanMaker IIx* **1239.**

★ **Centron Software** ... 30 day MBG
5910 *Crossword Creator 1.1.2* \$39.
8525 *Casino Master*... 39. 8524 (Color) 45.
Challenging Software
11188 *Pax Imperia* 30.
Colorado Spectrum
2554 *Mouse Yoke (aircraft yoke adapter)* 29.
★ **Cyan** ... 30 day MBG
6320 *Manhole 1.6* 19.
★ **Davidson & Associates** ... 30 day MBG
10953 *Kid Pictures 19. 3922 Talking Spell It +* 28.
2574 *MathBlaster Plus or 7942 Kid Works 2.* 34.
Delta Tao Software
2536 *Spaceward Hol or 2439 Strategic Conq.* 36.
EARTHQUEST
8050 *EARTHQUEST or 3118 Ecology 1.0* 34.
★ **Edmark Corporation** ... 30 day MBG
7155 *Kid Desk 24. 7318 Millie's Math House.* 29.
Electronic Arts
1907 *PGA Golf*... 39. 2963 *StarFlight II* 39.
2805 *PGA Golf Tournament Course* 18.
★ **Expert Software** ... 30 day MBG
6219 *Expert Astronomer 1.0* 29.
Graphic Simulations
8083 *Missions at Leyte Gulf (req. Hellcats)*... 20.
4756 *Hellcats Over the Pacific 1.0.3* 38.
★ **Great Wave** ... 30 day MBG
6693 *KidsMath 2.0 or 2276 Kid's Time* ea. 25.
8527 *NumberMaze or 3471 DaisyQuest*.. ea. 35.
1513 *ReadingMaze (Color, ages 3-7)* 35.
★ **HyperGlot Software** ... 30 day MBG
(French, German, Italian & Spanish)
Word Torture ea. 32. *Tense Tutor*.. ea. 38.
Pronunciation Tutor
(Span., Fren.) ea. 32. (Germ., Chin.) ea. 38.
★ **Inline Design** ... 30 day MBG
1562 *3 in Three*... 31. 7652 *Cogito* 37.
1944 *Swamp Gas* 31. 1747 *Europe* 37.
7646 *Tinies or 7650 S.C.OUT* ea. 37.
Innerprise
1662 *CyberBlast* 25.
Interplay Productions
1894 *BattleChess* .. 29. 1893 *CheckMate*.. 31.
★ **Learning Company** ... 30 day MBG
2670 *Reader Rabbit 3.0 (CP)* (ages 4-7) 34.
9570 *Reader Rabbit 2 1.0 (ages 5-8)* 34.
3281 *The Writing Center 1.0* 51.
★ **Leister Productions** ... 30 day MBG
7126 *Reunion 3.0* 115.
★ **Maxis** ... 30 day MBG
11272 *SimAnt or 11273 SimCity Supreme*.. ea. 35.
11270 *SimLife*... 39. 11271 *A-Train* 39.
★ **MECC** ... 30 day MBG
3960 *Number or 3959 Word Munchers* ... ea. 18.
3963 *Oregon Trail 1.1* 28.
★ **Microlytics** ... 60 day MBG
7871 *Berlitz Interpreter* 34.
MicroProse
9520 *Civilization: Sid Meier's* 39.
★ **Microsoft** ... 30 day MBG
2868 *Flight Simulator 4.0 (CP)* 42.
★ **Nordic Software** ... 30 day MBG
8257 *Preschool Pak* 34. 7470 *Jungle Quest* 30.
★ **Penton Overseas** ... 30 day MBG
VocabuLearn/ce Levels I & II (Span., Fren., Germ., Ital., Rus., Japan., & Heb.) ... ea. 35.
VocabuLearn/ce Level III (Span., Fren., Germ., Ital., Rus., & Japan.) ea. 35.
★ **Personal Training Sys.** ... 60 day MBG
Training for System 7, Excel, Lotus 1-2-3, Persuasion, FileMaker Pro, PageMaker,



★ **Aladdin Systems** ... 30 day MBG
6740 *StuffIt Deluxe 3.0*—1992 *MacUser's* Eddy Award Winner for *Best Compression*. "Anyone who needs compression tools...should have this package. Period." (*MacUser* 3/93) **\$65.**
7410 *StuffIt SpaceSaver 3.4* 34.

Illustrator, FreeHand, Word, HyperCard, QuarkXPress, ClarisWorks & Mac.. ea. 49.
Pluma, Inc.
8695 *Capitalist Pig* 34.
★ **Que Software** ... 30 day MBG
9743 *Typing Tutor V* 29.
Sierra On-Line
9078 *Stellar 7*... 15. 7396 *Red Baron* 39.
★ **SoftStream** ... 30 day MBG
4489 *Galactic Frontiers (1 to 4 players)* 38.
Software Toolworks
4619 *Mavis Beacon Typing 2.0 (CP)* 29.
★ **Spectrum Holobyte** ... 30 day MBG
3464 *Tetris*... 22. 3017 *Wordtris 1.0* 28.
4835 *Super Tetris* 28. 9113 *Falcon Color* 39.
★ **Strategic Studies** ... 30 day MBG
3287 *Warlords (empires at war)* 34.
StudyWare
ACT, GMAT, GRE or SAT Prep ea. 29.
★ **Toyogo** ... 30 day MBG
7624 *NEMESIS Go Master* 35. 7623 *Deluxe* 99.



RasterOps

11258 *Editing Aces Suite/Digital Video Solution*—RasterOps' single-slot solution for full-motion digital video recording, playback, CD quality sound and print-to-tape. Includes *MediaTime*, *MoviePak* and the *VideoExpander II* **\$3499.**



MacConnection®

© Copyright 1993 PC Connection, Inc. MacConnection is a division and registered trademark of PC Connection, Inc., Marlow, NH. MacTV is a trademark of PC Connection, Inc.

'Cause once you buy



★ **Berkeley Systems ... 30 day MBG**
 3392 *Star Trek: The Screen Saver—1992*
MacUser Editors' Choice Award for Best Desktop Diversion. Beam aboard the Enterprise to prevent screen burn-in \$34.
 5737 *After Dark 2.0w* 28.

Velocity

2934 *Spectre*..... 34. 5280 *LAN 3-Pak*..... 57.
Warner New Media
 11008 *Desert Storm 27*. 11007 *Word Tales* 39.
 11015 *View from Earth*..... 54.

VIDEO AND SOUND MONITORS, MUSIC, ANIMATION

★ **ARS NOVA ... 30 day MBG**
 9114 *Songworks 1.0*..... 64.
Articulate Systems
 7007 *Voice Record 56*. 2034 *Voice Impact* 79.
 7013 *Voice Navigator SW w/Headset Mike*.. 319.
 7014 *Voice Navigator SW w/Desktop Mike*.. 319.
 11048 *Voice Navigator II with Headset Mike*.. 469.
 9975 *Voice Navigator II with Desktop Mike*.. 469.
Coda Music Software
 8188 *MusicProse 2.1* 189. 5604 *Finale* 549.
 ★ **DIVA Corporation ... 30 day MBG**
 3011 *VideoShop 1.0*..... 369.
E-Machines
 9067 *ColorLink LC*..... 479.
 9070 *ColorLink DC/T*..... 510.
 10321 *ColorPage T16II*. 1299. 9064 *T19II*. 2299.
 9072 *Double Color LX*.. 639. 9073 *SX*..... 359.
 9066 *Futura SX*.. 479. 9065 *Futura MX*.. 799.
Envisio
 4106 *Quick-16*..... 399.



Articulate Systems, Inc.

Voice Navigator SW—Voice Recognition Software for all sound capable Macs..... \$319.
Voice Navigator II—Voice Recognition Hardware & Software for all Macs..... 469.
 Both incl. Headset Mike or DesktopMike.

Macromedia

5486 *Sound Edit PRO 199*. 7651 *Action!* \$349.
 4598 *MacRecorder Sound System PRO*..... 239.
 5087 *MacroMind Director 799*. 2246 *3-D 999*.
NEC
 4252 *MultiSync 3FGx*..... 689.
 ★ **Nutmeg Systems ... 30 day MBG**
 15" *Monochrome System for the II, LC, SE/30, si and SE*..... ea. 519.
Passport Designs
 10362 *Passport Producer 299*. 8250 *Encore* 379.
Radius
 1738 *PrecisionColor Pivot (reqs. interface)*.. 999.
 7870 *Rocket 33*..... 2199.
 1736 *PrecisionColor Display/20*..... 2499.
RasterOps
 8944 *RasterOps 24STV*..... 799.
Sigma Designs
 6944 *Power Portrait (platinum)*..... 679.
Software Toolworks
 5201 *The Miracle (piano teacher)*..... 349.
Sony
 10530 *14" Multiscan Trinitron Monitor*..... 689.
 10529 *17" Multiscan Trinitron Monitor*..... 1149.
Sound Source
Star Trek: Original TV Vol. 1 or 2 .. ea. 30.
Star Trek: Next Gener. Vol. 1 or 2 .. ea. 35.
 1759 *AudioClips: 2001 A Space Odyssey*..... 35.
 ★ **SuperMac Technology ... 30 day MBG**
 4122 *VideoSpigot LC 255*. 4164 *(for NuBus)* 379.
 7676 *VideoSpigot Pro or 3691 Pro si* .. ea. 1099.
 9074 *Spectrum/24 PDQ+*..... 1649.
 10286 *Spectrum/24 Series IV*..... 889.
 7679 *Spigot & Sound*.. 489. 7678 *Pro* .. 1189.
 7677 *17" SuperMatch Multimode*..... 1249.
 1805 *20" SuperMatch Color Display*..... 1599.
 4720 *21" Platinum Two-Display*..... 1099.
Warner New Media
 11024 *Beethoven: String Quartet #14*..... 44.
 11028 *Magic Flute 44*. 11026 *The Orchestra* 54.

CD-ROM

Against All Odds
 10330 *From Alice To Ocean Book (w/CD-ROM)* 39.
Broderbund
 3730 *Just Grandma and Me*..... 34.
CD Technology
 2321 *CD-ROM Caddy*... 11. 2533 *(5 Pack)*. 49.
 4084 *America Alive! (CD-ROM)*..... 75.
 8057 *Porta Drive (CD-ROM)*..... 619.
Creative Multimedia Corp.
 11001 *The Complete Works*..... 29.
 11004 *The Complete Audubon*..... 45.
 8744 *Total Baseball 40*. 2484 *Family Doctor 40*.
 11003 *Family Doctor HyperCard Version*..... 45.
 ★ **Cyan ... 30 day MBG**
 1343 *Manhole 23*. 2717 *Cosmic Osmo 1.1* 37.
 ★ **Highlighted Data ... 30 day MBG**
 7771 *Webster's Dictionary*..... 149.
 ★ **HyperGlot Software ... 30 day MBG**
 (French, German, Italian, or Spanish)
 Berlitz *Think & Talk*..... ea. 125.
ICOM Simulations
 3717 *Sherlock Holmes, Consulting Detective* 44.
Interplay Productions
 7111 *Battlechess CD-ROM Enhanced*..... 45.
 ★ **METATEC/Discovery Sys. ... 60 day MBG**
 9967 *Nautilus Mini-Subscription Kit*..... 20.
 4007 *World Almanac & Book of Facts 1993*.. 50.
 ★ **Multimedia Library ... 30 day MBG**
Image Series Vol. 1-4..... ea. 105.
NEC
 6577 *CDR-37 CD-ROM Portable Drive*..... 439.
 6582 *CDR-74-1 CD-ROM Drive*..... 629.
 4146 *CD Express (with CDR-25)*..... 429.
 4132 *MultiMedia Gallery (with CDR-74-1)*.. 865.
Peripheral Land, Inc. (PLI)
 10923 *Multi-Session Photo CD-ROM Drive* ... 699.



IOMEGA

10499 *Transportable MultiDisk 150—Bemoulli*
MacTransportable MultiDisk 150 removable disk drive (300 MB of storage with data compression)—optical capacity and hard disk performance for Mac..... \$799.

★ Presto Studios ... 30 day MBG

10351 *Hi-Res Audio Vol. 1*..... 84.
Software Toolworks
 10308 *US Atlas 34*. 4397 *Time Table/History* 49.
 3915 *Grolier Encyclopedia*..... 249.
Wayzata Technology
Font Pro Vol. 1 & 2..... ea. 62.
 8219 *CD Fun House 35*. 10188 *Macnificent 7* 48.

COMMUNICATIONS MODEMS, MAIL, NETWORKS

★ **Apple Computer ... 30 day MBG**
 7073 *Mac PC Exchg.* 59. 7102 *AppleShare* 969.
 7101 *AppleTalk Remote Access*..... 149.
 ★ **Applied Engineering ... 30 day MBG**
 8362 *QuadraLink*... 269. 10361 *DMA*..... 399.
 ★ **Argosy Software ... 30 day MBG**
 7872 *Software Bridge/Mac 2.0.1*..... 99.
Asanté Technologies, Inc.
Full line of Ethernet Adapters..... call
 2775 *10/T Hub-8 249*. 2772 *10/T Hub-12 499*.
Friendly Net Adapters..... ea. 79.
 ★ **CE Software ... 60 day MBG**
 8066 *QuickMail (5 user)* 249. 8067 *(10)* 375.
 ★ **CompuServe ... 60 day MBG**
 1676 *Mac Membership Kit 2.0*..... 25.
 1673 *CompuServe Navigator 3.1*..... 49.
 1674 *Membership Kit/Navigator Bundle*..... 72.



★ Dove Computer ... 30 day MBG

9634 *DoveFax+ Voice*—Features a 9600 bps S/R fax, a 2400 bps modem plus a voice answering system..... \$299.
 10200 *DoveFax Pro+ Voice*—A 14.4 Kbps S/R fax & modem plus a voice answering system. 499.



"I'm glad you talked me out of it."

Dear MacConnection,

Thanks for convincing me not to place an order this afternoon. You see, I rely on my PowerBook to work during regular cross-country flights. Recently, my machine stopped "sleeping" and would lose steam somewhere over the Mississippi. So, as a frequent customer (my accountant

thinks too frequent), I called you for software to correct the glitch before my next flight. Instead, like some 911 operator, your representative talked me through a detailed procedure to cure my Mac. The problem was quite specific, and I would not have been pleased had I bought an entire pro-

gram for that one anomaly. I'm glad you talked me out of it!

James Percelay
2 Bros & A White Guy Productions
Venice, CA

MacConnection[®] 800-800-3333

MacConnection, 14 Mill Street, Marlow, NH 03456 603-446-3333 FAX 603-446-7791

Just for the record, all the ads in this series feature real live MacConnection customers and the real live letters they wrote us. Really!

customer for life.

*Sophisticated Circuits ... 30 day MBG

- 8009 PowerKey 2.01. 75. 8008 Remote \$32.
Thunderware
 4994 LightningScan 400 359. 3107 Pro 256 489.
WACOM
 9110 Tablet (6" x 9") 499. 9109 (12" x 12") 725.

UPGRADES & DRIVES MEMORY, ACCELERATORS

SIMMs ... Various SIMMs for all Macs call

*Applied Engineering ... 30 day MBG

- 8361 1.44 MB High Density Drive 229.
 5290 Plus Drive (FDHD for Plus & SE) 299.
 TransWarp Series: Does not incl. FPU
 10263 SE (25 MHz) 469. 10264 (40 MHz) 609.
 10283 LC (33 MHz) 425. 10282 (40 MHz) 559.

*DayStar Digital ... 30 day MBG

Does not include optional math chip.

- 8556 FastCache ILCi 223. 10933 Charger 869.
 1613 FastCache 040 (Quadra 700 or 900) .. 279.
 8785 FastCache 040 (Quadra 700, 900, 950) 409.
 PowerCache for SE/30, II, ILC, ILCx, ILCi, ILCi, LC
 40 MHz 589. 50 MHz 769.

E-Machines

- PowerLink DeskNET (Thin, 10/T) (Apr.) ea. 609.
 10322 PowerLink Presenter (Apr. '93) 435.

FWB, Inc.

- 7567 PocketHammer 80 449. 7566 PH 120 559.
 9529 PocketHammer 170 599. 2314 PH 240 739.
 7570 hammer 80is.. 299. 7579 Int. 120is. 399.
 7991 hammer1000FMF 1959.

IOmega

- 6499 90 MB Transportable (reqs. interface). 659.
 2467 90 MB Gold Std. Rem. Cart. (Qty. 3) ... 439.
 7789 Mac 1B Interface (w/Central Pt. Backup) 39.
 8781 Mac Transportable 90 PRO 499.
 10500 21 MB Floptical Drive 489.
 10499 Transportable MultiDisk 150 799.

MASS Microsystems

- 2973 120 MB HD 479. 2972 210 MB HD 639.
 3678 120 MB Port. HD 449. 3663 210 MB .. 559.
 10848 Datapak 88c 649.
 7008 HitchHiker Portable Drive (120 MB) 749.

*MDS Drives ... 60 day MBG

- MDS 44 SyQuest w/SW & cartridge ea. 439.
 MDS 88 SyQuest w/SW & cartridge ea. 539.
 MDS 88c SyQuest w/SW & cartridge ea. 649.
Peripheral Land, Inc. (PLI)

- 6432 3 1/2" Optical Media 52. 9737 (10 pak) 499.
 8327 PLI Infinity 40 Turbo 579. 9752 88 ... 619.
 2864 PLI Infinity Floptical Drive (21 MB) 399.
 10926 1 GB Drive.. 1949. 10849 170 MB .. 549.
 4645 PLI Infinity MO 3.5" Optical Drive 1449.



SIMMs ... with free video and manual

We carry memory for the various Macs, PowerBooks, Quadras, Performas, and Centris models. All SIMMs come with a full 2-year warranty, plus a free installation manual and video. In recent months, memory prices have varied significantly. Please call for the latest prices and availability.

- 8316 1 MB SIMMs (80ns, set of 2) \$89.
 2199 1 MB SIMMs (80ns, set of 4) 175.
 9437 2 MB SIMMs (80ns) 79.
 7437 4 MB SIMMs (80ns) 169.
 7600 4 MB SIMMs (80ns, set of 4) 649.
 11151 72-pin SIMMs (70ns, 4 MB) 159.
 11152 72-pin SIMMs (70ns, 8 MB) 319.
 PowerBook Modules call

- 2865 Floptical Cart. (21 MB) 29. 2899 (10 pak) 259.
 10733 520 MB 1359.

*SuperMac ... 30 day MBG

- 2256 ThunderStorm 849.

MEDIA

*Fuji ... 60 day MBG

- 2214 3 1/2" DS Disks (10) 9. 2242 (50) 32.
 2215 3 1/2" HD Disks (10) ... 13. 2241 (50) 59.
 4863 3 1/2" HD Disks (20) with storage case 26.

KOMAG

- 10439 3 1/2" Optical Media 39. 10442 (5 pack) 175.

*Sony ... 60 day MBG

- 3297 3 1/2" DS Disks (10) 9. 6148 (30) 25.
 3298 3 1/2" HD Disks (10) .. 14. 6375 (30) 39.
 1603 DG60M 15. 2520 DG90M 19.
 1895 QD2120 19. 3984 QD2120Q 23.

*SyQuest ... 60 day MBG

- 5912 44 MB Cartridge (1) ... 65. 5529 (3) .. 189.
 5528 44 MB Cartridge (5) ... 310. 9728 (10) 615.
 3603 88 MB Cartridge (1) .. 100. 5531 (3) . 292.
 5530 88 MB Cartridge (5) ... 480. 3600 (10) 950.

TEAC

- 7671 CT600H 60 MB .. 16. 7672 150 MB ... 24.

*3M ... 60 day MBG

- 1581 DC2120 22. 11013 (3 pack) 60.

ACCESSORIES

TONERS, CASES, DUST COVERS

American Power

- 3447 SurgeArrest Plus 39.

*Apple Computer ... 30 day MBG

- 9773 StyleWriter Ink Cart. 20. 8499 (3 Pack) 57.
 7748 Personal LaserWriter Toner Cartridge .. 75.
 1115 LaserWriter II Toner Cartridge 95.

*Avery ... 60 day MBG

- 5392 Avery 5196 (3 1/2" Disk Labels-Laser) 29.
 7050 Avery 5660 (1" x 2 1/4" Clear Adrs.-Laser) 32.

*Curtis Manufacturing ... 30 day MBG

- 8973 Apple Security Kit (SL-2) 22.

*DOUBLECASE ... 30 day MBG

- 10306 DOUBLECASE NB-4400 139.

*I/O Design Cases ... 30 day MBG

- 8812 Ultimate Classic 59. 1941 Ultimate LC 89.

*Kensington (full line) ... 30 day MBG

- 2559 Apple Security Kit 33.
 4973 Power Tree 20 24.
 7060 MicroSaver Security System 39.

*MacConnection ... 60 day MBG

- 10930 Din 8 Teleconnector 19. 10931 (3 pack) 54.

*Moustrak ... 30 day MBG

- Star Trek Mouspads ea. 14.



*Zoom Telephonics ... 30 day MBG

- 3553 Fax/Modem VFX V.32bis—14,400 bps
 ix and data. Includes Fax STF full-featured
 fware, Microphone LT data software, cable
 1 automatic fall back/fall forward.
 7 year warranty \$259.

OUR POLICY/SHIPPING

- We accept VISA and MASTERCARD.
- No surcharge added for credit card orders.
- Your card is not charged until we ship.
- If we must ship a partial order, we never charge freight on subsequent shipment(s) (in the U.S.).
- No sales tax, except Ohio residents (please add applicable tax).
- All U.S. shipments insured; no additional charge.
- APO/FPO orders shipped First Class Mail.
- International orders U.S. \$100 minimum. Manufacturer support and upgrade eligibility may be limited outside the U.S.A.
- Upon receipt and approval, personal & co. checks clear same day for immediate shipment of your order.
- Corporate P.O.s accepted subject to credit approval.
- COD maximum \$1000. Cash or certified check.
- COD orders require an additional \$4.50 charge, ship via UPS and may require additional UPS charges.
- 120 day limited warranty on all products. Defective software replaced immediately. Defective hardware repaired or replaced at our discretion. All items are subject to availability. Prices and promotions are subject to change without notice (e.g. SIMMs).
- Order lines open continuously from 8 a.m. Monday until 5 p.m. Sunday ET. Business offices: 603-446-7711 Monday through Friday 9 a.m. to 5:30 p.m. ET.

Continental U.S.: The total shipping charge on any order placed with MacConnection is only \$3. Barring events beyond our control, all credit card orders (no COD orders) phoned in weekdays by 3:15 a.m. Eastern Time will ship Airborne Express for delivery the next business day. Which means same day delivery for orders placed between midnight and 3:15 a.m. Eastern Time. (Some orders may ship by UPS Ground for next day delivery). Saturday delivery available to many areas upon request at no additional charge. Order all day Saturday thru noon Sunday for Monday delivery. Some areas require an extra day delivery. **Hawaii, Alaska, Canada, Puerto Rico & U.S. Virgin Islands:** Shipping to these areas may require additional time and charges. Call 800-800-3333 for information.

All other areas: Please call 603-446-3333 or FAX 603-446-7791 for information.

from us, you're a

*DataViz ... 60 day MBG	
4842 MacLink Plus/Translator 7.1	\$109.
1823 MacLink Plus/PC 7.1	129.
*Dayna ... 60 day MBG	
DaynaPORT TRX: (BNC or 10 BASE-T) ea. 87.	
DaynaPORT E: (BNC or 10 BASE-T) ea. 149.	
DaynaPORT SCSI/Link (BNC or 10 BASE-T) 269.	
8719 EtherPrint or 9888 (10BASE-T)	ea. 339.
11012 EtherPrint 3 379. 11011 EtherPrint 3+	479.
1962 PathFinder	599.
10359 Network Vital Signs 1.0	249.
*Dove Computer ... 30 day MBG	
6758 DoveFax 2.3	199.
9634 DoveFax+V	299.
10199 DoveFax Pro	499.
*Dow Jones ... 30 day MBG	
5295 Dow Jones News Retrieval Membership	24.
*Farallon Computing ... 30 day MBG	
Full line of EtherMac Cards available ... call	
8726 Farallon Concentrator PN710-1	1999.
4869 PhoneNET Connector 10-Pk (DIN8)	195.
2206 PhoneNET StarController 307	879.
4802 Star 357	899.
4814 Star 377	1299.
9805 Timbaktu 5.0 or 4866 /Remote 3.0	129.
6513 Timbaktu Remote Twin Pack	199.
9516 PowerPath 105. 9518 LocalPath	139.
*Freesoft ... 30 day MBG	
6115 White Knight 11	85.
*Global Village ... 30 day MBG	
2174 TelePort/Bronze	197.
2175 TelePort/Silver 369. 2179 Gold	429.
Hayes	
5101 HayesConnect 3.0 (modem sharing)	73.
10822 Accura 2400	89.
2300 Smartcom II Mac 84. 3226 Upgrade	44.
5971 OPTIMA 24 145. 5970 OPTIMA 96	389.
Insignia Solutions	
7557 Access PC	59.
3441 SoftNode 2.0	99.
4089 Universal SoftPC 3.0	99.
10554 SoftPC Pro 195. 10553 SoftPC Win	299.
Logicode Technology	
5525 Quicktel Xeba M9624XV	149.
5524 M9696XV 289. 5523 M1414XV	299.
*Lotus Development ... 30 day MBG	
8123 cc:Mail Remote Mac	199.
MASS Microsystems	
2280 MASSim 24/96N Network Fax	329.
*Practical Peripherals ... 30 day MBG	
8994 2400 V.42bis Modem	125.
9849 SmartPack 9600 (with Smartcom II)	349.
11044 PM9600FX MT FaxModem	269.
11045 PM14400FX MT FaxModem	319.
11046 PM14400FX Pocket FaxModem	389.
8063 PM14400FX FaxModem	419.



***DOUBLECASE ... 30 day MBG**
10306 DOUBLECASE NB-4400—Protect your PowerBook from shock & impact with hard case protection, double-wall construction. High quality, "perfect-fit" protective foam interior. Lots of room for access. & papers; lockable .. **\$139.**

*Prometheus ... 30 day MBG	
4724 Home Office	185.
8990 Ultima	\$375.
PSI Integration, Inc.	
3143 COMstation ONE 142. 3142 TWO	247.
5340 COMstation FOUR 369. 6965 FIVE	439.
SAS Institute	
10797 JMP 2.0 and DeltaGraph Pro Bundle ..	619.
10796 JMP Design	262.
*Shiva ... 30 day MBG	
LANRover/4E for ARA or Netware ea. 1699.	
LANRover/8E for ARA or Netware ea. 2549.	
3444 NetSerial 1.35 275. 6555 LanRover/L ..	599.
4347 NetBridge or 4942 TeleBridge	ea. 399.
NetModem/E (thick, thin, 10BASE-T) ea. 1479.	
Sitka/TOPS	
6264 TOPS Network 3.1 187. 2419 (3-Pak) ..	249.
*Software Ventures ... 30 day MBG	
1964 MicroPhone II	139.
3455 Pro	209.
Sonic Systems, Inc.	
7572 LaserBridge	135.
7571 PowerBridge 99. 7573 SuperBridge	169.
*Sophisticated Circuits ... 30 day MBG	
10172 Desktop Dialer	47.



SAS Institute
10797 JMP 2.0—Use JMP for powerful statistical analysis & JMP Design for experimentation capabilities. Purchase JMP & receive a DeltaGraph Pro FREE

limited time special \$619.
10796 JMP Design

*STF Technologies ... 30 day MBG	
7644 FaxManager Plus 74. 7638 LC	25.
*Synergy ... 30 day MBG	
6618 VersaTerm 4.6	90.
6619 PRO 3.6	177.
*TechWorks ... 30 day MBG	
1582 GraceLAN	275.
1763 Hubworks-8	249.
Ethernet Cards	
Twincom	
10335 24/96 Commuter	122.
10332 14.4 Pro 329. 10337 14.4 Voyager	362.
*White Pine Software ... 30 day MBG	
2404 Mac 320	95.
3544 Exodus 4.0	199.
*Zoom Telephonics ... 30 day MBG	
1168 AMX Modem (2400 baud)	62.
7757 Fax/Modem AFX (9600S/4800R)	74.
2310 FX9624 Send/receive Fax/Modem	99.
3576 FX9624V Send/receive V.42 Fax/Modem ..	128.
2311 V.32 Modem	199.
4698 V.32bis	229.
3553 Fax/Modem VFX V.32bis	259.
7917 Pocket FaxModem	99.

INPUT/OUTPUT KEYBOARDS, MICE, TRACKBALLS, PRINTERS & SCANNERS

*Appoint ... 30 day MBG	
2760 Thumbelina Mac (mini 3 button mouse) ..	65.
2769 MousePen Pro Mac	65.



FWB, Inc.

7991 Hammer 1000FME—1,000 MB high performance hard disk with 9ms average seek. Includes a 2 year warranty and Hard Disk ToolKit utility software

\$1959.

Caere	
4476 OmniPage	459.
7705 Direct	259.
4930 OmniPage Professional	649.
Canon Computer Systems	
10105 BJ200 (with GDT PowerPrint)	449.
*CoStar ... 30 day MBG	
Stringray ADB (platinum or black)	
ea. 79.	
1884 LabelWriter II	185.
1880 Plus	239.
10300 Address Express	689.
*Curtis Manufacturing ... 30 day MBG	
8046 MVP Mouse (MVP-1)	89.
*Datadesk ... 30 day MBG	
9830 MAC101E 129. 2384 w/QuickKeys	159.
Dataproducts	
10318 LZR 960 Printer	1699.
10319 LZR 965 Printer	2099.
10326 LZR 1560 Printer - 2 Tray	3199.
Epson	
3052 Mac interface kit for ES600C or ES800C ..	325.
10752 ES600C Color Scanner (req. int. kit) ..	895.
10741 ES800C Color Scanner (req. int. kit) ..	1199.
*GDT Softworks ... 30 day MBG	
2499 PowerPrint 94. 10171 PowerPrint LT	259.
Hewlett-Packard	
6514 HP B&W DeskWriter (w/cartridge)	479.
2964 HP Color DeskWriter C (w/color cart.) ..	599.
9993 HP LaserJet IIIp (requires kit)	1099.
8368 HP LaserJet 4 (with toner)	2249.
*Kensington ... 30 day MBG	
2547 Turbo Mouse 4.0 ADB	107.
Key Tronics	
6974 Mac Pro + Kybrd. 139. 1070 TrakPro ..	219.
Kraft	
7519 KM30 Joystick	42.
*Logitech ... 30 day MBG	
1671 MouseMan	77.
1672 TrackMan	55.
5082 ScanMan Model 32 G-Scale Scanner ..	299.
7112 FotoMan with Digital Darkroom	639.
*MicroSpeed ... 30 day MBG	
6621 MacTRAC ADB 2.0 (SE & II family)	75.
Microtek Labs, Inc.	
5438 ScanMaker II	929.
5441 IIxe	1239.
Monster Design Group	
1486 MacSpeakers (two, stereo)	169.
*Mouse Systems ... 30 day MBG	
7520 Little Mouse ADB or 8001 Plus	ea. 68.
9471 A3 Mouse	74.
NEC	
5377 SilentWriter Modem 95	1439.
*Orange Micro ... 30 day MBG	
10928 Orange PC 486SLC/25	1699.
*Pacific Data ... 60 day MBG	
7958 LaserJet IV 2 MB 109. 7965 (4 Pack) ..	399.
7959 LaserJet IV 4 MB 165. 7966 (4 Pack) ..	599.

perceptions among different users, according to Torborg. He says the more sophisticated users were more forgiving of DigitalFilm's shortcomings because they spend hundreds of thousands of dollars on video equipment. "They knew this little product that cost \$6000 was a steal; even if it had a few of these little quirks, it was still great," Torborg says. "Whereas to the broader range of customers, \$6000 is a really expensive Mac product, and they expect it to do everything. So I think part of it was just the expectations, the mindset of the customers."

The expectation problem that Torborg alludes to, the gap between hype and reality, was not really the fault of the users but of SuperMac. After all, the company suggested DigitalFilm was an editing system for professional-quality video production, equal to a \$200-per-hour editing suite. The original product specifications claimed DigitalFilm supported full 30-frames-per-second video capture, for example, and could output directly to a videotape recorder at the same rate. But that's not true. Each frame has two fields; true 30-frames-per-second capability captures 60 fields per second. DigitalFilm captures 30 fields per second, resulting in a lower-quality image than that offered by

professional systems. Despite the advertising hype and marketing fanfare, DigitalFilm was not the professional tool video producers had been waiting for, according to four users I interviewed.

Of course, four is a very small number, and few customers returned their boards, according to SuperMac. Apparently many customers are happy with the product, including some high-profile, high-end users. Even the former DigitalFilm owners I spoke to harbor no ill will toward SuperMac. "I still would buy a SuperMac product and I feel they've handled it pretty well," says Michael Weiner, a video producer in Maryland. DigitalFilm "didn't work for me, but I believe that there is a market for it," he says. "I believe there are some people who will be very happy with the product."

But ask him—and others—about SuperMac's marketing campaign and they turn cranky or resigned. *Hype* is the most polite term bandied about—*misleading* and *dishonest* are also used. "The future is what SuperMac promised but didn't deliver," says Mario Acerra, a producer in Pennsylvania. "People were willing to sit through all these delays because they wanted to believe. [DigitalFilm] didn't do at all what

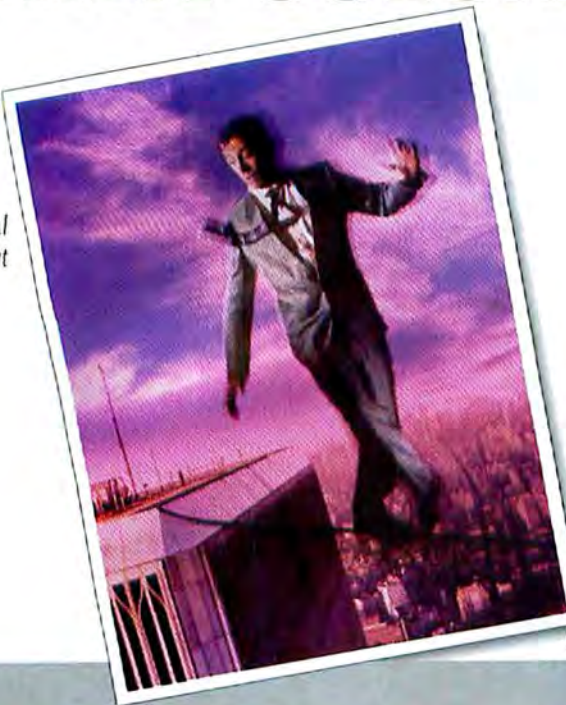
[SuperMac] said it would do, because [SuperMac] didn't understand video or they understood video but that was the best they could do."

It may be that SuperMac is too new to the market to understand how the needs of video professionals differ from those of computer users. "I think computer people are so excited to see these little dancing figures on their screen, it seems like such a miracle," says Acerra. "But it's not a miracle to us; we see them every day and it doesn't really matter to us if we see them on a computer screen or a video monitor." Because Acerra makes his living in video, his professional tools need to perform as advertised.

Company head McConnell recognizes the disparity between DigitalFilm's performance and SuperMac's claims about it. "There were bugs in the product, so we stopped shipping it; we're fixing the bugs, it'll start shipping in a couple of weeks. That's kind of obvious," says McConnell. "In general, you state as strongly as possible how wonderful your product is and how much it'll do for you. That's just good marketing. With a new category of product that is doing so many things that have never been done before, I think, in retrospect, it would have been

WHEN COLOR CONSISTENCY

Original
Input



Printer
Output



better to understate what it's capable of doing." According to McConnell, the company plans to "pull back the level of hyperbole."

As McConnell explains it, marketing wasn't a problem so much as the inexperience of users. "If you open a can of Miller beer, the world doesn't start snowing," says McConnell. "When I see the ad, I know that. But if I'm hot, it cools me off. OK, I understand—I can translate. . . . In that situation, I know what beer is, I know what hot days are, I know what happens. It's different with a new category of product where people don't know what to expect and have no way of calibrating the kind of sizzle with the steak. So . . . we should tone down the marketing claims."

"But in general, I don't plan to do that with other kinds of products because I think one of the things we do well here is create a lot of excitement about our products," says McConnell. "I just think in this one specific instance, when it's a new type of product . . . we should tone it down until after people have used it for a while and understand what's really going on."

Lessons for Consumers

ALTHOUGH THIS COLUMN CONCENTRATES on SuperMac, the issues it raises are

industry-wide. Last year, for example, RasterOps was forced to send out PROM board upgrades to some CorrectPrint 300 printers because they were shipped without the JPEG compression listed on the product data sheet.

Which means the most important lesson to be learned from the case of DigitalFilm is buyer beware. Marketing hype is just that. Advertising, promotional pieces, and spec sheets are designed to put products in the best possible light and can't always be taken as gospel.

It may seem obvious, but don't make a substantial purchase based on advertising alone. Educate yourself. Read computer publications, talk to other users, go to a dealer and take the product for a test run. And make sure anything expensive can be returned for a full refund if it doesn't meet your needs.

Other lessons to consider:

- The fact that you saw a product do something during a demo doesn't mean it will do the same thing when you get it home. Like promotional literature, product demos are supposed to highlight a product's features, not its flaws.
- The fact that a product has been announced or advertised doesn't mean it exists yet. Ads must be placed four to six

weeks before they appear in monthly publications, which means vendors may believe a product will be available by that time without knowing for sure.

Moreover, companies sometimes run ads as a form of market research, to see how much demand exists for a particular product before they fully invest in it. In other cases, ads may be a response to competitive pressures. When product delivery is uncertain, some companies may advertise the product anyway, because they expect their competitors to do so.

• Good companies respond to complaints. A measure of a good company is not whether it makes mistakes—because we all do—but how it rectifies those mistakes. After complaints surfaced, SuperMac began working to satisfy DigitalFilm owners.

In the end, marketing hype is a fact of life that few consumers can avoid. You can fight back by educating yourself about the technology, the products, and your true needs. **m**

Send nominees for sainthood to Service Heroes, Macworld, 501 Second St., San Francisco, CA 94107, or via AppleLink (Macworld1) or America Online (Branscum). Conversely, drop *Conspicuous Consumer* a line if a company is ignoring you.

HANGS IN THE BALANCE.

Introducing the KODAK COLORSense Color Manager. For true color balance across your entire Macintosh Computer System, in one complete and affordable solution.

To get the colors you want out of your color desktop peripherals, you want the KODAK COLORSense Color Manager. It's a software tool that balances your color desktop peripherals so they all speak the same color language. It's also a hardware tool that calibrates your monitor for consistent screen display over time.

The result? Balanced, accurate color from start to finish. What you see is what you get. No more guesswork. No more surprises. So now, when you want to present or sell a graphic idea, you'll have the color you want. Instead of a poor excuse. You'll also generate fewer reprints as you work. Saving you time, material, and wear and tear on the printer.

Thanks to an easy-to-use interface, the COLORSense Color Manager is a cinch to set up and use. Just select the devices (scanners, Photo CD disc, monitors, printers) and the COLORSense Color Manager does the rest.

Call 1 800 242-2424, Ext 56 (in Canada: 1 800 465-6325) today for information on the KODAK COLORSense Color Manager. And experience accurate color like never before.



Kodak
COLORSense
COLOR MANAGER



Even visionaries need to see reality



MacWAREHOUSE

1-800-255-6227

ORDER
UNTIL
MIDNIGHT(EST)
FOR
OVERNIGHT
DELIVERY

OVERNIGHT
DELIVERY
ONLY \$3.00



MiniCad+4

MiniCad+4: An unsurpassed mix of ease of use and powerful features defines MiniCad+4. The award-winning MiniCad+ combines 2D CAD, true 3D CAD, a database/spreadsheet, programming language, intelligent interface and AutoCAD translator into one program. New features include 3D walkthrough and flyover tools, tolerancing, automatic roof, wall, and floor tools, and more. CAD0030 \$595

Blueprint 4*

Blueprint 4 makes drafting and design easy for architects, engineers and illustrators. The new version 4 incorporates all the professional 2D features found in MiniCad+4. The price/performance ratio is absolutely unbeatable. Try it on Manufacturer's 30 day money-back guarantee!

CAD0024 \$219*

Publisher: GraphSoft

\$219*

DayStar Universal PowerCache

DayStar has set the standard for Mac acceleration. The PowerCache is an award-winning design that gives you affordable 68030 performance and the best in compatibility. Just plug it in and go...no downtime and it works with everything. Easy installation & no additional memory required. This universal design supports fifteen different Macs & doesn't take up valuable NuBus slots. Now work up to three times faster AND the PowerCache is upgradable to DayStar's Turbo 040 accelerator.

Manufacturer: DayStar Digital
Universal PowerCache 50 w/o 68882 DR10465
Full line available

\$769



DAYSTAR
DIGITAL

FolderBolt

FolderBolt: If you wish to protect folders and applications from changes, copying or unauthorized use, then you need FolderBolt. It's fully integrated into the desktop and makes management of your Macintosh a breeze.



UT10212 \$75

NightWatch II*

NightWatch II-II controlling the entire hard disk is your principal concern, NightWatch II is the answer. It protects your hard

disk while you're away and prevents access and ensure via individual user preferences. UT10262 \$89*

Publisher: Kent Marsh, Ltd.
Also available: FolderBolt/
NightWatch II Bundle
UT10338 \$135

\$89*



Fractal Design Sketcher™

Sketcher lets you faithfully duplicate the expressive line and texture of a soft lead pencil on rough sketch

paper or the luminous glow of oil paints. Pencils, chalks, charcoals, calligraphy pens, spray paint and a variety of brushes for oil and water color are all available along with a wide range of drawing surfaces. There's also photo retouching, cloning effects, type effects, "tracing paper" and more. Support's any PostScript or QuickDraw printer.

Publisher: Fractal Design Corp.

GRA0393

Also available: Fractal Design
Painter 2.0 GRA0412 \$279

\$99



After Dark/More After Dark Bundle*

The Ultimate Screen Saver Collection. Over 30 displays including Flying Toasters and Fish! With sound and password protection.

More After Dark—Over 25 incredible new displays for After Dark.

Publisher: Berkeley Systems

UT10231 \$45*

\$45*

Star Trek™: The Screen Saver

Beam aboard the Enterprise™ with Captain Kirk and Mr. Spock on a mission to prevent screen burn-in. Encounter thrilling Tribbles, Klingon battlecruisers, and burrowing horta. This all new screen saver provides over 15 animated displays, password protection, SystemIQ and full compatibility with After Dark.

UT10315 \$35

Help! 1.05

It's the only Macintosh application which uses artificial intelligence to check your system for problems. With Help! you can clean up your configuration and improve your Macintosh's efficiency. Help! analyzes your Macintosh and creates an easily understood report that describes all problems and tells exactly how to solve them. Help! detects conflicts, incompatibilities, improperly installed files, environmental problems, damaged files, and duplicate files. Includes a simulation feature which allows you to check in advance for problems.

Publisher: Teknosys
UT10251



\$89



Infini-D 2.0

Winner of the 1992 MacWorld Editors' Choice Best 3D Package! Infini-D 2.0 combines a friendly interface with 3D power: instant conversion of EPS files into 3D objects, awesome animation capabilities, and QuickTime support. Infini-D is the 3D package of choice for graphics and multimedia professionals.

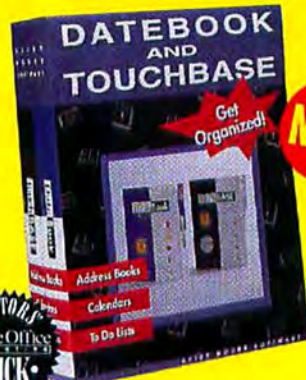


an unlimited number of BackBumer Engines and watch the magic of parallel processing burn up your rendering time! Includes a FREE Engine!
GRA0436 \$369*
Publisher: Speratus International

BackBumer*

BackBumer is the distributed network renderer for Infini-D. But BackBumer alone, or add

\$369*



TouchBASE/DateBook Bundle

Organize your life the Macintosh way with the TouchBASE/DateBook Bundle. TouchBASE lets you store information about personal and business contacts, alternative phone numbers, plus customize the fields. Also allows you to print envelopes, mailing labels, address books, and fax cover sheets. DateBook combines a calendar, To-Do list, and alarms into one package which keeps you on top of your appointments and things to do. Icons and Banners can be placed on your calendar for graphical reminders, and To-Do's can be prioritized and automatically carried forward if not completed. TouchBASE and DateBook are both multi-user, can print in popular address book formats, and can share information to form the ultimate personal information manager. Winner, "Editor's Choice MacWorld" best Personal Information Manager. Publisher: After Hours Software BUS0253

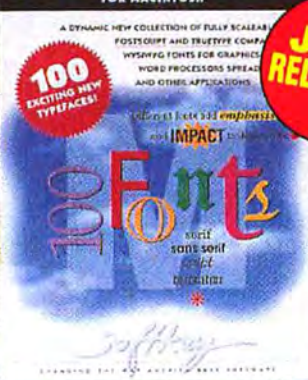
\$99

MACWORLD
EDITOR'S
CHOICE

100 Exciting New Postscript Typefaces for Mac

100 NEW Best Selling Typefaces for the Macintosh

MORE KEY FONTS FOR MACINTOSH



JUST RELEASED!

In More KeyFonts for Mac, Softkey brings you 100 new choices—a mammoth selection—of exciting new typefaces.

You get the Postscript Type 1 fonts AND TrueType—the technology that scales fonts on-the-fly for both your screen and printer. If you've got a PostScript printer, this is a must-have library of professional-quality Type 1 fonts. If not, then TrueType is for you. No more "jagged" text; you'll be printing typeset quality documents—with fabulous display headlines and crisp body text—within minutes! Now, with More KeyFonts for Mac you can afford an expanded font library to bring out all your creativity.

More KeyFonts for Mac

PRD 0013

Publisher: Softkey

Suggested Retail: \$59.95

MacWAREHOUSE Price \$39

SPECIAL BONUS OFFER!

Order both KeyFonts for Mac AND More KeyFonts for Mac for only \$79 and SAVE \$19!

BND 0185

Suggested Retail Value: \$149.98

MacWAREHOUSE Price \$79

BE A POWER USER...FREE!

POWER USER'S TOOL KIT 14.0

The ALL NEW Power User's Tool Kit 14.0 is **FREE** from MacWAREHOUSE when you order from us. If you want the disk, ask for product code number

AAA0038. You only pay \$1.50 postage and handling charges. The programs are shareware, so you can try them free of charge. If you wish to continue using them, some authors ask that you pay a small fee (\$5-\$20). All the details are explained on the disk, which is yours to keep.



Cachet

● Cachet, Editor's Choice for "Software Product of the Year" Mac/ser, lets you edit desktop color images in a remarkably intuitive and accurate way by using your own eyes! With Cachet's unique Edit-by-Reference feature, you'll never make another printing mistake because you adjust the on-screen colors of your image to match a reference image that has already been printed. Other features include MultiChoice, a quick way to correct color, EfiColor for matching color to any printer and more! Publisher: EFT GRA0432



\$399

IntelliDraw

● Aldus IntelliDraw defines an exciting new category of drawing program, with intelligent features that give you an easy new way to draw, refine and visually experiment with your ideas. Innovative smart tools link graphics in your drawing so they respond to changes automatically. Create visual "what-if" scenarios with features like intelligent clip art & templates, automatic symmetrical objects, and dimensions lines. Auto-alignment, shape blending, powerful text handling capabilities, unlimited layers, color



gradients, standard draw tools and more. Publisher: Aldus GRA0354
Also available: IntelliDraw Competitive Upgrade SID0028 \$99

\$199

Capitalist Pig



● New! Animated business simulation game challenges you to build and run your own business under authentic economic conditions. Experience the challenge of business, scandals, fires, terrorists, and more, as you battle for billions—or bankruptcy. Make crucial business decisions every

minute, and enjoy the results—or suffer the consequences. Packed with sound animation, and fun, it draws rave reviews from would-be entrepreneurs of all ages. Capitalist Pig is the must-have "Game of the Year". You never knew business could be so stimulating!

Publisher: Pluma Software ENT0447

\$35



DiskExpress II

Your Network Is Under Arrest!

● Slow hard drives spell trouble for networks of all sizes. Free your network by running DiskExpress II, the only true network optimizing software for the Macintosh. Fully AppleShare and FileShare compatible. LAN managers will love its sophisticated yet easy-to-use features, that allow for transparent operation without down time! Manage free disk space for large graphic files, and multimedia applications where contiguous space is a must. Works equally well on stand alone systems. Single user version. UT10132 \$49

Publisher: ALSoft, Inc.

Also available: Power Utilities UT10269 \$65 and Master Juggler UT10244 \$25.

\$49

Times Two

● Times Two is an easy, one-time installation that expands your disk to twice its size in minutes. Your PowerBook's 40 MB becomes 80 MB instantly. Your Iliac's 80 MB disk swells to 160 MB. Without ever opening your Mac or installing expensive hardware, you can expand your disk space in minutes. Mac/ser Editor's Choice Award Finalist! Publisher: Golden Triangle UT10343

Also available: Times Two 800K UT10344 \$109



\$109

Virtus WalkThrough 1.11

● The latest version of the award winning 3-D drawing program provides everything you need to quickly capture and explore your ideas in 3-D. Multiple windows and extensive drawing aids provide an interactive environment for editing and viewing your ideas. Interactive 3-D presentations, QuickTime® and HGS animated movies and perspective pictures dazzle your audiences. Enhanced Imports of 3-D DXF, Claris®CAD and MacDraw, PICT and EPS. Winner of "Breakthrough Product of the Year" Award 1990-Mac/ser. Publisher: Virtus Corporation GRA0278



\$369

I'm Kerry, call me at:

MacWAREHOUSE®

1-800-255-6227

(1-800-ALL-MACS)

Inquiries: 908-367-0440

FAX: 908-905-9279

Compuserve Code: GOMW

Call 24 hours a day,

seven days a week.

NEW! Express

Customer

Service Number:

1-800-925-6227

Midnight Express Service

available weekdays.



We carry more than 2000 Macintosh products, including all the latest releases and new versions. We pride ourselves on getting new products first. Just fill in the information requested below and mail the coupon. We'll start your free, one-year subscription to the MacWAREHOUSE catalog with the next issue.



FREE CATALOG SUBSCRIPTION MW0593

Free MacWAREHOUSE Catalog Subscription

1720 Oak Street, P.O. Box 3031, Lakewood, NJ 08701

Please enter my free, one-year subscription to the MacWAREHOUSE catalog

Name _____

Address _____ Apt. _____

City _____ State _____ Zip _____

(Expect to receive your first issue within 4-6 weeks.)

MacWAREHOUSE

1-800-255-6227

GUARANTEE

Many of our products come with a thirty day money back guarantee. If you are not completely satisfied, Ask for details when you place your order.

BUSINESS & PRESENTATION

Aatrix Software	
●FIN0162 CheckWriter 4.0	49
●FIN0168 Hit Finance	79
A Lasting Impression	
●PresumExpert: MS Word, Cover Letters, Manager, Sales & Marketing, Students, Computer Science & Engineering, Financing & Banking	ea 49
Abacus Concepts	
●STAT032 StatView 4.0	449
●STAT030 SuperANOVA	369
After Hours Software	
●DateBook 1.5 or TouchBASE 2.0	ea 79
Aldus	
●BUS0066 Persuasion 2.1	325
Attain Corporation	
●BUS0288 IN CONTROL 2.0	89
Claris	
●BUS0201 ClarisWorks w/Free Quicken	199
Lotus Development Corporation	
●BUS0188 Lotus 1-2-3 for Macintosh 1.1	299
●SID0034 Lotus 1-2-3 Competitive Upgrade	99
Microsoft	
●BUS0223 Microsoft Excel 4.0	295
●UPG0010 Microsoft Excel 4.0 Upgrade	95
●DAT0047 Microsoft FoxBASE+Mac 2.01	329
●BUS0181 Microsoft Project 3.0	445
●BUS0186 Microsoft Schedule+ 5 Pack	125
●BUS0243 Microsoft Works 3.0	159
●BUS0285 The Microsoft Office 3.0	475
●BUS0269 PowerPoint 3.0	295
●WRD0059 Word 5.1	295
Pastel Development	
●BUS0266 Daymaker 2.0	79
Round Lake Publishing	
●Legal or Sales LetterWorks	ea 45
Softsync Publishing	
●FIN0048 Accountant, Inc. 3.0.1	335
●WRD0057 ExpertWriter	295
Teleware, Inc.	
●FIN0057 M.Y.O.B. 3.0	109
T/Maker Co.	
●WRD0050 WriteNow Workshop	85
WordPerfect Corporation	
●WRD0041 WordPerfect 2.1	289

COMMUNICATIONS & NETWORKING

Apple Computer, Inc.	
●NET0250 AppleShare 3.1	999
●COM0131 AppleTalk Remote Access	159
●COM0126 Macintosh PC Exchange	69
Dayna Communications, Inc.	
●NET0125 DaynaPORT E/Z	269
●NET0076 DaynaPORT E/SE	149

Sounds

Instant relief from the work place. Let Sounds transport you to an Amazon rainforest, a South Pacific island, or a country farm. Sounds creates fantasy environments of sound while you work on your Mac. Sounds' colorful, picture filled interface lets you customize any of 11 exciting environments.

Publisher:
Digital Eclipse
LTI0359

\$39

Farallon™ Computing

●NET007 PhoneNET™ Plus, SE & II	31
●NET0019 PhoneNET StarController	899
●NET0329 Timbuktu® 5.0	139
●NET0334 Timbuktu Remote® 3.0	129
Global Village (full line available)	
●PowerPots	Call

Public Utilities

Public Utilities automatically examines your hard disk while you work. It checks for common problems (bad sectors, corrupted data, and damaged directories) and alerts you when it finds them. It also suggests how to fix the problem (or at your option, corrects problems automatically).

Manufacturer: Fifth Generation
LTI0325

\$99



Hayes

●MCD0055 Bundle 9600 ULTRA SmartModem	679
●MCD0077 OPTIMA 96 for the Mac	399
●MCD0096 OPTIMA 24 Bundle	145
Insignia (Full line available)	
●UTI0174 AccessPC 2.0	60
●COM0144 Soft PC Universal 3.0	155
PowerUser	
●MCD0015 24/96 Send/Receive Fax Modem	129
●MCD0011 2400 Baud Modem	79
Prometheus	
●COM0084 Home Office 24/96	199
●MCD0085 Ultimate Home Office 24/96	489
Shiva	
●NET0245 LAN Rover/L	369
TechWorks	
●NET0133 GrapeLAN 2.0 50-user	279
White Pine Software	
●COM0143 Mac 320-VT320 Emulator 1.1	95

EDUCATIONAL & ENTERTAINMENT

Broderbund	
●CDR0042 Just Grandma and Me-CD-ROM	35
●GRA0268 Kid Pix 1.2	35
Centron Software, Inc.	
●ENT0289 CasinoMaster Deluxe Color Version	45
●INT0440 Crossword Creator	39
Optimum Resource, Inc.	
●EDU0355 Stickybear's Reading Room	35
Personal Training Sys. (Full line available)	
●Excel 4.0 Word 5.1, Filemaker Pro 2.0	ea 49
Software ToolWorks	
●MUS0092 Miracle Piano	349

GRAPHICS & DESIGN

AbraCadabra	
●CAD0032 Design Your Own Home-Architecture	ea 59
Adobe Systems, Inc. (Full line available)	
●FOM0245 Adobe Type Reunion	39
●FOM0439 Adobe TypeStyle 2.0 w/ATM	127
●GRA0371 Adobe Premiere 2.0	429
●GRA0403 Illustrator 3.2 (w/ATM 2.0)	369
●GRA0191 PhotoShop 2.0	549
Aldus	
●GRA0305 FreeHand 3.1	395
●GRA0279 Gallery Effects Vol. 1	129
●GRA0354 InfillDraw	199

●GRA0112 SuperPaint 3.0	99
●DTP0072 PageMaker 4.2	455
●UPG0003 PageMaker 4.2 Upgrade	95
●DTP0050 Personal Press 2.0	99
Apple Computer, Inc.	
●GRA0347 QuickTime Starter Kit	149
Claris	
●GRA0350 MacDraw Pro 1.5	275
Dream Maker	
●GRA0105 Cliphues Vol. 1 Business Images	69
●GRA0323 Painter 2.0	279
Gryphon Software	
●GRA0378 Morph	89
Quark, Inc.	
●DTP0071 XPress 3.1	549
Ray Dream	
●GRA0383 addDepth	125
Softkey Software	
●FCN0483 KeyFonts	49
Softype Publishing	
●GRA0356 Expert Home Design	29

INPUT & OUTPUT

Caere	
●INP0205 Typist Plus Graphics	329
CoStar	
●INP0195 AddressWriter Envelope Printer	479
Datadesk International	
INP0174 Mac 101E Keyboard Platinum	129
INP0183 Mac 101E w/Keys 2	159
Kensington	
●INP0231 Turbo Mouse (SE or II) 4.0	109
Microtek	
●INP0245 Microtek ScanMaker II	926
●INP0247 ScanMaker II XE	1239
Mouse Systems	
●INP0132 Little Mouse ADB	74
●INP0232 PowerPad	79
SuperMac	
MCN0224 20" SuperMatch Color Display	1599

UnMouse

The UnMouse is an intuitive touch tablet. Move the cursor effortlessly. Just slide your finger over the glass, then press to click.



Plus it comes with special templates, each offering up to 60 programmable functions.

keys. And it even works with a stylus.

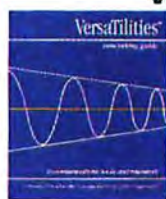
Manufacturer: MicroTouch INP0084

\$145

POWERBOOK PRODUCTS

Applied Engineering	
ACC0833 Automobile Power Adapter	69
ACC0834 Battery Charger	109
Battery Technology Inc.	
ACC0840 Battery for Powerbook	69
CMG Computer Products	
ACC0837 Powerlock for Powerbooks	49
Connectix	
●UTI0297 CPU Connectix for Powerbook Utilities	49
Kensington	
●INP0221 Notebook Keypad	79

VersaTilities



VersaTilities provides a suite of tools for use with Apple CommToolbox and MacTCP applications. VersaTilities' tools provide support for

Telnet and FTP (Client/Server) on LocalTalk, Ethernet and Serial (via SLIP) networks. VersaTilities' SLIP support enables Mac users to remotely access the Internet by dialing into a SLIP server. **Publisher:**

Synergy
COM0140

\$59

No Hands Software

●UTI0313 Magnet	89
Sophisticated Circuits	
●INP0232 Powerpad	79

UPGRADES & DRIVES

DayStar Digital	
●Universal PowerCache 33 Mhz	399
●Universal PowerCache 33 Mhz w/82	499
●Universal PowerCache 40 Mhz	589
●Universal PowerCache 40 Mhz w/82	699
●DRIO421 FastCache IISI (64K)	299
●DRIO500 FastCache Quadra 700/900	279
Mass MicroSystems	
●DRIO253 DataPak 45MB Removable	549
Peripheral Land, Inc.	
●DRIO375 Infinity 88 Removable single	649
●DRIO115 Infinity Turbo 40 Meg Removable	579
PowerUsers	
●CHP0011 4 Meg SIMMS 80ns	199
●CHP0013 1 Meg SIMMS 100ns	55
●DRIO499 160 Meg Drive	479
●DRIO533 20 Meg External Hard Drive	299
●DRIO550 80 Meg Drive	439
●DRIO494 Pro 105 MB Drive (Quantum LPS)	499
●DRIO546 Pro 210 MB Maxtor Drive	749
●DRIO549 Pro 40 MB Drive	379
●BND0054 44MB Syquest Removable	479
●BND0055 88MB Syquest Removable	609
SuperMac Technologies	
●DRIO437 Spectrum 824 PDD	899
●DRIO516 Spectrum 24 Video Mac II Card	759

UTILITIES & PROGRAMMING

Abbott Systems, Inc.	
●UTI0113 CanOpener 2	59
Aladdin Systems	
●UTI0302 StuffIt Deluxe 3.0	69
Apple Computer, Inc.	
●SYS0004 System 7.1 Personal Upgrade Kit	79
●SYS0003 All Ease	55
Caere	
●UTI0293 OmniPage Direct	269
●UTI0202 OmniPage Professional	549
Fifth Generations	
●UTI0324 AudioDoubler 2.0	59
●UTI0179 DiskDoubler 3.7	49
MAXA Corporation	
●UTI0337 Snapper Kit 2.0 w/Free Virex	179
MicroMat Computer Systems	
●UTI0285 MacKPG 2.0	89
Symantec Corporation	
●UTI0151 Norton Utilities for the Mac 2.0	95
●UTI0334 Symantec Antivirus for Mac 3.5 (SAM)	65

ALERT!

MAXA's ALERT!™ is essential Desktop Diagnostic™ software that lets you find the source of software conflicts and fix them! MAXA's ALERT! helps users find the cause of system crashes and frozen screens before they happen. MAXA's ALERT! diagnoses software on your Mac and reports actual and potential conflicts and problems. The program also consults a database of known conflicts reported by user groups throughout the world to further isolate possible problems. MAXA's ALERT! is fully networkable under System 7. With Alert's responder module, consultants, corporate MIS managers and end-users can diagnose and repair software conflicts over a network.

Publisher: Maxa
LTI0353

\$119



MacWAREHOUSE

1720 Oak Street P.O. Box 3031, Lakewood, NJ 08701
©1993 Micro Warehouse, Inc.

- Visa and Mastercard accepted.
- Your credit card will not be charged until your order is shipped.
- Purchase orders subject to credit approval.
- All products covered by 120 day full warranty. *Defective software replaced immediately. Hardware replaced or repaired at our discretion.
- Connecticut, New Jersey and Ohio residents add appropriate sales tax.
- Orders for in-stock items placed by 12:00 midnight (E) weekdays, (barring system failure, etc.) ship overnight by Airborne Express. (Some areas require an extra day.)
- Shipping charge \$7 per order up to 7 lbs. \$1 per lb. above 7 lbs.
- UPS ground service also available upon request - \$3 per order.
- UPS orders placed by 3:00pm (E) weekdays, ship same day.
- Actual freight charges apply for computers, hard disks, Benetton's, tape backups, monitors and printers.
- Alaska, Hawaii, outside continental U.S., APO/FPO call for information.
- Item availability and price subject to change without notice.
- Software is not copy protected, except where marked by asterisk.
- We reserve the right to limit quantities.
- Please indicate disk size.

Trademark of Adobe Systems Incorporated which is registered in the USA and other countries. Other marks are trademarks or registered trademarks of the manufacturers or marketers of the products with which the marks are associated.



It can take any color you throw at it.

Just in case you were wondering, yes. This is a real printout.

Let's say you have this outrageous design. But your color printer just doesn't get it. Looks like a job for the new Phaser™ III.

It has the broadest range of colors available—16.7 million of them—all delivered at 300 dpi with TekColor™ and Pantone-approved color matching. You'll get brilliant color on *any* paper, from stationery to card stock. And it takes up to 12" x 18" so you can even print tabloid bleeds.

Ten MB RAM and a 24 MHz RISC chip make it the fastest printer controller around. And with Adobe's PostScript™ Language Level 2, your stuff will look great. So go ahead. Throw out the wildest idea you can think of. The Phaser III can take it. Call 1-800-835-6100, Dept. 18C for a free output sample.



Tektronix

Circle 143 on reader service card

Fonts for the final frontier.

PostScript®
TYPE 1
FOR THE
Macintosh®



Get the authentic STAR TREK® fonts, symbols, insignias, and alien characters. Choose fonts from the original TV shows and films, and from STAR TREK®: The Next Generation™ series. They'll work on any Macintosh®, from the Performa® to the Quadra®.* And make your notes, memos, envelopes and faxes look like Starfleet Command Communications. If you're a trekker, you've got to have these font packs. Look for them at your favorite computer store. Or call us at 1-800-522-FONT. You'll live longer, prosper and find the fonts you're looking for.



**The only typefaces
with real characters.**

Only \$19.95 per package

How cool are Li'l Bits™? Try them for 30 days. If you can stand to be without them, just return them. And get your money back.

Software© Copyright 1993 Bitstream Inc., Cambridge, MA. Bitstream is a registered trademark and Li'l Bits is a trademark of Bitstream Inc. STAR TREK TM, ® and © 1993 Paramount Pictures. All Rights Reserved. STAR TREK is a Registered Trademark of Paramount Pictures. Bitstream Inc. Authorized User. All other product names are registered trademarks or trademarks of their respective companies.

*You may need Adobe Type Manager® to print to non-PostScript® printers.

End users circle 307 on reader service card

Dealers circle 308 on reader service card

Lab Notes

Running the Gamut of Color Matching

BY MARK HURLOW

IN THE PAST, WHENEVER MACWORLD Lab needed to compare color printers' color gamuts (their ranges of available colors), we had a consultant measure color values from sample output with a spectrophotometer and download the measurements via a telecommunications program such as MicroPhone from the test instrument to the Mac, where we exported them to a charting program. Comparing two printers' gamuts was hard; it meant printing a chart for each, as a transparency, and placing one chart over the other. This method is flawed, though, because a color gamut is three-dimensional (encompassing lightness, chroma, and hue) and doesn't reproduce accurately in 2-D form. Moreover, comparing the gamuts of a printer and a monitor was nearly impossible.

For this month's color printer articles, however, with the help of Randy Troast of Genoa Technology—a Southern California company specializing in printer and fax testing—we were able to speed up data measurement and analysis, and perform more-thorough testing. We also verified some of the assumptions we'd previously made about color printers. For the first time we were able to test device-independent color matching—a new feature of PostScript Level 2 that allows users to specify colors based on an international standard called CIE 1931 XYZ color space. Device-independent color makes it possible to input, view, and print documents with more-predictable results.

Improving Color Analysis

THE HARDWARE AND SOFTWARE SYSTEM that has changed the way we test printers' color quality is Genoa Tech-

nology's Color Performance Test. Its main element is Color Performance Analyzer (CPA), a Microsoft Windows-based application that allows color gamut data for a printer to be gathered very quickly. Color Performance Test includes a database of color gamuts for some of the more popular color printers such as the HP PaintJet XL 300, Tektronix's Phaser III PXi, and the Seiko ColorPoint PSX, as well as color gamuts for a generic monitor and an offset press (commonly used for magazine publishing). The spectrophotometer we used in conjunction with CPA was a Gretag SPM-50.



MARK GOUNA

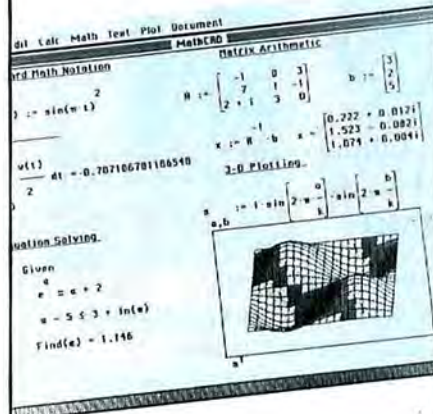
To generate output for color measurement, Genoa supplied a special PostScript file developed by the ANSI IT8.7 committee (formed to develop standards for color communications and device characterization in the graphic arts and printing industries) for downloading to the color printers.

With the output, we could use CPA to measure the color gamut in the CIE $L^*a^*b^*$ color space. Macworld Lab performed a basic 6-color gamut measurement for each printer. For the printers that were able to produce the widest range of colors, we used a 182-color gamut measurement to generate output covering the dynamic range of their color-rendering ability. This allowed us to differentiate the highest-quality color-printing performance from that of slightly lower quality.

Color Performance Test enabled us to verify one thing we suspected—color printers are unable to reproduce certain colors, especially saturated greens and blues. To test this yourself, try printing the brightest greens and blues your color application can generate, and then

continues

Technical calculations made easy!



Perform engineering and scientific calculations faster... and with fewer errors.

- **Mathcad 2.0 does your numerical analyses quickly, easily... and inexpensively!** The live document interface™ lets you integrate equations, text, and graphics on your computer screen. You can see what you solve and update your equations and graphs with a single keystroke.
- **You do the thinking while Mathcad does the work.** Mathcad picks up where calculators and spreadsheets leave off. With over 120 commonly-used functions built-in, Mathcad can handle your formulas, exponentials, differentials, cubic splines, FFTs, and matrices.
- **Applications Packs customize Mathcad to your work.** Ten different packs are available for electrical, mechanical, civil, and chemical engineering, and other technical applications.
- **Mathcad works on your Macintosh, PC, or UNIX workstation.** More than 120,000 engineers, scientists, and educators are already using Mathcad to turn their computers into powerful workstations that can handle virtually any technical application.

Call 800-MATHCAD to request a free demo disk!



In Massachusetts, call 617-577-1017.

For a free Mathcad Introductory Kit, clip this coupon and mail it back to us, or fax it to 617-577-8829. Or circle your reader service card.

☐ **Yes! Tell me more about Mathcad 2.0!**

Name

Title

Company

Address

City State Zip

Phone ()

MathSoft
201 Broadway
Cambridge, MA 02139
USA

MathSoft, Inc
201 Broadway
Cambridge, MA 02139
USA

MW5

MCTECH 2.0

Circle 34 on reader service card.

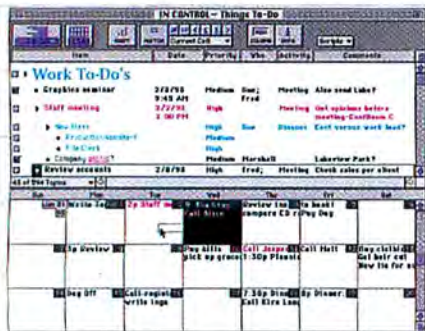
Relax, it's IN CONTROL.



Now the
best-selling
To-Do List
Manager!



IN CONTROL™ is the only
To-Do List Manager that can organize
and print all your activities...
— as outlines — as prioritized lists
— and as calendar pages!



Only **IN CONTROL** combines an outliner and
calendar to get you organized fast.

Use **IN CONTROL** to:

- Organize all your activities quickly.**
Powerful outliner re-arranges your activities easily
Auto Enter and Pop-up menus speed data entry
 - Categorize information the way you want.**
Unlimited columns handle any size project
Drag and drop to rearrange your plans quickly
 - Prioritize important activities.**
Match and Sort just the activities you want
Automatic Reminders make sure nothing slips by
Scripts automate sorting and other common actions
 - Schedule effortlessly.**
Instantly turn your lists into calendars
Drag listed events to the calendar days you want
 - Accomplish more than ever before!**
Check boxes record and archive done items
Print professional outlines, priorities, calendars
Link documents, share files, and much more.
FREE DynoPage Lite prints pages for Day-Timer,
Day Runner, FiloFax, Franklin, other planners
- Satisfaction Guaranteed.**
Full 60 day money-back guarantee.

"If you make lists...get this program." —Macworld

ATTAIN
Attain Corporation
48 Grove Street
Somerville, MA 02144 USA
© 1993 Attain Corporation. All products
are trademarks of their respective holders.

Available from your favorite
software dealer.
For more information, call
800-925-5615
or call or fax
617-776-1110 617-776-1626

FROM THE ORIGINAL
CREATORS OF FILEMAKER®

Circle 6 on reader service card

compare the output with what you see
on screen.

We also noticed that most desktop
printers have a larger color gamut than a
single-web offset press (used to print
magazines like *Macworld*), proving that a
large color gamut alone doesn't guarantee
the best color quality. Factors such as
resolution, dot size and shape, registra-
tion, and halftoning also contribute to
a printer's ability to reproduce high-qual-
ity color.

Devising Tests for QuickDraw Printers

SINCE CPA'S TEST FILE FOR COLOR
measurement is in PostScript format only,
we had to develop a method of obtaining
at least the primary color patches (red,
green, blue; and cyan, magenta, yellow)
color patches for plotting a basic 6-color
gamut for each of the QuickDraw-based
printers. Eventually we figured out four
ways to generate the color patches. (1) We
used vendors' test prints when available—
most printers can generate all the primary
colors on a test page. (2) We used Ultra-
Paint with a Mac Classic, which doesn't
have a color ROM. (3) We used
FreeHand for printers (such as the Canon
CJ-10) that require 32-bit QuickDraw
(specifying pure red, green, and blue un-
der Spot Color). (4) We used ColorAge's
PostScript interpreters—Freedom of
Press Pro and Visual Business Systems'
Professional Output Manager—to down-
load the PostScript file that contains the
color gamuts.

Device-Independent Color Matching

WE ALSO USED CPA TO PERFORM A
PostScript Level 2 color-matching test.
Our objective was to see how closely Post-
Script Level 2 printers could match de-
vice-independent color. Theoretically, if
you input a color value (such as a yellow
with a CIE L*a*b* value of 88, -9.9, 61)
that you know the printer can generate,
the printer should print a color whose
measurement is equal to or close to the
input value.

To test this theory, we measured the
values of the output from each printer's
original PostScript test file; fed those val-
ues into CPA, which generated a Post-
Script file; and printed the new file. We
then measured the values of the new out-
put and compared the old and new values.
Since the new output was based on the
measured values of the original output and
we knew the printer could produce that
color, we expected the new and the old
output to look identical. But a quick com-
parison of the two revealed big differences
on quite a few color patches. This proved

to be the case with all the PostScript Level
2 printers.

Some color deviations between print-
outs might result from temperature varia-
tions (over time) of a printer's thermal
head. We also noticed that in a few cases,
even a slight shift of the spectropho-
tometer's position within the same color
patch caused variations—especially when
using a halftone printer. And a spectro-
photometer's precision level could cause
it to place a data point outside the color
gamut. After researching the problem
with Genoa Technology and Adobe, we
determined that the mismatched colors
were mainly attributable to Adobe's
method of handling out-of-gamut colors.
Most of the variations involved colors that
were close to, or outside, the boundary of
a printer's color gamut. Adobe's method
of handling the out-of-gamut colors is to
keep the color's lightness and hue con-
stant but move the color's chroma inside
the gamut. However, that usually means
sacrificing color accuracy for more pleas-
ing colors.

Color-Rendering Dictionaries

BECAUSE WE WANTED TO MATCH
colors as precisely as possible, Adobe rec-
ommended that we use a color-rendering
dictionary called minimum Δ-E, which
would move out-of-gamut colors to the
nearest point on the boundary of the color
gamut, resulting in much closer matches.
When we used this dictionary in testing
the Tektronix Phaser II PXi, we found
that a few color patches still varied from
the original, but generally the results
were more acceptable. Printers equipped
with PostScript Level 2 have the ability
to accept multiple color-rendering dictio-
naries, but only if a given application sup-
ports that function—and so far, none do.
Being able to access multiple rendering
dictionaries would be useful, for example,
when printing a document containing a
company logo and a scanned image—
the minimum Δ-E method would pre-
serve the logo's original color, while a
color-rendering dictionary that uses the
constant lightness and hue method would
provide nicer-looking colors for the
scanned image.

So what conclusions can we draw
from our test results? There seems to be
no single method of color matching
that works successfully for all situations.
Using PostScript Level 2 device-indepen-
dent color, applications that support Post-
Script Level 2, frequently calibrating the
output and input devices, having a good
color-management system, and finally,
old-fashioned trial and error can all con-
tribute to producing the best possible
color match. **m**

Imagine the reaction to our new PostScript™ Level 2 printer.



HP LaserJet III
\$1895



DEC Laser II52
\$1199



Apple LaserWriter NTR
\$1695

Standard Features	DEC Laser II52	HP® LaserJet® III	Apple LaserWriter® NTR	Apple LaserWriter Select 310
PostScript Level 2	YES	Yes	Yes	No
AppleTalk	YES	Yes	Yes	No
Resident PostScript Fonts	17	35	35	13
Simultaneously Active Ports	YES	No	Yes	No
List Price	\$1,199	\$1,895	\$1,695	\$1,079

No matter what the competition says about our DEC Laser™ II52, you'll swear by it. Call 1-800-DECINFO, ext. 849 to place your order or get the name of your local **digital**™ distributor.

THIS MONTH:

General Magic Takes
a Bow • QuickTime
Special Effects • Big
ClarisWorks Update •
Utilities for Word •
Fast CD ROM Drives

BY DAN LITTMAN AND TOM MORAN

Apple Finally Steps into Server Market, Introduces Speedier AppleShare

After years of building network-ready desktop computers, Apple has finally entered the network server market. In a long-overdue move to fill a gap in its product line, Apple unveiled its first network servers—Macintoshes with preinstalled network operating systems designed as central repositories for, and managers of, shared data, such as files and databases.

The Apple Workgroup 60, 80, and 95 servers couple existing Macs—the Centris 610, Quadra 800, and Quadra 950, respectively—with new performance-tuned versions of AppleShare, Apple's server-based network operating system. Apple's design goal for these hardware-and-software packages was to significantly increase performance over Macs running the previous version of AppleShare, which customers had to install on their own. These preconfigured, higher-performance servers should help Apple achieve its strategic goal of competing more favorably in corporate environments.

Workgroup 95

WHILE THE APPLE Workgroup 60 and 80 repackaging ex-



THE APPLE WORKGROUP 95 (LEFT), BASED ON THE QUADRA 950, BOOSTS ITS PERFORMANCE VIA A UNIX-BASED VERSION OF APPLESHARE AND A PDS ACCELERATOR BOARD. THE WORKGROUP 80 (TOP RIGHT) AND 60 (BOTTOM RIGHT) COMPLETE APPLE'S TRIO OF PRECONFIGURED NETWORK SERVERS.

isting Macs with a souped-up network operating system, the Apple Workgroup 95, based on the Quadra 950, forges new ground for Apple. The server features a Processor Direct Slot (PDS) accelerator board, 16MB to 256MB of parity memory (for higher data integrity),

higher-capacity storage, and bundled backup software. The Workgroup 95 will run AppleShare Pro, the first version of AppleShare to run on A/UX—Apple's version of Unix with a System 7 user interface.

The Workgroup 95's PDS board improves the system's

performance by using built-in 128K (upgradable to 512K) of static RAM that serves as a cache, storing the most frequently accessed data. Because the server's CPU accesses data faster from the SRAM than from system DRAM, caching shortens processing time.

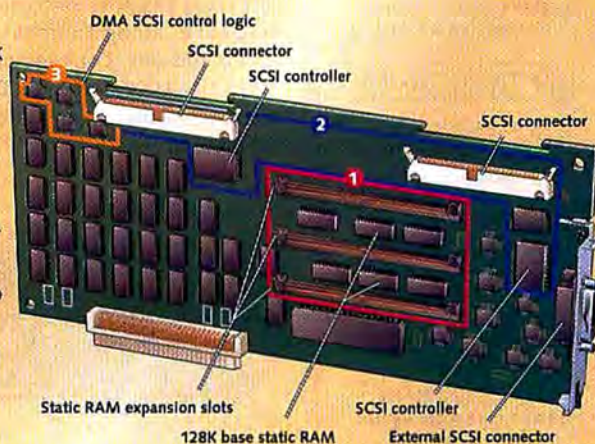
PDS Board Speeds and Expands Workgroup 95

Much of the Workgroup 95's performance comes from its PDS board, the Workgroup Server PDS Card, which Apple also offers as an upgrade for the Quadra 900 or 950. Here are its three key benefits:

1 Speeds data access The Workgroup Server PDS Card lets the server access data faster by using 128K to 512K of static RAM that serves as a secondary memory cache for a 68040 server. The cache stores the most frequently accessed data, boosting performance.

2 Supports more SCSI devices The PDS board's two SCSI controllers augment the two on the server's logic board. The Workgroup 95 can recognize 28 SCSI devices, 7 for each controller; however, physical constraints restrict it to 14 external and 6 internal devices.

3 Frees up the CPU The DMA (Direct Memory Access) SCSI control logic chip set offloads I/O processing, freeing the CPU for other tasks.



Two DMA SCSI channels on the board ease the load on the processor, freeing it for other tasks. The two DMA SCSI channels supplement the logic board's two SCSI channels; because A/UX 3.0.1 can see 7 SCSI devices per channel, the server can logically recognize 28 attached SCSI devices. Due to physical constraints, however, attaching 14 external devices and 3 to 6 internal devices is the practical limit.

Because AppleShare Pro is based on Unix, a multitasking operating system, it supports asynchronous I/O (the ability to overlap reads and writes), which lets the server perform I/O for multiple users simultaneously, speeding response times.

AppleShare Pro will boost performance to four times that of AppleShare 3.0, a speed that matches Novell NetWare 3.11 running on a comparable Intel-based platform, according to Apple's tests on a 20-node network. AppleShare Pro, which supports 200 simultaneous users, is scheduled to ship in April priced at less than \$2500.

The Workgroup 95, which includes AppleShare Pro, A/UX 3.0.1, and Retrospect Remote backup software, is scheduled to ship in April and to cost \$7000 to \$15,000, depending on configuration. The higher-end models will have higher memory capacities and multiple hard

drives. Apple will offer an internal CD ROM or tape drive, which can store 4GB to 6GB.

A/UX 3.0.1, a version optimized for this hardware, includes AppleTalk and TCP/IP protocol stacks. A/UX allows AppleShare Pro to support 5000 open files, compared with 246 files (a Macintosh Operating System limit) with other

AppleShare versions.

The Workgroup 95 clearly demonstrates Apple's desire to penetrate the higher-end server market, especially the database server market, which is growing faster than the file- and print-server markets. Apple is working with such companies as Oracle and ACI US (which makes 4D) on databases for

the Workgroup 95. In April, Oracle is scheduled to release Oracle 7 Cooperative Server for A/UX, a distributed database with a Macintosh user interface. The Workgroup 95 also addresses the need for a Macintosh file server for large workgroups (100 or more users) and for workgroups using performance-demanding or Unix applications.

Quadra 900 and 950 owners will be able to buy upgrade kits, scheduled to ship in April. One kit will include the Workgroup Server PDS Card and A/UX 3.0.1. A second kit will include the PDS board, A/UX 3.0.1, and the internal tape drive. Both will include Retrospect Remote. AppleShare Pro will be sold separately.

Workgroup 80

THE APPLE WORKGROUP 80 IS positioned in two ways: as a file-and-print server for midsize workgroups (30 to 40 users of general-business applications), and as a communications platform for software applications such as a router, an SNA, X.25, or X.400 gateway; or an Apple-

continues

Apple's Powerful Text Retrieval

A new text-retrieval technology from Apple will make it easier for users to locate information based on keywords contained in a file. AppleSearch information-access software technology, which is scheduled to ship this summer, will let networked Macintosh users query text-based information located on servers. For example, users at a software development firm or a canned-fruit company might ask the software for a weekly report of any news-feed items with the word *apple* in them.

The text-retrieval technology consists of separate software on the server and on a user's machine. Users define the parameters—such as keywords and time period—of search queries and define which folders to search on the server. Because the server processes the queries, searches can take place even when a user's machine is turned off. To determine which users can access which folders, the server software uses AppleShare file services (or System 7 file-sharing, although Apple doesn't recommend this approach because it supports fewer users and it's more difficult to manage).

The server software finds the data that fits the search criteria, rates its relevancy (based on the num-

ber of matches to search criteria) using a five-star system, and sends the names of the files that contain the data back to the user's Macintosh. A user can view a list of files or a newspaper-style report with the first paragraphs of the file; look at the text in the files (even if the user's machine doesn't have the application on it); and copy the files from the server.

The server can index data, manually or automatically, at the word level. Every time the server indexes the folders, it re-executes those queries that include a request to search new information.

The text-retrieval software supports AppleTalk Remote Access, allowing PowerBook users to connect to the server to execute queries or to a client Macintosh to download finished reports.

The server software requires a 68040-based Macintosh server, such as the Apple Workgroup 60, 80, or 95. The client software runs on any Mac running System 7.0 or higher. Apple expects to offer in the summer a client software developers' kit with a programming interface and software for customizing "newspaper" report formats. Pricing was not set at press time for any of the AppleSearch software.

—ELIZABETH DOUGHERTY

Talk Remote Access server. For example, later this year Apple plans to introduce multiline AppleTalk Remote Access server software. The software will also run on the other new server platforms and compete against dedicated hardware remote access servers. Apple's planned AppleTalk Remote Access server, which will also support X.25, will allow remote users to access a network through a server, rather than through a desktop as with AppleTalk Remote Access 1.0.

The Workgroup 80 is a Quadra 800 bundled with AppleShare 4.0, System 7.1, and 8MB to 136MB of interleaved memory; it is expected to ship in June and to cost between \$6500 and \$10,500, depending on configuration.

AppleShare 4.0, for 68040 Macintoshes such as the Workgroup 60 and 80, will perform twice as fast as AppleShare 3.0, according to Apple. (Apple will continue to sell AppleShare 3.0 because it runs on all Mac platforms currently sold.) AppleShare 4.0, scheduled to ship in June, will support up to 150 simultaneous users and will cost less than \$2000 as a stand-alone software product.

The network operating systems will support services beyond file and printer sharing. Apple will provide some services (such as information access; see "Apple's Powerful Text Retrieval") through applications, and other services (such as messaging, directory services, and user authentication) through the Apple Open Collaboration Environment, which will run on a dedicated server.

Workgroup 60

THE APPLE WORKGROUP 60, AN entry-level file-and-print server, is targeted at small workgroups (15 to 20 users of general-business applications). The Workgroup 60 consists of a Centris 610 bundled with AppleShare 4.0, System 7.1, and 8MB to 68MB of DRAM. Scheduled to ship in June, the Apple Workgroup 60 will be priced between \$3000 and \$5000, depending on configuration.—ELIZABETH DOUGHERTY



VIRUS WATCH

CURRENT VIRUSES, TROJAN HORSES, AND WORMS

T4-A, T4-B

TYPE: Virus
FIRST LISTED IN VIRUS WATCH: 10/92
INFO: Initially discovered in a game called GoMoku
IMPACT: Both versions of T4 damage system files and applications

ChinaTalk

TYPE: Trojan Horse
FIRST LISTED IN VIRUS WATCH: 10/92
INFO: ChinaTalk is an INIT that comes with a read-me file that claims it provides a female voice for MacinTalk
IMPACT: Deletes the contents of disk drive on restart

CPPro

TYPE: Trojan Horse
FIRST LISTED IN VIRUS WATCH: 5/93
INFO: Claims to be a new version of Compactor Pro, but when launched it attempts to reformat mounted hard drives and floppies
IMPACT: Can delete data. May be more likely to affect floppy disks than hard drives

ClarisWorks' Upgrade Packed with Features

Claris is adding a hefty set of new features to its all-in-one small-business package, ClarisWorks. Version 2.0's most obvious new pieces are an outliner for simple click-and-drag reorganizing of documents, a paint environment, a slide-show feature, and button palettes for one-click access to many common commands and user-defined macros.

Version 2.0's word processor can wrap text around graphics and can create character styles, though it does not

Software Add-On Searches Word

When a product has the enormous installed base that Microsoft Word has, smaller companies come along to develop useful add-ons. For example, Alki Software's new Seek DA searches for text strings in the contents of Word, MacWrite,



and text files (it also searches dates, file names, Word's summary info, and so on). Seek DA

News

has an almost endless set of search tools including Booleans and a relatively unimposing form of GREP, a powerful pattern-matching system. Search criteria can be saved and reused.

Alki has previously released other Word add-ons, including the \$99.95 MasterWord (see "New Add-Ons for Microsoft Word," *Macworld News*, December 1992). Seek is \$39.95. Alki also publishes English and foreign-language dictionaries and thesauruses. Alki, 206/286-2600.—D.L.

TREND

No Paper, No Barriers

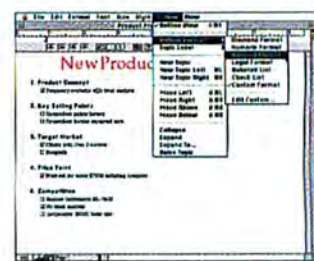
Technology for sharing computer documents across applications and platforms is a vision—or an obsession—that lures programmers to their keyboards just as gold lured men to the Sierra Madre. The company that hits this mother lode will gain control of a platform as fundamental to computing as Microsoft's DOS or Adobe's PostScript.

Pickax wielders include Adobe, with its still-under-development Acrobat, which saves a PostScript image of a file to disk, navigates the image file with a viewer, and uses Multiple Master fonts to compensate for missing fonts; Frame Technology, with a FrameMaker hypertext viewer; and Northern Telecom and Interleaf, which both have products in the same vein.

Most recent to stake a claim is No Hands Software with its Digital Paper technology, the basis for Common Ground. Common Ground creates images that are, pixel-for-pixel, identical to the original file; incorporates the original font shapes in the file; has password-protection and encryption; can search text; and can compress a full page of text to 7K. Common Ground is \$189. Future Digital Paper-based products will do routing, have multiple layers for annotation and stick-on notes, and provide tools for creating hypertext books. No Hands Software, 415/321-7340.—D.L.

support Word-like paragraph styles. The charting module has been expanded with Hi-Lo charts, pictograms, combination charts, and improved labeling and formatting options. The database adds automatic data entry for serial numbers and similar uses; pop-up lists; and data validation.

ClarisWorks' list price remains \$299, and Claris says it still runs in 600K of memory. Claris, 408-727-8227.—D.L.



CLARISWORKS' NEW OUTLINE VIEW CAN FORMAT ITEMS WITH CHECK BOXES TO KEEP TRACK OF COMPLETED TASKS.

Give La Cie your toughest driving test.

Buying a hard drive is a lot like buying a car. You want a quality product that will last from a reputable company you can trust—all at a competitive price.

We think that's not too much to ask. So before you go shopping, give us this little test. Then give it to the competition.

C H E C K O U R L I S T

✓ **Quantum quality under the hood!** For high-speed performance and reliability Quantum mechanisms are simply the best you can buy. As a Quantum company, La Cie proudly offers a full range of Quantum drives.

✓ **Award-Winning Design!** La Cie's award-winning Cirrus and Tsunami cases are sleek, streamlined, space-saving. They not only look sexy, they're actually smaller than conventional zero-foot-print cases.

✓ **Award-Winning Performance!** Check the record books. Year after year, the experts rate La Cie tops. In the race for Macworld's 1992 World Class Awards, La Cie won Best Hard Drive under 80MB, Best Hard Drive 80-200MB, Best Hard drive over 200MB, and Best Color Scanner.

✓ **Prompt, courteous sales and support!** We hate to wait, and we know you do too. That's why we answer the phone fast (95% of calls answered before the fourth ring). If somehow you get our voice-mail, we'll call you back fast (usually within the hour) during the business day.

✓ **30 day 100% satisfaction guarantee.** That's what you get with La Cie. Why settle for less?

✓ **Disk-for-disk or better replacement.**

✓ **Hard driving Silverlining software.** La Cie drives come with System 6, System 7, and 30MB of shareware and Silverlining, the number one rated hard drive management software, ABSOLUTELY FREE. Silverlining works with all the drives in your system and optimizes your drive to let your applications run faster.

✓ **Unique switchable active termination.**

✓ **FCC, UL, TUV, VDE, CSA certification.**

✓ **A company you can count on.** La Cie has successfully served our customers with award-winning products since 1986. Quantum since 1980. With more than a billion dollars in revenue, La Cie and Quantum allows you to buy with full confidence in our ability to deliver tomorrow's technology along with long-term service and support.

Call us now for our new free Winter 1993 catalog!

800-999-1422

International 503-520-9000 Fax 503-520-9100 6 a.m.-6 p.m. PST Mon.-Fri. VISA, MasterCard, C.O.D. and approved purchase orders accepted*



*Call for details on terms, conditions, limited money back guarantee and free offers. System 7.0.1 software included only with certain configurations. ZFP+ Drives do not have switchable termination. Prices do not include shipping and only apply to products shipped within the continental United States. Please contact La Cie for international distribution. Add sales tax where applicable. ZFP, ZFP+, Cirrus, Tsunami, PocketDrive, PocketDock, ExpressDrive, Silverscanner, Silverscan, Silverlining, La Cie and the La Cie logo are trademarks of La Cie, Ltd., a Quantum Company. All other trademarks are the property of their respective companies. All prices, specifications, terms, descriptions, products and services herein are subject to change without notice or recourse. © Copyright 1992-93 La Cie, Ltd. 8700 SW Creekside Place, Beaverton, OR 97005. Phone: (503) 520-9000, Fax: (503) 520-9100. All rights reserved. Printed in U.S.A.

BEST!
Macworld
Hard Drive
under 80MB

BEST!
Macworld
Hard Drive
80-200MB

BEST!
Macworld
Hard Drive
over 200MB

BEST!
Macworld
Color Scanner
Silverscanner

FCC
Certified!

TOLL-FREE
Technical
Support

TOLL-FREE
Customer
Service

FREE!
Silverlining™

Switchable
Termination!

Universal
Power
Supply!

30 Day
Money Back
Guarantee!

The drives you love from the company you trust, La Cie, a Quantum company.

Quality inside and out.



PocketDrives
From
\$299

La Cie's PowerBook drives and PocketDrives are built right from the start.

Performance in the palm of your hand.

Our sporty 40MB, 80MB, 120MB and 160MB PocketDrives are built for mobility. Travel light (under 10 ounces). Travel fast (19ms seek time). The PocketDrive features Quantum's new 2 1/2" drive technology, whisper quiet operation and our exclusive switchable external termination. Pack in your pocket, purse or briefcase. PocketDrives come complete with our exclusive T-connector adapter for connectability to almost any Mac. For more connectivity, try our optional PocketDock desktop cable. Our T-connector and PocketDock make the PocketDrive system the most versatile and convenient pocket-size drive—anywhere.

Driving power by the book.

Here's Quantum horsepower for PowerBook owners. Available in 80MB, 120MB and 160MB capacities, La Cie's high-performance PowerBook drives come standard with Quantum's high-mileage 2 1/2" drive technology. Lightning fast. Lexus quiet. Easy to install. La Cie PowerBook drives come complete with the correct brackets for convenient internal installation and an outstanding easy-to-read, easy-to-follow instructional and owners manual. And as always, each drive is fully equipped with System 6, System 7, our number one rated Silverlining disk management software and one of the industry's longest warranties.

C H E C K O U R L I S T

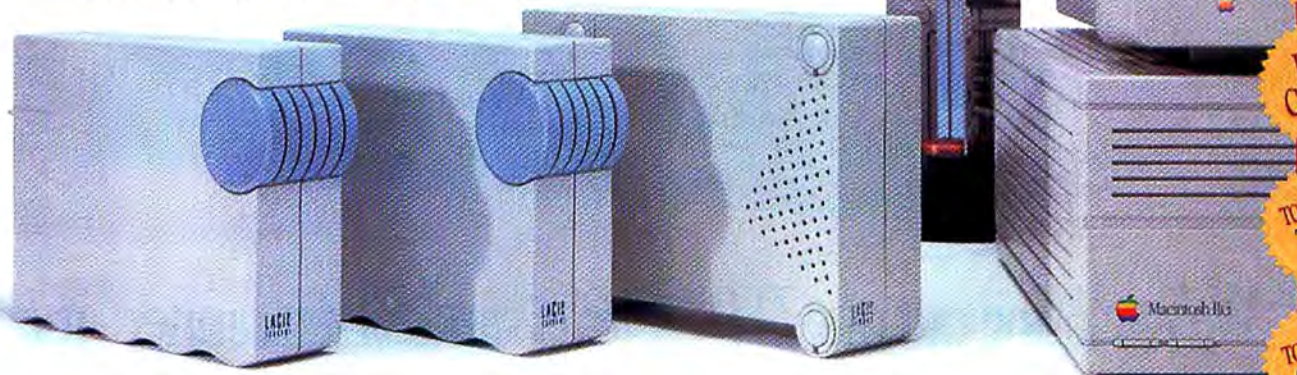
- ☒ **Disk-for-disk or better replacement.** If you have a problem with your La Cie drive while under warranty, we'll ship you a replacement within 48 hours. We've also been known to replace disks with better ones, rather than make a customer wait. That's how important your drive is to you. That's how important you are to us.
- ☒ **Unique switchable active termination under the hood.** Only La Cie hard drives provide simple, straight forward termination for your SCSI bus. No need for external terminators, just flip a switch. Our advanced circuitry is smart too, termination power is provided only if it is needed.

High speed safety.



External
Drives From
\$239

Internal
Drives From
\$179



La Cie's Tsunami and internal drives like to be driven hard and fast.

Lap the competition.

La Cie's Cirrus and Tsunami drives outpace the competition for performance and value. That's because they're loaded with quality features like Quantum mechanisms, whisper quiet fans, 12ms access time, award-winning chassis designs and our Silverlining disk management software. From 40MB to 1.2GB take home your pick of load capacities. Each delivers the streamlined styling, diminutive footprint and single-handed convenience of the true portable. And that's not all. All Cirrus and Tsunami drives offers the La Cie's exclusive active switchable termination. No wonder they're rated tops in their class, year after year.

Never be afraid to internalize your drives.

If the fear of installation has deterred you from satisfying your desire for a more powerful internal drive, stop fretting. La Cie not only offers a full range of quality Quantum drives for your Mac, PowerBook or Quadra, we make them easy to install. Each La Cie disk comes complete with the correct bracket hardware for internal installation, and an outstanding easy-to-read, easy-to-follow instruction manual, plus all the no-extra-charge, toll-free telephone technical support you need to make the job quick, convenient, and painless.

Test us for real and call now for fast, friendly service!

800-999-1422

International 503-520-9000 Fax 503-520-9100 6 a.m.-6 p.m. PST Mon.-Fri. VISA, MasterCard, C.O.D. and approved purchase orders accepted*

*Call for details on terms, conditions, limited money back guarantee and free offers. System 7.0.1 software included only with certain configurations. ZFP+ Drives do not have switchable termination. Prices do not include shipping and only apply to products shipped within the continental United States. Please contact La Cie for international distribution. Add sales tax where applicable. ZFP, ZFP+, Cirrus, Tsunami, PocketDrive, PocketDock, ExpressDrive, SilverScanner, SilverScan, Silverlining, La Cie and the La Cie logo are trademarks of La Cie, Ltd., a Quantum Company. All other trademarks are the property of their respective companies. All prices, specifications, terms, descriptions, products and services herein are subject to change without notice or recourse. © Copyright 1992-93 La Cie, Ltd. 8700 SW Creekside Place, Beaverton, OR 97005. Phone: (503) 520-9000. Fax: (503) 520-9100. All rights reserved. Printed in U.S.A.

BEST!
Macworld
Hard Drive
under 40 MB

BEST!
Macworld
Hard Drive
40-80 MB

BEST!
Macworld
Hard Drive
over 80 MB

BEST!
Macworld
Color Scanner
Shareware

**FCC
Certified!**

**TOLL-FREE
Technical
Support**

**TOLL-FREE!
Customer
Service**

**FREE!
Silverlining™**

**Switchable
Termination!**

**Universal
Power
Supply!**

**30 Day
Money Back
Guarantee!**

Super,
fantastic
closeout prices!!!

These chassis

Time to
Drive a Hard
Bargain!*



We're closing out our ZFP™, Cirrus™ and Silverscanner™ models!

40MB to 1.2MB capacities available

- La Cie is discontinuing our classic zero foot print (ZFP) and Cirrus hard drive cases in favor of newer, sleeker body styles.
- We're not fooling around—we're blowing out every ZFP and Cirrus hard drive in inventory at once-in-a-lifetime bargain prices.
- These are top quality, award winning drives. All La Cie ZFP and Cirrus hard drives deliver the latest in high-performance Quantum technology.

All La Cie ZFP and Cirrus drives include:

- FREE Silverlining hard disk management software (\$149 value)
- 2-year Limited Warranty on parts and labor
- Unlimited TOLL-FREE technical support
- FREE switchable termination (\$50 value)
- All drives are burned-in and tested
- SCSI cables included
- Apple System installed; ready to plug and play
- Universal Power Supply
- Approved by FCC and UL.

Seeing is believing! Award-winning closeout!

La Cie is replacing our original Silverscanner (1992 World Class Award winner) with a newer model. Now you can enjoy the rich imagery of our original Silverscanner at cheap thrills prices (perfectly balanced color to our shadowy details to our crisp clean curved lines). But don't wait! The only thing limited about our state-of-the-art Silverscanner is our inventory. Don't let this one-pass beauty pass you by this time. Call us and order one right now, before they're all gone!



Closeout!
Original La Cie
Silverscanner
Limited Supply!

Silverscanner

with Color It! and Read-It
O.C.R. Pro

Was! ~~\$1399~~ Now! **\$999**

Silverscanner

with Photoshop and
Read-It O.C.R. Pro

Was! ~~\$1799~~ Now! **\$1349**

Silverscanner

with Photoshop, ColorStudio and
Read-It O.C.R. Pro

Was! ~~\$1899~~ Now! **\$1449**

are history!!!

**Super
fantastic
closeout prices!!!**



**While
Supplies
Last!***

Call us now for super, fantastic, incredible closeout prices!!!

Quantum	ZFP	Cirrus	Quantum	ZFP	Cirrus
	<i>Was!</i>	<i>Now!</i>		<i>Was!</i>	<i>Now!</i>
40MB	\$299	\$239	240MB	\$689	\$479
85MB	\$379	\$269	525MB	\$1249	\$999
120MB	\$499	\$409	700MB	\$1429	\$1259
127MB	\$439	\$339	1.05GB	\$1769	\$1399
170MB	\$469	\$369	1.2GB	\$1999	\$1649

Other capacities may be available on ZFP and Cirrus closeouts. Call for details.

These low, low, closeout prices will disappear with our inventory, so call us now for fast, friendly service! And as always, your satisfaction is guaranteed!

800-999-1422



International 503-520-9000 Fax 503-520-9100 6 a.m.-6 p.m. PST Mon.-Fri. VISA, MasterCard, C.O.D. and approved purchase orders accepted*

*Call for details on terms, conditions, limited money back guarantee and free offers. System 7.0.1 software included only with certain configurations. ZFP+ Drives do not have switchable termination. Prices do not include shipping and only apply to products shipped within the continental United States. Please contact La Cie for international distribution. Add sales tax where applicable. ZFP, ZFP+, Cirrus, Tsunami, PocketDrive, PocketDock, ExpressDrive, SilverScanner, SilverScan, SilverLink, La Cie and the La Cie logo are trademarks of La Cie, Ltd., a Quantum Company. All other trademarks are the property of their respective companies. All prices, specifications, terms, descriptions, products and services herein are subject to change without notice or recourse. © Copyright 1992-93 La Cie, Ltd. 8700 SW Creekside Place, Beaverton, OR 97005. Phone: (503) 520-9000, Fax: (503) 520-9100. All rights reserved. Printed in U.S.A.

BEST!
Macworld
Hard Drive
under 80 MB

BEST!
Macworld
Hard Drive
80-300 MB

BEST!
Macworld
Hard Drive
over 300 MB

BEST!
Macworld
Color Scanner
SilverScanner

**FCC
Certified!**

TOLL-FREE!
Technical
Support

TOLL-FREE!
Customer
Service

FREE!
SilverLink™

**Switchable
Termination!**

**Universal
Power
Supply!**

**30 Day
Money Back
Guarantee***

Great for your image.



Introducing!
Silverscanner II
With transparency
and sheet feeder options.
From **\$1599**

Silverscanner II makes you look great with fabulous color, rich detailing.

Improve your image.

Continuing our award winning tradition of providing outstanding scanning solutions for the Macintosh, La Cie proudly announces Silverscanner II. It is so good, we used it to produce this page. Gorgeous color. Fine image detail. Excellent tonal range. The proof is right in front of you.

Great color from the start.

With Silverscanner II, you get great color and gray-scale in one pass. That's because Silverscanner II's built-in image control operates on 9 bits of data *before* conversion to 8 bits per color. You get clean, bright scans with excellent detail and tonal range in highlight and shadow areas in one pass. Easy for the beginner, but with all the powerful control the advanced user craves.

Hug the curves.

When scanning line art, the Silverscanner II really shines! At 1600 dpi, you get what amounts to an electronic stat.

Superior software at the controls.

La Cie's powerful plug-in modules have been hailed some of the best software ever written for flat-bed scanners. And with features like dynamic color preview, independent color (R,G,B)/gamma correction/contrast/brightness controls, nine scan modes, savable scan settings, color dropout and magnified previews, proof scans, 25% to 400% scaling in 1% steps and 25 dpi to 1600 dpi in 1 dpi steps. And now with an electronic densitometer, color histogram and automatic tone adjustment, all interactive in the preview. How's that for an image building machine!

Test us for real and call now for fast, friendly service!

800-999-1422

International 503-520-9000 Fax 503-520-9100 6 a.m.-6 p.m. PST Mon.-Fri. VISA, MasterCard, C.O.D. and approved purchase orders accepted*



*Call for details on terms, conditions, limited money back guarantee and free offers. System 7.0.1 software included only with certain configurations. ZFP+ Drives do not have switchable termination. Prices do not include shipping and only apply to products shipped within the continental United States. Please contact La Cie for international distribution. Add sales tax where applicable. ZFP, ZFP+, Cirrus, Tsunami, PocketDrive, PocketDock, ExpressDrive, Silverscanner, Silverscan, Silverline, La Cie and the La Cie logo are trademarks of La Cie, Ltd., a Quantum Company. All other trademarks are the property of their respective companies. All prices, specifications, terms, descriptions, products and services herein are subject to change without notice or recourse. © Copyright 1992-93 La Cie, Ltd. 6700 SW Creekside Place, Beaverton, OR 97005. Phone: (503) 520-9000. Fax: (503) 520-9100. All rights reserved. Printed in U.S.A.

Circle 246 on reader service card



CREATING SPECIAL EFFECTS WITH AFTER EFFECTS BY LAYERING PICT IMAGES, QUICKTIME MOVIES, AND ANIMATIONS.

Special Effects for QuickTime

The Company of Science & Art (CoSA) recently released After Effects, a program for adding special effects to QuickTime movies. After Effects lets users layer multiple QuickTime movies, applying filters (sharpen, blur, emboss), motion (spin, rotate), color manipulation (color balance, tint), and masks.

CoSA's \$1295 program offers many of the same effects as VideoFusion's \$649 VideoFusion but adds special features for output to video. After Effects includes a titling module, audio fade, frame sizes up to 4000 by 4000 pixels, background rendering, animatics, adjustments for broadcast color, and field rendering for interlaced video (field rendering compensates for the time lag when a device such as a TV draws odd and even lines for each frame). CoSA, 401/831-2672.—ERFERT FENTON

Industrial-Strength Graphics Database

Clip art publisher Multi-Ad Services is preparing version 2.0 of Search, its industrial-strength system for storing and distributing digital images.

Multi-Ad says a Search 2.0 catalog (an image database) can handle 150,000 images easily and can go to a half-million. The company says catalog size maxes out at 4GB, and Search can open ten catalogs at once. It supports most file formats, including QuickTime movies, and can catalog art onto, and retrieve it from,



Ad's own Creator.

The first version of Search was recently acquired by Aldus, updated, and republished as Fetch; but Search 2.0 is grown from different root stock. Search is \$249. Multi-Ad Services, 309/692-1530.—D.L.

More TV on the Mac

Workstation Technologies has tuned in to Macintosh television by designing WTI PrimeTime, a TV tuner that brings VHF, UHF, and cable broadcasts to the computer screen. The self-contained tuner receives television signals and sends them to video-digitizing boards such as SuperMac's VideoSpigot. The tuner is controlled through the Apple Desktop Bus and comes with a software package that allows users to change channels using mouse commands. The tuner won't be available to users directly from Workstation Technologies, but will be available from other Mac peripheral sellers, probably by the spring of 1993, and will probably list for less than \$400. A spokesperson for the manufacturer predicts that the tuner will come in handy as consumer electronics products converge with computer systems, so that for video and computing, people will be able to buy interchangeable components the way they do for home stereo systems. Workstation Technologies, 714/250-8983.

—JONATHAN CASSELL

News

Make Your Own CD ROMs

Pinnacle Micro has introduced the RCD-202, a recordable CD ROM drive designed to let typical users make their own master CD ROMs inexpensively. It supports the ISO 9660 and HFS standards, standard OS data files, incremental and multi-session recording, audio files, and mixed data types. The drive comes with complete software for creating the CD ROMs. The drive can also make small production runs of CD ROM discs, since the discs are readable by standard CD ROM drives. The Macintosh version lists for \$3995 and began shipping in February. Pinnacle, 714/727-3300.—T.M.



PINNACLE'S RCD-202 RECORDABLE CD ROM DRIVE CAN CREATE CD ROM DISCS ON YOUR DESKTOP.

Sharp Ships Dye-Sub Printer

Sharp Electronics is shipping its JK-7000 dye-sublimation printer, which produces a four-color letter-size page in about four minutes, according to the company. The \$7500 300-dpi printer also handles legal-size pages and transparencies. It comes with a SCSI-2 interface and 8MB of RAM but can accommodate up to 32MB. Sharp, 201/529-9593.

—NANCY E. DUNN



BUG REPORT

PageMaker and System 7 Archivers beware: You will not be able to reopen PageMaker 4.2 files that subscribe to text or graphics files if PageMaker can't find the external files. Aldus says the workaround is to open them under System 6.

MacInTax 1992 Large imported files can overflow MacInTax's normal memory partition. Workaround: increase MacInTax's memory partition.

Using the fonts bundled with MacInTax can change completed tax forms to print with incorrect fonts. ChipSoft says an upgraded font suitcase is available on request.

Microsoft Word 5.1 Files duplicated with the Save As command do not have the headers or footers of the original files. Microsoft says this bug is fixed in the currently shipping version of 5.1, and a patch is available free on request to registered owners of the early version of 5.1.

Microsoft PowerPoint 3.0 Crashes on PowerBook 160s, 180s, and Duos. A patch is available on request to registered users at no charge.

System 7.1 and Mode32 Using virtual memory under 7.1 with Connectix's Mode32 installed causes a crash. Apple is working on a patch to be called 32-bit Enabler Extension. The distribution policy was not set at press time.

MACWORLD WILL SEND YOU A BUG REPORT T-SHIRT IF YOU ARE THE FIRST PERSON TO INFORM US OF A SERIOUS, REPRODUCIBLE BUG THAT WE REPORT IN THIS COLUMN. SEE HOW TO CONTACT MACWORLD.

Looks like Mac users just got their very own HP LaserJet.



The new generation HP LaserJet 4M printer.

At last. An HP laser printer built specifically for the Mac—the new LaserJet 4M. A laser printer with everything Mac users need. From built-in PostScript™ Level 2 software from Adobe™ to standard LocalTalk and optional EtherTalk.

The finest print quality in its class.

Thanks to HP's microfine

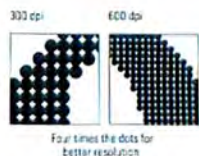
toner, Resolution Enhancement technology, and advanced engine designed expressly for 600 x 600 dpi, the LaserJet 4M printer delivers the finest print quality of any 600 dpi machine available.

And with a new RISC processor and 6 MB of standard memory accelerating formatting and I/O speeds, complex

PostScript and graphics files are rendered faster and more clearly than ever before.

Greater flexibility. The HP LaserJet 4M printer also sets new standards in versatility, with a wide range of typefaces and two integrated paper trays. As well as the

options of a 500-sheet tray and power envelope feeder.



And it's designed to be shared simultaneously by PCs and Macs. Automatic language switching between PCL 5 and PostScript, and 3 hot I/Os give mixed environments greater flexibility. Without compromise to either.

Of course, with the HP LaserJet 4M printer, you'll enjoy HP's renowned quality and reliability. All for only \$2,399.* So call **1-800-LASER-JET (1-800-527-3753) Ext. 7340**** for print sample† and comparison disk. Or visit your nearest authorized HP dealer.



**HEWLETT
PACKARD**

LaserJet

4M

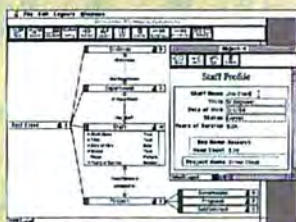
The HP LaserJet 4M is the one for all Macintosh and PCs alike. This new generation provides superior output with 600 dpi, Resolution Enhancement technology and microfine toner. 6MB built-in memory means that PostScript files and full-page graphics print out crisp, clear and fast.

- True 600 dpi creates rich, 1/8-inch dimensional text and graphics.
- Smother curves, no jagged edges, thanks to HP's exclusive Resolution Enhancement technology.
- Microfine toner makes 600 dpi output look even sharper.
- 35 PostScript Type 1 typefaces for Mac and PC PostScript language users. 35 more fonts and 10 TrueType typefaces for PC users produce a broad range of document styles.

Object-Oriented Databases Arrive

Relational databases store information in many tables. Reassembling the information generally requires knowledge of a query language such as SQL. A new and fundamentally different technology, object-oriented database management, organizes data into structures (called objects and classes) that understand how records differ and how their attributes differ, automatically creating relationships between types of information when relationships between classes are defined.

Previous attempts at object-oriented database systems assumed a knowledge of C++ or LISP. Mainstay's newly announced object-oriented Phyla will be nonprogrammable, with a graphical environment for designing databases, defining classes, creating forms and reports, and querying the database. Phyla promises the power of a relational database such as 4th Dimension and the ease-of-use of a flat-filer such as FileMaker. Mainstay expects to ship Phyla in mid-1993. Price was not set at press time. Mainstay, 818/991-6540.—DANIEL W. RASMUS



DRAWING A FEW LINES IN PHYLA TO SET UP LINKS BETWEEN PEOPLE, DEPARTMENTS, AND PROJECTS.

Alien Computer Invades Mac

Orange Micro has come out with three improved 386- and 486-based boards designed to run DOS and Windows with VGA graphics on Macintoshes with NuBus. Because the OrangePCs are essentially a separate DOS system board inside the Mac, users can run DOS or Windows applications at the same time as Mac applications. The products are intended for environments where running DOS applications is a requirement.

The low-end OrangePC board lists for \$1099 and includes a 386SX microprocessor. The midrange board, which lists for \$1499, adds a compatible PC-AT bus slot, a serial port, a parallel port, and 2MB of RAM expandable to 16MB. The high-end board retains those features but adds a 25MHz 486 SLC microprocessor. It lists for \$1799. All three boards are currently shipping with DOS included. The VGA graphics can be full-screen or limited to a window on the Mac, according to the company. Orange Micro, 714/779-2772.—T.M.

Speedier CD ROM Drives

Both Peripheral Land Inc. (PLI) and Procom Technology have introduced versatile dual-speed, multisession CD ROM drives with fast 200ms average access times and maximum data-transfer rates of 330K per second. Based on the same Toshiba mechanism, both the PLI CD ROM MS 200 and the Procom macCD/MX also support Kodak's Photo CD format and have 256K of cache RAM, a SCSI-2 interface, and a door that keeps dust out of the drive's slot. The Procom macCD/MX lists for



PERIPHERAL LAND'S CD ROM MS 200 (TOP) AND PROCOM'S MACCD/MX OFFER 200MS ACCESS TIMES.

Apple Spin-Off Develops Object-Oriented Platform

Mainstay's Phyla isn't the only object-oriented data manager headed for the Mac (see "Object-Oriented Databases Arrive," left). Apple spin-off Rae Technology is creating a development platform with a built-in assistant that appears at opportune moments to perform mundane tasks.

Rae Tech (Rae was the assistant's early nickname) will release an application based on its technology, and will later release a tool kit for developers. The first application combines datebook and address book features, using a notebook binder metaphor with sections for people, companies, events, and so on. Its object-oriented nature adds unusual strengths—for example, if you add a person to the address book, the assistant offers to make a new company record for that person's company. The system provides many such self-incarnating links and smart tunneling between information. Rae Tech expects third-party developers to apply the tool kit to everything from serious databases to executive information systems to hypertext books. Pricing was not set at press time. Rae Technology, 408/725-2850.—D.L.



TURKEY SHOOT

DESIGN FLAWS NOTED

At Ease Apple's childproof Finder replacement will keep your kids from opening your files from the Finder—but if the kids can open the creating applications, the files are wide open.

Microsoft Excel 4.0 Excel is picky about numbers in worksheet cells that are too narrow and, depending on how cells are formatted, converts numbers to scientific notation or displays them as #####. So far no problem. Problem: If you export your worksheet as a text file, your numbers come out in scientific notation or just plain #####.

MacInTax 1992 Form 8271, for reporting tax-shelter registration numbers, has disappeared from MacInTax this year. Unfortunately, the IRS is still around to collect a \$250 fine for each unreported number.

If you don't itemize, the Interview mode doesn't ask for estimated state tax payments, allowing you to help pay off the federal deficit, because state tax prepayments won't be subtracted from adjusted income on federal forms.

Macworld will send you a Turkey Shoot T-shirt if we shoot your turkey in this column. See *How to Contact Macworld*.

\$795 including stereo headphones, and is available now. Procom is also offering the macCD Station II, a \$995 bundle of the macCD/MX drive with seven popular CD ROM titles and amplified external speakers. The PLI CD ROM MS 200 lists for \$928 and is shipping now.

Procom has introduced the macCD Player, a CD ROM drive that has a slow 650ms average

access time and lists for only \$399. Although it supports Photo CD, the macCD Player is a single-session drive, which means that photos can only be recorded on it one time. Multisession drives have hardware that allows for adding more images long after the first photos are recorded on a disc. Procom, 714/852-1000; PLI, 510/657-2211.—T.M.

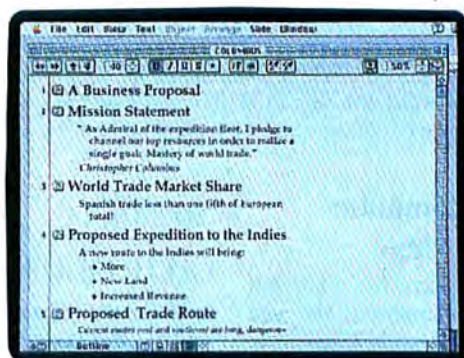
New PowerPoint 3.0. tools make power



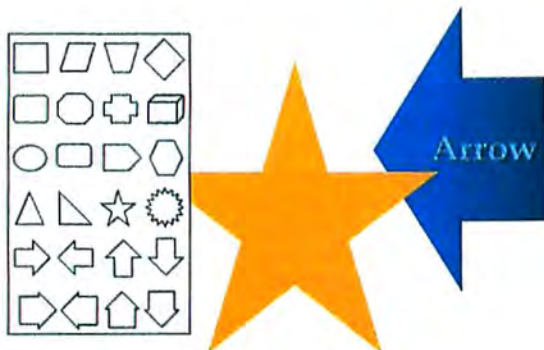
The toolbar. A powerful way to save time. Because now the most commonly used features are just a point and a click away.



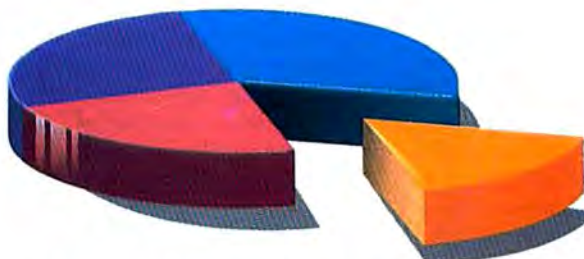
Output you have to see to believe. Creating sharp-looking overheads, 35mm slides or speaker's notes has never been easier.



WYSIWYG Outline view lets you create and work with the content of your entire presentation as an outline. Plus, full text formatting capabilities let you see and edit fonts, sizes and styles right in Outline view.



Presenting the Shape tool. Now making diagrams is quick and easy. There's a palette of 24 adjustable shapes to choose from.



Get graphical. 84 different graph styles to pick from, including 3-D graphs with rotation and perspective control.

Now you have everything you need to make all your presentations as powerful as your ideas.

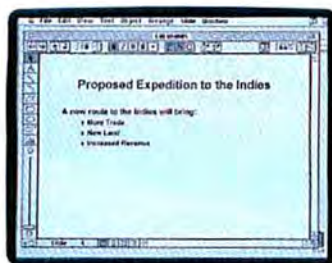
And that includes cross-platform support. Which means you can share

files with PowerPoint 3.0 for Windows™ directly. No translation necessary.

Best of all, you can upgrade to PowerPoint 3.0 for only \$129. This offer is valid for everyone who is

*Microsoft PowerPoint 2.01 or older, Aldus Persuasion, Synantec MORE™, CA-Cricket® Graph, CA-Cricket Presents®, and DeltaPoint DeltaGraph users are eligible for the upgrade price. Proof of purchase and while supplies last. © 1993 Microsoft Corporation. All rights reserved. Printed in the USA. For more information inside the 50 United States, call (800) 426-9400. For information only: In Canada, call 1-800-387-2345. PowerPoint is a registered trademark and QuickTime and System 7 are trademarks of Apple Computer, Inc. Aldus and Persuasion are registered trademarks of Aldus Corporation. Cricket and CA-Cricket are trademarks of CA-Cricket.

Because powerful presentations.



With Anytime Templates, you can apply one of 160 professionally designed templates or use any other presentation as a template. Anytime.

For polished, professional electronic presentations use automatic build slides with flying bullets, transition effects, on-screen notation, sound and video.



(800)426-9400



You can upgrade to PowerPoint 3.0 and all these powerful features for only \$129.*



The PowerPoint presentation graphics program fully supports QuickTime™ and System 7™ and is part of a complete line of powerful Microsoft applications for the Macintosh.*

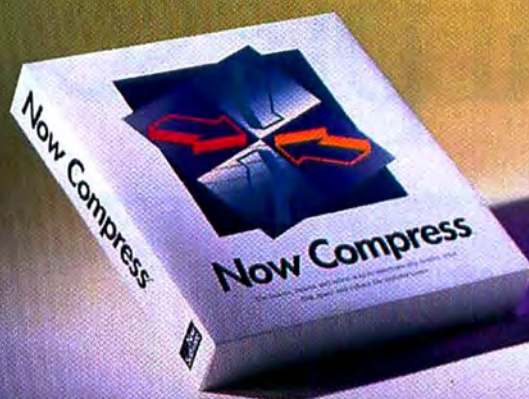
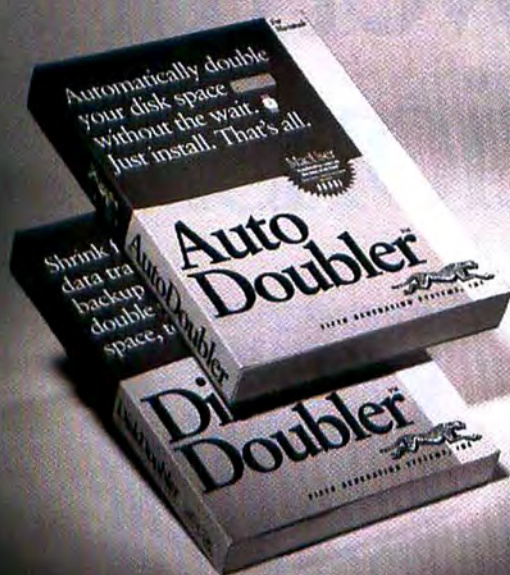
using PowerPoint 2.01 or older, Aldus® Persuasion®, or any other competitive presentation graphics program.*

So get your hands on PowerPoint 3.0 for the Macintosh. And before

you know it, you will find yourself in a position of power.

Microsoft®
Making it easier

required: title page of user's manual or Disk 1 of the program. Reseller prices may vary. Plus applicable sales tax and freight if ordering directly from Microsoft. Offer good only in the 50 United States (800) 563-9048; outside the United States and Canada, call (206) 936-8662. Microsoft and PowerPoint are registered trademarks and Windows is a trademark of the Microsoft Corporation. Macintosh Presents are registered trademarks of Cricket Software. Symantec MORE is a trademark of Symantec Corp. Installation of PowerPoint version 3.0 for the Macintosh requires System 7 to run.



LOOK, IT'S COMPRESSING EVEN BEFORE IT'S OUT OF THE BOX.

Ever wonder why you had to buy one compression program to automatically free up disk space and another to let you shrink files on demand? Ever suspect it was because somebody wanted to bill you twice?

How cynical of you.

Fortunately, Now Compress combines both functions in one rather amazing package. It can double the size of your hard drive by compressing your data smaller than AutoDoubler™, DiskDoubler™ or any other product. Additionally, it creates tiny archives that drastically reduce the time it takes to transfer files throughout a network.

What's more, it decompresses so quickly you won't notice when you're working with compressed data.

In the Now Software tradition, we've humanized the interface to make it far simpler to use than other

compression products.

Note the Inspector window on the left. It lets you see the status of any file, folder or

	Original	Compressed	Saved	Status	Creator	Type	Label	Last Modified
1992 Year-end Report	13.2K	5.9K	42%	Compressed: Faster	FILEV	VC68	None	Fri, Jan 29, 1993
1993 Year-end Report	62.7K	19.7K	68%	Compressed: Faster	BC80	C-VIS	None	Thu, Feb 25, 1993
Healthcare app	48.7K	9.4K	78%	Compressed: Faster	FILEV	VC68	None	Thu, Aug 27, 1992
Newsletter for Jan 93	100.2K	25.4K	75%	Compressed: Slower	ALDA	ALDA	None	Fri, Sep 11, 1992
Product Description doc	254.7K	...	...	Archived	NC44	APPS	None	Thu, Feb 25, 1993
2193 Objects	6.5K	...	...	Disk Compressed: Item	FILEV	VC68	None	Thu, Feb 25, 1993
Team Photo 187	235.5K	56.4K	84%	Compressed: Faster	TFF	TFF	None	Fri, Jan 15, 1993
Compressed: 5 of 7	712.9K	176.6K	85%	...	...	...	...	...

disk, and perform any compression operation with a click of your mouse. Now Compress. It's the fastest, safest, most useful compression package you can get.

For the full, non-compressed, story call us at 1-800-237-3611. Or talk to a dealer.

**Now
Software**

Linking LocalTalk to Ethernet

If you need to plug LocalTalk-using workgroups into an Ethernet backbone, Tribe Computer Works' new hub, the TribeStar, may provide better throughput than a standard router for about the same cost per user.

Like Tribe's LocalTalk-only LocalSwitch, the TribeStar is built for speed: with eight LocalTalk ports, it deploys four processors, each of which is able to open two connections simultaneously. The net result is that every port has access to the Ethernet network at LocalTalk's 230 Kbps top speed.

The TribeStar connects to thin-net, thick-net, or 10BaseT and ships with SwitchMonitor management software (Tribe plans to support SNMP when Apple makes that possible). With Ethernet boards for individual Macs now running about \$200, the \$1795 TribeStar becomes economical only when more than one Mac is daisy-chained to each port. Tribe, 510/547-7800.—D.L.



WITH A PORT FOR EVERY LOCAL-TALK USER, THE TRIBESTAR SPEEDS UP ACCESS TO THE ETHER-NET BACKBONE.

SCOTT PETERSON

Do You Believe in (General) Magic?

For over two years now, suspense has been building over the activities of a small communications start-up in Mountain View, California, called General Magic. The company's cofounders include key members of the original Macintosh design team, Andy Hertzfeld and Bill Atkinson, along with several other talents who had formerly worked for Apple. On February



8, in a posh press gathering in New York City, General Magic went public with some of its plans and revealed its strategic partners, all of whom are stockholders. Previously, only the participation of Apple—which owned 10 percent of the young company—had been announced. Now it has been confirmed that the magic is also owned in part by industry giants Sony, Motorola, AT&T, Matsushita, and Philips.

What's General Magic got that these big companies want so much? Two ground-breaking technologies, either or both of which will be integrated into hardware devices, enhanced with application software, or supported by communications

services all provided by General Magic's partners. The first technology, conceived by Atkinson and Hertzfeld, is called Magic Cap, an interface designed to seamlessly and efficiently allow users to control communications. The second, designed largely by Xerox PARC veteran Jim White, is

Telescript, a programming language for wired and wireless communications that can run on different hardware platforms. General Magic hopes that the language will be widely used as an easy, yet powerfully flexible means for small devices to communicate with the digital world at large—on everything from phones and faxes to other computers.

General Magic's partners didn't demonstrate their hardware devices because they are still under development. But Apple said it will implement General Magic technologies for the Mac OS, PowerBooks, Newtons, and online services. When? No date given. The wait continues.—STEVEN LEVY

RAGE Speeds Applications

Envisio has announced RAGE (Radically Accelerated Graphics Engine), a 24-bit video-display board that accelerates general video display and the graphics-processing of applications such as Photoshop. Similar to DSP (digital signal processor) acceleration boards like SuperMac's ThunderStorm and Spectral Innovations' Lightning Effects, RAGE makes an application run faster by replacing or augmenting parts of the software—usually filters. The basic board accelerates QuickDraw; application-specific acceleration will be sold in modules for a variety of programs. Initially, only a Photoshop module will be available.

Unlike DSP boards, RAGE uses a 25MHz RISC microprocessor, which makes RAGE programmable so it can handle a wide range of products and features. RAGE supports monitors as large as 21 inches and provides on-the-fly resolution switching for multisyncing monitors. The introductory price is \$1995, including the acceleration module for Photoshop, which will be optional later. Envisio, 612/628-6288.

—GALEN GRUMAN

News

Graphics Board Adds Ethernet

Lapis Technologies has introduced a line of boards that combine Ethernet and video interfaces. The four DisplayNet boards support Lapis's Full-Page Display and Two-Page Display monitors in 1-bit mode. The DisplayNet II, designed for NuBus Macintoshes, supports both 10BaseT twisted-pair and 10Base2 thin-net Ethernet. The DisplayNet PDS/30, designed to plug into the Processor Direct Slot on the Macintosh SE/30 and IIsi, can also interface to both 10BaseT and 10Base2 Ethernet networks. The DisplayNet LC-10BaseT board supports 10BaseT, while the DisplayNet LC-ThinNet supports 10Base2, both for the Macintosh LC family. All the boards are available now at a list price of \$549. Lapis Technology, 510/748-1600.

—JONATHAN CASSELL

DESKTOP LIBRARIAN

Books on Desktop Publishing

This month we study two volumes on the ever-popular topic of DTP.

• *Desktop Publisher's Idea Book*, by Chuck Green (1993, \$21.95). This book starts with one chapter on production basics and another on adding professional touches, then the rest of the book leads the reader through an amazing variety of practical projects step-by-step. Suggests typefaces and design for binders, books, brochures, cards, tickets, letters of all kinds, envelopes, fliers, forms, and on and on. Advice is not specific to the Mac. Intended for novices to intermediate DTPers. No glossary or index. Bantam Computer Books, 212/492-9479.

• *The Desktop Design Workbook*, by Don Busché and Bernice T. Glenn (1992, \$29.67). Intended to teach good page design, this book includes lots of discussion of principles of publishing followed by lots of exercises. Covers the publishing process from planning and budgeting to working with commercial printers. Advice is not specific to the Mac. Includes a form for ordering a \$10 disk containing files required to complete the worksheets in the text. Regents/Prentice Hall, 515/284-6751.—T.M.



ROSEMARY WILSON

DESKTOP PUBLISHER'S IDEA BOOK (BOTTOM), AND THE DESKTOP DESIGN WORKBOOK.

How to Master Macintosh Programs Without Reading The Manuals!

Speed Learning

Most people are amazed. They need training. They hate reading manuals and they don't want to pay huge sums for local Macintosh training. At first they feel like giving up in frustration. Then someone tells them about MacAcademy's unique and valuable Video Training Library.

The Price

The first benefit of the training library is the price. Each video is only \$49. While other training companies have raised their prices out of sight, MacAcademy videos cost the same as five years ago.

Selection

The next bit of good news is the huge selection of training videos available from MacAcademy. Below you will find a sampling of the videos currently available.

Quality

No blurry screens. No paid actors reading scripts. No frills. Each MacAcademy video features one of our top trainers recreating the classroom atmosphere and teaching you each program from start to finish.

Effectiveness

Many of our customers say our videos cut their learning curve by up to 70%! Videos give you the ability to actually *see* each technique on the Macintosh screen. The video allows you to replay, to fast-forward, or to find any particular technique immediately by using our unique counter system.

Flexibility

MacAcademy videos make excellent learning libraries for companies, schools, individuals, and clubs. They can be watched over and over and can even be projected to large groups. New employees can take them home and learn on their own.

Reputation

MacAcademy is the winner of the 1992 **MACWORLD World Class Award**. Readers chose MacAcademy as the top trainer in the nation. No other organization even came close! When it comes to training, MacAcademy has the best reputation in the business. You deserve World Class training at an extremely low price. In addition, all videos carry a complete 30 day guarantee.



30 Day Money - Back Guarantee. If you're not totally satisfied simply send the videos back for a full refund.

To Order

Call 800-527-1914 with credit card info. Purchase order info can be mailed or FAXed to the address and number below. Add \$3 plus \$1/video shipping and handling.

Accountant, Inc. Video #1
Accountant, Inc. Video #2
ACIUS 4th Dimension Video #1
ACIUS 4th Dimension Video #2
ACIUS 4th Dimension Video #3
ACIUS 4th Dimension Video #4
Adobe Illustrator 3.2 Video #1
Adobe Illustrator 3.2 Video #2
Adobe Illustrator 3.2 Video #3
Adobe Photoshop Video #1
Adobe Photoshop Video #2
Adobe Photoshop Video #3
Adobe Photoshop Video #4
Aldus Freehand Video #1
Aldus Freehand Video #2
Aldus Freehand Video #3
Aldus Freehand Video #4
Aldus PageMaker Video #1
Aldus PageMaker Video #2
Aldus PageMaker Video #3
Aldus PageMaker Video #4
Aldus Persuasion Video #1
Aldus Persuasion Video #2
Aldus SuperPaint Video #1
Aldus SuperPaint Video #2

Aldus SuperPaint Video #3
Claris FileMaker Pro Video #1
Claris FileMaker Pro Video #2
Claris FileMaker Pro Video #3
Claris FileMaker Pro Video #4
Claris MacDraw Pro Video #1
Claris MacDraw Pro Video #2
Claris MacProject Pro Video #1
Claris MacProject Pro Video #2
Claris MacProject Pro Video #3
Claris MacWrite II Video #1
Claris MacWrite II Video #2
ClarisWorks Video #1
ClarisWorks Video #2
ClarisWorks Video #3
ClarisWorks Video #4
Deneba Canvas Video #1
Deneba Canvas Video #2
Deneba Canvas Video #3
Design & Layout
Claris HyperCard Video #1
Claris HyperCard Video #2
Claris HyperCard Video #3
Intuit Quicken Video #1
Intuit Quicken Video #2

Videos can be updated upon release of new software versions for only \$14.95 each.

Lotus 1-2-3 Video #1
Lotus 1-2-3 Video #2
Lotus 1-2-3 Video #3
Macintosh (6.0 or 7.0) Video #1
Macintosh (6.0 or 7.0) Video #2
Macintosh (6.0 or 7.0) Video #3
Microsoft Excel Video #1
Microsoft Excel Video #2
Microsoft Excel Video #3
Microsoft Excel Video #4
Microsoft Excel Video #5
Microsoft Word Video #1
Microsoft Word Video #2
Microsoft Word Video #3
Microsoft Word Video #4
Microsoft Works Video #1
Microsoft Works Video #2
Microsoft Works Video #3
Microsoft Works Video #4
Using Desktop PowerBook Video #1
PowerBook on the Road Video #2
QuarkXPress Video #1
QuarkXPress Video #2
QuarkXPress Video #3
WordPerfect Video #1
WordPerfect Video #2

\$49^{ea.}

MacAcademy®

477 S. Nova Rd. Dept. MW593
Ormond Beach, FL 32174
800-527-1914 FAX 904-677-6717



Understanding Borrowed Money

You can waste many, many hours building spreadsheet models to calculate monthly loan payments, total up interest over the life of a loan, or compare interest rates—and your models won't help you with balloon payments, prepayments, and other real-world finance wrinkles. Softflair publishes Compare-A-Loan 4.0 and the new Compare-A-Loan Professional for such analyses.

To Compare-A-Loan 4.0's capabilities (see *Reviews, Macworld*, April 1993), Pro adds support for the Rule of 78s, U.S. Rule, planned extra payments, and other sophisticated tools. Pro can save complete reports as separate files and has improved printing options.

Compare-A-Loan 4.0 costs \$79.95; Pro will list for \$129. Softflair, 612/894-3357.—D.L.

ScanOffice Bundles Scanner and Apps

UMAX Technologies is offering a complete business-office scanning solution that integrates hardware with a suite of popular Macintosh applications. ScanOffice for the Macintosh features complete versions of Timeworks' Publish It Easy 3.0 desktop publishing application, Ofoto One Step Scanning Software from Light Source Computer Images, and ExpertVision's TypeReader 1.0 optical character recognition software. The system also includes UMAX's OA-1 gray-scale image scanner, a 1200-by-1200-dpi resolution flatbed scanner. ScanOffice for the Macintosh is available now at a list price of \$999. UMAX Technologies, 408/982-0771.

—JONATHAN CASSELL

Full-Time Fax Forwarding

Vomax from Macronix is a new kind of telephone-answering device that accepts and forwards voice messages and faxes over a single phone line while you access the device from afar using a touch-tone phone or fax modem. The Vomax can also optionally display faxes on a television screen, so you don't need to print them out. The Vomax, which stays in your home or office, can be set to call your pager so you know when you've received a message or a fax. The Vomax also lets callers leave a voice-annotated fax. The answering device also puts a date-and-time stamp on all transactions.

The Vomax includes a fax modem that sends and receives faxes at 9600 bps and data at 2400 bps. It does not have a printer or scanner. It can connect

to a computer's serial port, but also works as a stand-alone device. It stores 20 minutes of voice messages or 40 fax pages with its standard RAM. The memory has a battery to preserve data in a power failure. Vomax lists for less than \$400 including its software with security features. Macronix, 408/453-8088.—T.M.



MACRONIX'S VOMAX DEVICE CAN STORE AND FORWARD FAXES AND VOICE MESSAGES.

RICHARD REHMEYER

Cricket Draw Modernized

In 1986, Cricket Draw's support for snazzy PostScript features took the early Mac community by storm, but Cricket later fell on hard times and was acquired by giant Computer Associates. Computer Associates' Cricket division has been slowly updating the Cricket line, and now Draw is getting a big upgrade, to be called CA-Cricket Draw III version 2.0.

The new version straddles the MacDraw/Illustrator fence. Version 2.0 has a full text editor. It can kern text and bind text to a path—even edit it without unbinding. All objects, even polygons and text, are editable Bézier curves. Tweening (better known as blending) can merge objects' shapes and colors. High-end features provide color seps and color printing controls. CA-Cricket Draw III 2.0 will list for \$249. Computer Associates, 516/342-6000.—D.L.

Nikon Hi-Res Film Scanner

The Coolscan from Nikon Electronic Imaging Products is a compact 24-bit film scanner that provides resolutions up to 2700 dpi. The Coolscan handles 35mm color or black-and-white negatives or transparencies in a single pass, averaging 100 seconds per scan. The lightweight device will come in internal (\$2195) and external (\$2495) versions and is expected to ship in March or April. Nikon, 516/547-4355.



AN ILLUSTRATION CREATED IN THE NEW CRICKET DRAW.

DOROTHY CARICO SMITH

News

Software Drives 900 Printers

GDT Softworks has introduced PowerPrint/LT, a collection of Chooser-level drivers that supports more than 900 different models of printers over AppleTalk. Users can control resolution, color, duplex printing, and paper-tray selection where the printer itself supports those choices.

The PowerPrint/LT collection supports ink-jet, dot matrix, and laser printers, including some wide-carriage and high-speed models. It also offers reduction and enlargement of images, page flipping and inversion, cover pages for separating print jobs, and printing odd and even pages only (for two-side printing on single-side printers).

GDT began shipping the software in January at a suggested list price of \$399. The company is also working on PowerPrint/NW for Novell NetWare, which will have a list price of \$499 for 50 users, and on PowerPrint/ET for EtherTalk, which is essentially the same as PowerPrint/LT for LocalTalk but with an EtherTalk adapter. The PowerPrint/ET will probably list for \$599. PowerPrint/NW should ship in early April, and PowerPrint/ET should be available in the first half of 1993. GDT, 604/291-9121.—T.M.

JUST FOR FUN

Iron Helix CD ROM Game

Imagine a distant future where you suddenly discover that a spaceship with a lethal payload is on its way to destroy your world. That's the scenario of Iron Helix, a new CD ROM game developed by Drew Pictures and published by Spectrum HoloByte. To win the game you must maneuver your weaponless biological probe throughout six levels of the enemy ship, each with dozens of rooms, and try to disable the enemy vessel. The CD ROM title, the first from Spectrum HoloByte, provides a window with fast and smooth 3-D animation. The company expects to begin shipping Iron Helix in mid-March at a list price of \$99.95. Spectrum HoloByte, 510/522-3584.—T.M.

Creating A Masterpiece Starts with 1200 dpi...



**Camera-Ready
Layouts on
11x17-Inch Paper!**

Now you can print camera-ready copy for all your masterpieces, in-house, for just pennies a page.

LaserMaster's *Unity™ 1200XL Plain-Paper Typesetter* provides the highest resolution available on plain paper. And even though it's small enough to fit on your desk, it handles up to 11x17-inch paper for all your over-sized jobs.

Give us a call for some free sample output from the new Unity 1200XL. You'll see. Creating in-house masterpieces has never been so easy.

Unity 1200XL Features 11x17-Inch Format Plus:

- 1200x1200 TurboRes® output
- Internal hard disk with 135 pre-installed Type 1 typefaces
- High-speed, 33-MHz processor with floating-point unit
- 40K of fast-cache memory
- TurboGray™ halftone enhancement
- HotPorts™ automatic port switching for LocalTalk, parallel, serial, and Ethernet (optional) ports.
- SmartSense™ automatically switches between PostScript™ language and PCL
- Flexible paper handling up to 11x17-inch (A3) with up to 3 paper sources (optional)
- User-expandable RAM
- Software-upgradable controller



Unity 1200XL shown with optional paper trays.

1-800-950-6868
1-612-944-9330
(FAX) 1-612-944-0522

ASK
FOR
DEPT.
34Z

LM LASERMASTER®
TURBORES TYPESETTING DIVISION

1000 dpi—\$1,000 rebate!

LaserMaster 1000/4 Personal Typesetter

\$2,995
INCLUDES REBATE

The lowest-cost, camera-ready output available! This small, bus-based typesetter prints 1000-dpi output from your Mac or PC on letter, A4, and legal-sized paper.



© 1993 LaserMaster Corporation, 6900 Shady Oak Road, Eden Prairie, MN 55344. LaserMaster Europe Ltd., Hooftdorp, The Netherlands (31) 2503 22000, Fax (31) 2503 31240. LaserMaster, the LM logo, and TurboRes are registered trademarks, and Unity, SmartSense, HotPorts, and TurboGray are trademarks of LaserMaster Corporation. PostScript is a trademark of Adobe Systems, Inc. These products incorporate TrueImage v.1 software with LaserMaster enhancements for performance and resolution. Microsoft is a registered trademark, and TrueImage is a trademark of Microsoft Corporation. All other product names or brand names are trademarks or registered trademarks of their respective holders. Specifications subject to change without notice. Prices valid in U.S. only. This ad was typeset using a LaserMaster Unity 1200XL.

Circle 43 on reader service card

QMS Printer Races up to 45 PPM

Designed for high-volume DTP, production, or distributed environments, the QMS 4525 Print System is a network laser printer that produces up to 45 pages per minute. The 4525 can staple, sort, print on both sides of a page, and print booklets. It includes a serial port, parallel port, and AppleTalk connection. QMS also offers two optional network interfaces: Token Ring with NetWare; or Ethernet with NetWare, TCP/IP, EtherTalk, or DECnet and TCP/IP. The printer emulates PostScript Level 1 and Level 2, HP PCL 5, HP GL, and other print control languages.

QMS also includes an internal 40MB hard drive, with another bay for a second drive, and a 1.44MB floppy disk drive. The printer has a paper capacity of 2200 pages, with options for bin sorters and a stapler/stacker. The 4525 also incorporates a high-speed RISC processor, 16MB of RAM expandable to 32MB, and the QMS Crown print-control architecture for multiprocessing and other advanced features. At press time, the list price for the QMS 4525 Print System was not set, but was expected to be about \$60,000 to \$70,000. The company scheduled first shipments of the printer for March. QMS, 205/639-4474.—T.M.

QuickTime, Animation for Presentations

Gold Disk's new Astound offers all the basics for standard business presentations—an outliner, slide sorter, templates, and so on—plus multimedia tools to spruce up your work.

With Astound, you can animate a chart on sales growth, add music to set a presentation's mood, or play a QuickTime movie illustrating your point. A run-time player for both Mac and Windows lets you distribute your desktop presentations. For the multimedia neophyte, Astound ships with lots of clip media: sound effects, high-resolution images for backgrounds, music clips, QuickTime movies, animations, and clip art. Astound imports PowerPoint and Persuasion files.

Astound lists for \$399. Gold Disk, 416/602-4000.

—JEANETTE BORZO



ASTOUND'S TIME LINE, WHERE TRANSITIONS, QUICKTIME MOVIES, AND OTHER NONSTATIC ELEMENTS ARE CONTROLLED.

Asanté Unveils Highest-Capacity Mac Hub

Aiming at the departmental Ethernet market, Asanté Technologies has announced its AsantéHub 2072 Ethernet con-



THE ASANTÉHUB 2072 ETHERNET CONCENTRATOR CAN EXPAND TO PROVIDE UP TO 72 PORTS.

centrator, which can expand to 72 ports, making it the highest-capacity hub that can be managed through a Macintosh.

The AsantéHub 2072 has seven expansion slots for adding ports and network connections. The basic model comes with 12 ports, provides a dual-segment backplane for redundancy or creating a second network, and allows the user to swap port modules without shutting down the network. The hub will have a base price of \$1095. It can connect via 10BaseT (twisted-pair), 10Base2 (thin-net), or 10BaseF (fiber-optic) Ethernet cabling. Port-expansion modules will range from \$725 for a 10BaseT module with 12 RJ-45 or RJ-21 connectors, to \$2845 for a 10BaseF module with 12 ST connections. The chassis, port

Radius Monitor

Gets Smart

The PrecisionColor Display/20i is a 20-inch color-calibrating monitor that offers more intelligence and better display characteristics than Radius's existing PrecisionColor Display/20, which it replaces. One new feature, called Dynamic Desktop, lets users change resolution and bit depth without restarting so they can open up a 24-bit image at the resolution of a 16-inch monitor, even on a larger display. Software called IntelliColor helps set the white point, vertical and horizontal convergence, brightness, keystone, pin-cushioning, and other screen characteristics using an on-screen control panel. The monitor includes a tutorial on the various software features. The display incorporates a Trinitron tube with a maximum resolution of 1360 pixels by



THE 20-INCH RADIUS PRECISION-COLOR DISPLAY/20I INCLUDES INTELLICOLOR CONTROL SOFTWARE.

1024 pixels. Radius expected to begin shipping the Display/20i in March at an estimated list price of \$3299.

Radius also recently announced its SoftPivot 2.0 software for the Radius Pivot line that lets the rotating monitors work with more Macs without requiring a \$599 board from Radius. The Pivots can now work with the built-in video on the Centris 610 and 650, LC III, PowerBook 160 and 180, both Duo Docks, and any Mac with 16-inch-resolution graphics on board. Radius, 408/434-1010.—T.M.

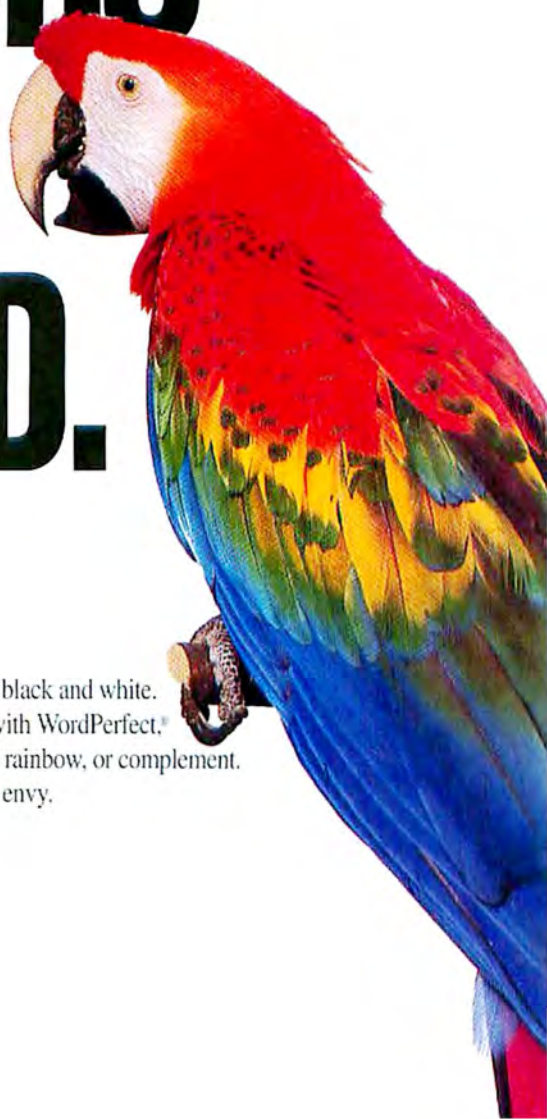
Survey: Font Mania

How many different fonts do you have installed on the Mac you use most often?



Based on 579 respondents to a 1992 Macworld reader survey who use a Macintosh. Figures do not add up to 100% due to rounding.

THE LATEST THING IN WORD PROCESSORS ISN'T THE WORD.



It's the colors. Life is more than black and white.
It's magenta, indigo, auburn, and with WordPerfect,[®]
253 other dazzling colors to blend, rainbow, or complement.
Enough to make others green with envy.



It's the movies. With WordPerfect and Apple's Quicktime, using video and sound is as natural as using just plain words. So place a color movie in your document, and have yourself the ultimate in show and tell!

PLANNED GROWTH

To Matthew Long, "I just don't want more."

He's talking about his own "Pine Run Road," a seven-building development on the edge of the city of Long Beach, California.

Long says he's not sure how much he'll build, but he's sure he'll build it right.

Long says he's not sure how much he'll build, but he's sure he'll build it right.

Long says he's not sure how much he'll build, but he's sure he'll build it right.

Long says he's not sure how much he'll build, but he's sure he'll build it right.

Long says he's not sure how much he'll build, but he's sure he'll build it right.

Long says he's not sure how much he'll build, but he's sure he'll build it right.

Long says he's not sure how much he'll build, but he's sure he'll build it right.

Long says he's not sure how much he'll build, but he's sure he'll build it right.

Long says he's not sure how much he'll build, but he's sure he'll build it right.

Long says he's not sure how much he'll build, but he's sure he'll build it right.

Long says he's not sure how much he'll build, but he's sure he'll build it right.

Long says he's not sure how much he'll build, but he's sure he'll build it right.

Long says he's not sure how much he'll build, but he's sure he'll build it right.



Long says he's not sure how much he'll build, but he's sure he'll build it right.

Long says he's not sure how much he'll build, but he's sure he'll build it right.

Long says he's not sure how much he'll build, but he's sure he'll build it right.

Long says he's not sure how much he'll build, but he's sure he'll build it right.

Long says he's not sure how much he'll build, but he's sure he'll build it right.

Long says he's not sure how much he'll build, but he's sure he'll build it right.

Long says he's not sure how much he'll build, but he's sure he'll build it right.

Long says he's not sure how much he'll build, but he's sure he'll build it right.

Long says he's not sure how much he'll build, but he's sure he'll build it right.



While the current recession has generally cooled much of this country's growth, in any event it has not cooled it all. In Las Vegas, for example, increases

Las Vegas, for example, has seen a 10% increase in new construction. In any event, it has not cooled it all. In Las Vegas, for example, increases

It's the layout. Say goodbye to boring, cookie-cutter pages. Because WordPerfect makes it easy to add attention-getting text boxes, callouts, or columns. Choose from 36 borders and 64 border patterns. Create overlays. Watermarks. Even rotate a headline.



It's the compatibility. There are millions of Mac systems in the world today. But hey, there are plenty of systems like Windows, DOS, NeXT, and UNIX too. With WordPerfect, your files will be compatible with them all.



It's the system. As the first word processor to be fully System 7 savvy, WordPerfect brings you features like TrueType, Publish and Subscribe, and more. For the latest in Mac innovations, you can count on WordPerfect.

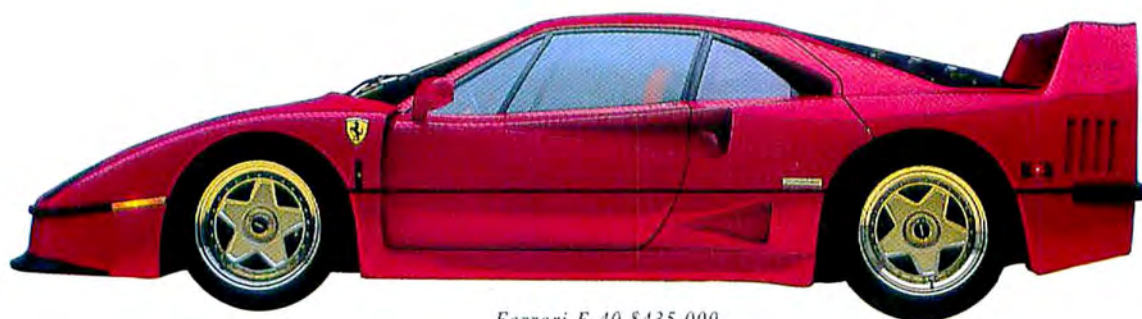
It's the pictures. WordPerfect makes adding graphics to documents easy. Without even leaving the program, you can import a visual, change it, or just create one of your own. Then drag-and-drop your masterpiece in place, and watch how text flows automatically around it.

It's the people. While its elegance of design embodies all that is Macintosh, WordPerfect also brings you a standard all its own: WordPerfect's dedicated toll-free support staff. Just call (800) 526-7820. Whatever your need, we're always here to help.



WordPerfect®

HOW TO BUY POWER.



Ferrari F-40 \$435,000.



Arabian Purebred \$275,000.

HOW TO STEAL IT.



LetterPerfect® \$149.

No, it's not larceny. It's LetterPerfect Macintosh.

For a mere \$149, LetterPerfect delivers the kind of power features you'd expect from programs that cost a fortune more.

Like its ingeniously intuitive formatting Ruler. Its multiple-column layout capabilities. Drag-and-drop graphics. Stationery templates for instant forms, styles, or letterheads. And full support of System 7 technology.

All within a deceptively simple program that gives you all the features you need, but spares you those you don't.

Call (800) 526-5195 today to find out more.

Or better yet, get LetterPerfect today and discover how easily you can get used to power.

Not to mention afford it.

WordPerfect is a registered trademark of Wordperfect Corporation within the United States and other countries. All other brand and product names are trademarks or registered trademarks of their respective companies. © WordPerfect Corporation 1993.

WordPerfect®

INTRODUCING WORDPERFECT[®] EVEN BEFORE IT WAS LAUNCHED,

When WordPerfect[®] set out to give Macintosh users the ultimate works package, we didn't head for the drawing board. We headed for the most powerful works program in the industry – Beagleworks.[™] A program widely considered to be the top integrated package you can buy.

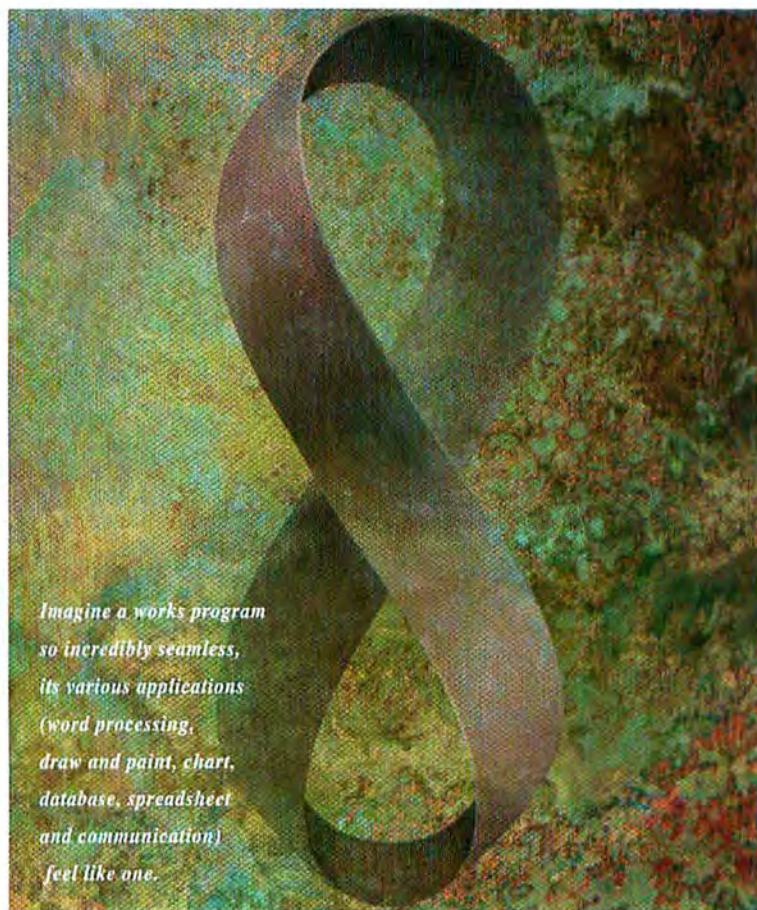
FEATURE	WORDPERFECT WORKS	CLARIS WORKS	GREAT WORKS	MICROSOFT WORKS
In-Context Editing [™] (multiple documents)	YES	NO	NO	NO
Paint and Draw	256 custom	81 draw	256	NO
Common tool bar with module-specific tools	YES	NO	NO	NO
Log-in script/phone book	YES	NO	NO	YES
Multiple columns can be turned on/off anywhere on the page	YES	NO	NO	NO
Auto Sum Tool	YES	NO	NO	NO

Then, we improved it, and backed it with a team of support specialists that are unmatched in the industry.

Seamless is the best way
to describe using
WordPerfect Works.

Thanks to a break-
through technology called In-

Context Editing that optimizes System 7's Publish and
Subscribe feature, you can get into any of its modules

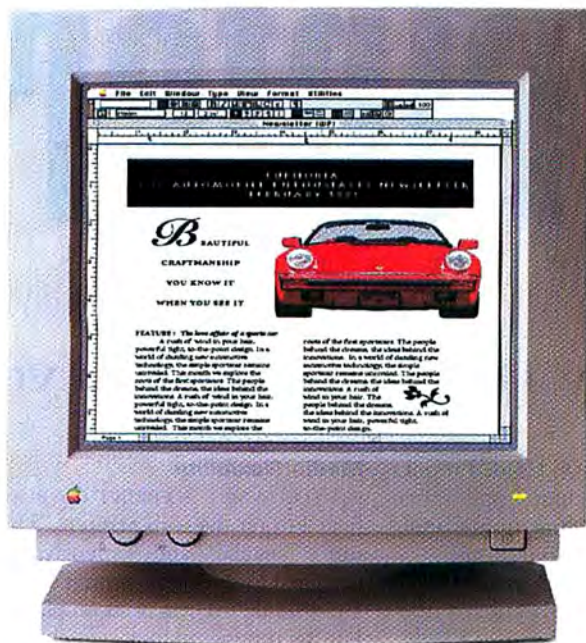


*Imagine a works program
so incredibly seamless,
its various applications
(word processing,
draw and paint, chart,
database, spreadsheet
and communication)
feel like one.*

(word processing, database, spreadsheet, chart, draw and
paint) without leaving your current document. Double-
click on an item, and the menu and tool bar change auto-
matically to correspond to the program you're using.



WORKS. IT WAS RATED THE BEST.



Text runaround, multiple section layouts and custom type styles help give WordPerfect Works the best desktop publishing capabilities of any word processor.

Even in System 6, you can edit information in a new document and have both the original and the new linked document instantly updated.

And when it comes to the other applications in WordPerfect Works, there are no weak links. In the spreadsheet, there's an automatic sum tool and in-cell editing. In both the paint and

draw modules, you get 128 custom fill patterns and 256 custom colors. The communications module gives you editable log-on scripts.



And one look at the screen on this page and you'll see what sets the word processor apart: multiple columns, irregular text wrap (something many desktop publishing programs can't do), and more.

But to truly appreciate what WordPerfect Works Macintosh can do, see your dealer or give us a call at (800) 526-5150. And discover a brand-new product that's already a legend.

WordPerfect is a registered trademark of WordPerfect Corporation within the United States and other countries. All other brand and product names are trademarks or registered trademarks of their respective companies. © WordPerfect Corporation 1991.



WordPerfect®

How to Buy a Color Printer

Finding the color printer technology that's right for you

PEOPLE RELY ON monochrome printers for day-to-day work, but more and more are buying color machines—to proof publications, create package mock-ups, print scanned or video-captured images, and produce overhead transparencies, as well as just punch up documents.

The increasing interest in color isn't all that surprising. Color printer prices have never been lower, and print quality has never been better. The complex hardware and software required to accurately mix and apply pigments continue to mature—color consumers need no longer feel like pioneers chasing rainbows.

In the following three articles, Macworld Lab evaluates 27 color printers. We've divided the contenders into the three dominant printer technologies: ink-jet, thermal-wax transfer, and dye-sublimation. These categories form a good-better-best hierarchy, and as you might expect, prices range from cheap to steep (see "Find the Right Printer for the Job").

The low end is represented by ten ink-jet printers, from the \$779 Hewlett-Packard HP DeskWriter C to the \$9995

Tektronix Phaser III PXi Color Printer. This year's ink-jets include Apple's first color printer and a machine from Canon that's also a color copier and scanner.

In the midrange sit nine thermal-wax transfer machines, which begin at \$2999 for Seiko Instruments' Personal Color-Point PSE—the lowest-priced thermal-wax transfer machine to date—and end at \$6990 for Océ Graphics' G5241-PS.

At the high end are eight dye-sublimation machines, whose prints look downright photographic. That quality goes for about \$10,000—steep, but far less than the average price reported in last April's "Color Printer Progress."

This time we didn't test stratospherically priced devices such as Iris's Smart-Jet, and we passed over color laser printers such as the Canon CLC-500 color laser copier with PostScript option. Such units are ideal for service bureaus and corporations, but the rest of us are likely to find something that does the job for a great deal less.

Grouping printers into the ink-jet, thermal-wax, and dye-sublimation categories is convenient for price and basic comparisons, but your shopping list needs to address other things, too. Here's an overview of the key issues I'll examine in the articles that follow.

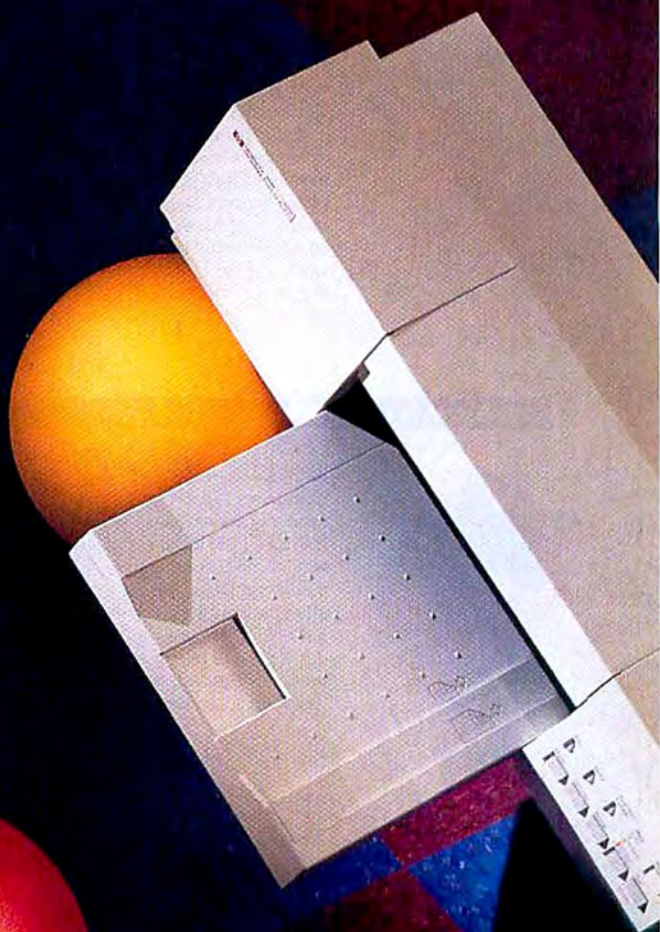
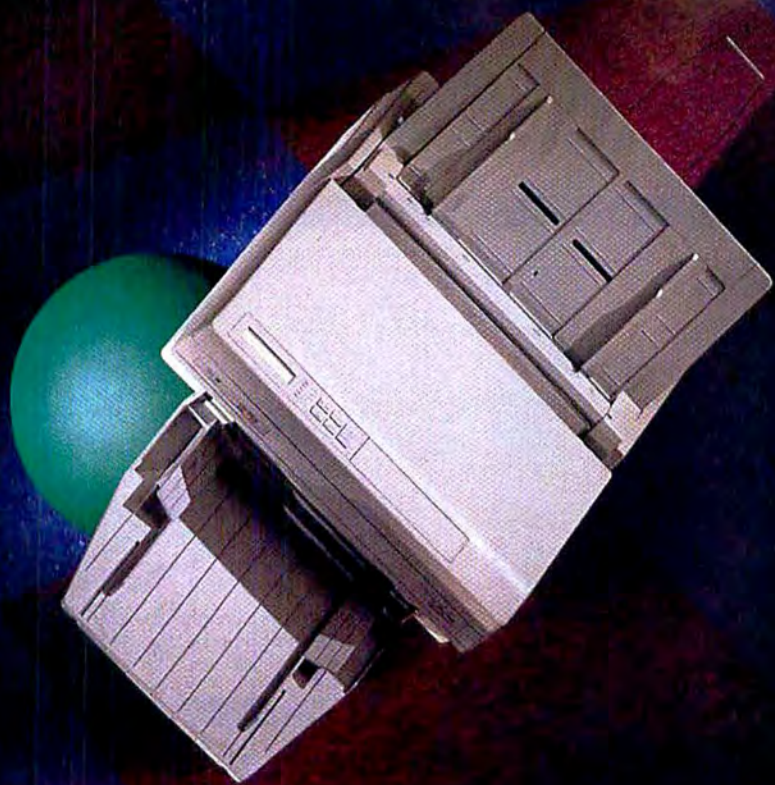
Media Flexibility

DO YOU WANT TO PRINT ON PLAIN PAPER? Forget dye-sub printers. They require special—and expensive—paper designed to absorb the printer's dyes. The latest liquid ink-jets print on plain paper, but the results can look splotchy—a little like using a fountain pen to write on a paper towel. A few thermal-wax printers, such as units from Tektronix, QMS, NEC, and Seiko, can print on plain paper, and even these printers require premium laser bond. Most thermal-wax printers use a lightweight, coated paper that feels flimsy. If you want the wide-ranging plain-paper support that monochrome laser printers provide—the ability to feed in everything from letterhead to card stock—you need to consider a solid ink-jet printer such as the Tektronix Phaser III PXi.

For many people, printing business letters in color isn't nearly as important as printing color overhead transparencies for presentations. All color printers can print on transparency film, but in general, thermal-wax machines produce the best results.

The finish and durability of output varies from one technology to another. Liquid ink-jet output smears when wet. Solid ink-jet output has a textured, matte

by Jim Heid



Seiko Personal Color-Point PSE (top), Hewlett-Packard Paint-Jet XL300 (right), and Mitsubishi International ColorStream/DS.

Find the Right Printer for the Job

INK-JET



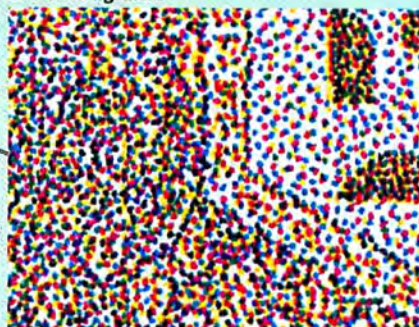
Starting at about \$800, ink-jet printers represent the only inexpensive color-printer option. They work well for presentations, simple transparencies, business graphics, and rough proofing. But except for a few high-end models, ink-jets do not offer PostScript and their output is mediocre. And liquid-ink output smears when wet, while solid-ink output may crack when folded.

11% enlargement



Ink-jet output tends to look splotchy or muddy, and often shows obvious banding when one color changes gradually to another.

500% enlargement



Ink-jets *dither*—use dot patterns of primary colors to trick the eye into seeing other shades. This obscures fine details and subtle color shifts.

THERMAL-WAX



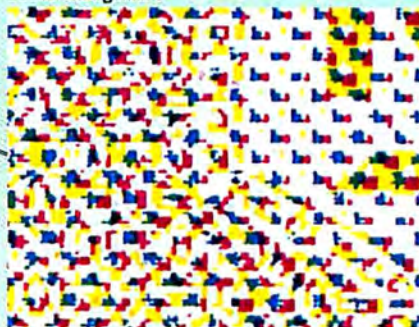
With its vivid colors, plain-paper support, and network options, thermal-wax is the technology of choice for routine business graphics and other business uses. This technology also produces the best overhead transparencies and works well for prepress proofs.

11% enlargement



Printed areas show an appealing gloss, though banding in gradual color changes can be a problem.

500% enlargement



Dithered images can lose fine details and subtle color shifts.

DYE-SUBLIMATION



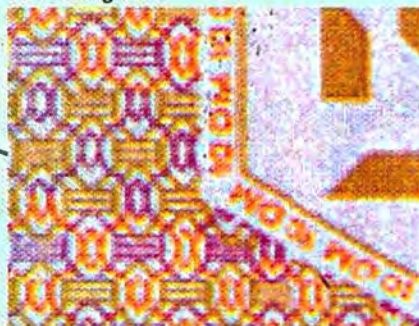
Dye-sublimation printers provide brilliant, photographic-quality images. They represent the only desktop option for top-quality proofing and digital photography. But these machines start at about \$7000, and each print costs about \$5 and requires special coated paper.

11% enlargement



Output is unmatched in its smooth color gradations and clear, sharp details. It looks and feels like a photograph.

500% enlargement



By mixing inks instead of dithering, dye-sublimation alone reveals the tiny "10DM" text in the above detail.

finish that can crack after repeated folding. Thermal-wax gives printed areas of the page an appealing gloss. Pages from a dye-sub printer are glossy in all areas of the page, including white space, and text printed on dye-sub machines looks a little out of focus.

PostScript versus QuickDraw

IN THE MACINTOSH WORLD, BUYING ANY kind of printer means choosing between one that uses PostScript, the page-description language of desktop publishing, or buying one that relies on QuickDraw, the Mac's built-in software for

creating text and graphics. A PostScript printer contains its own computer, or controller, that interprets PostScript-language commands coming from the Mac and translates them into the dots that form the printed image. A QuickDraw printer, on the other hand, relies on the

Mac to perform the calculations required to print a page. As a result, QuickDraw printers cost less but tie up the Mac. Hewlett-Packard's PaintJet XL300 retails for \$3495 in its QuickDraw form; with PostScript, the tab rises to \$4995.

But a PostScript printer is a better choice for printing desktop publications and illustrations created with PostScript drawing programs such as Aldus Free-Hand and Adobe Illustrator. Most PostScript color printers include or accept an optional SCSI hard drive that can store fonts and provide other performance-boosting benefits I'll describe shortly.

For presentation materials and scanned images, a QuickDraw printer suffices. It is also possible to coerce QuickDraw printers into supporting PostScript by using emulation software such as Freedom of Press Professional from ColorAge (508/667-8585; formerly Custom Applications).

In last year's color-printer roundup, only one ink-jet printer had built-in PostScript. This year, PostScript is built in or available as an option for five ink-jet models. Among thermal-wax machines, PostScript is common. At the high end, numerous PostScript dye-sub models are now available (only two were last year).

If you opt for PostScript, you need to choose between the real thing and a clone. Some printers use true Adobe Systems PostScript interpreters, but many use clone interpreters—they understand PostScript but were created by other firms. In the past, true Adobe PostScript produced smoother text quality when printing Type 1 downloadable fonts—the most popular format for fonts that you buy to supplement a printer's built-in fonts. Improvements in clone interpreters have virtually erased this quality gap.

Compatibility is the larger issue, and the most difficult to quantify. No PostScript clone we tested had compatibility problems—each successfully printed our test documents. But problems could surface in the future—as they did last year, when numerous PostScript clones choked on Adobe's newly released Multiple Master fonts (see "Personal Printers," *Macworld*, September 1992). The clone developers responded with updates, but until the updates became available, clone owners were barred from a significant new font technology.

To complicate matters, Adobe interpreters come in two flavors—Level 1 and Level 2. In theory, Level 2 PostScript offers additional benefits for color printing, including image decompression and device-independent color capabilities. With the latter feature, the time-consuming translation of colors in an image

into colors that a given printer can render is handled by the printer's Level 2 interpreter.

Color Accuracy

OK, PUT ON YOUR GARDENING GLOVES; we're about to discuss one of the thorniest issues facing the industry: color matching.

For pie graphs and bullet charts, you may not care if the output doesn't exactly match the colors on screen. But color accuracy is critical for publication proofs and scanned images. Monitors create color by combining red, green, and blue light; printers create color by combining cyan, yellow, magenta, and black pigments. This means that what you see on screen is rarely what appears on paper.

If Adobe can deliver on its Level 2 promises, Level 2 could solve this problem. But some pieces are missing. The Level 2-aware version of the Mac's PostScript printer driver software—under development by Adobe and Apple for years—should finally be available by the time you read this. We'll have to see how well it works.

And in order for a Level 2 printer to be able to pleasingly render everything from color scanned images printed on white paper to corporate logos printed on off-white letterhead, a variety of complex software components are required. One such component is a color-management system such as Apple's new ColorSync. Alas, the first release of the Level 2 driver will not support ColorSync.

In the meantime, numerous firms, including Kodak and Electronics for Imaging (EFI), have developed color-management systems—software and, in some cases, calibration hardware—that offer greater fidelity between screen and page (see "Managing Color," *Macworld*, January 1993).

Networking Features

WHEN BUYING A COLOR PRINTER FOR the office, you probably want each Mac—and perhaps also your DOS PCs—to be able to access the printer. PostScript and networking go hand in hand: all PostScript printers provide a LocalTalk port for connecting Macs and LocalTalk-equipped DOS PCs. A growing number of printers also include Ethernet ports—or offer them as options.

If you print from DOS PCs as well as Macs and don't want to buy LocalTalk boards for the PCs, look for a printer that offers an *all ports active* feature: all the ports are always listening for data. When a print job arrives at one port, other ports are temporarily disabled. The benefit is that you need not flick switches to tell the

printer which port to use. Some printers from QMS, Seiko, and General Parametrics provide an even better variation—the ability to temporarily store incoming jobs on the printer's hard drive, allowing the printer to accept jobs from various ports at the same time.

As for QuickDraw printers, every machine tested can be shared on a network. You couldn't say that last year.

Speed

COLOR PRINTER PERFORMANCE IS OFTEN measured in minutes per page, not the pages per minute of monochrome laser printers. This year's color printers are, on average, faster than last year's—not to damn them with faint praise. Color output requires more processing time than does black-and-white output, as the controller—whether built-in or Mac-based—has to figure out how much cyan, yellow, magenta, and black ink to apply in order to create various hues. For QuickDraw printers, this means that the faster your Mac, the faster the printer. Beyond processing time, the actual printing process takes longer for color than for black-and-white laser printers, too.

Time to Buy?

IS THIS THE YEAR TO BUY? FALLING prices, rising quality, and imminent availability of system-level color management, have brought desktop color printers closer than ever to the mainstream of personal-computer peripherals. Still, it will be some time before color printers become as common as color monitors. One reason is cost: today's color printers are slower, are more expensive, and cost more to operate than monochrome printers.

Another reason is common usage: many business documents are photocopied for distribution, and nearly all copiers are color-blind. Adding color charts or diagrams to a multipage report means printing the color pages separately and then collating them into the final product—a labor-intensive job.

There may come a time when you won't think about buying a color printer any more than you think about buying a color television. Until then, color printers will remain specialized devices primarily for publishers and presenters. The good news for those groups is that the latest batch of machines is the best ever. Color printers may not have entered the mainstream yet, but they are most definitely making waves. **m**

Contributing editor JIM HEID is coauthor of *Inside the Apple Macintosh* (Brady, 1992) and author of *Macworld Complete Mac Handbook* (IDG Books Worldwide, 1992).

Ink-Jet

Macworld Lab faces off ten solid and liquid

CHOOSING A COLOR ink-jet printer used to mean living with limitations: muddy output, special paper, no PostScript, and slow performance. Today's color ink-jets are not going to break any speed limits, but they are faster and more flexible than ever. Most of last year's models produced between 180 and 300 dots per inch and required special coated paper. This time around, most have resolutions of 300 dpi or 360 dpi and can print on plain paper.

As Macworld Lab tests of ten color ink-jet printers show, these machines produce surprisingly good results, considering their cost. Hewlett-Packard's HP DeskWriter 550C retails for \$1099 and often sells for between \$700 and \$800. More-expensive ink-jets, such as the \$3495 HP PaintJet XL300 and the \$2349 Apple Color Printer, can handle paper as large as 11 by 17 inches (tabloid). This capability in a thermal-wax transfer printer costs several thousand dollars more.

The software that drives the printers has also evolved. Printer drivers for QuickDraw printers have improved significantly for printing scanned images and color blends (see "Output Quality Varies Widely"). Today's QuickDraw drivers are better at *dithering*, the process of applying dots in patterns to simulate hues other than cyan, magenta, yellow, and black (CMYK); red, green, and blue (RGB); and white.

PostScript has become more preva-

lent, too. You'll find PostScript support in Tektronix's Phaser III PXi Color Printer, Lexmark International's IBM 4079 Color Jetprinter PS, and Dataproducts Corporation's Jolt PS. HP offers a PostScript option for its PaintJet XL300. All of these PostScript machines offer enhanced dithering options that produce much sharper output of scanned images than did early PostScript color printers.

Liquid Ink versus Solid Ink

MOST INK-JETS SPRAY FINE STREAMS OF liquid ink through minute nozzles located in disposable ink cartridges. The ink itself consists of dyes dissolved in a water-based medium. Canon and Hewlett-Packard have worked hardest on this liquid-ink technology; indeed, every liquid ink-jet reviewed here uses either an HP or Canon print mechanism.

We tested two ink-jet printers—Tektronix's Phaser III PXi and Dataproducts' Jolt—that use solid inks, which are melted before being applied to the page. The Phaser III PXi and Jolt are *phase-change* ink-jet printers, so named because the ink changes phases from a solid to a liquid and back again when applied to paper.

Phase-change ink-jet printers use ink sticks that look like mutants from the Crayola factory—fat, colorful wedges of wax containing adhesives and dyes. The dyes are not water-soluble, so output doesn't smear if it gets wet.

The Jolt and Phaser III PXi apply ink in the manner of conventional ink-jets. But the ink solidifies on the page before the paper's fibers can absorb much of it—

the chief problem with liquid-ink printers. Solid ink sits on the paper, giving a slightly textured feel to printed areas.

Because very little ink soaks into the paper, solid inks tend to deliver more brilliant colors than liquid ink. Solid-ink printers generally have larger color gamuts—they can reproduce a wider range of colors. Solid ink-jets aren't as finicky about paper quality, either, delivering better results than liquid ink-jets on inexpensive photocopier bond.

Solid ink's real weakness is with transparencies. The solidified beads of ink scatter light that's transmitted through them, giving projected transparencies a washed-out, almost black-and-white appearance. Both Tektronix and Dataproducts sell desktop laminating machines that fix the problem by adding a layer of material that has the same optical density as the beads. But this adds to the printer's cost and adds a manual step to the printing process. If you plan to print transparencies extensively, try a liquid-ink or a thermal-wax machine.

Macworld Lab tested ten ink-jet printers for image quality, media handling, and performance. (See "Find the Right Feature Mix" for the vital statistics, and "How Fast Are the Ink-Jet Printers?" for the performance results.)

Liquid-Ink Options

Apple Color Printer Apple has finally released its first serious color printer. (The ImageWriter II dot matrix printer supports a color ribbon, but calling it a color printer is generous.) The Apple

by Jim Heid

Color Printer uses the 360-dpi Canon BJC-C80 mechanism, whose tray holds 100 sheets of up to 11-by-17-inch paper. This engine can print on plain paper, thanks to a fast-drying ink formulation. The printer uses four ink cartridges (for cyan, magenta, yellow, and black).

The Apple Color Printer connects to the Mac via the SCSI port and can be made available to other Macs on a LocalTalk network. However, the Mac slows down as it processes other users' jobs. This drawback doesn't apply to the QuickDraw ink-jets from HP or Canon.

The Apple printer uses a QuickDraw-based driver. The driver interface is easi-

ink-jet printers

er to use than Canon's and HP's, which are a bit jargon-heavy. Clicking on the Color button opens a dialog box that enables you to adjust ColorSync color-matching options. Unlike HP's and Canon's drivers, Apple's doesn't let you adjust the intensity of the printed image. (Reducing the intensity can reduce color bleeding when printing on plain paper.)

Apple's new GrayShare QuickDraw driver technology adjusts the dots applied to the page to improve the quality of printed scanned images and color blends—at least in theory. The Apple printer's test output was often inferior to that of the competition. Fine details were blurred or disappeared entirely, and subtle color gradations in scanned images sometimes appeared splotchy.

The Apple Color Printer was also consistently slower than the QuickDraw version of the HP PaintJet XL300 and was often slower than Canon's BJC-820. In the MacDraw Pro test, the Apple Color Printer was slower than any other printer tested.

At \$2349, the Apple Color Printer is the least expensive tabloid-capable printer tested, but weigh that against its inferior performance and output quality—and against the fact that Apple does not offer a PostScript upgrade.

Canon BJC-820 Think of this printer as a faster Apple Color Printer with better output, but with a slightly less-friendly driver. The \$2995 BJC-820 has the same paper-handling features and SCSI connection scheme as the Apple, and the same 360-dpi resolution. The BJC-820 also has a Centronics parallel port for connecting DOS PCs, making it better for mixed-platform offices.

The QuickDraw-based driver lets you adjust print intensity and offers two



PHOTOGRAPH BY MARK JOHAN/ILLUSTRATION BY MARK FOX

Tektronix Phaser III PXI (top) and Hewlett-Packard DeskWriter 550C.

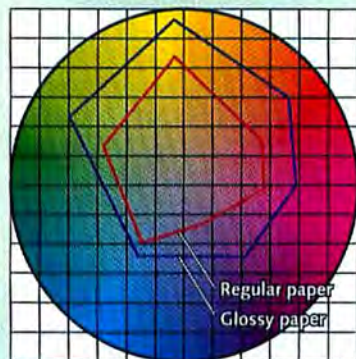
dithering options. The Canon driver required more color and intensity adjustments than did the Apple Color Printer driver. Once we found optimum settings, however, it yielded better detail and smoother color gradations.

The BJC-820 includes software that lets you share the printer on a network. The software supports both System 6 and System 7 and includes a utility that lets you check on pending print jobs and rearrange their printing order—a convenience Apple doesn't offer.

Canon CJ-10 Color Bubble-Jet Copier with IPU The Canon CJ-10 is a \$6995 color copier that combines Canon's digital color-copier technology with a 400-dpi ink-jet print mechanism. Add a SCSI-based computer interface unit for \$2700, and the CJ-10 becomes a color scanner and printer, too.

The CJ-10 is an impressive color copier. You can reduce to 50 percent or enlarge to 200 percent as well as adjust color balance, brightness, and contrast.

Better Paper Allows More Colors



Better-quality paper generally expands the gamut, or range, of colors that ink-jet printers can offer. Hewlett-Packard sells a glossy paper that dramatically improves the gamuts HP printers offer, as shown in gamut testing for the HP PaintJet XL300, above.

Instead of scanning the entire page in one pass and then printing it, the CJ-10 scans a narrow band, prints it, and then repeats the process. Letter-size paper—the largest the CJ-10 can handle—takes roughly 90 seconds. It supports transparency film, but not plain paper.

The CJ-10's computer interface unit includes a QuickDraw driver similar to that of the BJC-820, as well as a utility that enables you to scan images directly into Adobe Photoshop. The printer driver also enables you to correct a document's colors using one of several pre-configured correction settings. You can also create your own settings.

The CJ-10 accepts a 35mm slide attachment that lets you scan slides, and a video adapter that can connect a video camera or other video source. This makes for a versatile device, but one that quickly gets pricey as you add accessories. You can easily buy a separate color flatbed scanner, slide scanner, and color printer for less than \$9695. The CJ-10's appeal is

Output Quality Varies Widely



Hewlett-Packard PaintJet XL-300



Dataproducts Jolt P5



Hewlett-Packard DeskWriter C



Canon BJC-820



Lexmark International IBM 4079 Color Jetprinter P5



Hewlett-Packard PaintJet XL300-P5

that it gives you these peripherals—plus a slick color copier—in one package.

Hewlett-Packard HP DeskWriter 550C
The \$1099 HP DeskWriter 550C is the latest in a series of inexpensive color ink-jet printers from HP. Its predecessor was the DeskWriter 500C, which used a disposable ink cartridge containing cyan, yellow, and magenta chambers. The 550C adds a second ink cartridge for black, eliminating the need to produce black by applying all three primary colors. (This derived black is called *composite black*, and is often slightly brownish.)

HP also improved the ink formulations to allow the DeskWriter 550C to print on plain paper (including envelopes), although the results aren't as good as those of the costlier HP PaintJet XL300. HP's line of ink-jet papers works best. The LX JetSeries Glossy Paper is actually laminated with a plastic transparency-like film that does wonders for presentation graphics and scanned images; because more ink sits on the sur-

face of the paper, the printer's color gamut is enlarged significantly (see "Better Paper Allows More Colors"). At \$59.95 for 50 sheets, however, the glossy paper is a bit pricey.

The DeskWriter 550C's QuickDraw-based driver provides a wide selection of dithering, color control, and intensity options. Overall performance was better than average, except for the presentation graphic test. A LocalTalk port allows network sharing.

The 550C's tricolor cartridge has drawbacks. Because the ink chambers are small, you're likely to run out of ink often. And if you run out of one color, you must replace the entire \$34.95 cartridge. Still, the DeskWriter 550C is a great value.

Hewlett-Packard HP PaintJet XL300
The HP PaintJet XL300 is the successor to the PaintWriter XL, which produced 180-dpi output. With the PaintJet XL300, HP boosted the resolution to 300 dpi and added plain-paper support. A heating element in the printer dries the

ink almost immediately, preventing it from soaking into the paper.

The PaintJet XL300's four ink cartridges aren't keyed, so it's possible to insert a color in the wrong slot. Another surprising flaw: the printer doesn't detect when a cartridge is empty. This could result in a lot of wasted paper or, worse, costly transparency film.

The PaintJet XL300 is built for networking and expansion. LocalTalk and Centronics parallel ports are built in; Ethernet, Token Ring, and other network interfaces are optional. A Level 2 PostScript controller upgrade retails for \$1495. (Regarding PostScript Level 2 capabilities, see "How to Buy a Color Printer" in this issue.) The PostScript upgrade installs easily in a front-panel slot and also adds support for the Hewlett-Packard Graphics Language (HPGL/2) used by pen plotters, ensuring the printer's compatibility with computer-aided design and engineering software. All ports are active simultaneously, and the printer



Hewlett-Packard DeskWriter 550C



Original



Apple Color Printer



Canon CJ-10



Tektronix Phaser III PXI

Compared against the original image (this page, top right), the inexpensive HP DeskWriter 550C (this page, top left) shows good color fidelity, except for a slight overall lightening. Its effective dithering scheme holds sharp details, as seen in the scientific diagram at the left of the image. In contrast, fine print was illegible as rendered by the Apple Color Printer (this page, middle left). The 400-dpi Canon CJ-10 (this page, bottom right), though offering the sharpest details in the group, suffers from significant darkening of all shades.

switches emulation modes automatically. Mac and Microsoft Windows drivers are included.

The PostScript-equipped PaintJet XL300-PS was among the slowest machines tested. The Photoshop test scan took 24 minutes to print; on the Quick-Draw XL300 it took only 7 minutes. There were similar disparities in all tests except the PowerPoint presentation graphic, where the PostScript XL300 was negligibly slower. The printers' Quick-Draw and PostScript drivers offer several halftone screening settings as well as options for color-matching output to the screen. In all, the PaintJet XL300 yielded excellent output—with better color fidelity than the Canon, Apple, or IBM machines.

IBM 4079 Color Jetprinter PS The \$3495 Color Jetprinter PS uses the same engine as the Canon BJC-820 and the Apple Color Printer, but controls it with Phoenix Technologies' PhoenixPage PostScript-clone interpreter. An enhanced screening option called Color-Grade provides much better results than PostScript's standard halftoning.

The Jetprinter PS includes an installer utility that modifies Apple's PostScript driver (the LaserWriter file) to add options. Beware of the high-quality printing option: choosing it causes the print head to pause for eight seconds at the end of each pass to allow the ink to dry thoroughly. This prevents each pass from bleeding into its neighbors but slows printing dramatically.

The Jetprinter PS is the least-expensive PostScript color printer tested. If you

MW

EDITORS' CHOICE

Low-End Liquid-Ink Printers

HP DeskWriter 550C It's no prepress proofing tool, but its output quality may surprise you. With a street price between \$700 and \$800, there isn't a better way to test the waters of liquid ink-jet color printing. **Company:** Hewlett-Packard. **List price:** \$1099.

Midrange Liquid-Ink Printers

HP PaintJet XL300 This unit has the expansion options its competitors lack: a generous choice of network interfaces and a PostScript Level 2 option. Output quality is excellent. **Company:** Hewlett-Packard. **List price:** \$3495.

Solid-Ink Printers

Phaser III PXi Color Printer The only printer in its price range that has the paper-handling flexibility that monochrome printers provide. The controller offers fast performance, PostScript Level 2, and sharp prints of scanned images. **Company:** Tektronix. **List price:** \$9995.

long for the PostScript-equipped HP PaintJet XL300-PS but can't swing its \$4995 price, consider this one.

Clear Choice in Solid Ink

Dataproducts Jolt PS The \$6695 Dataproducts Jolt is the less expensive and slower of the two solid-ink machines tested. The Level 2 PostScript-based Jolt PS handles up to legal-size plain paper.

The Jolt's output quality isn't as good as the Phaser III PXi's. Print a bar with gradual color changes, and you'll notice bands at regular intervals. Jolt output is less durable, too. Fold a printed page, and the ink cracks and begins to flake off.

A front-panel Mode switch lets you choose between paper and transparency printing modes as well as two halftone-screening options. Most PostScript printers provide small liquid crystal displays for status messages, but the Jolt uses flashing lights—a slow flash means one thing, a fast flash means another, and it's easy to forget what means what. If you're in the \$6000 price range and want plain-paper output, consider one of the plain-paper thermal-wax machines from QMS, Tektronix, or Seiko instead.

Tektronix Phaser III PXi The second of the two solid-ink printers tested, the Phaser III PXi is more refined and more capable than the Jolt. At \$9995, it's also the most expensive ink-jet printer reviewed here.

The PostScript Level 2-based Phaser III PXi can print on paper as large as 12 by 18 inches (full-bleed tabloid). Add 4MB of memory to bring the printer's total to 14MB, and you can print proofs of tabloid-size publications that have bleeds (printed areas extending to the edges of the page). This combined with the ability to print on plain paper—including card stock—has made the Phaser III PXi popular among publishers.

Last June, Tektronix shipped an updated Phaser III PXi whose controller contains improved halftoning software called Finepoint that does wonders with

FIND THE RIGHT FEATURE MIX

Company	Phone	Product	Tested by Macworld Lab	Price	Page-Description Language	Standard Ports/Optional Ports/All Active	Emulations/Autosensing
Apple Computer	408/996-1010, 800/776-2333	Apple Color Printer	yes	\$2349	QuickDraw	SCSI/none/NA	NA/NA
Brother International	908/356-8880, 800/284-4357	HS-1PS	no	\$9995	BR-Script Level 1	L, P, S/none/yes	HPGL, PCL4/yes
Canon Computer Systems	714/438-3000, 800/848-4123	Canon BJC-820	yes	\$2995	QuickDraw	P, SCSI/none/yes	Epson LQ-2550/no
		CJ-10 Color Bubble-Jet Copier with IPU	yes	\$9695	QuickDraw	SCSI/none/none	NA/NA
Dataproducts Corporation	818/887-8000, 800/776-7788	Jolt PS	yes	\$6695	Adobe Level 2	L, P, S/none/yes	HPGL, PCL4/no
Hewlett-Packard	800/752-0900	HP DeskWriter C	yes	\$779	QuickDraw	L, S/none/yes	NA/NA
		HP DeskWriter 550C	yes	\$1099	QuickDraw	L, S/none/yes	NA/NA
		HP PaintJet XL300	yes	\$3495	QuickDraw	L, P, S ¹ /yes	NA/NA
		HP PaintJet XL300-PS	yes	\$4995	Adobe Level 2	L, P, S ¹ /yes	HPGL/2, PCL5/yes
Lexmark International	606/232-2000, 800/358-5835	IBM 4079 Color Jetprinter PS	yes	\$3495	PhoenixPage Level 2	L, P, S/none/yes	HPGL/yes
Tektronix	503/682-7377, 800/853-6100	Phaser III PXi Color Printer	yes	\$9995	Adobe Level 2	L, P, S/E, T/yes	HPGL/no

E = Ethernet, L = LocalTalk, P = parallel, S = serial, T = Token Ring. Technical-support ratings are based on a series of calls made to each company by Macworld staffers (posing as customers) system, including bonuses and demerits, to derive the final rating. Ratings are for companies, not individual products, and we call only those companies whose products Macworld Lab tests.

¹ HP PaintJet XL300 accepts any of numerous HP JetDirect network boards; adapters are available for Ethernet, Unix (TCP/IP), Token Ring, and others. ² The Phaser III PXi can accept any size



How Fast Are the Ink-Jet Printers?

■ = Fastest result in test.
Shorter bars are better. Products are listed in order of overall performance, from fastest to slowest. Times are in seconds.

Object-Oriented Graphic

Print speed for a complex color MacDraw Pro document with more than 840 color objects, most of them gradient-filled.

PostScript Graphic

Print speed for graphics that include special PostScript effects. We used a FreeHand illustration with nonlinear blends and Bézier curves.

Presentation Graphic

Print speed for a PowerPoint transparency with a color gradient background and several lines of text in the Times font.

Scanned Image

Print speed for a 910K, 72-dpi, 9 1/2-by-6 1/2-inch scanned Photoshop image with many shadow details.



* Faster mode. † QuickDraw version. ‡ Higher-quality mode. † With ColorSync off.

scanned images. The printer also includes Tektronix's TekColor drivers, which provide several color-matching schemes and let you preview printed colors on screen. The Phaser III PXi's solid inks mean second-rate transparencies, but with its Fine-point and color-matching technologies, it's an excellent printer for graphic arts and technical applications.

Brother International recently announced a solid-ink printer. The \$9995 HS-1PS uses Brother's BR-Script Post-

Script-clone interpreter and a Brother-built print engine that can print tabloid-size bleeds. What's noteworthy about the HS-1PS is that it addresses the washed-out-transparency problem with a built-in mechanism that remelts the ink to change the shape of the solidified droplets. This mechanism, which Brother calls a transparentizer, eliminates the need for a laminator. The HS-1PS was not available for testing, but the Brother-supplied output samples I examined looked impressive.

HP Is on Top

ALL IN ALL, HEWLETT-PACKARD'S PRINTERS delivered better output and better performance than the competition. The HP DeskWriter 550C provides a generous mixture of affordability and output quality. The HP PaintJet XL300 costs the same as the large-format machine from Lexmark International, and more than those offered by Apple and Canon. But the XL300 offers superior output and more expansion options.

As for the solid-ink offerings, both the Dataproducts Jolt PS and the Tektronix Phaser III PXi produce excellent results on plain paper, but not with transparencies. The Phaser III PXi is the better of the two, and remains a good choice for publishing applications.

Today's liquid-ink printers are still on the slow side and are still a bit finicky about paper, while the solid-ink machines have problems with transparencies. Liquid ink's disadvantages are likely to remain, but this technology's relatively low cost offsets them. Solid ink's future looks promising, but expensive. Despite the improvements in the latest generation of printers, buying an ink-jet printer still means making some compromises. **m**

Contributing editor JIM HEID is coauthor (with Peter Norton) of *Inside the Apple Macintosh* (Brady, 1992) and author of *Macworld Complete Mac Handbook* (IDG Books Worldwide, 1992).

Macworld Lab testing supervised by MARK HURLLOW.

RAM (base model/maximum)	Resolution (in dots per inch)	Number of Fonts	Paper Sizes	Tray Capacity (in sheets)	Technical Support
NA/NA	360	64	A, A3, A4, lgl, B	100	NA ¹
10MB/26MB	300	35	A, lgl	100	NA
NA/NA	360	3	A, A3, A4, lgl, B	100	satisfactory ²
NA/NA	400	0	A	90	unsatisfactory ²
6MB/10MB	300	39	A, A4, lgl, B	200	satisfactory
NA/NA	300	13	A, A4, lgl, B	100	good
NA/NA	300	35	A, A4, lgl, B	100	good
2MB/18MB	300	35	A, A4, AB, lgl, B, B4	200	good
6MB/18MB	300	35	A, A4, AB, lgl, B, B4	200	good
4MB/16MB	360	35	A, A3, A4, lgl, B	100	excellent
10MB/22MB	300	39	4	200	excellent

to gauge the accessibility, helpfulness, and accuracy of the company's support technicians. Macworld uses a point

¹ Printer not on sale long enough to test technical support. ² Each product tested independently for this company, from 4 by 6 inches to 12 by 18 inches.

Thermal-Wax

New models offer plain-paper output and

FOR THERMAL-WAX printers, the news is all about paper and price. While print quality has held fairly steady in the past year, several machines now print on plain paper—not the wide range of exotic papers and card stocks that monochrome laser printers can handle, but photocopier or laser-printer bond. Besides providing alternatives to the flimsy-feeling special paper to which some thermal-wax printers are still limited, plain-paper support eliminates the need to stock yet another category of office supply.

Meanwhile, prices are dropping into the office-laser-printer range, with one high-end machine, the Tektronix Phaser 200e, retailing for less than \$4000, and one low-end newcomer, the forthcoming LaserMaster Crayon-FX, announced at a cost of only \$1495. Thermal-wax inks give printed areas of the page an appealing gloss that ink-jet printers can't match. And speed is up—as a group, the nine thermal-transfer printers tested by Macworld Lab were the fastest printers evaluated for this series.

How Thermal-Wax Printers Work

THERMAL-WAX PRINTERS PRODUCE output through a combination of heat and pigmented wax. Inside the printer is a roll of plastic film coated with wax-based pigments of each process color (cyan, magenta, yellow, and often, black—or CMYK). Each ink panel is the size of a full page, and a set of three or four panels is used in the course of printing a page. As a result,

you always know how many pages to expect from an ink roll. With ink-jet and monochrome laser printers, the number of pages per cartridge depends on the amount of ink or toner that is applied to each page.

The print head in a thermal-wax printer contains thousands of heating elements that turn on and off to print individual dots, melt the wax, and thereby transfer ink to the paper. Nearly all thermal-wax printers can apply up to 300 dots per inch.

A page makes several trips past the print head. After the dots for the first process color are applied, the page briefly appears in the output tray as the ink ribbon advances to the next panel. Then the printer draws the paper back in and applies the next process color. The printer's mechanism must position the paper accurately for each pass, lest registration and color quality suffer.

Most thermal-wax printers accept either a three-color (CMY) or four-color (CMYK) ink ribbon. (Some machines also accept a black-only ribbon and produce color separations by printing one page for each process color.) Printing with a three-color ribbon is the fastest, since it requires one less pass. Without the black-ink panels, however, the printer must print black areas as composites of cyan, magenta, and yellow ink, which sometimes produces muddy-looking blacks.

The ink ribbon is attached to a take-up spool around which spent ink panels are wound. This presents a potential security problem: someone can unwind the

used ribbon and read documents that have been printed. When security is important, be sure to destroy spent ink rolls.

With three (or four) entire ink panels used for every printed page, you may think that thermal-wax printers cost more to operate than ink-jets. That can be true for documents containing only small areas of color, but if you print overhead transparencies or other colorful pages, thermal-wax output often costs less. Put another way, the cost per page of ink-jet output varies depending on the amount of ink used, but the cost per page of thermal-wax output is the same regardless of how much color you use. (The lesson is to beware of the cost-per-page figures used by ink-jet vendors. Such estimates are meaningless unless they specify the colors used and the amount of coverage.)

Thermal-wax transparencies aren't just more economical, they're also more vivid than ink-jet transparencies. The wax-based inks adhere well to transparency film and don't diffuse projected light to the extent that liquid and solid inks do. Given these quality, speed, and potential economic advantages, thermal-wax represents the best technology for printing overheads and other presentation materials.

The Media Elite

MANY INK-JET PRINTERS CAN'T USE plain paper effectively because ink wicks into the paper before drying, blurring the image. Plain paper presents different challenges to a thermal-wax printer. The surface of a sheet of plain paper is not

by Jim Heid

smooth, but a bumpy mélange of criss-crossing fibers. Adhering a smooth, wax-based ink to such a surface is like wallpapering a textured plaster wall—you can do it, but it isn't easy.

All thermal-wax printers used to require special paper with an ultrasmooth surface designed to accept the melting wax. This paper was roll-fed, and a blade within the printer cut the paper to size at the end of the print job. Some printers still rely on such rolls, but a far greater number of units use cut-sheet plain paper (see "Find the Right Feature Mix").

QMS, Seiko, and NEC met the plain-paper challenge by redesigning their print

reduced prices

heads to apply more heat to the ink ribbon, thereby transferring more wax to the paper. In the QMS ColorScript 210, for example, you can select between plain paper and thermal-transfer paper by using a front-panel switch or by choosing an option in the Print dialog box.

Tektronix takes a different approach with its Phaser 200i and 200e printers (which were not shipping at this writing and thus could not be tested, but will replace the Phaser II PXi and II PXe by the time you read this). Tektronix sacrificed the black-ink panel in favor of a special primer medium that the printer applies to all areas of the paper that will hold ink. This primer coat covers the peaks and fills in the valleys of the paper, providing a smoother surface for the inks. It also means all blacks must be printed as composites of cyan, magenta, and yellow, however.

Tektronix claims that this approach allows for a wider range of paper surfaces and finishes. But my tests show that only high-quality paper yields acceptable results.

The trend toward using plain paper is accompanied by the same kinds of paper-handling features as those found on laser printers or photocopiers. Many thermal-wax machines now use slide-in paper trays that hold 50 to 200 sheets. The Tektronix Phaser 200i and 200e will also accept an optional second paper tray—put paper in one and transparency film in the other.

The \$4995 CalComp ColorMaster Plus series are the only color printers available that can print on both sides of a sheet of paper. The ColorMaster Plus doesn't support plain paper, but the special paper it does require has a heavier weight than most thermal-wax papers.

PHOTOGRAPH BY MARK JOHAN/ILLUSTRATION BY MARK FOX



The CalComp ColorMaster Plus (top) and the QMS ColorScript 210.

Compare Both Color and Texture



NEC Colormate PS Model 80



QMS ColorScript 210



CalComp ColorMaster Plus



Brother HT-500PS



Seiko ColorPoint PSX Model 4



Océ Graphics G5241-P5

Printers from Seiko, QMS, Panasonic, General Parametrics, and CalComp can print on a special material that lets you create transfer sheets for fabric and ceramic. Some of these printers also print on offbeat media such as silver peel-and-stick paper (for plaques and nameplates) and static-cling plastic (for signs that stick on windows, with no adhesive). For ad agencies and design studios, the ability to do small, in-house runs of T-shirts and other promotional gimcracks could be more significant than being able to print on plain paper.

Another plus for graphic artists is the ability to print documents with bleeds (printed areas that extend to the edge of the page). Among smaller machines—ones with an 8½-by-14-inch maximum

page size—only the Seiko Personal ColorPoint PSE and ColorPoint PSX Model 4 and the RGB Technology CB8000X (not tested) can print a letter-size bleed. To print tabloid-size documents with bleeds, look at Océ Graphics' G5242-PS, Seiko's ColorPoint PSX Model 14, QMS's ColorScript 230, or RGB Technology's CB8014X (not tested). As for color matching, support for EFI's EfiColor color-management system is available for the Tektronix, QMS, Seiko, and CalComp thermal-wax machines.

Many vendors are also creating *profiles* for Apple's ColorSync. Profiles are data files that describe a printer's color capabilities, such as its color gamut, ink characteristics, and halftone screen fre-

quencies. Together with the color-management software (such as EfiColor or ColorSync), these profiles form an intermediary between an application program and a printer. When you print a document, the color-management system checks the printer profile to translate the colors in the document into ones that can be rendered by your printer.

Speed and Networking

ALL BUT ONE OF THE NINE PRINTERS tested support PostScript. The exception is the \$6295 Panasonic EPL-8534, which uses a QuickDraw-based driver. (Panasonic also sells a version of Freedom of Press software from ColorAge [508/667-8585], which provides PostScript support, however.) This roll-fed printer is unique



Seiko Personal ColorPoint PSE



Original



General Parametrics SpectraStar Q10



Panasonic EPL-8543

Output quality among thermal-wax printers does not vary as widely as with other printer technologies, though these samples show visible differences in color fidelity and image texture. Comparing output against the original image (this page, top right), the Seiko Personal ColorPoint PSE (this page, top left) shows excellent color fidelity, particularly in the hard-to-match green of the leaves in the center of the image, and in the aqua swirls at the far left. The General Parametrics SpectraStar Q10 (this page, bottom left) unduly lightens the same green and aqua. The Brother HT-500PS (facing page, middle right) washes out greens and reds with excess yellow. Thermal-wax devices use dot patterns to create different colors. This can cause severe banding when moving from one shade to the next or in subtle fills, as seen at the lower right of the bird, as rendered by the Panasonic EPL-8543 (this page, bottom right).

in another way: its resolution is only 203 dpi, but it can vary the size of those dots to create continuous-tone images. But I don't recommend this printer. It lacks a LocalTalk port and relies instead on the printer driver for network sharing, a scheme that slows down the Mac to which the printer is connected. Also, the printer can't print on plain paper, and in our testing Panasonic delivered unsatisfactory technical support.

As for the PostScript machines, most use PostScript-clone interpreters rather than Adobe interpreters. Exceptions include the Tektronix, NEC, and Océ Graphics machines. All the clones passed Macworld Lab's compatibility tests, which were designed by Genoa Technology (805/583-2677). Most PostScript

printers (whether clones or not) provide additional emulation modes such as HPGL, the most popular language for pen plotters.

On the test track, the overall winner was Seiko Instruments' PSX series. The Seiko ColorPoint PSX Model 4 finished first. (Actually, it finished a close second to Tektronix's Phaser II PXi, which has since been replaced by the Phaser 200 series and therefore does not appear in our benchmarks.) Slow performers included the Océ Graphics G5242-PS, the NEC Colormate PS Model 80, and the Seiko ColorPoint Personal (see "How Fast Are the Thermal-Wax Printers?").

The forthcoming Tektronix Phaser 200i and 200e boast an innovation that should put them among the fastest

thermal-wax printers. The Phaser 200i and 200e wind the sheet of paper around a circular drum that eliminates the time wasted by partially ejecting a page and then drawing it back into the print engine to print the second and third process colors. Tektronix claims a maximum print speed of 2 pages per minute—still glacial compared with a monochrome office printer's 10 to 20 ppm, but faster than any current thermal-wax printer.

Seiko's ColorPoint PSX series, General Parametrics' SpectraStar series, and QMS's ColorScript 210 and 230 have noteworthy performance-related features. These printers accept optional SCSI hard drives that can store downloadable fonts and incoming print jobs from the Macs on a network. This improves the perfor-

FIND THE RIGHT FEATURE MIX

Company	Phone	Product	Tested by Macworld Lab	Price	Page-Description Language	Emulations/Autosensing	Processor/Clock Rate
Brother International Corporation	908/356-8880, 800/284-4357	HT-500PS	yes	\$4995	BR-Script Level 1	HPGL, PCL4/yes	34010/60MHz
CalComp	717/821-2000, 800/932-1212	ColorMaster Plus †	yes	\$4995	PhoenixPage Level 1	none/NA	i960/16MHz
General Parametrics Corporation	510/524-3950, 800/223-0999	SpectraStar Q10 ‡	yes	\$4999	Pipeline PowerPage Level 2	HPGL, Targa, Mils G370/no	i960/20MHz
Mitsubishi International	914/997-4999	ColorStream/Plus	no	\$7950	PowerPage Level 2	HPGL/yes	AMD29000/16MHz
NEC Technologies	508/264-8000, 800/632-4636	Colormate PS Model 80 §	yes	\$6299	Adobe Level 1	none/NA	68020/16MHz
Océ Graphics	415/964-7900, 800/545-5445	G5241-PS †	yes	\$6990	Adobe Level 1	none/NA	68020/16MHz
Panasonic Communications	201/392-4932, 800/742-8086	EPL-8543	yes	\$6295	QuickDraw	none/NA	none/NA
QMS	205/633-4300, 800/777-7782	ColorScript 210 †	yes	\$4995	QMS Level 2	HPGL/yes	i960/25MHz
RGB Technology	703/834-1500	CB8000X	no	\$5995	PhoenixPage Level 2	HPGL/yes	i960/25MHz
Seiko Instruments USA	408/922-5800,	Personal ColorPoint PSE	yes	\$2999	PhoenixPage Level 1	HPGL/yes	i960/16MHz
	800/888-0817	ColorPoint PSX Model 4 †	yes	\$5999	PhoenixPage Level 1*	HPGL/yes	i960/25MHz
Tektronix	800/853-6100;	Phaser 200e Color Printer	no	\$3695	Adobe Level 2	HPGL/no	AMD29000/16MHz
	503/682-7377	Phaser 200i Color Printer	no	\$5995	Adobe Level 2	HPGL/no	AMD29000/24MHz

Technical-support ratings are based on a series of calls made to each company by Macworld staffers (posing as customers) to gauge the accessibility, helpfulness, and accuracy of the company's support technicians. Macworld uses a point system, including bonuses and demerits, to derive the final rating. Ratings are for companies, not individual products, and we call only those companies whose products Macworld Lab tests. * E = Ethernet, L = LocalTalk, N = Novell NetWare, P = parallel, S = serial, T = token ring. † B-size model also available. ‡ Other models available equipped with internal hard drives. § Unit with fewer fonts also available. ¶ Free upgrade to PhoenixPage Level 2 begins in April 1993. * To evaluate support, we asked questions about the Phaser II PXe and II PXi, which were shipping at the time of testing.



How Fast Are the Thermal-Wax Printers?

■ = Fastest result in test. Shorter bars are better. Products are listed in order of overall performance, from fastest to slowest. Times are in seconds.

Object-Oriented Graphic

Print speed for a complex color MacDraw Pro document with more than 840 color objects, most of them gradient-filled.

PostScript Graphic

Print speed for graphics that include special PostScript effects. We used a FreeHand illustration with nonlinear blends and Bézier curves.

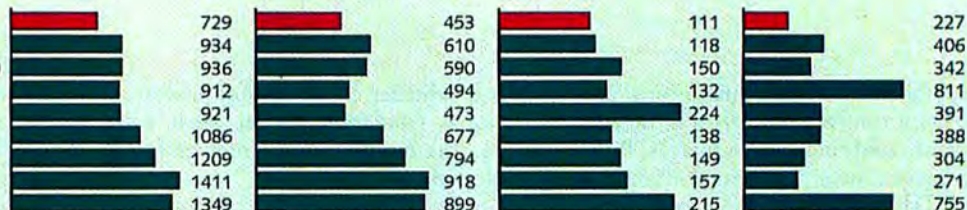
Presentation Graphic

Print speed for a PowerPoint transparency with a color gradient background and several lines of text in the Times font.

Scanned Image

Print speed for a 910K, 72-dpi, 9 1/2-by-6 1/2-inch scanned Photoshop image with many shadow details.

Seiko ColorPoint PSX Model 4
Brother HT-500PS
General Parametrics SpectraStar Q10
QMS ColorScript 210
Panasonic EPL-8543
CalComp ColorMaster Plus
Seiko Personal ColorPoint PSE
NEC Colormate PS Model 80
Océ Graphics G5241-PS



mance of your network and individual Macs. Instead of waiting for someone else's job to print, the PrintMonitor utility on your Mac immediately transfers your job to the printer's hard drive. As a result, PrintMonitor doesn't take up memory and slow down your machine.

The Seiko ColorPoint PSX series offers an additional feature that will lift the spirits of people who always find their jobs next in line after a massive Photoshop

file. These printers allow small jobs to bypass large ones that are still being transferred from a Mac. If someone on a network starts printing a large Photoshop image and someone else tries to print a PowerPoint transparency a moment later, the ColorPoint PSX will accept, process, and print the transparency while simultaneously storing the incoming Photoshop file.

The QMS ColorScript 210 and 230

owe their ability to store incoming print jobs to QMS's Crown printer operating system, which resides within each printer. The Crown system is also behind these printers' emulation-sensing talents and their ability to accept print jobs from a variety of ports simultaneously. Crown also provides customizing options galore—you can, for example, tell the printer how much hard drive space to use for storing fonts and how much to use for

Standard Ports / Optional Ports/ All Active	RAM (base model/ maximum)	Internal Hard Drive/ SCSI Port	Number of Fonts	Paper Sizes	Resolution (in dots per inch)	Paper Feed	Supports Plain Paper	Technical Support
L, P, S/none/yes	5MB/21MB	no/yes	35	A, lgl	300	100-sheet tray	no	unsatisfactory
L, P, S/none/yes	6MB/34MB	no/yes	35	A	300	100-sheet tray	no	NA
L, P, S/none/yes	10MB/10MB	no/no	52	A, A4, lgl, SA4	300	100-sheet tray	no	excellent
L, P, S, SCSI/E/yes	14MB/38MB	no/yes	35	A, B, SB	300	100-sheet tray	no	NA
L, P, S/E/no	8MB/8MB	no/yes	35	A, A4, lgl	300	100-sheet tray	yes	satisfactory
L, P, S/none/no	4MB/8MB	no/yes	35	A, SA	300	100-sheet tray	no	good
P/none/none	3MB/8MB	no/no	0	A	203	roll	no	unsatisfactory
L, P, S/ E, N, D, T/yes	8MB/32MB	no/yes	65	A, A4, SA4, lgl	300	50-sheet tray	yes	good
L, P, S/E/yes	10MB/34MB	no/yes	39	A, A4, SA	300	roll	no	NA
L, P, S/E, N/yes	5MB/21MB	no/optional	17	A, lgl, A4, A4 lgl, B4	300	100-sheet tray	yes	excellent
L, P, S/E, N/yes	10MB/34MB	no/yes	39	A, A4, SA	300	roll	no	
L, P, S/T/yes	4MB/8MB	no/no	17	A, A4	300	100-sheet tray	yes	excellent *
L, P, S/E, T/no	6MB/14MB	no/yes	39	A, A4	300	100-sheet tray (200-sheet tray optional)	yes	

storing incoming print jobs. QMS's Crown-based printers have the most sophisticated controllers in the industry. Much of their sophistication doesn't show up in specifications tables or benchmarks, but in the real world of complex networks, competing page-description languages, and large documents.

Output Quality

ANY THERMAL-WAX OUTPUT LOOKS better than that of a liquid ink-jet printer (except the liquid ink-jets from Iris Graphics, which start at over \$30,000). But within the thermal-wax world, output quality doesn't vary dramatically (see "Compare Both Color and Texture").

Still, some printers stand out from the pack. The prints produced by General Parametrics' SpectraStar Q10 had colors that were a bit more vivid than most. Macworld Lab measurements (conducted with the assistance of Genoa Technology) show that the Q10 has one of the largest *color gamuts*—range of reproducible colors—of any thermal-wax printer tested.

Seiko's ColorPoint series and prerelease versions of the Tektronix Phaser 200i and 200e (which use the TekColor image-enhancement technologies to improve color fidelity between screen and printer) yield sharp prints of scanned images, thanks to enhanced screening (the process of representing a scanned image as a series of dots). The Seiko printers are hampered by relatively narrow color gamuts, however.

The QMS ColorScript 210 renders fine lines and small text particularly well. QMS is also planning an upgrade to the 210 and 230 that improves screening for printing scanned images. A ROM upgrade will be available for existing machines, but its price had not been determined at press time.

Brother's HT-500PS provides only average output quality and performance and Brother's technical support was unsatisfactory, but the printer does stand out in one way. Add a \$200 controller board, and you can attach an inexpensive, non-PostScript laser printer, such as an HP LaserJet, to the HT-500PS. Flick a switch on the HT-500PS's front panel, and you can use the laser printer for proofing or printing monochrome documents, with the HT-500PS's controller interpreting the PostScript. General Parametrics' \$6799 SpectraStar Q40 accepts an optional film recorder that can make color 35mm slides, which we did not evaluate; the same film recorder is standard equipment on the \$13,798 SpectraStar Q50.

At press time, LaserMaster (800/477-7714) announced the least-expensive thermal-wax to date: the \$1495 Crayon-FX, which prints 203 dpi on high-quality plain paper. The Crayon-FX, which should be available by the time you read this, will ship with a QuickDraw-based driver and 50 TrueType fonts.

In the end, however, the leaders in the thermal-wax world are the firms that have worked for years to pioneer and popular-

ize this technology: Tektronix—with innovative engines, color-matching software, and fast controllers—would have been an Editors' Choice if it hadn't been in the middle of a product-line shift during our testing period. QMS, with excellent output quality and sophisticated Crown architecture; and Seiko, with fast controllers and reasonable prices, are also superb values. **m**

Contributing editor and *Getting Started* columnist JIM HEID is the coauthor (with Peter Norton) of *Inside the Apple Macintosh* (Brady, 1992) and author of *Macworld Complete Mac Handbook* (IDG Books Worldwide, 1992).

Macworld Lab testing supervised by MARK HURLLOW.

MW

EDITORS' CHOICE

Personal ColorPoint PSE This unit offers the lowest price of any 300-dpi thermal-wax machine. Its enhanced screening delivers remarkably sharp prints of scanned images, and the technical support is excellent.
Company: Seiko Instruments. **List price:** \$2999.

ColorScript 210 Offering plain-paper support and the sophisticated Crown printer-architecture, this machine is a good choice for workgroup printing. A forthcoming controller upgrade promises improved halftones, too.
Company: QMS. **List price:** \$4995.

Dye-Sublimati

Photographic-quality printing finally becom

FOR PHOTO-REALISTIC results, you want a dye-sublimation printer. Unlike ink-jet and thermal-wax machines, dye-sub printers mix cyan, magenta, yellow, and black pigments to create any of 16.7 million hues without dithering. Dye-sub images are free of dot patterns that obscure details and destroy realism. And as Macworld Lab tests of eight units show, the benefits of healthy competition—lower prices and higher quality—have finally hit the dye-sub market.

Photo-realistic results make dye-sub the preferred printers for proofing color publications. Dye-sub are also the natural output choice for the growing field of electronic photography. The special paper that dye-sublimation machines use has a glossy finish that closely resembles photographic paper. Dye-sub printers' dither-free output is also well suited to scientific and medical imaging, where every detail counts.

Dye-sub printers also work with transparency film and do a beautiful job with the flashy graduated backgrounds that Aldus Persuasion and Microsoft PowerPoint provide. Ink-jet and thermal-wax printers must use dither patterns to simulate graduated fills (areas where one color blends into another), but dye-sub printers produce the continuous color blends that appear on the Mac's screen.

But the very qualities that make dye-sub machines so adept at printing continuous-tone images impair their ability to print sharp text. Text from a dye-sub

machine sometimes looks fuzzy—like a slightly misfocused photograph. Large type, such as the 18- or 24-point text you might use in an overhead transparency, doesn't look bad, but small sizes can be difficult to read. If you work more with small text sizes and spot colors than with scanned images and graduated fills, you probably want a thermal-wax machine (see "Thermal-Wax," in this issue). Besides being able to print on plain paper, you'll pay less.

A lot less. Prices have dropped in the past year, but dye-sub printers remain among the most expensive color printers. The eight machines reviewed here range from \$6995 for Nikon's CP-3000D Full Color Printer to \$24,895 for Kodak's XLT 7720 Digital Continuous with most retailing for around \$10,000.

Dye-sub printers also cost more to operate. A page from an ink-jet or thermal-wax machine generally runs between 50 cents and a dollar; most dye-sub prints cost several dollars each. But against photographs—a closer comparison from the quality standpoint—dye sublimation looks almost reasonable in cost, especially considering that chemicals and dark-room work are not needed.

How Dye-Sub Printers Work

DYE-SUBLIMATION (ALSO CALLED *DYE-DIFFUSION*) printers closely resemble thermal-wax machines. Both types of printers use ribbons containing successive panels of cyan, magenta, yellow, and, optionally, black pigment. In both, a print head transfers pigment from the ribbon to the

page. The paper shuttles into and out of the print engine once for every process color—cyan, magenta, yellow, and black.

The key differences between thermal-wax and dye-sub printers are the type of paper, the composition of the color pigments, and the way the print head applies the pigments. As the technology's name implies, dye-sub pigments are not inks. Inks rest on top of the print medium; dyes permeate the surface. When a heated element in the dye-sub machine's print head contacts the dye ribbon, the dye *sublimates*—turns from a solid into a gas, with no liquid phase in between. The gaseous dyes are absorbed by the polyester coating on the paper. Inks are opaque and must be printed in various dither patterns to fool the eye into seeing various colors. Dyes are transparent, so a dye-sub printer creates a given color by applying dots of the process colors directly on top of one another. And a dye-sub print head varies the temperature of its heating elements to apply pigments in unequal amounts—say, a lot of yellow and just a tad of cyan. There are none of the dot patterns, or rosettes, that are the building blocks of color halftones. This lack of dot patterns is one of the factors that make dye-sub output look like a photographic print. This extra sophistication also contributes to dye-sub's higher cost.

As the paper absorbs the dyes, they diffuse, so rather than having a sharply defined edge, each dot is slightly fuzzy. This diffusion helps the dots blend and contributes to the printer's ability to produce continuous-tone images.

by Jim Heid

on

es affordable

Quality Concerns

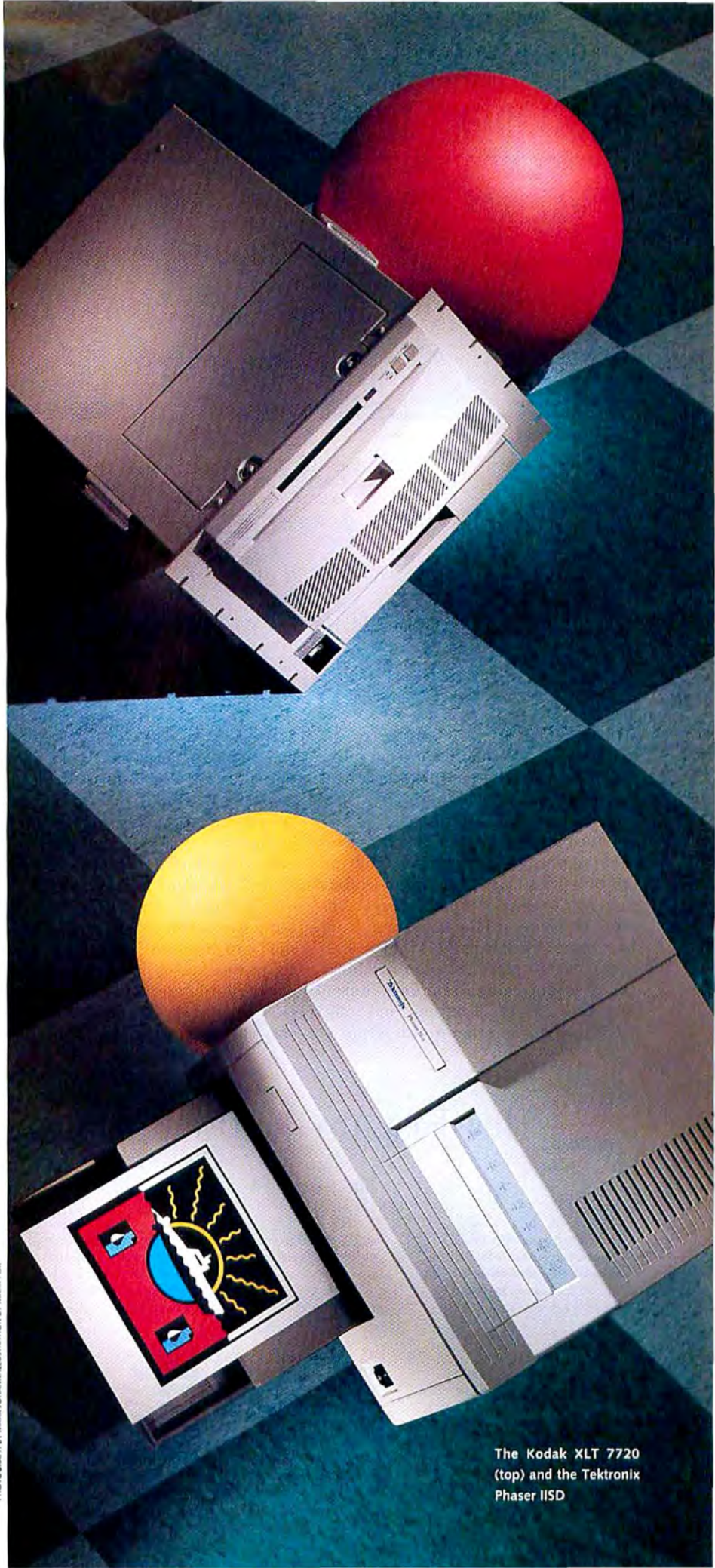
BUT SOFT-EDGED DOTS CAN CAUSE small text and line art to look blurred. Under magnification it's apparent that the dyes diffuse to a greater extent along the axis of paper movement—just as a raindrop hitting a moving car's windshield spreads more in one direction than in others. One printer, Tektronix's Phaser IISD, compensates for this by adjusting the amount of dye applied using the Tektronix Photofine technology. The technique helps: the Phaser IISD produced some of the best-looking text of the printers tested.

Some printers turn their soft-edged dots into weapons against the stair-stepped jagged edges that are common artifacts in line art and large text. Several models provide a text *antialiasing* option that fills jaggies with subtle shades of intermediate color values.

As you scan the specifications in "Dye-Sublimation Features," you may notice that output resolution varies in this category—from 163 dots per inch for the Sony UP-D7000 to 300 dpi for most other printers. For printing text or line art, the standard resolution rule applies—the more dots per inch, the better. For scanned or video-captured images, however, images printed by the 163-dpi Sony UP-D7000 looked as sharp as those produced by the 300-dpi printers.

The weight of the paper also affects the look and feel of dye-sub output. The printers from GCC Technologies, RasterOps, and Tektronix use a lighter-weight paper than do the Sony, SuperMac Technology (which we examined in a pre-release version), 3M, Eastman Kodak, and Mitsubishi machines, which use a so-called high-opacity paper whose weight more closely resembles that of photo-

PHOTOGRAPH BY MARK JOHANN/ILLUSTRATION BY MARK FOX



The Kodak XLT 7720 (top) and the Tektronix Phaser IISD

Continuous-Tone Clarity



Kodak XLT 7720



GCC Technologies ColorTone



3M Rainbow



RasterOps CorrectPrint 300i

graphic paper. Besides feeling more like the prints publishers or photographers may be used to, the high-opacity paper provides better color saturation.

For prepress proofing, the dye-sub's colors must closely match colors from the printing press. Therefore, most vendors support a variety of color-management schemes. The Eficolor system from Electronics for Imaging (415/742-3400) is popular for prepress color matching, and is supported by RasterOps, SuperMac, GCC, Kodak, Tektronix, and Sony. GCC provides its printers with *profiles*—

descriptions of the printers' color-rendering abilities—for Apple's ColorSync matching system, while Tektronix printers use the proprietary technology. (For background on these and other color-management systems, see "Managing Color," *Macworld*, January 1993.)

One printer, the \$19,500 3M Rainbow, uses color-matching technology similar to that of 3M's Matchprint system, a film-based color proofing system. Supporting a paper size of 17.2 by 11.8 inches (super B size), the 3M Rainbow is the only currently shipping dye-sub printer

that can produce tabloid-size output with bleeds. (SuperMac's ProofPositive Two-Page Printer should join it by the time you read this.) The Rainbow is also the only printer that can directly print desktop color-separation (DCS) files along with any traps and overprints specified in them. Prints cost about \$7 each, while Matchprints can run \$50 or more.

Controllers and Connectors

IN THE THERMAL-WAX WORLD, THE VAST majority of printers provide network ports and built-in PostScript controllers.



How Fast Are the Dye-Sublimation Printers?

■ = Fastest result in test.
Shorter bars are better. Products are listed in order of overall performance, from fastest to slowest. Times are in seconds.

Object-Oriented Graphic

Print speed for a complex color MacDraw Pro document with more than 840 color objects, most of them gradient-filled.

PostScript Graphic

Print speed for graphics that include special PostScript effects. We used a FreeHand illustration with nonlinear blends and Bézier curves.

Presentation Graphic

Print speed for a PowerPoint transparency with a color gradient background and several lines of text in the Times font.

Scanned Image

Print speed for a 910K, 72-dpi, 9 1/2-by-6 1/2-inch scanned Photoshop image with many shadow details.

Sony UP-D7000
GCC Technologies ColorTone
Mitsubishi Intl. ColorStream/DS
Kodak XLT 7720
RasterOps CorrectPrint 300i
Tektronix Phaser IISD
Mitsubishi S3600-30U
3M Rainbow

393
694
791
2369
871
720
1205
1727

235
682
494
413
634
571
844
1363

177
382
305
288
347
477
481
513

216
292
365
259
514
732
915
611



Mitsubishi International ColorStream/DS



Original



Tektronix Phaser IISD



Mitsubishi Electronics America S3600-3OU

Unlike ink-jet and thermal-wax printers, which use dot patterns to represent different shades, dye-sublimation printers mix colors. This yields smooth, continuous-tone images. Compared against the original (top right), the Mitsubishi International ColorStream/DS (this page, top left) shows particularly good color fidelity. See, for example, the difficult-to-render green in "Honderd." In contrast, the Mitsubishi Electronics America S3600-3OU (this page, middle right) unduly lightens all the colors. Only the Sony UP-D7000 (this page, bottom), a 163-dpi unit, shows banding, as seen on the man's face.



Sony UP-D7000

There's a greater variety of connector and controller schemes in the dye-sub field because of the need to move the vast amounts of data present in scanned images from the Mac to the printer as quickly as possible, and because some vendors want more-flexible alternatives to conventional PostScript interpreters.

A LocalTalk network is a bottleneck for printing scanned images; even Ethernet can be inadequate for large files. Besides slowing printing, sending huge scanned images over a network slows down any file servers and electronic-mail systems on the same network. Therefore, printers from 3M, Seiko, Nikon, Sharp, Kodak, and Sony connect to the Mac's SCSI port, which provides the fastest data-transfer rates. These machines also provide print-server software that enables other Macs on a LocalTalk or Ethernet network to print, albeit with those networks' performance limitations.

As for controllers, GCC, Mitsubishi, Tektronix, RasterOps, and Sharp (in the JX-7000PS only) provide built-in Post-

Script-compatible controllers. The 3M Rainbow uses Adobe's software-based PostScript, called CPSI—configurable PostScript interpreter (see "How to Buy a Color Printer," this issue). Because CPSI runs on the Mac, this printer's performance depends on the speed of the Mac it's connected to—and the printer slows down the Mac while printing. You can speed up CPSI-based units (and, for that matter, printers that use PostScript emulators or QuickDraw) by upgrading the host Mac's memory and processor—though this can be a costly option. A service bureau or publishing house should use a Quadra or accelerated Mac II-family machine.

The Sony UP-D7000 and Kodak XLT 7720 Digital Continuous include QuickDraw-based drivers as well as Photoshop export modules that let you print Photoshop images without using the printer's driver. Printing through the export module is generally faster than using the printer's Chooser driver, since

Photoshop has already divided the image into the red, green, and blue components the printer requires. 3M's Rainbow also includes a Photoshop export module, as will SuperMac's ProofPositive.

In the ease-of-use department, GCC Technologies' ColorTone deserves special mention for its oversize front-panel liquid crystal display that displays status messages and options from a well-designed menu system. The ColorTone's controller also includes a built-in hard drive, a SCSI port for an external hard drive, and a built-in Ethernet connector. The internal hard drive also contains the PhoenixPage interpreter, so you can upgrade the interpreter without swapping ROM chips—just download the new software to the printer's hard drive.

Performance and Picks

THE OVERALL PERFORMANCE LEADER IN Macworld Lab tests was Sony's Quick-

Calibration Can Improve Color Fidelity

To get the most out of dye-sublimation, consider using a color-management system. Compared with the original image (middle), standard output from the Kodak XLT 7720 (left) shows an overabundance of yellow, particularly noticeable in the building's thatched roof. After the printer was calibrated using the Kodak ColorSense color-management system, the new output (right) closely duplicates the original, except for the unduly blue cast added to the circular shape at the right side of the image.

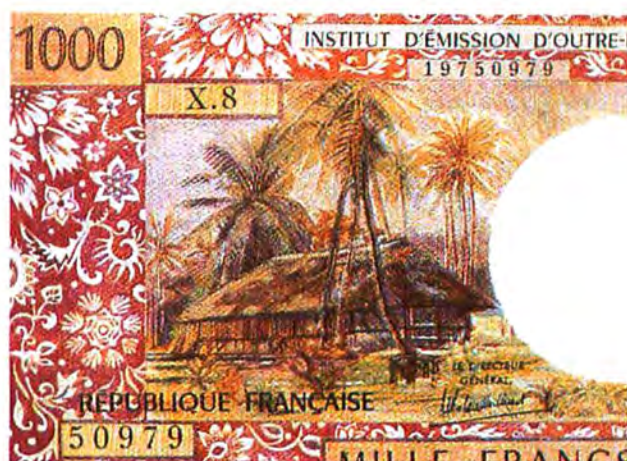
Draw-based UP-D7000, thanks in part to its 163-dpi resolution. (The Mac works harder with more dots to print.) Among 300-dpi printers, GCC's ColorTone took first place, followed by Mitsubishi's ColorStream/DS. These machines' controllers have fast processors—AMD29050 RISC chips. The slowest Photoshop performer was Mitsubishi's S3600-30U equipped with the Q-Script controller.

Which printer to buy? At the low end—if you can call \$8995 low—it's hard to beat Sony's UP-D7000 for electronic photography. It's fast, and Sony's high-opacity paper produces vivid prints with a photographic look-and-feel. The UP-D7000 is also among the most compact printers tested—it looks like an oversize video recorder. The UP-D7000 is not a good choice for prepress proofing, how-

ever. Its 163-dpi resolution hampers text quality, and by the time you buy the \$1495 Freedom of Press Professional PostScript emulator from ColorAge (508/667-8585) you need, you've spent as much as a 300-dpi PostScript dye-sub machine costs.

If you don't need letter-size prints, you might evaluate Nikon's CP-3000D, which retails for \$6995 and produces 5-by-7-inch prints. We didn't test this 203-dpi, QuickDraw-based machine, which includes a Photoshop export module.

If you need built-in PostScript and you can spend a few thousand dollars



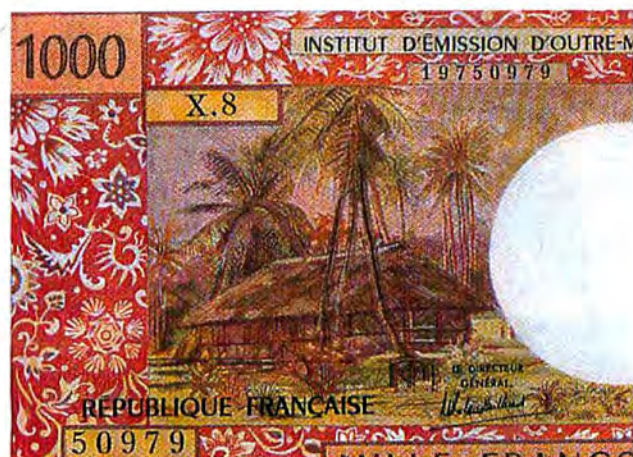
Before calibration

more, consider GCC's ColorTone, Mitsubishi's ColorStream/DS, or Tektronix's Phaser IISD. The ColorStream/DS's high-opacity paper yields excellent results, and at \$9950, it's also the least expensive of the top three. Still, the GCC ColorTone, with its full complement of ports and internal 100MB hard drive, is a great overall value at \$10,999. (The \$9995 Sharp JX-7000PS, not tested, is also worth checking; it offers a built-in 80MB

DYE-SUBLIMATION FEATURES

Company	Phone	Product	Tested by Macworld Lab	Price	Standard Ports/ Optional Ports/ All Active	RAM (base model/ maximum)	Resolution (in dots per inch)	Page- Description Language
3M Company	612/736-3481, 800/362-3455	3M Rainbow	yes	\$19,500	SCSI/1/NA	8MB/8MB	300	Adobe Level 1 (CPSI)
Eastman Kodak Company	716/781-9264, 800/445-6325, ext. 130	Kodak XLT 7720 Digital Continuous	yes	\$24,895 ²	SCSI/none/NA	12MB/12MB	203	QuickDraw
GCC Technologies	617/275-5800, 800/422-7777	ColorTone	yes	\$10,999	E, L, P, S/NA/yes	16MB/64MB	300	PhoenixPage Level 1 ³
Mitsubishi Electronics America	800/733-8439	S3600-30U ⁴	yes	\$12,995	L, P, S/E/yes	46MB/74MB	300	PowerPage Level 1
Mitsubishi International Corporation	914/997-4999	ColorStream/DS	yes	\$9950	L, P, S/E/yes	14MB/38MB	300	Pipeline PowerPage
Nikon Electric Imaging	516/547-4355, 800/526-4566	CP-3000D Full Color Printer	no	\$6995	GPIO, P, SCSI/ NA/no	4MB/4MB	203	QuickDraw
RasterOps Corporation	408/562-4200, 800/729-2050	RasterOps CorrectPrint 300i	yes	\$9999	E, L, S/NA/no	36MB/48MB	300	RIPS Level 1
Seiko Instruments USA	408/922-5800, 800/888-0817	Professional ColorPoint PSH	no	\$9999	L, P, S, SCSI/E, N/yes	16MB/64MB	300	Seiko Page Level 1
Sharp Electronics Corporation	201/529-9593, 800/237-4277	JX-7000 JX-7000PS	no	\$7500 \$9995	SCSI/NA/NA E, L, S/NA/no	8MB/32MB 16MB/48MB	300	QuickDraw PhoenixPage Level 1
Sony Corporation of America	201/930-6576, 800/472-7669	UP-D7000 Digital Color Printer	yes	\$8995	SCSI/NA/NA	9.4MB/9.4MB	163	QuickDraw
Tektronix	503/682-7377, 800/853-6100	Phaser IISD Color Printer	yes	\$9995	L, P, S/E, T/yes	16MB/64MB	300	Adobe Level 2

E = Ethernet; L = LocalTalk; N = Novell NetWare; P = parallel; S = serial. Technical-support ratings are based on a series of calls made to each company by Macworld staffers. Macworld uses a point system, including bonuses and demerits, to derive the final rating. Ratings are for companies, not individual products, and we call only those printer. ² Version that does not print transparencies costs \$19,995. ³ PhoenixPage Level 2 to be available summer 1993. ⁴ B-size, QuickDraw printer also available.



Original



After calibration

hard drive and an Ethernet port.)

The Phaser IISD is slower than the ColorStream/DS and the ColorTone, but provides true Adobe PostScript, Tektronix's TekColor color-management system, and the Photofine technology, which sharpens text and line art. At \$9995, the Phaser IISD also retails for \$1004 less than the ColorTone, although the IISD doesn't include an internal hard drive or an Ethernet port. In our survey,

Tektronix technical support was best, followed by GCC and Kodak.

At the high end, both the 3M Rainbow and the Kodak XLT 7720 are superb printers. The Rainbow has the edge in paper size and overall sophistication, with its Adobe CPSI interpreter and ability to print DCS files. But the XLT 7720 produces stunning results through its QuickDraw driver and its Photoshop export module (many PostScript options are

available from third parties). In all, the Rainbow is the better choice for prepress proofing, while the XLT 7720 is the less-expensive alternative for electronic photography and imaging applications.

With Kodak's Photo CD and Apple's QuickTime fueling the trend toward electronic imaging, dye-sub printers have the potential to be the most popular type of color printer—if only they weren't so expensive. Prices are likely to drop in the next year or two as the market and competition heat up, but don't expect the kind of price-tag free-fall that the last year brought. If you need a dye-sub printer, now is a good time to buy. **m**

Processor/ Clock Rate	SCSI Port for Font Storage	Number of Fonts	Text Antialiasing	Paper Sizes	Technical Support
NA/NA	NA	13	no	SB, A, A4	NA
varies/varies	NA	0	yes	A, A4, 11" x 11"	very good
AMD29050/ 25MHz	yes	35	yes	A, A4, lgl, SA4	very good
AMD29000/ 20MHz	yes	35	yes	A, A4, lgl, SA4	good
AMD29050/ 25MHz	yes	35	yes	A, SA	good
68020/ 16MHz	no	0	no	A5	NA
LSI R33000/ 33MHz	yes	35	yes	A, A4, lgl, SA4	poor
Weitek 8220/ 25MHz	yes	39	yes	A, A4, lgl, A4 lgl, Br	NA
NA/NA	no	0	no	A	NA
not disclosed/33MHz	yes	35	no	A, lgl	NA
varies/varies	no	0	yes	A, A4	good
AMD29000/ 24MHz	yes	39	no	A, A4, lgl, SA4	excellent

(posing as customers) to gauge the accessibility, helpfulness, and accuracy of the company's support technicians. companies whose products Macworld Lab tests. * Any interface available to host Mac becomes available to

Contributing editor JIM HEID is coauthor (with Peter Norton) of *Inside the Apple Macintosh* (Brady, 1992) and author of *Macworld Complete Mac Handbook* (IDG Books Worldwide, 1992).

Macworld Lab testing supervised by MARK HURLLOW.

MW

EDITORS' CHOICE

ColorStream/DS One of the fastest printers reviewed here, the ColorStream/DS produces beautiful results on its high-opacity paper, although small text is a bit fuzzy. The ColorStream/DS is also the least expensive of the top machines tested. **Company:** Mitsubishi International. **List price:** \$9950.

Phaser IISD Color Printer Boasting Adobe Level 2 PostScript, Tektronix's Photofine text-enhancement technology, and TekColor image-enhancement technologies, the Phaser IISD is an excellent choice for presenter and publisher alike. **Company:** Tektronix. **List price:** \$9995.



Editors' Choices Elsa asked Sam to play it again, for old times' sake, and everyone knows what happened. Macworld Lab has tested monochrome monitors again, not for old times' sake but for our readers' edification, and the result is an Editors' Choice list that includes Sigma Designs' SilverView Pro (upper left), Mobius Technologies' MD 202 Two Page Display (upper right), and Mirror Technologies' 15-Inch Gray Scale Portrait Display (bottom).

Here's Looking at

MONOCHROME MONITORS

Macworld Lab tests 25 displays of all sizes

It may be true that a kiss is just a kiss and a sigh is just a sigh, but when it comes to purchasing a monitor, things are not quite so simple. You must decide between monochrome (whether black-and-white or gray-scale) and color, evaluate a wide array of products, measure price versus quality, and finally, determine the best alternative.

To help those who are in the market for a monochrome monitor, Macworld Lab decided to round up the usual suspects—25 monitor-and-board systems from 9 vendors—and put them through their paces with a series of measurement tests; a panel of Macworld editors conducted a series of complementary perceptual tests. We also tested monitors that are sold without video-display boards if they work with a Mac's built-in video, since all new Macs come with built-in video. Armed with these results, you won't be misinformed (unlike Rick Blain, who went to Casablanca for the waters) and will be able to make an intelligent purchasing decision.

We tested systems, as opposed to just monitors or just boards, because most large-screen manufacturers design their monitors with a specific video-display board in mind, and they frequently sell the two as a bundle, often at a better price than if purchased separately. Many users prefer the simplicity of this sort of one-stop shopping.

Overall, our measurements and perceptual tests show that the quality level of monochrome systems is high. We have our favorites, of course (unlike Rick, we're not completely neutral about everything), but, with a few exceptions, we feel we'd be in pretty good shape with just about any of the monitors reviewed here.

On This You Can Rely

WHY BUY A MONOCHROME MONITOR WHEN EVERYONE SEEMS TO BE SO ENAMORED of color displays? For one thing, while Ilsa Lund may be willing to be overcharged, you shouldn't be so sanguine. Color is expensive—considerably more expensive than the cost of a comparable monochrome system. Also, images displayed on monochrome monitors tend to be sharper—and thus the text clearer—than on color monitors. If you work mostly with words and numbers, the purchase of a color monitor could well be something you come to regret; maybe not today, maybe not tomorrow, but soon, as your eyes tire from reading less-than-perfect text.

Of course, on a monochrome monitor you won't be able to tell that the Germans wore gray and Ilsa wore blue or whether Rick's eyes are really brown. But in a monochrome world, you can place a scarlet macaw in an exterior shot of the Blue Parrot Bar and no one will be the wiser.

As for black-and-white versus gray-scale, the choice depends on the tasks to be performed. Rick's Café Américain was closed by the *préfet de police*, but if it were still in

by Robert C. Eckhardt



Portrait Displays Rick took no chances, not even with his friend Captain Renault. You won't be taking any chances, either, if you choose Radius's Pivot Display (left), one of *Macworld's* favorites, or the MD 102 One Page Display from Mobius Technologies (right).

operation, I'd recommend a black-and-white display for a letter writer and number cruncher like Carl, the waiter/bookkeeper. Black-and-white displays are cheaper, their text is as good as it gets, and they are faster and more responsive than gray-scale (or color) displays.

Editing scanned photos, creating many kinds of PostScript art, and previewing color art in monochrome all require a monitor that can display as many as 256 shades of gray. Thus, for the Café Américain graphics department, I'd recommend spending more to have a gray-scale monitor. For anyone who spends most of the day working with large gray-scale images, I'd also consider the purchase of a video-display board that includes acceleration. Although most such boards are designed for use with color monitors, they work well with gray-scale monitors, too. For 256 shades of gray, an 8-bit board is sufficient (don't buy a 24-bit board thinking you'll get even more levels of gray—gray scale doesn't get any better than 256 shades).

It's Not the Same Old Story

IN THE LAST TWO YEARS, A MAJOR change has complicated the marriage of monitor and video-display board: most Macs since the IIx now contain built-in video circuitry (on-board video) that can handle 15-inch and larger monitors. With these Macs, you can attach compatible monitors directly to the video port. You don't have to buy and install a separate

video board (although you can if you want). With the built-in video, you get 16 or more levels of gray, depending on the configuration (see "How Many Grays Does Your Mac Support?").

But just as Ilsa faced important trade-offs between taking the plane to Lisbon with Victor or staying in Casablanca with Rick, there are trade-offs between using built-in video and installing a separate video-display board. You paid for built-in video when you bought the Mac and there's no need to open the system unit and install a board. But built-in video is slower than a separate video board (more so with graphics than with text), especially in the PowerBooks, the IIsi, and IIfx, so it may be a false economy.

There's Something You Should Know

MONOCHROME DISPLAY SYSTEMS FALL into four groups. The first cut separates black-and-white from gray-scale. Each of these two groups can then be divided according to the size of the monitor: portrait displays and two-page displays.

Small Display The one exception to this size scheme is Apple's Macintosh 12" Monochrome Display, a low-cost landscape monitor with the same 640-by-480-pixel resolution as that of a standard 14-inch color monitor. Now, we don't mind an inexpensive monitor (which this one decidedly is), but we do object to a cut-rate one. This monitor failed our perceptual tests for sharpness, has a strong blue cast that makes it appear especially dim,

and displays about half the area of a portrait monitor. Thus we don't recommend the Apple 12-inch monitor to anyone intending to work long hours at the computer. But its rock-bottom price makes it appropriate on a server whose monitor is viewed only rarely.

Portrait Displays Virtually all portrait displays display 640 by 870 pixels, just big enough for a standard, letter-size page. The only exception is Sigma Designs' SilverView Portrait, which we cover in the section on two-page gray-scale displays. It displays 870 by 1152 pixels, which is about the size of a tabloid page (11 inches by 17 inches). Portrait monitors are ideal for wordsmiths who want to see as much text as possible at one time, yet don't want the inconvenience or expense of a big screen. But portrait monitors should be avoided by those whose visual domain tends to be horizontal (landscape-oriented graphics or two-page spreads, for example).

A marked contrast to most monitors' fixed orientations is the Radius Pivot Display, which can be run either as a portrait monitor or as a small landscape monitor.

Two-Page Displays Despite their name, most two-page monitors cannot display two full pages side by side. A 19-inch monitor usually displays an area of 1024 by 768 pixels (which crops about an inch off the top and bottom and two inches on each side of a full two pages); a 21-inch monitor usually displays 1152 by 870 pixels (which crops about an inch right and left).

Despite the misnomer, two-page displays are prized by spreadsheet artists (who tend to accumulate columns faster

HOW MANY GRAYS DOES YOUR MAC SUPPORT?

Macintosh	Portrait Displays (640 by 870 pixels)	Two-Page Displays (up to 1152 by 870 pixels)
Centris 610, 650 *	16	16
Centris 610, 650 †	256	256
IIsi, IIfx	16	†
IIfx	256	†
LC III *	16	†
LC III †	256	†
PowerBook 160, 180	256	†
PowerBook Duo 210, 230	256	†
Quadra 700 *	16	16
Quadra 700 †	256	256
Quadra 800, 900, 950	256	256

* With base amount (512K) of VRAM. † With VRAM expansion. ‡ Monitor size not supported; video-display board is required.

than rows) and graphic designers (especially those who work with double spreads or large graphics) almost as highly as letters of transit were valued by Casablanca's transient population.

In two display systems—Sigma Designs' MultiMode 120 and L-View MultiMode—you can change the pixel density of the display, which in essence lets you zoom in or out. Both systems let you select any of six pixel densities from 36 dpi to 120 dpi (with six corresponding pixel dimensions, from 512 by 384 to 1664 by 1200 pixels), which is a little like choosing from among the large-type, standard, and microfiche editions of *Reader's Digest*. Conveniently, you can change pixel density on these two monitors as you work, without restarting the Mac, which is handy if you are editing text but occasionally want to zoom out to preview how the text fits in its two-page spread, or if you want to use a large monitor in a presentation.

Black-and-White Portrait Displays

MACWORLD LAB TESTED NINE portrait displays; three of these we tested as black-and-white monitors: the Lapis Technologies Full Page Display, Mirror Technologies 15-Inch Gray Scale Portrait Display, and Mobius Technologies One Page Display (sold in two versions, one that uses built-in video, and one that requires a video-display board). With the appropriate third-party video-display board, the Mirror monitor can display gray scale.

The Mirror portrait monitor has a paper-white screen phosphor. Phosphors in the other two are bluish. The Mobius and Mirror monitors are distinctly brighter than the Lapis monitor in both measurement and perceptual tests (see "Monochrome Monitor Quality"). Measurement tests of contrast placed the Mobius and Lapis monitors at the top, while in tests of perceived contrast, the panel again preferred the Mobius and the Mirror monitors. Lab tests for distortion ranked the Mobius monitor the best; the Lapis monitor shows a slightly—but not significantly—greater departure from the straight and narrow.

The human eye is one of the best and most reliable instruments for measuring sharpness and focus. Our panel of editors thus cast a wary eye toward the four

black-and-white portrait monitors and judged the Mirror monitor to be the best, with sharp focus over the entire screen. The panel rated the Mobius monitor second best (it is slightly out of focus on the edges), and the Lapis third.

Flat screens are a big plus in portrait displays—the more a screen curves, the more the images it displays appear to be falling over backward—and the Mobius screen is about as flat as they come. The other two portrait displays have slightly curved screens.

favorite black-and-white portrait system is the Mirror display; the Mobius One Page comes in a close second.

Gray-Scale Portrait Displays

MACWORLD LAB TESTED SIX GRAY-scale portrait displays: the Apple Macintosh Portrait Display, Lapis Technologies Full Page Gray Scale Display, Radius Full Page Display System and Pivot Display, RasterOps Monochrome/Gray Scale Portrait Monitor, and Sigma Designs PageView GS. The PageView is the only such



Two-Page Displays While Victor was completing arrangements for the Lisbon plane, Rick told Ilsa that he had a job to do, alone. You have a job to do, too, but it requires a video-display partner. If you need a two-page display, consider teaming up with Sigma Designs' L-View MultiMode (right) or the pricier MultiMode 120 (left), both of which are on the Editors' Choice list, or SuperMac's Platinum 20 Full-Page Display (center).

The Mobius has the power switch and brightness and contrast controls on the side. The other two monitors all have the power switch and brightness control placed more conveniently on the front, but like Captain Renault, we were shocked, shocked to discover that their contrast control is at the back and requires a screwdriver. None of the three let you set the brightness greater than the optimum level. That's too bad, because as time goes by, the screen phosphor ages and brightness tends to decline. If the brightness control can be turned up higher than the current optimal setting, you can compensate for the monitor's natural aging. If the monitor must be set at optimum brightness from day one, you can't compensate later on. Overall, the panel's

monitor we tested using built-in video, which it requires; we ran it with a Mac IIci, which can generate only 16 gray levels. The Apple Portrait was tested with an Apple video-display board, since discontinued in favor of built-in video, that generates only 4 shades of gray. Used with built-in video, the monitor produces up to 256 gray shades. We tested it at both 4 and 256 gray shades.

The phosphor color of all six monitors is on the blue side. All are relatively bright (the Sigma PageView and Lapis Full Page somewhat less so than the Apple Portrait) with good contrast. Only the Lapis and RasterOps monitors let you adjust brightness above the optimal position. Distortion is acceptably low (lowest in the PageView), and the Sigma Page-

View and Apple Portrait have the flattest screens. The Apple Portrait did only fairly in the sharpness test (the entire screen appears to be slightly out of focus); focus on the PageView is a problem toward the bottom of the screen. The RasterOps is slightly blurry all over.

In their ability to clearly distinguish a full range of gray levels, the Sigma PageView and Radius Pivot top the list in both measurement (gray linearity) and perceptual tests. The Lapis Full Page fares poorly in the gray-scale linearity test and received harsh criticism from the panel for a very apparent inability to separate midtones. The Apple Portrait falls squarely in between.

Controls on the Sigma PageView are the most convenient (all three are out front). On the Apple Portrait, brightness and contrast are on the side and the power control is on the back. The Lapis Full Page has the power control on the front, brightness on the side, and, inexcusably, the contrast control is on the back and requires a screwdriver.

Overall, the review panel rated the Radius monitors as the best of the gray-scale portrait displays. In the panel's opinion, however, even the Radius monitors are not up to the standards of the best-rated two-page gray-scale displays. Thus, if you need gray scale and can afford the additional expense, or if your Macintosh

does not have built-in video, we suggest that you skip the portrait displays and purchase one of the recommended two-page systems instead. Otherwise, go for either of the Radius monitors.

Black-and-White Two-Page Displays

WE TESTED FOUR BLACK-AND-WHITE two-page systems: Mirror's 19-Inch Two Page Display and 21-Inch Gray Scale Display, Mobius Technologies' MD 202 Two Page Display, and Sigma Designs' L-View MultiMode. (The 21-inch Mirror monitor we tested came with a black-and-white video-display board; a gray-scale board is also available.)

The phosphor color of the Mobius

MONOCHROME DISPLAYS COMPARED

Company	Product	Tested by Macworld Lab	Monitor List Price	Supports Mac Built-in Video *	8-Bit Video Board List Price	Non-NuBus Macintoshes Supported by Video Board †
SMALL DISPLAYS						
Apple Computer	Macintosh 12" Monochrome Display	●	\$245	●	\$569	none
PORTRAIT DISPLAYS						
Apple Computer	Macintosh Portrait Display	●	\$889	●	\$569	none
Hardware That Fits	RealTech 15" Full Page Display	○	\$449	●	\$429	SE, SE/30, LC series
Lapis Technologies	Full Page Display	●	\$599	○	\$299	SE/30, LC series
	Full Page Gray Scale Display	●	\$799	●	\$499	SE/30, LC series
MacProducts USA	Panasonic M1500	○	\$150	○	\$299 ‡	none
Mirror Technologies	15-Inch Gray Scale Portrait Display	●	\$399	○	\$299 **, §	SE, SE/30, LC series
Mobius Technologies	MD 102 One Page Display **	●	\$499	○	\$199 **	Classic, SE, SE/30, LC series
Radius	Full Page Display System	●	\$699	●	\$459	Classic, SE, LC series, IISI, IISI, Centris series, Quadra series
	Pivot Display	●	\$849	●	\$299	Classic, SE/30
RasterOps Corporation	15" Monochrome/Gray Scale Portrait Monitor	●	\$649	● §§	\$579 to \$699 ¶ ||, §§	Classic, LC series
Sigma Designs	PageView GS	●	\$599	●	†††	†††
TWO-PAGE DISPLAYS						
Lapis Technologies	Two Page Display	●	\$1049	○	\$499 ¶ ¶	SE, SE/30, LC series
MacProducts USA	Panasonic M1900	○	\$299	○	\$299 §	none
Mirror Technologies	19-Inch Two Page Display	●	\$799	○	†††	SE, SE/30
	21-Inch Gray Scale Display	●	\$999	● §§	\$299 **, §	none
Mobius Technologies	MD 202 Two Page Display	●	\$699	○	\$199 **, §	Classic, SE, SE/30, LC series, IISI
Nanao USA Corporation	FlexScan 6500	○	\$1899	●	†††	†††
Radius	Two Page Display/19	●	\$1099	●	\$599 ¶ ¶	SE, SE/30
	Two Page Display/21	●	\$1399	●	\$599 ¶ ¶	SE, SE/30
	Two Page Display 21/E	○	\$1599	●	\$599 ¶ ¶	SE, SE/30
RasterOps Corporation	21" Monochrome/Gray Scale Monitor	●	\$1299	●	\$579 ¶ ¶	Classic
Relax Technology	Ikegami DM2010	○	\$799	○	\$200 ¶¶¶	SE/30, LC series
	Sampo OfficePro IIa	●	\$599	○	\$200 ¶¶¶	SE/30, LC series
Sigma Designs	L-View MultiMode	●	\$1099	○	\$299	SE, SE/30, LC series
	MultiMode 120	●	\$1099	○	\$1299	none
	SilverView Portrait	●	\$1299	○	\$799	none
	SilverView Pro	●	\$1299	●	\$549	SE/30
SuperMac Technology	Platinum 20 Full-Page Display	●	\$1099	●	\$499 ¶ ¶	LC series
	Platinum 21 Two-Page Display	●	\$1199	● ¶¶¶	\$499 ¶ ¶	LC series

● = yes; ○ = no; NA = not applicable. Technical-support ratings are based on a series of calls made to each company by Macworld staffers (posing as customers) to gauge the accessibility, helpfulness, and accuracy of the company's support technicians. Macworld uses a point system, including bonuses and demerits, to derive the final rating. Ratings are for companies, not individual products, and we call only

those companies whose products Macworld Lab tests.

* For portraits, this includes the Quadras, PowerBooks 160 and 180, and PowerBook Duos with docking stations, unless noted. For two-page displays, this includes only the Quadras and PowerBook Duos with docking stations, unless noted.

† All boards may be installed in Macs with a NuBus slot.

‡ B&W indicates a black-and-white monitor; Quadra 700 supports only 16 levels of gray with standard amount of video RAM.

§ Supports only 16 levels of gray on LC and LC II.

¶ Company does not provide technical support.

¶ Board is 1-bit.

** Price is lower if purchased with monitor.

and Mirror monitors is on the blue side (the 21-inch Mirror monitor decidedly so), while the color of the Sigma L-View tends toward green. The Mirror 19-inch monitor is the brightest in both measurement and perceptual tests, while the Mirror 21-inch is the dimmest; the other two monitors fall about midway in between. None let you adjust brightness above the currently optimal position.

The Mirror 21-inch tops the list in contrast measurements, but because it is so dim its perceived contrast actually falls at the bottom of the list (alongside the Sigma L-View). Perceived contrast is best in the Mobius and Radius monitors and second best in the Mirror 19-inch.

The winner in the sharpness test is the Sigma L-View. Both Mirror monitors, on the other hand, are the losers here: the Mirror 19-inch monitor's screen appears slightly out of focus, and the Mirror and RasterOps 21-inch monitors' screens show subtle ghosts next to vertical lines, such as the vertical strokes of letters and numbers. In measurements of distortion, the Mirror 21-inch and the Sigma L-View monitors have the least; distortion is slightly greater in the other two monitors. Physically, the Mirror 21-inch monitor has the flattest screen; all the others display a slight curve.

Power, brightness, and contrast controls are all on the front of the Mobius

Does 72 dpi Matter?

The built-in monitors of the original compact Macs displayed 72 dots per inch, and hardware manufacturers used to adhere to this standard to ensure that what you saw on the screen precisely matched the size of the printed version. But manufacturing realities—and the fact that few people need or expect the size of an object on screen to correspond exactly to the printed result—have changed all that.

These days, the pixel densities of monitors (including Apple's) range from 72 dpi to 82 dpi; the higher the density, the more condensed the image. For most people, these pixel densities are not significantly different. When choosing a monitor, worry less about the dpi value itself and more about how the image feels to you when you view it.

Screen Diameter (in inches)	Active Screen Area (w x h, in inches)	Gray Levels [†]	Customer Contact: Toll	Customer Contact: Toll-Free	Technical-Support Rating
12	8.4 x 6.3	256 [§]	408/996-1010	none	"
15	8.0 x 10.9	256	408/996-1010	none	"
15	7.8 x 11.7	256	none	800/364-8737	NA
15	7.8 x 10.9	B&W	510/748-1600	800/435-2747	good
15	7.8 x 10.9	256	510/748-1600	800/435-2747	good
15	7.5 x 10.2	B&W	512/472-8881	800/622-3472	NA
15	8.0 x 10.9	B&W ^{††}	none	800/654-5294	good
15	8.2 x 11.0	B&W	510/654-0556	none	excellent
15	12.5 x 14.3	256	408/434-1010	800/227-2795	good
15	7.8 x 10.5	256	408/434-7010	800/227-2795	good
15	7.5 x 10.4	256 ^{***}	801/785-5750	800/729-2656	very good
15	8.0 x 10.7	256	510/770-0100	800/845-8086	good
19	13.8 x 10.8	256	510/748-1600	800/435-2747	good
19	16.7 x 13.7	B&W	512/472-8881	800/622-3472	NA
19	14.2 x 10.7	B&W	none	800/654-5294	good
21	15.0 x 11.3	256 ^{††}	none	800/654-5294	good
19	13.7 x 11.0	B&W	510/654-0556	none	excellent
19	15.4 x 11	256	310/325-5202	800/800-5202	NA
19	14.1 x 10.8	256	408/434-1010	800/227-2795	good
21	15.5 x 11.9	256	408/434-1010	800/227-2795	good
21	15.5 x 11.9	256	408/434-1010	800/227-2795	good
21	19.2 x 18.4	B&W ^{***}	801/785-5750	800/729-2656	very good
19	14.2 x 10.7	256	510/471-6112	none	poor
19	14.2 x 10.7	256	510/471-6112	none	poor
19	14.0 x 10.5	B&W	510/770-0100	800/845-8086	good
19	14.1 x 10.2	256	510/770-0100	800/845-8086	good
21	16.0 x 12.0	256	510/770-0100	800/845-8086	good
21	16.0 x 12.0	256	510/770-0100	800/845-8086	good
19	14.2 x 10.6	256	408/245-2202	800/334-3005	satisfactory
21	15.0 x 11.2	256	408/245-2202	800/334-3005	satisfactory

^{††} Gray scale available only with Mac built-in video or third-party board.

^{††} Also available in a version (MD 103) that supports only built-in video; MD 103 also tested by Macworld Lab.

^{§§} Supports only Quadra built-in video.

^{†††} Lower-cost black-and-white version is also available.

^{§§§} Price depends on Macintosh model that board is

designed for.

^{***} Supports only black-and-white on Classics.

^{†††} Works only with built-in video.

^{††††} Video-display board is included with monitor.

^{§§§} Price is for NuBus board; PDS board costs \$400.

^{§§§§} Supports only Quadra 800 and 950 built-in video.

Two Page and the Radius monitors; they are on the side of the Mirror 21-inch. In the Sigma L-View, the power switch is on the side and the other controls on the front, while on the Mirror 19-inch, brightness and power are on the side (there is no contrast control).

Overall, panel members preferred the Mobius Two Page and the Sigma L-View, more or less in equal measure. Anyone on a budget will undoubtedly prefer the much less expensive Mobius Two Page. Even when you factor in street prices, the L-View is the most expensive of the four—its ability to change pixel densities is in part responsible for this—and for some people, its extra versatility may be worth the added expense. At the opposite extreme, panel members disliked the Mirror 21-inch monitor, and felt it would be a strain to have to work on this monitor for long periods of time.

Gray-Scale Two-Page Displays

GRAY-SCALE TWO-PAGE SYSTEMS MADE up the largest group tested, including Lapis's Two Page Display, Radius's Two Page Display/19 and Two Page Display/21, RasterOps' 21" Monochrome/Gray Scale Monitor, Sampo America's OfficePro IIa, Sigma Designs' MultiMode 120 and SilverView Pro, and SuperMac's Platinum 20 Full-Page Display and Platinum 21 Two-Page Display. (The Sampo monitor is sold by Relax Technology and other direct sellers.) We also include the tabloid-size Sigma Designs SilverView Portrait in this group since it has more in common with these monitors than with

MW**EDITORS' CHOICE****Black-and-White Portrait**

15-Inch Gray Scale Portrait Display This gray-scale display system's paper-white phosphor, sharp focus, and low price add up to an excellent value. **Company:** Mirror Technologies. **List price:** \$399; with video-display board \$549.

Gray-Scale Portrait

Pivot Display Its quality imaging, particularly for gray-scale clarity and text sharpness, plus its pivoting feature make this display system an excellent choice. **Company:** Radius. **List price:** \$849 plus \$299 for video-display board.

Black-and-White Two-Page

MD 202 Two Page Display A competitive price, good contrast, and sharp focus make this system an excellent choice. **Company:** Mobius Technologies. **List price:** \$699; with video-display board, \$798.

L-View MultiMode Six pixel densities, sharp focus, and low distortion distinguish this higher-priced system. **Company:** Sigma Designs. **List price:** \$1099 plus \$299 for video-display board.

Gray-Scale Two-Page

MultiMode 120; SilverView Pro The MultiMode 120 offers six pixel densities for a relatively high price; the SilverView Pro's much lower price makes it an excellent value. **Company:** Sigma Designs. **List price:** MultiMode 120 \$1099 plus \$1299 for video-display board; SilverView Pro \$1299 plus \$549 for video-display board.

the far smaller portrait displays.

The Sigma MultiMode 120 and SilverView Pro and the SuperMac Platinum 21 all have relatively paper-white phosphors. The phosphors of the Radius, Sampo, and Lapis monitors all tend toward blue, while those in the remaining monitors are on the green side.

In terms of brightness, the MultiMode 120, SilverView Pro, and Sampo are at the top according to both measurement and perceptual evaluations. Dimmest of the group is the Lapis Two Page, while the remaining are all in between (and perfectly acceptable). The Platinum 20, Platinum 21, and RasterOps 21-inch all let you adjust brightness above the currently optimal position. Measurement tests of contrast rate the RasterOps 21-inch monitor best, the Platinum 20 and the Lapis Two Page worst, and all the others good or better. Perceived contrast tests place the Sigma MultiMode 120 at the top and the Radius 19-inch and 21-

inch, Sampo, Sigma SilverView Pro, and SuperMac Platinum 21 not far behind. Perceived contrast in the Lapis Two Page was poor. We also did a perceptual test on the Ikegami DM2010 (sold by several vendors), which arrived too late for lab measurement.

The highest marks in perceived sharpness go to all three Sigma monitors. The RasterOps 21-inch monitor, which has a ghosting problem similar to the Mirror 21-inch's, and the Radius 19-inch display receive the lowest marks, while grades for all the others are very good. Distortion is negligible in all monitors.

Gray-scale linearity tests place the SilverView Pro and RasterOps 21-inch monitors at the top of the rankings and the Lapis Two Page at the bottom, but perceptual ratings by the panel do not entirely agree. The panel rates the RasterOps 21-inch, Sigma MultiMode 120,

and SuperMac Platinum 20 and Platinum 21 equally high in gray-scale rendering; the Sampo and Lapis Two Page monitors received the lowest marks.

All the gray-scale two-page monitors have both brightness and contrast controls; these controls and the power switch are relatively convenient in all but the SilverView Portrait. Because that monitor stands on end, the power switch ended up underneath and toward the back, where it is difficult to reach.

Overall, the panel's gray-scale favorites are the Sigma MultiMode 120 and SilverView Pro. The MultiMode 120 is the one of the most expensive, but as with the L-View, some may find its multiple pixel densities worth the added expense. We think most people will take to the SilverView Pro's lower cost, which makes it a great value. The panel rated the Ikegami DM2010, SuperMac Platinum 20 and

**Monochrome Monitor Quality**

■ = Best result in test
B&W = Monitor displays only black and white

For perceived quality results:



Small Display
Apple Macintosh 12"

Portrait Displays

Apple Macintosh Portrait
Lapis Full Page
Lapis Full Page Gray Scale
Mirror 15-Inch Gray Scale
Mobius MD 102, 103 One Page
Radius Full Page
Radius Pivot
RasterOps 15" Mono/Gray Scale
Sigma PageView GS

Two-Page Displays

Lapis Two Page
Mirror 19-Inch Two Page
Mirror 21-Inch Gray Scale
Mobius MD 202 Two Page
Radius Two Page/19
Radius Two Page/21
RasterOps 21" Mono/Gray Scale
Sampo OfficePro IIa[†]
Sigma L-View MultiMode
Sigma MultiMode 120
Sigma SilverView Portrait
Sigma SilverView Pro
SuperMac Platinum 20
SuperMac Platinum 21

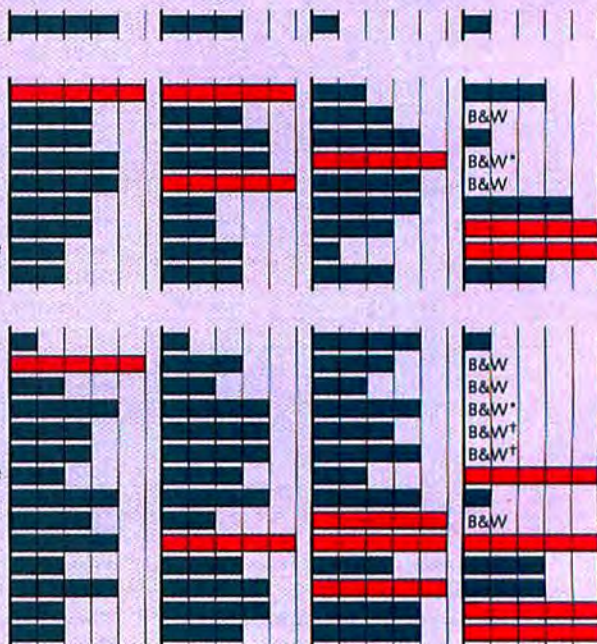
PERCEIVED QUALITY**Brightness Contrast Sharpness Gray Scale**

A monitor's color cast can fool the eye into seeing the monitor as darker than its measured brightness (blue casts do this most).

A monitor's brightness level determines whiteness, while the electron beam's control circuitry determines blackness.

Slightly inaccurate electron-beam controls result in faint shadows behind objects; a greater inaccuracy leads to fuzziness.

Most monitors' electron-beam controls overly darken dark grays and overly lighten light grays, causing blurry highlights and shadows.



* Can display gray scale with third-party video-display boards.

† Can display gray scale with color RasterOps board.

‡ Sold by several vendors.

Platinum 21, and the two Radius monitors only slightly behind its favorites; in terms of street price, all three vendors' 19-inch models are a very good value.

The panel rated the Sampo display as very good except for gray-scale display. With one of the lowest prices, this is a definite candidate for the financially strapped—especially for people who don't do gray-scale work. The Lapis Two Page came out as lowest in quality overall.

One two-page gray-scale monitor we received too late to formally test—the Nanao FlexScan 6500—requires built-in video or a third-party video-display board. Perceptually, the paper-white Nanao appears to be a very good, but not excellent, display. An optional \$65 cable lets you change pixel densities. However, unlike with the Sigma Designs Multi-Mode displays, you must restart the Mac to change the Nanao's resolution.

The odd man out is the SilverView Portrait, which the panel deemed a very good product. This large portrait display is specifically designed for viewing tabloid-size publications one page at a time. If this is the way you work, you may find the SilverView Portrait worth its hefty price tag; most everyone else will prefer one of the more standard systems.

You Must Remember This

MACWORLD LAB TESTED ALL MONITORS for emissions of extremely-low-frequency radiation. There is, as yet, no scientifically determined range within which ELF emissions are deemed safe or unsafe, but *Macworld's* rule of thumb (less than 1.5 milligauss—equivalent to typical background radiation levels in an office—28 inches from the display), when applied against our test results, indicates that none of the emissions from any of the

tested monitors are out of the ordinary.

Not so long ago, monitor shopping was a time-consuming process, by the end of which you began to think you'd been doing this all your life. But now the differences between most monochrome monitors are not great and quality, for the most part, is high, so you can spend more time thinking about special details of interest to you and less worrying about whether the fundamental things apply. And hitching up a high-quality monitor that has all the little extras you want—that, my friend, is just the beginning of a beautiful friendship. **m**

When he's not contemplating Macintosh matters, contributing editor ROBERT C. ECKHARDT travels the rivers and backroads of Central America in search of Mayan ruins.

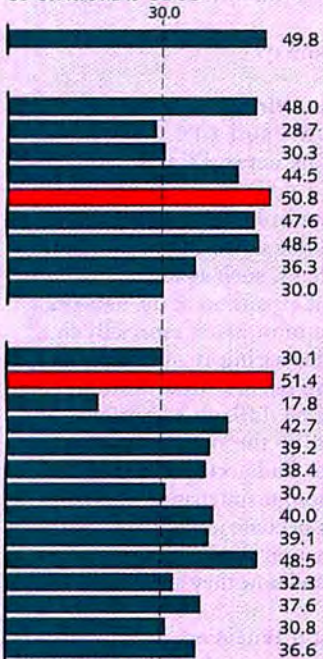
Macworld Lab testing supervised by TIM WARNER.

MEASURED QUALITY

Maximum Brightness

Most people prefer a brighter monitor. We turned up the screen's brightness as high as it could go without showing scan lines. A monitor that puts out less than 20 footlamberts is considered dim.

30 OR MORE IS GOOD

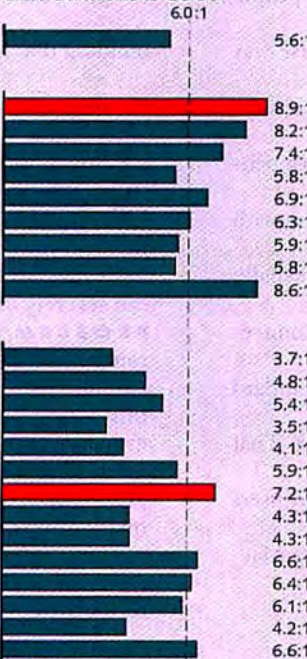


Footlamberts

Contrast Ratio

The better the contrast ratio, the better you can see details in both light and dark areas of an image. We calculated the ratio between the luminance of white and black squares throughout the screen.

6.0:1 OR MORE IS GOOD



Ratio of white luminance to black

Distortion

The greater the difference (the bar's length) between the screen's minimum distortion and its maximum distortion, the more noticeable the distortion will be. A difference of 0.0 is perfect.

Minimum Difference Maximum

8.0 OR LESS IS GOOD



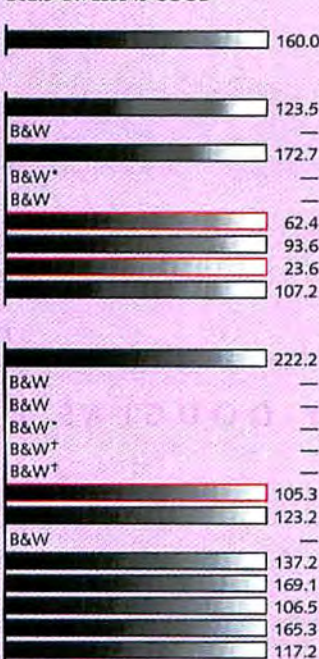
64ths of an inch

Gray Linearity

Gray linearity shows how accurately a monitor displays shades of gray across the spectrum from black to white. Perfect linearity measures 0. The worst possible linearity is 900.

Ideal spectrum

202.5 OR LESS IS GOOD



Total of variances from ideal values in 12 tests

BUILDING AN EXPANDABLE NETWORK

The design of most Macintosh networks belies their bootleg history. At many companies, Macs were brought in through the back door and were not supported by the company's technicians and computer managers. This meant that the average Macintosh network first consisted of a connection between one Mac and its printer. Frequently the next step was to connect a few more devices in a daisy chain so that people could share the printer, but little else was usually done. Although Apple has always had a LocalTalk wiring standard, most people opted to connect network devices with low-cost LocalTalk connectors (usually Farallon Computing's PhoneNet Connector)

BY DOUGLAS E. WELCH

and standard phone wire. That cheap, ad hoc solution helped everyday users solve the basic problem of connecting Macintoshes and peripherals.

Macs are now an important part of corporate life, and LocalTalk is no longer suffi-

cient for the large Mac networks in corporate environments. Still, a little planning can help anyone turn an ad hoc Mac network into a full-fledged, high-speed communications highway that everyone can use. The following tips for five basic areas of network design should put you well on your way to building that highway.

1. Upgrade the Wiring

APPLETALK, THE BUILT-IN PROTOCOL used on LocalTalk networks, was designed to be used on a variety of wiring types, including the standard phone wires that run through most office walls. But such wiring can cause problems, such as lost data, and can severely limit expansion of the network.

PROBLEM In most cases, especially in a rented space, the wiring is owned by the landlord, not the tenant. Modifications to this wiring may be difficult to perform or even prohibited by the owner. Also, it is often difficult to find accurate wiring diagrams. Installation, maintenance, and troubleshooting can become a nightmare without basic information about where the wires are in the walls and how they are spliced and terminated.

The costs of maintaining a phone-line-based network are extremely high when you factor in the amount of wasted support time and lost productivity when the network fails.

SOLUTION When planning for new wiring in an office or building, consider future uses. Some unused areas may later become offices, printer stations, or cubicles—where you'll want to have nodes. Wire all areas at installation time so that

Existing phone wiring may work fine for 20 or 30 devices, but device number 31 might cause problems across the entire network. So, while phone wiring can be used to start a network, it is in everyone's best interest to develop plans for using

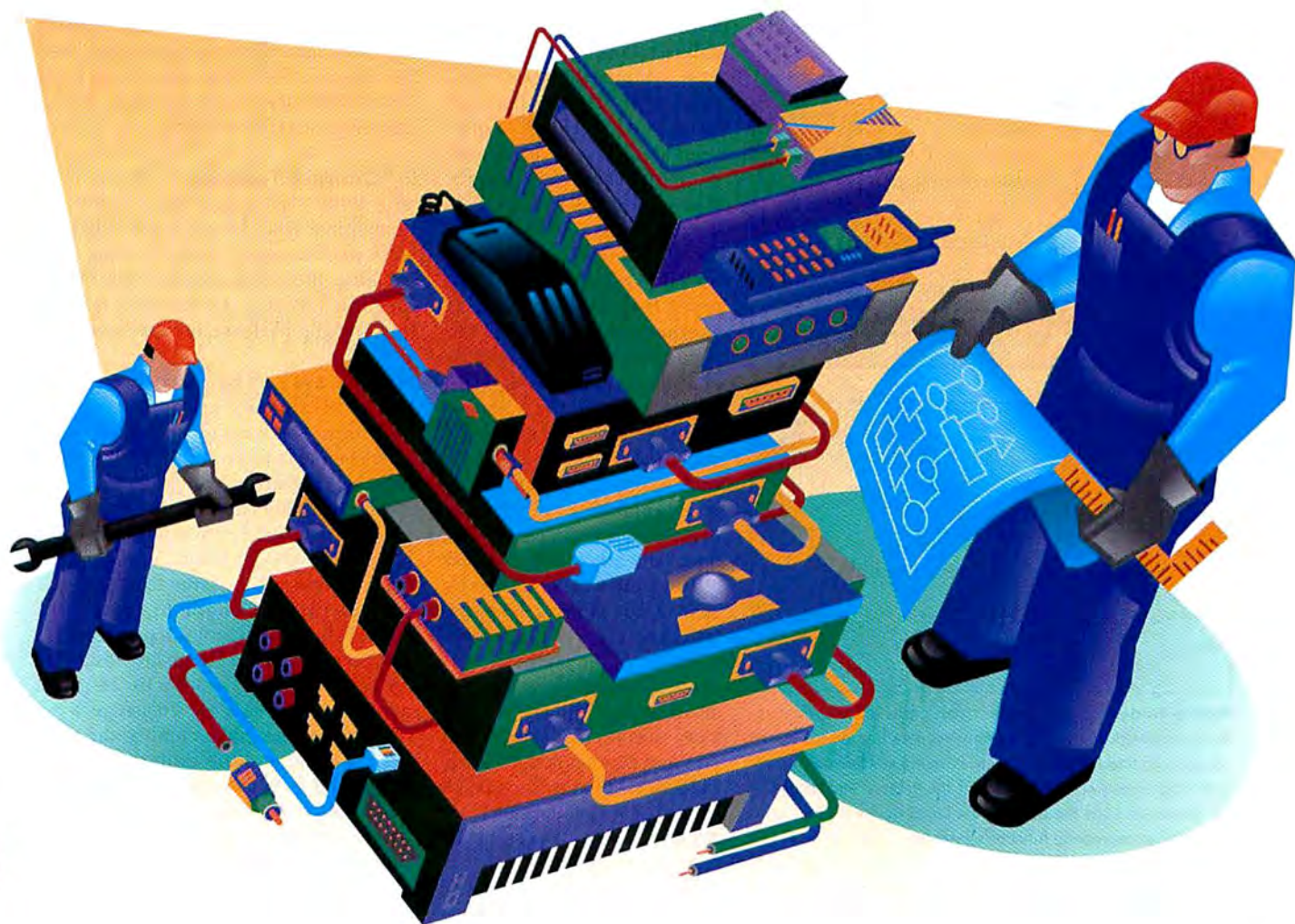
PLANNING AHEAD WILL SAVE YOU HEADACHES LATER AS YOUR MAC NETWORK GROWS

you can extend the network to those areas as you convert them from unused space to someone's desk or printer space.

PROBLEM The line quality of internal phone wiring is an unknown. Poor-quality wire makes it difficult to expand a network to provide for higher-speed protocols like Ethernet or Token Ring. The AppleTalk protocol, partly because of its slow transfer rates and protocol design, works well over lines of uneven quality. But higher-speed protocols are more sensitive to line quality. If the wiring is poor, networks based on these protocols can experience unacceptable errors during data transmission or can even cease to function.

dedicated network wiring to support future growth. By providing your data with the best possible path to follow, you will be creating a good foundation for the rest of the network.

SOLUTION Select the proper type of wire. United Laboratories (known best for the UL fire-prevention certification seen on many devices) provides a five-level standard for deciding which type of wire fits your present and future needs. Level 1 is for data rates below or equal to 200 kilobits per second (Kbps), which is the transfer rate of a standard LocalTalk connection; Level 2 is for 4 megabits per second (Mbps) and slower; Level 3 is for 20 Mbps and slower (Ethernet's 10-Mbps



speed fits in this level); and Levels 4 and 5 are for speeds of up to 200 Mbps.

TIP Wall jacks are rated by using the same system as wires use. Make certain that you match, for example, Level 3 wire with Level 3 wall jacks, or Level 2 wire

connections as the floor plan develops. By working with designers and contractors, you can create a network wiring plan that will meet your needs for many years to come.

TIP Most offices already have an ad hoc

UPGRADE YOUR NETWORK ONE SECTION AT A TIME TO KEEP IT OPERATIONAL

with Level 2 jacks.

TIP Put in more wire than you think you need. A good rule of thumb is to install 1½ times the wiring needed to support the current usage. This gives you room to grow and offers flexibility in network setup. For example, LocalTalk cabling requires two wires (one pair), Ethernet requires four wires (two pairs), and voice/fax/modem lines require two wires (one pair). With 4-pair wiring (8 wires) you can use all these features in the same office at the same time. (No matter how many pairs are used, this cabling is called *twisted-pair wiring*.) And you can have multiple connections if offices will be shared or if they will contain more than one computer or peripheral device.

Expect to spend about \$100 for every cable installed, including the cost of termination, testing, and installation of the wall jacks at each end.

TIP Standardize on wall jacks that can support all future networking types. Equipping all wall jacks with the RJ-45 connectors ensures that LocalTalk, Ethernet, Token Ring, and voice lines can all use the same jack and the same wiring. That way, to move from one protocol to another you just change the connection in the wiring closet and add a new cable from the computer to the wall jack. No new wiring or wall jacks are required.

TIP Consider phone service when planning a network installation. Perhaps you can have network wiring installed at the same time and thereby spare some contractor costs. This also ensures that everywhere a phone connection is made a network connection is also installed, and vice versa.

TIP Install the wiring when you move into a new building or office. That's the easiest time to do it, since there are no worries about keeping an existing network operating, and you can decide on the placement of wiring and con-

network, which needs to remain operational while being upgraded. The secret to dealing with this situation is to upgrade the network wiring slowly, one section (20 to 30 Macs) at a time.

If the Macs are connected via existing phone wiring, you can put new wiring in place without disturbing the current network. After the new network wiring is in place and has been tested, one evening or weekend is usually enough time to reconnect the Macs and confirm that everything is working properly.

How do you know the new network is working properly? First, have the wiring contractor check the wiring for electrical continuity and other errors to ensure that no damage occurred during installation. Then, using a portable Mac, if you have one, test each connection to confirm that all file servers and printers can be recognized and accessed (see "Testing Nodes"). Also, print a test page (from any node) to each printer to ensure that printing is also working.

2. Choose a Topology

THE WIRES FOR EACH DAISY-CHAINED branch in a typical large LocalTalk network all converge in a central wiring closet. They are connected to each other, forming a passive star network topology (networking parlance for the network's layout).

PROBLEM The electrical signals that travel from one machine to another over the network can go only so far along a wire before fading out. The more wiring you have, the farther the electrical signals must travel; a signal on a passive star must travel through the entire network to get to its intended destination. A network can quickly grow to be so large that it exceeds the severe wire-length limitations of LocalTalk. Length limits depend on wire thickness; common limits are 4500 feet for 22-gauge wire, 3000 feet for 24-gauge wire, and 1800 feet for 26-gauge wire. (The higher the gauge number, the thinner the wire; and the thinner the wire, the greater its resistance.)

SOLUTION One way to overcome wire-length limits is to install a LocalTalk repeater, such as Farallon's PhoneNet StarController; repeaters typically cost about \$1300. These repeaters amplify the

Device: Net: 42004 Node: 190 Boneless Chicken Ranch - Macintosh IIx - Server Zone

Packets: 20 Using: ☐ Echo Pkts ☐ Printer Status Packets ☒ System Info Packets

Interval: 2.5 Secs

Timeout: 1.5 Secs

Packets Sent: Rcvd: 4 Left: 16 Last: 0 Total: 4

	Current	Average	Minimum	Maximum
Hops Away	0	0.00	0	0
Delay (secs)	0.17	0.05	0.00	0.17

Status: Macintosh System File Version 7.0.1, © Apple Computer, Inc. 1985-1991
Macintosh Finder Version 7.0, © Apple Computer, Inc. 1985-1991
Printer Driver: Other Laserwriter 7.0, © Apple Computer, Inc. 1985-1991
Responder: NET Version: 205
AppleTalk Driver Version: 57
AppleShare Version: 7.0

Buttons: Stop, Done, Clear

Device: Net: 42002 Node: 100 marvin - LaserWriter - Server Zone

Packets: 20 Using: ☐ Echo Pkts ☐ Printer Status Packets ☒ System Info Packets

Interval: 2.5 Secs

Timeout: 1.5 Secs

Packets Sent: Rcvd: 3 Left: 19 Last: 3 Total: 3

	Current	Average	Minimum	Maximum
Hops Away	0	0.00	0	0
Delay (secs)	0.00	0.08	0.00	0.23

Status:

Buttons: Stop, Done, Clear

Testing Nodes A program like Apple's InterPoll lets you monitor the network's status by sending test data to a device on the network and tracking whether it arrives. A properly functioning network (top) shows no lost packets (at the Packets Sent section of the screen) and lists the status of the target device (at the Status section). An improperly functioning network (above) shows lost packets and does not list the target device's status. Send test packets to each device to see if there are any trouble spots at a particular device or a particular section of the network.

Ideal Network Growth

A network typically grows in stages. But this evolution can be planned so that the network works well at each stage. The accompanying feature describes in greater detail how to move your network from stage to stage.

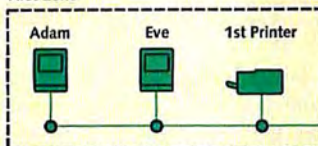
KEY

	Macintosh		Zone
	DOS PC		Router
	Printer		Concentrator
	Server		Repeater
	Patch panel		LocalTalk
	Star controller		Ethernet
			TCP/IP

STAGE 1: Cobbled Networks

Macintosh networks often start as a series of daisy-chained Macs and printers connected by phone wire. This is fine for small LocalTalk networks, since traffic is not an issue.

First Zone

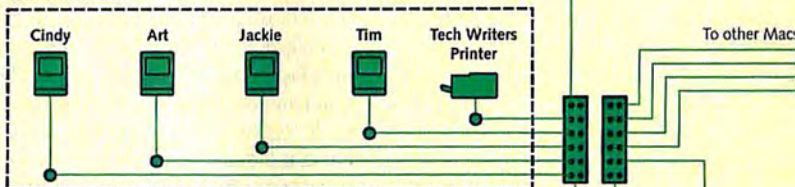


STAGE 2: Small Department

Once you get more than a handful of Macs, you should add a patch panel to connect the Macs so traffic between any two does not depend on the daisy chain working across all Macs. This arrangement is called a star.

You should also replace the phone wire with better wiring designed for networking, and start creating zones and standardizing node names to make it easier to locate nodes.

Tech Writers Zone



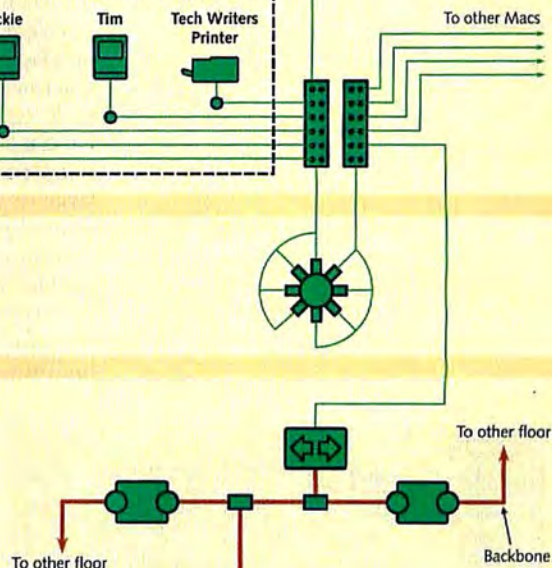
STAGE 3: Large Department

When the network gets large enough that it begins to lose data, you need to add an active star controller to boost the signals between branches on the star.

STAGE 4: Linked Departments

When you connect to other department networks, you should use a high-speed backbone, such as Ethernet. You need a router between each network and the backbone.

If the backbone connects to other floors or buildings, you need a repeater at that connection.



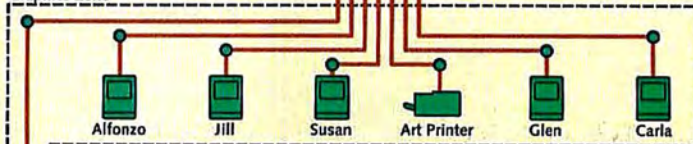
STAGE 5: Corporate-wide Integration

In a mixed network, you link different local networks, typically through an Ethernet hub (such as a patch panel or star controller).

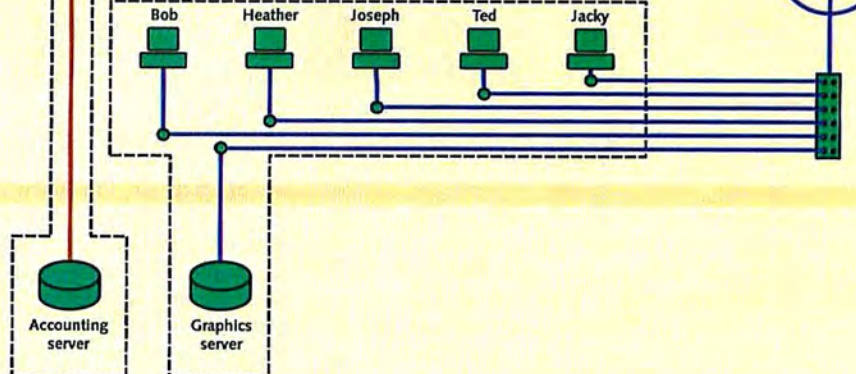
You should also use a concentrator on a non-Mac local network to add expansion options and allow convenient backbone tapping (to add branches). Communication between DOS PCs and Macs is determined by software, not hardware, so routers are not needed. But if large amounts of traffic are involved, routers come in handy, since they filter out specific protocols and make the amount of traffic within each branch manageable.

If the network is robust enough, like Ethernet, all the signals can travel throughout the entire network across multiple platforms. If you have the proper software, you can read any signal from any platform.

Graphics Zone



Accounting Zone



STAGE 6: Massive Shared Data

If you work with large files for graphics and data, you should place the files on dedicated servers.

Servers are also useful for high-volume traffic such as electronic mail.

You may have servers on any network branch, but make sure your highest-volume servers are on a high-speed branch.

LocalTalk signals so they can travel much longer distances. Repeaters also provide some management tools that can, for example, automatically remove a malfunctioning machine from the network and track network traffic (see "Monitor-

work: increased errors, disappearing services, and slow printing speeds.

SOLUTION Upgrade to the next network level: Ethernet, a high-speed data-linking protocol that transfers data at 10 Mbps. (LocalTalk transfers data at 230

ATTACH HIGH-VOLUME SERVERS TO A BACKBONE TO OPTIMIZE TRAFFIC

ing Traffic"). You place repeaters where all network lines terminate, in the wiring closet. Doing so turns the network into an active star, in which a repeater actively amplifies the signals to ensure that they reach every machine on the network.

Manufacturers say that each repeater can support 10 network devices, printers, or Macs. But judging by my experience, you can connect as many as 30 devices to each repeater before problems arise.

PROBLEM Eventually, even an active star topology also proves insufficient for large or complex networks, particularly those that go between floors or buildings. One of the first symptoms of an overloaded network is slow printing. Repeaters can also begin showing high error rates on their status panels or in their monitoring software's log files. In a severely overloaded network, shared devices—such as printers and servers—will begin disappearing from the Chooser listing (see "Now You See It...").

SOLUTION An overloaded LocalTalk network requires the next big step in expanding a network: the use of routers and a high-speed backbone to separate the traffic on the network so it is more manageable.

Kbps, or about 1/40 the speed of Ethernet.)

To connect Macs via Ethernet, you need an Ethernet board or external Ethernet box (either of which costs \$200 to \$300) on each Mac. While Quadras offer built-in Ethernet (thus needing no board), they do require a \$175 transceiver.

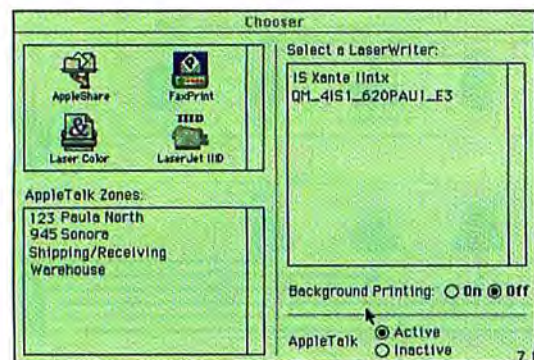
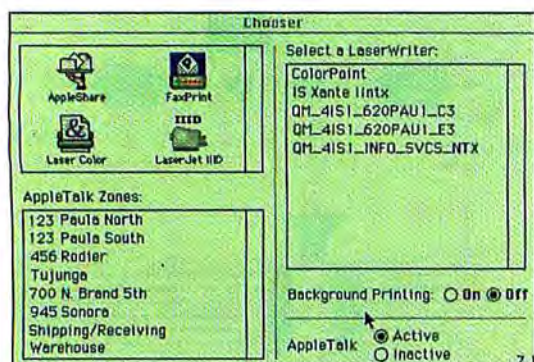
TIP Not everyone on the network needs to be connected via Ethernet—you can still connect many Macs via LocalTalk. All users could connect directly to the high-speed network using Ethernet boards (or the built-in Ethernet in the Quadras), or all users could connect to members of their own group via LocalTalk and the groups could connect to each other over an Ethernet backbone—essentially a mininetwork that connects network branches. You can also mix these two approaches so that, for example, graphic artists are linked directly to each other via Ethernet so they can send huge files of scanned images and page layouts relatively quickly, while accountants and administrative personnel are linked via LocalTalk, since their spreadsheet and text files are typically not large.

To connect LocalTalk-based groups to other LocalTalk-based groups via an Ethernet backbone, all you need is a LocalTalk-to-Ethernet router such as Shiva Corporation's \$1999 FastPath/5 and the high-speed wiring you have already installed. A router lets LocalTalk protocols pass from the strictly LocalTalk environment of the original network to the Ethernet environment of the backbone and back again.

TIP Similarly, attaching high-volume servers directly to a backbone lets you separate the majority of heavy traffic from the day-to-day traffic, which remains on the LocalTalk side of the router.

4. Add a Server

SERVERS ARE COMPUTERS THAT TYPICALLY have high storage capacity so you can put common data—whether files or applications—in one place for everyone to access. Servers can also make electronic mail and printing more efficient; for example, sending all print jobs to a print server keeps the user's Mac from being tied up in processing the file or waiting for a printer to be ready—the server does all the waiting.



Now You See It . . . A network whose size exceeds its wiring capacity often begins intermittently dropping devices and zones from the Chooser's AppleTalk zone and device lists. At top, the screen shows the full network; above, the screen shows the same network after some zones and devices have disappeared. This symptom indicates it's time to change topologies, such as from passive star to active star, or to add routers and a backbone.

3. Move Past LocalTalk

AS THE NUMBER OF MACS ON a network increases, users require more services, such as electronic mail, online calendars, and file sharing. Most of those services recommend or require the installation of a dedicated file server to store all necessary data centrally.

PROBLEM The inclusion of a file server, the use of System 7's file sharing, and the sheer size of the network eventually slows down an AppleTalk network. The reason? Too much traffic is being sent over the network through the slow AppleTalk protocols, causing the common symptoms of an overloaded net-

NETWORK HARDWARE SOURCES

	LocalTalk Connectors	SCSI-to-Ethernet Connectors	Ethernet Boards	Hubs, Repeaters, and Concentrators	Routers	Consumer Contact: Toll	Consumer Contact: Toll-Free
Allied Telesis	○	○	●	●	○	415/964-2771	800/424-4284
Anco Corporation	○	○	●	●	○	714/992-9000	800/545-2626
Apple Computer	●	●	●	○	●	408/996-1010	800/776-2333
Asanté Technologies	○	●	●	●	○	408/435-8388	800/662-9686
Avatar Corporation	○	○	●	○	○	508/435-3000	800/282-3270
Cabletron Systems	○	●	●	●	●	603/332-9400	800/332-9401
Cayman Systems	○	○	●	●	●	617/494-1999	none
Chesapeake Systems	○	●	●	●	●	410/243-1023	none
Chipcom	○	○	●	●	●	508/460-8900	800/228-9930
Codenoll Technology	○	○	●	●	○	914/965-6300	800/966-1512
Compatible Systems Corporation	●	●	●	○	●	303/444-9532	800/356-0283
David Systems	○	○	●	●	○	408/541-6000	800/726-7848
Dayna Communications	○	●	●	●	●	801/531-0600	none
Engage Communication	○	○	○	○	●	408/688-1021	none
EOP Group (an AMP Company)	○	○	○	●	●	919/481-5100	800/888-5261
Farallon Computing	●	○	●	●	●	510/814-5000	800/998-7761
Focus Enhancements	●	●	●	●	○	617/938-8088	800/538-8866
Hewlett-Packard	●	○	○	●	○	none	800/752-0900
International Transware	○	○	○	○	●	415/903-2300	800/999-6387
Lancast	○	○	●	●	○	603/880-1833	800/752-2768
LRU Systems	●	●	●	○	○	415/594-9697	none
MacProducts USA	●	●	●	●	●	512/472-8881	800/622-3475
National Semiconductor Corporation	○	○	●	●	○	408/721-5000	800/272-9959
Network Resources Corporation	○	○	●	●	○	408/383-9300	none
NetWorth	○	○	○	●	○	214/929-1700	800/544-5255
Shiva Corporation	○	○	○	○	●	617/252-6300	800/458-3550
Sonic Systems	●	○	●	○	●	408/736-1900	800/535-0725
SynOptics Communications	●	●	○	●	●	408/988-2400	none
TechWorks	●	●	●	●	○	512/794-8533	800/688-7466
Thor Manufacturing	●	○	○	●	○	702/324-6600	800/346-4694
3Com Corporation	○	○	●	○	○	408/764-5000	800/638-3266
Tutankhamon Electronics	○	○	○	●	○	510/682-6510	800/998-4888
Webster Computer Corporation	○	○	○	○	●	408/954-8054	800/457-0903
Wellfleet Communications	○	○	●	○	●	617/257-2400	800/252-6926

● = Company offers products of this type; ○ = company does not offer products of this type.

TIP For more moderate server needs, you can enable users to share files among themselves by using file sharing, which comes bundled with System 7. File sharing lets you make any or all of the folders on a Macintosh's hard drive accessible to other users on the network. File-sharing options let you add password protection and determine which groups of users have which types of access (such as read/write or read-only) to shared data. Such a collection of Macs is called a distributed server.

PROBLEM When your network requires major services like electronic mail, you will want to dedicate a Mac to providing that service. While it could run on a user's Mac, the service would slow down that Mac, and the mail system would be unavailable during any restarts and whenever that user turned off the Mac.

SOLUTION To avoid this problem, dedicate one Mac to be an AppleShare server. Dedicated servers make the most sense for storing large files such as color scans and customer databases, since these require more processing power than any user can spare and still use his or her Mac. If you decide to use an existing Mac as a distributed server, expect significant slowdown when other nodes access large files or applications.

TIP While any type of Mac can work as a file server, it is best to use the fastest machine possible—a Mac IIci at the least (you don't want the server to be a speed bottleneck). Make sure any high-volume servers are connected to frequent users via a high-speed connection like Ethernet. (This prevents another bottleneck.)

TIP One way to reduce costs is to not purchase a monitor or keyboard for the

server—they will rarely be used. Instead, borrow a keyboard and monitor from another machine to set up the server, and from then on use Farallon's Timbuktu (\$199) to operate the server from another Mac or even a Windows PC.

department names that provide them with some indication of how the network is divided.

TIP Printer names should include some geographical designation such as North or East.

A WELL-DESIGNED NETWORK INCLUDES STANDARDIZED NAMES FOR ALL DEVICES

TIP Large networks (more than 100 nodes) or high-volume servers should use a network operating system like NetWare (which costs \$12,495 for a 250-user license, including NetWare for Macintosh software) from Novell (801/429-5540). While AppleShare requires only a Macintosh on either LocalTalk or Ethernet, NetWare requires one DOS-based system for the server and another DOS system for configuration and management. This second DOS machine runs Novell utilities that configure and manage the server. Client software that lets both DOS PCs and Macs talk to the server is included with NetWare.

For the NetWare server, you should use a machine based on the Intel 80386 or 80486 processor, because of its processing power. An inexpensive 80286-based DOS PC is usually fine for the NetWare manager. Together, the two DOS PCs cost about \$3000, plus the cost of the high-capacity storage (perhaps \$800 to \$2000) you should have on the NetWare server.

TIP Because servers are usually located in one central area, geographic clues are not needed, so their names can be more friendly. Some companies name them after cartoon characters or personalities from popular fiction. You can have fun with server names, but make sure they bear some relation to the services they provide—for example, Balance Sheet for the financial users' server and Post Office for an electronic-mail server.

TIP Changing zone names is easy, but doing so can cause users difficulties: automatic log-ons, mail programs, and printer selections, for example, might be disabled when a zone or server name changes.

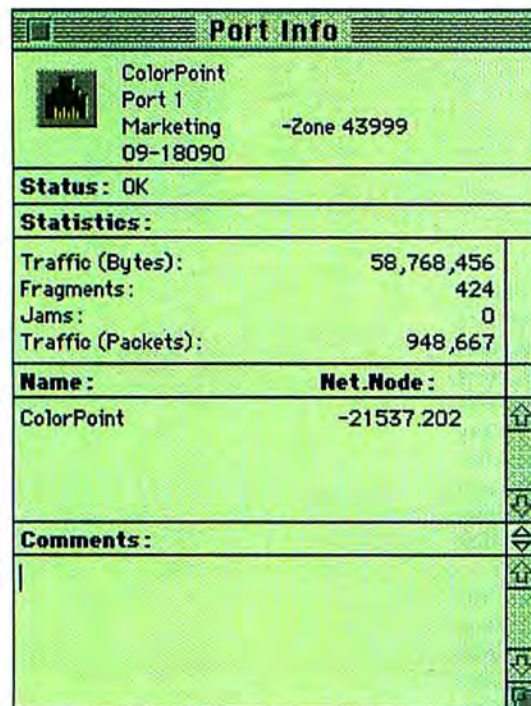
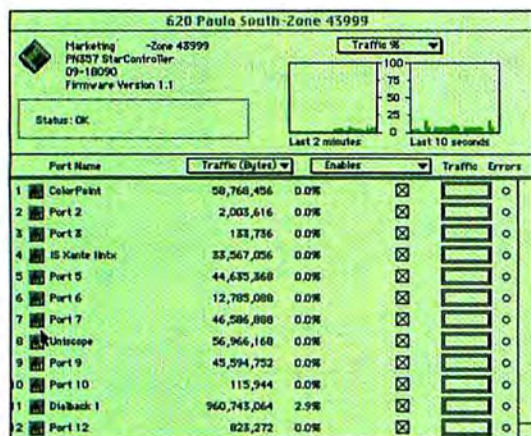
TIP Plan your naming structure to accommodate growth and minimize renaming later. When names do change, make sure that users are informed of how to recover and reset the services they use, like electronic-mail and file-server connections. Although this doesn't usually require reinstalling the products, the setup of both hardware and software often must be altered to point to the newly renamed servers or zones.

Strategies for Growth

WITH NETWORKS, AS IN MANY OTHER endeavors, planning is the secret of success. Whether you are installing a new network in new offices or upgrading an existing one, planning goes a long way toward making the installation cheaper and better while disrupting current work as little as possible.

Allow as much time as possible for configuring and testing the various components. Put together a sample network in one room and test it with current software and any software that the company plans to use in the future to ensure that the network meets the company's needs. Also, make sure that all the pieces work together. Try attaching files to mail messages to see if they get through, and try using dedicated servers at the same time as distributed ones. This type of planning results in the best possible network for both the users and the company. ■

DOUGLAS E. WELCH is a free-lance writer and a microcomputer analyst for a major entertainment corporation in Southern California.



Monitoring Traffic Star controllers, such as those from Farallon Computing, come with software to monitor the controller's ports. The screen at top shows a report on network traffic; here, traffic is light for all ports, and there have been no errors. The screen above shows the details for one port.

5. Standardize Node Names

A WELL-DESIGNED NETWORK includes some planning for standard Macintosh, zone, printer, and server names. Names like Mac-n-stein are cute, but they tell very little about the owner of the Mac or its location.

TIP You create zones when you divide a network into different segments, usually through the use of a LocalTalk-to-Ethernet router. The names of the zones should reflect this segmentation—typically by including the building names, locations, or departments that are attached to that network segment. Users are usually most comfortable with geographical or

Distributing your document without Common Ground can get you nowhere.



The document "Sautoir Newsletter" could not be opened, because the application program that created it could not be found.

OK

With Common Ground, it gets you everywhere.



Now you can let anyone view and print your documents, without the creating application and fonts.

Have you ever sent or received a file that simply could not be opened, viewed, or printed due to a missing application? Or even worse, opened a document only to find the fonts replaced and the formatting ruined?

Common Ground™ changes all that. Now you can distribute any document to anyone, confident it will be absolutely identical



In making a pixel-perfect copy of your document, Common Ground works with virtually all Macintosh applications and fonts, including PostScript® and TrueType®.

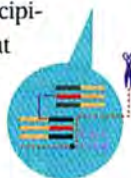
to your original, right down to the individual pixels. How? Our unique

DigitalPaper™ technology produces an exact duplicate, which can then be opened, viewed, and printed by any Macintosh® user – and soon, MS-DOS®/Windows™ users – even without the application and fonts.



Search, Copy, Paste — And More.

Common Ground is no mere bitmap copy. Your recipients can actually work with the data, and even save out to text or PICT for editing. And by enclosing our simple viewer utility, you create a truly portable, self-launching document that can be viewed and printed without the Common Ground application.



Call Us Today.

For the name of your nearest Common Ground reseller or more information, call 1-800-598-3828, ext.9. At just \$189.95 suggested retail price, there's no better way to get your entire distribution list on common ground.



© 1993 No Hands Software. All rights reserved. No Hands Software is a registered trademark, and Common Ground and DigitalPaper are trademarks of No Hands Software. All other trademarks or registered trademarks are the property of their respective owners.

Circle 299 on reader service card

Reviews

IN THIS ISSUE: WriteMove II, RapidTrak, MacProject Pro, SuperATM, SpreadBase, Theorist, DiskFit Direct, Data Desk 4.0, LapTrack for the Mac, MacPhase, TimeVision, and more

Photoshop Plug-Ins

Kai's Power Tools Volume 1, 1.0

PROS: Nearly inexhaustible supply of creative effects tools; image-editing filters complement Photoshop's standards; texture, gradient, and fractal generators vastly expand Photoshop's capabilities. **CONS:** Mind-boggling user interface; shoddy documentation.

COMPANY: HSC Software (310/392-8441).

REQUIRES: Mac II; 4MB of RAM; math coprocessor; hard drive; 1.4MB floppy drive; color monitor; System 6.0.5; Photoshop 2.0.

Recommended: 8MB of RAM; 24-bit video board; System 7. **LIST PRICE:** \$149.



IF YOU SPEND MUCH TIME ON AMERICA Online and you're at all interested in Adobe Photoshop, chances are you've heard of Kai Krause, electronic Einstein of the Photoshop-tips circuit. Having shared a wealth of techniques over his Kai Power Tips forum for the past year, he has now released a collection of Photoshop plug-ins that include image-editing filters; texture, gradient, and fractal generators; and special-effects tools. Although at times monstrously complicated, the Kai's Power Tools (KPT) collection represents a virtually infinite supply of visual resources that puts previous filter collections like Aldus Gallery Effects to shame. The only problem is getting to first base with them.

Interface from Another Planet

MUCH OF KPT IS ART—BEAUTIFUL TO look at but mysterious in purpose. The Texture Explorer plug-in, for example, features a series of unlabeled marbles emerging along what appears to be a



Green Surreal Spheres The background texture of this image was created using the Texture Explorer followed by KPT's Find Edges Soft filter. Then Gradients on Paths was used to create the black concentric lines and the "green glow." The spheres were created using KPT's Glass Lens filters.

downed tree (see "A New Kind of Dialog Box"). You use the marbles to specify how much the Texture Explorer should mutate a selected texture in order to generate 12 variations. The dialog box is stunning in appearance, but it has no precedent in the Macintosh's visual nomenclature and may leave you frustrated and bewildered.

The present documentation doesn't help much. Although each dialog box provides its own help screen, the text—like that in the printed manual—is haphazard and obscure. You can even find occasional reminders to the authors that never got addressed, such as "Enter the mutation metaphor and its implementation here!" According to HSC, new documentation is due out soon.

Down-to-Earth Filters

ONCE YOU GRASP KPT'S UNUSUAL LOGIC, however, the software takes on a life of its own. All together there are 33 plug-ins, 24 of which produce immediate effects. You can add noise to a selection within the confines of the selection's color scheme, disperse pixels randomly throughout the selection area to create a sort of shaken-sand-art effect, apply a horizontal motion blur that extends only in a single direction and either darkens or lightens the selection area, and adorn your images with glass bubbles complete with highlights and shadows. Each one complements Photoshop's built-in filters by supplying a much-needed variation on an existing filtering theme. KPT's flashiest immediate-effect filter is 3-D

Stereo Noise. This filter assigns depth to a gray-scale image by converting it to a repeating pattern of black and white pixels (see "Op Art for a New World Order"). After the filter is applied, you relax your eyes and look beyond the image so that a cluster of pixels viewed with the left eye coincides with its immediate neighbor viewed with the right eye. If you're able to fool your eyes into accepting the effect, the image appears to take on several inches of real depth, like a 3-D movie but without the glasses. Dark areas from the original gray-scale image appear farthest away; light areas appear the closest.

Cosmic Shower of Special Effects

IF THIS WERE THE EXTENT OF KPT'S capabilities, it'd be just a ho-hum filter collection. What ultimately makes the package one of the finest image-editing tools for the Mac are its texture, gradient, and fractal generators. Designed for advanced users, these generators enable you to explore entirely new artistic frontiers.

The Texture Explorer lets you choose one of more than 100 predefined textures. You can then generate variations by specifying the degree of mutation. Though many variations end up looking like arbitrary spray patterns, some yield stunning results. KPT can apply the finished texture according to a *procedural blend* so that it fades away in light areas and concentrates in dark areas. The result is a texture that follows the contours of a selected image rather than simply covering it.

The Gradient Designer allows you to create a multi-colored gradation, specify its direction, and adjust the shape and style of color transitions. A bracket lets you isolate specific portions of the gradation so you can decide where transitions start and stop, as well as control their speed. If you click on the Einstein button and enter the secret code (available from HSC Software for \$39), you enter the professional-level Expert mode. In this mode, you can insert alpha-channel entries into a gradation to make certain portions transparent. You can also access special color spectra, including a palette of

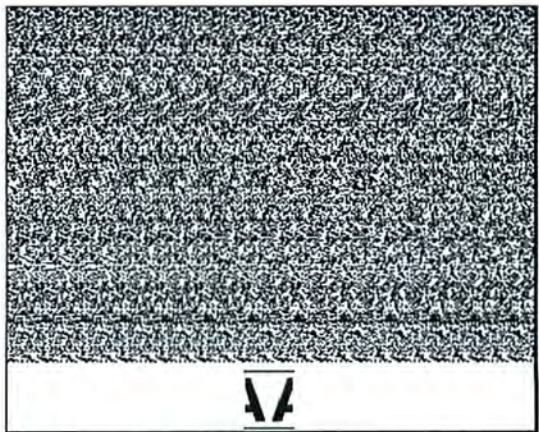


A New Kind of Dialog Box Radio buttons, check boxes, and 2-D icons are a thing of the past in Kai's Power Tools. In their place are extensive hierarchical pop-up menus, spherical buttons that highlight when the cursor passes over them, and surrealistic accents like the emerging stream of marbles shown on the left.

"legal" CMYK colors (that is, they're guaranteed to print reliably from process-color separations).

So far as the four fractal generators are concerned, you'll go far so long as you don't expect to understand what you're doing. You can create some remarkably naturalistic images using fractals, and KPT draws its fractals very quickly. But be prepared to spend a lot of time monkeying around with friendly options like Julia Speed Constant and Real and Imaginary Complex Plane Focus.

On its own, Photoshop is one of the best graphics applications for the Mac. Combined with Kai's Power Tools, it's absolutely unbeatable. No one who uses Photoshop regularly should be without this amazing tool.—DEKE MCCLELLAND



Op Art for a New World Order Hidden among these seemingly random dots is a simulated 3-D effect created using the KPT 3-D Stereo Noise filter. Look beyond the page so that the two halves of the A beneath the dots separate into four halves, then refocus your eyes slightly until the two center halves fuse to form a single A. Look up at the noise without changing your gaze and you'll see three numbers floating down a hole. Be patient. It may take you several minutes or even multiple attempts to see the effect, but it's well worth the effort.

Portable Printer for PowerBook

WriteMove II

PROS: Compact; high-quality output; flexible print utility. **CONS:** Slow; AC adapter can be confused with PowerBook's.

COMPANY: GCC Technologies (617/275-5800).

REQUIRES: Mac Plus; hard drive; System

6.0.7. **LIST PRICE:** \$599.



GCC'S WRITEMOVE II PRINTER WAS designed especially for PowerBook users. Measuring just 11½ by 2 by 3½ inches and weighing 2½ pounds, the WriteMove II fits easily into many carrying cases. The printer's dark gray color matches the PowerBook's. Although the plastic is not as sturdy as that of the PowerBook, the printer should hold up with reasonable care.

WriteMove II's front panel sports a power switch, a print-darkness dial, and buttons designed to advance and retract paper and put the printer online or offline. A small light glows when the battery is recharging, and an LED indicator window displays the printer's condition, including battery charge and paper and ribbon status. A 32-inch cable connects the WriteMove II to the Macintosh serial port.

The WriteMove II comes with a nickel-cadmium battery that fits into a compartment on the side of the printer, and an AC adapter so similar to the PowerBook's that it's easy to mistake one for the other (but be careful—they're not interchangeable). A full recharge takes about 6 hours and in my tests was sufficient to print between 10 and 20 pages, depending on the complexity of the documents. To conserve power, the printer shuts off automatically after about 3 minutes of inactivity.

Pulling the printer's top cover back reveals a holder for snap-in ribbon cartridges. The WriteMove II ships with two ribbons: a single-strike ribbon that produces high-quality output but is good for only about 20 pages of double-spaced text. The reusable multistrike ribbon lasts for about 80 pages at some cost to print quality. Replacement cartridges cost about \$5 each.

A fold-down tray located at the back of the WriteMove II can accommodate most weights of plain paper. To print on transparencies, envelopes, or thick stock, you can feed sheets into an opening on the bottom of the printer. The WriteMove II has no automatic sheet feeder, but given the limited jobs the

continues

printer is designed to handle, that should not be a problem.

GCC's printing software is a genuine joy to use, and the thorough manual is easy to follow. An installer loads the printer driver and the GCC Print Manager and extension onto the hard drive. The printer also ships with Adobe Type Manager and six Type 1 PostScript fonts, although it's also compatible with TrueType fonts.

The Chooser-selectable printer driver provides several handy options. For example, you can define custom paper sizes to supplement the standard formats, and the Print dialog box includes a page-preview feature similar to Microsoft Word's. The driver also lets you scale the output between 25 and 400 percent in 1 percent increments.

Because WriteMove II's driver uses the Mac's QuickDraw routines to image pages before sending them to the printer, immediate printing ties up the CPU. If you choose delayed printing, however, pages spool to the hard drive and get handed off to GCC's Print Manager application. Unlike Apple's PrintMonitor, the GCC software enables you to change some printing options such as font substitution and the number of copies. You can also specify default settings for the Page Setup and Print dialog boxes and set a priority level for background printing.

The WriteMove II uses a Citizen thermal-fusion engine for printing. The mechanism is rated at 360 by 360 dpi and consistently produces readable text as small as 4-point, even using the multi-strike cloth ribbon. Graphics output also is excellent. Although the WriteMove II is no speed demon (a page of double-spaced text takes about two minutes), it's fine for short jobs, and the noise level is tolerable. For portable printing, the WriteMove II is an excellent choice.

—FRANKLIN N. TESSLER



GCC Technologies' WriteMove II

Hard Drive Formatter

RapidTrak 1.0.1

PROS: Fast, easy-to-use, smart RAM cache settings speed up read performance of slower hard drives; supports DOS-formatted removable media. **CONS:** RAM-hungry; RT Formatter application doesn't work when Radius Rocket 68040 accelerator is running; start-up disks for formatter not supplied. **COMPANY:** Insignia Solutions (415/694-7600). **REQUIRES:** Mac Plus; System 6.0.5. **LIST PRICE:** \$99.95.



INSIGNIA SOLUTIONS' NEWEST PRODUCT, RapidTrak, is a general-purpose drive formatter with a twist. Instead of just formatting, partitioning, and testing a hard drive or cartridge, RapidTrak will improve drive performance as well, especially on slower-speed drives.

RapidTrak provides this speed boost with a smart, driver-level RAM-caching scheme to store frequently used data. Taking Apple's own Disk Cache one step further, RapidTrak offers five different caching techniques based on the way you use your computer.

Insignia Solutions uses the Apple Installer for one-click installation of RapidTrak. Formatting your drive is done through RT Formatter, a fast, slick utility that provides all the features most users will need to format, test, and partition a fixed or removable hard drive. There's an Easy Setup button that runs through the formatting process and sets up a single partition. You need to back up first, as RapidTrak has no safe update feature (some hard drive formatters have this capability, which lets you update the driver without destroying data).

If your needs are more sophisticated, the standard Format button brings up a Partition window when the formatting operation is complete. There you can name your drive, enter partition sizes, and use a pull-down menu that allows you to select a partition type. Selecting the Initialize button completes the operation. Holding down the \mathbb{H} key when launching the application brings up a menu of Custom settings, establishing Blind reads and writes and other functions that are briefly explained in the short manual.

The RapidTrak control panel controls the caching feature. Additionally, it mounts removable cartridges and even provides improved math performance with a RapidMath option. Activating the cache requires restarting, but you can set the type of cache simply by opening the control panel, changing the setting, and

closing the control panel. A Performance Monitor gives you a set of statistics showing how the setting affects performance. Insignia suggests that you experiment with the cache settings until you find the one that provides the best result.

Two other utilities are provided: RapidLock, a control panel that mounts, locks, and sets passwords on drive partitions; and PC DiskJockey, a control panel that works with Insignia's Access PC and Apple's PC Exchange to allow RapidTrak to support MS-DOS-formatted removable cartridges and SoftPC files.

Taken without the cache capability, RapidTrak provided hard drive performance comparable to other general-purpose formatters in my testing. But in one case, with my Quantum 210 drive (using the FWB Bench Test utility), I got results that were a good 20 percent faster in most respects than results from other formatters I've used.

I also confirmed Insignia's own claims of major performance boosts with slower drives, using La Cie's Time Drive utility. A SyQuest 88MB cartridge attached to my Mac IIci, using the Repetitive cache setting at 512K, provided consistent transfer speeds upwards of 2MB per second. I got comparable performance ratings from my Quantum 425MB and Quantum 210MB drives. While Finder-level file transfers didn't speed up noticeably, due to the limits of the Macintosh Finder, opening large applications and documents seemed noticeably quicker.

But there is no such thing as a free ride. It required a minimum 512K RAM cache for *each* drive to provide a noticeable performance boost. The RapidTrak control panel uses an estimated 575K of RAM. That's RAM that you cannot use for running applications. If your computer doesn't have the extra memory, these fancy features might go for naught.

I found technical support friendly and helpful, though it required a toll call and took a couple of calls to get all my questions answered. The manual was clear, and easy to follow, though somewhat brief when explaining the more complex functions of the software.

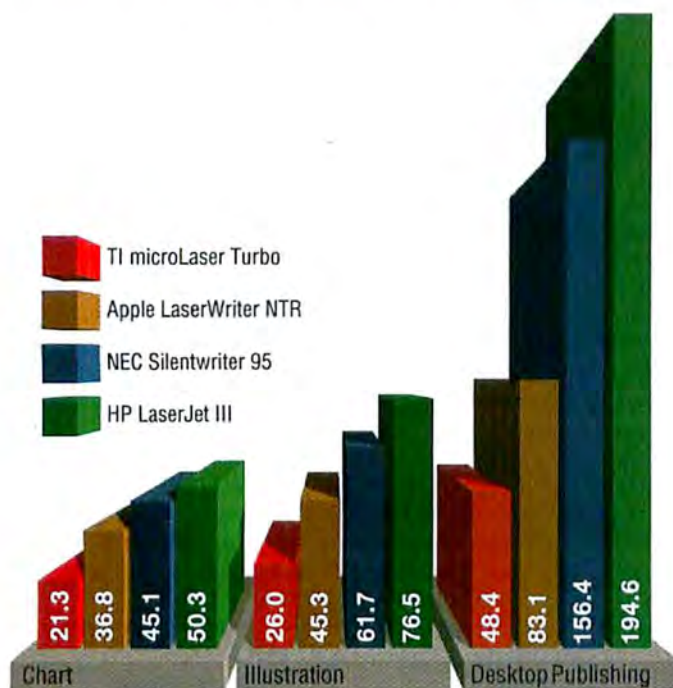
In general, RapidTrak was fast and stable and seemingly bug-free. However, I could not get the RT Formatter to work with the Radius Rocket 68040 NuBus accelerator board.

Insignia's RapidTrak is a solid entry in the general hard drive formatter race. And if you've got RAM to spare, RapidTrak's sophisticated caching capability can provide a healthy performance boost for many slower hard drives and removable cartridges. I recommend it.

—GENE STEINBERG

FASTER FASTER FASTER

LOWER



Total Printing Time In Seconds

It's a fact. Now you can get faster PostScript® printing at a new lower price.

According to benchmark performance tests,* the TI microLaser™ Turbo printer is faster than the Hewlett Packard LaserJet® III, NEC 95 and Apple® NTR when it comes to charts, illustrations and desktop publishing. That's because it sports two processors — standard and RISC — for turbo-charged speed.

But when it comes to high performance, consider what else the Turbo has to offer:



Your choice of PC or PC/Macintosh® configuration. HP LaserJet II emulation and Adobe® PostScript Level 2 software with 35 of the most popular outline fonts to dress up your documents. Automatic switching between HP and PostScript modes so you can print and go — no setup, no problem. And the ability to connect simultaneously to more than one computer, Windows™-based or Mac, and print with ease.

Best of all, with its new lower price of \$1,749** for the PC model and only \$50

more for PC and Mac compatibility, the microLaser Turbo is selling fast, too. Call right now for more information on the Turbo or other microLaser printer models. 1-800-527-3500.

 **TEXAS
INSTRUMENTS**



MacUser



*Call TI for a copy of Genoa Technology's benchmark test results and specifications of models tested.

**Manufacturer's suggested retail price — dealer prices may vary. microLaser is a trademark of Texas Instruments Incorporated. Adobe, PostScript and the PostScript Logo are trademarks of Adobe Systems, Incorporated, which may be registered in certain jurisdictions. Apple and Macintosh are registered trademarks of Apple Computer, Inc. Windows is a trademark of Microsoft Corporation. The microLaser printer family has earned MacWorld's 1992 Editor's Choice Award and the microLaser Turbo has earned MacUser's 1992 Four Mice award. Reprinted from MacUser, September 1992. ©1992 Ziff Communications Company.

Cache Card for the Quadra

FastCache Quadra

PROS: Good overall performance; excellent warranty. **CONS:** Wastes a NuBus slot.

COMPANY: DayStar Digital (404/967-2077).

REQUIRES: Mac Quadra 700. **LIST**

PRICE: For Quadra 950, 900, and 700 \$449; for Quadra 900 and 700 \$299.

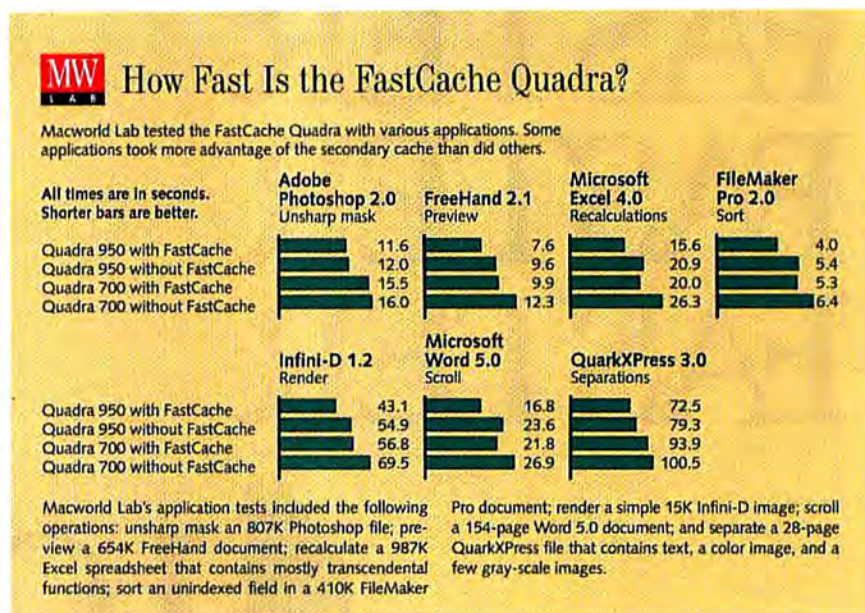


WHEN YOU FIRST GET A QUADRA, all the applications seem to run so fast it's hard to remember seeing the cursor change from the idle arrow to the "I'm thinking" wristwatch. Six months later, that dreadful watch cursor seems to pop up all the time. Fortunately, you can squeeze a little more performance out of your Quadra by installing a DayStar FastCache Quadra.

The FastCache Quadra is a PDS board that provides 128K of secondary cache. The 68040 in the Quadra already has instruction and data caches built in, but they are only 4K each. When the instruction or data is present in the cache, that information can be loaded into the processor at lightning speed. However, due to the small cache size, most of that information is not in the 68040 cache and has to be fetched from the system-board memory—a much slower process. The FastCache Quadra uses 128K of fast, 15-nanosecond static RAM (25ns static RAM on the 900/700 version). Instructions and data in the 128K RAM of the FastCache Quadra can be retrieved much faster than from the system board's memory.

In terms of real-world performance, the Quadra 950 with the FastCache runs 15 percent faster overall than the stock 950 in the Macworld Lab benchmark. Some operations benefit from the cache card more than others. Microsoft Word scrolling, Infini-D rendering, and Excel calculating, for example, run at least 20 percent faster than on a stock 950. Photoshop's Unsharp Mask operation, on the other hand, showed a marginal improvement of only 3 percent. DayStar admits that the improvement in Photoshop is minimal.

To install the FastCache, just open the CPU, identify the PDS slot, and plug the cache card into it. (If you really want to read the manual, the four-color document has a step-by-step procedure with excellent illustrations.) The only drawback is that a NuBus slot is wasted. Chances are you don't need to use all five slots in the Quadra 950/900, but if you have a 700, you will have only one slot



left—a concern if you have another board already installed in a NuBus slot.

To activate the FastCache Quadra, simply drop the QuadControl control panel into the System Folder and restart the Mac. Then select QuadControl from the control panel and select the options you want. One option allows you to speed up CPU processing by using a technique known as ROM shadowing—copying part or all of the ROM content onto the system board RAM. There are three options on how much memory to allocate to ROM shadowing. Macworld Lab tested the optimum setting of 384K and the maximum setting of 1MB and found little difference between the two. QuadControl's PowerMath option reroutes all mathematical functions to the math coprocessor instead of through SANE (Standard Apple Numeric Environment).

QuadControl also allows the Copyback cache of the 68040 to be turned on and off for selected applications. For example, if the application is not compatible with the Copyback cache, you can turn the cache off. Whenever you launch that application, QuadControl turns off the Copyback cache. When you quit the application, the CopyBack cache turns back on. The applications used in the Macworld Lab benchmark did not have any trouble running with the Copyback cache on.

Like most DayStar products, the FastCache Quadra is well designed, with no jumpers or components that were soldered on at the last moment to fix any design flaws. DayStar pays attention to details—a good indication of quality. The FastCache Quadra has an impressive three-year warranty, a toll-free tech-support line, and an upgrade policy

that allows you to upgrade to another DayStar product by paying the difference in list price.

If your Quadra seems to have lost its zip, we recommend giving this board a try.—DANNY LEE AND MARK HURLLOW

Photoshop-Acceleration Boards

Lightning Effects II

PROS: Fast; decent manual. **CONS:** Expensive; limited set of filters; no motion blur or sharpen-edges features; problems acquiring some JPEG files. **COMPANY:** Spectral Innovations (408/955-0366). **REQUIRES:** Mac II; Photoshop. **LIST PRICE:** \$1295.



ThunderStorm

PROS: Fast; good JPEG compatibility; great manual. **CONS:** Expensive; limited set of filters; no rotation option. **COMPANY:** SuperMac Technology (408/245-2202). **REQUIRES:** Mac II; Photoshop. **LIST PRICE:** \$999.



SITTING IN FRONT OF A MAC AND waiting for Adobe Photoshop to finish a filter effect or a resize operation is a familiar occurrence for many prepress and image processing professionals. The ThunderStorm from SuperMac Technology and the Lightning Effects II from Spectral Innovations are NuBus boards that use the digital-signal-processor (DSP) chips to dramatically speed up some Photoshop operations.

continues

LESS NOISE LESS HASSLE LESS MONEY!



DataPort™ 14.4/Fax Modem with optical technology

MORE SPEED: Only AT&T's exclusive Optical Line Interface (OLI), pat. pending, eliminates the noise that other high-speed fax modems add to the data stream. Less noise means you get the highest speeds possible on good or bad phone lines!

- V.32bis (14,400 bps data, 9,600 bps fax)
- V.42bis/MNP 5 (data compression, error correction)
- Effective throughput up to 57,600 bps!

MORE COMPATIBILITY: OLI delivers hassle-free compatibility for more consistent connectivity than other high-speed fax modems.

MORE VALUE: You get everything you want in the DataPort 14.4/Fax Modem, backed by AT&T with:

- AT&T's lifetime warranty for as long as you own it, plus
- Toll-free technical support.

Solidly-built, solidly-backed by AT&T.

\$299

Reg. price, \$585.

For the Mac. Also available, PC version for DOS and Windows.

Comes complete with QuickLink II comm/fax software, CompuServe bonus (\$22.95 value), user's manual, Mac cable, fax modem phone cord.

Visit these dealers! Or for name of the dealer nearest you, or to order, call: 1 800 554-4996 ext 3305.



Offer ends April 30, 1993. Visit the dealer nearest you, today!

Prices under \$300 vary by dealer, while supplies last. Hurry!



DSP chips are specialized programmable microprocessors that perform a small set of operations very efficiently. SuperMac and Spectral Innovations have programmed these chips to replace Photoshop filters and other plug-ins and to take advantage of the DSP's faster processing speed. How accurately—and how fast—these boards duplicate native Photoshop effects varies.

It's a snap to install the boards, which work in any Mac with a NuBus slot (or the IIx with a NuBus adapter). Both boards are 32-bit clean and require 32-bit QuickDraw. Each board includes software plug-ins. The ThunderStorm's plug-ins come in a single file; the Lightning Effects' come in separate files. Each product offers replacements for blur, sharpen, resize, and JPEG-file-compression filters. The ThunderStorm has no rotate filter but the Lightning Effects does, while the Lightning Effects has no motion-blur or sharpen-edges filters.

While testing the boards, I ran into an interesting bug in Photoshop. I have an unusually large number of filters and other plug-ins installed with my copy of Photoshop (version 2.0.1). Photoshop limits the number of custom submenus that can appear in the Filter menu. So when I first installed each board, I was unable to get the new filters to show up. However, by removing some of my installed filters, and restarting Photoshop, I was able to get the new filters to appear. Adobe said this limitation will be fixed in the next version.

I tested the filters and effects of each board on a IIx with 32MB of RAM, running 32-bit clean. I allocated 24MB of memory to Photoshop and used a 7.6MB image file. With this configuration, Photoshop ran all of the effects without swapping out to the hard drive. The results are summarized in "Filters' Performance." Your performance gains will vary depending on your Mac's configuration.

The resize filters for each product work much differently—and often less effectively—from the native Photoshop resize filter. Except for Photoshop, the times given for resizing reflect only the time it took to complete the operation, not the time it took to have a resized image ready to work with (until you regain control of the cursor). You'll find the Lightning Effects resize filter in the Export submenu because the board writes the resized image as a file to disk (which

Gaussian Blur

Original image



Photoshop



Lightning Effects



ThunderStorm



Unsharp Mask

Original image



Photoshop



Lightning Effects



ThunderStorm



The Lightning Effects gaussian blur sample is not blurred as much as the ThunderStorm and Photoshop gaussian blur samples. This is due to the different algorithm used for gaussian blurring in the Lightning Effects software. The difference is subtle but present. I was unable to discern any differences in the unsharp mask samples.

partially explains the longer resize time). Therefore, you must make sure your hard drive has enough space to store the resized image. In addition, you can't resize a selected area.

The ThunderStorm resize also has problems. Reducing an image centers it within your original image. When you enlarge an image you must change the canvas size first or else you'll lose some of the image. The ThunderStorm resize filter can automatically pass the correct dimensions to Photoshop's Canvas Size dialog box, which makes the resizing process easier, but it's still not the one-

step process that it normally is in Photoshop. You can resize a selected area, but the area will always be rectangular.

I also tested the ThunderStorm and Lightning Effects filters to see how accurate they are compared with Photoshop's native filters. The exact results depend on how you're using the Photoshop file, the contents of your file, and the final display medium for your images. When I filtered the image with a native Photoshop filter and then subtracted the filtered image from the same image treated with a ThunderStorm or Lightning Effects filter, I saw minor differences.

Most of the features in Adobe's recently announced Photoshop 2.5 can be accelerated by DSP boards. This new open architecture will eliminate the need for third-party accelerators to duplicate native Photoshop effects. Both SuperMac and Spectral Innovations have stated that they will support this new approach to accelerating Photoshop. Both companies plan to offer performance-enhancing software for other third-party software packages.

The ThunderStorm board was developed by Storm Technology and uses the AT&T 16-bit 16A DSP chip, which is more difficult to program but runs twice as fast as the AT&T 32C chip that is used in the Lightning Effects II board. Storm Technology has also licensed its DSP technology to DayStar Digital. Spectral Innovations has licensed its DSP products to Newer Technology, which markets the boards under the name Image Magic.

—MATTHEW LEEDS

FILTERS' PERFORMANCE

Times are in seconds

Filter	Photoshop	ThunderStorm	Lightning Effects II
Blur *	16	16	20
Blur more	26	15	20
Gaussian blur	117	39	32
Motion blur	203	29	NA
Super blur	NA	NA	21
Sharpen *	17	14	19
Sharpen edges	94	27	NA
Sharpen more	24	15	19
Unsharp mask	417	21	20
Resize	57†	10	23
Rotate ‡	185	NA	51
JPEG Acquire			
Photoshop	43	18	49
ThunderStorm	43	18	5
Lightning Effects II	44	18	31
JPEG export	76	21	30

* Both boards' manuals state that the blur and sharpen filters may not be faster on some IIci and better machines—test results are included only for completeness. However, I did see marginal improvement in the ThunderStorm's sharpen filter on a IIci.

† Time to regain control of the cursor. ‡ The ThunderStorm has no rotate filter. The rotate filter in the Lightning Effects II is limited to small amounts of rotation. I couldn't rotate much more than 0.5 degrees. The manual says the rotate filter is for straightening scanned images. § The Lightning Effects II crashed when trying to acquire ThunderStorm JPEG files using its JPEG Acquire plug-in.

The Critics' Choice For Best Picture.

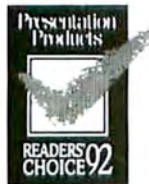
Again. And Again. And Again.



LUMINATOR™
JANUARY, 1993



MEDIAPRO™
JANUARY, 1993



LUMINATOR™
MEDIAPRO™
DECEMBER, 1992



For convincing presentations, powerful instruction, and productive meetings, choose an award-winning LCD projection display from nVIEW. From gray scale computer projection to brilliantly colorful computer animation or full-motion video. From nearly any

computer or video source.

Performance.
Innovation. Service.
Cast your own vote.
See how an nVIEW
projection display can improve your
work — *and your*
image.

Call 1-800-736-8439
or 804-873-1354.



nVIEW products are manufactured under U.S. Patent #4,763,993; #4,976,536; #5,153,621; and #5,150,236. Other and foreign patents pending. nVIEW, Luminator, and MediaPro are trademarks of nVIEW Corporation.

nVIEW
VISIONARY DISPLAY
TECHNOLOGIES

Video-Titling Software

Comet CG 1.0.3

PROS: Generates broadcast-quality antialiased text over live video; lets you map PICT graphics over text; supports any PostScript or TrueType font; nice transition effects. **CONS:** Incompatible with many video boards; no leading, text rotation, or custom pair kerning; lacks support for TIFF and QuickTime JPEG compression; cumbersome interface; overpriced.

COMPANY: AT&T Graphics Software Labs (317/844-4364). **REQUIRES:** Mac II; 40MB hard drive; 1.4MB floppy drive; 4MB of RAM; System 7; NuVista+ or Video Explorer video board; additional multisync monitor. Recommended: 8MB of RAM. **LIST PRICE:** \$995.



COMET CG BELONGS TO THAT EXCLUSIVE breed of programs that boasts the ability to bring professional-quality video graphics to personal computers. If you make your living editing videos, Comet CG (as in character generator) might seem like something of a bargain: not only is it the best Mac program for generating antialiased text over live video, but it is also reasonably priced compared with dedicated graphics systems. However, if you're a video-editing enthusiast who already knows his or her way around the Macintosh, you're likely to be as astonished by Comet CG's limitations as impressed by its capabilities. One fin short of a G-note buys you too few formatting options, a cumbersome interface, an insubstantial manual, and a few memory and speed surprises.

Because Comet CG does video overlay, it requires a video output device that permits chroma keying (an effect that permits live video to share screen space with Macintosh text and graphics). Unfortunately, Comet CG limits itself even further by supporting two video boards only, TrueVision's NuVista+ and Intelligent Resources' Video Explorer. If you own another board that's capable of chroma keying titles over video—among them Mass Microsystems' ColorSpace FX, RasterOps' ProVideo32, and Video-Logic's DVA-4000/Macintosh—you're out of luck.

And You Thought You Understood Antialiasing

TO ANTIALIAS TEXT OVER VIDEO IMAGES, Comet CG exploits the video board's 8 bits of alpha channel, which permit 256 degrees of transparency for each of the 16 million colors available to the Mac. For example, one screen pixel might be solid

computer-generated blue, another might be translucent blue mixed with underlying video, and a third is pure video. To antialias text, Comet CG softens the outline of each character by varying the translucency of border pixels and allowing the underlying video images to show through in progressive increments.

Comet CG isn't the first Macintosh titler to support antialiasing, an honor that goes to Data Translation's now extinct VideoQuill. However, where VideoQuill provided one get-by antialiasing setting, Comet CG provides nine degrees of antialiasing, ranging from very good to fantastic. The lower settings suffice for commercial video resolutions, which is a good thing because higher settings require gobs of RAM, and I do mean *gobs*. To render a single line of 72-point text at the highest setting requires somewhere in the neighborhood of 12MB of RAM, a steep departure from the program's 4MB minimum. More complicated text and multipage scenarios need even more memory, frequently upwards of 32MB. Unfortunately, Comet CG doesn't offer virtual memory, so there's no chance of taking advantage of empty hard drive space in a crunch. If you don't have the RAM, you're out of luck.

No Perks with This Paradigm

IN TERMS OF FLEXIBILITY AND INTERFACE, VideoQuill was a vastly superior product. VideoQuill supported custom leading and pair kerning, two absolute necessities in any display text program; Comet CG offers one leading setting (automatic) and two kerning options (on and off). VideoQuill let you rotate text; Comet CG does not. VideoQuill was capable of filling text with automated gradations or even live video; Comet CG lets you fill text with a stagnant PICT graphic (no TIFF and no QuickTime JPEG compression), but titles always appear in front of the video image and gradations are absent. Granted, VideoQuill worked only with its own proprietary typefaces, while Comet CG renders any PostScript or TrueType fonts. But the fact remains, if Comet CG can't keep up with a two-year-old product that wasn't able to amass any sales at half the cost, I can't imagine folks breaking down the doors to get hold of the thing.

My complaints don't end here. Comet CG purports to emulate that most sacred of interface models, the page-layout paradigm. But in truth, the program does a pretty lousy job of it. Comet CG offers one tool for creating text, another for editing it, and a third for coloring it. If you want to change block-level formatting attributes—alignment, drop



First-Class Antialiasing, Coach Flexibility

Even on low-resolution 8mm tape, Comet CG does a great job of rendering crisp, clear titles. But because it lacks leading options, the only way to create this specially spaced text was to create each line as a separate text block.

shadows, picture mapping—you have to use still a fourth tool. Importing a picture is likewise unnecessarily complicated. You have to use one tool to draw the picture box, manually choose a command to subscribe—yes, you *have* to subscribe—to a PICT file on disk, crop away unwanted portions of the picture using a second tool, and reposition the picture in its frame using a third tool. This may be the first time in nine years of working on the Mac that I've ever had to read a manual to figure out how to import a graphic.

You can preview a single page of text over your live video or render several pages at once and then play the pages in any order. Comet CG offers only three transition effects—replace, dissolve, and a vertical scroll—but they're well implemented and tasteful. You can specify the length of time a page appears on screen and how long the transitions take. What you can't adequately control are the gaps between pages. Comet CG loads each page independently from disk into the video board's RAM, instead of loading all pages at once into the allotted application RAM—if possible—and then swapping them to the video RAM one at a time, which would be much, much speedier. On my Mac IIci with 40MHz cache card, the disk-to-video RAM swapping process took nearly two seconds, or 60 NTSC frames, per page. Even if you have a wicked-fast Quadra 950, you'll experience noticeable delays between pages.

Any Mac program that provides broadcast-quality character generation represents an advancement in desktop video. For video pros who've already made the Macintosh plunge and invested in Comet CG's chosen video technology, this program is a reasonable, though somewhat disappointing, investment. But if you haven't yet purchased a Mac II or better, Comet CG warrants little more than raised eyebrows. And if video is only a hobby, stock away your savings for another day.—DEKE MCCLELLAND

So Small. So Powerful...



New Data Storage Systems Now
Available for Quadra 800, Centris 610,
Centris 650, and Macintosh LC III



Padded Carrying Bag
Especially Designed For The
"Super-Small" Series

For Those Who Think Something Has to be Big to be Powerful... Take a Look at MicroNet's "Super-Small" Storage Systems

Are you looking for cost-effective but powerful 3.5" hard disk drives, rewritable optical systems, or DAT backup? We invite you to examine our new "Super-Small" Series of data storage systems.

MicroNet is offering 3.5" disk drives from 240 to 1186 MBytes, with average times as fast as 8 ms and spindle speeds fast as 6300 RPM. These small, yet powerful, hard drive systems can sustain data transfer rates as high as 3.8 MBytes per second!

In addition, MicroNet offers 3.5", 128 MB Sony rewritable optical drives, and 4 mm DAT backup systems with up to 8 GBytes on a single shirt-pocket size cassette. All of this in a system of only 4.5 x 5 x 9.5" and weighing less than 6 lbs.

These systems are compatible with IBM PC, PS/2, EISA and compatibles, RS/6000, Macintosh, Quadra, Sun, SGI, and NeXT computers. They're shipped fully tested and formatted and come complete with shielded data cable, and SCSI terminator.

Nothing is more powerful than MicroNet's new SS-540 or SS-1240 hard disks systems developed around Maxtor's new 3.5", 8 ms, fast-spindle drives. These new systems are especially suited for use with file servers, graphics, multi-media, or other disk-intensive applications.

So when you need the most powerful and reliable data storage systems, think "Super-Small". Call today for the name of a Reseller near you. 1-714-581-1540.



MicroNet Technology, Inc.

20 MASON • IRVINE, CA 92718 • TEL: (714) 837-6033 • FAX: (714) 837-1164
AppleLink: MICRONET.SLS • Compuserve: 76004,1611

Super-Small is a trademark of MicroNet Technology, Inc. All other trademarks are property of their respective owners.

Circle 139 on reader service card

Introducing SuperATM. Now You Can Move It Without Losing It.

TRAVEL WISE

VOLUME 10 ISSUE NO. 3

Riding the Rails

Emergency Items

Leave Jet Lag Behind

1. Aspirin/antacid
2. Band-aids/first-aid ointment
3. Zip-top plastic bags
4. Bottle opener/corkscrew
5. Foldable tote bag
6. Small flashlight
7. Liquid detergent
8. Insect repellent/bite ointment
9. Heavy-duty tape

individual railroads.
continued page 2

TRAVEL WISE

Riding the Rails

There's no more economical, efficient and less way to travel in Europe than by train.

To see cities most effectively, plan your journey so you can avoid unnecessary backtracking. Trains are also ideal for the weekend. You can get round-trip tickets or regional discounts from your local agent or from the local office of individual railroads.

Emergency Items

1. Aspirin/antacid
2. Band-aids/first-aid ointment
3. Zip-top plastic bags
4. Bottle opener/corkscrew
5. Foldable tote bag
6. Small flashlight
7. Liquid detergent
8. Insect repellent/bite ointment
9. Heavy-duty tape

Leave Jet Lag Behind

Whether you travel for pleasure or for business, the last thing you want is to waste precious time at your destination feeling overly tired or ill. Here are six simple steps that you can take to help keep jet lag from messing up your itinerary:

1. Avoid the rush. Arrive at the airport at least an hour before your flight is scheduled.

As dawn, so your clock in and get used to it. If you have a hard time, place your watch in a dark place when you're in bed. It's a simple way to get yourself prepared for travel.

Adjust your timing. As soon as you take off, set your watch to your destination's time zone. It's a simple way to get yourself prepared for travel.

Stay hydrated. It's so easy to get dehydrated when you're on the go. To avoid this, drink plenty of water.

This ever happen to you?

Someone sends you a document and when you pull it up on your computer or print it, it looks like alphabet soup: letters floating off, no formatting, and type that's...that's...what is that Geneva? Courier?

What happened?

You're missing SuperATM™ software from Adobe. You see, until now, if you didn't have the same fonts as the author of the document, you didn't have a document. You had a problem.

But SuperATM is going to change all that.

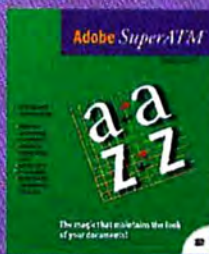
With SuperATM, people can send you documents that you can view, print, even edit, in all their original glory.

Magic?

No, but close. SuperATM creates "substitute fonts" that accurately maintain the look of your formatted text.

But that's not the only reason it's called super. It's also a super value. SuperATM includes Adobe® Type Reunion™ font menu software, a new version of Adobe Type Manager™ software, five free typefaces, and Type On Call™ a CD-ROM with more than 1,350 typefaces that you can buy as you need them.

To get your copy or upgrade,* just call us: 1-800-83-FONTS (1-800-833-6687), Dept. E, ext. 1235 and order. Or see your local Adobe reseller. And don't ever worry about moving documents - and losing them - again.



*If you already have Adobe Type Manager, you can upgrade to SuperATM for just \$49. That's \$100 off the suggested retail price.



Adobe, the Adobe logo, Adobe Type Manager, SuperATM, Type Reunion and Type On Call are trademarks of Adobe Systems Incorporated which may be registered in certain jurisdictions. Copyright © 1993 Adobe Systems Incorporated. All rights reserved.

Circle 134 on reader service card

Personal Tax-Preparation Software

Andrew Tobias' TaxCut for Macintosh

PROS: Includes "what-if" feature for comparing tax strategies and scenarios; excellent help system; Shoebox command handles leftover receipts; supports 1040PC and electronic filing. **CONS:** Whole-dollar calculations only; interface awkward in areas; only two state-tax versions available. **COMPANY:** MECA Software (203/256-5000). **REQUIRES:** Mac Plus; 2MB of RAM; hard drive; System 6.0.2. **LIST PRICE:** \$79.95.



MacInTax

PROS: Attractive display; File Cabinet command handles leftover receipts; supports electronic filing; 15 state-tax versions available; includes Plan mode for estimating 1993 tax liability. **CONS:** Errors can be difficult to correct; 1040PC filing program available only on request. **COMPANY:** ChipSoft (619/453-8722). **REQUIRES:** Mac Plus; hard drive. **LIST PRICE:** \$79.95.



TAX PREPARATION BY HAND IS NOT A task for the faint of heart. This year, there's a competitor to ChipSoft's MacInTax, the leader in the field: Andrew Tobias' TaxCut for Macintosh, ported over from the DOS platform.

Both programs appeared toward year's end in preview versions for entering preliminary data and estimating tax liability. The final editions shipped free to registered users of the preview software shortly after the tax laws and IRS forms were set for the year—in January. Unfortunately, TaxCut's preview version, HeadStart, looks like a product rushed to market, with many basic features not implemented, including tax-data importing, interview help, scratch pads, and the ability to show all forms that are related to a particular item. In contrast, few essentials are missing from MacInTax's preview edition, called Easy Step.

The programs have so much in common that selecting one based solely on features is almost impossible. Both let you choose between manually selecting forms and entering data in whatever order makes sense to you, or submitting to the program's "interview," in which you answer on-screen questions and let the program transfer the data to the proper forms (see "MacInTax Interview"). Data can be actual or estimated, and you can

import existing tax data from Intuit's Quicken or any program that saves in STD (standard tax data) format. Both programs provide on-screen tax help; TaxCut's is especially thorough and contains an excellent Search feature. Both also have memo pads for annotating line items and itemization calculators for recording finer detail. Shoebox (TaxCut) and File Cabinet (MacInTax) menu commands help handle your leftover, oddball tax receipts.

The programs also can run a final review of your return, checking for errors and entries likely to trigger an audit. Using 1993 tax tables and incorporating changes in the tax law, MacInTax's Plan mode lets you see how you'll fare next year. TaxCut goes even further by providing a spreadsheet-style "what-if" form that lets you compare different tax strategies using tax tables from any year between 1988 and 1999 (see "What-If Form"). Both programs print IRS-acceptable forms, as well as related worksheets and notes. MacInTax can also print data directly onto actual IRS forms.

Each program is driven by a detailed tax interview. TaxCut conducts the interview by means of dialog boxes, so you can't summon DAs or switch to other programs until you halt the interview. However, because TaxCut always remembers where you left off, you can exit to the tax form, call up your DAs, and then continue. You can also revisit any section of the interview to examine or change your answers. Revisiting, however, has a severe penalty: you cannot resume the main interview until you again answer every question in the section you're revisiting. Although the TaxCut manual states that you can jump directly to any interview topic (as you can in MacInTax), the feature is not implemented.

TaxCut automatically rounds all numeric entries to the nearest dollar; MacInTax lets you choose between calculating exact amounts or rounding. TaxCut also handles check boxes in a non-standard fashion, which initially caused me some serious problems. When you click in a check box, the box is merely selected; it requires a second click to change the state of the box.

MacInTax's biggest shortcoming is the ease with which you can enter erroneous interview data and the difficulty you'll have correcting the mistakes. For example, since there's no option to delete a multipart line item (such as a depreciation entry), you have to switch to manual-entry mode and edit the form. Similarly, if you answer an interview question incorrectly, you often have to revisit the interview to change your answer. Manu-

MacInTax Interview During the interview, you can see the form and line item that will be affected by each answer. The menus and icon bar remain accessible during the interview.

Scenario	1991	1992	1993	1994
1991	10,100	10,100	10,100	10,100
1992	10,100	10,100	10,100	10,100
1993	10,100	10,100	10,100	10,100
1994	10,100	10,100	10,100	10,100

What-If Form This TaxCut worksheet makes it easy to compare alternate tax scenarios, as well as plan for coming years.

ally correcting the affected items often doesn't work—or isn't allowed.

Because state tax forms often rely heavily on information from federal returns, TaxCut and MacInTax sell separate programs for calculating state returns. For 1992, TaxCut offers only New York and California versions; and many users complain about the difficulty of reaching ChipSoft tech support. MacInTax has programs for 15 states.

Both companies guarantee the accuracy of their programs' calculations. If a miscalculation results in an IRS penalty, the software publisher will pay the penalty. The programs also support electronic filing, for an additional fee, as well as the new 1040PC format for data-only submissions (included with TaxCut and available on request for MacInTax).

Neither program lives up to my expectations. This year's MacInTax seems more difficult to use than last year's version, despite the more attractive interface. TaxCut's weak HeadStart Edition and its lack of a jump-to-interview-topic feature made me wish the company had taken an extra month or two to get its act together. Even so, using either program is preferable to completing complicated taxes by hand—and still a bargain.

—STEVEN A. SCHWARTZ

Project Management

MacProject Pro

PROS: New scheduling and formatting features; improved resource-management and analysis tools; well-designed interface; easy to customize; great manual. **CONS:** Limited integration between program charts; multistep scheduling process. **COMPANY:** Claris Corporation (408/727-8227). **REQUIRES:** Mac Plus; 2MB of RAM; hard drive; System 6.0.5. **LIST PRICE:** \$599.



MACPROJECT PRO IS DESIGNED TO help people who are responsible for finishing projects on time and on budget. Whether it is the right tool for you depends largely on how you like to visualize information. MacProject Pro's main organizing chart, a PERT network chart, shows each task as a separate box connected with straight lines to related tasks; MacProject Pro is a well-designed and useful tool for seeing tasks displayed this way. However, if you prefer seeing tasks arrayed in a Gantt chart, in which tasks are displayed as bars that stretch across a time line, MacProject Pro can be a frustrating program to use.

What's New

MACPROJECT PRO IS A SIGNIFICANT upgrade to MacProject II, providing tools for better organization and entry of data, enhanced display capabilities, much-improved resource management, more-sophisticated scheduling features, more-flexible printing options, better tools for tracking the progress of a project, easier data import and export, and support for System 7's publish and subscribe and Apple events. Better yet, MacProject Pro has the same kind of clean design and understandable menu structure that users of Claris's FileMaker Pro or ClarisWorks would expect, a boon for the beginning project manager.

MacProject Pro offers only a few well-chosen ways to enter and display data. The Schedule Chart, a PERT diagram, is the heart of the program. You can easily add annotations, graphics, and notes to the chart to quickly communicate what needs to get done and who is going to do it. The new Outline view is a hierarchical outliner that is most useful for quickly organizing a project from the top down. The enhanced Task Timeline is a Gantt chart that shows when tasks occur over the life of the project by displaying each task as a horizontal bar against a calendar grid.

MacProject provides four views that help you focus on the resources you'll be using to complete the project. The Resource Timeline shows the duration of time that each resource is allocated to a particular task. The Resource Table lists all the assigned resources in a spreadsheet format. The Resource Histogram shows the work load for each resource, highlighting in red the periods when someone is being asked to do too much at once. The Allocation table is a spreadsheet that lists all the resources you'll be using; it groups them by task and calculates the cost of each resource for each task.

Finally, MacProject Pro provides three views that help you get an overall grasp of your project. The Cash Flow Table provides a chronological summary of the project's costs and income. The Dependency Table lists all the tasks in your project and how they relate to each other. The Project Overview is a single-page report that lists the number of tasks in the project, the planned start and finish dates, the planned costs, and other project details.

Operating Constraints

BUT EVEN THOUGH MACPROJECT PRO provides all the essential tools for managing a project, comes with a terrific manual, and has a relatively simple interface, I found its architecture occasionally confining. Scheduling tasks and changing dependencies between them, something you do a lot when refining a project plan, requires several steps and multiple charts. I was often unable to work directly in the views that I found most useful, the Gantt and outline views, and was forced instead to return to the PERT network diagram or a spreadsheetlike tabular view.

The outliner is a useful place to start brainstorming and organizing a project. Once you finish a rough outline, howev-

er, you must move to the Schedule Chart to schedule the tasks, then move to the Task Timeline to see how the tasks distribute themselves over time.

To rearrange the order of tasks, or add new tasks, you must go back to the Schedule Chart and make changes, or return first to the outliner, add new tasks, then go to the Schedule Chart and schedule them. In either case, you cannot work directly in the Timeline's Gantt view.

To change the dependencies between tasks, or change the lag time between tasks, you must use the Dependency Table, which lists all data in tabular form; or you can go to the Schedule Chart, select the dependency line between two tasks, select Lag Time from the Edit menu, and change the dependency and lag time. To see how this changes the distribution of tasks over time, you must go back to the Task Timeline, making what seems like a simple change into a multiple-step process.

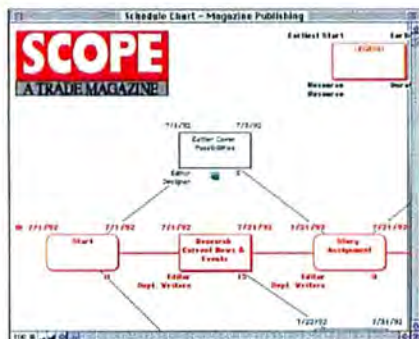
I found the program constraining in several other ways. You're limited, for instance, to one duration scale for the entire project—either minutes, hours, days, weeks, or months. That means that if you've specified days as the most useful measure of duration for entering resource allocations or task duration, you'll also have to use them for lag-time calculations.

I wanted to display milestone dates along with my Task Timeline, but MacProject Pro limits your formatting choices to changing the time-line bar formats and displaying the task names next to these bars.

Managing MacProject Pro

MACPROJECT PRO FITS NICELY BETWEEN scheduling programs like AEC Software's FastTrack Schedule 2.0, which allow the elegant creation of useful charts but offer minimal resource-management capabilities, and higher-end packages like Microsoft Project 3.0 and Scitor Corporation's Project Scheduler 5.0, which provide capabilities for managing more tasks per project and more resources per task as well as offering more reporting capabilities. I'd recommend MacProject Pro for people who are managing midsize projects (Claris recommends using no more than 500 tasks and 50 resources per task) and who particularly like the PERT diagram view of a project. For those who prefer Gantt views but don't need to manage resources, I'd recommend AEC FastTrack Schedule 2.0. For those who do need to manage resources, I'd recommend spending the extra money and time needed to master Microsoft Project 3.0.

—LIZA WEIMAN



The Heart of MacProject Pro In the Schedule Chart view, you schedule tasks, create dependencies, and set lag times. Critical tasks are highlighted in red; the small blue square under Gather Cover Possibilities at the top can be expanded into the electronic equivalent of a sticky note, useful for annotating charts.

How Butterflies Transform

The butterfly passes through several stages in its glorious transformation from egg to the completed creature that we all visualize as the butterfly. The adult female lays between one hundred and several thousand eggs throughout her lifetime each with the potential of becoming an adult butterfly like it.

Each egg, so tiny that it can only be seen by the human eye with the help of a microscope, is laid over near a plant on which the newly hatched grub will be able to feed. These eggs are often green or yellow, but can also be found in shades of blue or red, each with a shell-like design covering it.

Usually in the spring or summer a tiny caterpillar, or grub, will hatch from the egg. This omnivorous creature almost immediately begins to feed as it will consume the majority of all of its nutrients during this phase of its life.

The caterpillar will continue to eat until it has eaten so much that its skin can no longer contain the newly acquired mass. The skin then hardens and the caterpillar will shed it in order to have it replaced by a newer and larger one. This process continues for weeks as the caterpillar increases in size, several times its original mass.

Often during the time of fall, the caterpillar will then either spin a silken pad from which it suspends itself by its hind legs or it will fasten a body segment by silken threads to a twig creating a chrysalis or pupa. Usually after spending the winter months dormant, the final stage of transformation will take place.

The shell of the chrysalis is broken open and the creature that emerges is barely recognizable as the butterfly that it will become. Its wings are crumpled and large close to its moist fleshy body. It will remain clinging to the cocoon or a nearby branch as its form gradually begins to become dry and firm.

It moves its wings slowly at first with little strength but as they dry it is soon ready to take flight. The creature that ascends into the air has been through its final stage of development and is now the completed butterfly. This butterfly is now called the imago, or perfect insect.

How Butterflies Transform



The butterfly passes through several stages in its glorious transformation from egg to the completed creature that we all visualize as the butterfly. The adult female lays between one hundred and several thousand eggs throughout her lifetime each with the potential of becoming an adult butterfly like it.

Each egg, so tiny that it can only be seen by the human eye with the help of a microscope, is laid over near a plant on which the newly hatched grub will be able to feed. These eggs are often green or yellow, but can also be found in shades of blue or red, each with a shell-like design covering it.

Usually in the spring or summer a tiny caterpillar, or grub, will hatch from the egg. This omnivorous creature almost immediately begins to feed as it will consume the majority of all of its nutrients during this phase of its life.



The emergence of the butterfly is a magical event. The creature that emerges is barely recognizable as the butterfly that it will become. Its wings are crumpled and large close to its moist fleshy body. It will remain clinging to the cocoon or a nearby branch as its form gradually begins to become dry and firm.



Often during the time of fall, the caterpillar will then either spin a silken pad from which it suspends itself by its hind legs or it will fasten a body segment by silken threads to a twig creating a chrysalis or pupa. Usually after spending the winter months dormant, the final stage of transformation will take place.

The shell of the chrysalis is broken open and the creature that emerges is barely recognizable as the butterfly that it will become. Its wings are crumpled and large close to its moist fleshy body. It will remain clinging to the cocoon or a nearby branch as its form gradually begins to become dry and firm.

It moves its wings slowly at first with little strength but as they dry it is soon ready to take flight. The creature that ascends into the air has been through its final stage of development and is now the completed butterfly. This butterfly is now called the imago, or perfect insect.



DocuMorphosis

An ordinary caterpillar is miraculously changed into a vibrantly colored, graceful butterfly. It's one of nature's most awe-inspiring events.

Now, you can share in the splendor of a similar magical event: DocuMorphosis™. Transform dull looking pages into exciting, attention grabbing documents. Add excitement with logos, photographs, line drawings, charts — in 24-bit color or 256 shades of gray. See your applications enriched with new meaning and importance — with the affordable ScanMaker II, by Microtek.

Place the image you want on the scanner. ScanMaker II has built-in features to make the transformation easy. The results will be astonishing.

Images are crystal clear, brimming with all the rich color and fine detail of the original at resolutions up to 1200 dpi. You can even scan printed text directly into your word processing program with optional OCR software. No more re-typing!

Find out how simple and convenient scanning can be. Experience the wonder of DocuMorphosis. Bring new life to your documents — for under \$1000. ScanMaker II. For more information, or the name of your nearest authorized Microtek dealer, call 1-800-654-4160.

MICROTEK
Better Images Through Innovation.

Font-Substitution Utility Pack

SuperATM

PROS: Generates and prints smooth approximations of most fonts in the Adobe Type Library; includes entire screen-font library on CD ROM; protects against Courier substitution during printing. **CONS:** Doesn't work with most non-Adobe fonts; incompatible with special characters. **COMPANY:** Adobe Systems (415/961-4400). **REQUIRES:** Mac Plus; 2MB of RAM; hard drive; System 6.0.5. Recommended: CD ROM drive. **LIST PRICE:** \$149.



SUPERATM IS AN UPGRADE TO THE popular Adobe Type Manager utility, which lets you view Adobe-brand PostScript fonts on screen and output those fonts at high resolutions even when the corresponding printer fonts are unavailable. It doesn't work with non-Adobe PostScript fonts—including fonts from Agfa, Monotype, Bitstream, and many others—and it supports only the handful of TrueType faces that make up the Apple Font Pack (see *Reviews, Macworld*, March 1993). But if you've ever wanted to expand your typeface library or open other people's font-infested documents on your machine without having to reformat, SuperATM qualifies as an outstanding advancement in technology and a tremendous value to boot.

To work its magic, SuperATM scatters a variety of programs and resource files throughout the System Folder, none of which is actually named SuperATM. The heart of the little network is the

familiar ATM control panel, now promoted to version 3.5. In previous incarnations, ATM followed a two-step approach: first, it assembled a list of the screen fonts available to your system, then it generated smooth outlines for those faces on the fly by referencing the mathematical outline definitions contained in the corresponding printer fonts. ATM 3.5 goes a few steps further. If it doesn't find a printer font, it consults a hefty, 1.4MB database containing font metrics—character size, pair kerning, and proportional spacing information—for 1300 faces from the Adobe Type Library. Once ATM 3.5 locates the desired metrics, ATM blends two multiple-master fonts—one serif and the other sans serif—according to a recipe found inside the database, in order to fashion a reasonable facsimile of the desired typeface. ATM 3.5 can both display the result on screen and print it at full resolution to a variety of PostScript and non-PostScript printers.

An Adobe CD ROM named Type on Call is bundled with SuperATM. Type on Call includes every font now available in the Adobe Type Library. All printer fonts are locked—you can unlock them for a fee—but the screen fonts are unprotected. Provided you have a CD ROM drive, you can copy any screen font to your system, then use ATM 3.5 to approximate the typeface at sizes and resolutions that the screen font can't accommodate. If you don't have a CD ROM drive, SuperATM bundles Font Builder, a superbly convenient but ultimately limited utility that lets you generate screen fonts for a mere 31 font families. The majority of these are the handiwork of Adobe's in-house type staff; the rest are

licensed in the public domain. Until big licensors like ITC, Monotype, and Linotype-Hell jump on board, Font Builder is a swell idea with a stunted potential.

SuperATM proves itself invaluable when editing documents created on different machines. Even without the appropriate screen fonts, ATM 3.5 generates outlines for Adobe-brand typefaces that it finds inside a document. For example, suppose a design-sensitive associate formats a weekly memo in Berthold Bodoni Antiqua and asks you to perform the old once-over for the sake of accuracy. You appreciate the font's linear composition and classic stylings, but you don't want to hunt it down and load it on your machine. With SuperATM, you can open the memo, edit it, and save the file, all without upsetting paragraph breaks, pagination, or any other formatting attributes.

SuperATM's emulations are not meant to take the place of true printer-font definitions. They're only intended to be placeholders, props to hold up your documents when nothing better is available. Having said that, many users will have a hard time telling ATM-generated serif and sans serif text faces from their printer-font originals. Slab serif fonts, display faces, and cursive scripts don't fare nearly as well, though the font metrics in every test I tried were right on.

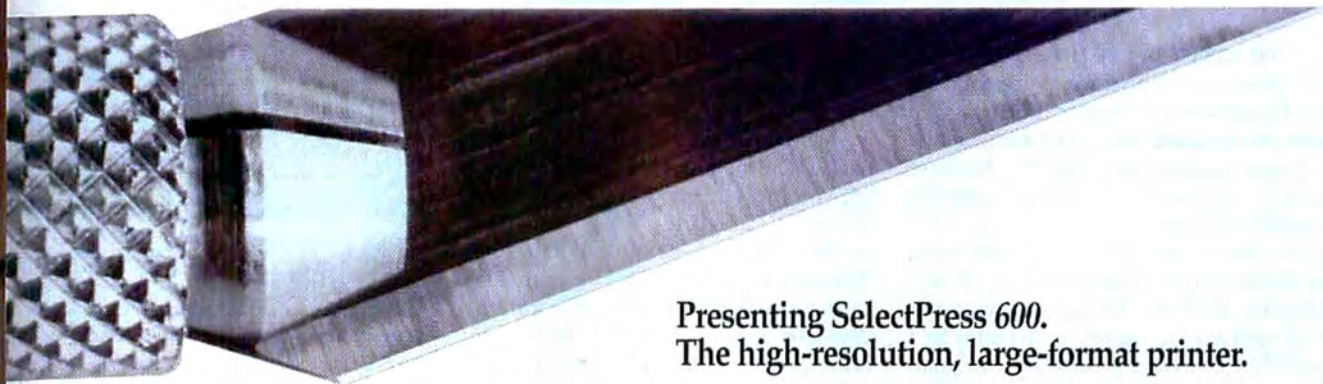
Sadly, ATM 3.5 has no information about symbol fonts (such as Zapf Dingbats and Mathematical Pi) and special-character fonts (such as Utopia Expert Collection and Helvetica Fractions). If special characters appear in a document, ATM 3.5 uses the default screen font, so they appear as bitmaps. This means that more than 10 percent of the fonts in the Adobe Type Library are incompatible with SuperATM. A more flexible font-rendering algorithm is needed. For example, if a font includes the *ffi* ligature, as do all of the Expert Collections, why can't SuperATM blend and merge the *f* and *i* outlines from its master designs to create a single character? If this is impossible, Expert Collection master designs should be included with SuperATM.

A local typesetter I know made an interesting comment. He worried that SuperATM might do too good a job of emulating a font, and therefore make it difficult to tell if he had typeset a page using the proper printer font or the SuperATM emulation. But if you've ever reproduced thousands of copies of a document only to notice too late that a line of text had defaulted to Courier, or worse, bitmapped, you'll appreciate SuperATM. No SuperATM emulation is perfect, but in most cases you'll be the only one who notices the difference.—DEKE MCCLELLAND

Real Adobe Printer Fonts	SuperATM Substitutions	Overprinted (Font Metrics)
Dom Casual	Dom Casual	Dom Casual
<i>Caxton Italic</i>	<i>Caxton Italic</i>	<i>Caxton Italic</i>
<i>Linotext</i>	<i>Linotext</i>	<i>Linotext</i>
Garamond Condensed	Garamond Condensed	Garamond Condensed
Folio Light	Folio Light	Folio Light
<i>Shelley Script</i>	<i>Shelley Script</i>	<i>Shelley Script</i>
Serifa Black	Serifa Black	Serifa Black

Great Font Forgeries The left column shows seven printer fonts from the Adobe Type Library. The middle column shows the same typefaces generated by SuperATM without printer-font definitions. ATM 3.5 works best when rendering serif (Caxton Italic, Garamond Condensed) and sans serif (Folio Light) text faces. Slab serif (Serifa Black) and display faces (Dom Casual) suffer, while scripts (Shelley Script) and other decorative styles (Linotext) are unrecognizable. However, as shown in the right-hand column, which has the printer fonts superimposed on the ATM substitutions, the font metrics are the same even when the approximations look different from the originals—letterspacing and leading remain unaffected, thus ensuring proper copyfitting.

SHARP OUTPUT FOR YOUR BIG IDEAS



FREE ETHERNET UPGRADE

*Limited time offer.
Call for details.*

Presenting SelectPress 600. The high-resolution, large-format printer.

The new SelectPress™ 600 delivers sharp, full-bleed edge-to-edge, 11" x 17" output that's simply untouchable. Its 25MHz RISC processor and high-precision laser combine to produce crisp 600 dpi documents with astonishing speed. And its PostScript® Level 2 compatibility, PCL5, TrueType™ and Type 1 font support make it the best large-format printer for Macintosh®, PC or combined environments.

The SelectPress 600 comes with an internal 40 MB hard drive for quick font access, a trouble-free one-year warranty, toll-free support – and an affordable price. At just \$4,499, it's the perfect printer for graphic arts, large-scale design, or CAD. Call 800-942-3321 for the name of your nearest dealer, or 800-422-7777, ext. 999, to order direct. In Canada, call 800-263-1405. The new GCC SelectPress 600. The sharpest choice for your big ideas.



GCC
TECHNOLOGIES
Peripherals With Vision™

42003U

Data-Analysis Program

SpreadBase 1.0.1

PROS: Unique combination of database and spreadsheet functions; designed for easy modification of data views; accepts and formats SQL data through Clear Access. **CONS:** Big program, big files, slow operation; modest assortment of graph types; cranky text-based macro language; meager documentation. **COMPANY:** Objective Software (415/306-7410). **REQUIRES:** Mac II with math coprocessor; 5MB of RAM; hard drive; System 6.0.5. **LIST PRICE:** \$695.



SPREADBASE IS THE MOST POWERFUL business-analysis tool yet produced for the personal computer. The program aims to eliminate the rather artificial distinction between the flat-file database (really just one sort of table) and the spreadsheet (just another sort), and it succeeds. If you need multiple, flexible views of business data, SpreadBase is an outstanding product. The only drawback is that SpreadBase would work better in a world of 200MHz processors and gigabytes of RAM, but for power users it's worth a close look right now.

Categorical Superiority

SPREADBASE DESCRIBES ITSELF AS CATEGORY-BASED modeling, in contrast to spreadsheet modeling in which quantities are identified simply by locations in a grid. A category in SpreadBase is almost identical in concept to a database field, and a SpreadBase matrix is defined in terms of these categories rather than single items. The matrix (actually a 3-D matrix) rather than the spreadsheet is the central feature of SpreadBase; each cell corresponds to one field value of a database record. When you highlight a cell in SpreadBase, a line labeled "location" in the matrix view shows the names of the rest of the data fields associated with the database record connected to that cell (see "Big Firm Matrix").

Setting up a SpreadBase matrix is more like defining a database than formulating a traditional spreadsheet model. This means it takes longer and requires more thinking at the outset. The benefits of this additional effort, however, are considerable. First, formulas in SpreadBase are defined in terms of category names, for example "Profit = Revenue - Expenses" rather than $C5 = B5 - A5$. Second, you can do any conceivable rearrangement of your work by selecting categories in a matrix-view dialog box, and everything rearranges itself magically (and correctly)—

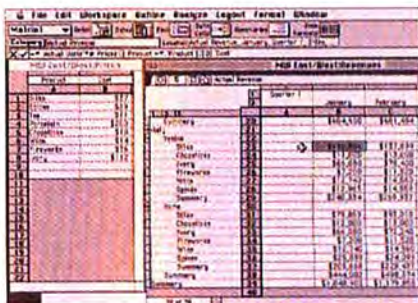
including formulas. From the same basic data, you can have the matrix highlight, for example, sales by quarter, sales by region, or any of the other views beloved of product planners, budgeters, and marketing managers. Highlighted data roughly corresponds to cross-tab views of data, except that SpreadBase implements a sophisticated type of view-to-view data linking and the cross-tab function works across all linkages. All this data is further organized in a convenient outline mode, and SpreadBase offers all the expected math, financial, statistical, and other functions for analysis.

SpreadBase automatically generates sets of graphs corresponding to its cross-tab views, albeit from a somewhat austere set of basic graph types (area, bar, pie, column, line, and scatter—all of them 2-D). The graphs aren't fancy, but they set a new standard in ease of use. Once you have asked the program for any graph at all, you can see any other graph just by selecting categories from pull-down menus in a graph-definition dialog box. This technique is so superior in practice to the standard spreadsheet highlight-the-cells method, you'll wonder why every program doesn't use it. Well, the other programs, particularly spreadsheets, don't do it because they don't "know" what the data means. The extra time needed to set up a SpreadBase matrix, compared to an Excel spreadsheet, is paid back as soon as you start looking at a few comparative graphs.

Does Size Matter?

SPREADBASE ITSELF TAKES UP ABOUT 3MB and runs small projects in 5MB of RAM, but the program really calls for 8MB for general-purpose use under System 7. Files are similarly substantial: a 12 by 20 array that would constitute a 5K Excel file becomes a 100K SpreadBase matrix. Because of the overhead associated with the implicit database attached to your data, you can expect this level of file-size inflation for most projects. Most big programs aren't fast, and this one isn't either. Although the format makes direct comparisons difficult, an action corresponding roughly to the recalc of a 10 by 10 matrix (changing a term in one linked sheet and observing a change in totals in a matrix) takes 20 to 40 seconds on a IIci, depending on setup details.

Other negatives are SpreadBase's ModelTalk macro language, documentation, and help. ModelTalk is a text-only (there are no watch-me-style macros), pseudo-code-like language with uniquely annoying variable-name syntax (see "Severe Macro-ation"). Here's the problem: this program's main features are



Big Firm Matrix The matrix view, effectively a 2-D view through a 3-D stack of database records, is the central data document in SpreadBase. Note the formula associated with this cell, expressed in terms of field names rather than cell addresses.



Severe Macro-ation SpreadBase now has the unenviable distinction of being the only business-analysis program with a fussy, text-based macro language. See all those little periods and single quotes in the expression? They're crucial.

most valuable to financial officers and executives, who seldom have a real programming background. The help stacks included with SpreadBase are mostly an online version of the documentation, and the documentation skimps on crucial areas (error messages, for example). It would also be good to have more documentation on the numerous small glitches that arise translating files in and out of Excel and SYLK formats.

Rating this program is a bit of a problem. If you're the person your company flies out to the head office with a PowerBook 180 to work on divisional budgets, it's an honest four stars, missing the top rating only for sluggish performance, hastily written documentation, and programmers-only macro language. If you're balancing a checkbook on a Performa 200, SpreadBase would rate about one star. If your needs are more complex but are still below top power-user levels, you might be better served limping along with Excel's own cross tabs or buying the admirable special-purpose cross-tab program DataPivot from Brio Technology. But if you currently have lots of linked spreadsheets, are constantly modifying them, and have everyone in the company looking to you for answers, SpreadBase is what you need.—CHARLES SEITER

[illegible]

ROCA RATCH™ (ICI)	\$19
abcdefghijklmnopqrstuvwxyz	
CHARACT™ (FTI)	\$19
abcdefghijklmnopqrstuvwxyz	
BUCKLEY VERTICAL	\$29
abcdefghijklmnopqrstuvwxyz	
LETRASET™ LASER	\$29
abcdefghijklmnopqrstuvwxyz	
NEWTRON™ (ICI)	\$29
abcdefghijklmnopqrstuvwxyz	
QUARTZ™ (ICI)	\$29
abcdefghijklmnopqrstuvwxyz	
LETRASET™ MAGTIME™	\$19
abcdefghijklmnopqrstuvwxyz	



Financial-Planning Software

WealthBuilder 2.0

PROS: Easy to use; keeps investor goal-oriented; extensive database of investment options.

CONS: High monthly maintenance costs; sophisticated investors will outgrow program; investment recommendations subjective and unproven.

COMPANY: Reality Technologies (800/346-2024). **REQUIRES:** Mac Plus; hard drive; modem for online database; System 6.0.5.

LIST PRICE: \$79.99.



WEALTHBUILDER 2.0 CAN HELP YOU make your money grow. This easy-to-use program calculates your net worth, tracks your household budget, helps you attain financial goals, and advises you on different investment options.

After the initial setup, you probably won't have to spend too much time entering personal financial data. To set up, you specify your investment philosophy (from Very Conservative to Very Aggressive), enter full information on all sources of income, the money you owe, the cost and worth of your investments, and the value of your personal property and residences. WealthBuilder calculates your net worth and annual income.

For setting up a household budget, you list your income, expenses (including taxes), and savings. WealthBuilder is not a checkbook-management program, though, and you must calculate income and expenses first; however, WealthBuilder can import this data from Intuit's Quicken, Survivor Software's MacMoney, and MECA Software's Managing Your Money.

WealthBuilder helps you work toward financial goals such as retirement, a house purchase, or a vacation. You enter the amount of money you'll need, how much money you have allocated to savings, and financial assumptions such as inflation and interest rates. WealthBuilder suggests how much to allocate each month. Each time you use the program, it charts your finances and tells you how close you are to your goal.

Once you know where you stand financially, the question remains: Where do you invest your money? This is where WealthBuilder shines. It includes a massive database (10.4MB of hard drive space) of possible investment vehicles (over 5000 stocks, 6000 bonds, and 2500 mutual funds). WealthBuilder helps you find the right investment. For instance, you can find conservative mutual funds that have increased in value for five con-

secutive years, high-tech companies with consistently strong earnings, or high-yield high-risk bonds. The program presents you with a list of investments that meet your criteria. Click on the name of an investment, and you see three pages of detailed financial data.

Since stock, bond, and mutual-fund information gets stale quickly, the data that comes with the program is already out of date by the time you load the program. You can update WealthBuilder's database monthly via modem (generally through a local phone call). Updating the full data set takes about an hour with a 2400-bps modem. The first month of updated data is free; after that, you pay \$9.95 a month for updated mutual-fund data and unlimited access to stock option and mutual-fund quotes, or \$17.95 a month to update all stock, bond, and mutual-fund data. The online system also gives you access to current stock, bond, and mutual-fund prices (delayed 15 minutes) as well as a brief summary of current market activity. When you log on to the database, WealthBuilder automatically updates the value of the stocks, bonds, and mutual funds in your portfolio. Unfortunately, the database can't chart the stocks, and the online system won't give you current news (including earnings changes) on individual companies—information that is often crucial in making an investment decision. You can receive quarterly updates by mail for a fee (\$119.95 for mutual-fund data; \$199.95 for all stock, bond, and mutual-fund data).

WealthBuilder suggests how you should allocate your investments (what percentages to put in stocks, bonds, precious metals, and so on), but this is just one opinion—take the program's advice at your own risk.

WealthBuilder includes a portfolio manager; however, it's extremely limited and gives you only the barest details on your investments. You can print other reports (net worth, budget, and so on) but you can't customize them or even use the fonts installed in your system.

The program is easy to use and makes excellent use of the Mac interface. The extensive online tutorials were written by the editors of *Money* magazine covering such topics as retirement, stocks, insurance, and estate planning. If you need help with the program, toll-free technical support is knowledgeable and is available six days a week.

WealthBuilder forces you to think about your money and helps you develop an investment plan. It is a good program for beginning investors, but more-sophisticated investors will want more.

—SAUL D. FELDMAN

Automatic Disk-Compression Utility

TimesTwo 1.0.1

PROS: Compresses all files; fully transparent operation; no decompression utility needed.

CONS: Doesn't work with partitioned disks; copy-protected installation master; requires special crash-recovery steps; awkward full-disk handling. **COMPANY:** Golden Triangle Computers (619/279-2100). **REQUIRES:** Mac Plus; 2MB of RAM; System 6.0.4. **LIST PRICE:** \$149.



UNTIL RECENTLY, AUTOMATIC DATA compression for the Mac required system extensions, control panels, and special-case handling for some applications. That's because compression utilities were designed as add-ons to the Mac Operating System. TimesTwo is the first Mac compression product to bypass such inconveniences, a feat it accomplishes by operating at the disk-driver level rather than as an OS add-on, using the same algorithm as the MS-DOS utility Stacker, a popular PC driver-level compressor.

The installation procedure is straightforward: you start up from TimesTwo's copy-protected installation master disk, select the hard drive to be converted to a TimesTwo disk, and stand back. The installer first runs diagnostic tests to ensure your drive and SCSI connections are reliable, then it compresses all data on the drive in place. When you next restart, the Finder shows the hard drive as being twice its former capacity. You use the drive normally—the TimesTwo driver automatically compresses all it writes and decompresses all it reads.

Except for speed, operation with a TimesTwo-compressed drive is completely transparent. The Finder reports the expanded size of files, avoiding size ambiguity problems affecting some applications under OS-based compressors. When you copy files from a TimesTwo drive to a non-TimesTwo drive or floppy disk, they arrive in uncompressed form; similarly, communications programs always see uncompressed data when transmitting files from a TimesTwo drive. The TimesTwo driver is self-contained on each drive, so you can use a TimesTwo-compressed drive (or removable cartridge) on another Mac without installing any special extensions or utilities.

The faster the CPU, the faster TimesTwo's CPU-intensive compression algorithm runs. In tests Macs with 68000 or 68020 processors took about twice as long under TimesTwo for most I/O tasks

continues

THE FIRST INK JET COLOR PRINTER THAT USES WHAT YOU ALREADY HAVE!

The Brother
HS-1PS
plain paper
color printer...
make the
most of it!



YOUR PLAIN PAPER

Includes both letter and ledger size trays



YOUR STANDARD TRANSPARENCY STOCK

Built-in transparentizer means excellent quality—fast, with no accessories or expensive, special stock to buy



YOUR COMPUTER

Ready to run with Mac's, PC's & workstations—thanks to auto emulation and auto interface switching



YOUR DEADLINES

When you need it yesterday, our high-performance 60 MHz. controller & high-speed printing system make sure you can deliver!



Model HS-1PS Features:

- Prints via PostScript® language emulation
- HP-GL** & HP-PCL** emulations with auto switching
- 10 MB of RAM expandable to 26 MB
- Centronics RS232 & AppleTalk*** interfaces with auto switching
- 300 DPI resolution
- Accepts paper up to 12" x 20"

*© Adobe Systems, **© Hewlett Packard Company, ***© Apple Computer

FREE VIDEO!

Call 908-356-8880

ext. 4300

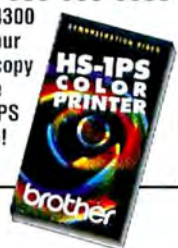
for your

free copy

of the

HS-1PS

video!



We're at your side.

brother®

BROTHER INTERNATIONAL CORPORATION • 200 Cottontail Lane, Somerset, NJ 08875-6714

Circle 294 on reader service card

(such as copying files, launching applications, and saving data). Delays were far less noticeable on 68030-based Macs; a IIfx ran only 15 percent slower on average. Most users will probably find performance on the Mac Classic and PowerBook 100 unacceptably slow.

Data-compression efficiency varies with the type of data no matter what utility you use. Files previously compressed by another utility won't compress further. TimesTwo is smart enough to recognize uncompressible data and leave it as is, so you don't pay a time penalty for accessing such data.

TimesTwo does have its limitations. It doesn't work with partitioned disks, and it doesn't let you swap a removable TimesTwo cartridge without restarting. The amount of available space on a volume is only an approximation, based on the compressibility of data already on the disk. For an accurate gauge of available space, you must run the TimesTwo installer again to "verify" the drive. If the estimate is inaccurate, applications crash if they run out of physical space during a save or copy operation. TimesTwo issues a series of warnings when space falls below 3MB. However, tests probing TimesTwo's disk-full behavior sometimes resulted in application or system crashes despite these warnings. Particularly for unattended operation (such as copying a large folder), avoid saving to a TimesTwo disk that's nearly full.

Any time you experience a system crash, you're supposed to rerun the TimesTwo installer from the floppy disk to validate the disk before using it again. The validation step is mandatory; according to Golden Triangle, restarting directly from the hard drive can result in corrupted files. While you can perform this validation step using a copy of the TimesTwo utility, you can install TimesTwo only from the copy-protected original master. Reinitializing a drive to restore from a backup, for example, requires reinstalling TimesTwo from the original master. This could be a problem for users who need to reinstall TimesTwo while on the road. If you forget the disk at home—or, heaven forbid, lose it—and need to reinstall, you're out of luck until Golden Triangle gets you a new one. You could, of course, reinitialize the hard drive with its normal driver, but chances are you won't be able to restore many of your files from backup because there won't be room on the lower-capacity hard drive.

Golden Triangle says a future TimesTwo release will address these limitations. Even in its current incarnation, though, you may find TimesTwo's transparency compensates for its quirks.—MEL BECKMAN

Mail-List Management

AccuZip6 1.5.2

PROS: Full featured; reasonably priced CD ROM updates; toll-free technical support. **CONS:**

Slow; doesn't work in background; documentation rife with typos; many user-interface violations.

COMPANY: Software Publishers (714/846-

1908). **REQUIRES:** Mac Plus; 4MB of RAM; CD ROM drive; System 6.0.5. **LIST PRICE:** \$899.



ACCUZIP6 IS BILLED AS A PROFESSIONAL-LEVEL mail-management system. At its most basic, AccuZip6 stores mailing lists, but unlike database applications, it lowers your postage costs by cleaning up lists; eliminating duplicates; and preparing all the forms, sack tags, and labels required for first-, second-, and third-class bulk mailings. Nothing else on the market is nearly as comprehensive (and the lack of competition might partially explain its many problems).

It's possible to import addresses from almost any existing database because AccuZip6 allows you to specify the delimiters. AccuZip6 can even split name and address components contained in a single field. However, AccuZip6 incorrectly splits suffixes such as Jr., Sr., III, and so on from names. On my 8MB Mac IIfx running System 7.1, AccuZip6 imports approximately 75 records per minute. Importing is slow because AccuZip6 standardizes the records by identifying discrete address components, correcting abbreviations and capitalization, then placing the components in the order preferred by the U.S. Postal Service.

You can manually add records by typing just the recipient's name, street address, and zip code. Because AccuZip6 standardizes as you enter, there's no need to correctly spell the street name or use proper punctuation. Furthermore, AccuZip6 provides the correct city and state when it codes the record—adding the zip+4, carrier route number, and PostNet bar code—by consulting its CD ROM, which contains every valid postal address in the United States. Standardization is almost instantaneous, but since on-the-fly coding takes up to 30 seconds if you have not entered a valid street address for the zip code, on-the-fly coding should be a preference item so as not to interrupt data entry.

You can batch-code either during or after importing. My system was able to code roughly 430 records per hour. Unfortunately, this time-consuming process can't be performed in the background.

About 10 percent of my records were undeliverable according to AccuZip6. Still, many acceptable records were "corrected" in error. For instance, "100 Main St., 15th Floor" was changed to "100 Main St STE FLOOR." Software Publishers is aware of this problem and promises a fix soon, though coding performance will most likely continue to suffer as long as AccuZip6 is written primarily in ACI US's 4th Dimension.

AccuZip6's closest competitor, Semaphore's ZP4 (*Reviews, Macworld*, May 1992), can also standardize and code addresses, but AccuZip6 goes much further. It presorts your addresses and prints labels in the order required to take advantage of significant postage discounts. It then prints the required CASS (Coding Accuracy Support System) forms and sack tags. However, if you're unfamiliar with postal rules, rates, and regulations, the documentation isn't illuminating. In fact, it's so haphazardly organized and full of typos that it's being rewritten.

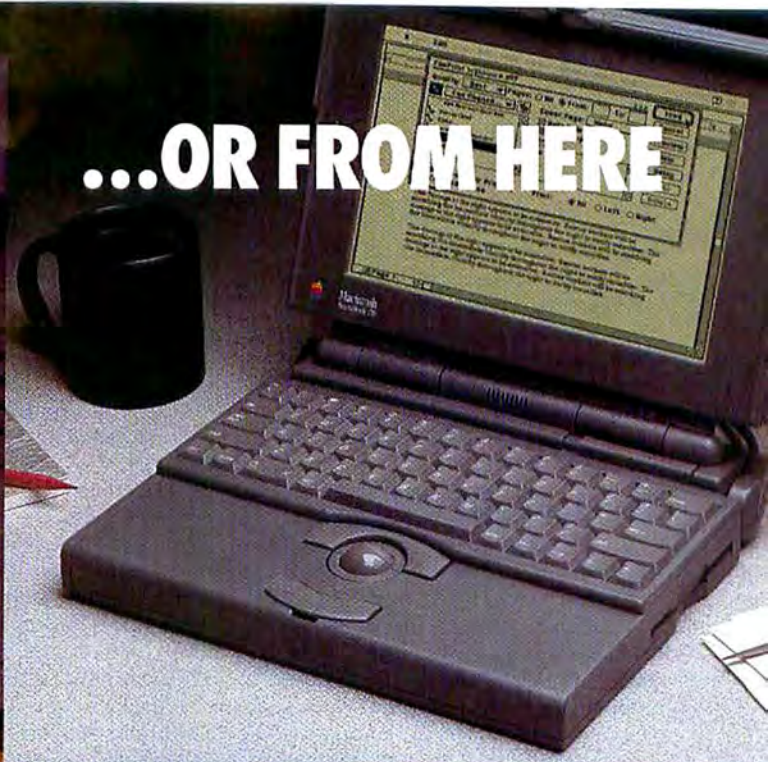
Software Publishers should also focus on AccuZip6's egregious user-interface violations. AccuZip6 is inexcusably modal: switch from importing to entering records, for example, and you get wholesale menu changes, which destroy any semblance of consistency. There are all sorts of other nits to pick, too. For instance, pressing the return key doesn't initiate default buttons outlined in bold; check boxes are used where radio buttons should be; and, amazingly enough, there's no New option in the File menu. To create a new database, you have to hold down the option key while double-clicking on the AccuZip6 application icon. How's that for intuitive?

Software Publishers deserves credit for greatly raising expectations for Mac mail-management software. Although ZP4 codes almost 10 percent faster, its upgrades are more costly (\$125 per quarter versus \$200 per year), printed documentation is nonexistent, and the feature set is not nearly as complete. Nonetheless, with AccuZip6's inadequate documentation and confusing user interface, I hesitate to recommend this version unless your mailing needs are extremely pressing and you're willing to spend lots of time on Software Publishers' knowledgeable staffed, toll-free, technical-support line. Software Publishers clearly understands the needs of bulk mailers, and in fact plans to release \$100 modules for telemarketing, real estate, and mail-order professionals. If they place as much emphasis on clarity and ease of use, I'm sure AccuZip6 will eventually deliver more postage savings than headaches.

—OWEN W. LINZMAYER

FAX FROM HERE

...OR FROM HERE



TO ANYWHERE HERE



WE'LL GIVE YOU THE WORLD AND \$50 BACK

\$50 REBATE*

On most PSI fax/data modems through April 30, 1993. Purchase your PSI fax/data modem from your participating reseller, attach this coupon with proof of purchase and your name, company, address, phone and fax and send it to: PSI Integration Rebate, 851 E. Hamilton Ave., Suite 200 Campbell, CA 95008. Your Purchase must be made before 4/30/93. Limit one rebate per purchase. Valid for US customers only.

☐ I am a MacWorld subscriber

*Offer not valid on COMstation I and II or PowerModem I and II.

Just click your mouse. It's really that simple. Then you'll see how a PSI fax/data modem can dramatically increase your productivity. PSI brings you a full range of fax/data modems for the Mac, with the latest standards in data compression and error correction. Choose from PSI's COMstation line of desktop models, including ultra-high speed and networkable modems, or the internally-mounted PowerModem family that puts the power of a fax right in your PowerBook. Keep in touch and keep it simple. Call 1-800-622-1722.

Desktop Products	PowerBook Products	Data	Fax	SRP
COMstation ONE	PowerModem	2400	9600	\$195
COMstation TWO	PowerModem II	2400	9600	\$295
COMstation THREE	—	14.4	N/A	\$445
COMstation FOUR	PowerModem III	9600	9600	\$445/\$395
COMstation FIVE	PowerModem IV	14.4	14.4	\$545/\$495
COMstation Network	—	2400	9600	\$395

PSI FAX/DATA MODEMS. WE GIVE YOU THE WORLD.™



INCLUDES OCR TECHNOLOGY FROM CAERE.™ THE MAKERS OF OMNIPAGE.™

Circle 61 on reader service card

Scientific Data Visualization

MacPhase 1.2

PROS: Low-cost, flexible data visualization for science and engineering; large assortment of mathematical tools; good interface to picture formats and programming languages.

CONS: Assumes some user sophistication.

COMPANY: Otter Solution (315/768-3956).

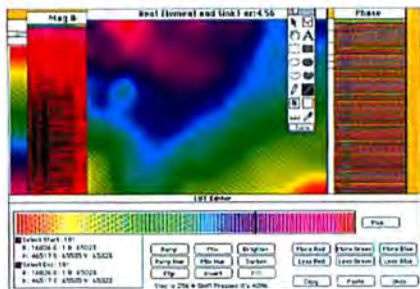
REQUIRES: Mac II; 2MB of RAM; System 6.0.7. Recommended: hard drive; 256-color monitor. **LIST PRICE:** \$159.



A FEW YEARS AGO, DOUG NORTON needed a program that would be able to represent, graphically, imperfections and distortions in a mirror surface. He wrote a program that could exhibit 2-D color-scale or gray-scale data (that is, it scaled a 2-D array of numbers to represent the numbers as color or intensity values), and in fact it provided a good representation of the small blips on mirror surfaces that result in phase differences in light reflected from different parts of the mirror. That original work has now been expanded to become a commercial program with a large assortment of 2-D data-manipulation facilities. It's one of the few authentic bargains in science software.

MacPhase has a feature set you would normally associate with programs that cost \$895 or so. Besides native, binary, and text files, and the expected PICT and TIFF formats, you can work with PostScript EPS files, Windows bitmaps, and files from Mathematica and MATLAB. Once the files are imported, you have a choice of seven windowing functions, with Hamming as the default. You get ten standard filters (edge, blur, Laplace, and so forth) with explicit control of filter matrix elements. The Math menu lets you perform calculations of any level of complexity on view windows (the program takes file names as the array names), and there's a pop-up RPN calculator for simple calculations (adding arrays, multiplying by a constant). The Transform menu offers four modes of Fourier transforms (on a Mac IIci, transforming a 128 by 128 array takes about six seconds).

MacPhase also has nine built-in types of gray-scale representation and a large assortment of stock lookup tables, but one of its principal strengths is a well-planned lookup-table editor. In a few minutes you can generate a custom lookup table to highlight salient data features in any given window. In fact, between the lookup-table editor and the Math menu, you can readily surpass the special effects available in Adobe Photoshop (MacPhase is faster, too). MacPhase generates histograms and statis-



Electric Crayons The lookup-table editor in MacPhase is delightfully easy to use; it's actually more intuitive than the color-scheme modifiers in professional graphics programs.

tics on visualized data sets, and also does 3-D contour and vector plots besides the usual color and gray representations.

Otter Solution is a small operation, with the disadvantage that you have to go to America Online or Otter's Internet board for support, but with the corresponding advantage that the support comes from Doug Norton. The program and manual assume that you know the function of most image-manipulation operations, and that you might want to tinker with interface source code (thoughtfully provided). But even if you don't have much experience in data representation, you could be very happy with MacPhase as your only image processing tool.—CHARLES SEITER

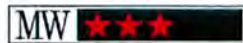
Executive Information System

EISToolKit 2.0

PROS: Wingz-based scripting easy to use; Clear Access for Mac/SQL connectivity. **CONS:** Slow; Wingz-based approach calls for workaround.

COMPANY: MicroStrategy (302/427-8800).

REQUIRES: Mac IIx; math coprocessor; 5MB of RAM; hard drive; System 7. **LIST PRICE:** \$1995.



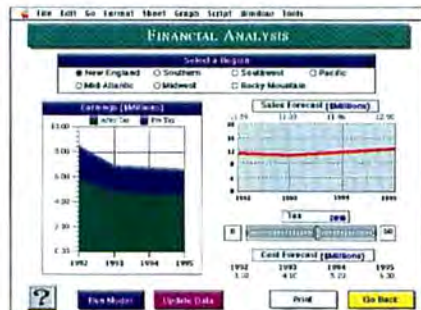
EISTOOLKIT IS A DEVELOPER'S ENVIRONMENT for creating an executive information system (EIS). Like executive word processors, EISs are designed on the assumption that business decision-makers are irrevocably complexity-impaired and should see a minimum of on-screen database choices at a time. EISToolKit helps you develop applications for this audience.

MicroStrategy's approach is ingenious. This product consists of Wingz, Clear Access plus ClearLink (both are included), and a set of 100 or so Wingz scripts that represent MicroStrategy's programming effort. These scripts in turn give you an environment in which you can create the elements of an application (layouts, buttons, graphs, links to databases, and data views) simply by calling commands from a Tools

menu and following some dialog box choices. This simple scheme works much better than you might expect.

The HyperScript language in Wingz is well designed—there's not much you can't do with it, and its performance is acceptable if not exactly quick. The command set and facilities are well designed for easy application construction. Besides simply collecting data, EISToolKit can distribute data into a Wingz spreadsheet for complex analysis and then present the results in simplified form in the user environment. To access the information, executive users navigate via button clicks and other basic operations.

EISToolKit can easily create links to data in Excel and Lotus 1-2-3 spreadsheets



Picks That Click This simple but effective demo app was formulated from a straightforward set of calls to EISToolKit's graphing and data-access tools.

as long as those files are saved in early formats (it can't link to Excel 4.0, for example). Through its set of SQL tools, EISToolKit can collect data from Oracle, Informix, Clear Base, Sybase, DB2, and nearly all other SQL databases, using prepared SQL queries; but for the most accurate queries you need to do some HyperScript programming. EISToolKit also implements a proprietary routine called Drill-Down, in which the results of a SQL query are used to generate choices to guide users through successive, more-specific queries. Finally, the product is platform-neutral—if you create your system on a Mac, you have a Windows version as well.

EISToolKit provides good documentation, and the company offers on-site support and training. For many medium-size businesses, the \$7995 ten-pack and MicroStrategy's Quick Strike support option (in which a trained designer comes to your site for a week) is an attractive deal. One cloud on MicroStrategy's horizon is that Microsoft is already shipping a comparable EIS product for Windows and is promising the Mac version in spring 1993, but it remains to be seen whether that product's Visual Basic internals can outperform HyperScript. If you don't mind working from Wingz, MicroStrategy at least guarantees you a reliable, field-tested EIS development system.—CHARLES SEITER

FIND THE PROBLEM



THE SOFTWARE DIAGNOSTIC FOR MACINTOSH

Maxa's ALERT!™ finds software conflicts and fixes them!

ALERT! analyzes your Mac's software and also checks a database of reported conflicts. It alerts you to incompatibilities among system extensions or INITs, background applications, applications, control panel devices, system software and more.

ALERT! can find software conflicts and fix them over a network! When you buy ALERT! you receive an unlimited FREE subscription to our database update service.

ALERT! is an essential utility for any Mac user to save time and avoid lost data by preventing software conflicts, frozen screens, system crashes and bombs.

MAXA CORPORATION 116 N. MARYLAND AVENUE • GLENDALE, CA 91206 IN THE US AND CANADA CALL: 800-788-6292

First in Desktop Diagnostics



MAXA, Maxa's ALERT! and SHOOPER are trademarks of MAXA Corporation. Other product and company names are trademarks of their respective owners. ©1993 MAXA Corporation. All rights reserved.

Circle 270 on reader service card

Input Device

The UnMouse

PROS: Cursor control, keypad, and graphics tablet in one; ergonomically superior to mouse; 60 programmable macros per template.

CONS: Only 16 macro buttons per template; ergonomically inferior to trackball.

COMPANY: MicroTouch Systems (508/694-9900). **REQUIRES:** Any Mac with an ADB port; System 6.0. **LIST PRICE:** \$199.



THE UNMOUSE IS A CURSOR-CONTROL device, programmable keypad, and small graphics tablet in one. You move your finger or a stylus across a touch-sensitive tablet, pressing down when you want to click. Who might need an UnMouse most? Users who don't like mice; users—especially PowerBook users—who need a keypad, a graphics tablet, or both; users without extended keyboards; and users with more macros than they can remember.

The UnMouse uses about the same space as a trackball, and far less than a trackball, keypad, and graphics tablet combined. Plus, it fits into a PowerBook carrying case, making it handy for people needing both a graphics tablet and a keypad on the road.

Using the UnMouse is simple; whether it's more intuitive than a mouse (as the company claims) is a personal call—I didn't find it so. In Absolute mode, every position on the UnMouse screen corresponds to the same spot on the Mac screen; touch the upper-left corner to access the Apple menu, and the lower-right corner to access the Trash Can. Mouse and Trackball modes give the UnMouse the feel of those devices.

The UnMouse can be particularly useful with PowerBooks, which don't have function keys, and with Macs that lack extended keyboards. All of the functions normally found on the extended keyboard are mapped on a template that slides under the UnMouse screen. To cut, just press Cut. MicroTouch supplies 60-macro templates for Word and Excel (16 "buttons," with shift-, option-, ⌘-, and control-key modifiers), three blank templates, and a MacDraw file that you use to print maps to your macros for the templates. Say you're in Claris MacWrite and you want to access your MacWrite macros. Slide in your MacWrite template and notify the UnMouse you're doing so in the control panel. If you switch programs, slide in the new template and revisit the control panel. These custom templates are great for those of us who have trouble remembering keystroke combinations. The only problem is that because of the UnMouse's small size, using the 60-



MicroTouch Systems' UnMouse

macro templates requires that you lean over to squint at the tiny print. With sets of more than 16 macros, you have to memorize movements just as you would keystroke combinations.

I wanted to try the UnMouse because mouse use led to repetitive-strain injury in my right shoulder and neck. Replacing my mouse with a trackball helped, but not enough. So now I use keyboard macros whenever possible to reduce mouse movements. MicroTouch makes no claims for the UnMouse's ergonomic design, but I'm still disappointed to find that this device also causes strain. For me, the trackball is a mouse-injured user's best option, but by taxing the shoulder less than the standard mouse, the UnMouse comes in second.

—ANN GARRISON

PostScript Laser Printer

DECLaser 1152

PROS: Contains PostScript Level 2; simultaneous support of Macs and PCs; excellent print quality; HP LaserJet emulation; inexpensive.

CONS: Small set of internal fonts; occasionally fails to print complex images; DECimage difficult to access; doesn't include software or drivers.

COMPANY: Digital Equipment Corporation (508/493-5111). **LIST PRICE:** \$1299.



POSTSCRIPT LASER PRINTERS MAY previously have been out of your price range, but the situation has just changed. The DECLaser 1152 is an inexpensive, 4-pages-per-minute laser printer with built-in PostScript Level 2. (Emulations of PostScript Level 1 and Hewlett-Packard LaserJet PCL4 are also provided.) Like most low-end PostScript printers, the 1152 prints at 300 dpi.

To keep the price down, DEC has provided the printer's ROM with only 17 font outlines, covering the Helvetica, Times, Courier, and Symbol font families. You can add other PostScript fonts, including Avant Garde, Bookman, Lubalin Graph, Souvenir, New Century Schoolbook, Palatino, Zapf

Chancery, and Zapf Dingbats, by buying a special font cartridge (\$249) that fits into slots in the side of the printer; or you can let your Mac's system software download PostScript or TrueType font outline files to the printer as needed.

The manual-feed tray handles up to 70 sheets of 20-pound paper or 5 envelopes. If you need larger quantities, you can buy an optional 200-sheet paper tray (\$174).

One feature that makes the 1152 a standout is its ability to handle print jobs from multiple sources. The printer's back panel has four connectors: LocalTalk, parallel, and a pair of serial ports. Using the first two ports, for example, you can simultaneously connect a Macintosh and a PC. It isn't necessary to flip a switch or disconnect cables when you want to change from one computer to the other. The printer automatically senses where each print job is coming from and queues them for printing.

The standard 1152 has 2MB of RAM. Although this is sufficient for normal print jobs, you may find that some highly complex images—such as those occasionally created in DTP programs—will not print. For another \$159, the printer's memory can be upgraded to 4MB.

As do the other DEC PostScript printers, the DECLaser 1152 includes a built-in image-enhancement routine called DECimage. DECimage, however, is difficult to

invoke and very slow. To turn it on, you must download a PostScript program to the printer, using a downloading program that DEC does not provide, such as LaserWriter Utility from Apple. However, the PostScript code that is generated when printing from many popular Mac programs frequently contains a PostScript keyword that conflicts with DECimage—effectively turning it off. Because DECimage requires extensive calculations and the printer is not equipped with a floating-point processor, you may grow impatient waiting for the output. It took two and a half hours to print an enhanced half-page graphic, for instance. Because of these limitations, I suspect that many will either ignore DECimage or use it only occasionally.

The DECLaser 1152 does not include software or a print driver. However, most major options (communications parameters, paper-tray selection, printer test, spilled-toner collection, and so on) can be set from the printer's LCD menu—accessed by pressing buttons on the front panel.

Print quality is excellent. The blacks are considerably richer than those from a IINT, for example. The only significant print problem I experienced was that envelopes tends to wrinkle badly. Otherwise, the 1152 provides an excellent combination of features at a ground-breaking price.

—STEVEN A. SCHWARTZ

You too can paint and draw...



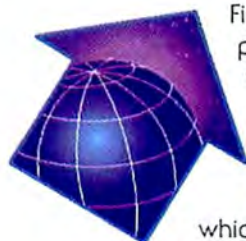
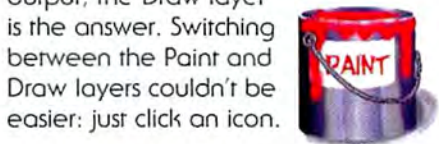
One program makes it so easy to paint and draw — even enhance scanned photographs — that anyone can create beautiful black-and-white or full-color artwork. Award-winning Aldus SuperPaint.

Versatility is the key to SuperPaint's success with "non-artists." Start with the spontaneity

of the Paint layer. It's almost impossible to resist the excitement of experimenting with the endless special effects you can create by combining two or more tools.



Factor in the precision of the Draw layer. Whenever you want crisp curves, sharply defined lines and corners, and high-resolution type and printed output, the Draw layer is the answer. Switching between the Paint and Draw layers couldn't be easier: just click an icon.



Finally, SuperPaint performs equally well on either black-and-white or color machines. So no matter which Macintosh system you're working on, SuperPaint provides a complete graphics environment designed to unlock your imagination.

Best of all, SuperPaint is value-priced, so everyone can afford it.

Discover for yourself how SuperPaint opens the door to a whole new world of creative possibilities. It's the graphics solution for every situation!



ALDUS SuperPaint®

FOR THE MACINTOSH®

Aldus, the Aldus logo and SuperPaint are registered trademarks of Aldus Corporation. Other product and corporate names may be trademarks or registered trademarks of other companies, and are used only for explanation and to the owners' benefit, without intent to infringe.

For FREE literature or to upgrade, call

1-800-888-6293, ext. 2.



Personal Scheduler and Organizer

TimeVision 1.0

PROS: Context-sensitive help; list view can show noncontiguous days. **CONS:** No undated to-do's; fixed-size windows; limited advance warning for alarms. **COMPANY:** Powercore (815/468-3737). **REQUIRES:** Mac Plus; hard drive; System 6.0.5. **LIST PRICE:** \$99.



BILLED BY THE COMPANY AS A PERSONAL information manager, Powercore's TimeVision is a scheduler with notepad and card-file functions tacked on. But with competitors like After Hours Software's DateBook and Now Software's Now Up-to-Date to contend with, Powercore will find the going rough.

Like most time managers, TimeVision lets you post events to a calendar file. But except for the way they appear in TimeVision's views, the three main event types (appointments, follow-ups, and to-do's) behave identically. To-do's must be given a date and time—not much help if you don't know when you will be able to get to a particular task. And TimeVision doesn't automatically carry forward uncompleted to-do's.

TimeVision has two other events—specials and holidays—that it reserves for special occasions. But these don't display automatically when you open a calendar; you must use menu commands to load them each time. And since holidays and specials are stored with the TimeVision application instead of the calendar file, you have to make a copy of the program to back them up.

You can schedule new events by dragging the cursor along a time line in the day view or by typing event times directly into the floating PowerEdit window. The interface is intuitive, but the pop-up menu for choosing times covers the entire day in half-hour increments, making the menu way too long. You can also enter repeating events directly from the PowerEdit window, but TimeVision books them forever into the future, not terribly useful for mere mortals. To schedule a limited number of recurrences, you must use the Replicate Event menu command, which is decidedly less convenient.

You can define up to 64 event categories, but each is limited to only four characters. And though you can merge individual TimeVision calendars, you can't import events from other schedulers. The reminder function is also limited: you can set alarms only up to 101 hours before an event; if you need a reminder a week in advance, you're

out of luck. (A separate DA lets you set alarms for any date and time, but again, it's inconvenient.)

TimeVision's event-viewing options are uneven. For starters, all the windows are fixed-size, a serious limitation if you're working with a 21-inch monitor. This restriction is especially noticeable in the miniature calendars that appear in TimeVision's day, month, and list views. Since there's not enough space to show event text, graphic symbols denote holidays, specials, and to-do's, resulting in a crowded display.

The Note Card feature provides the functionality of a paper index-card file. Each card can contain 32K of text, prefaced by an index of up to 35 characters that TimeVision uses for sorting. The Memo pad is simpler still—it lets you create, read, or edit unformatted text files up to 32K long. Most users will probably opt for a separate utility to store names, addresses, and phone numbers.

TimeVision does have a few worthwhile features. The context-sensitive help is very good, and the ability to display noncontiguous days in the list view is handy. And Powercore is genuinely interested in delivering a good product—in fact, the Read Me file lists several of the limitations noted here. Barring a major revision, though, I'm afraid that I can't recommend TimeVision.—FRANKLIN N. TESSLER

Biology Test Review on CD ROM

Comprehensive Review in Biology

PROS: Four complete reviews; less expensive than buying the components separately. **CONS:** Plain monochrome text throughout. **COMPANY:** Queue (203/335-0908). **REQUIRES:** Mac Plus; CD ROM player; hard drive; System 6.0. **LIST PRICE:** \$295.



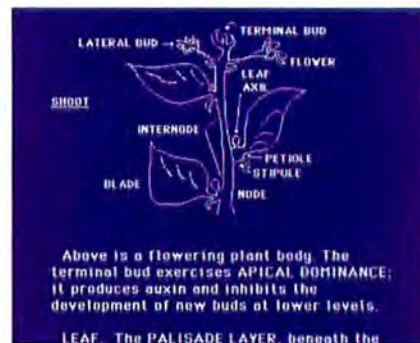
WHEN TELEVISIONS BECAME widely available in the late 1940s, educators were positively ecstatic about the medium's instructional possibilities. Predictions about the uses of a new technology are always somewhat tricky (the unchallenged triumph of lowest-common-denominator network programming was the one scenario not envisioned by early media pundits), but here's a prediction that should be safe: if companies don't start making better educational CD ROMs than Comprehensive Review in Biology, the Year of the CD ROM will always be next year.

CRB does have valuable contents. It covers the material generally assigned as Biology I and II, and provides three sample

tests for the Educational Testing Service's Advanced Placement Test in biology, practice for the CBAT biology test (six samples), and a large folder of material called Comprehensive Review. The modules are available separately, but the combined-product CD is several hundred dollars cheaper.

The test reviews are perfectly respectable—there just isn't any obvious reason why they couldn't have been a \$14.95 large-format paperback instead of a \$300 CD. The material in Biology I and II presents this same problem in more extreme form. There isn't a textbook publisher in North America with the nerve to publish a black-and-white biology book with nothing more than text and basic line drawings, much less charge several hundred dollars for it, but that, in effect, is what Queue is doing. This is not to say that Queue is doing something reprehensible by current industry standards—this effort is comparable to many other educational CD ROMs. This CD, in fact, may be a good investment for a large high school, since teachers could download and print for individual lessons and tests.

But knowing what can be accomplished on a Mac in 1993, it's just bafflingly meager. Hypertext referencing on the highlighted keywords, for example, would be extremely helpful, but there is none. And please remember, this is *biology*—how about a few 8-bit-color pictures illustrating plant



Just the Facts, Ma'am CRB lives up to its name—the coverage of topics is thorough. But don't expect anything except plain-text drills and low-resolution line drawings.

structures or anatomy? The material is so plain that all the tests take up only 6.5MB, leaving more than 200MB blank. With compression, the whole package could have been shipped on four floppy disks.

Queue and other publishers should, I think, accept this challenge: make educational CD ROMs that are better than books in some aspect other than simple durability. Right now, few products meet this challenge. Comprehensive Review in Biology might make sense for some institutional uses, but as the product stands now it would make more sense as a \$39 set of floppies than as a \$299 CD.—CHARLES SEITER

**ANNOUNCING A NEW GENERATION OF SoftPC
AT NEW LOWER PRICES! CALL 1-800-848-7677**



Now Your Mac Does Windows Too.



New SoftPC[®] with Windows[™] not only lets your Macintosh run Windows applications, it's been accelerated to really shine with Microsoft Windows 3.1.

SoftPC is the software only solution that lets you run more than 50,000 standard and custom DOS applications on your Macintosh.

And now, SoftPC with Windows, the newest member of the

SoftPC family, includes Windows installed and ready to run. Plus, we've added special optimized drivers to give

you the performance you need.

So while a PC is just a PC, SoftPC with Windows makes your Mac both a Mac and a PC with Windows.

At a click, you can run any standard-mode Windows application you want. VGA graphics too, of course.

Click again, and you're back on the Mac track.

Ask for "SoftPC with Windows" where you buy Mac software, or call us for the name of your nearest dealer. After all, if you can run Windows and have your Mac too, you've got a very clear advantage.

**Microsoft
Windows 3.1**
Pre-installed and
ready to use

Insignia Solutions
Bridging Worlds Of Software[™]

For information on all Insignia's products and services, call our toll free Fax Response Service at 800-8-SOFTPC.

Insignia Solutions Inc., 800-848-7677. 526 Clyde Avenue, Mountain View, CA 94043. FAX (415) 964-5434. Call (415) 694-7600.

Insignia Solutions Ltd., Chippendale Court, Kingsmead Business Park, Frederick Place, London Road, High Wycombe, Buckinghamshire, HP11 1JU, UK. FAX +44 494-459720. Call +44 494-459426

SoftPC and Insignia are registered trademarks of Insignia Solutions Inc. Windows is a trademark and MS-DOS is a registered trademark of Microsoft Corporation. All other product names are trademarks or registered trademarks of their respective holders.

Circle 72 on reader service card

Symbolic Mathematics Software

Theorist 1.5

PROS: Useful new tables feature; bigger special-function set for physics; better graphics; still the only program to use real notation directly.

CONS: Not easy to program large problems.

COMPANY: Prescience Corporation (415/543-2252). **REQUIRES:** Mac Plus; hard drive; System 6.0.2. **LIST PRICE:** \$449.95.



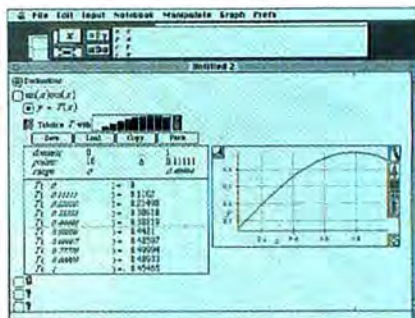
THEORIST HAS LONG BEEN DISTINGUISHED for sheer audacity on several counts. First, it offers an interface in which mathematical notation appears on the screen directly (Prescience also makes the math typesetting package Expressionist), so a page of calculus looks like calculus and not a patch of C-language programming. Second, Theorist is marketed as a David-like alternative to the Goliath Mathematica, a 6MB computational juggernaut used by hundreds of universities. Finally, the program assumes that users want to tackle their own problems directly; it lacks add-ons for electrical engineering, for example.

Version 1.5 is Prescience's response to two years of detailed feedback from users. It's interesting that, while Theorist origi-

nally offered a simple path to symbolic computation, users are clearly pushing it in a more numerical direction. The new version includes an expanded set of special functions: Airy, $J_n(x)$, $Y_n(x)$, $I_n(x)$, and $K_n(x)$. Theorist 1.5 also features a Fast Fourier transform routine of amazing speed; on data sets of 1024 points, a complex FFT on a Mac IIci takes less time than a screen redraw.

The principal innovation is the table function. A Theorist table can be defined in terms of other known functions, or purely numerically, or as a piecewise or even pointwise combination of the two. A table defined this way can be given a function name, and this function can then be used by name in symbolic manipulations. If you perform an integration, for example, you generate a new table function, which can also be manipulated symbolically. Combined with the new FFT capability, Theorist is now a much better product for working with imported instrumental data.

Version 1.5 of Theorist includes some necessary changes—Theorist's special font has been dropped, equation printing is greatly improved, and System 7 (including animation saved as QuickTime files) has at last been accommodated. Other changes are true improvements to the program: there's a greater variety of 2-D and 3-D plots, including parametric 3-D plots of space curves, and the balloon help



Totally Functional The new table function lets you define functions numerically and then use them in symbolic computations. Tables include graphical snapshots and a collapse-expand icon for viewing and concealing table text definition.

can sufficiently substitute for the manual.

You can take a copy of Theorist, and as a beginner, have something substantial to show for your efforts on the first afternoon—and on low-end hardware besides. There is no subindustry of training programs and seminars for Theorist as there is for Mathematica and Maple—Theorist is a program you can figure out by yourself, and the customer support is exceptionally good. I wouldn't count on Theorist for preparing a theoretical-physics Ph.D. thesis, but I'd pick it for a four- or five-page engineering problem or bit of quick experimental data analysis any day.—CHARLES SEITER

Backup Utility

DiskFit Direct 1.0

PROS: Uncomplicated backup and restore functions; updates only changed files; deleted files are automatically removed from backup disks.

CONS: Doesn't back up to hard drives or tape drives; some unintuitive commands; can't perform unattended, scheduled backups. **COMPANY:**

Dantz Development Corporation (510/849-0293).

REQUIRES: Mac Plus; 2MB of RAM;

System 6. **LIST PRICE:** \$49.95.



DANTZ DEVELOPMENT'S NEWEST utility, DiskFit Direct, is an efficient backup system that's simple and painless enough to improve anyone's backup habits.

DiskFit's interface is refreshingly uncomplicated. The main window contains three buttons—two to initiate the basic backup and restore functions, and one to access the well-written help files. The program supports 800K or 1.44MB floppies, as well as SyQuest or Bernoulli cartridges and optical drives. DiskFit Direct can't be used to back up to a tape drive or a hard drive.

DiskFit Direct saves your data to a set of disks called a SmartSet. You begin by assigning a name to the SmartSet and indi-

cating the data you want to back up—an entire drive, documents only, or the contents of specific folders. DiskFit Direct then asks for as many floppy disks as it needs. (You'll need eight 1.44MB floppies for every 10MB you want to back up.)

DiskFit Direct automatically erases any existing data from each disk introduced into the set, assigns each disk a number for future reference, and then copies files to it.

If a single file is too large to fit on a single floppy, DiskFit Direct automatically splits the file and stores the pieces as separate numbered files (1. Large Graphic, 2. Large Graphic, 3. Large Graphic, and so on). When you copy the split file back to the hard drive, you reassemble it using the Join Files command.

Once you've created a set of backup disks, the subsequent incremental backups are relatively easy. During updates, DiskFit scans your drive and backs up only the changed files. The program prompts for the necessary disks in the SmartSet.

DiskFit also determines which files have been deleted from your drive since the last backup, prompts for the SmartSet disk containing those files, and erases them from the backup. While this saves disk space, it can also be dangerous. If you back up your drive and then discover that you've inadvertently deleted an important file, you'll no longer have it stored on the SmartSet

either. For this reason, Dantz recommends creating at least three full SmartSet backups and alternating between them in your backup strategy.

DiskFit's commands and prompts are mostly straightforward, with a few odd exceptions. Most notably, after you've restored files from your backup disks, you have to click on the Missing button, even though none of the backup disks are missing—a completely counterintuitive step.

For each new set of backup disks you create, DiskFit Direct prepares a complete report, showing the date and time of the previous backup, the names of the backed-up drive and of the SmartSet containing the backup, the number of disks used, and how much disk space was required for all the files. Each file is assigned a number corresponding to the SmartSet disk containing that file, so you can quickly locate a particular file in the set of disks. The report also shows whether or not the backup was successful and reports any errors.

DiskFit Direct lacks some of the advanced backup features, such as the ability to compress and archive seldom-used files and perform unattended, scheduled backups. It is admittedly a bare-bones utility, but that's the whole point—it's inexpensive, it takes almost no time to master, and it's trouble-free enough to encourage frequent use.—JOSEPH SCHORR

6 steps to healthy computing

1. Curtis Custom Glare Filter —

Relieves eye strain and fatigue, cuts glare up to 99%, and reduces VLF radiation up to 98%.

3. Curtis Keyboard Organizer —

Keeps supplies in reach and relieves tired, aching wrists with built-in wrist rest. (Wrist rest also available separately.)

2. Curtis Monitor Arm —

Positions and adjusts monitor to optimum viewing angle to reduce glare and improve posture. Both arm and platform swivel 360°.

4. Curtis Clip —

Holds copy next to monitor to reduce eye fatigue and neck strain by eliminating constant refocusing from desktop to monitor.

5. Curtis Wrist Rest —

Supports wrists at a more comfortable height to help reduce pain and fatigue.

6. Curtis

MVP Mouse — *Ergonomic palm rest supports hand at a natural angle for improved comfort and control.*

Curtis offers many practical and low cost accessories that can reduce everyday physical stress and strain from computing.

Long periods of highly routine computing can harm your physical and mental well-being. That's why Curtis offers an entire family of ergonomic accessories to improve your computing health and comfort.

Choose from eye-saving Copy Clips and Glare Filters, wrist-saving Keyboard Organizers with Wrist Rests, and posture enhancing Monitor Arms. In no time, you'll be able to feel the difference these

innovative Curtis accessories make in your personal computing comfort and well-being.

So why wait any longer? Six simple steps you can take today can mean more energy, greater productivity, and more job enjoyment tomorrow.



For more information, call Curtis at 1-800-955-5544, Ext. 242.
Ask for your free "Healthier Computing Guide" brochure.

Circle 20 on reader service card

Manufacturing Company, Inc.
CURTIS

30 Fitzgerald Drive, Jaffrey, NH 03452
©copyright 1993, Curtis Mfg. Co., Inc.
All Rights Reserved

Time-Management Software

DayMaker 2.0

PROS: Flexible printing options; supports recurring calendar items; easy to customize; improved performance. **CONS:** No network support. **COMPANY:** Pastel Development Corporation (212/941-7500). **REQUIRES:** Mac Plus; hard drive; System 6.0.5. Recommended: 2MB of RAM. **LIST PRICE:** \$129.95.



WHEN IT FIRST CAME OUT, DAYMAKER was my choice for a personal information manager. It was free-form enough to handle disparate types of information, but structured enough to provide quick access to whatever I needed to find. DayMaker 2.0 is even better. It addresses the earlier version's key weaknesses by providing better tracking for to-do items, much-improved printing capabilities, support for recurring calendar items, and faster performance.

DayMaker's structure remains unchanged. The basic unit of information is an item. Items associated with dates are calendar items; those that aren't are note items. You can assign any item up to four labels, which you can use to create related groups of items. You can display calendar items in

a day, week, or month view, and all types of items can be displayed in the list view. And version 2.0 adds a to-do view.

The to-do view makes DayMaker even better at what it always did well, keeping a running, prioritized list of the tasks you need to accomplish. To-do items display in a split window, with all pending to-do's at the top and a list of all completed tasks at the bottom. To create a new to-do, a procedure that formerly required several steps, you click once in the undone-items section.

The inclusion of Portfolio Software's DynoPage Lite technology makes DayMaker 2.0 a great tool for organizing information and taking it on the road. Six pre-configured layouts let you print on double-sided pages that fit into a 3¼-inch-by-6¼-inch six-ring binder, multiple-page booklets, half-page binders complete with headers and footers, storyboards, or trifold brochures. With version 2.0 you can now print single items too.

Also new to DayMaker 2.0 is the ability to schedule recurring items. Plus, you can select the intervals by day or month, making it easy to track paychecks that recur every other Thursday, for example, or rent that is due on the 4th of every month. An upcoming upgrade will let you schedule meetings and events over a network.

Finally, DayMaker 1.0 was annoyingly slow to open because the entire data file

loaded into RAM (although performance was quite fast once the file was loaded). DayMaker 2.0 is disk-based, so files open much more quickly.

My former job required keeping track of a lot of phone calls, and for that I liked using After Hours Software's TouchBase and DateBook in combination. But my current job focuses more on internal management—organizing disparate information, following up on meetings with many people, maintaining my own calendar, creating an archive of completed work, and printing lists of to-do items to take on the road. For all of that, DayMaker 2.0 is a great choice.

—LIZA WEIMAN



To-Do View To mark a to-do item as completed, click once to select the item, then drag it to the lower window; dragging it to the upper window changes it back to an undone item.

Writing Tool

RightWriter for the Mac 5.0

PROS: Analyzes different writing styles; good for students. **CONS:** No custom language rules. **COMPANY:** Que Software (317/573-2500). **REQUIRES:** Mac Plus; hard drive. **LIST PRICE:** \$99.95.



MY TENTH-GRADE ENGLISH TEACHER was always looking over my shoulder critiquing my work. Her ruthless, persistent criticism taught me a lot, and it's given me an appreciation for that relentless drive to improve writing. RightWriter 5.0 is an electronic version of Mrs. Quatermass.

It's shortchanging RightWriter to call it a grammar checker. While it traps common grammar problems, the product also deals with writing style, word usage, punctuation, and capitalization issues. Even better, it offers writing-style filters for your prose. Passive-voice sentences can get you the death penalty in the technical-documentation world, but they are standard in the world of funding, where a proposal

written in active voice may fail because it looks "simplistic."

RightWriter's style filters include Fiction, Newsletter, Proposal, Scholar, and Technical Manual, among others. If you know your grammar and need more-precise control, you can tweak every one of RightWriter's many switches to customize a writing style for your specific needs. The manual includes a matrix of the settings for each style, so you can understand both the differences in writing styles and how to adjust the settings for your own goals.

RightWriter also gives summary statistics such as Flesch and Fog readability indexes. For the uninitiated, these are rigid numeric measures of the grade level you are writing to, based on how long your words and sentences are.

I like the different ways you can go through the analysis procedure. You can interact with RightWriter as it checks your file, flags potential shortcomings, and advises you on improvements. This feature, new to the program, lets you make changes as you go. You can also have the program create a marked-up copy in your word processor's file format, allowing you to look at all the suggestions and deal with them as a whole. Finally, you can get just the Summary, a statistical overview with some overall critique, most useful in situations where you use the product as a teaching aid.

Version 5.0 overcomes a limitation in previous versions—it checks text you've changed to make sure it doesn't have flaws. Que has also added an industrial-strength online help system and Clipboard support for importing text from nonsupported applications such as databases and spreadsheets.

RightWriter is fully compatible with a range of files: ASCII, MacWrite (4.5 and 5.0), MacWrite II (1.0 and 1.1), Microsoft Word (3.0 and higher), Microsoft Works, WordPerfect, and WriteNow.

The manual is adequate. It includes a 26-page overview of common grammar mistakes and how to avoid them.

RightWriter's chief competition is Reference Software's Grammatik for the Mac. Grammatik is far more customizable; you can create your own corporate or personal rules. With RightWriter, on the other hand, it's easier to tinker with the program's internal rules, and I think RightWriter does a slightly better job of differentiating styles. I prefer Grammatik for my own use or as a corporate standard (because of the custom rule-checking), but RightWriter is probably the stronger entry for students.

RightWriter is a serious tool for people looking to improve their writing, and it sure beats the heck out of having Mrs. Quatermass looking over your shoulder.

—JEFFREY GORDON ANGUS

MIRROR'S GOT SOMETHING YOU NEED TO LOOK INTO.

No matter which Macintosh you use, your work will look better on a Mirror display system. From our stunning ProView Trinitron 24-bit color system, to our PowerVision board for PowerBooks, Mirror display systems are engineered for top performance and priced

for the tightest budget. With over a dozen systems to choose from, you're bound to find one that's right for your needs and budget. Whether you're looking to upgrade a Classic to the convenience of a full-page display, adding a color display to your PowerBook, or need a 24-bit ProView system, Mirror is your one source for value and performance in Macintosh displays. Nobody offers a wider range of systems.

Not sure what display you need? Our expert sales staff can recommend the system that's just right for your application. All Mirror products are backed by our famous 30-day "love it or return it" guarantee, and lifetime technical support. Call today, and you could be looking into a Mirror tomorrow.



Low monthly payments with your Mirror credit card. Call for an application.

MIRROR

The Best Thing Next To Your Mac™

MEDIA: 1045

COLOR SYSTEMS

14-inch Color Display \$399

20-inch ProView Trinitron
with 8-bit card \$2499
with 24-bit card \$2799

20-inch ProView V
with 8-bit card \$1799
with 24-bit card \$2099

MONOCHROME SYSTEMS

15-inch Grayscale Portrait Display \$399
with monochrome card \$549

19-inch Two-page Display
with monochrome card \$799

21-inch Grayscale Display \$999
with monochrome card \$1199

POWERVISION CONNECTS BIG SCREENS TO YOUR POWERBOOK

"We strongly prefer the Mirror [PowerVision] board because of its lower price and broader software compatibility."

MacWorld, February 1993 MW ★★★★★

"The PowerVision was the best performer of the bunch..."

"PowerVision actually increased the scrolling speed on the PowerBook..."

MacUser, February 1993

See what you've been missing on your PowerBook. Our PowerVision™ video adapter for the PowerBook 140/145/170, gives you 8-bit color on a 13/14-inch display, or 4-bit grayscale on a 15-inch Portrait Display. Completely internal, the

PowerVision is absolutely the highest performance video available for PowerBooks. It's a perfect match for the Mirror 14-inch Color Display.



NEW lower price, from \$399

ORDER DIRECT ANYTIME 1-800-643-0625

† Free built-in video. Prices are FOB origin. All prices subject to change. Prices are for U.S. orders only; call for international pricing.
Technical Support Hotline: 1-612-635-2105 • Telephone: 1-612-635-4450 • FAX: 1-612-635-3136 • Address: 2644 Patton Road, Roseville, MN, USA 55113

Circle 122 on reader service card

Tree-Drawing Software

Tree

PROS: Visually appealing and entertaining; responsive performance; extensive controls.

CONS: Nonstandard File menu; limited color support; exports only PICT format; expensive.

COMPANY: Onyx Computing (617/876-3876).

REQUIRES: Mac II; 2MB of RAM; 8-bit, 13-inch color monitor; System 6.0.5; 32-bit QuickDraw. Recommended: Math coprocessor.

LIST PRICE: \$295.

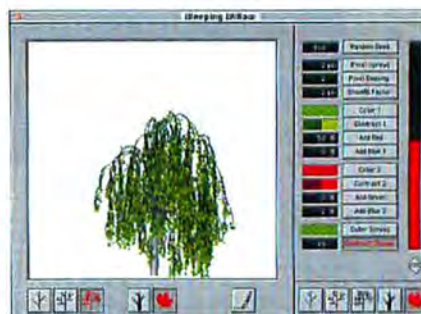


ARCHITECTS, LANDSCAPE DESIGNERS, environmental planners, and anyone who needs to produce visual-impact studies should consider purchasing Onyx Computing's Tree. Tree is an elegant, single-purpose program that generates lifelike color drawings of trees from a number of easily controlled parameters. Instead of simply replicating a selected clip art image, with Tree you tell the program the kind of tree you want to "grow."

Tree does not look or behave like other Mac applications, but once you get the hang of the interface, it's easy to be creative and free-flowing. To create a tree, you pick one of ten sample trees to use as a template

(either from the File menu or by choosing the Load Parameters command) or you set your own parameters from scratch. The main window features a drawing area and a parameter-controls area, each with an identical set of five buttons. Three determine whether you're working on the bough, branch, or twig level. This trio in the drawing area (on the left) produces a linear representation of your tree; the same trio in the parameters area (on the right) enables you to set numerical controls for 45 traits, such as twig length, bough angle, and branch curve factor. The other two buttons in the drawing area toggle the program's "rendering" mode on and off. When these are inactive, you get a simple linear drawing, with or without foliage; active gets you a simple shaded bitmapped image. The correlating buttons on the parameter side let you numerically define the program's limited shading and colors. Finally, there's one central button that initiates the draw command (you have no drawing tools per se).

You cannot color or assign patterns to the trunks or branches. Bark is depicted as modifiable gradations of gray. Foliage is limited to three colors—green, red, and blue—but you can modify the mix and contrast. Also, leaves do not have individual shapes but are instead generalized clusters of pixels, whether you intend pine needles, palm fronds, or magnolia leaves. And



Weeping Willow After visualizing the tree in two dimensions and setting parameters, I added three-dimensionality and leaves to grow this modified weeping willow from one of Tree's sample files.

although you can interrupt the drawing cycle to modify settings or switch drawing modes, you cannot halt the growth process at an immature state, for example, to show young trees planted near new buildings.

You can either save your trees as parameter settings or save the images in PICT format. Note that unless you export your tree to an image-editing program that supports antialiasing, your tree will print at 72 dpi and suffer serious jaggies.

Tree is a fascinating and entertaining limited-purpose program. And though the trees you draw with it are not scientifically accurate, they do provide a naturalistic touch to visual-impact studies.—RITA LEWIS

Dynamic Systems Modeling

ithink 2.2.1

PROS: Forces user to understand business models; simplified iconic model-programming language; good support graphics. **CONS:** Requires real training commitment for effective use.

COMPANY: High Performance Systems (603/643-9636). **REQUIRES:** Mac SE; hard drive; System 6.0.4; 2MB of RAM. **LIST PRICE:** \$695.



THREE HUNDRED YEARS AGO, 98 percent of humankind could use the job description "farmer." The business model appropriate to this situation was, at least, straightforward: if the right amount of rain appeared, everything was fine, and if not, everything was a disaster. Besides, 10,000 years' accumulation of folk wisdom about farming made modeling unnecessary. Our fabulous and yet not-always-satisfactory postindustrial society, by contrast, calls for business models that we expect to be complex, and we therefore concoct remarkably complicated spreadsheet models for business operations.

These models present two problems. First, they tend to be snapshots of a business's finances at a single time rather than

a true dynamic model. Second, the relationships, in formulas, that define the model are typically hidden, and only results are displayed. A subtler drawback of spreadsheet models is that users rarely accept counterintuitive conclusions. Faced with a model that shows a company being steered off a cliff, the usual response of the modeler is to rewrite the assumptions (often originally correct) built into the spreadsheet.

The best remedy for this is dynamic modeling, and ithink is currently the most attractive dynamic-modeling system for the Mac. With hundreds of pages of training material and many examples, it introduces the user to a world in which adding more people to the shipping department slows down shipments, processing more sales leads brings sales to a halt, and reducing internal inventory boosts output. The point is, these situations often occur in business practice but are never predicted except by dynamic models, which take into account explicitly the impact that timing, delays, and interrelationships have on results.

ithink provides a small set of icons for quantities, flows, changes in flows, and feedback relationships between quantities. These icons make an on-screen model of the business process, so that in contrast to spreadsheet practice, in which formulas are usually hidden, in ithink the formulas are directly represented pictorially. As you draw

connections, you double-click on each type of icon to fill in numerical details (initial value, range of possible values), and indicate whether you want to associate a graph with the icon. This simple scheme is naturally quite easy to master. What's more difficult is becoming competent at modeling technique—that's why you really must work through most of HPS's examples and tutorials to make the program valuable. Once you do, you realize that making a model in ithink corresponds exactly to understanding the quantitative relationships in a business. Once you get the hang of it, ithink is impressive. Quantities can be associated with realistic distributions rather than single values, and, ithink computes a distribution of results; complex models can be built up from simple models defined in linked sectors, so you're not put through the error-prone process of making a single huge diagram for a complex process.

If you're ordering ten more copies of Excel for the ten new employees, order nine instead and get ithink for the employee with the most math background. After that, if a spreadsheet projection contradicts the results of an ithink model, you have found an area that deserves more investigation. It calls for more intellectual effort than standard spreadsheet work does, but ithink is your best bet for identifying cloudy spots in the crystal ball.—CHARLES SEITER

BACKUP 50 GB IN HALF THE TIME.



Two 8mm tape drives, each capable of storing up to 25 GB, can be combined in a single desktop cabinet. This dual configuration lets you take full advantage of our Advanced SCSI Processor.

Now, two drives can work together simultaneously to maximize backup speed and capacity with a variety of recording modes.

STRIPING MODE. In striping mode, you can write data to two tapes at once, in alternate blocks—doubling speed and capacity. In fact, you can backup 50 GB overnight this way.

MIRRORING MODE. In mirroring mode, you write the same data to two tapes at the same time. This is ideal for users who want to keep a backup off-site, for extra security, or for users who need to exchange data with other sites.

OFF-LINE COPY. An off-line copy function lets you copy the contents of one tape to another—without tying up the host. Off-line verify ensures that the tapes are identical.

CASCADE MODE. In cascade mode, data spills over to the second tape when the first tape is full.

FLEXIBILITY IS ONLY HALF THE STORY.

Data compression is built into every drive. And it's switch-selectable, so you can still read and write standard 8mm tapes. Bright backlit status displays give you complete drive status information: recording mode, transfer rate, compression ratio, tape remaining and more.

Best of all, you get the advantages of 8mm helical scan technology—reliable, unattended operation and the best price-performance on the market.

Plug compatible with virtually every computer system, the drives are fully backed by our 12-month warranty that includes support from our in-house engineering staff.

For information, call today at
(804) 873-9000

TRUE PLUG COMPATIBILITY

Alliant	Convergent	DEC Unibus	ICL	Novell	Plexus	Sun
Alpha Micro	Data General	Gould/Encore	Intergraph	OS/2	Prime	Texas
Altos	DEC 3100/5000	HP	Macintosh	PS/2	Pyramid	Instruments
Apollo	DEC BI-Bus	IBM AS/400	McDonnell	Parallel Port	Sequent	Unisys
Arix	DEC DSSI	IBM Mainframe	Douglas	PC 386/ix	Silicon	Wang
AT&T	DEC HSC	IBM RISC/6000	Motorola	PC MS-DOS	Graphics	and more
Basic-4	DEC Q-Bus	IBM RT	NCR	PC Xenix/Unix	STC	
Concurrent	DEC TU/TA81	IBM S/38	NeXT	Pertec	Stratus	

Rock Landing Corporate Center • 11846 Rock Landing • Newport News, Virginia 23606 • Fax (804) 873-8836

Circle 322 on reader service card

CONTEMPORARY
CYBERNETICS

Training Software

CPM Graphic Tutor 1 & 2

PROS: Addresses a need of novice users.
CONS: Unpolished; difficult to navigate; illogically organized in parts. **COMPANY:** Casey's Page Mill (303/220-1463). **REQUIRES:** Mac II; hard drive; CD ROM drive; System 6.0.4. **LIST PRICE:** \$489 per volume.



ADobe Illustrator and Adobe Photoshop, workhorses of Macintosh graphic production, are powerful, complex programs that can be intimidating. Although tutorial guides accompany both programs, many people—particularly newcomers to the Mac—find they need extra help. Casey's Page Mill aims to provide this help through a pair of CD ROM discs, the CPM Graphic Tutors.

What holds true about classroom instruction also applies here: to convey your material, you've got to keep your students' attention; and to do that, the style of instruction can be as important as the content. While the information contained in the CPM Graphic Tutors may be valuable to the novice, the programs' distracting interfaces and inconsistent execution weigh

strongly against them. For \$489 a pop, you've got a right to expect a highly professional product.

Each disc consists of lessons with voice-over instruction that you access via hierarchically arranged buttons. The lessons cover most of the basics of the programs; advanced users will not find much of interest. Illustrator topics include scanning templates for autotracing, drawing with the freehand and pen tools, and selecting and painting objects; Adobe's Streamline and Separator programs are also discussed. The Photoshop volume covers feathering selections, exporting to Aldus PageMaker, file formats, and color theory, among other topics.

The lessons move slowly, which can be good or bad, depending on the needs of the user, but they're also sometimes disorganized. For example, the discussion of bit depth appears, illogically, in the section on Photoshop PICT files. Some of the lessons also contain factual errors. For instance, the Photoshop tutor advises you to use ASCII encoding and to avoid the 5-file DCS format when saving Photoshop EPS files for placement in Adobe Illustrator. In fact, Illustrator 3.2 (the version shown in the tutorial) accepts binary (a much smaller file than ASCII) as well as DCS.

The visual component of the lessons consists of animations recorded using Farallon's MediaTracks, a program that was

never intended for creating commercial training presentations. MediaTracks often delivers sloppy results—pull-down menus that don't fully draw, screens that redraw in pieces, and so on.

You enter the tutorials by launching the MediaTracks player (copied from the CD ROM to the hard drive) and navigating through an Open dialog box to the master MediaTracks file. A more polished approach would have been to have the tutorial launch with just one double-click. Also, the MediaTracks control panel retards navigation. Aborting a lesson causes the MediaTracks player to quit; to continue with the tutorial, you need to relaunch the player and plod through the Open dialog box again. Skipping or replaying parts of lessons is equally annoying: sometimes the fast-forward and fast-reverse buttons work, sometimes they don't.

For comparison, I looked at the videotape demo that shipped with Adobe Illustrator 88. It's polished and professional. Twenty minutes covers Illustrator essentials in a clear, engaging manner—the way tutorials should be done.

I hesitate to dismiss the CPM tutorials entirely; some Macintosh neophytes may find them helpful. You have the opportunity to judge for yourself by ordering the \$10 sampler CD ROM disc from Casey's Page Mill.—BILL JUSTIN

Interior-Design Software

Expert Home Design

PROS: Multiple layers; 8-bit color; large furniture library; online help. **CONS:** Does not generate side views; does not provide π -key access to library objects. **COMPANY:** Expert Software (305/567-9990). **REQUIRES:** Mac Plus; 2MB of RAM; hard drive; System 6.0.5. **LIST PRICE:** \$49.95.



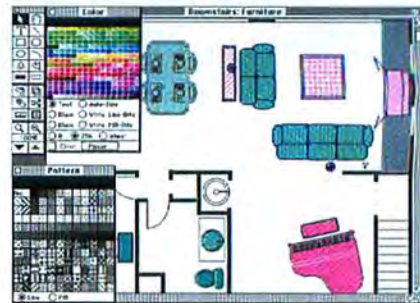
IF YOU NEED A HOME- OR OFFICE-interior layout that is precise but not as detailed as a blueprint, you can quickly and easily create it with Expert Home Design. Even if you've never used a graphics program before, you can readily produce an interior plan complete with furniture, accessories, and appliances, in your choice of colors and patterns. Geared toward the home and small-business user (rather than toward professionals such as architects and interior designers), Expert Home Design provides an array of 256 editable colors, multiple document layers, a large library of furniture objects, online help, good documentation, at a very reasonable price.

Expert Home Design opens to a floating tool palette and a graphics window

with layers, which act like the transparent acetate sheets architects use. Additional floating palettes accessible from the Window menu contain colors; patterns; an alignment feature; a help display; and libraries with more than 120 customizable furnishings for the bathroom, bedroom, living room, and so on. Unfortunately, you can't access objects from the Objects library with command keys, as you can in Design Your Own Home Interiors, a competing program from Abracadabra.

Expert Home Design is simple to use but flexible. You can draw the layout of a space using the wall and window tools, and copy furniture from the libraries to your interior. Using the line, arc, rectangle, oval, and polygon drawing tools, you can customize furniture from the libraries or create your own. You can also import PICT-format images from drawing programs or clip art collections, and export your room plans to other applications. The text tool lets you label areas or objects, or annotate your drawing. You can also easily copy objects from one drawing to another, replace objects with a drawing, grab particular attributes of objects (such as line width, color, and texture), and measure areas.

Available color modes are black-and-white, 16 grays, 16 colors, 256 editable



Colors and Patterns Galore Using Expert Home Design's Grab Attributes tool, you can apply colors and patterns to furniture, or copy them from one object and apply them to another—a boon for coordinating your plan. These objects come from the program's extensive library; you can also draw your own or import PICT images.

grays, and 256 editable colors. Expert Home Design lacks Design Your Own Home Interiors' capability to generate side views—not a serious shortcoming, in my opinion.

Expert Home Design offers the user an appealing combination of features, ease of use, well-integrated design, and performance for creating precise interior-design layouts at an unbeatable price. If you create interior layouts from time to time, buy Expert Home Design.

—REBECCA HUBA

The only statistics package you'll ever need.

NEW SYSTAT 5.2

"For Mac-based statistical analyses and presentations, choose SYSTAT."

P. Wayner, BYTE, 1-92

The most comprehensive and powerful statistics software for Macintosh now provides the most advanced multivariate general linear hypothesis program. Yet it remains the easiest to use—with a friendlier-than-ever interface.

New SYSTAT 5.2 for Macintosh enables you to perform statistical analyses you can't do with any other Macintosh statistics program. It offers more advanced statistical procedures, more types of graphs, and greater data management capabilities.

More statistics, from basics to the most sophisticated

A full range of univariate and multivariate statistics—including multidimensional scaling and nonlinear modeling.

Basics include descriptive statistics, *t* tests, correlations, autocorrelations, simple regression, and frequency tables. With a few clicks you can turn each statistic into a graph.

SYSTAT offers the most advanced multivariate general linear hypothesis program available for Macintosh. SYSTAT can estimate and test any univariate or multivariate model including:

- REGRESSION: simple linear, multiple linear, stepwise, polynomial, mixture, and weighted;
- ANOVA (analysis of variance): one-way, two-way, factorial, nested, unbalanced, post-hoc tests, mixed, repeated measures, split plot, multivariate, means model coding;
- MULTIVARIATE: discriminant analysis, principal components, canonical correlations.

Just point and click

SYSTAT is truly Mac-like. Just point and click: SYSTAT works with the pull-down menus, dialog boxes, icons, buttons and graphics tools you're accustomed to on the Mac.

The most graphics

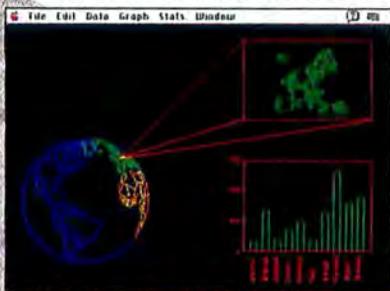
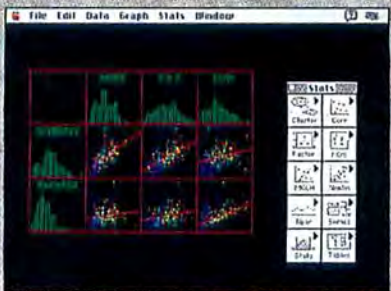
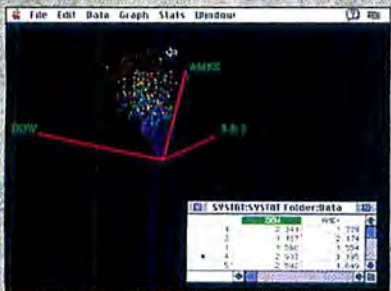
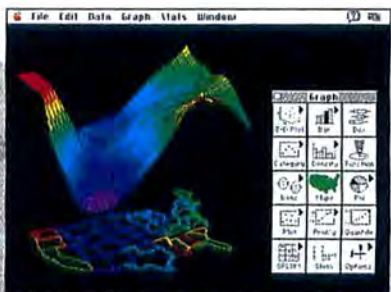
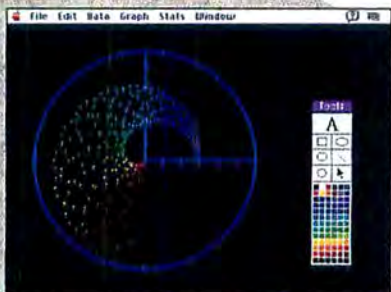
No other statistical or graphics package can produce all the scientific and technical graphs available on SYSTAT—nor surpass its ease of use. And you can save SYSTAT graphics and data in QuickTime™ movie file formats. Graphics options include:

- linear, quadratic, step, spline, polynomial, LOWESS, exponential, and log smoothing
- confidence intervals and ellipses
- scatterplot matrices
- single, multiple, stacked, and range bar graphs
- single and grouped box plots
- stem-and-leaf diagrams
- histograms
- log and power scales
- maps with geographic projections
- Chernoff faces
- pie charts
- contour plots
- control charts
- 3-D data and function plots
- complete color spectrum

For more information, upgrades, and demo disks phone:

708-864-5670

Circle 29 on reader service card



SYSTAT

For more information call or write: SYSTAT, Inc., 1800 Sherman Avenue, Evanston, Illinois 60201-3793. Tel: 708.864.5670, Fax: 708.492.3567

Australia: Hearne Marketing 61.3.8661766, BeNeLux: Oasis 31.3402.66336, Denmark: Agrolab 45.64.406575, France: Deltasoft 33.76.418508, Germany: STATCON 49.55.4272075, Italy: PiSoft 39.587.213640, Japan: HuLinks 81.33.5902311, New Zealand: Hoare & Assoc. 64.78.562675, Poland: COMPANION 48.12.338573, Spain: AddLink 34.3.4590722, Switzerland: F & P 41.31.215151, SYSTAT UK: 44.81.4620093

© 1992 SYSTAT, Inc.

Adventure Game

Monkey Island 2: LeChuck's Revenge

PROS: Two play modes; hugely funny and horrendously entertaining. **CONS:** Disappointing ending; copy protected. **COMPANY:** LucasArts Games (415/721-3394). **REQUIRES:** Mac II; 4MB of RAM; hard drive; SuperDrive; 256-color monitor; System 6.0.7. **LIST PRICE:** \$59.95.



MONKEY ISLAND 2: LECHUCK'S Revenge, the adventure-game equivalent of *Mad* magazine, is loaded with witheringly sarcastic dialogue, splendid gross-out jokes, self-parody, and enough hilarious detail to keep you amused for days.

The game has two play modes: Lite and Regular. You can graduate from Lite to Regular, but since both modes share the same story line, there are few surprises the second time around. The Regular mode compensates for its increased complexity by providing the lion's share of the jokes.

As in the first Monkey Island game, *The Secret of Monkey Island*, your character is a young blowhard who seeks high adventure and the acceptance of his pirate-

ing peers. Ghost pirate LeChuck, the scourge of the seven seas who was vanquished in *Monkey Island 1*, is reincarnated from a fragment of beard that you stupidly give away to the evil Largo. To permanently defeat LeChuck and Largo you must locate that most precious of pirate treasure troves, the fabled Big Whoop.

Other old friends from the last game include Stan, onetime used-ship salesman, now selling used coffins; the Men of Low Moral Fiber; and your one true sweetheart, Elaine Marley. Unfortunately, Elaine has quit her job as Governor of Mêlée Island and moved away without leaving a forwarding address, hoping to avoid seeing you again. (Apparently your free-agent relationships with other women led to an off-screen breakup.) Elaine hasn't forgotten you, though, even naming her dog after you. When you finally escape the mutt and enter the Marley mansion, the lady of the manor sums up her deep-seated feelings for you: "There's something about your weakness and ineptitude that I find infectious."

As hard as this kind of abuse is to take, it's even harder to dish out. At one point, you must steal a monocle from Wally, the game's nicest guy, and harden your heart as he searches for it in vain. "I can't see without my monocle!" he exclaims, then, "I'm such a dope," and finally, "I bet my mom would help me find it... if she were alive."



The Sins of Real Grog Our pirate hero dons a beard and enters drinking contests. But there's a moral to the story: If he slurps down the real thing, he wakes up disoriented and defeated. "Drinking never solves anything," the hint book warns.

My wife felt so sorry for Wally that she made me give the monocle back. My wife would make a poor pirate.

Like other LucasArts products, *Monkey Island 2* is copy protected. But my real disappointment was the game's ending. Not only does the climax steal directly from *The Empire Strikes Back*—at least it's all in the family—it's an enormous letdown, and nowhere near as spectacular as the finale to *The Secret of Monkey Island*. As if to make amends, the game offers a few bits of wisdom after the credits wind down. "Turn off your computer and do something constructive," it suggests, "like talk to a member of the opposite sex." Words to live by. —DEKE MCCLELLAND

Screen Saver

Star Trek: The Screen Saver

PROS: Entertaining; high-quality animation. **CONS:** Repetitive sounds; no Final Exam grade. **COMPANY:** Berkeley Systems (510/540-5535). **REQUIRES:** Mac Plus; 2MB of RAM; hard drive; System 6.0.4. **LIST PRICE:** \$59.95.



CREDIT THE FOLKS AT BERKELEY SYSTEMS—they've taken a simple application and turned it into an industry. Like *After Dark* and *More After Dark*, *Star Trek: The Screen Saver* is a utility that prevents static images from burning into monitors by changing the display at user-specified intervals. *Star Trek's* control panel provides the functionality of *After Dark* and is fully compatible with earlier modules.

As any "Star Trek" fan will admit under the influence of a Vulcan mind meld, the TV episodes varied in quality, and so it goes with the screen saver. Communications, which pops up messages in "Trek"-inspired fonts, is the simplest module. The Mission, the most ambitious, opens with Kirk sitting on the bridge. Every so often the scene

shifts to Mr. Scott tinkering away deep in the *Enterprise*. But the real action takes place on the ship's main screen, which shows an endless parade of aliens, spacecraft, and artifacts from "Star Trek" episodes. My only complaint is that the accompanying sound clips often don't match the action, and listening to Kirk saying "Scotty, give me that power!" gets tiresome. (As in the other modules, you can turn the sound off.)

Several modules are centered around *Enterprise* view screens. Planetary Atlas is a travelogue of missions, complete with fascinating facts about each world. Another module shows the diagnostic displays in sick bay, along with notes about space age diseases and sarcastic comments from Dr. McCoy. Scotty's Files presents schematic



Spock In this module, Spock roams your screen, taking tricorder readings and engaging in other typical activities.

diagrams of phasers, communicators, and other paraphernalia, and Ship Panels displays *Enterprise* control panels, including a food replicator and the ship's chronometer.

Other modules are related to specific episodes. For example, Brain Cells conjures up the disgusting amoeba-like aliens encountered on one mission, and Tribbles brings hordes of the cuddly little creatures cascading onto your monitor. (A nasty Klingon appears every now and then, eliciting a noisy reaction from the furry crowd below.)

Star Trek's most unusual module isn't really a screen saver at all. Final Exam challenges you with—you guessed it—a "Star Trek" trivia quiz. Correct answers to the multiple-choice questions bring a fanfare or a verbal pat on the back from an *Enterprise* officer, while incorrect responses sound an ominous note from the Mac's speaker. Most questions are moderately difficult, even for longtime fans. Alas, you don't get an overall grade—the display disappears with nary a word of encouragement from Starfleet Academy.

The software is as solid as earlier offerings, although there have been the usual sporadic reports of hardware and software incompatibilities. If you want to go where no Mac has gone before, *Star Trek: The Screen Saver* is the logical choice.

—FRANKLIN N. TESSLER, WITH HELPFUL HINTS FROM MARY GROOMS



OR



HOW TO BE NEAT, PRECISE AND ORGANIZED. WITHOUT BECOMING ONE OF THOSE OBNOXIOUS PEOPLE WHO ARE NEAT, PRECISE AND ORGANIZED.

Step 1: Load Now Up-to-Date 2.0, the software that lets you schedule events, set reminders, manage To Do lists, print calendars and keep your associates informed, allowing you to become disgustingly organized.

Step 2: Notice how incredibly easy Now Up-to-Date is to use. Totally customizable. 100% non-fascist. Just click on a date, enter your info, bang, you're done.

Step 3: Think to yourself, "Wow, calendar software that's actually faster and easier than the old pen and appointment book approach. Amazing."



Step 4: If you are on a network, share events from



Now Up-to-Date lets you schedule appointments and To Do's instantly—just click on the date you want and then enter your information.



Calendars can be printed in all major appointment book sizes and formats, in a wide variety of views and styles. You can even print out wall charts.

your calendar with the other folks on your network. In return, they'll no doubt share meeting dates and whatnot with you. Not on a network? No sweat, Now Up-to-Date still works fine all by itself.

Step 5: Fly to Zimbabwe and bring up your calendar on your PowerBook. Good. Now change everything. Perfect. Now connect to your office via modem. Presto! All your calendars automatically update themselves.

Step 6: Pick up Now Up-to-Date 2.0. Or, for more info, call us at 1-800-237-3611.

Step 7: Quit goofing around reading software ads and get back to work. You've got a lot of stuff to do.

**Now
Software**

Statistical Analysis

Data Desk 4.0

PROS: Brilliant interface; intelligent anticipation of choices; increased usability of advanced functions; compact and fast. **CONS:** No conventional time-series tools. **COMPANY:** Data Description (607/257-1000). **REQUIRES:** Mac Plus; hard drive; System 6.0.4. **LIST PRICE:** \$595.



THE BEST MAC PROGRAMS REFLECT the strong vision of an individual, and are seldom the product of committee design. Data Desk, one of the best Mac programs of any kind, reflects the opinions of developer Paul Velleman on the way the Mac can lend itself both to exploratory data analysis and to more traditional types of statistics. Version 4.0 is even faster than earlier versions and still can run on a humble 1MB Mac Plus or PowerBook 100.

Here's an interface example. When you open a data file, you see all the data elements represented as little icons, which correspond roughly to columns in a table. You can drag across a selection of these, pick Scatterplots from the Plot menu, and Data Desk 4 generates scatterplots from the

selected data. If you want a different y-variable plotted against a given x-variable, you simply drag the new variable's icon to the y-axis of the appropriate graph. There's no fussing with dialog boxes, no clicking back and forth between windows, and no delay (Data Desk is the fastest plotter around).

Here's another example. Since output from even a small linear model can take up pages of text, Data Desk 4.0 automatically generates an outline window for reporting the results of an analysis—you click on arrow icons to expand outline sections and click again to contract. And if you decide that a graph of one variable against another would be illuminating, you can drag the variables by name to any available plot window and generate the plot automatically. Essentially, you can perform tests on your data as fast as you can think of them. This is true, remarkably, for data sets of any size; in principle, analyses are limited only by hard drive space (the program has its own virtual memory system, better than Apple's), and data sets of more than 100,000 cases are no problem for Data Desk 4.0.

Increased program intelligence, in the sense that the program correctly anticipates choices for the user, is evident in several other areas. Data Description found that users often have trouble picking appropriate transformations of data to simplify analyses. Thus Data Desk 4.0 provides an

interactive transformation mode; in picking an exponent for a power-law transformation, the user moves a slider and watches a graph of the results of the transformation. In analysis of nested models, for which a brute-force approach can lead to lengthy numerical churning, Data Desk 4.0 performs an internal preliminary analysis to determine the most efficient computational path. It also has an automatic sampling function, meaning that very fast approximate analysis of huge data sets is possible.

The program also provides a novel data-smoothing method called *trewess smoothing* (in reference to the standard *lowess* smoothing) that essentially represents Data Desk's approach to time-series problems. Trewess smoothing is robust and in most cases a better forecasting tool than more popular techniques, but it's time that Data Description coded up ARIMA and a few other routine methods, if only for comparison with extrapolated trewess results.

You don't get a lot of help with chart prettification, and Data Desk leaves out (on purpose) many of the tests found in larger programs such as SYSTAT. But for getting to the heart of the matter, which is finding patterns in data, Data Desk 4.0 has no peer. Years of pedagogical and programming refinement have made it a unique, and uniquely valuable, tool for analysis.

—CHARLES SEITER

Math Tutorial

Algebra

PROS: Interactive, imaginative, yet keyed to standard textbook order of topics; thorough, includes solid self-testing; great use of hypertext and graphics. **CONS:** Can't size windows. **COMPANY:** Broderbund Software (415/382-4400). **REQUIRES:** Mac Plus; hard drive; System 6.0.4 (2MB of RAM and System 6.0.7 for color). **LIST PRICE:** \$89.95; school edition \$99.95.



ALGEBRA, LIKE ITS COMPANIONS Geometry, Physics, and Calculus, was written by a small company called Sensei, but is being sold by Broderbund, creator of Carmen Sandiego. Although Algebra is something of a poor relation in the Broderbund family (there was no sign of any Sensei software in the Broderbund display at Macworld Expo in January), it may be, for high school students at least, the most valuable program in the company's lineup.

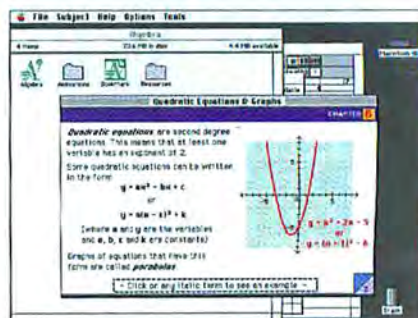
The program is organized like a standard textbook: starting with basic definitions and graphing and ending with polynomials and factoring. You navigate Algebra by clicking on the corner of individual pages. Continuing the book theme, the pro-

gram has an index for looking up topics quickly, and features an automated bookmark to save your place between sessions.

This program, however, is a great improvement over an algebra book. Most pages have several hypertext references—when you click on these you get in-depth textual or graphical explanations of terms. Many pages feature a More button that pops up an anecdote, historical or biographical, about the topic on the page, or another set of questions. What's impressive about Algebra is that there's always something besides plain math drills available. This is a refreshing contrast to the dozens of tutorial programs on disk or CD ROM in which the format follows, exactly, that of traditional drill books. In fact, it's amazing that this three-floppy set, rather than a CD ROM, offers many of the best examples of the use of animation in a tutorial.

Each chapter includes quizzes and questions interspersed throughout the material and a chapter test at the end (there's even a pop-up scientific calculator for you to use on questions). All questions let you proceed to a new topic with a correct answer, try a simpler question if your answer is wrong, or bounce back into the text for more explanation. Chapter tests are self-grading, and you get a clear picture of how you would do on a real test in school.

Algebra is strong in two areas that cause

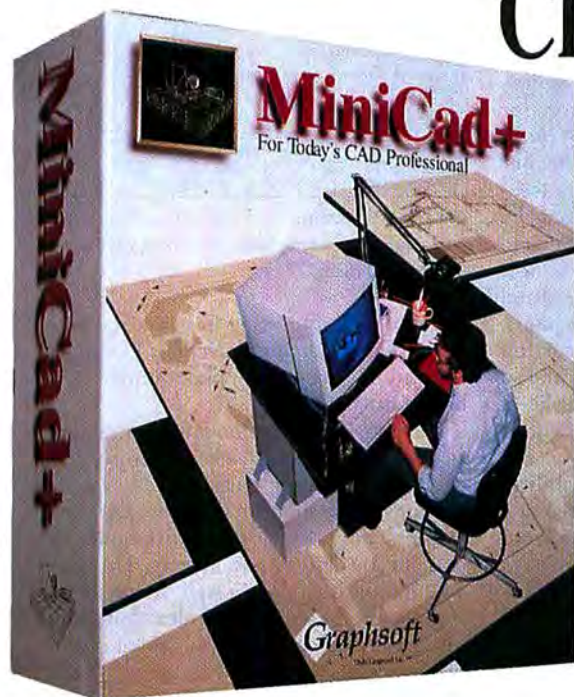


Clever Plot Expressions in italics are hypertext and can be expanded. A minor drawback is that windows can't be sized to fit your monitor.

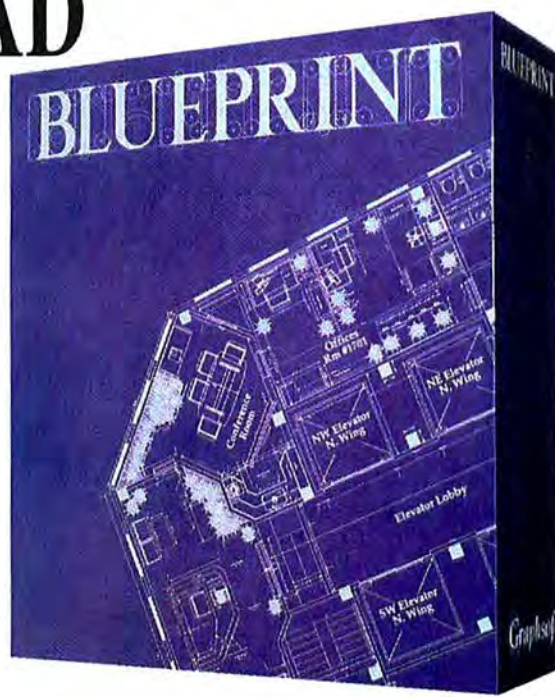
difficulties for many students: word problems and graphing. Given that most of the algebra you encounter outside of school amounts to translating a situation into an equation or interpreting a graph, it's an appropriate place for emphasis. Having reviewed most preparation programs for the Scholastic Aptitude Test, I can tell you that serious sessions with Algebra will do more for your SAT math score than those special-purpose programs.

If you're in high school, borrow a car to drive to the next prom instead of renting a limo, and sink the money you save into a copy of Algebra. Better yet, lobby your school to get the discounted school-lab pack.—MARY TOTH

Graphsoft Outruns Clarisc CAD



For
Quality, Power
and
Price/Performance
MiniCad+
and
Blueprint
Race
Ahead!



MiniCad+4 \$ 795.00

2D CAD:

- ☐ smart walls
- ☐ Smart Cursor for locating snaps
- ☐ advanced auto-dimensioning
- ☐ editable line styles
- ☐ pan by scroll bars or hand
- ☐ color by object or layer
- ☐ DXF translator - free
- ☐ unlimited layers
- ☐ global symbol editing
- ☐ on-line prompts
- ☐ unlimited drawing space
- ☐ pick-up and put-down attributes
- ☐ selection by properties
- ☐ auto-insert symbols in walls
- ☐ hierarchical symbol library
- ☐ add & subtract surfaces
- ☐ fractional feet and inches option

3D CAD:

- ☐ mechanical projections
- ☐ orthogonal or perspective views
- ☐ work in wire-frame or solid
- ☐ walkthrough and flyover tool
- ☐ create 3D view from floorplan
- ☐ sweeps, extrusions & meshes

Integrated Database/Spreadsheet:

- ☐ attach data to graphic objects
- ☐ export reports to text, merge.dif, & sylk
- ☐ familiar spreadsheet interface
- ☐ search or select by field value

Programmability:

- ☐ Over 300 powerful routines
- ☐ generate drawings automatically
- ☐ perform engineering analysis

Additional Features:

- ☐ fillets
- ☐ editable fills
- ☐ beziers
- ☐ wall-join
- ☐ chamfers
- ☐ tolerancing
- ☐ unlimited saved views
- ☐ hatching
- ☐ polylines
- ☐ classes
- ☐ export EPSF
- ☐ free Claris CAD translator
- ☐ round wall caps
- ☐ edit inside groups
- ☐ scale by layer

Clarisc CAD \$ 899.00

2D CAD:

- ☐ smart walls
- ☐ Graphic Guide for locating snaps
- ☐ advanced auto-dimensioning
- ☐ editable line styles
- ☐ pan by scroll bars or hand
- ☐ color by object only
- ☐ DXF translator - extra charge
- ☐ unlimited layers

3D CAD:

none

Integrated Database/Spreadsheet:

none

Programmability:

none

Additional Features:

- ☐ fillets
- ☐ editable fills
- ☐ beziers
- ☐ wall-join
- ☐ chamfers
- ☐ tolerancing
- ☐ 9 saved views
- ☐ hatching

Blueprint 4 \$ 295.00

2D CAD:

- ☐ smart walls
- ☐ Smart Cursor for locating snaps
- ☐ advanced auto-dimensioning
- ☐ editable line styles
- ☐ pan by scroll bars or hand
- ☐ color by object or layer
- ☐ DXF translator - free
- ☐ unlimited layers
- ☐ global symbol editing
- ☐ polylines
- ☐ unlimited drawing space
- ☐ file compatible with MiniCad+
- ☐ fractional feet & inches option
- ☐ auto-insert symbols in walls
- ☐ hierarchical symbol library
- ☐ add & subtract surfaces
- ☐ pick-up and put-down attributes

3D CAD:

- ☐ mechanical projections
- ☐ orthogonal or perspective views
- ☐ work in wire-frame or solid
- ☐ walkthrough and flyover tool
- ☐ create 3D view from floorplan
- ☐ sweeps, extrusions & meshes

Integrated Database/Spreadsheet:

- ☐ attach data to graphic objects
- ☐ export reports to text, merge.dif, & sylk
- ☐ familiar spreadsheet interface
- ☐ search or select by field value

Programmability:

- ☐ Over 300 powerful routines
- ☐ generate drawings automatically
- ☐ perform engineering analysis

Additional Features:

- ☐ fillets
- ☐ editable fills
- ☐ beziers
- ☐ wall-join
- ☐ chamfers
- ☐ tolerancing
- ☐ unlimited saved views
- ☐ hatching
- ☐ on-line prompts
- ☐ export EPSF
- ☐ scale by layer
- ☐ classes
- ☐ round wall caps
- ☐ edit inside groups

Graphsoft wins races by aggressive product improvement year after year. MiniCad+ was the first CAD program on the Macintosh. Since then, our R&D department has never stopped working on MiniCad+ and Blueprint. Graphsoft customers can rely on getting significant upgrades at a reasonable cost which support current technology, new operating systems, and evolving user needs. We've won awards worldwide, and are the top selling Macintosh CAD program in quality-conscious Japan. Our technical support is staffed by professionals who know drafting and design, not just computers. We stand behind our line of products with a 30-day money-back guarantee. Send for a video and trial diskette for MiniCad+ or a tutorial and trial diskette for Blueprint, \$19 each. MiniCad+ and Blueprint, the answers you've been looking for.



1988 MacWorld
Award
-Australian-
MiniCad+



1989 MacWorld
World Class Award
-US-
MiniCad+



1990 MacUser
Eddy Award
-US-
MiniCad+



1992 MacWorld
Editors Choice Award
-US-
Blueprint



1992 MacWorld
Best CAD Award
-Switzerland-
MiniCad+



1992 MacUser
Eddy Choice Award
-Finalist-
MiniCad+



Also from Graphsoft Inc.
Azimuth
The ultimate map creation tool
including 9 cartographic
projections. Used by U.S. News
& World Report.
\$395.00

Diehl Graphsoft Inc.
Graphsoft
The Macintosh CAD People

Also from Graphsoft Inc.
ContoursPro
Make high-precision survey
maps with accuracy and ease.
Exports DXF to AutoCAD™ or
modeller of choice.
"Recommended" says Cadalyst!
\$495.00



8370 Court Ave. Ellicott City Md. 21043 410-461-9488 fax 410-461-9345
© 1992 Diehl Graphsoft Inc. All rights reserved. MiniCad+, Blueprint, Azimuth, ContoursPro and Smart Cursor are trademarks of Diehl Graphsoft Inc. Claris CAD and Graphic Guide is a trademark of Claris Corp. All other brand and product names are trademarks of their respective holders.

Circle 46 on reader service card

Time and Expense Accounting

LapTrack
For the Mac 1.0b

PROS: Excellent time and expense tracking and reporting; lets you combine office and on-the-road use; flexible import, export, and backup options.

CONS: Interface could be better; documentation needs work. **COMPANY:** Timeslips Corporation (508/768-6100). **REQUIRES:** Mac Plus; hard drive; System 6.0.2. **LIST PRICE:** \$79.95.



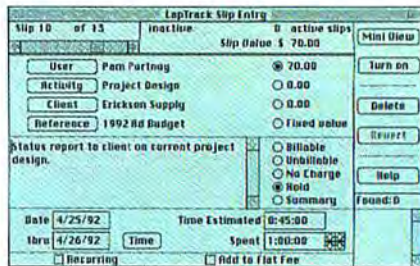
TIMESLIPS CORPORATION HAS DONE an excellent job of taking the key features from Timeslips, its full-size time-and-expense-tracking program, and paring them down for the laptop crowd. LapTrack For the Mac consists of two small programs for on-the-go professionals—LT Reports, for setup and minimal reporting, and LT Data Entry. It also lets you download essential information to a laptop prior to going on the road and upload the new data when you get back to the office.

LapTrack does essentially one thing and does it well—it lets you record, track, and report time and expenses. It's ideal for any person or business—a law firm, a pay-

roll department, a salesperson—that records time-dependent activities or detailed expenses. (For a workgroup, each workstation needs a separate copy.)

With LapTrack, as with Timeslips, you record your data in forms called *timeslips*. Each specifies a time-based charge or expense for a *user*, an *activity*, and a *client*. You can customize the categories to fit your particular business. If you work as a freelance editor, for instance, the user would be you, the editor; the activity an article; and the client an author. Slips can cover almost any imaginable billing situation—fixed and variable rates (up to three rates per user), billable and unbillable charges, recurring charges, charges added to a flat fee, and so on. Including a reference category makes it simple to group charges for each client so that you can track projects easily.

Several data-management capabilities make it easy to take LapTrack on the road. First, you clone the essential data from a centralized database and load it onto your laptop. Away from the office, you enter information as if you were in the office. Then when you're back in the office, you combine the data from the laptop with the centralized database so that both machines reflect the most current information. LapTrack makes this process a breeze. LapTrack also has commands for backing up and restoring data, purging



Entering Timeslips You enter all LapTrack data, into a timeslip, which tallies the charge for user, activity, and client.

old slips, and importing from and exporting to other programs, including Timeslips III, should you need more-sophisticated billing capabilities.

LapTrack is not without flaws. Its interface could be improved. There are too many nested dialog boxes, unusual window conventions, and redundant (and obscure) control keys. For instance, \mathbb{H} -Y and option- \mathbb{H} -A both let you define a new activity. The documentation is sloppy as well. Some menu commands are not in the index, and some setup sections don't tell you which of the two programs they refer to.

In spite of these minor flaws, however, LapTrack does an excellent job. With a first-class interface design and overhauled documentation, LapTrack could be a truly exemplary product.—STEVE MANN

NTSC Interface Board

L-TV

PROS: Inexpensive; includes filtering software for flicker-free images. **CONS:** Weak documentation; sluggish performance with some applications; poor resolution limits practicality of using TV monitor. **COMPANY:** Lapis Technologies (510/748-1600). **REQUIRES:** Mac Color Classic or LC; System 6.0.8; 2.5MB of RAM. Recommended: System 7; 4MB of RAM. **LIST PRICE:** \$349.



THE L-TV IS AN INTERFACE BOARD that allows a Mac LC to use a standard television monitor as a display device. And by hooking the L-TV through a VCR, you can even record your output to videotape.

The L-TV hardware is easy to install. The board snaps into the one Processor Direct Slot (PDS) on the LC's logic board, providing a DB-15 pin connector through the access port on the back of the computer. The supplied video adapter screws into the connector and allows you to connect a standard 75-ohm RCA video cable (not included) to the unit. You connect the video cable to the video-in port on your VCR or television.

The L-TV comes with its own software, TV-Show. This control panel lets you activate the board and shift between Presentation Mode, in which everything on the Mac's monitor is duplicated on the television, and Dual Display Mode, in which the television serves as a second display, capable of having its own windows open.

The software also includes four flicker filters to help stabilize the picture on the television screen. You activate the flicker filters using various option- \mathbb{H} -number key combinations. The filters do a good job of reducing flicker, though it takes some experimentation to figure out which filters produce the best image for a given application. Some filters reduce flickering but make the stabilized image intolerably fuzzy.

Once you've installed the software and hardware and connected to your VCR or TV, you restart the Mac to use the L-TV. The TV-Show software loads automatically and produces a color test pattern on your television. After a few seconds, the Mac desktop appears and you're ready to work.

But, as one might expect, the quality of the television picture is relatively poor; smaller text—12-point or less—is almost unreadable. Lapis suggests increasing the font size used in Finder windows to at least 14-point. You can also improve the on-screen image by turning down the brightness and contrast settings on the television,

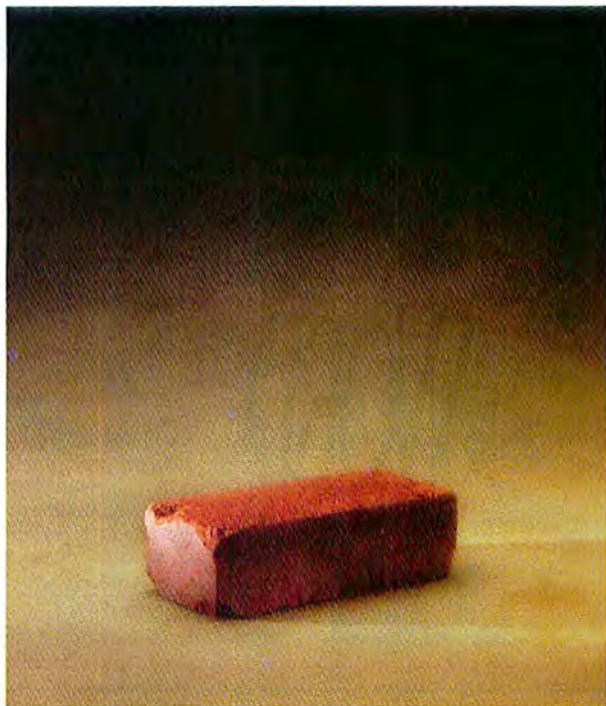
but the results will be somewhat crude.

For this reason, the L-TV's practicality is limited. The bold graphics used in programs such as The Learning Company's Reader Rabbit translate well to the television, but applications involving more intricate operations—word processing, desktop publishing—are impractical. On a 20-inch RCA color TV, I had to use an 18-point New York font to work comfortably.

Another caution: The L-TV is unacceptable for some animation-intensive programs that require frequent screen redraws. For example, running Brøderbund's Prince of Persia game on an LC was virtually impossible because the animated sequences on the television screen lagged horribly behind the rest of the program.

TV-Show also has some incompatibilities. One involves versions 1.0 and 1.1.1 of the System 7 Tuner extension. If Tuner is installed, AppleTalk must be active in the Chooser or the system crashes when TV-Show attempts to load. Lapis also warns of possible conflicts with presentations created with Macromedia's Director.

The L-TV is not a high-quality large display or a second monitor for your Mac—nor does it claim to be. But it does provide an economical way to capture images to video and—depending on the application—turn your TV into a passable display device.—JOSEPH SCHORR



ONCE YOUR BATTERY RUNS OUT, WHAT'S THE DIFFERENCE?



*A new idea from
Peter Norton, the leader
in utilities software.*

Let's face it. With a dead battery, your PowerBook is nothing but dead weight. Precisely why you need the Norton Essentials™ for PowerBook. It's the only software package that lets you adjust power settings by application, so each battery charge will last up to twice as long – without compromising performance.

Of course, the Essentials does more than just prevent sudden blackouts. It also comes with our exclusive SyncIt! function, which synchronizes files between your PowerBook and your desktop Macintosh in mere seconds.

Plus, you'll get several gauges that show exactly how much battery time and power you have remaining, a feature that makes it easy to turn AppleTalk on and off without having to reboot, and a selection of twenty highly visible cursors to choose from. In other words, all the essentials.

Pick up the Norton Essentials for PowerBook at your local dealer today or dial FAST FAX 1-800-554-4403* for complete specs. Because after all, there's really not much you can do with your PowerBook once the battery calls it quits. Except maybe arm curls.

**THE NORTON
ESSENTIALS™
FOR POWERBOOK**
SYMANTEC.

*Option 1, document 499. Norton Essentials™ is a trademark of Symantec Corporation. Other names are trademarks of their respective companies. Offer valid in the U.S. and Canada only. For more information in Europe, call 31-71-353111. In Australia, 612-879-6377. In Canada, 1-800-465-2295. Everywhere else outside the U.S., call 408-252-2570. ©1993 Symantec Corporation.

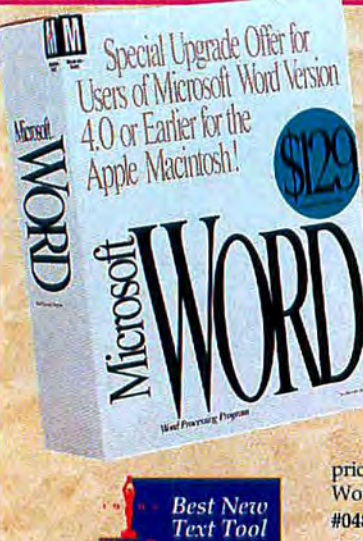
The Mac Zone
Established 1986

- Over 2,400 Products In Stock
- Lowest Prices
- Shipping until 2 AM E.T.
- Latest Releases
- \$3 Overnight Shipping
- Quality Products
- Hassle-Free Ordering
- Top-Rated Sales Advisors

NOW WE SPEAK YOUR LANGUAGE

- Hablamos Español • 日本語でどうぞ
- 저희는 한국말을 사용합니다

Outside USA & Canada? Call 1-206-883-3088/Fax 1-206-883-6940



Special Upgrade Offer for Users of Microsoft Word Version 4.0 or Earlier for the Apple Macintosh!

Microsoft Word

Best New Text Tool

WINNER

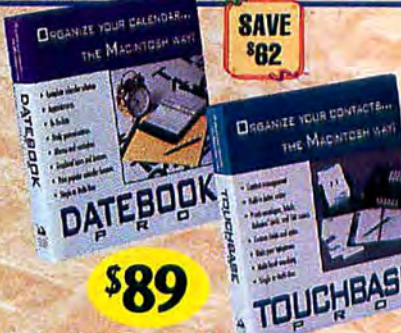
Microsoft Word 5.1

To make Word the best it can be, Microsoft has been listening to their users. And in response to user requests, they have produced the best version of Word ever, the all-new version 5.1. You told Microsoft you wanted easy ways to do the most common tasks. That's why they've provided new tools that make it incredibly easy to apply the full power of Word version 5.1 to the chores you do every day. For example, the Ribbon provides on-screen buttons that reduce even complex chores to a simple point and click. So adjusting formatting, changing the number of columns, or even starting a drawing is as easy as pressing a button. You can even custom program Ribbon buttons to simplify the tasks you perform most often! Special upgrade price requires proof of ownership of an earlier version of Word. Microsoft #00596 ✓

- #04898 Microsoft Word 5.1\$294
- #05023 Microsoft Word 5.1 License Pak\$248

VERSION
UPGRADE

\$124




SAVE \$82

\$89

DateBook Pro/ TouchBASE Pro-Bundle

Together they combine contact management, calendaring, appointments and to-dos to help keep you organized and on track. Use them alone or together. Macworld Editor's Choice Award for Best Personal Information Management Software. After Hours Software #06713



Special Upgrade Offer for Users of Microsoft Works Version 2.0 or Earlier for the Apple Macintosh.

Microsoft Works

NEW VERSION


Microsoft Works 3.0

If you haven't seen Microsoft Works Version 3.0, you're in for a welcome surprise! The total overhaul of this industry-standard works program helps you get more work done, faster than you ever have before. How? Try a host of new global enhancements, including headers and footers with automatic date, time and page numbering; word processing enhancements like footnotes, 190,000-word thesaurus, 120,000-word dictionary; database enhancements like 254 multi-line fields, 256 characters per field, multiple named filters for finding specific information and data view for entering information into forms; and much, much more. Special upgrade price requires proof of ownership of an earlier version of Works. Microsoft #05750

- #00567 Microsoft Works 3.0\$158

VERSION
UPGRADE

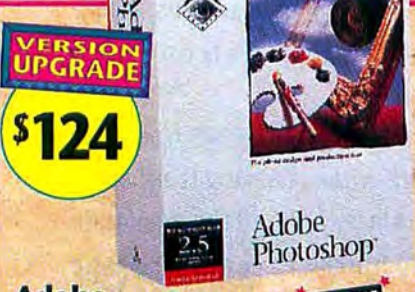
\$78



\$57

MacMoney 3.53

MacMoney is a full double-entry personal and small business bookkeeping system and financial planning tool. MacMoney tracks expenses, bank accounts, credit cards, assets, liabilities, cash and income. You can create up to 250 accounting categories and divide transactions among as many as 8 categories. Survivor Software #01582 ✓



VERSION UPGRADE


\$124

Adobe Photoshop 2.5

NEW VERSION

Whether you start with scanned photographs, slides or electronic artwork from scratch, Photoshop's full range of filters, painting, drawing and selection tools gives you the artistic control you need. And it does it all in 24-bit living color! Upgrade price requires proof of ownership of an earlier version of Photoshop. Adobe #06341

#04042 Adobe Photoshop 2.5\$548




COMPETITIVE UPGRADE

\$94

Aldus IntelliDraw

New from Aldus, IntelliDraw is an exciting new type of drawing program that gives you an easy new way to visually experiment, refine and draw your ideas. Full text and drawing options provide the flexibility you need. You can even share files seamlessly between Mac and Windows versions! Aldus #06666

#05481 Aldus IntelliDraw\$194



\$34

Uncle Milty's Clip Art Collection

Use Uncle Milty's clip art and your newsletters, ads, fliers, invitations, brochures, memos, etc. will be more effective and inviting. It includes 100 high-resolution 300dpi illustrations on three disks. Use them with most popular page layout programs that import compressed TIFF. Works with Microsoft Word 5.0 and WordPerfect 2.1. Uncle Milty #04273

The Mac Zone: Who To Call.

Call 1-800-248-0800 / Fax Anytime 1-206-881-3421

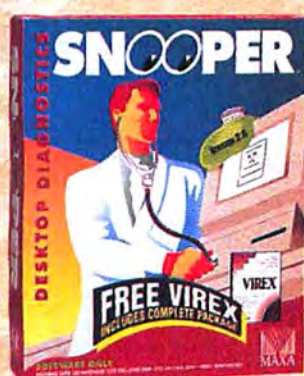
The Mac Zone
Established 1986

NEW PRODUCT

ALERT!

This software diagnostic for Macintosh helps you find the source of software conflicts and fix them. Maxa's ALERT! is an essential utility and productivity tool for saving time and lost data by preventing software conflicts, frozen screens, system crashes and bombs. Fully networkable under System 7. Maxa #06602

\$124



SNOOPER 2.0 HARDWARE DIAGNOSTIC w/ FREE Virex

Diagnose from your desktop with SNOOPER. It performs over 250 tests, checks all your hardware and finds any problems. Runs on all Macs. This vital utility is easy to use and saves time and money. Buy now and get complete VIREX

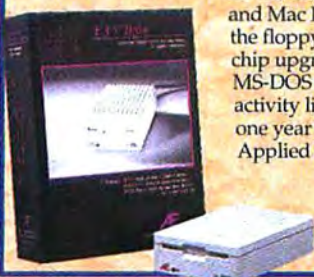
\$128

virus protection FREE. Maxa Corporation #05025 ✓
#05026 ✓ SNOOPER 2.0 w/NuBus Card and FREE Virex\$178

AE Plus Drive 1.44/800K FD

It's one of the finest drives available for the Mac. The Plus Drive is a 100% FDHD-compatible drive for the Macintosh Plus, SE and Mac II. It installs through the floppy connector and requires no SWIM chip upgrade. You also get full SuperDrive and MS-DOS compatibility, a two color read/write activity light; auto, touch and paper clip eject; one year warranty and more. Applied Engineering #04956

\$298



#05315 Mac II Cable for AE Plus Drive\$14

\$98

TimesTwo

Transform your 40MB drive into an 80MB or your 80MB drive into a 160 without buying new hardware! A one-time installation converts your disk to twice its original size in minutes, leaving all your data unchanged. No additional settings are needed! Golden Triangle #06579



Performantz Series Hard Drives—Available Only at The Mac Zone

Quality Performantz hard drives set the new standard for performance and value. Utilizing top-quality mechanisms from the leaders in hard drive technology, Performantz series drives allow you to enjoy the benefits of speed and reliability at a price that can't be beat. Each drive is thoroughly tested and preformatted for reliability and ease of installation. Performantz series drives offer a much higher quality mechanism than the "off-brand" drives found in the backs of computing magazines.

Performantz 105MB External

\$388

A high-performance, high-quality hard drive has never been more affordable! At this price, you can't afford to pass up this storage potential. If an extra 105MB could come in handy—for huge applications or backup—this Performantz drive is your chance. The finest quality and high speeds define these drives, so you know it will perform just the way you expect. This is a limited time offer, so call today! Performantz #06215



Performantz 44/88MB Rem. 5110C Drive

\$699

That's right, the Performantz 44/88 Removable Drive reads and rights both 44 and 88MB

SyQuest cartridges. Finally, you can run both formats with one drive! It's perfect for anyone who needs both

limitless storage potential and broad format compatibility. Performantz removable hard drives are engineered using the very same removable drive technology which has set the standard for removable hard drives. The only difference is that Performantz makes this technology affordable! Fast enough to be used as a second hard drive, it is ideal for backing up or removing your data for security purposes. Includes one 88MB SyQuest cartridge. Performantz #06539



06225	Performantz 85MB EXT	\$368
06228	Performantz 170MB EXT	\$498
06216	Performantz 210MB EXT	\$628
06730	Performantz 520MB EXT	\$1,338
06731	Performantz 1.2GB EXT	\$1,978
06737	Performantz 2.0GB DAT w/Retrospect ..	\$1,548
06738	Performantz 8.0GB DAT w/Retrospect ..	\$1,698
06732	Performantz 85MB INT	\$278
06733	Performantz 170MB INT	\$398
06223	Performantz 210MB INT	\$528
06735	Performantz 520MB INT	\$1,248
06736	Performantz 1.2GB INT	\$1,383
06330	Performantz 44MB REM w/Cartridge	\$498
06329	Performantz 88MB REM w/Cartridge	\$619
06707	PLI 85MB EXT	\$467
06706	PLI 170MB EXT	\$567
06702	PLI 1GB EXT	\$2049
*06229	Performantz Q 900/950 INT Mount Kit	\$29

* = Required for Internal Drives

\$69

SyQuest 44MB Removable Cartridges

With removable SyQuest cartridges your storage capacity is virtually limitless. Lifetime warranty. SyQuest #02183

#00183 SyQuest 88 MB\$106



SOFTWARE

Business Essentials

ACCOUNTING

00033	Managing Your Money 5.0	\$31
04712	MYOB for Mac 3.0	\$108
01871	Payroll 4.0	\$108
05745	Peachtree Insight Accounting for Mac	\$298
04230	Quicken 3.0	\$42

COMMUNICATION

04497	Hayes Smartcom II 3.4	\$53
04893	Microphone II 4.0	\$144
04168	QuickMail 2.5.1 10 User	\$374
02881	White Knight II	\$84

DATABASE

06319	Aldus Fetch	\$195
03478	FileMaker Pro 2.0	\$268
02648	4th Dimension 3.0	\$598
02581	MS FoxBase+Mac 2.01 Sngl	\$328
05323	Userland Frontier 2.0	\$184

DESKTOP PUBLISHING

04573	Aldus PageMaker 4.2/Preprint Bundle	\$494
04769	Publish It Easy 3.0	\$112
04736	Quark Xpress 3.1	\$548

INTEGRATED

04466	Claris Works	\$196
04247	MS Office 3.0	\$474
00567	MS Works 3.0	\$158

MANAGEMENT

06231	ACT! for Mac	\$248
03910	Business Plan Toolkit 4.0	\$78
04949	In Control 2.0	\$85
00588	Inspiration 4.0	\$158
01159	Mac Flow 3.7	\$214
04161	MS Project for the Mac 3.0	\$444
04140	MacProject Pro	\$398
04720	Nolo's Living Trust	\$43

SPREADSHEETS

00699	Claris Resolve Competitive Upgrade	\$98
00518	Lotus 1-2-3 1.1 Competitive Upgrade	\$98
00227	MS Excel 4.0	\$294
04545	MS Excel Version Upgr 4.0	\$94

WORD PROCESSING

05738	LetterPerfect 2.1	\$94
04898	MS Word	\$294
00596	MS Word Upgrade	\$124
03972	WordPerfect 2.1	\$278

EDUCATION

05379	Algebra I Homework Tutor	\$49
00671	Just Grandma and Me	\$33
05991	KidDesk	\$26
03994	Kid Pix 1.2	\$33
05512	Kid Pix Companion	\$24
05992	Millie's Math House	\$32
00577	Miracle Piano Mac	\$348
00825	New Math Blaster Plus	\$34
00074	Oregon Trail 1.1	\$28
01855	Reader Rabbit 1	\$35
03800	Sim Earth Planet Sim	\$39
06109	SimLife	\$38
04251	Swamp Gas Visits U.S.	\$32
05688	Where in the World is Carmen Sandiego	\$46

ENTERTAINMENT

03599	3 in Three	\$31
05607	Capitalist Pig	\$34
05071	Crossword Creator 1.0	\$39
05550	Davidson's Kid Works 2	\$34
06394	Falcon MC	\$42
04582	Fun Bundle	\$39
04580	Glider 4.0	\$29
06019	Heaven & Earth	\$36
01046	Hellicopter Over the Pacific	\$38
06486	Lemmings	\$36
04293	MS Flight Simulator 4.0	\$41
00473	PGA Tour Golf	\$38
05649	Prince of Persia	\$31
04116	Spaceward Ho!	\$36
00600	Tristan: Solid State Pinball	\$39

Graphics

CLIP ART

05601	Images with Impact! Accents and Borders	\$78
02085	Images with Impact! Business 1	\$62

00421	Images with Impact! People 1	\$78
04356	MapArt Vol 1: USA & International	\$88
05647	MapArt Vol 2: US States by County	\$48
04273	Uncle Mitty's ClipArt	\$34

DESIGN

04121	Aldus Gallery Effects	\$128
05481	Aldus IntelliDraw	\$194
05493	Aldus Personal Press 2.0	\$98
04190	Aldus SuperPaint 3.0	\$98
04180	Design CAD 2D/3D	\$159
03609	Design Your Own Home Architecture	\$58
00665	Fractal Design Painter 2.0	\$298
03582	FrameMaker 3.0	\$594
04073	MacDraw Pro 1.5	\$274
05969	Mac Value Pak	\$39
03540	MiniCAD Plus 4	\$594
05521	Pantone Process Color Imaging Guide 1000	\$61
04055	Pantone Process Color System Guide	\$54
00853	Quick Art Dix CD-ROM	\$218
04347	TypeStyle 2.0 w/ATM	\$125

FONTS

03497	Adobe Type Mgr. 2.0	\$58
04049	Effects Specialist 2.0	\$94
05964	Fluent Laser Fonts Lib Two	\$98
04537	Fontographer 3.5	\$258

GRAPHS

00203	Crickle Graph III 1.0	\$118
04805	Deltagraph Pro	\$198
04806	Org Plus for Mac 1.0	\$124

ILLUSTRATION

06263	Adobe Dimensions	\$98
03533	Aldus Freehand 3.1	\$393
00803	Canvas 3.0	\$258
05925	Morph 1.1	\$95
01015	Print Shop 1.3	\$34
05157	Sketcher	\$93
03971	Streamline 2.0	\$121

IMAGE PROCESSING

04042	Adobe Photoshop 2.5 for Mac	\$548
06338	Image Assistant for Mac	\$328
00815	Infini-D 2.0	\$698
00657	Oloto GS Scanning SW	\$274

PRESENTATION

00346	Aldus Persuasion 2.1	\$324
01220	MS PowerPoint 3.0	\$328
06299	MS PowerPoint 3.0 Upgr	\$98
06275	Pointwrite	\$149
06280	PowerPoint (Laser Light Pointer)	\$98

MULTIMEDIA

04670	Adobe Premiere 2.0	\$428
05702	Adobe Premiere 2.0 Upgr	\$148
00339	MacroMedia Director 3.1	\$795
00838	MacroMedia Three-D	\$998
05310	MacroModel	\$998
04084	Stratavision 3D 2.5	\$628

Utilities

GENERAL

03664	Access PC 2.0	\$59
04955	Auto Doublet 2.0	\$58
03515	Disk Doubler 3.7	\$49
00258	FolderBolt 1.02	\$71
03837	Think 2.2	\$424
05513	Mac to DOS Transfer 3.0	\$94
05889	Magnet 1.0	\$68
04046	More After Dark End! 2.0	\$38
04890	Norton Util 2.0	\$94
04191	Now Utilities 4.0	\$94
05690	PowerMerge	\$64
00642	PowerPrint 2.0	\$94
03751	Quick Keys 2.1.3	\$94
02586	Retrospect 2.0	\$146
00116	Sam 3.5	\$64
04760	Soft PC Professional 3.0	\$198
04541	Soft PC Universal 3.0	\$98
05827	Shufft Deluxe 3.0	\$65
04776	Suitcase II 2.1	\$49
05679	Super 7 Utilities	\$62
05433	System 7.1 Personal Upgr Kit	\$78

HARDWARE

ACCELERATORS

06653	25MHz Turbo 040 for the Mac ci	\$1,189
-------	--------------------------------	---------

05477	25MHz Turbo 040 for the Mac II	\$1,189
06654	33MHz Turbo 040 for the Mac ci	\$1,462
06478	33MHz Turbo 040 for the Mac II	\$1,462
04071	Cache In 50	\$779
04072	Cache In 50 w/FPU	\$935
06482	Charger	\$367
05004	Combo Cache II si w/FPU	\$319
00561	Fast Cache Quadra700/500	\$274
05719	Fast Cache Quadra700/500/550	\$410
06481	FastCache Turbo 33 (128K Cache for Turbo 040)	\$364
05003	Power Math LC	\$118
03673	Quadrant	\$204
04154	Quicksilver IIsi w/FPU	\$268
05250	Radius Rocket 33	\$2,175
05720	SE30 PowerCache 33MHz	\$410
05802	SE30 PowerCache 33MHz w/FPU	\$502
05721	SE30 PowerCache 40MHz	\$594
05803	SE30 PowerCache 40MHz w/FPU	\$696
05722	SE30 PowerCache 50MHz	\$776
05804	SE30 PowerCache 50MHz w/FPU	\$914
05797	ThunderStorm	\$848
00873	TransWarp 040 25 Mhz	\$1,788
05363	TransWarp Classic 16MHz	\$345
05361	TransWarp Classic 25MHz	\$389
05359	TransWarp Classic 33MHz	\$489
05357	TransWarp Classic 40MHz	\$635
05356	TransWarp Classic 40MHz w/FPU	\$759
05380	TransWarp LC	\$378
04732	TransWarp LC 33MHz w/FPU	\$529
05381	TransWarp LC w/FPU	\$485
04323	Univ. Powercache 33 MHz	\$410
04634	Univ. Powercache 33MHz w/FPU	\$499
04319	Univ. Powercache 40MHz	\$594
04320	Univ. Powercache 40MHz w/FPU	\$685
04321	Univ. Powercache 50 MHz	\$776
04322	Univ. Powercache 50MHz w/FPU	\$914

ELECTRICAL ACCESSORIES

05626	Axon Serial Switching Device	\$128
05354	Full Cycle Battery Charger	\$104
09521	Kensington MasterPiece Plus	\$98
00577	Miracle Piano Mac	\$348

MEMORY

06699	1MB for TI microLaser XL	\$69
06700	2MB for NEC M35 Printer	\$149
05331	2MB PowerBook 100/140/170	\$118
05392	4MB PowerBook 140/170	\$238
06696	4MB PowerBook 160/180	\$209
05393	6MB PowerBook 140/170	\$278
06695	6MB PowerBook 160/180	\$289
06691	8MB PowerBook 160/180	\$408
06692	10MB PowerBook 160/180	\$499
06694	8MB PowerBook Duo RAM	\$499
06693	4MB PowerBook Duo RAM	\$248
05657	LC Video Ram 512K	\$39
05818	Quadra 950 Video Ram 512K	\$68
05658	Quadra Video Ram 256K	\$98

LUGGAGE

04690	NoteBook Traveler Deluxe Case	\$78
05284	Targus Premier Leather Notebook Case	\$138
07454	Targus Universal Notebook Case	\$68

DRIVES

04955	AE PlusDrive - 1.44/800K FD	\$298
09916	Bern 90MB Cart 3Pk	\$438
05422	Hammer 1000 FMF	\$2,264
05227	Mac SE Int Mounting Kit	\$19
05228	Mac II Int Mounting Kit	\$20
06225	Mac LC/II Int Mounting Kit	\$15
06229	Mac Quad 900/950 Int Mounting Kit	\$29
05849	NEC CD Express Mac w/CDR 25	\$438
05848	NEC Multimedia Gail Mac w/CDR74	\$876
04965	FWB HammerDisk 44MB Removable	\$738
04964	FWB HammerDisk 88MB Removable	\$948
01060	FWB HammerDisk 5000 Sgb	\$2,594
00506	FWB PocketHammer 100	\$748
04991	FWB PocketHammer 240	\$1,198
00843	FWB Hammer 1400	\$3,678
00844	FWB Hammer 1400 FMF	\$4,738
00240	FWB Hammer 600	\$2,108

05422	FWB Hammer 1000 FMF	\$2,284
03691	PLI CD-ROM HD	\$574
05813	PLUDAT 3.5 4 Gig w/Built in Compres. for 8 Gigs	\$1,699
02181	PLI Infinity 40 Turbo HD Rem	\$553
00182	Supra Fax 88 Turbo HD	\$648
06330	Performant 44MB Rem	\$498
06329	Performant 88MB Rem	\$698
02183	Syquest 44MB Cart	\$69
01683	Syquest 88MB Cart	\$106
04698	PLI Infinity Opt Sony 3.5 128MB	\$1,498

Input / Output

MODEMS & FAXES

05684	PowerPort Gold	\$474
05655	PowerPort Silver	\$438
00877	Prometheus Ultima Home Office Ext	\$399
00862	Prometheus Ultima Ext	\$269
04351	Supra Fax Modem Plus	\$178
00414	Supra Fax Modem V.32BIS w/sft cable	\$319
00413	Supra Fax Modem V.32BIS w/sft cable	\$349
00424	Supra Fax Modem V.32 w/sft cable	\$259
00426	Supra Fax Modem V.32 w/sftCable	\$289
06267	TelePort Gold	\$438

SCANNERS

00520	Lightning Scan Pro 256	\$488
02561	Logi Scanman Mod32 Digital Darkroom	\$295
00870	Logitech Scanman Model 32 w/Catchword Pro	\$378
00370	Microtek ScanMaker 1650S	\$1,898
06251	ScanMaker II	\$928
06252	ScanMaker II XE	\$1,214
00599	Umax 24bit UC 630 w/Photoshop	\$1,249

MONITORS / VIDEO CARDS

04995	NEC Mac FG 24X Cir Display Interface Crd	\$1,284
07144	NEC Multisync 15 Mon 3FGX	\$658

07143	NEC Multisync 15 Mon 4FG	\$778
07399	NEC Multisync 17 Mon 5FG	\$1,398
07182	NEC Multisync 21 Mon 6FG	\$2,698
00578	NEC Mac #G8X Cir Display Interface card	\$718
05496	Precision Cir 24XP	\$538
04206	Radius Pivot Display	\$1,298
04899	Radius Precision Cir 20	\$2,489
00399	Sigma Platinum Power Portrait 15	\$658
06315	Spectrum24 PQD Plus	\$1,648
05117	Spectrum24 Series IV	\$872
05123	SuperMatch 17 Multimode Cr.	\$999
06100	SuperMatch 17 T Trinitron Color Display	\$1,149
05127	SuperMatch 20 Cir Display	\$1,616
06234	SuperMatch 20 T Multimode Trinitron Color Display	\$2,698

MICE / KEYBOARDS

05177	Kensington Notebook KeyPad	\$78
01584	Mac 101E Key NEW	\$125
02813	Mac Pro KB 105 Plus Kyb	\$108
05176	TurboMouse 4.0 Trackball	\$126

PRINTERS

05068	Apple StyleWriter Ink Refill System Black/2Pak	\$14
11650	NEC M95FX W/Postscript Fax	\$2,075
05701	NEC Silent Writer M95	\$1,544
04096	TIPS 17 Laser W/Apple Talk	\$1,298
04313	TIPS 35 Laser W/Apple Talk	\$1,543
04049	TIPS 35 micro laser Turbo	\$1,698

Take Off With System 7.

FREE
Overnight
Shipping
with Any
System 7 Bundle



Buy both System 7 and one of the Apple partner products and get a \$5 to \$20 Rebate.



4 Super Reasons to Switch to System 7

The Mac Zone

EXCLUSIVE Rebate Offer.

When you buy System 7 and a participating Apple product get

Free Freight!

Buy both System 7 and one of the Apple partner products now and get a \$5-\$20 rebate. Plus, we'll ship your order to you **FREE** via Airborne Express Overnight!

\$78

System 7

Macintosh System 7.1 software brings your Apple Macintosh personal computer more exciting capabilities and greater ease of use. Plus, it provides you with powerful new tools and capabilities. #05433

Work, smarter, faster than ever!

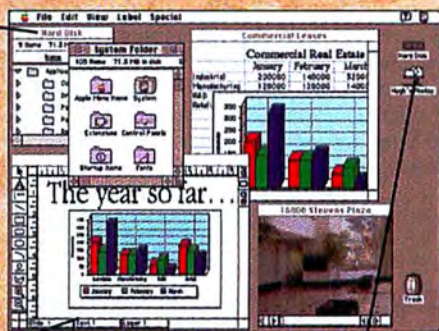
Organizing and accessing files is much easier with the powerful new tools provided in the Finder windows of System 7.1. Click on a folder and the contents of that folder drop down from it instantly. Now you don't have to open a new window every time you wish to check the contents of a folder!

Run more than one application at a time!

With System 7.1 you can keep multiple applications open at a time. Copy items into your word processor from your database, one at a time, while both applications are open on your desktop. Open as many applications as you want, then click back and forth between them, instantly!

Keep it up-to-date!

With Publish and Subscribe you can create and control live links between imported data and the original documents, so you can create files that are updated automatically to reflect changes made elsewhere.



Share information easily!

If you're part of a network, you can share any folder or volume on your hard disk with other users—without using a dedicated server! Before System 7, you had to purchase hundreds of dollars of software and hardware to do this. Now it's built right in.

Hurry! Offer good only from March 15 — June 30, 1993. FREE freight offer applies only to System 7/Apple partner products purchased together.

Apple Partner Products

Item #	Product	Price	After Rebate	Item #	Product	Price	After Rebate	Item #	Product	Price	After Rebate
Aldus				04197	Playroom 2.0	\$28	\$23	Learning Company			
04121	Gallery Effects	\$128	\$118	05649	Prince Of Persia	\$31	\$26	01856	Reader Rabbit 1	\$35	\$30
05481	Intellidraw	\$194	\$184	04999	Spelunx	\$28	\$23	05070	Reader Rabbit 2	\$34	\$29
04573	PageMaker 4.2	\$494	\$479	04347	Typestylar 2.0 w/ATM	\$125	\$115	04897	SuperSolverOut Numbered	\$33	\$28
05493	Personal Press 2.0	\$98	\$88	05688	Where In The World Deluxe	\$46	\$41	05126	SuperSolver Midnight Rescue	\$34	\$29
00346	Persuasion 2.1	\$324	\$309		CD-ROM Versions:			05652	SuperSolvers Spellbound	\$34	\$29
04190	SuperPaint 3.0	\$98	\$88	06108	Arthur's Teacher Trouble	\$44	\$39	02593	Talking Math Rabbit	\$35	\$30
Amaze, Inc.				00671	Just Grandma & Me	\$33	\$28	04754	The Writing Center	\$51	\$41
05072	Cathy Daily Planner 2.0	\$48	\$38	Central Point Software				Lotus			
04706	Farside Daily Planner 2.0	\$49	\$39	06763	Anti Virus Mac	\$48	\$33	00507	123 Mac Upgrade	\$298	\$278
06168	Trivial Pursuit 2.0	\$48	\$38	03481	Mac Tools	\$104	\$84	Microsoft			
Apple Computer				06648	Safe & Sound	\$37	\$27	00227	Excel 4.0	\$294	\$274
06297	Apple Font Pak	\$68	\$53	Chipsoft				02581	Foxbase 2.01	\$328	\$308
05432	Mac PC Exchange	\$68	\$53	06164	MacTax	\$49	\$39	01220	Powerpoint 3.0	\$328	\$308
Berkley				Claris				04161	Project 3.0	\$444	\$424
02785	After Dark	\$28	\$23	05749	Clarix Works Version 2	\$196	\$181	04898	Word 5.1	\$294	\$274
05934	After Dark: Star Trek	\$35	\$30	03478	FileMaker Pro 2.0	\$268	\$258	00567	Works 3.0	\$158	\$138
Broderbund				06290	MacWrite II	\$88	\$78	Symantec			
03970	Bannermania	\$28	\$23	06525	MacWrite Pro	\$174	\$154	04890	Norton Utilities 2.0	\$94	\$74
03994	Kid Pix	\$33	\$28	Diva				00116	SAM 3.5	\$64	\$49
05512	Kid Pix Companion	\$24	\$19	00602	VideoShop	\$398	\$378	WordPerfect			
05479	Mac USA	\$34	\$29	Intuit				05738	LetterPerfect	\$94	\$84
04328	MacGlobe	\$38	\$33	04230	Quicken Mac	\$42	\$37	03972	WordPerfect Mac 2.1	\$278	\$258
								06303	WordPerfect Works 1.2	\$158	\$148

Circle 70 on reader service card

CODE #30502

TAKE OFF WITH SYSTEM 7 AND THE MAC ZONE

Murder-Mystery Game

Who Killed Sam Rupert

PROS: Logical solution; good use of QuickTime; surprisingly solid dialogue and acting.
CONS: Time limit hampers game; no pause feature; may be unsuitable for children.
COMPANY: Creative Multimedia Corporation (503/241-4351). **REQUIRES:** Mac II; 4MB of RAM; CD ROM drive; 8-bit color; color monitor; System 6.0.7. **LIST PRICE:** \$39.95.



MOST MURDER-MYSTERY GAMES ARE based on a single principle: mislead the player. Introduce a bunch of suspects, make them out to be arrogant, manipulative creeps, then hinge the solution on a last-minute piece of evidence that pins the blame squarely on some sweet soul who wouldn't hurt a fly. If you hate that type of game, you'll like *Who Killed Sam Rupert*.

This interactive game takes all the information you need to solve the mystery, hides it evenhandedly, then leaves it to you to uncover it. Sure, you run into false leads and questionable information, but the trail is ultimately logical and entertaining.

QuickTime movies, synchronized voice and music, and hundreds of 256-color

images create the virtual murder. You're a police detective trying to solve the murder of a popular restaurateur by evaluating the guilt or innocence of eight suspects while contending with a nagging chief, a contingent of local press ghouls, and a persnickety judge who seems to know more about the case than you do. Your assistant detective, Lucie Fairwell, assembles information for you, makes phone calls, videotapes the interviews with the suspects, provides hints—in short, she does the work while you ruminate over the information.

The trick is to interview the eight suspects, marshal as much ancillary evidence as possible, correctly answer at least seven out of ten questions at the press conference, reinterview key suspects, and submit a defensible arrest warrant—all within six hours. Time is measured according to actions. At 20 minutes apiece, your interviews leave you little opportunity to check alibis, inspect the scene of the crime, read the autopsy report, procure lab tests, and track down all the other details.

There are ways to save time. You can save your place (using an undocumented technique—click on the dimmed clock icon in the opening screen) and pursue one avenue of clues, then return to the saved time and pursue another avenue of clues. You can even cheat by using a word processor to alter the time value in a saved file.



Six Hours with the Deceased The point-and-click interface lets you investigate clues in any order but each bit of information costs you time.

To its immense credit, *Who Killed Sam Rupert* exploits the full range of multimedia options. The acting and dialogue in the QuickTime movies are more than adequate to draw you into the story. And though the press conference scene is pure contrivance ("Is the medulla oblongata part of the brain?" asks one intrepid reporter), the trail to the murderer provides a wealth of clues and surprises to hold your interest.

The game cries out for a pause feature for times when real life rears its ugly head. Also, a smidgen of cursing and some mention of anatomical details may make the game unfit for the kiddos. But you'll probably be pleased at how much fun you have tracking the killer.—DEKE MCCLELLAND

CD ROM Detective Game

Sherlock Holmes, Consulting Detective, Volume II

PROS: Superb video sequences; games in progress can be saved. **CONS:** Needs more detail in reporting scores and a more useful notebook feature. **COMPANY:** Icom Simulations (708/520-4440). **REQUIRES:** Mac LC; 2MB of RAM; 256-color monitor; CD ROM drive with 380ms access time and 150K data-transfer rate; System 6.0.7; 32-bit QuickDraw. **LIST PRICE:** \$69.95.



IN SHERLOCK HOLMES, CONSULTING Detective, Volume II, you match wits with Sir Arthur Conan Doyle's legendary detective by attempting to solve three difficult mysteries. After questioning suspects and gathering clues, you bring each case before a judge, who asks questions to determine if you know who committed the crime and why.

Each game starts with a brief movie in which a key individual is questioned by Sherlock Holmes and provides background information about the crime. You then

select icons to initiate actions. From the top left of the main screen the various icons let you return to the main menu; examine the Notebook; open a Directory of characters and locations; read articles in the *London Times*; travel to different locations; check Holmes's files for background info; send out the Baker Street Irregulars—a group of rag-tag messengers—to collect clues; or meet with the judge. The Carriage icon has splendid cinematic scenes in which Holmes or Watson interviews key characters.

Any name or location in the Directory can be copied into the Notebook, to create a less cluttered record of the people you've met or intend to question. Unfortunately, the Notebook isn't designed for real note-taking. You need to use a notepad DA or paper and pencil to record the wealth of information you uncover.

Although solving the crime is the main objective, how well you do is based on the resources you use. Each time you consult Holmes's files, send out the Irregulars, or travel to a location, points are added to your score. The fewer points you accumulate, the better a detective you are.

Whether you enjoy Sherlock Holmes, Consulting Detective, Volume II, depends on your need for autonomy. Some players may feel they don't have sufficient control. For example, you don't direct the questioning—you only decide whom to question

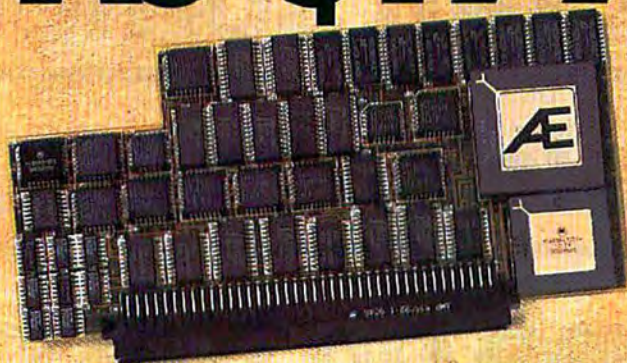


The Notebook The Notebook is a convenient place to store the names of important people and places. Most of the first page is already filled with the names of the Baker Street Regulars—helpful contacts such as Inspector Lestrade of Scotland Yard.

and where to go. And the point at which the mystery can be solved isn't entirely up to you; if the judge feels you are still missing critical clues, he sends you back to continue your investigation. Finally, although a file explains the scoring, the program ought to explain where your score and Holmes's score differ. (I know I did badly, but I want to know what I should have done.)

If you like a good mystery, though, you'll enjoy the game. The three stories aren't straightforward, and you have to interrogate many individuals before you can confidently assemble the pieces of the puzzles.—STEVEN SCHWARTZ

DOUBLE YOUR MAC'S SPEED FOR AS LITTLE AS \$199.



No wonder the competition is running for cover.

Our new accelerators deliver all the speed theirs do. Plus a lot more features. At a much better price.

Take our new 25 MHz SE/Classic Accelerator. For about half the price of DayStar's entry-level accelerator, it more than doubles the speed of your SE or Classic. And at \$349, our 25 MHz LC Accelerator is another spectacular value.

But that's not all. Only our accelerators feature expansion options for EtherNet and enhanced video capabilities. So when you plug them in, you can still add high-speed networking and a full-page display.

GET GREATER EXPANDABILITY AT A BETTER PRICE WITH AN APPLIED ENGINEERING ACCELERATOR.

	CPU Speed	EtherNet Expandability	Video Expandability	Price
Applied Engineering SE/Classic Accelerator	68030 25 MHz (2x faster)	Yes	Yes	\$199
Applied Engineering LC Accelerator	68030 25 MHz (2x faster)	Yes	Yes	\$349

Ask about our complete line of upgradeable accelerators!

Complete line of accelerators and cache cards. Chances are, there's one that matches your needs. At a price no one else can match.



**CALL DIRECT FOR SAME-DAY SHIPPING
1-800-554-MACS, ext. 214**



APPLIED ENGINEERING® 3210 Beltline, Dallas, TX 75234, 214-241-6060

Apple's Oldest and Largest Developer since 1979.

©1993, AE Research, Inc. All rights reserved. Brand and product names are registered trademarks of their respective holders. All specifications, terms and descriptions of products and services are subject to change without notice or recourse.

Circle 167 on reader service card





They're exactly the same, but somebody just paid \$100,000 for the one on the right.

When you use illegally copied software, you're committing a federal crime and risking a fine of up to \$100,000. How can you and your company stay legal? It's easy with our Software Management Guide. You'll receive SPAudit for



DOS and Macintosh™, comprehensive auditing software, a video and procedures for establishing and enforcing a policy that will keep your organization's software legal. And, at only \$80, it's a real bargain when you consider what some people pay.

Keep your software legal. To order, call the Software Publishers Association at 1-800-388-7478, or include credit card information or a check and send or FAX this coupon to: SPA Management Guide, P.O. Box 79237, Baltimore, MD 21279-0237, FAX (202) 223-8756

Name _____
 Company _____ Title _____
 Address _____
 City _____ State _____ Zip _____
 Phone () _____ Ext _____
 Please send me _____ copies at \$80 each. Total \$ _____ (DC residents add 6% sales tax)
☐ Check enclosed ☐ American Express ☐ VISA® ☐ MasterCard®
 Card Number _____ Exp. Date _____
 Signature of Cardholder _____ Name of Cardholder _____



Once upon a ROM

BY DAVID POGUE

OUR FAVORITE COMPUTER company is betting on CD ROM—compact discs designed for the computer. These plastic 600MB discs play not just music but video, text, speech, and anything else people feel like handing you on a silver platter. As soon as Apple started building CD ROM players into its latest Macs, new discs began gushing onto the market. Many of them fall into a new entertainment category: interactive fiction, in which you're a character with control over the pace, if not the direction, of the plot.

But there are two reasons that CD ROM may not be everything you've ever wanted to slide into your Mac. First of all, CDs have all the pep of a tranquilized slug. Click on a button and you sometimes have to wait the worst part of a minute before anything happens on the screen. Unfortunately, such a response puts something of a damper on that white-knuckled, heart-throbbing tempo you'd want in your interactive adventures.

The new dual-speed drives from Apple, NEC, and Toshiba help the speed problem, if only slightly. But there's a second issue: content. Do you know how much 600MB is? If you laid out that many floppy disks end to end, they'd stretch halfway across Microsoft's parking lot. The challenge, then, is to do something useful with that potential. On the participatory-story bookshelf, few have ventured much beyond the safe bounds of two categories: comic books come to life, and solve-the-mystery games. (Note: Most of these require a color Mac—for some, a 13-inch monitor is the minimum size—and at least 5MB of memory.)

Spaceship Warlock

SPACESHIP WARLOCK WAS AMONG THE first interactive CDs (\$95; Reactor, 312/573-0800). In this hi-sci space opera, you wake up, try to figure out your unfamiliar futuristic surroundings, and soon realize that you're the sole defense against hostile aliens from space that threaten to mess up life as we know it. I think we all know that feeling.

You amble through your richly painted, simplified-floor-plan universe,

navigating gorgeous 3-D rooms, hallways, and space cruisers by clicking the mouse. You meet a cast of colorful characters, like Hammer, the eye-patched space pirate, and you rocket forth into a tale of star travel and intergalactic politics. More than any other interactive story, *Spaceship Warlock* feels like a movie: there are fancy special effects; you converse with other characters (by typing); and your wanderings are accompanied by a percussive cosmo-punk sound track. And regardless of your gender, you get the girl at the end.

In terms of character development, *The Color Purple* it ain't. And I don't much care for getting repeatedly killed by some unexpected space bully. But the sheer imagination poured into this disc will keep you absorbed for about 12 hours of red-blooded space anarchy.

The Journeyman Project

IN THIS HI-SCI SPACE OPERA, YOU WAKE up, try to figure out your unfamiliar futuristic surroundings, and soon realize that you're the sole defense against hostile aliens from space that threaten to mess up life as we know it.

The Journeyman Project (\$99.95; Presto Studios, 619/689-4895) creates a whole new world, immaculately and stunningly conceived. Your photo-realistic surroundings have light, depth, and body. Details have been sweated. (Check out the Mood Walls in your futuristic apartment: you can dial up Seascape, Whispering Leaves, or any other soothing rear-projection scenes.)

The premise is neat: some scientist has invented a time machine, now kept under lock and nine-digit password. After all, reckless time travel, as we know from *Back to the Future*, can change history in hideous and unpredictable ways (hair-styles being the prominent example on this disc). And now somebody has stuck a finger into the great faucet of time; you must go back to the critical temporal splatters and clean up the mess.

Note well: This game is the slowest in a very slow medium. (The manual optimistically suggests that you grab a

handy 400MB hard drive and copy the game onto it for faster performance.) Worse—for me, anyway—is that your character keeps getting killed arbitrarily until you've learned the game's idiosyncrasies. Just once, couldn't somebody create a world as rich as *The Journeyman Project*, without making it so gosh-darned hard to stay alive to see it?

L-Zone

MY MOTHER ALWAYS SAID: "BE CAREFUL what you wish for. You might get it." In *L-Zone*, you don't die; in fact, you don't meet any other characters at all. You find yourself deposited in yet another futuristic *Omni* magazine cover, with absolutely nothing to do but walk around, all by yourself, and admire room after room of gleaming abandoned machinery. It's *Home Alone 10*.

L-Zone (\$99; East West Distribution, 213/848-8436) is from Japan, so to keep it marketable here, it has no dialogue or text. (Except for the Read Me document: "All operation you have to do is drag this QuickTime file into your system folder." Right.) You're free from the risks and rigors of typical futuristic space fantasy. In fact, after wandering around Planet Dullsville for a while, you wish a few murderous space bullies would liven things up.

Alice in Blendoland

THE EXPLORATION-LOVING 3-D GRAPHICS artists who brought you *L-Zone* appear also to have had a hand in this similarly aimless disc (same company and price). *Alice* (\$69.95; Greg Brown Associates, 714/673-4301) is a modern, hallucinatory, museum-like wonderland. Just as in *L-Zone*, there is no plot, no end point, no characters; *Alice* is primarily an exercise in weirdness. You wander through art galleries; when you click on furniture, walls, doors, and paintings, oddball things happen. You get small, or big. R-rated goings-on appear. The guy in a portrait starts vomiting grapes. Makes ya glad you dropped \$400 on a CD ROM player, don't it?

continues



*Fiction
comes to CD
ROM,
and you're the
hero*

In order to service our customers as accurately and efficiently as possible, please include a copy of the QC paperwork with every shipment.

EasyFlow Users:
Now You Can Convert Your
EasyFlow DOS Files Into
MacFlow Flowcharts!

Show them you mean business.

MacFlow 3.7 Flowchart Design and Development

Lay it all out for them—the process, the procedures, the relationships. Business works best when everything is clear, and there is no better way to make things clear than a detailed flowchart.

The best way to create flowcharts is MacFlow—the highest-rated flowcharting program. Neither drawing programs nor pencil and paper can create flowcharts as easily as MacFlow. And no program is simpler to learn or use. Graphically organize complex processes, projects, and structures—minutes after opening the package.

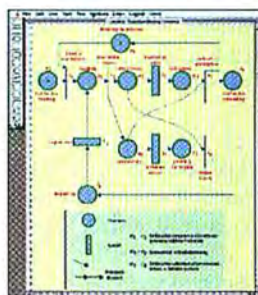
Simply drag pre-drawn symbols onto a page and connect with curved or straight lines. Place text in symbols and on lines, as well as in freestanding notes. Change the chart as desired; lines stretch and stay attached to symbols. Even create stand-alone flowcharts that can be freely distributed to any Macintosh user (and any Windows user with an optional viewer). MacFlow is also System 7-savvy, letting you publish your charts and subscribe to text. Translate to and from text in ASCII and RTF formats as well as outlines created in Acta 7 and MORE.

MacFlow actually enhances your thought process because the interface is so simple and intuitive, nothing stands between your ideas and a presentation-quality flowchart. In fact, you'll find just creating flowcharts keeps your thoughts organized and helps you get a handle on any task.

Show them you're serious—
get MacFlow today.



MacUser Magazine July '91



MacSchedule 3.0 Project Planning and Tracking

Lay it all out for them—the plan, the people, the cost. Give them a path to follow and a way to track progress.

Successful projects need a roadmap, and nothing can beat a simple yet comprehensive project schedule.

The best way to create quick, presentation-quality project schedules is MacSchedule. The Gantt-chart interface lets you create schedules, with integrated financial data, minutes after you open the application—unlike complex project management software. And MacSchedule is as easy to learn as it is to use.

MacSchedule automatically creates and manages a project calendar. Just enter task names, then indicate timing with a click and drag of the mouse. Status tracking is also easy—just click on a task bar to show progress.

MacSchedule helps track a project from initial estimates to current status by automatically developing calendarized cost estimates and reporting cost and schedule variances in an Earned Value summary. MacSchedule is also System 7-savvy, letting you publish your schedules and data as well as subscribe to data from other programs. Place schedules in documents for proposals and reports or print schedules as slides, overheads, or wallcharts.

With MacSchedule's graphic feedback, you can tell at a glance where your project is and where it's headed. It's the perfect tool for any manager.

Show them your plans for success—
get MacSchedule today.



For a free demo disk and catalog,
phone, write, or fax Mainstay today.

Mainstay

MacFlow, MacSchedule and other Mainstay products are available through retail and mail-order outlets worldwide. Ask for them at: MacConnection, Mac Zone, Mac's Place, MacWarehouse, CompUSA, Egghead, and other fine retailers and mail-order resellers. In Europe, Mainstay products are available at authorized Apple resellers. EasyFlow is a registered trademark of HavenTree Software Ltd.

5311-B Derry Avenue, Agoura Hills, CA 91301 (818) 991-6540 (818) 991-4587 fax
71 rue des Atrebatres, B-1040, Brussels, Belgium 322/733.97.91 322/732.32.46 fax

Who Killed Sam Rupert

A CALIFORNIA YUPPIE HAS BEEN KILLED in his own restaurant. He's got a \$42,000 diamond ring still in his pocket, a hatpin in his neck, and eight shifty-looking friends. Your job is to figure out whodunit and whydunit—and you have only six hours (\$39.99; Creative Multimedia, 503/241-4351).

You interview the suspects, played by actors ranging from hopeless to outstanding; their replies come in the form of QuickTime movies, which are great fun to watch. You can listen to Sam's answering machine, look over his reservations computer, read crime-lab reports, and so on. The solution, while not requiring Mensa mentality, is fun to ferret out.

About this six-hours gimmick, though: it's not six *actual* hours, but six *virtual* hours. Every time you check a source, the program deducts time from your six-hour countdown. You have no way of knowing how much it'll subtract for a certain inquiry, and no way to say "Oh, in that case, forget it." I used up my "six hours" in about one real hour, and needed another "six" to solve the mystery. Nonetheless, the disc is done with maximum realism and minimum pointless game-gimmicks. And it's relatively cheap.

Sherlock Holmes, Consulting Detective (Volumes I and II)

EACH OF THESE CDS GIVES YOU THREE mystery-story bangs for the buck (69.95 bucks, actually; Icom Simulations, 708/520-4440). After you watch a movie clip of some British guys sitting around in consternation discussing a crime that's just occurred, you get a list of about 200 names. For each name, you read a message from your scouts (the Baker Street Irregulars); look in Sherlock's files; or, for some names in the list, play a movie clip of Sherlock's interview. You piece to-



Mr. Personality You meet some pretty out-there folks on your journey, man, through *The Journeyman Project*. Take this cheerful-looking robot, for example, who inhabits one of the disc's many gleaming high-tech interiors.

gether surprisingly complex plots, motivations, and personalities.

The video clips deserve special mention. They're nothing like typically tiny, jerky QuickTime movies. Though the image quality is blocky, the picture fills a good part of your screen, and the motion is unbelievably smooth and cinematic. How did the programmers achieve such smooth video from such a slow disc?

However, there's more to frustrate you than solving tough crimes. Many of the 200 names are dead ends; you get awfully tired of hearing an actor explain that somebody "knew nothing about this case." My biggest gripe, however, is that the program, not you, determines when you've solved the case. If you haven't yet watched a scene the program considers vital to the case—even if you already know what it'll tell you—you won't be admitted to the courtroom, where you prove you've cracked the case. The movie clips and the plots are great; too bad the simple mechanics of the game—all that waiting and repetition—dilute their impact.

The Vampire's Coffin

IF SPACESHIP WARLOCK IS A COMIC book, and Sherlock Holmes is "Masterpiece Theatre," then this disc is a Saturday morning cartoon (\$59.95; Sanctuary

Woods Multimedia, 604/380-7582). It's a somewhat confused tale of a guy in a white jumpsuit (do you remember *Speed Racer*?) and his talking dog (remember *Scooby-Doo*?). For some reason, they're assigned by a giant talking robot to go back in time to Transylvania to retrieve Count Dracula's coffin. Or something.

This one seems to have been designed for young teenagers, as evidenced by the lame dialogue ("Man, is that thing nasty-looking, or what?" "After you, scaredy-cat."). The faux-Goofy character voices are goofy; and while the painted illustrations are state-of-the-Saturday-morning-art, there's almost no animation. But jeez, it's no fair to judge this disc against the standards of grown-ups' discs. I haven't quite forgotten what it's like to be 13; I guess if *The Vampire's Coffin* were my first CD ROM, I'd probably love it.

The Madness of Roland

ARTIST/COMPOSER/WRITER/PROGRAMMER/actor Greg Roach genuinely tried to do something groundbreaking with this disc (\$59.95; HyperBole Studios, 713/529-9696). It *is* interactive, and it *is* a story, but you don't really affect the tale's outcome. Instead, you read text as it's spoken by actors. Along the way, you can switch to another character's viewpoint, watch some peripherally related movie clips, or jump to another part of the story.

The problem—and it's a whopper—is the content: vulgar, confusing, ungrammatical. And oh, it art pretentious. "I have many brethren, but no kin." Profound, dude. As soon as a naked guy got fully frontal on my screen, but before I read the term *bitchmeat* applied to women again, I realized that this ground should probably remain unbroken.

The Upshot

THE TWO SPACE ADVENTURES MAKE the best use of the medium: *Spaceship Warlock* for its music and characters, and *The Journeyman Project* for its visuals and story line. If they strike you more as space idiocy than odyssey, then try one of the crime-solving discs, or hold out a few months for an influx of new titles. And then, in the words of the L-Zone Read Me file, "Have a nice trip we invite you to." **m**

Contributing editor DAVID POGUE is an interactive fiction author: read his \$5 Macintosh thriller, *Hard Drive* (Berkley Publishing Group, 1993), and then interact with him by E-mail on America Online.

Other Disks, Rated G and X

The industry wags are probably thinking: What's gotten into this kid? In a review of interactive CDs, how come there's no mention of the very best discs on the planet?

The wags refer, of course, to Broderbund's intoxicating and imaginative Living Books, of which there are now two: *Arthur's Teacher Trouble* (\$59.95) and its predecessor, *Just Grandma and Me* (\$49.95). I didn't cover them because they're designed for kids. But heavens, are they great! Each is modeled on a previously published children's book (included with the disc). On each page, every tiny detail of the illustration has been programmed to do something hilarious when clicked. In a spasm of crinkling sounds, a piece of paper folds itself into a paper airplane and zooms away. Click on the door of the Science Room, and an unsteady finger writes out **3M 9J3H** on the inside of the fogged-up glass. Don't be embarrassed to work out a time-sharing arrangement with your kid.

There's a second category of discs I didn't bother with: the handful of, er, adult seedy ROM discs like *Virtual Valerie* (Reactor). I guess they're interactive fiction, all right, but probably not the kind you want to read about in *Macworld*.

MIRROR'S NEW COLOR SCANNER IS GREATLY ENHANCED. FORTUNATELY, THE PRICE ISN'T.



600 Plus Color Scanner,
with MirrorScan™ Software
\$999

Introducing the new, improved Mirror family of color scanners. Starting with what we learned from the original Mirror 600, we designed the new 600 Plus to be the fastest, easiest-to-use 600 dpi color scanner you could buy. Then we



Low monthly payments
with your Mirror credit card.
Call for an application.

priced it so low you
might mistake it for
an average scanner.

Then we did the same thing with an 800 dpi version. But we still weren't satisfied. So we designed the Mirror Pro series, featuring integrated JPEG compression acceleration.

Transparency
adapter available



The new Mirror scanners feature hardware gamma correction and a precision single-sensor scan head for rich, vibrant colors, stunning sharpness and superb registration every time.

We also redesigned our scanning software from the ground up. MirrorScan™ combines sophisticated and powerful controls with a clear, easy-to-use interface, for great scans every time.

Don't wait! All Mirror products are backed by a 30-day money-back guarantee; order today, and you could have an enhanced image tomorrow.

MIRROR

The Best Thing Next To Your Mac™

MEDIA 1043

MIRRORSCAN SOFTWARE FOR TOTAL CONTROL



MirrorScan gives you total control of the scanning process, for professional results every time. Scan from black and white to 24-bit color; save your scans as EPS, TIFF, PICT, or JPEG; zoom in on

the full-color preview; set white and black points; adjust image gamma, brightness and contrast; and set cropping, resolution and scale from one easy-to-use window. Whether you use the application, Desk Accessory or Photoshop Plug-in, you get maximum control and optimum results.

PRICES

600 DPI 800 DPI

600 Plus, \$999

600 Pro, \$1,399[†]

800 Plus, \$1,299

800 Pro, \$1,699[†]

Transparency adapter, \$599

Adobe Photoshop™, \$200
(requires Scanner purchase)

INTEGRATED JPEG ACCELERATOR*

The Mirror 600 Pro and 800 Pro include Mirror's exclusive Quick! technology for JPEG compression and decompression. Working with QuickTime, the Pro series can save high-resolution scans faster and saves disk space by compressing images up to 50 to 1. These features are fully integrated into the MirrorScan software; JPEG files can be used in most applications that support PICT. (The Mirror Pro series scanners require an available NuBus slot.)

ORDER DIRECT ANYTIME 1-800-643-3384

*Pro models only. †Requires an available NuBus slot for the JPEG accelerator. Prices are F.O.B. origin. All prices subject to change. Prices are for U.S. orders only; call for international pricing. Technical Support Hotline: 1-612-633-2105 • Telephone: 1-612-633-4450 • FAX: 1-612-633-3136 • Address: 2644 Patton Road, Roseville, MN, USA 55113

Circle 304 on reader service card

New Products

The Latest Macintosh Releases

EDITED BY CAMERON CROTTY

THIS SECTION COVERS
MACINTOSH PRODUCTS FORMALLY
ANNOUNCED BUT
NOT YET EVALUATED BY
MACWORLD.
ALL PRICES ARE SUGGESTED
RETAIL. PLEASE CALL
VENDORS FOR INFORMATION ON
AVAILABILITY.

HARDWARE

ColdScan

Feeling chilly? Must be these new cold-lamp flatbed scanners. Relisys's cold-lamps make encapsulated optics possible, and cooling fans unnecessary. Maximum scanning area for all models is 8½ by 14 inches. All models feature three-pass technology and 8-bit gray scale, with both color models offering 24-bit color. Scanners bundled with Adobe Photoshop. ColdScan 800 (400-dpi optical color) \$1995; 600 (300-dpi optical color) \$1795; 600G (300-dpi optical gray-scale) \$1195. Relisys, 408/945-9000, 800/783-2333; fax 408/945-0587.



ColdScan

DATdisk-1000

From the living room to the computer room, digital audiotape (DAT) is coming. The DATdisk-1000 is a 1GB, 4mm DAT system with a 20-second average access time and 1.38K-per-second average transfer speed, according to the manufacturer. System supports read-write applications and can be mounted on the Finder desktop for quick viewing and updates. \$3395. MicroNet, 714/837-6033; fax 714/837-1164.

DisplayNet

Have your net and see it, too. Combination Ethernet and video-interface board supports monochrome Lapis Full Page Display and Two Page Display in black-and-white, also Apple Portrait Display (monochrome); twisted-pair 10BaseT and ThinNet Ethernet connec-

tions. Compatible with SE/30, LC family, II family, Quadras, and Performa 400 and 600. \$549. Lapis Technologies, 510/748-1600, 800/435-2747; fax 510/748-1645.

Focus 2.1g

They're husky hard drives, weighing in at 560MB, 1GB, and 1.2GB. Drives feature Micropolis mechanisms; a five-year warranty; and come bundled with Complete Undelete, DiskMaker, Virex, and Citadel. User has choice of vertical or horizontal case, in black or platinum. According to the company, average access times range from 10ms to 13ms, and sustained data-transfer rates range from 3MB to 5MB per second. 560MB \$1199; 1GB \$1799; 2.1GB \$2749. Focus Enhancements, 617/938-8088, 800/538-8866; fax 617/938-7741.

M21LMuMax

This 21-inch gray-scale monitor has protective shielding to allow proper operation in areas where stray magnetic fields, such as X rays, exist. Circuitry allows monitor to adjust dynamically to horizontal frequencies between 48KHz and 105KHz (15KHz and 65KHz for model M21LMuMaxV65). Offers horizontal resolution of 1024 to 2048 (320 to 1280 for M21LMuMaxV65) and vertical resolution of 768 to 1536 (250 to 1024 for M21LMuMaxV65). Both models have a vertical frequency range of 55KHz to 90KHz. Requires Mac II series computer. \$5950; M21LMuMaxV65 \$6150. Image Systems, 612/935-1171; fax 612/935-1386.

MacPlot Raster

Chooser-level driver and NuBus board that supports the Encad NovaJet and Hewlett-Packard DesignJet plotters using RTL (Hewlett-Packard's Raster Transfer Language). Product supports over 250,000 colors or 65 shades of gray, custom paper sizes, and network spooling. Plot-to-disk feature available. 30MB hard drive space required. Requires Mac II series or Quadra. 8MB min. memory. \$1295. Microspot USA, 408/253-2000, 800/622-7568; fax 408/253-2055.



MacPlot Raster

Massfm 144

Burn up the phone lines with this 14,400-bps fax modem. The Massfmv 144 adds an answering system with a user-recorded greeting and remote message retrieval. Messages are compressed, saved to a hard drive, and date/time stamped. An unlimited number of users can access the Massfm 144N across a network. All Massfm modems are bundled with Faxstf software by STF. All support MNP Classes 1 through 5, v.42/v.42bis, and v.32/v.32bis. Massfm 144 \$449; Massfm 144N \$769; Massfmv \$649. Mass Microsystems, 408/522-1200, 800/522-7979; fax 408/733-5499.

Micropolis Drives

Size-large drives for size-large storage. The half-height 500MB and 1.2GB drives fit into many late-model modular Macs; full-height 2.4GB drives can be installed in the Mac Quadra 900 and 950. Drives feature average seek times of 9.4ms and sustained data-transfer rates approaching 4MB per second, according to the company. 500MB internal \$1299, external \$1369; 1.2GB internal \$1999, external \$2069; 2.4GB internal \$2899, external \$2999. APS, 816/478-8300, 800/235-2752; fax 816/478-4596.



Micropolis Drives

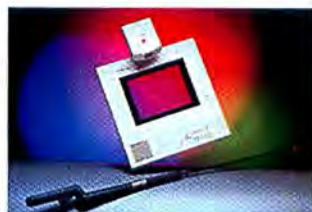
OrangePC

MS-DOS NuBus coprocessor board allows user to run Mac and PC programs simultaneously. Includes VGA controller chip, Windows 3.1 compatibility. With 386SX/25 MHz \$1099; with 386SX/25 MHz with AT bus slot, PC serial and parallel ports, and 2MB of memory (expandable to 16MB) \$1499; with 486SLC-25, AT bus slot, and 2MB of on-board memory (expandable to 16MB) \$1799. Orange Micro, 714/779-2772; fax 714/779-9332.

Ovation 810 and 820

A color, active matrix LCD projection panel with digital video capability. The panel decodes NTSC, PAL, and SECAM video input. The Ovation 810 has the same features without the video capa-

bility. Both panels have an 8.4-inch display area and are intended for smaller audiences. Ovation 810, \$4995; Ovation 820, \$5695. Proxima Corp., 619/457-5500, 800/447-7694; fax 619/457-9647.



Ovation 820

Speedster

Power-hungry? This accelerator board plugs directly into the Mac IIci and Performa 600 Processor Direct Slot; the IIsi and SE/30 require an available adapter; and adapters for the II, IIfx, IIfx, LC, LC II, and Performa 400 will be available soon. The board also features an expansion connector for optional 128K high-speed static RAM cache card. 25MHz \$799, with FPU \$1099; 33MHz \$999, with FPU \$1299; 40MHz with FPU \$1499. Mobius Technologies, 510/654-0556, 800/523-7933; fax 510/654-2834.

XL1500

Let there be phone lines and there shall be networks. Proprietary noise-reduction hardware allows these repeaters to connect Ethernet networks between buildings at distances of up to 1500 feet using existing UTP Level-2 wire. Models available with thin Ethernet (BNC), thick Ethernet (AUI), and 10BaseT (UTP) connections. XL1500 \$1999; XL1502 \$1999; XL1503 \$1499; XL1504 \$3999. Prices are for single units; models sold only in pairs. Tutankhamon Electronics, 510/682-6510, 800/998-4888; fax 510/682-4125.

SOFTWARE

Achieving Your Career

Timely software for the turbulent nineties job market. Product helps organize a job search and motivates the user with music, humor, graphics, and digitized speech. Program features a national 500-company database, a contact organizer, résumé and cover-letter templates, a research module, a calendar, a to-do list, and a scheduler. 2.5MB min. memory. *continues*

\$99. Up Software, 415/921-4691; fax 415/921-0939.

Brody's Dictionary of Medical Terms

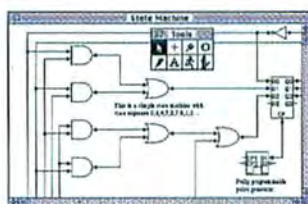
Dictionary contains over 40,000 medical definitions that can be popped up from any word processor. A reverse-search feature finds words whose definitions contain a given set of words; the program also provides wild card searching and batch-file searching, which looks up the definitions of all the words in a text file and puts those definitions in a separate file. 1MB min. memory. \$59.95. Inductel, 408/866-8016; fax 408/243-1762.

Chameleon

Interior decor for the Macintosh. Desktop-pattern utility is a stand-alone application that provides instant access to 256 patterns. Includes pattern editor, import/export capabilities, and over 100 Artbeats patterns. Requires System 7.1 and a hard drive. 4MB min. memory. \$59.95. Logical Solutions, 612/659-2495, 800/645-2495; fax 612/659-2498.

CircuitMaker

Circuit schematic software allows user to draw, modify, combine, and test digital circuits. Features a device library (including TTL and CMOS devices, gates, flip-flops, and switches), the ability to move wires and devices while maintaining circuit integrity, text-documentation capabilities, and devices that are customizable via macro. 2MB min.



CircuitMaker

memory. \$200; demo disk \$10. Micro-Code Engineering, 801/226-4470; fax 801/226-6532.

DPI-On-The-Fly

Display mode switching for Quadra users with MultiSync Plus, XL, 4D, 5D, and FG series monitors. Users select 640 by 480, 832 by 624, or 1152 by 870 resolution via Options in the Monitors control panel. Users must close applications and switch from the Finder but do not need to restart their systems. Free for registered owners of NEC's MultiSync monitors. NEC, 708/860-9500, 800/388-8888; fax 708/860-5618.

HyperScale

HyperCard stack teaches guitar players how to play scales. Guitarist can hear notes seen on fretboard display and relate them to notes on a musical staff. Product shows a full 24-fret fretboard; each note in the selected scale is labeled with either note name or scale degree. Comes with run-time version of HyperCard. 2MB min. memory. \$39.95. Gadden Musical Instruments, 503/

624-9309, 800/582-2297; fax 503/624-9309.

Icon 7

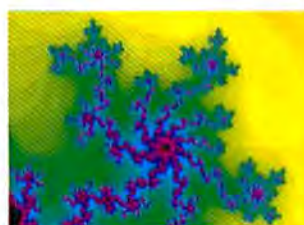
System 7 color icon creator and editor. Includes a 17-tool palette; image rotation; and editing in black and white, 16, and 256 colors. Software allows editing of all eight members of the icon family, and will automatically shrink icons to the small icon format. Requires System 7. 2MB min. memory. \$79.95. Inline Design, 203/435-4995, 800/453-7671; fax 203/435-1091.

InfoLog

The next leg of the paper chase is this document-logging and -tracking system. Users label each document with a serial number, log the document by entering keywords that describe the document, file the document in serial-number order, and then retrieve the document by searching the database by keyword. 2MB min. memory. \$149. Connectix Corp., 415/571-5100, 800/950-5880; fax 415/571-5195.

Kaleidoscope

Who says that science can't look cool? This fractal-art generator features the Mandelbrot set in living color. Users can zoom in on infinite detail, cycle the colors for an illusion of motion, and generate pictures for use as illustrations, clip art, or desktop patterns. 1MB min. memory. \$49. Abbott Systems, 914/747-3116, 800/552-9157; fax 914/747-9115.



Kaleidoscope

KopyKat

This INIT (called an extension under System 7) allows multiple clipboards. After you issue a Kut or Kopy command (commands replace the standard Cut and Copy), product adds a hierarchical submenu of clips to the Paste command. Requires MultiFinder under System 6.0.2 or later. 2.5MB min. memory. \$89. Cra Z Software, 508/521-5262; no fax.

Lido 7

Disk-management utility that allows a user to format and initialize any disk storage device on the Mac. Supports devices from 8-inch hard drives, to removable-cartridge drives, to magneto-optical and floptical mechanisms. Company claims that product allows user to resize partitions without losing data. Features include Defect Management tests and a system INIT or extension that detects and mounts removable-media cartridges. 1MB min. memory. \$95. Surf City Software, 714/289-8543; fax 714/289-1002.

OUR NEW 88MB DRIVE READS AND WRITES YOUR 44s.

MediClip

Dem bones, dem bones, dem dry bones. A series of images of medical anatomy and art: Anatomy Volumes I and II and Medical Art & Instruments Volume I cover all major anatomical systems and organs, as well as the most popularly used art, symbols, and instruments of the medical world. Other volumes to follow. Specify graphics format when ordering. \$99 per volume. Alpha Media, 310/315-3470, 800/736-1567; fax 310/315-1983.



Memorize It

Memorize It

Have trouble remembering the good stuff? Memorize It allows you to create decks of flash cards with text, pictures, and sound. Product ships with decks on topics such as Foreign Language (Spanish, French, and German), Art History, Mathematics, and Chemistry. 1MB min. memory. \$35. Side Eight, 714/952-4114; no fax.

Mpower 701

An interface kit for Kodak Diconix 701 portable ink-jet printer consists of a Mac

printer driver and a serial-to-parallel cable. \$79. Eastman Kodak Company, 716/724-4000; fax 716/724-0663.

Oxyd

Arcade/strategy game stars captive, oxygen-producing Oxyds and the gamer as a heroic marble, determined to save the computer universe. Player must open Oxyds of like patterns or colors sequentially. Obstacles include objects to be moved, puzzles to be solved, and instant destruction by death's-heads and flying rotors. Users can try the first ten levels for the cost of a disk but must purchase a code manual to progress further. 2MB min. memory. 1.44MB disk \$4; code manual \$39. Dongleware Publishing, 617/497-1130, 800/228-6993; fax 617/497-1130.

Pararena 2.0

Futuristic sports-simulation game gives players the choice between playing against the computer or against one other player on a network. Player selects a champion, who glides on a hover board across the surface of a disk trying to bump, push, or knock a ball into a goal or into the other player. 1MB min. memory. \$59.95. Casady & Greene, 408/484-9228, 800/359-4920; fax 408/484-9218.

ParaRisk Administrator

High-end information system for risk managers and claims adjusters. Features claims tracking with up to five organizational levels, payment processing, re-

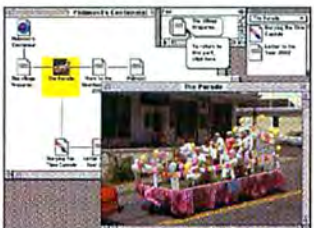
serve tracking, customizable form letters and claimant records, and availability of all data in report or graph format. System displays paper forms for easy navigation; all administrative operations center around an electronic claims folder. Tracker is a scaled-down version for self-insured companies that might not administer claims. Cost includes five days of on-site training. Recommended: 11si or greater with 5MB of RAM, 40MB of free space on hard drive. \$25,000; Tracker version \$15,000. Paradigm Infosystems, 206/486-2956, 800/637-5766; fax 206/486-3173.

PC Rx 2.5

Three-in-one antivirus program scans and removes viruses on DOS, Windows, and Macintosh platforms. 1MB min. memory. \$69. Trend Micro Devices, 310/782-8190, 800/228-5651; fax 310/328-5892.

Philmont Symposium System

Two-part multimedia presentation-creation system. Allows integration of



Philmont Symposium System

QuickTime movies, HyperCard stacks, PICTs, Kodak Photo CDs, and text files. Possible uses: training, electronic publishing, interactive kiosks. Requires System 7. 2MB min. memory. \$75. The Philmont Software Mill, 518/672-4890, 800/527-9199; no fax.

PlayWrite

How tedious is formatting a theatrical script? This package intuitively adjusts scene heads, dialog, and other script elements to meet accepted entertainment-industry standards for margins, spacing, and capitalization. PlayWrite features automatic backup and macros for frequently typed words or phrases. 1MB min. memory. \$245. PlayWrite Systems, 818/304-6808, 800/627-5297; no fax.

Signature Font

Send your signature to SignaFont Designs and get back a PostScript Type 1 and TrueType font containing an electronically rendered version of your John Hancock. First-name signature and/or initials available at an extra charge. Compatible with Adobe Type Manager. 1MB min. memory. \$40. SignaFont Designs, 303/355-9137; fax 303/355-3202.

SkyClock

Consult the stars from the safety of your Macintosh. SkyClock allows you to cast charts in several different astrological formats, including Western Wheel, Bi-Wheel, and Vedic. Real-time horary clock displays the current positions

continues



MACWORLD



"SyquestDrives.

... SyQuest is clearly the best choice [for removable storage] for most users... Widely available from dealers and heavily used by service bureaus, SyQuest drives can be counted on for the long term and are reasonably priced. And with the new generation of SyQuest drives just announced, these strengths should only grow."

—Macworld, November 1992



Over 4 million cartridges sold. Protecting your enormous investment in SyQuest cartridges was the inspiration for our new 88MB drive. It reads and writes to all your 44MB cartridges. So you can move to higher capacity and higher performance and still have complete access to all the hard work you've invested. It's one of a series of products resulting from our on-going development of the 5.25" form factor. With more to come.



Circle 234 on reader service card



Look for this logo when buying removable storage products.

Syquest Technology, 47071 Bayside Parkway, Fremont, CA 94538 1-800-245-2278

SyQuest, SyQuest Technology and the SyQuest Logo are registered trademarks of SyQuest Corporation. Quotes reprinted courtesy of Macworld Communications, 501 Second Street, San Francisco, CA 94107. All other products or names are registered trademarks of their respective companies. © 1993 SyQuest Technology



SyQuest

Removing The Limits Without Compromise.

of the planets, signs, and houses in all chart formats. Supports color. 1MB min. memory. \$89.95. SynEnergy, 415/327-2633, 800/621-2633; fax 415/327-2316.



SkyClock

Snap Mail

Simple, serverless E-mail and messaging. Features include automatic installation, autoconfiguration, and continuous monitoring of the network for other Macs running Snap Mail. No system administrator necessary. Requires AppleTalk network. 1MB min. memory. 5-pack \$200, 10-pack \$320, 50-pack \$1440. Casady & Greene, 408/484-9228, 800/359-4920; fax 408/484-9218.

VisualClips

What good's a new technology if it doesn't generate widgets for the Mac desktop? VisualClips bundles a set of QuickTime movie clips with QuickTime and VideoBee, a control panel that triggers preselected QuickTime clips when certain system events are activated, such as opening or closing a window or ejecting a disk. The VisualClips Starter Kit in-

cludes MoviePlayer for clip editing, a set of clips featuring home video examples, and clips tailored to the VideoBee event list. Star Wars Visual Clips features (amazingly enough) scenes from the movie *Star Wars*. 4MB min. memory. Starter Kit \$69.95, Star Wars \$89.95. Sound Source, Unlimited, 805/494-9996, 800/877-4778; fax 805/495-0016.

Yearn 2 Learn: Peanuts

Say goodbye to invisible grownups and wah-wah talk, because the Peanuts gang is teaching school. Snoopy, Woodstock, and the regular cast of Peanuts characters lead kids through math, U.S. geography, reading, and coloring exercises. There's also a dodge-'em-style arcade game, featuring the World War I Flying Ace in his Sopwith Camel. Requires Quadra, Performa, or II series Mac with 256 colors, and 11MB of hard drive space. 4MB min. memory. \$64.95. Image Smith, 310/325-1429, 800/876-6679; fax 310/539-9784.

Zounds

From the gizmos and gadgets department comes a control panel that creates fantasy sound environments while you work at your Mac. Product comes with several modules, ranging from Aviary to Hard Work and Swamps. Software allows user to set volume and frequency of sounds, and modular design allows users to mix and match sound clips. 1MB min. memory. \$59.99. Digital Eclipse Software, 510/547-6101, 800/289-3374; fax 510/547-6104.

CD ROMS

Facelift Fonts

Make 'em big, make 'em smooth, with Volume One in the Pixel Presenter Series. The product is a collection of antialiased screen fonts. Fonts require a software package that can handle color text. Several typefaces provided, including Silver Bullets, a typeface of bullets, charting symbols, and dingbats. Product includes tutorials on screen and in the manual that show how to colorize characters and add type effects with gradient fills, drop shadows, and texture/pattern fills. \$149. ReMedia, 619/693-1448; no fax.

MacExclusives

Compilation of over 150 Mac shareware and freeware programs, most of which cannot appear on any other CD ROM disc, according to the company. Software is organized with on-disc Librarian, a navigational program containing compatibility reports, descriptions of all programs, and search features. Disc also includes more than 100 commercial demos. 3MB min. memory. \$49. ShareWare Authors, 504/838-0190, 800/879-1150; fax 504/837-0880.

Masterpiece Library

Disc of classic texts including works by Shakespeare, Milton, Hans Christian Andersen, Aesop, Poe, Chaucer, Twain, and Whitman. Also includes religious books, Confucius, and ancient Greek

authors. Indexing system searches by titles, words, and phrases. 2MB min. memory. \$39.95. Pacific HiTech, 801/278-2042, 800/765-8369; fax 801/278-2666.

Pro-100 #1

ISO-9660 format CD ROM contains 24-bit color imagery for use in video, 3-D graphic design, color slides, and print production. Textures include animal skins, marbles, plants, woods, metals, textiles, and others. TIFF, TARGA, PCX, and IFF formats included. \$199.95. Texture City Software, 310/836-9224; fax 213/656-9576.



Pro-100 #1

Svinga

Subtitled "A multimedia journey through Zimbabwe." A HyperCard database containing information on all aspects of Zimbabwe, including flora, fauna, geographical and historical information. Disc includes digitized voices; animal calls; excerpts from historically significant speeches; and 50 copyright-free 32-bit TIFF images for use by schools, travel agents, or desktop publishers. 2MB min.

Portable Power,

NEW

SupraFAXModem 144PB

Designed for PowerBook™ models 100 through 180

- Can wake up PowerBook from sleep mode
- Fax and data transmissions up to 14,400 bps
- Modem-level compression and correction enhance multi-tasking performance
- Low power requirements
- Completely internal
- Includes CCL file required for AppleTalk Remote Access



SupraFAXModem 144PB Plus - \$449.95

This enhanced model will include voice messaging capabilities and software, as well as Flash ROM — allowing remote firmware upgrading & enhancements.



memory. \$149. Advanced Multimedia Company, 914/734-9171, 800/578-4860; fax 914/734-4053.

ACCESSORIES

Cable-Trap

If boardroom mice keep "walking away," this product will lock up to five input-device cables to a computer or work surface. Using exclusive bonding system, heavy-duty metal encasement mounts on desk or computer. \$24.95. Qualtec Data Products, 510/490-8911, 800/628-4413; fax 510/490-8471.

Marathon

Move over, extended-flavor chewing gum, this EP-S toner cartridge means that HP LaserJet II, III, and other Canon SX-based laser printers can go twice as long between cartridge changes. According to the company, the cartridge increases page output up to 8000 pages under standard use. \$125. Action Laser Products, 714/491-1983, 800/289-1983; fax 714/491-0501.

Mouse Shadow

Mick Jagger said, "We all need someone we can lean on." The Mouse Shadow is a cushioned support that helps to keep the wrist straight during mouse use. The user's wrist rests on the pad, which rolls behind the mouse on three geoplast rubberized balls. \$14.99. Shadowtech International, 405/536-7108, 800/392-1402; fax 405/536-6201.



Mouse Shadow

Multi Media Disk Box

Polypropylene plastic boxes hold up to 100 disks or 24 CD ROMs and have dividers of different sizes with tabs that allow users to customize boxes. Lifetime warranty. \$6.95. Curtis Manufacturing, 603/532-4123, 800/955-5544; fax 603/532-4116.

Persona Micro

Lightweight self-powered speakers bring clear, high-fidelity sound to the Macintosh. Magnetically shielded speakers run on either four AA batteries per speaker or a 6-volt power supply. Speakers feature bass and treble boost switches, plus individual volume controls. \$79.95.



Persona Micro

Persona Technologies, 415/871-6000; fax 415/871-6555.

BOOKS AND VIDEOS

The America Online Membership Kit & Tour Guide

Official handbook guides members through electronic-mail features, interactive forums, software files, computing support, online classes, news, stock quotes, and other information on America Online. Includes operating software and ten hours of free sign-on time. Written by Tom Lichty. 406 pages; \$34.95. Ventana Press, 919/942-0220; fax 919/942-1140.

Basics of Designing and Producing Newsletters with PageMaker

From the publishers of *ThePage* comes a book concentrating on the practical aspects of newsletter design. Includes a 16-page step-by-step guide to creating a newsletter prototype, converting the prototype into a template, and creating the first issue. 60 pgs. Written by David Doty. \$15 plus \$3 s/h (\$5 outside U.S.). PageWorks, 312/348-1200; fax 312/404-0717.

The Design Desktop Workbook

Reference guide and do-it-yourself workbook for desktop publishers helps users learn fundamental design, layout, production, and publishing concepts using a desktop publishing environment. In-

cludes over 350 illustrations, checklists, and sample forms, plus a 17-page glossary. Written by Don Busché and Bernice Glenn. 336 pages; \$27.95. Regents/Prentice Hall, 515/284-6751, 800/223-1360; fax 515/284-2607.

Macintosh and You: The Basics

Tutorial introduces Macintosh Finder interface and provides introductions to Works, Excel, PageMaker, Word, MacWrite, and Filemaker Pro. Written by Patricia Sullivan. 324 pages; \$18.95. Franklin, Beedle & Associates, 503/682-7668; fax 503/682-7638.

The Macintosh Multimedia Sourcebook

Lists more than 400 products for use on the Mac when producing or presenting multimedia applications. Listings include software, computer hardware, video and sound equipment and accessories, and CD ROMs and accessories. Edited by Trysh Brown-Freeborg. 72 pages; \$29.95 plus \$3 s/h. TBF Publications, 314/351-1729; fax 314/351-1729. **m**

To have your product considered for inclusion in *New Products*, send an announcement with product name, description, minimum memory, peripherals required, pricing, company name, and phone number to New Products Editor, *Macworld*, 501 Second St., San Francisco, CA 94107. *Macworld* reserves the right to edit all product announcements.

Desktop Dynamo

SupraFAXModem V.32bis

- "Top Honors" *MacUser* 11/92
- ★★★★★ *Macworld* 8/92
- Designed for use with all Macintosh models
- Upgradable to voice processing
- Revolutionary status display
- Compact size



Supra's full family of Macintosh faxmodems comes with everything you need to start communications — from the full-featured FAXstf™ and MicroPhone™ software packages, to the CCL file for ARA. Whether you're looking for portable power or a desktop dynamo, seek Supra! Call 1-800-967-8772 for more information or the name of a dealer near you.



Thinking of Buying Norton Utilities or MacTools? Think again, think... SuperSet

Introducing Datawatch SuperSet Utilities™, five full-featured data recovery, protection and management products packed into one.

Air Tight Disk and File Security

SuperSet lets you restrict access to your data with a powerful set of Citadel security tools. Use passwords to protect certain files or to lock entire hard disks and floppy drives. Datawatch Citadel with Shredder™, a MACWORLD Editors' Choice, includes DES file encryption, and Shredder, which can turn your Trash Can into a secure document shredder. Only SuperSet includes a complete, Editors' Choice security product.



Double-Barreled Data Recovery

Datawatch 911 Utilities™ brings data back from damaged disks or files, and includes an extensive Troubleshooting Guide. 911 recovers files and disks the others can't. Complete Undelete™ lets you quickly and easily recover files deleted from the Trash.



The Original Virus Eliminator

Virex®, a perennial best-seller, detects and repairs files infected by all known viruses. And it prevents future infections, even by unknown viruses. Only SuperSet includes a complete, best-selling anti-virus product.

Super Remote Access and Control

ScreenLink™ lets you control another Mac's screen, keyboard and mouse over a network or via modem. ScreenLink works with both System 6.0.4 and later and System 7. Only SuperSet includes remote access and control capabilities.

Comparison with other Disk Utility Packages					
Product	Standalone Anti-Virus	Remote Access and Control	Disk & File Security	Disk & File Recovery	Undelete Capability
SuperSet	✓	✓	MACWORLD Editors' Choice	✓	✓
Norton Utilities			✓	✓	✓
MacTools	✓		✓	✓	✓

SuperSet costs no more than the others. So, see your favorite retailer for SuperSet today, or call us for your free *SuperSet Overview* at (919) 490-1277 ext. 201.



Datawatch Corporation
Triangle Software Division
PO Box 51489 • Durham, NC 27717
(919) 490-1277 ext. 201 FAX:490-6672
BBS: 419-1602 (8,1,N)

Questions and Tips from Macworld Readers

BY LON POOLE

WOULD YOU LIKE TO SEE text on screen in a larger size than it prints on paper? Don't bother fiddling with Microsoft Word's style sheets as suggested in last November's *Quick Tips*. Several readers suggest using two Word commands, Larger Font Size and Smaller Font Size,

which are somewhat obscure because they are not normally on any menu. You can add them to a Word menu with the Commands command or you can simply use their keyboard equivalents. All you do is select the entire document (press ⌘-A in Word 5 or ⌘-option-M in Word 4) and press ⌘-shift-> to enlarge text to the next larger standard size (for example, from 12-point to 14-point). Press ⌘-shift-> again to increase to the next larger size. When you're ready to print, once more select the entire document and press ⌘-shift-< enough times to bring the text down to the size you want for printing. The advantage of this method, as Jim Noble of McLean, Virginia, points out, is that it affects the entire document at once while maintaining the relative sizes of text throughout the document.

Another method works with Word and many other applications if you print to a LaserWriter or another printer that can reduce documents for printing. Saadya Sternberg of Chicago says the company where she works settled on 12-point Times as its standard, but quickly realized the screen versions were too difficult to read. The solution was to use the more readable 14-point Times, to set the margins and leading of the standard document proportionally higher with the Paragraph command (for example, 1.16 inches or 7 picas instead of 1 inch or 6 picas—the same 116 percent increase as the text size), and to set the Reduce or Enlarge option of the Page Setup command to 86 percent. Text prints at 12-point because 12 is 86 percent of 14, and margins are the correct size because 86 percent of 116 percent is 100 percent (14 is 116 percent of 12). Tab settings, other

paragraph formatting, and graphics must be increased by the same percentage as margins.

Stationery Awareness

Q One of System 7's more useful features is creating stationery (template files) by turning on the Stationery Pad option in a document's Get Info window. When I showed this feature to a co-worker, I expected we would see the dialog box that advises, "You have opened a stationery pad, so a new document will be created." Instead, Word 5 created a new document with the dumb default name "Untitled1." I guess Microsoft considers this an improvement over Word 4. I notice the same difference between Excel 4 and Excel 3. Can I change this behavior so that the dialog box appears before the file is opened? Is there a quicker way of setting the Stationery Pad option?

Bill Ellena
Lisle, Illinois

A According to Apple's guidelines for software developers, applications that know about stationery pads are supposed to do exactly what Word 5 and Excel 4 (and many other applications) do: open an untitled document with the format and contents of the stationery pad. For applications that don't know about stationery pads, such as Word 4, System 7 automatically creates a new document by making a copy of the stationery pad and displaying the dialog box you described. The dialog box contains a place for naming the copy. When you dismiss the dialog box, System 7 has the application open the copy of the stationery pad.

System 7 determines whether an application knows about stationery pads by inspecting a setting in one of the application's resources. You can use a resource-editing program such as Apple's ResEdit (available from APDA, 800/282-2732 in the United States,

800/637-0029 in Canada, 716/871-6555 in other countries) to change this setting so that System 7 handles stationery. Follow these steps:

1. Make a backup copy of the application, and then use ResEdit to open the copy.
2. Open the application's SIZE resource icon, and then open the SIZE resource whose ID is 0. If there is no SIZE 0 resource, open the SIZE -1 resource. (You probably won't find a SIZE 0 resource unless you have previously used the Finder's Get Info command to change the application's memory size.) A window opens showing the various settings in the SIZE resource.
3. Scroll until you see the setting "Stationery aware" and set it to 0 (see "Becoming Unaware"). This setting tells the system software to handle stationery for the application.
4. Quit ResEdit, answering Yes when asked if you want to save changes.
5. Drag the original application out of its folder and drag the modified application into the folder.

If you change your mind later and want the application to handle stationery instead of System 7, change the "Stationery aware" setting from 0 to 1 in step 3. Warning: If an application originally has a "Stationery aware" setting of 0, don't change it to 1. You can't make an application learn how to handle stationery simply by changing this setting; the application must be programmed to handle stationery as well.

Most applications that know about System 7's stationery let you save a document as a stationery pad, short-cutting the Get Info window. In Word 5, for example, you choose Stationery from the Save File as Type pop-up menu in the Save dialog box. You can also make any document a stationery pad with the

continues



*Hacking
Finder 7.1,
deter-
mining RAM
capacities,
and more*



Becoming Unaware Changing the "Stationery aware" setting in an application's SIZE 0 (or SIZE -1) resource makes System 7 handle stationery for that application as it would for an application that has no stationery capability.

shareware utility program Stationer by Robert Gibson (available from online services and from user groups such as BMUG, 510/849-9114).

Elusive PostScript Fonts

The first time I printed a document with my new Mac LC II and HP DeskWriter C, using System 7 and Adobe Type Manager (ATM) 2.0, I was surprised at the poor appearance of Adobe PostScript fonts compared with Apple's TrueType fonts (no accident, I'm sure). The font quality was just fine with my old Mac Plus and HP DeskWriter using System 6.0.7 and ATM 2.0. My Adobe font collection is fairly substantial, so I hesitate to invest in TrueType. Is there a way for me to improve the print quality of the font collection I already have?

*Geoffrey Kind
Richmond, California*

Looking at the sample output you sent with your letter, I would say at least some of your PostScript fonts are in the wrong place. Your version of ATM expects to find them loose in your System Folder. But if you drag PostScript fonts to the System Folder's icon, Finder 7 puts them into a special folder inside the System Folder—the Extensions folder with Systems 7.0 and 7.0.1, or the Fonts folder with System 7.1. If you use the Installer program to update a disk from System 6 to System 7, PostScript fonts are likewise put into the Extensions folder or the Fonts folder (depending on the System version).

ATM 3.0 (the most recent version at this writing) knows to look in the Fonts folder, Extensions folder, or System Folder for PostScript fonts (depending on which system version you're using). Through a special offer sponsored by Apple and Adobe, anyone in the United States or Canada can get the latest version

of ATM plus four Adobe Garamond fonts for \$7.50 by calling 800/521-1976, ext. 4400. For other countries, an International English version (Adobe's term) of ATM is available for \$30 by calling 303/799-4000, ext. 4600.

Until you get an ATM upgrade, you can place your PostScript fonts loose in the System Folder, where your older ATM can find them. Just open your Extensions folder (or Fonts folder, if you have System 7.1) and drag your PostScript fonts into the System Folder window.

Memory Sizes

A DOS user at work, I am learning to use an LC II 4/40. Repeated messages that the computer is out of memory have prompted me to investigate a memory increase. Can I upgrade the LC II to 8MB of RAM? The sources I've consulted, including the LC II manual, Apple's hotline, an Apple dealer, and a Macintosh reseller that advertises in *Macworld*, agree I can upgrade to 6MB or 10MB, but they disagree about 8MB.

*Phil Evans
Austin, Texas*

Decimal Precision

TIP When you use Word's Calculate command (Σ =), the resulting amount matches the precision of the most precise number. For example, $4 + 8 + 16$ yields 28, whereas $4.0 + 8 + 16$ yields 28.0. This is particularly important for calculating dollar amounts and for dividing numbers. For example, $735/60$ rounds to 12, but $735.00/60$ yields 12.25.

*Neil Parker
Summerland, British Columbia*

continues

FINDER HACKS

Effect	Resource Type	ID	Where	Change to
Remove the icon-renaming delay	CODE	11	Offset A34	50C0 (from 5DC0)
Add a %key equivalent for Make Alias	fmnu	1252	Offset 9E	M or any key not used for another Finder command
Add a %key equivalent for Empty Trash	fmnu	1255	Offset 2C	T or any key not used for another Finder command
Add a %key equivalent for Restart	fmnu	1255	Offset 7E	R or any key not used for another Finder command
Change the suffix for a new alias's name	STR#	20500	Item 1	One blank space, or any text up to 31 characters
Change the default name of a new folder	STR#	11250	Item 3	Any text up to 31 characters
Change the sample text displayed when you open a TrueType or fixed-size font	STR#	14516	Item 1	Any text
Disable animated zooming when opening and closing windows	CODE	4	Offset 78	6000 00E6 (from 48E7 1F38)
For a document whose creator application can't be found, specify which application to substitute (for example, TeachText opens text and PICT documents)	fmap	17010	Before the eight 0's at the end of the resource	Insert eight characters for each type of document: the document's four-character type code and the substitute application's four-character creator code

This table lists some of the more interesting modifications you can make to Finder version 7.1 with Apple's resource-editing program, ResEdit. Successfully performing any of these changes gains you membership in the Legion of MacHackers, which entitles you to wear a sweatshirt and dirty sneakers to work (consider additional articles of clothing, depending on local weather and ordinances) and to litter your work space with Styrofoam cups half-filled with week-old coffee.

st about
fect."
printer...all the
need to buy you'll ever
PostScript
"Best of 1992"
"Printer of the year 1992"
"A luxury printer at a bargain basement price."
"A perfect 10 in price."
"Model 95 is just out perfect."
recognition of the personal printer.

—The Washington Times
Sept. 2, 1992

—Home Office Computing
July 1992

—PC/Computing
June 1992

—PC Magazine
January 12, 1993

—PC Magazine
November 24, 1992

—BIS Strategic Decisions
September 1992


—MacUser
September 1992

200
BEST PC PRODUCTS
WINNER



The Silentwriter® Model 95. **Come see what all the noise is about.**

Purchase the \$1749* Silentwriter Model 95 by April 30, 1993, and get a \$250 rebate along with Adobe® PostScript™ Level 2 interpreter, HP® PCL® 5 emulation, PC and Mac® compatibility, 6PPM speed and microfine toner.

Because  is the way you want to go.

NEC

Circle 180 on reader service card

*Manufacturer's suggested retail price.
For information, call 1-800-NEC-INFO (in Canada 1-800-343-4418), or NEC FastFacts™ at 1-800-366-0476, request #SWM95.
Silentwriter is a registered trademark and FastFacts is a trademark of NEC Technologies, Inc. All other trademarks are the property of their respective owners. All quotes are reprinted with permission from the respective publications. © 1993 NEC Technologies, Inc.

"The overall best and fastest set of 2-D CAD tools on the market..."

MacWorld, Jan. '93

We know your technical drafting requirements are complicated...

...But your CAD software doesn't have to be!

PowerDraw™
By Engineered Software
Dedicated to Drafting Solutions Since 1985

Our Users Are Our Best Salespeople!

"We were productive and profitably competitive in three days."

Gene Hammond, Graphic Resource Group

"PowerDraw is the CADD package you use to work, rather than work to use."

Angelo Mattacchione, Prosum Engineering

To place an order or for a brochure, call Engineered Software (919) 299-4843 or fax (919) 852-2067. In Canada call Evox & Assoc. (204) 453-8111.



Circle 12 on reader service card

IF YOU HATE TO WAIT...



ASK US
ABOUT
OUR
NEW
50 MHz
VERSION

Accelerator-Video Board starts at \$549.
Mac SE, Classic, Plus & 512KE Versions.

Stop leaning on your elbows during screen refreshes!

If you're looking for blow-your-hair-back-speed, the ImagePro™ combination accelerator-video board delivers a sizzling 400-2000% blast! Works with most large monitors, including Radius™. Buying your little Mac was a good investment, now you can make it a better one with our ImagePro™ board.

Motorola 68030 processor/optional math co-processor ▼ SIMM sockets for extra memory ▼ Speeds of 16, 25, 33, 40, 50 MHz ▼ 15" & 19" Monitors ▼ 30 day-money-back guarantee ▼ Ask your Dealer about FREE installation

Call 1-800-553-2038 for The One Board Solution

IMAGEPRO

Novy Systems, Inc. • 107 E. Palm Way, Suite 14 • Edgewater, FL 32132 • Tech Support 904-428-0411 • Fax 904-428-0765

Circle 202 on reader service card

HOW TO/QUICK TIPS

Modifying Finder 7.1

TIP Bold Macintosh users who rushed to install System 7.1 have by now found that some of their favorite utilities for modifying the Finder don't work with Finder 7.1. System 7.1 has relocated some pieces of Finder code, which means that old utilities may have trouble finding the code they're trying to modify. For example, one resource that's been moved is the piece of code that controls the delay the Finder creates before letting you edit an icon name you've clicked. If you try to modify that delay with an old utility, you'll be out of luck. But if you're comfortable applying a minor ResEdit hack, you can remove the icon-editing delay in Finder 7.1 without using your old utility.

1. Open the System Folder and press the option key as you drag a copy of the Finder to the desktop. Open this duplicate Finder with ResEdit.

2. Open the Finder's CODE resource icon, then open the CODE resource whose ID is 11. You'll see a window showing the CODE resource's contents.

3. Find hexadecimal 5DC0 at offset A34, and replace it with 50C0.

4. Quit ResEdit, answering Yes when asked if you want to save changes.

5. Drag the original Finder from System Folder to the Trash, and drag the modified Finder from the desktop to the System Folder.

6. Restart the computer. Test your modification by clicking the name of an unlocked icon. The name should be highlighted immediately. When you're satisfied that your new, improved Finder performs satisfactorily, empty the Trash to remove the original unmodified Finder.

You can use similar ResEdit techniques to make other popular modifications to Finder 7.1 (see "Finder Hacks").

If in the future you wish to restore your Finder to its unmodified state, you'll find a pristine copy on the System 7.1 installation disk labeled Install 2.

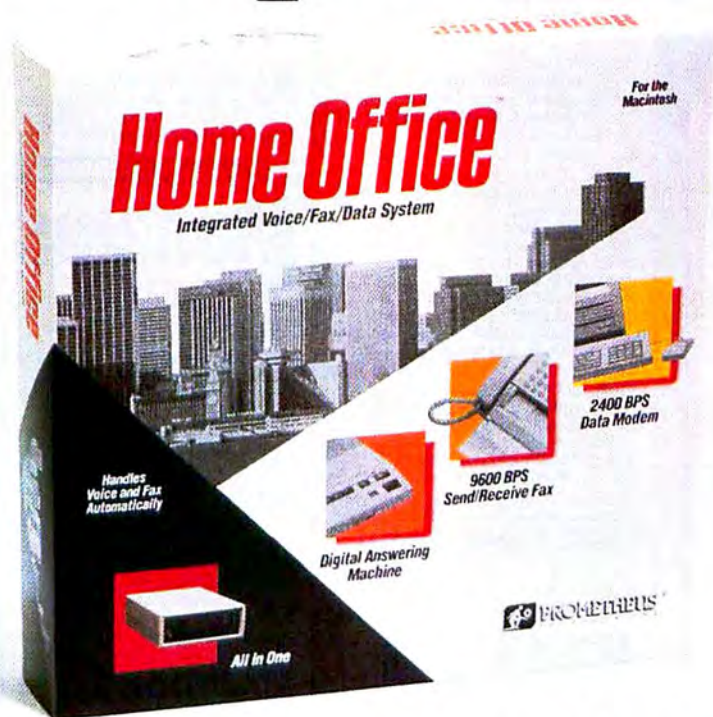
Dan Rhodes
Northborough, Massachusetts

We pay from \$25 to \$100 for tips published here. Send questions or tips on how to use Mac computers, peripherals, or software (by mail or electronically) to Quick Tips, Lon Poole, at the address listed in How to Contact Macworld at the front of the magazine (include your address and phone number). All published submissions become the property of Macworld. Due to the high volume of mail received, we're unable to provide personal responses. **m**

LON POOLE answers readers' questions and selects reader-submitted tips for this monthly column. His latest book is *Macworld Guide to System 7.1* (IDG Books Worldwide, 1992).

INTRODUCTORY OFFER
Ultima Home Office for PowerBook
ONLY \$399*

At Last, A Fax Modem That Speaks Up



Home Office, the modem that handles voice and fax calls automatically.

Now, there's a single solution for small business communications. Home Office for the Macintosh integrates a data modem, a send/receive fax *and* a digital answering machine all on one phone line. For about the price of a fax modem you can have communications power similar to a Fortune 500 company.

Unlike most fax modems, Home Office provides a sophisticated voice messaging system. The 999 password protected mailboxes keep messages

for each caller private and organized. And you can easily change greetings or retrieve messages remotely.

The 9600 bps, Group III fax sends or receives fax communications from anywhere in the world. Plus our MaxFax software, bundled with each product, makes faxing as easy as printing.

With the choice of the powerful V.32bis modem operating at 14.4K or the 2400 bps modem, both the Ultima Home Office and Home

Office know how to perform. Data throughput is up to four times faster with V.42bis data compression and error correction.

Isn't it time your business communications are heard? For more information about Home Office for the Macintosh and Ultima Home Office for the Macintosh or PowerBook*, call 1-800-477-3473.

PROMETHEUS
PRODUCTS • INC.

Providing you reliable communications technology for over a decade.

© Prometheus Products, Inc., 9524 SW Tualatin-Sherwood Rd., Tualatin, OR 97062, (503) 692-9600 All product or brand names are trademarks of their respective companies.

* Introductory offer on Ultima Home Office for PowerBook ends March 31, 1993.

Circle 288 on reader service card

800-998-0093

RIVER

Formerly Maya Computer 2.0

Drives

Hard Disk ToolKit
Personal Edition
FAST!
Improve performance of your drive system

ALL OUR internal drives come with FWB Hard Disk ToolKit PE

Internal Drives

Quantum 2-year warranty (80 drives 1-year warranty)

10414...85 MB ELS Drive	229
10412...127 MB ELS Drive	319
10411...170 MB ELS Drive	349
10412...105 MB Pro Drive	299
10131...240 MB Pro Drive	479
10130...525 MB Pro Drive	1039
10145...700 MB Pro Drive	1215
10141...1225 MB Pro Drive	1649
10148...80 MB Go Drive for PB	339
10134...120 MB Go Drive for PB	459
New Apple Drives (Conner, Quantum, IBM)	
9126...40 MB LPS Drive	179
9139...80 MB LPS Drive	229
Bracket w/cable (specify computer)	10
Bracket w/cable/Quadra	20

Accelerators

Applied Engineering 30 day MBG

6319...TransWarp Classic 16 MHz, w/32K static RAM cache, 4 SIMM sockets	325
4850...FastMath for Classic II	
16 MHz w/ 68882 FPU	109
2464...QuickSilver - 32k cache card/slot extender for Mac IISI	199
4903...TransWarp LC 40 - 40 MHz for LC, w/ 32K static RAM cache 68882 FPU	699
7322...TransWarp CI 50 - 68030, 50 MHz, 68882 FPU, 64K static RAM for IISI	899
8362...QuadraLink, 4 serial ports NuBus	269
DayStar 30 day MBG	
10360...33 MHz Turbo 68040	1439
1667...Univ. PowerCache 40 - 68030, 40 MHz, 68882 FPU, 32K static RAM cache	679
1734...Univ. PowerCache 50 - 50 MHz	899
1613...FastCache 040 - 128K super-fast static RAM for Quadra	277
3584...Dualport IISI - 2 PDS slots, 20 MHz 68882 FPU	165
5561...Equalizer LC - 68030, 16 MHz, optional FPU, virtual memory compatible	185
Radius	
10314...Radius Rocket 25i 25 MHz - 25 MHz, 68040 for NuBus, 8 SIMM Slots	1299
2949...Radius Rocket 25 MHz - 25 MHz, 68040 for NuBus, FPU, 8 SIMM slots	1679
7870...Radius Rocket 33 MHz - 68040, 33 MHz, FPU, 8 SIMM slots	1995

21 MB Floptical Drive

Read & Write:
DSDD/HD DOS
1.44 HD Mac #2864

\$399

PLI
Peripheral Land Incorporated

MDS SyQuest Removable Drives

State of the Art
88 MB 5110c \$649
READS AND WRITES 44 MB CARTRIDGES



Industry Standard
44 MB \$439
Removable

88 MB 5110c SyQuest Drives

10589...w/Norton Utilities	649
10591...w/ Auto Doubler	649
44 MB SyQuest Drives	
5533...44 MB w/ Auto Doubler	439
5532...44 MB w/Norton Utilities	439
5534...88 MB w/ Auto Doubler	539
5535...88 MB w/Norton Utilities	539

All Drives include a cartridge, cables and software.

Practical Peripherals
\$319
PM14400FXMT



LIFETIME WARRANTY

Practical Peripherals -

External 14,400 bps data/14,400 bps fax. Supports V.32bis, V.32, V.42, MNP 2-4, V.42bis, MNP 5. Comes with QuickLink II software, cable and a lifetime warranty.

30 day MBG

11045...PM14400FXMT	319
5434...2400/96 S/R fax w/QuickLink	119
8994...2400, V.42, V.42bis, MNP4-5	125
3089...2400 w/ Smartcom lifetime warr.	139
9849...9600 w/Smartcom lifetime warr.	349
11044...PM9600MT 96/96 s/r fax, V.32bis	269
11043...PM2400FXSA 24/96 s/r fax, V.42bis	169
11046...PM14400FX Pocket 14400 s/r fax	389

Modems

Dove 30 day MBG

6758...DoveFax Desktop	199
5554...DoveFax LAN unlimited User	399
4796...DoveFax LE	149
9634...DoveFax Plus	299
10200...DoveFax Pro 14,400/14,400 voice/fax	499
10199...DoveFax Pro 14,400/14,400	399
Global Village 30 day MBG	
2174...TelePort/Bronze - 24/96 S/48 R fax	197
2175...TelePort/Silver - 96 fax V.42bis	369
2179...TelePort/Gold - 14,400 fax V.42	429
Hayes	
5971...Optima 24 - V.42, V.42bis	145
5970...Optima 96 - V.32, V.42, V.42bis	389
8186...Optima 14,400 - V.42, V.42bis	439
8187...Optima 24 + 96 S/R fax - V.32	159
8168...Optima 96 + 96 S/R fax - V.32	379
7395...Optima 144 + 144 S/R fax - V.32	479
7440...Ultra 24 - V.42, V.42bis	399
7391...Ultra 9600 - V.32	599
1610...Ultra 96 bundle - Smartcom II, Hayes Connect, 9600, V.32, V.42, V.42bis	649
5024...Ultra 14,400 - V.32, V.32bis	669
Logicode Lifetime Warranty	
1774...Quicktel 2400X Platinum	79
1775...Quicktel M1414XV Platinum	299
1776...Quicktel M9624XV Platinum	149
1777...Quicktel M9696XV Platinum	289
Mass Microsystems	
3655...24/96 Fax Modem	144
2280...24/96 Networkable Fax	329
Shiva 30 day MBG	
3443...NetModem 2400	339
6917...NetModem v.32 9600	1039
2004...NetModem/Ethernet (10Base-T)	1475
PSI Integration 30 day MBG	
3143...COMstation One - 24/96 S/R fax	142
3142...COMstation Two - 24/96 V.42bis	247
5340...COMstation Four - 96 fax V.32	359
6965...COMstation Five - 14,400 fax V.32bis	439
Supra	
11246...SupraFax Modem V.32	279
11223...SupraFax Modem V.32bis	339
11247...SupraFax Modem Plus	142
Twincom	
10335...24/96 Commuter	122
10332...14.4 Pro - 14.4/14.4 S/R	329
10337...14.4 Voyager 14.4/96 S/R	362
Zoom Telephonics 30 day MBG	
1168...AMX 2400 - V.22bis, V.22	62
7757...FaxModem AFX - 24, 96S, 4800R	74
3576...FX9624V - 24, 96 S/R fax, V.42, V.42bis	127
4698...VXV.32bis 14,400 - V.42, V.42bis	227
3553...VXF V.32bis 14,400 fax V.42, V.42bis	259

SIMMs

1107...1 MB SIMM low profile	(1) 44
8316...1 MB SIMM 80ns	(2) 78
2199...1 MB SIMM 80ns	(4) 156
4201...1 MB SIMM for IItx	(2) 78
7497...1 MB SIMM for IItx	(4) 156
9437...2 MB SIMM 80ns	(1) 74
7437...4 MB SIMM 80ns	(1) 169
7600...4 MB SIMM 80ns	(4) 579
7599...4 MB SIMM for IItx	(4) 579
5482...16 MB SIMM for 900	(4) 2349
5478...16 MB SIMM for 700	(4) 2199
9422...2 MB RAM PB 160/180	149
9424...4 MB RAM PB 160/180	209
9426...6 MB RAM PB 160/180	289
9427...8 MB RAM PB 160/180	405
9446...10 MB RAM PB 160/180	499
10341...4 MB RAM Duo 210/230	229
10340...8 MB RAM Duo 210/230	447
11151...4 MB RAM MACSM72	(1) 149
11152...8 MB RAM MACSM72	(1) 299
11153...16 MB RAM MACSM72	(1) 589

POWERBOOK MODEMS

Apple

9834...Apple Express Modem for Duo	315
Applied Engineering 30 day MBG	
10854...DataLink Internal 14,400 s/r w/voice	499
Dove 30 day MBG	
5383...DoveFax PowerBook 24/96/48	99
Global Village 30 day MBG	
7730...PowerPort/Bronze Fax Modem	197
7720...PowerPort/Silver V.42bis Fax	369
7710...PowerPort/Gold V.32bis Fax	429
Mass Microsystems	
2220...24/96 Internal Fax Modem	149
PSI 30 day MBG	
5320...PowerModem 24/96 S/48 R fax	155
6961...PowerModem II 24/96 s/r V.42 bis	235
7798...PowerModem III 96/96 s/r V.32	329
7786...PowerModem IV 14,400 s/r fax	429
Supra	
11245...SupraFax Modem V.32bis for PB	279
Twincom	
10334...14.4 PowerTwin internal	299
10333...24/96 PowerTwin internal	125
Zoom Telephonics 30 day MBG	
10737...2400/9600 send fax/4800 receive fax	92

Telecom

CE Software 30 day MBG

8067...QuickMail 10 User	375
DataViz 60 day MBG	
1823...MacLink Plus	129
4842...MacLink Plus Translators	109
Farallon 30 day MBG	
9805...Timbuktu	129
6513...Timbuktu Remote Twin	199
FreeSoft 30 day MBG	
6115...White Knight II	85
Software Ventures 30 day MBG	
1964...Microphone II	139
3455...Microphone Pro	209
1842...Personal Microphone	36
2019...Microphone Pro Go Bundle	499
STF 30 day MBG	
7644...FaxManager Plus	74
7645...Fax STF Net	79



800-998-0093

8:30 am to 8:00 pm
Eastern Time
10:00 to 6:00 Sat.

\$3 OVERNIGHT DELIVERY
For all in stock Hardware and Software

PowerBook Gear

Applied Engineering 30 day MBG	
8500.....PowerBook Charger.....	105
8799.....Auto Adapter.....	67
Asanté	
2555.....10Base-T - PowerBook SCSI.....	279
BTI 30 day MBG	
10390.....PowerBook Starter Kit.....	122
7562.....PowerBook Battery.....	62
Connectix 30 day MBG	
8441.....CPU PowerBook Utilities.....	49
Dayna Communications 30 day MBG	
5396.....DaynaPort SCSI/Link (thin).....	299
5414.....SCSI/Link-3 (thick, thin, 10Base-T)325	
Envisio	
1837.....NoteBook Disp. Adapt w/2 MB.....	699
1835.....NoteBook Disp. Adapt w/4 MB.....	929
7098.....NoteBook Disp. Adapt w/6 MB.....	1099
FWB	
5567.....80 MB PowerBook Int. Drive.....	449
5568.....120 MB PowerBook Int. Drive.....	549
Inlign Design	
10731.....PowerBook Tools Software.....	62
Kensington 60 day MBG	
9585.....Executive PowerBook Case.....	125
1118.....Compact PowerBook Case.....	36
1092.....Deluxe PowerBook Case.....	75
Symantec 30 day MBG	
1199.....Norton Utilities PB.....	67
Sophisticated Circuits 30 day MBG	
7425.....PowerPad.....	79
Targus 30 day MBG	
7370.....Business Traveler.....	199
4341.....Premier Notebook Leather Case.....	139
7369.....NotePac.....	35
1305.....Universal Notebook Case.....	69
E-Machine	
10323.....PowerLink DeskNet 10T.....	609

TMaker Bundle

***139** #7664

WriteNow Workshop

WriteNow 3.0, Reference Software's
Grammatik 2.0 & Correct Quotes,
and the American Heritage
Dictionary from Wordstar.



SuperView Display Expander
Super Mac SuperView is the only color solution for the PowerBook that works with Macintosh displays up to 20", VGA displays, TV monitors, and projection systems. SuperView has a built-in video encoder that lets users display their PowerBook documents or presentations on the standard TV monitors in 8-bit color mode. Only SuperView lets users see their PowerBook documents in 256 colors on displays up to 20" in size.



E-Machines
The PowerLink Presentation dock for the Apple PowerBook Duo connects directly to Mac and SVGA displays, LCD panels and televisions for electronic presentations in the office or on the road. Displays 256 colors at resolutions of 640 x 480 and 832 x 624, and 16 colors at 1024 x 768. Includes port for external diskette drive, ADB and stereo output. Accessories include carrying case, TV cable adapter and VGA adapter.

Software UPGRADES

Proof of Purchase Required. Mail or fax us the first page of your user manual.

4725.....Aldus PageMaker 4.2.....	95
8173.....Microsoft Works 3.0.....	79
3199.....Adobe Premiere 2.0.....	149
5237.....Microsoft Excel 4.0.....	95
6947.....Aldus SuperPaint 3.0.....	65
6943.....Claris Cad 2.0.....	79
9511.....Claris HyperCard 2.1.....	99
2190.....Claris MacProject Pro 1.0.....	99
5259.....T/Maker WriteNow.....	49

DISKS

3297.....Sony 3.5" 800k Disks (10).....	9
6148.....Sony 3.5" 800k Disks (30).....	25
3298.....Sony 3.5" FDHD Disks (10).....	14
6375.....Sony 3.5" FDHD Disks (30).....	39
2214.....Fuji 800k Disks.....	9
2242.....Fuji 800k Disks.....	32
7379.....Fuji FDHD Disks.....	13
2241.....Fuji FDHD Disks.....	59
2243.....Fuji 800k Color Disks (10).....	10
2239.....Fuji FDHD Color Disks (10).....	14

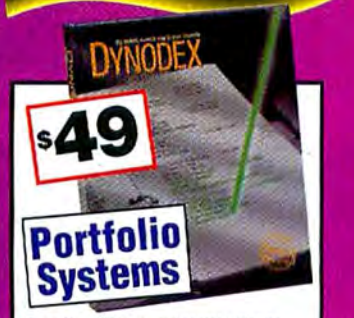
High Density Disks
Fuji 11 Pack \$14
Pre-Formatted #7758



SyQuest Cartridges

44 MB \$61.50 ea.	
When you buy a 10 pack of 44 MB cartridges for \$615	
5912.....44 MB Cartridge.....	65
9728.....44 MB Cartridges.....	615
3603.....88 MB Cartridge.....	99
3600.....88 MB Cartridges.....	950

RIVER



Dynodex
Manage your contact information. Find, mark and sort records according to your own criteria. Keep detailed notes. Synchronize data between two files, and includes a memo feature enabling you to compose, mail merge and print.

Utilities

Aladdin Systems 30 day MBG	
6740.....Stuffit Deluxe.....	65
Berkeley Systems 30 day MBG	
2196.....After Dark & More After Dark.....	39
3392.....Star Trek Screen Saver.....	34
Casa Blanca 30 day MBG	
3225.....Driveshare 5 Pack.....	85
1593.....Drive 7.....	49
Dantz 30 day MBG	
5255.....Retrospect.....	147
7945.....Retrospect Remote.....	264
3393.....DiskFit Pro.....	72
Datawatch 30 day MBG	
2462.....Citadel w/ Shredder.....	62
6978.....MVP Bundle.....	93
4803.....Virex.....	62
Fifth Generation 30 day MBG	
3955.....Suitcase.....	53
7404.....DiskDoubler.....	45
4838.....AutoDoubler.....	58
Insignia	
3229.....SoftAT.....	299
7552.....Rapid Track.....	58
4089.....Universal Soft PC.....	99
10554.....Soft PC Professional.....	195
Now Software 30 day MBG	
1793.....Now Up-To-Date.....	65
6925.....Now Utilities.....	84
Symantec 30 day MBG	
6748.....Norton Utilities For Mac.....	95
5176.....SAM.....	64
5724.....SUM II.....	96

We Sell Macs

Complete Mac systems for every business application.

All with our exclusive:

- One Year Warranty
- \$3 Overnight Shipping
- NEW Hard Drives in all used Macs
- Toll FREE Technical Support

Complete Systems NOW in Stock

Macintosh II, IIcx, IIcx+, IIxi & PowerBooks

Mac II Expandability

8 MB RAM, 80 MB Hard Drive, Apple RGB monitor with 8-bit color card, extended keyboard, DayStar 50 MHz with FPU installed, tested and guaranteed.

***2899**

Mac IIcx Efficiency

8 MB RAM, 80 MB Hard Drive, Apple RGB monitor with 8-bit color card, and extended keyboard, all tested and guaranteed.

***2275**



800-998-0093

RIVER

Formerly Maya Computer 2.0

- \$3.00 Overnight Delivery
- Money Back Guarantees
- Toll FREE Technical Support
- Latest Product Versions Only

A New Expansion Concept So Radical, Nothing Else Stacks Up.



Introducing SmartStack™ from Envisio, the world's first modular SCSI expansion system. Connect up to seven interlocking SCSI SmartModules™ to the SmartSource™ power base to handle even massive storage needs with ease. • Mix and match modules to suit your needs. Choose hard drive modules from 127 MB to over 1 GB, a 128 MB optical, as well as a 2 GB DAT module. ▲ Envisio's award-winning design team has taken the mystery out of expanding your system. Start with the base and a single drive module; when your needs grow, simply snap on another module and you're ready to go. No additional cables to connect, no additional power cords, and no hassles. ■ Do the Smart thing; see your authorized Envisio dealer today for your very own SmartStack.

A EXPANDABILITY

With 10 modules now, and more to come, SmartStack has an unlimited future. The SmartModules will be able to accommodate network interfaces, display adapters, and disc arrays.

B NO CABLE HASSLES

SmartStack's patented connector eliminates SCSI cables between devices with just one SCSI cable and one power cord, even with seven devices connected.

C COOL AND EFFICIENT

The patented cooling system protects your data and your sanity with two whisper-quiet fans. SmartStack's small "footprint" is a perfect complement to any Mac.



E N V I S I O

2640 PATTON ROAD • ST. PAUL MINNESOTA 55113 • TELEPHONE 612 628 6288 FAX 612 633 1083 APPLE LINK:ENVISIO

Attention Hardware Developers!

Developer kits are available to aid in the development of SmartStack-compatible products. Contact Mike Evangelist at Envisio.

Circle 204 on reader service card

Understanding File Formats

BY JIM HEID

REMEMBER THE VIDEOTAPE format wars of a few years ago—Beta versus VHS? You couldn't play one type of tape in the other type of machine, and until Beta finally died, video stores stocked both. Before that, the standards battle was between the 8-track tape and the audio-cassette. Earlier it was long-playing records versus fast-spinning 78s. And in the last century, railroads argued about how far apart the tracks should be. As the industry joke goes, the great thing about standards is that there are so many to choose from.

In the Macintosh world, this lack of standards hits home as you start using more and more application programs and need to move information between them. Maybe you want to include a scanned image in a document you've created with a publishing program. Or you want to move a database file created with Microsoft Works on a PowerBook to your desktop Mac, which is running FileMaker Pro. Or perhaps a client gave you a WordPerfect file, but you use Microsoft Word.

In each of these cases, you need to contend with *file formats*—the way a particular program stores information when you use the Save command. This month, I examine some of the technical issues behind exchanging data with disk files. I also show how to use the file-conversion features many popular programs provide, and I spotlight some programs that convert files from one format to another. "File-Conversion Guide" maps out the basic steps you must take to determine how to get "foreign" files into a format you and your Mac can understand.

The Format of Things

IDEALLY, YOU SHOULD BE ABLE TO USE one program to open another program's documents without thinking about file formats—just as you can play a compact disc using any brand of CD player.

The complex nature of applications makes this ideal world impossible, at least for now. Each category of program works with information in a different way, and each has its own information-storage requirements. A word processor needs to store long strings of text characters as well

as formatting information—fonts and type sizes, headers and footers, page numbers, margins. A spreadsheet program needs to store the numbers and formulas you've entered as well as column-width and text-formatting information. A publishing program must store formatted text and graphics as well as layout-related details such as the location of ruler guides. A database manager must store the data you entered and also the data entry screens and reports you designed.

You can see the common thread here: programs must store not only the text you type and the images you draw, but also the formatting codes necessary to re-create a document's appearance on screen and on the printed page.

A program's own file format is often called its *native* format. For example, Microsoft Word's native files are Word documents, while QuarkXPress's native files are QuarkXPress publications. A non-native file is often called a *foreign* file. To Word, for example, a WordPerfect document is a foreign file. The process of saving a file in a nonnative format is called *exporting*, while bringing data in from a different program is called *importing*.

Many programs are able to open and save files in competing programs' native formats. Among word processors, for example, Microsoft Word 5 can open and save WordPerfect documents, and vice versa. Among spreadsheet programs, Microsoft Excel can open and save Lotus 1-2-3 documents, and vice versa.

But there can be flies in the ointment. A document's formatting can change because one program might not support all the features of the other. Even worse things can happen: for example, if you use WordPerfect to open a Word file saved using Word's fast-save option, WordPerfect crashes. The solution: disable the option using the Open and Save option of Word's Preferences dialog box.

Filters for Files

MORE AND MORE SOFTWARE firms are creating programs

whose file-conversion features can be expanded through the use of conversion *filters*, also called *converters* or *translators*. A filter is a small file that tells a program how to convert a particular type of foreign file. Filters usually reside within a specific folder on your hard drive; when you start a program, it determines which filters are present and then adjusts its Open and Save dialog boxes to reflect those conversion options.

The filter approach has its advantages. You can save hard drive space by deleting unneeded filters or by not installing them to begin with. You can add additional filters as they become available; many developers make new filters available for downloading through online services such as America Online and CompuServe. (For details on downloading software from online services, see "Getting Started with Downloading Freeware and Shareware," *Macworld*, December 1992.)

Just a few of the programs that use conversion filters include Microsoft Word, Aldus PageMaker, QuarkXPress, WordPerfect, T/Maker's WriteNow, and Claris's MacDraw Pro, ClarisWorks, and MacWrite II. The last five programs use a file-translation technology called XTND. Originally developed by Claris and now under Apple's wing, XTND es-

tablishes a standard design for filters, so that any filter designed for XTND can be used with any program that supports XTND. This standardization also makes it possible for companies to sell libraries of file translators that work with any XTND-compatible program. DataViz's MacLink Plus/Translators is one such package, offering over 150 translators.

How to Convert Foreign Files

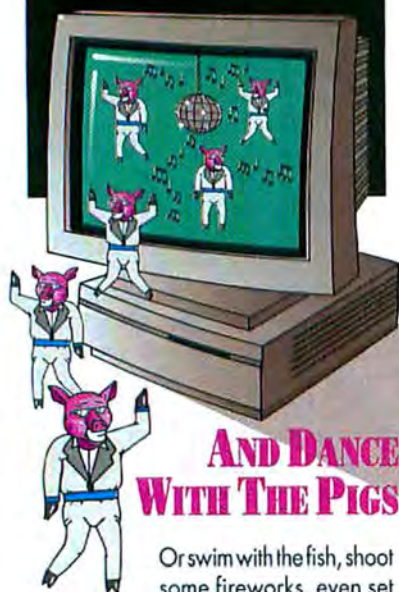
SO HOW DO YOU DETERMINE whether Program A can import Program B's documents? Start by checking Program A's manual—it probably has a chapter or appendix on exchanging files with other programs. If you don't have the

continues



How
to transfer—
and
translate—files
between
programs and
computers

TAKE AN Intermission FROM OTHER SCREEN SAVERS



AND DANCE WITH THE PIGS

Or swim with the fish, shoot some fireworks, even set up your own ant farm. With

55 amazing dazzle-my-eyes screen savers—including three **playable** game screens. Intermission does double duty by preventing monitor burn-in and providing enhanced system security and advanced password protection. You even have the option of importing modules from other screen savers or creating your own. And now, Intermission comes with incredible tickle-my-ears sound! Available for both Macintosh or Windows. Start dancing with the pigs now!



Call ICOM Simulations, Inc. at
1-800-877-4266.

ICOM
ICOM SIMULATIONS, INC.

648 South Wheeling Rd.
Wheeling, IL 60090
(708) 520-4440

**ONLY
\$39.95**

manual or you can't bring yourself to read it, there are two techniques you can try.

- **Drag and drop.** This technique works with System 7 only. Simply drag the document's icon to the icon of the application program. If the program is able to open the document, the program's icon becomes highlighted (see "Opening Foreign Files"). Release the mouse button while the program's icon is highlighted, and the Mac starts or switches to the program, which then automatically opens the document.

- **Use the program's Open command.** Because the Finder doesn't know which import filters you have installed, this technique is more reliable than the previous one. Start the program you want to use to open the document, choose Open from the File menu, and then navigate your way to the folder containing the document. If the program is able to open the document, its name will appear in the Open dialog box. (In many programs, you can narrow down the list of files displayed by choosing the type of file you're looking for from a pop-up menu in the Open dialog box.) When you double-click on the document, you'll probably see a message saying the program is converting a foreign file.

When a program imports a file, that file's contents usually appear in a new, untitled window. If you choose the Save command, you'll need to supply a name for the document. Don't type the same name as the original foreign file unless you really want to replace it. It's better to use a different name, one that reflects the fact that you've converted the file. For instance, if you used Word to open a foreign file named Business Plan, you might name the new file Business Plan/Word.

Desktop publishing programs put a different spin on the import-export routine. In Aldus PageMaker, instead of using the Open command to import a document, you use the Place command. In

QuarkXPress, you use the Get Text or Get Picture command. With both programs, an imported file doesn't appear in a new, untitled window, but in the currently active publication window. Both PageMaker and QuarkXPress include filters for a large variety of file formats—any publishing program must, since one of its chief roles is to allow you to combine text and graphics created in other programs.

Interchange Formats: Common Ground

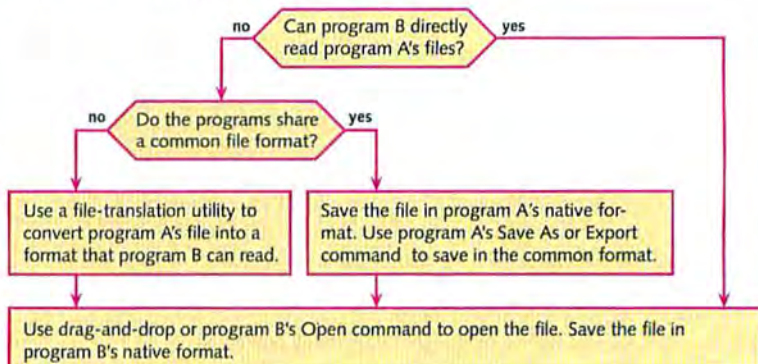
IF ONE PROGRAM CAN'T DIRECTLY READ another program's documents, you need to find a file format that both programs do support. This parcel of common ground is often an *interchange* file format—a file format designed for moving data between programs.

For word processor documents, the best interchange file format is the *rich-text format*, or *RTF*. Developed by Microsoft, this format is supported by Word and a number of other programs, including WriteNow, WordPerfect, and Aldus PageMaker. RTF files retain all text formatting and graphics. The least desirable interchange format is *text-only*, which discards nearly all formatting information.

For spreadsheets and databases, a common interchange format is the *symbolic link*, or *SYLK*, file. If you save a spreadsheet as a SYLK file, you'll lose font, style, and size information, but you will save rudimentary formatting such as column widths and cell alignment. All popular spreadsheet and database programs can open and save SYLK files. You can also exchange databases through text-only files, although you'll lose all formatting. (See last month's *Getting Started* for details on creating text-only files using a database manager.)

For graphics, you can choose from a variety of interchange formats. For bit-
continues

File-Conversion Guide



WE'VE JUST LAPPED CLARIS.®

Canvas™ has never been shy about its reputation for running circles around MacDraw® Pro. But even we are stunned by just how wide the performance gap has grown. Over the last couple years, while the competition's been idling, Canvas has been pouring it on. Winning converts by the thousand. And accumulating a trophy case full of top industry awards, including two MacUser 5-Mice Ratings (no other drawing program's received even one). One look at the feature differences, and you'll understand why. Canvas offers vastly more powerful text handling tools like binding to curves, shape wrapping, full kerning control, and font-to-Bézier conversion. Unrivaled technical drawing features like auto dimensioning, parallel lines and curves, and a SmartMouse™ drawing aid. Plus sophisticated design/illustration capabilities, including object combinations and object blends. Best of all, only Canvas is self-upgrading. Our exclusive Open Architecture allows you to totally customize your work environment — turning existing tools on and off at will, and "plugging in" a steady stream of brand new ones (like our red-hot Design, Imaging, and Utility ToolPAKS™) by simply dragging them into a designated folder. Here's what MacWeek had to say about this feature in their January '93 review of Canvas: "Being able to add more than 40 tools to a program simply by copying files into a folder adds remarkable power to that program. In Canvas' case, it reinforces its position as the best object-oriented drawing program money can buy." So if you're on the fence about which program to buy, or tired of being stuck in low gear with the one you bought, just get ahold of Canvas. And you'll never look back.

**MACDRAW® PRO,
ILLUSTRATOR® AND
FREEHAND™ USERS:
GET AHOOLD OF
CANVAS FOR ONLY
\$149, WHILE YOU
CAN. TRADE UP NOW
BY JUST CALLING
1-305-596-5644.**

(Have your MasterCard, VISA or Amex card number & expiration date ready!) Or mail your original program disk to the address below, along with your credit card information or check drawn in US dollars on a US bank. Offer limited to the US and Canada, and ends June 30, 1993. Offer subject to change without notice.

AGAIN.



CANVAS™

THE HIGH PERFORMANCE DRAWING ENVIRONMENT FROM  SOFTWARE

This entire ad was created and color-separated in Canvas. For more information about Canvas ToolPAKS, call (305) 871th Avenue, Miami, Florida, 33173. ©1993 Deneba Systems, Inc. Canvas™, SmartMouse™, and ToolPAKS™ are trademarks of Deneba Systems, Inc. MacDraw® is a registered trademark of Claris Corporation. Illustrator® is a registered trademark of Adobe Systems, Incorporated. Freehand™ is a trademark of Aldus Corporation.

596-5644 or FAX: (305) 273-9069. Deneba Software, 7400 Southwest Deneba Systems, Inc. MacDraw® is a registered trademark of Claris

Circle 57 on reader service card



MACUSER
MAY '91
MAY '92



MACWEEK
TARGET
AWARD
JAN '92



MACWORLD
MAY '93



MACUSER
APRIL '90
JAN '92



MACWEEK
DIAMOND
AWARD
JAN '93



INFOWORLD
DEC '91



For millions of kids, doors opened when this one did.

When kids walk into a Boys & Girls Club they enter a safe, nurturing environment. One where a trained, professional staff and enriching activities help to instill the knowledge, skills and confidence needed to succeed in life.

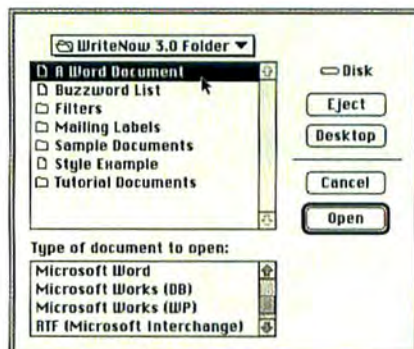
Over the years millions of kids have come through our doors. Your contribution helps assure those doors will continue to offer access to opportunity.

Please open your heart and give generously.



BOYS & GIRLS CLUB

SUPPORT THE CLUB THAT BEATS THE STREETS



Converting from "A Word Document". To cancel conversion hold down the ⌘ key and type period (.).

Opening Foreign Files If you use System 7, one way to open a foreign file is to drag its icon to the icon of the program. When the program's icon highlights (top), release the mouse button. Here, a Word document is being dragged to the icon of T/Maker's WriteNow. A better technique is to start the program and then choose its Open command (middle). When you open a foreign file, most programs display a conversion dialog box similar to this one (bottom).

mapped graphics such as scanned images, you will probably want to use the *tagged-image file format*, or *TIFF*. For object-oriented graphics such as illustrations created with MacDraw, the *PICT* format is a good choice (for color images, use the *PICT2* format). For PostScript illustrations created by programs such as Aldus FreeHand and Adobe Illustrator, use the *encapsulated PostScript*, or *EPS*, format. Each of these formats is supported by major graphics programs as well as desktop publishing software and even many word processors, including Microsoft Word and WordPerfect.

Some programs' native file formats are so widely supported that they can serve as interchange formats. For example, every Mac word processor I know of can open and save MacWrite documents. If you need to transfer files between two programs that can't read each other's files but do support the MacWrite format, you can use this format as a middleman.

Before exporting a document from a given program, first save it in the program's native format—in case you have to edit the original later. To save the document in a foreign format in most programs, you use the Save As command and then choose the desired format from a

continues

MIRROR'S DRIVES ARE FOR A VERY SELECT GROUP...

THOSE WHO NEED MORE STORAGE.



Storage is like money; everyone can use more. Mirror, one of the industry's leading peripheral manufacturers, makes it possible to have lots of storage, even on a tight budget. Whether you are shopping for your first hard drive or looking for a way to easily back up gigabytes of data, Mirror has a storage system for you.

We offer high-performance hard drives from 85 MB to 1 GB, 44 and 88 MB SyQuest removable cartridge drives, 128 MB removable optical drives, a 2 GB DAT drive, and our award winning CD-ROM drive.

All Mirror products are backed by our famous 30-day "love it or return it" guarantee, and lifetime technical support. Plus, for a limited time, every Mirror drive comes with a free copy of *7th Heaven Utilities*, the hot new utility package for System 7 (a \$99 value).

Call today to find out how Mirror can solve your data storage problems.

MIRROR

The Best Thing Next To Your Mac™

MEDIA 1047

STORAGE

DRIVES	INT.	EXT.
85 MB	\$299	\$349
170 MB	\$379	\$429
250 MB	\$499	\$549
540 MB	\$1,049	\$1,099
1.2GB	\$1,699	\$1,749
128 MB Optical		\$1,199
44 MB Syquest		\$429
88 MB Syquest <i>New Version</i>		\$649
2 GB DAT <i>with Retrospect</i>		\$1,499
CD-ROM <i>Multi-session PhotoCD™</i>		\$579
Double-speed CD-ROM <i>New</i>		\$679

7TH HEAVEN FREE!

7th Heaven Utilities make System 7 faster, more flexible and better looking. FinderExpress speeds file copying up to 300%. FileMapper reassigns documents to



*the application of your choice. Chameleon and RedAlert customize the look of your desktop, and the VectorPlasma screen-saver protects your monitor from burn-in. This \$99 package is yours free with any Mirror drive purchase.**

OPTICAL DRIVE

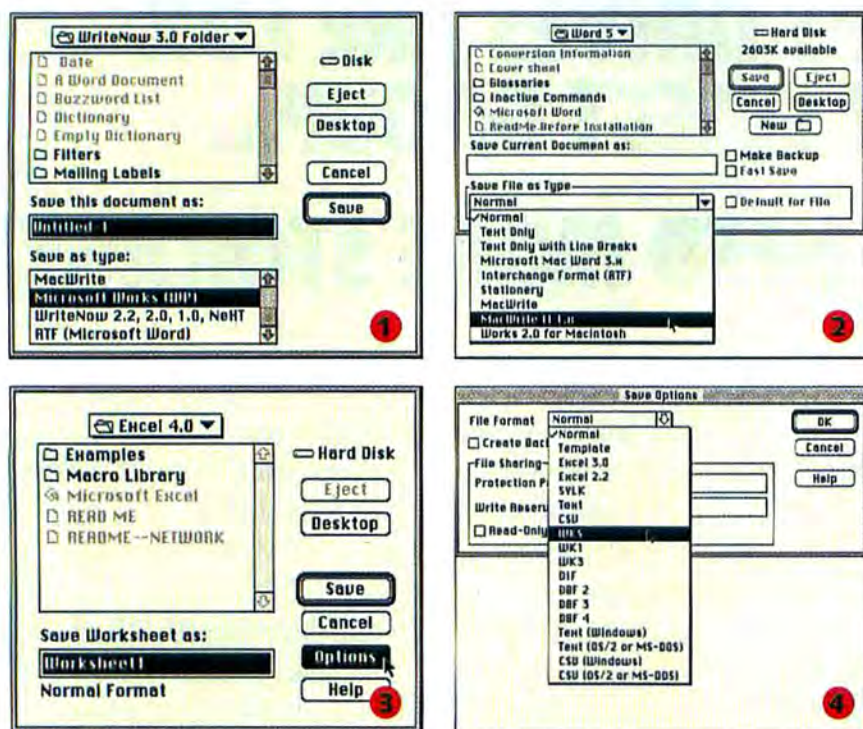
If you need easy access to massive amounts of economical storage, you should check out the Mirror Optical Drive. Store 128 MB of data on a pocket-size removable disc cartridge; it's perfect for service bureaus, graphic departments, or anyone who needs unlimited storage and fast data access. Additional 3 1/2" cartridges are just \$59, that's only about 50¢ per MB!



ORDER DIRECT ANYTIME 1-800-643-0629

*Price includes one cartridge/type. *Limited time offer. Prices are F.O.B. origin. All prices subject to change. Prices are for U.S. orders only; call for international pricing. Technical Support Hotline: 1-612-633-2105 • Telephone: 1-612-633-4430 • FAX: 1-612-633-3136 • Address: 2641 Patton Road, Roseville, MN, USA 55113

Circle 125 on reader service card



Pick a Format The key to saving documents in foreign formats is usually the Save As command. Typically, a program—such as WriteNow (1) or Microsoft Word (2)—lists recognizable file formats in its Save As dialog box. An exception is Microsoft Excel; to select a different format, you must click on the Options button in the Save As dialog box (3) and then choose from the File Format pull-down menu (4) that subsequently appears.

pop-up menu or button list (see “Pick a Format”). Some programs, including Claris FileMaker Pro, provide an Export command instead. Aldus PageMaker and QuarkXPress provide Export commands for exporting text from a publication. You might use their Export commands if you want to create a word processor file containing some or all of a publication’s text.

Translator Utilities: Data Bridges

IF TWO PROGRAMS DON’T SHARE A common file format, there’s still hope—a translation utility such as the MacLink Plus series (Dataviz, 203/268-0030) or DeBabelizer (Equilibrium, 415/332-4343). These programs bridge the gap between disparate programs by enabling you to convert files of one format into

another format. The MacLink Plus series includes MacLink Plus/Translators, that package of XTND filters mentioned earlier; and MacLink Plus/PC, for swapping files between Macs and IBM PCs and their clones. MacLink Plus’s translators support all popular file formats for word processors, spreadsheets, databases, and graphics programs. DeBabelizer handles graphics formats only.

Translation utilities such as MacLink Plus/PC can be especially valuable if the gap you’re bridging is between Macs and PCs. MacLink Plus/PC version 7.02 includes Apple’s PC Exchange extension, which allows you to insert PC disks in a Mac’s floppy drive and work with them as you normally would. PC Exchange requires a SuperDrive floppy drive, which is built into all Macs made after August 1989 (except for the PowerBook 100 and the Duo models, which lack floppy drives). SuperDrive upgrades are available for most older Macs. For more details on Mac-PC file swapping, see “Bridging Two Worlds,” *Macworld*, March 1992.

MacLink Plus/PC also includes Apple’s new Easy Open extension, which helps put an end to those annoying error messages that say a document can’t be opened “because the application program that created it could not be found.” When you double-click on a document that normally couldn’t be opened because its creator is missing, Easy Open steps in and searches for programs and translation utilities that are capable of opening the document, and then lists them for you. Once you select an alternate program, *continues*

From Extensions to Signatures

A Macintosh document contains special codes—collectively called a *signature*—that identify the application in which it was created. The signature allows you to open a document by double-clicking on its icon. When you do, the Mac consults the document’s signature to determine which program to start. If you don’t have that program, a message appears saying the document “could not be opened, because the application program that created it could not be found.”

Application programs also use signatures to narrow down the list of files in their Open dialog boxes. When you choose a program’s Open command, its Open dialog box shows only those documents the program knows how to open. That’s because the program checks the signature of every file, and displays only those files whose signatures—and therefore, whose formats—it recognizes. This often confuses newcomers, who wonder why a document they can see when using the Finder doesn’t show up when they switch to a program and choose the Open command.

A document’s signature has two components: a *creator* code and a *type* code. The creator code identifies the program that created the document; this is the part of the signature the Mac uses when you double-click on a document to open it. The type code identifies what kind of document it is—a Word document, a PageMaker document, and so on. A

program uses the type code to determine which files to display in its Open dialog box.

The type and creator signatures are four-character codes; for example, a Word document has a type code of WDBN and creator code of MSWD. Both codes are stored within a document; you can’t see them by opening the document or by looking at its icon. However, you can examine and even change a document’s type or creator code using a utility such as Apple’s ResEdit. Changing a signature doesn’t change a file’s internal format, but it can still be useful. For instance, if a colleague gives you a TIFF image on a DOS disk, you must change the file’s type code to TIFF before it can appear in a Mac graphics program’s Open dialog box. That’s because a PC file normally has TEXT as its type code—causing most Mac graphics programs to see it as a text-only file rather than a graphics file.

Utilities such as Dataviz’s MacLink Plus, Apple’s PC Exchange, and Dayna’s DOS Mounter give PC files signatures that enable you to open them by double-clicking. They do this by associating a specific Mac signature with a specific PC file extension—a three-character suffix that appears after a PC file’s name. For example, when you double-click on a PC document’s icon whose name ends with DOC—the extension used by the PC version of Microsoft Word—PC Exchange tells the Mac to start Word.

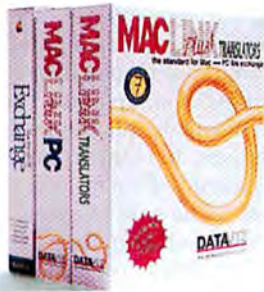


With Apple Products on the Team, MacLinkPlus is the Most Powerful Solution for Mac-PC Data Exchange.

It takes real teamwork to get any job done these days, especially if you're dealing with incompatible Macintosh and PC files. That's why DataViz has teamed up with Apple to add even more utility to MacLinkPlus. It's the most muscle ever assembled to overcome your toughest file translation problems between Macs and PCs.

For years, MacLinkPlus has set the standard for ease of use. And thanks to two new Apple products, what was once easy is now practically effortless. We now include Macintosh PC Exchange[™] and Macintosh[®] Easy Open with every package of MacLinkPlus we ship.

*Now every
MacLinkPlus
includes
Macintosh PC
Exchange
and Macintosh
Easy Open.*



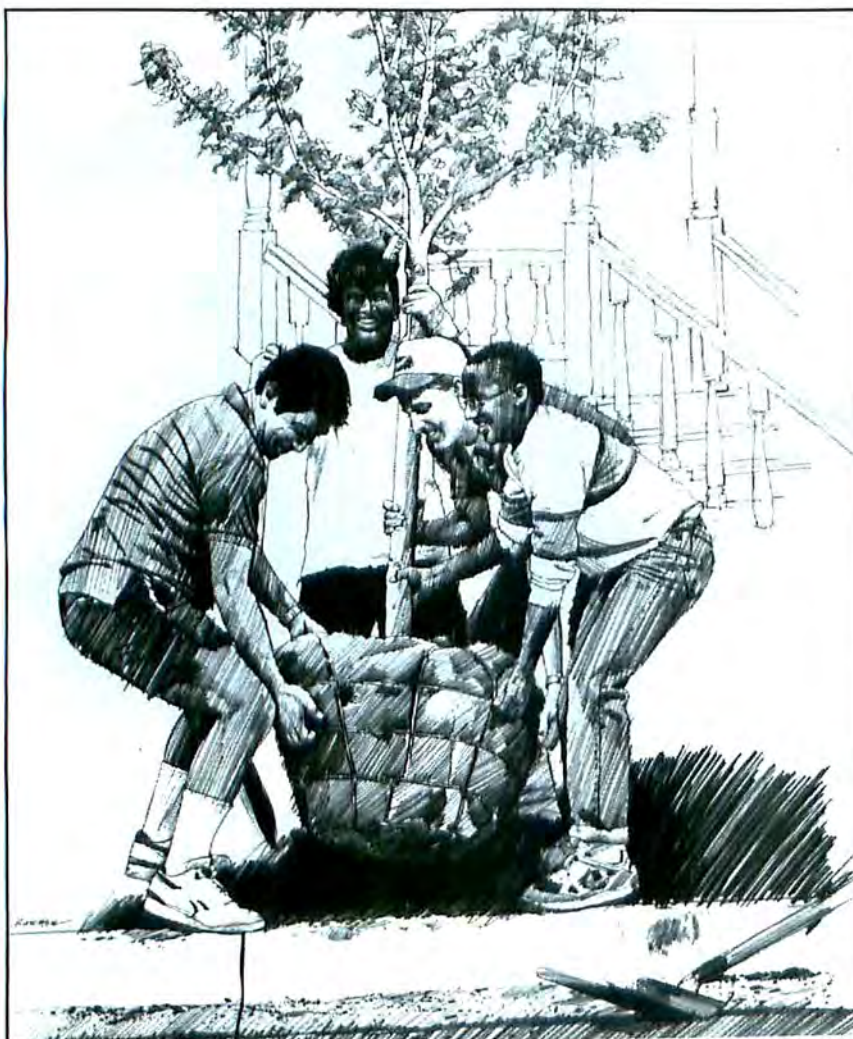
Macintosh PC Exchange makes DOS disks appear on the Mac desktop and shows their contents as Macintosh files and folders. New Macintosh Easy Open is a System 7[™] extension that helps you open Mac or PC files when the application that created them isn't on your Mac. These technologies from Apple teamed with our translators offer the most complete solution to file transfer and translation available in a single package.

MacLinkPlus contains over 700 conversion paths to and from all popular word processing, spreadsheet, database and graphics applications. Files are converted quickly and easily, with all of their original formatting intact.

In addition to providing you with transfer capability, MacLinkPlus also translates files transferred via other methods. Such as disk mounting utilities like DOS Mounter and AccessPC, MS-DOS emulators such as SoftPC, and network software such as NetWare and LANtastic. Let MacLinkPlus do the work of converting foreign files transferred with these products into the exact format you need. MacLinkPlus/Translators contains the full translator library, Macintosh PC Exchange and Macintosh Easy Open. While MacLinkPlus/PC has all of these, it also allows you to connect a Mac and PC with the included serial cable or via modems.

If you're looking for the best in Mac-PC file translation, put MacLinkPlus on your team today. Call 1-800-733-0030, and look forward to some smooth sailing.

DATAVIZ[™]
THE DATABRIDGE SPECIALISTS



Turn A New Leaf

Bringing new life to the old neighborhood is as easy as one, two, tree! With the help of our city forester . . . a little muscle and sweat . . . and a lot of fun, we're bringing a fresh new look to our street by planting trees. Trees add natural beauty and help keep our city cool. They clear the air. And in years to come, they will remind us that we can accomplish great things when we join together.

You can turn a new leaf in your neighborhood, too. Join me and plant a tree. For your free booklet, write: Tree City USA, The National Arbor Day Foundation, Nebraska City, NE 68410.

 **The National
Arbor Day Foundation**

Easy Open converts the document by using that program's built-in translation capabilities or by using a translation utility you've previously installed.

If you use PC media other than 3½-inch floppy disks, investigate Dayna Communications' DaynaFile II (801/531-0060) series of disk drives (which can handle 5¼-inch DOS PC floppies) and DOS Mounter software (which is similar to Apple's PC Exchange but supports a wider array of media, including SyQuest and Bernoulli removable-cartridge drives). DOS Mounter and PC Exchange also help the Mac's Finder determine which program to open when you double-click on a PC file's icon. For a look at how they accomplish this, see "From Extensions to Signatures."

Avoiding Formatting Foibles

WHEN YOU'RE MOVING FILES BETWEEN two computers—whether Macs or DOS PCs—you may encounter formatting problems if both machines don't have the same fonts. If you open a document that uses fonts you don't have on your system, you're likely to see a lot of oddly spaced text in the Courier font.

One solution to this problem is to make sure your Mac contains all the fonts used in the original document. Another solution is to use SuperATM (Adobe, 415/961-4400), a new-and-improved version of the legendary Adobe Type Manager utility, which uses PostScript fonts to let the Mac display smooth-looking text at any point size. SuperATM does this, too, but it also automatically generates substitute fonts whose widths match those of missing ones. The resulting document won't look exactly like the original, but at least its line endings and overall formatting will be the same.

Having to contend with file formats, file signatures, and formatting problems can make exchanging files between programs and computers one of the trickier aspects of computing. The process may eventually become easier—Apple, Adobe Systems, and other firms are working on standardized file formats that promise to bridge the gaps between disparate programs and computers. But until these technologies become available and reliable, your best strategy is to standardize on programs that support one another's file formats. And be sure to keep a file-translation utility handy just in case those standards fail you. **m**

Contributing editor JIM HEID looks at a different aspect of Mac fundamentals each month. He covers System 7 and 7.1 in his latest book, the second edition of *Inside the Apple Macintosh* (Brady, 1992), which he coauthored with Peter Norton.

Hold everything! Iomega introduces sizeable improvements in removable storage.



Bernoulli® MultiDisk™ 150. Handles like a floppy, performs like a hard disk.

- 150MB capacity.
- 18-msec effective access time.
- Rugged Bernoulli Technology.*
- Disks also available in 105, 65, and 35MB capacities.
- Reads/writes 90MB Bernoulli Disks, reads 44MB Disks.



Iomega® 21MB Floptical Drive: A standard floppy drive and a 21MB floppy drive in one.

- Reads/writes 1.4MB floppy diskettes.
- Up to 3 times faster than floppies.
- Holographic Optical Tracking for added reliability & speed.
- New Iomega laser-etched media—every one is a master.

Never-ending storage solutions.

Multimedia, DTP, CAD, graphics, System 7, programming, databases. Today's demanding software needs big storage—removable storage.

At Iomega, our solutions provide you with the ultimate in data management.

Need more storage? Our products never fill up. You simply insert new media.

Want data security? You can lock our disks in a safe, file cabinet or even off-site.

How about transporting data? You can mail it or take it to service bureaus without worry. And our disks are more

convenient than networks for sharing very large documents.

A company you can trust.
Iomega has won more awards than any other removable stor-



age maker. And we've been doing it for nearly 13 years with a 99% satisfaction rate.

**Call 1-800-967-0326 for a
free brochure.**

Pick up the phone. We'll send you all you need to know about our sizeable line of products.

IOMEGA®

*Awards won for products using Bernoulli Technology. ©1993 Iomega Corp. Iomega, the Iomega logo, Bernoulli, and Bernoulli Technology are registered trademarks, and MultiDisk is a trademark of Iomega Corp. Floptical is a registered trademark of INSITE Peripherals, Inc. All other products are trademarks of their holders. For customer service in U.S.A. and Canada, call 1-800-456-5522. In Europe, call 49-761-45040. For worldwide customer service, call 1-801-778-3000. For accessory items, call IOMART at 1-800-723-3770.

Circle 240 on reader service card



Get Flexible. Get Functional. Get Mac Compatible Input Devices From Key Tronic.

...Get The Point.



The Key Tronic TRAKPRO™ keyboard offers all the features of an extended 105-key layout. Plus, you get the power of an integrated trackball that's customizable for ease of use and enhanced productivity.

...Get The Word.



The MACPRO PLUS™ keyboard from Key Tronic offers all the convenience of a 105-key extended keyboard layout. Added to that are the benefits of an enlarged L-shaped return key and a Key Tronic's unique *Hot Key*™ that lets you change key functions quickly and easily. The MACPRO PLUS features high performance switches, double-shot molded keycaps and a solid, durable enclosure.

...Get To The Bottom Line.



The ABACUS™ on-line keypad from Key Tronic is a uniquely functional and dramatically styled keypad that has been designed with calculator functions, F-key functions and a *Send Key*™ that lets you paste calculations directly into your text or spreadsheet.

Get Mac Solutions That Help You Work Better, Faster And Smarter – From Key Tronic.

To get more information about the Key Tronic family of products, get to your phone and call 1-800-262-6006 in the U.S. or 1-800-348-6006 in Canada for the name of the dealer nearest you.



800-262-6006

Key Tronic®
MADE IN THE U.S.A.

BY CARY LU

PowerBook

Notes

Tips for Fast Faxing and Data Transfer on the Road

MODEMS, THE MOST POPULAR POWER-Book hardware accessory, forge a nearly essential link to the outside world. Every modem sold for a PowerBook plays two distinct roles. The data-communications side supports E-mail, file transfers, and remote networking. The fax side turns a distant fax machine into a remote printer.

When you're deciding which data/fax modem to buy for a PowerBook, start with the question "Internal or external?" (If you don't know much about data communications, start with "How to Buy a Modem," *Macworld*, August 1992.)

External modems have the obvious advantage that they can be rotated among other computers—other PowerBooks or desktop Macs, even IBM PCs. Avoid 2400-bps portable external modems that draw power from the serial port (such as those from Hayes and Practical Peripherals). These modems are designed for PC-compatible laptops, which, unlike PowerBooks, supply power through their serial ports. Nearly all 9600-bps and 14.4-Kbps external modems work with PowerBooks because the faster modems have their own power supplies, but be sure to get a hardware handshaking cable. (Before you buy, it's a good idea to double-check that the modem comes with the Mac cables, software, and AppleTalk Remote Access script that you'll need.)

Internal modems fit inside the computer and contain processing circuits that manage the modem with minimal demands on the PowerBook's CPU. The big differences among the non-Apple internal data/fax modems are speed and software. When pressed, modem manufacturers concede that the hardware differences, if any, are minimal.

If you already have a modem for your desktop Mac, get a similar one for your PowerBook. Compatible modems with identical supporting software can share



setup parameters and fax phone number lists, which is a real convenience.

Apple's Express modems for recent PowerBooks retail for lower prices than competing internal modems. The two Express models, one for the PowerBook 160, 165c, and 180 and a second for the Duos (thus far the only modem that fits inside this PowerBook), have a simplified design that relies on the PowerBook's CPU to manage transmissions.

If you happen onto older equipment, keep in mind that although most recently made fax modems receive and send faxes, not all early models can. For instance, the original Apple Data/Fax modem (2400-bps-data/9600-bps-fax) can't receive faxes.

Foreign Travel

MODEM MODULATION SCHEMES (FOR 2400 bps and up) and the tone-dialing codes are international, but pulse dialing and call-progress detection—dial tones, ringing, busy signals—vary from country

to country (sometimes small adjustments to the signal level will improve the connection). And many countries have intricate regulations for equipment attached to a telephone line.

There are three ways to deal with modem operation in foreign countries.

- Use a modem designed for operation in North America. You may run into some operational glitches, but the modem should work most of the time. (One exception is Apple's original PowerBook fax modem, which can cause problems for users in Japan.) You'll definitely violate telecommunications regulations in many countries; you may not care.

- Get a modem designed for international operation. Several companies, such as Global Village and PSI, make PowerBook modems with non-volatile RAM that stores configuration parameters for several countries that you can select through software. The international model may be distinct from a North American version, although modem makers are moving toward worldwide models. This strategy solves many operational glitches but doesn't necessarily meet regulatory requirements. Some countries are so restrictive as to prohibit software-reconfigurable modems.

With these two alternatives, you will need a cable adapter for many countries. Teleadapt in Great Britain (29A Bridge St., Pinner, Middlesex HA5 3HR, England; 44(0)81 429 0479, fax 44(0)81 868 1697) offers 35 cable adapters for about £15 each. A kit of 10 adapters for European Community countries costs £100.

- Get an Apple modem. To create a modem that meets all countries' regulations, Apple plans to split the international version of its Express modem into two parts: a board that goes inside the PowerBook plus a small external hard-

continues

IT MAKES WORKING WITH YOUR HOST A COLLABORATION. NOT A COMPROMISE.

When it comes to friendliness and ease of use, a mainframe is the antithesis of a Macintosh®. But with IRMA™ WorkStation for Macintosh, your Mac® can become a full partner with your host, creating a powerful synergistic collaboration.



It runs with NetWare

IWM now supports NetWare for SAA.

IRMA WorkStation for Macintosh now adds NetWare for SAA® and TN3270 over TCP/IP support to an

already impressive list of connectivity options. It includes productivity enhancers like KeyStroke Macros, to automate common tasks; QuickPad™ and QuickHit™ for point-and-click navigation of host applications; and QuickPoints™ to simultaneously resize

PF1 Process o
PF2 Open the r
PF3 Search fo

QuickHit lets you execute PF keys with a click.

QuickPad, QuickHit and QuickPoint productivity enhancers, multiple sessions, APA graphics and full System 7 support are just a few of IWM's strengths.

screen and fonts.

The recent merger with Avatar® has further strengthened DCA's commitment to the Mac marketplace. And now, our combined resources are focused on advancing the most comprehensive suite of Mac connectivity products

ever. In fact, we offer the only complete line of Mac-to-host software and token-ring and coax hardware. As well as the only family of micro-



to-host solutions for Mac, DOS, Windows™ and OS/2®.

Until June 30, you can trade up to IWM from an earlier version—or any competitive product—for only \$95 through the DCAdvanTage™ Program. (The price can be even less, when you buy MultiPaks of 10, 50 or 100.) You can also call

IRMA WORKSTATION FOR MACINTOSH

HOST CONNECTION:
CUT, DFT, 802.2,
TN3270 over TCP/IP.

GATEWAY CLIENT SUPPORT: NetWare for SAA, IRMALAN™/EP, DCA/Microsoft® Select™ Comm Server,** DEC GAI*** IBM® OS/2 EE and PC3270.

FILE TRANSFER:
DCA® FT/Express™
IRMALINK® FT/TSO
and FT/CMS, IBM
IND\$FILE.

API SUPPORT:
HLLAPI, Application
Development Tool Kit.

for free demo disks and our new Mac Enterprise Connectivity Guide.

So stop compromising. Call 1-800-348-3221, ext. 40G*, and become part of a powerful collaboration.

THE FREEDOM
TO COMMUNICATE.

DCA

SEE US AT COMDEX BOOTH #6348.

*Or call (404) 475-8380 if outside the U.S. and Canada. Offer available in U.S. and Canada only, through 6/30/93. © 1993 Digital Communications Associates, Inc. All rights reserved. DCA and IRMALINK are registered trademarks and IRMA, DCAdvanTage, QuickPad, QuickHit, QuickPoint, FT/Express, IRMALAN and Select are trademarks of Digital Communications Associates, Inc. Windows is a trademark of Microsoft Corporation. All other trademarks are property of their owners. **Coming soon. ***With Avatar's MacMainFrame.

ware add-on called a DAA (Data Access Arrangement). About the size of a pack of gum, the DAA will connect the PowerBook and the phone line. Apple plans to produce different DAAs for about 15 countries. According to Apple, you won't be able to get a set of DAAs before a trip; you'll have to buy one locally in each country. DAA pricing wasn't set at the time of this writing but was expected to be under \$100 each. The DAAs will be compatible only with the international Apple Express modem, not with the Express modem sold for use in North America, and Apple has not yet decided whether to make a North American DAA. Thus an international traveler might have to swap modems when traveling to and from North America, besides having to collect the necessary DAAs for other countries. This is a mess, but so are international telecommunications regulations.

Getting Up to Speed

ONCE YOU KNOW WHETHER YOU NEED an internal, external, or Apple Express modem, the big question is what speed. The simple answer is buy the fastest modem you can afford.

On the fax side, 9600 bps is fast enough because there are very few fax machines out there that can receive any faster than that. Some data/fax modems, including APS's budget model, send at 9600 bps but receive at 4800 bps. If you prefer to receive faxes by modem only as a last resort because they're hard to read on screen, that wouldn't be much of a disadvantage. If you mostly need fax, an internal 2400-bps-data/9600-bps-fax model should do fine, and prices start at only \$69 (from APS Technologies, 816/373-5800, 800/235-2752).

For heavy data use, though, buy a modem that handles data transfer at 14.4 Kbps; such modems cost only about \$60 more than the ones with a top data speed of 9600 bps. If you ever use AppleTalk Remote Access (ARA) to dial into an AppleTalk network through phone lines, it's worth spending the extra dollars. A low-cost modem that exchanges data at 2400 bps suffices for tasks like picking up E-mail and linking to online services, but the additional time and telephone charges you run up with a slow modem offset any initial savings.

Watch out for one common, misleading marketing practice. Some modem makers claim that their 2400-bps modems operate at 9600 bps (or that their 14.4-Kbps modems operate at 57.6 Kbps), a four-times speed improvement that the modems can *theoretically* achieve through

V.42bis data compression. Practically, though, this compression usually only doubles the speed. So if the price of a "9600-bps" modem seems too good to be true, it's probably a 2400-bps modem using compression.

Piling On the Extras

BEYOND THE HARDWARE SPECS, LOOK at the companion software and any special features. The basic fax software that comes with most data/fax modems is just that: basic. It's incredible that I couldn't find one package that could do something as simple as accessing a fax number from a FileMaker database and then sending a message. Maybe next year. PostScript fax software, which sends a crisp PostScript image to compatible fax machines (and a standard fax to others) is unlikely to be available soon for individual fax modems.

On the other hand, you'll soon be able to buy modems, such as the \$349.95 SupraFAXModem 144PB from Supra Corporation (503/967-2400), that offer Caller ID decoding. If Caller ID is offered in your area, the phone number of a caller appears on screen every time you receive a call. In a modem, Caller ID could trigger a database search and display of the name of the calling party. Such a feature might also help limit modem access to authorized parties.

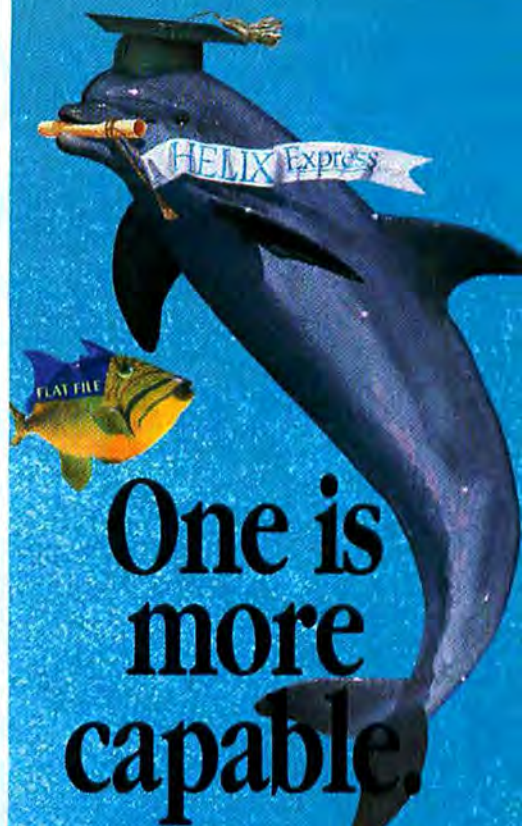
Applied Engineering (214/241-6060, 800/554-6227) has shipped the first PowerBook modem with voice processing, the \$525 DataLink PB. This modem and the \$399 Ultima Home Office modem announced by Prometheus Products (503/692-9600) can digitize telephone conversations for storage on a PowerBook's hard drive. They can act as answering machines while you travel so you can get messages in your hotel room, for example. (But would you leave a PowerBook unattended in a hotel room?)

The DataLink PB goes further than the Ultima by turning the PowerBook into a speakerphone, using the PowerBook's built-in speaker and Apple's microphone (built-in or external). The DataLink makes a pretty good speakerphone, especially if you hold an external microphone close to your mouth. Unfortunately, the DataLink PB is unusually difficult to install; it requires soldering to the system board.

Hitting the Road

ANY MODEM CAN BE CONNECTED TO a cellular phone that has a data port, using

continues



One is more capable.

Compared to FileMaker® Pro, Helix Express is the more intelligent choice. There are oceans of differences between a flat file database (like FileMaker, for example) and Helix Express. A flat file program can handle basic business needs. But a relational database program like Helix Express has more depth, and the capability to grow as your needs grow.

Helix Express: the complete database solution for Mac users of all sizes. It's more flexible, more expandable, more adaptable, and more capable than other database programs. And because it's a multi-user program, its capabilities can keep pace with your needs, from basic to complex. Helix Express can be used to design dozens of applications needed in every business:

- accounting
- contact management
- list management
- order entry
- invoicing
- proposal management
- inventory control
- prepress production
- time & billing
- asset management
- mailing list control
- project management
- document routing and distribution
- document storage and retrieval
- document version control
- workgroup publishing production
- and much more!

More capability. Greater value. Helix Express. Call us today!

1-800-36-HELIX

708-205-1669 FAX: 708-291-7091

HELIX TECHNOLOGIES

4100 COMMERCIAL AVE. NORTHBROOK, ILL. 60062

Circle 315 on reader service card

Until Now PostScript® Language Printing and Portability had Nothing in Common.



MOBILEWriterPS™... the real printer for PowerBooks®

At last! A printer designed to truly match the power and portability of your Macintosh® PowerBook. Now there are no compromises, on what you print, or where you can print it.

- **Built-in Microsoft® PostScript Language Interpreter** - 35 standard PostScript compatible fonts, plus TrueType® and Adobe Type 1 support.
- **AppleTalk® Connectivity**
LaserWriter® IINT
Compatible - "plug and play" just select LaserWriter in the chooser ... works with LocalTalk® networks.
- **6 Pages Per Minute** - up to five times faster than portable ink jet or thermal fusion printers.



- **Laser Quality and Performance** - Thermal Transfer Page Imaging produces crisp 300 dpi on plain papers and transparencies; 16 mhz. processor; 2MB memory.
- **Built-in Sheetfeeder** - folds out to hold 80 pages - letter, legal, A4 sizes.
- **Battery/AC Desktop Operation** - permanent ni-cad battery, 150 pages/charge, print while charging from AC.
- **Multi-Platform Support** - Parallel I/O and HP® PCL 4 also included for MS-DOS/Windows® users.
- **Compact Size & Weight** - same size as a closed Powerbook, weighs about 8 lbs.

The MOBILEWriterPS ... what a LaserWriter would be, if only you could take it with you ... and for a lot less money! For the dealer nearest you, just call:



**The Only Portable Printer with
PostScript Language Compatibility and
AppleTalk Connectivity ... Built in!**

All listed trademarks are trademarks or registered trademarks of their respective manufacturers. Printout shown is a sample file from Quark XPress® 3.0.

1-800-843-1347 Ext: 1010

**MANNESMANN
TALLY®**

Mannesmann Tally Corporation
Kent, Washington

The Top 16 Modem Tricks

1. Make sure that the Apple Communications Toolbox extensions (such as Apple Modem Tool and Apple Serial Tool) that come with your communications software are up-to-date (version 1.1.1 at this writing), because earlier versions don't work as reliably. Obtain updates from AppleLink (in the Software Sampler) or through Apple Customer Assistance at 800/776-2333.
2. Whenever possible use the Zmodem protocol, which is much more efficient than the Xmodem protocol designed in 1977 for local phone links at 1200 bps. Like all such protocols, Zmodem must be installed on both ends of the link. If your communications program doesn't have Zmodem, there's a Zmodem protocol in the File Transfer Tool Bundle, \$69.95 from Sequest Software (503/531-0252), that works with any program that uses the Apple Communications Toolbox; the bundle also supports Ymodem and Kermit.
3. Some modems don't allow enough time to negotiate speed, error correction, and data compression when attempting to connect with the modem at the other end of the line—instead they drop the line. Sometimes you can fix matters by turning off error correction at your end. (For the Apple PowerBook modem, insert `&Q0`—ampersand, letter Q, number zero—in the modem string; `AT&Q0TD`).
4. Apple's Data/Fax modem can't send a break signal, so if you connect to a host computer that requires one, try a different modem.
5. PowerBooks won't go to sleep if an internal modem is set for autoanswer.
6. To save battery power, always turn off modems and close communications programs when they aren't in use.
7. Some office phone systems produce dial tones the modem can't recognize. If that's the case, the modem won't dial. Try putting in a comma as the first character of a phone number; the comma is treated as a pause and some software will dial everything after the comma whether there's a dial tone or not.
8. If you have an internal modem and connect some other device to the modem serial port, keep in mind that operating the internal modem deactivates the modem port—you can't run the other device at the same time.
9. When you use an external modem, select External Modem in the PowerBook control panel. If you have a PowerBook 100, connect an external modem to the Printer serial port and deactivate AppleTalk in the Chooser.
10. Fax modems fail to connect to about 5 percent of standard Group III fax machines. If you notice trouble with a machine, record the brand and model number and the type of trouble. Sometimes the fax modem company offers software or ROM fixes that let you connect with nonstandard fax machines.
11. Make sure your hard drive is up and running before you fax; otherwise the machine on the other end might get tired of waiting and hang up.
12. To save time and money, choose the lower fax resolution (called *standard*, or *faster*) whenever the image quality doesn't matter. Also avoid faxing images that use patterns of alternating black and white pixels to simulate gray areas—they confound the automatic fax compression and thus slow down transmission.
13. For the fastest fax transmission with brief messages, shorten the page length in your application's page setup menu. But don't make it so short that it gets lost in the fax basket at the receiving end on fax machines that use rolls of paper—the majority of machines.
14. Skip the fax cover sheet and instead put a bold header on the first page to identify sender and recipient.
15. If you don't have time to wait for a busy fax line to clear, you can send text-only faxes through an electronic-mail service such as MCI Mail, which can inexpensively make multiple attempts to deliver. Or send it to a fax-forwarding service (like the ones offered by many phone companies). If your desktop computer and modem are equipped with new DTMF (dial tone multifrequency) software, which lets you dial in and issue commands with telephone tones, you can send the fax to your desk and have it relayed from there.
16. Remember that you can't edit the faxes you receive. Some companies bundle OCR software with their fax modems, but OCR isn't perfectly reliable. If the document you want is a computer file to start with, you're better off having it sent as a data file so you won't have to rekey and proofread.

continues



One is more powerful.

Helix Express puts some muscle into helping you solve everyday business problems. Would you like to manage your sales orders, customers, inventory, purchasing, and accounting needs with an integrated single- or multi-user solution?

A flat file program is a limited tool for meeting your complex business needs. Helix Express is the champ! It can outmatch any other Mac database program. It's easy to learn and use because it's icon-oriented; you don't need to know programming codes.

Helix Express is the only proven multi-user database based on client-server technology available for the Mac. It outperforms other database programs because it lets you:

- store and retrieve data, pictures, and documents
- create customized windows with radio buttons, checkboxes & pop-up windows
- create individual menus with automated macro capabilities
- set up password protection for selected activities in single- and multi-user modes
- "sub-launch" documents in their native applications without returning to the desktop

More power. Greater value. Helix Express. Call us today!

1-800-36-HELIX

708-205-1669 FAX: 708-291-7091

HELIX TECHNOLOGIES

4100 COMMERCIAL AVE. NORTHBROOK, ILL. 60062

Circle 131 on reader service card



Brilliantly sharp landscape
color for PowerBook 160,
180 & Duos with Duo Dock
& Duo MiniDock.
Mac LC, LC II, IIsi, IIfx,
IIfx, IIfx & Quadras.



COLORMAX 15™

Cost-effective grayscale
portrait for PowerBook 160,
180 & Duos with Duo Dock
& Duo MiniDock.
Available in platinum for
Mac IIsi, IIfx & Quadras.



PAGEVIEW GS™

Accelerated SCSI
monochrome portrait for
PowerBook 100, 140,
145 & 170 computers.
Available in platinum for
Mac SE, SE/30, Classic,
Classic II, Plus & Portable.



POWER PORTRAIT™

THE VIEW IS BETTER FROM HERE.

As convenient as a PowerBook is on the go, the screen just isn't large enough when you're back on your desktop. To be more productive, you need to see a full page of work and more of your spreadsheet. Sigma Designs provides a complete line of 15" desktop displays designed especially for use with PowerBooks to provide more viewing area and minimize scrolling. We offer color, grayscale or monochrome models, each with its own set of unique features like multiple resolutions, built-in QuickDraw acceleration, or virtual desktop. These displays are even granite-colored to match your PowerBook. Naturally, all Sigma Designs displays meet the latest SWEDAC* guidelines for reduced VLF/ELF magnetic field emissions (MPR II). So take advantage of larger views on a Sigma Designs 15" display because seeing more means working better.



1-800-845-8086 Ext. 230

© 1992 Sigma Designs, Inc. ColorMax, PageView and Power Portrait are trademarks of Sigma Designs, Inc. All other product or brand names are property of their respective holders.

*Swedish Board for Technical Accreditation, formerly Swedish National Board for Testing and Measurement

47960 Bayside Parkway, Fremont, CA 94538 USA, Tel: (510) 770-9169 Fax: (510) 770-2640

Circle 176 on reader service card

a hardware interface box such as Axccl from Applied Engineering. The Axccl box connects the modem and specific cellular phone models that can accept an external signal; the price is \$299 to \$399, depending on the phone model. The sometimes erratic performance of cellular calls makes error correction essential. The standard V.42 error protocol works, but a protocol (such as MNP 10) designed specifically for radio links works best. Applied Engineering's DataLink PB is the first PowerBook modem to include MNP 10. Like other protocols, MNP 10 must operate at both ends of the link, but very few desktop modems now include it.

Plugging In

ALL THE MODEMS DESCRIBED THUS FAR connect electrically to the phone line through the RJ-11 modular phone jack that's a standard throughout North America. For an older, four-prong jack, use an adapter (Radio Shack #279-351). If the phone has no jack and you know what you're doing, you can disassemble either the phone or the wall box and connect directly to the phone-line wire pair, generally red and green wires. The Radio Shack #279-391 cable has spade lugs at one end (cut off the black and yellow wires) and a male RJ-11 plug at the other; use an RJ-11 coupler (Radio Shack #279-358) to get a standard female RJ-11 jack. Please don't get into the wiring unless you're experienced. You can damage equipment easily. Phone lines can

produce a shock, although they are not as dangerous as power lines. And if the phone equipment isn't yours, respect the owner's wishes about disassembly.

If you are dealing with a PBX system that will not accept a modem connection directly, you may be able to connect at the handset plug with the \$149 Konexx coupler from Unlimited Systems (619/277-3300). It will work with many digital PBX systems, although you might have to dial manually, and autoanswering often won't work. If you don't have a Konexx coupler, connect to the fax phone lines.

If you can't get at the wires, you can use an acoustic modem, which has a small speaker and microphone to fasten to the handset. Handsets in old telephones may need some shaking or repositioning to work. With luck, a \$149 Unlimited acoustic coupler can achieve 9600 bps. Unlimited also offers a complete \$290 portable acoustic modem that runs on a 9-volt battery (2400 bps for data, 9600 bps for fax).

When you make hotel reservations, look for hotels with free local calling and fair long-distance charges. Also ask whether rooms have plug-in phone jacks or second lines so you can talk on the phone while your modem transmits. Who knows—if enough of us ask, we might more often see the electronic accommodations we need along with basic hotel furnishings. **m**

CARY LU got his first Mac in the summer of 1983. He is the author of *The Apple Macintosh Book* (Microsoft Press, 1992).

More on Hidden Storage

In my *PowerBook Notes* column of February 1993, I explained how to unlock the hidden storage of Macintosh hard drives by changing the partition size. Here are some additional cautions:

- If your PowerBook has an Apple 120MB drive, do not change its partition size because you'll risk corrupting the System Folder. If you have already repartitioned such a drive, back it up and reinitialize it with Apple HD SC Setup to restore the default partition.
- Always back up a hard drive, and make sure the backup files are functional, before partitioning or making other major adjustments to the drive, because repartitioning often wipes the hard drive clean, destroying all the data.
- If the size of your hard drive remains the same or gets smaller after repartitioning, it's probably due to a mistake. Try again, scrupulously following the instructions in the February column. Don't reinitialize after a partition change.

Finally, I apologize to anyone who ran into difficulty trying to follow my instructions. Many users and Apple engineers confirm that the procedure is appropriate, except in the case of the PowerBook 120MB drive. Contrary to some rumors, the hidden storage is not set aside to fill in if other parts of the drive develop defects; it is simply unused space. Users should keep in mind the time that may be needed to restore files in deciding whether to use this procedure.



One is all you need.

Helix Express is a real treasure for businesses of all sizes. If a flat file database is all you need now, Helix Express is still the logical solution. Because as your business grows, you can use the relational capabilities of Helix Express to grow with you. Track customers now, produce invoices later...and when you're ready, control inventory and receivables on a single- or multi-user basis.

It's easy to use. You can dive right in...no need to learn programming codes. You can use Helix Express right out of the box with our family of Ready-to-Go solutions. What's more important is that it includes document management features not available anywhere else. Helix Express's power, flexibility, and multi-user capability ensure that your business won't outgrow it. What else could you & your crew ask for?

**More capability. More power.
Greater value. Helix Express.**



1-800-36-HELIX

708-205-1669 FAX: 708-291-7091

HELIX TECHNOLOGIES
4100 COMMERCIAL AVE. NORTHBROOK, ILL. 60062

Now
Available!

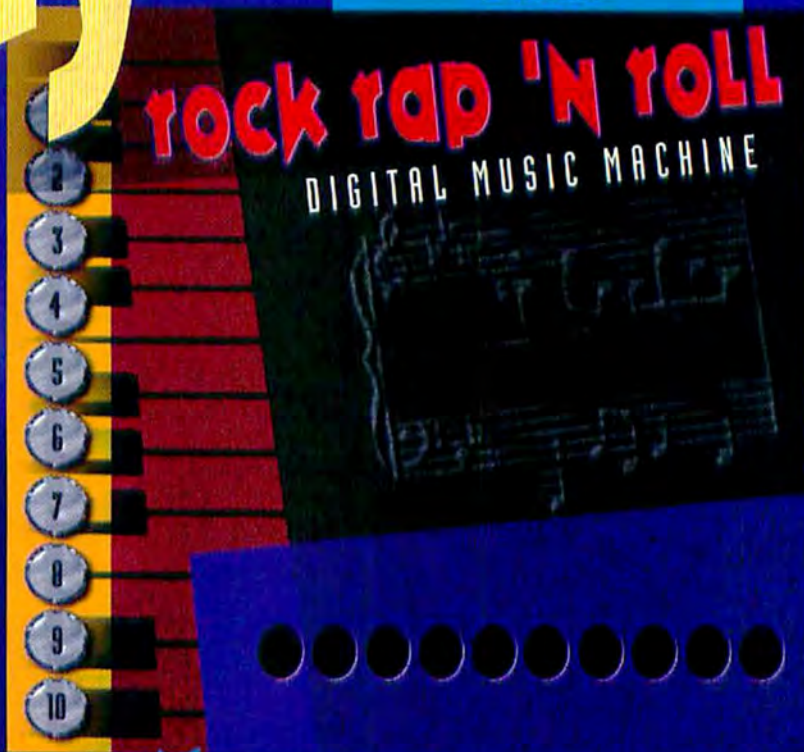
Introducing Totally Addic

CALL 1-800-821-1177 ext 112
TODAY!

System Requirements: Any QuickTime™ capable Macintosh® with a minimum of 4 megabytes of RAM, a Macintosh compatible CD-ROM drive and System 6.0.7 or later.

TasteMate Video Selection System and Rock, Rap 'N Roll are trademarks of Macworld CD Ventures. VideoLog Select is a registered trademark of Trade Service Corporation. Macintosh and QuickTime are registered trademarks of Apple Computer, Inc. Rock, Rap 'N Roll music is composed and produced by Interactive Audio.

*Permission to use copyrighted material has been granted by the respective owners for promotional purposes only. Any unauthorized use is prohibited.



\$5995

Turn your Macintosh® into a **Hip Music Machine**—and you run the show!

Featuring **Ten Styles of Music**—select a style and you're ready to roll!

Assign **Instruments, Vocals and Sound Effects** to your keyboard and screen—add your own voice and sing along!

In Minutes **You'll be Composing Tunes** supported by the sounds of top Hollywood musicians!

You'll have non-stop musical fun with **Rock, Rap 'N Roll**, the digital music machine!



Interactive CD-ROMs

For years

there have been great expectations for CD-ROMs. In fact, many consider CDs to be the single most important information medium of the future.

Now, that future is here with Macworld CD Ventures.

Our distinctively compelling CD titles are designed to broaden the experiences of Macintosh users. From education to recreation, Macworld CD titles represent the best work from the most talented interactive producers.

Macworld CD Ventures. Defining a whole new genre in CD publishing.



CALL 1-800-821-1177 ext 112 to order
TODAY!

Your Addictive CD Order Form

☐ **Yes!** Please send me the TasteMate Video Selection System for the **SPECIAL LOW PRICE OF \$69.95.**

☐ **Yes!** Please send me the Rock, Rap 'N Roll Digital Music Machine **FOR ONLY \$59.95.**

☐ **Extra Special Offer:**

Please send both TasteMate and Rock, Rap 'N Roll for the **SPECIAL LOW PRICE OF \$115.95!**

Name _____

Company _____

Address _____

City/State/Zip _____

Telephone _____

☐ Payment enclosed ☐ M/C ☐ Visa

Card Number _____

Exp. Date _____

Signature _____

Call 800-821-1177 ext. 112 or send coupon to:

Macworld CD Ventures

P.O. Box 105443

Atlanta, GA 30348-5443

FAX ORDERS CALL 415-543-3984

MA, NJ, CA and IL residents add applicable sales tax. All foreign orders please add \$12.50 per CD.

QuickTime Movie Previews

of hot new video releases including *Basic Instinct*, *Patriot Games*, *Beauty and the Beast*, *Alien 3*, *Sister Act* and many more!*

\$69.95

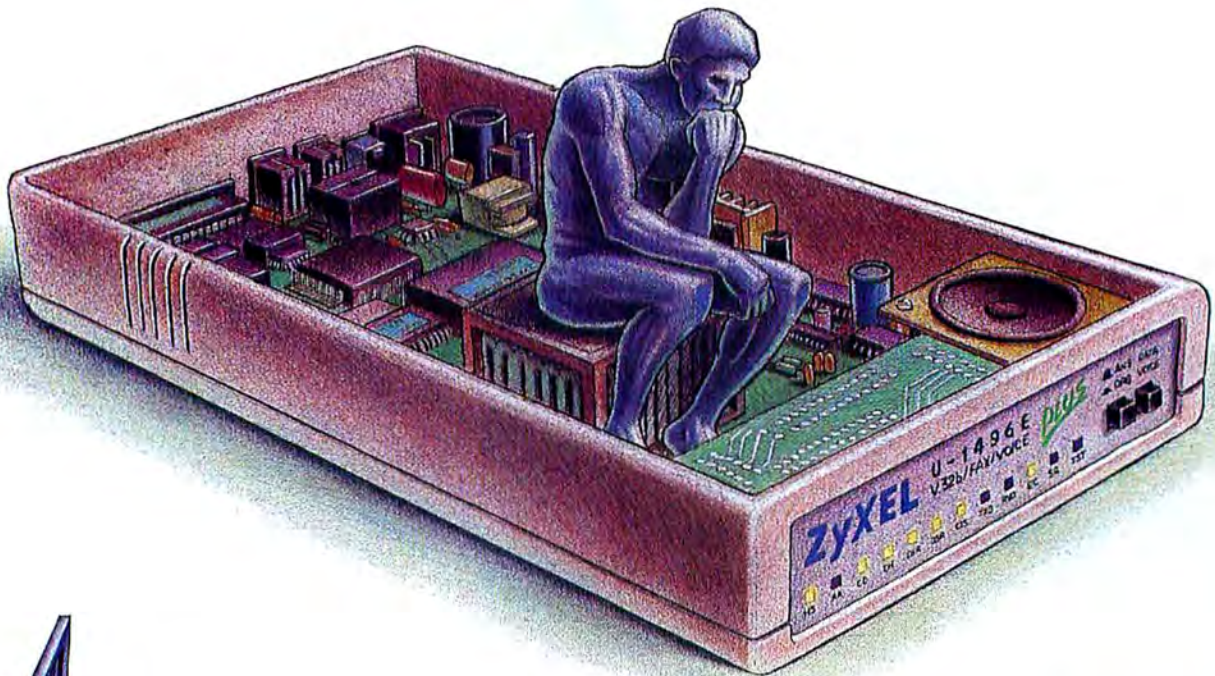
A Video Recommendation System that uses Artificial Intelligence to help you find movies you're bound to like!

Featuring **The VideoLog Select® Database** of over 40,000 video titles—the information used by industry professionals!

Search for any video by star, title, director or category with the Hollywood Guide!

TasteMate is a must for movie buffs and weekend renters alike!

WHY OUR INTELLIGENT MODEMS ARE A WISE INVESTMENT.



With the ZyXEL U-Series modems, you're sure to save. Time. Effort. Money.

The savings begin with the U-Series' ultra-high speed—16.8Kbps data, 14.4Kbps fax (send and receive). And our new PLUS Series runs at 19.2Kbps.

But what keeps you saving are the U-Series' intelligent features—features that save you effort and ensure reliable communications.

Like *Fast Retrain with Auto Fall-Forward/Fall-Back*. And multi-level security features—*Call-Back Security* and *Password Protection*. With *Caller ID*, you can even answer calls selectively.

Want to save by having one phone line do the work of three? Get the U-Series. It adds *Digitized*

Voice Capability with Speech Compression to its fax and data capability. And, *Distinctive Ring* and *Auto* Data/Fax/Voice Detection* for intelligent access to all three.

And now there's a *Cellular Option* for the new PLUS Series.

Everyone can save with the U-Series modems. Because they're smart enough to work in all environments including DOS*, Windows*, OS/2*, Macintosh*, NeXT*, UNIX*, and Amiga*. The U-Series modems support V.32bis/V.32, as well as industry-standard data compression and error correction protocols.

In case you believe all this intelligence is expensive... relax.

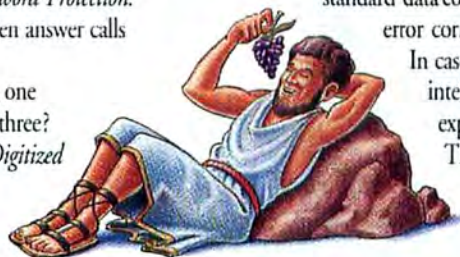
The U-Series are the

lowest-priced, high-performance modems around. And they come with free ZFAX software and a 5-year warranty.

Which means now is the perfect time for smart people to save—by getting the ZyXEL U-Series modems.

To start your wise investment, just call today for the name of your nearest ZyXEL dealer.

(800) 255-4101




ZyXEL
The Intelligent Modem

Star Ratings

OVER 350 HARDWARE AND SOFTWARE REVIEWS
AT A GLANCE

Macworld Star Ratings lets you compare hardware and software products for the Macintosh by providing summaries of hundreds of Macworld's authoritative product reviews. The number of stars at the beginning of each capsule review indicates quality; our reviewers assign five stars to outstanding products and one star to poor ones.

If a product has been upgraded since our last review, the most recent version number supplied by the vendor appears in parentheses after the reviewed version number. Key products that have not been rated since Macworld began assigning star ratings in April 1992 have a  symbol before the name. To read a full review of any product in the listing, please consult the issue listed at the end of each synopsis.

Vendors: Please write to Macworld Star Ratings, 501 Second St., San Francisco, CA 94107, to inform us of changes in the version number or list price of your product, or of changes to your phone number.

★★★★★ Best ————— ★ Worst

Software

ACCOUNTING/FINANCE

★★ **Business Sense 1.6**, Business Sense, 307/877-2231, \$199. Competent, single-user, all-in-one bookkeeping package will adequately help you keep the books for a small company, but it's not as easy to use as its competition. Feb 93

★★★★ **Components 1.0**, Satori Software, 206/443-0765, \$795 per module. Simple, flexible architecture sets a new design standard for Macintosh accounting software, but is not without its bugs and flaws. Sep 92

☑ **Great Plains Accounting 6.0 (6.1)**, Great Plains Software, 701/281-0550, \$795. High-end bookkeeping software offers a first-rate lineup of dedicated modules. Different individuals or groups can easily use the various accounting functions.

★★ **HyperTax Tutor 1991**, SoftStream International, 508/991-4011, \$99. If you're willing to put up with a design that's neither intuitive nor easy to use, this cross-referenced book contains extensive explanations, strategies, and examples of complex IRS tax laws. Apr 92

★★★ **Job Cost/Time Billing 1.05**, Satori Software, 206/443-0765, \$1495. Professional billing software incorporates high-end job-cost and accounts-receivable features in one module, plus an excellent report function; but confusing elements, minor bugs, and inaccuracies in the documentation are weaknesses. Aug 92

★★★★ **MacInTax 1992**, ChipSoft, 619/453-8722, \$79.95. It's difficult to correct your errors when using this personal tax-preparation software, but it's definitely easier than doing your taxes by hand. The display is attractive, the program supports electronic filing, and there are 15 state-tax versions available. May 93

★★★★ **Managing Your Money 5.0**, MECA Software, 203/256-5000, \$79.95. An already strong financial-management program becomes easier to use and slightly more powerful with this upgrade. Jan 93

☑ **MYOB 3.0**, Teleware, 201/586-2200, \$199. A file-cabinet metaphor makes the interface of this accounting package easy to use and understand. For an accounting system with one user who has no need for payroll capabilities, it's the best choice.

☑ **Quicken 3.0**, Intuit, 415/852-9696, \$69.95. Track assets, liabilities, income, and expenses with this personal-finance package. It has a good Mac interface and is easy to learn and use.

★★★★ **Timeslips III 2.1**, Timeslips Corp., 508/768-6100, \$299.95. Complexity is the price you pay for this time-billing utility's impressive flexibility. Fortunately, thorough documentation, excellent tech support, and default settings help any user get started. Sep 92

BUSINESS TOOLS

★★★★ **4th Dimension 3.0.1**, ACI US, 408/252-4444, \$895. Multitasking, which greatly improves speed in a carefully designed application, makes this upgraded relational database delightful for both developers and end users. For a relational database, it's impressively easy to use. Apr 93

★★★★ **Aspects 1.01 (1.03)**, Group Technologies, 703/528-1555, \$285 to \$1295. Collaborative software allows up to 16 people to edit a project. Controlled access as well as individual and linked views are good features; but the lack of outlining and spreadsheet modules limits its usefulness. Jun 92

★★★★ **Atlas Pro 1.0.6 (1.5)**, Strategic Mapping, 408/985-7400, \$795. Although this mapping software is not a complete geographic-information system, it boasts a rich feature set and a competitive price. Nov 92

★★★ **Bar Code Pro 1.0**, Synex, 718/499-6293, \$450. Easy-to-use desk accessory creates bar codes in EPS or PICT for use in desktop publishing or labeling programs. It does well what it sets out to do, but lacks automatic sequential coding and fails to catch invalid characters. Sep 92

☑ **Claris Resolve**, Claris Corp., 408/727-8227, \$249. Advanced features come within easy reach of spreadsheet pedestrians with this program. Anyone can learn how to use it in 10 minutes and how to customize it in 20.

★★★★ **DataPivot 1.02 (1.1)**, Brio Tech-

nology, 415/961-4110, \$299. Convenient and flexible report-generator includes fast formatting, automatic import, and just about every other item on the wish list of users who need report tables that emphasize cross-tabulation. May 92

★★★★ **DeltaGraph Professional 2.01 (2.02)**, DeltaPoint, 408/648-4000, \$295. A smooth interface and outstanding technical support are only two of the stellar features in this graphing and charting program. This upgrade adds 13 new chart types and a number of presentation capabilities. May 92

★★★★ **Fair Witness 1.1 (1.2)**, Chena Software, 215/770-1210, \$295. A valuable tool for planning any project, this software coherently integrates outlining, information charts, scheduling, and time charts. Oct 92

★★★★ **FileMaker Pro 2.0**, Claris Corp., 408/727-8227, \$399. Easier scripting, improved mailing labels and text-handling, and support for QuickTime and Apple events are the major new features of this upgraded, multiuser, flat-file database. Although it has some minor bugs, this is a strong upgrade to an excellent program. Jan 93

★★★ **FlowChart Express 1.0**, Kaetron Software Corp., 713/890-3434, \$149. Inexpensive, easy-to-use flowchart software readily meets the needs of most flowchart creators, although those with extensive requirements will still need a larger, more powerful feature set than this program has. Jan 93

★★★★ **GeoQuery 3.02**, GeoQuery Corp., 708/357-0535, \$395. Gain geographic perspective with this custom-map generator and data-analysis software that uses zip codes to create "pushpin" maps of files from your spreadsheet or database. Nov 92

★★★★ **GraphMaster 1.31a (1.33)**, Visual Business Systems, 404/956-0325, \$295. Excellent general-purpose charting and graphing program offers a number of unusual features, including pictographs and 360-degree free rotation. A frequent inability to undo actions is the only serious irritation. May 92

☑ **GreatWorks 2.0**, Symantec, 408/253-9600, \$299. High marks to this integrated program for including an outlining module and a color paint module. While the integration may not be ideal, it's a solid program, worth a close look.

★★★★ **Lotus 1-2-3 for Macintosh 1.0 (1.1)**, Lotus Development Corp., 800/343-5414, \$495. Spreadsheet program from the other side holds its own against Mac competitors. Its many strengths include graphing, well-implemented linking, compatibility with the DOS version, and an outstanding Help system. Apr 92

★★★★ **MacProject Pro**, Claris Corp., 408/727-8227, \$599. If you're working on a midsize project and like using PERT charts (where tasks appear in boxes and are connected by straight lines), this may be the project-man-

continues

Star Ratings

agement software for you. However, the multistep scheduling process and the limited integration between charts are frustrating if you prefer Gantt charts. May 93

★★★★ **Microsoft Excel 4.0, Microsoft Corp., 206/882-8080, \$495.** Create impressive spreadsheets with this upgrade that includes all the features you've been wishing for and more. It's slower, and now needs 2MB of RAM for practical use, but almost all users will want to upgrade. Oct 92

★★★★ **Microsoft Project 3.0, Microsoft, 206/882-8080, \$695.** An amazing range of functions, including new scheduling and formatting, are packed into this upgraded project-management software. The improved tool bar helps beginners schedule tasks with push-button ease. Jan 93

★★★★ **Microsoft Works 3.0, Microsoft, 206/882-8088, \$295.** Capable but unspectacular upgrade delivers marginally improved functionality and a welcome face-lift to this integrated program, but there are a number of incompatibilities, odd design choices, and performance flaws. Feb 93

★★★★ **Muse 1.0 (1.01), Occam Research Corp., 617/923-3545, \$695.** Innovative data-analysis software is based on a large, ambitious vision of how to organize and use data, and is an excellent environment for some data handling. Free-form query language is powerful, but easy to misread. Jun 92

★★★★ **nuBase Pro 1.5 (1.54), Tactic Software Corp., 407/832-6691, \$395.** Although still slower than FoxBase and without the rich feature-set of 4th Dimension, this is the only relational database that makes it possible for users with no programming experience to design a useful database. Sep 92

★★ **Office Wiz 1.1 (1.1.2), Oryx Associates, 415/563-9971, \$695.** 4D-based program attempts to integrate calendar, project, and contact management, as well as simple accounting for a multiuser environment, but the complexity of the interface requires a substantial investment in start-up time. Nov 92

★★★★ **Omnis 7 1.1, Blyth Software, 415/312-7100, \$1250.** The plain, businesslike functionality of this database-development system produces solid applications without much fuss. Dec 92

★★★★ **OrgChart Express 1.0, Kaetron Software, 713/890-3434, \$279.** Organization-chart software links a database to standard box-drawing functions. Although the learning curve is steep, the effort may be worth it for people who regularly work with large or complex organization charts. Apr 93

★★★★ **Panorama 2.0 (2.06), ProVue Development Corp., 714/892-8199, \$395.** Disarmingly easy-to-learn flat-file database is full of labor-saving data-entry features, plus it boasts a remarkable macro function that lets you record and play back almost any series of database routines. May 92

★★ **PEMD Discovery 1.3.1, PEMD Education Group, 707/894-3668, \$189.** Unsophisticated data-search and -retrieval routines, limited displays, and a weak manual restrict this graphical data-analysis software's usefulness. Apr 92

★★★★ **Perspective 1.5, U.S. Data on Demand, 800/352-7352, \$129.95.** The level of detail and comprehensive information in this collection of U.S. demographic and economic data is impressive, and the reasonable price puts it within reach of even the smallest business. Sep 92

★★ **PowerPlay 1.0 (1.1), Cognos, 617/229-6600, \$695.** A good program for a very limited range of business-analysis tasks. The views of data and graphs are small and manageable, and the program tabulates them in several colorful ways. Aug 92

★★ **PowerTrax 1.1 (1.2), Soft Solutions, 404/457-9400, \$495.** Convoluted and repetitive data-entry processes slow you down when they should speed you up in this 4D-based information-management system. Apr 92

★★★★ **RateFinder 1.5 (1.6), Elefant Software, 510/843-7725, \$99.** Numerous interface violations don't change the fact that these all-inclusive shipping-rate tables make the old-fashioned chore of checking mail rates easier and more efficient. Jun 92

★★★★ **ZP4 7 (10), Semaphore Corp., 408/688-9200, \$125.** Clean up and standardize addresses with this CD ROM, thereby reducing postage costs and avoiding undeliverable mail; uses a licensed version of the U.S. Postal Service's official database of every valid postal address in America. May 92

COMMUNICATIONS / NETWORKS

★★★★ **A/UX 3.0, Apple Computer, 408/996-1010, \$709.** Hybrid-operating-system package implements the Stone Age, type-one-line-at-a-time text interface of Unix in a way a Macintosh user might actually like. Nov 92

★★★★ **AccessPC 2.0, Insignia Solutions, 415/694-7600, \$99.95.** Slick control over formatting multiple types of DOS media is the major advantage of this file-transfer utility. Oct 92

★★★★ **Carbon Copy for the Mac 2.0 (2.04), Microcom, 919/490-1277, single-user \$99, multi-user \$299.** Screen-sharing utility is convenient and economical for occasional use but because it competes for RAM on attended low-memory Macs, it isn't efficient enough to use as a global solution for remote-control support. Apr 92

★★★★ **CompuServe Information Manager 2.0.1, CompuServe, 614/457-8600, \$49.95.** The goal of this product is to give friendlier information-access to CompuServe for Macintosh users. An appealing color interface and increased speed are signs of success, but there's still room for improvement. Dec 92

★★★★ **DataClub Classic, DataClub Elite 2.0, Novell, 800/638-9273, \$175, \$1395.** Fully distributed file servers allow users to pool the free space on their drives into one virtual server. File sharing is transparent, but when a participating Mac disconnects from the network, users lose access to files stored on its hard drive. Aug 92

★★★★ **DOS Mouter 3.0, Dayna Communications, 801/531-0600, \$89.95.** If you need to use wild cards in extension mapping, this file-transfer utility is the only option, although it's slower than other file-transfer programs. Oct 92

★★★★ **Macintosh PC Exchange 1.01, Apple Computer, 408/996-1010, \$79.** For basic file-transfer, this control panel device allowing cross-platform file sharing is fine, but it's hardly state-of-the-art. Oct 92

★★★★ **MicroPhone II 4.0 (4.0.2), Software Ventures Corp., 510/644-3232, \$295.** Refinements are evident throughout this telecommunications software's upgrade, but not everyone needs \$295 worth of sophistica-

tion. The impressive scripting facility is countered by poor help features. Jul 92

★★★★ **MicroPhone Pro, Software Ventures Corp., 510/644-3232, \$295.** Truly comprehensive telecommunications package now includes send-and-receive fax software. Although the new TCP/IP tools are complicated, the documentation is clear and precise. Apr 93

★★★★ **NetMouter 1.00 (1.01), Dayna Communications, 801/531-0600, \$99.** Reasonably priced utility provides Macs access to NetWare file servers without your having to install NetWare for the Macintosh on the server. It's not an ideal choice, but it is economical for mixed networks with only a few Macs. Sep 92

★★ **NetVirtual 2.0, Eclectec, 408/462-2040, \$995, unlimited nodes \$4985.** One-of-a-kind network-simulation product favors flexibility at the expense of usability. Only after hours of work will your simulation report anything meaningful about your network, and even then the results are difficult to analyze. Apr 93

☐ **NetWare for the Macintosh 3.011, Novell, 800/638-9273, \$495-1995.** NetWare 3.11, an expensive but robust network operating system, runs on a non-Mac dedicated server and is complex to manage. This set of NetWare Loadable Modules lets you add Macs to a NetWare network.

★★★★ **Network SuperVisor 2.0.1 (2.1), CSG Technologies, 412/471-7170, \$495.** Fast and accurate data collection is the strong point of this network-management utility, but the interface isn't that intuitive. Aug 92

★★★★ **Network Vital Signs 1.0 (1.1), Dayna Communications, 801/531-0600, \$449.** Fault-monitoring application continually watches selected network devices and services, monitoring specific equipment for specific errors. Unfortunately, when monitoring more than ten devices, it noticeably degrades the performance of the monitoring Mac. Mar 93

★★★★ **NetWorks 1.0.1 (2.0), Caravelle Networks Corp., 613/596-2802, \$1195.** Become a network demigod with omnipresent capabilities over network devices using this network-management and paging utility. Macworld's network manager loved it, calling it versatile, flexible, and worth its weight in gold. Jun 92

★★ **Notify 1.0, Ex Machina, 718/965-0309, \$149.** Innovative wireless transmitter uses the Mac to send messages to pager. It's a start on a new technology, but the quirky product has a long way to go. Jun 92

★★★★ **PacerForum 1.0.1, Pacer Software, 619/454-0565, \$549.** Any file server or underused networked Mac can host an online forum using this network bulletin board system. The well-designed graphical interface stands out, although the display looks better on color monitors. Jul 92

★★★★ **RouterCheck 2.0, Neon Software, 510/283-9771, \$895.** Keep your finger on the pulse of router configurations and internet traffic with this network-administration utility. It's a must for midsize or larger internets, but too pricey for small networks. Oct 92

☐ **SoftPC 2.0 (2.5), Insignia Solutions, 415/694-7600, \$399.** A graceful implementation of the PC architecture on a Mac, this program emulates PC AT hardware through a powerful BIOS that remaps Intel 80286 addresses to a Motorola 68000-series CPU. The main drawback is slowness.

★★★★ **Status Mac 2.0.2 (3.0), On Technology,**

617/876-0900, \$449. With less hassle for network managers and users, this upgrade invites customization in both the collecting and storing of information about networked Macs; users can even delay time-consuming profiling. May 92

★★★★ **TechWorks Net Utilities 1.0, Technology Works, 512/794-8533, \$129.** Collection of five separate applications provides essential network-monitoring tools at a price low enough to please anyone. Dec 92

★★★★ **Timbuktu 5.0.1, Farallon Computing, 510/814-5000, single user \$199, multiuser \$999 to \$5500.** By letting one computer (a Macintosh or a Windows-based PC) control, observe, or exchange data with another computer, this terminal-emulation product allows you to use resources almost anywhere on a network. Despite minor blemishes, such as its inability to cut and paste between Macs and Windows PCs, it's a clear winner. Mar 93

❑ **VersaTerm/Pro 3.1 (3.6.2), Synergy Software, 215/779-0522, \$295.** It's a great tool for working with VAXs or when you want Tectronix-terminal emulation, but this communications software lacks the scripting many people use for working with EBSs or commercial information services.

★★ **Vicom Terminal Emulators (4.2), Vicom Technology, 604/684-9517, \$195 to \$3500.** These bare-bones, British-designed terminal emulators lack many common U.S. modem configurations, but do support multiple simultaneous sessions. Aug 92

❑ **WhiteKnight 11 (11.14), The FreeSoft Company, 412/846-2700, \$139.** In the right hands, this product is the precision tool of communications software, but it does assume familiarity with telecommunications and with programming concepts.

DESKTOP PUBLISHING

❑ **Adobe Type Manager (ATM) 1.0 (2.03), Adobe Systems, 415/961-4400, \$99.** Radically improve the quality of screen fonts and the versatility of QuickDraw printers with this font-optimizing utility that uses information from a printer font (which is also called an outline font) to produce accurate character representations on-screen.

★★★★ **Aldus PageMaker 4.2, Aldus Corp., 206/628-2320, \$795.** Interruptible screen redraw is one of the dozens of enhancements that make this upgrade well worth its price. Even so, some of the features that users need the most—opening multiple documents, for instance—are still missing. May 92

★★ **Aldus Personal Press 2.0, Aldus Corp., 206/628-2320, \$199.** Basic, inexpensive page-layout program adds features and gains strength, but is still missing elements that novice users need, such as automatic kerning. Furthermore, its software-knows-best approach to copyfitting makes manual fine-tuning difficult and is almost certain to confuse and confound beginners. Mar 93

★★★★ **Apple Font Pack, Apple Computer, 408/996-1010, \$99.** Apple's first collection of TrueType fonts includes only 12 fonts that haven't been available since the late eighties in the PostScript format. Still, it's not a bad deal, considering that Adobe PostScript fonts cost four times as much. Mar 93

★★★★ **Fontographer 3.5, Altsys Corp., 214/**

680-2060, \$495. Versatile tools that enable you to edit PostScript typefaces or create your own are the highlight of this font-design software. But beware, some processes are technical and cumbersome. Nov 92

❑ **FrameMaker 3.0 (3.0.1), Frame Technology, 408/433-3311, \$795.** Powerful and well-designed, this page-layout software is the best choice for scientific and technical publishing. It has a fine table editor and allows manual kerning, but its power demands commitment—and a Mac II-class machine.

★★★★ **Lazy Dog Foundry Personal Font, Lazy Dog Foundry, 612/291-0306, \$199.99, full 180-character set \$499.99.** Type 1 font made from your handwriting has clean, even lines—whether or not your writing does. Apr 93

★★★★ **LetraStudio 2.0, Letraset USA, 201/845-6100, \$249.** Precise, intuitive control over character spacing and shapes, as well as a straightforward interface, make this program a superior choice for manipulating type, but it lacks flashy effects, such as gradient fills. Oct 92

★★ **MacQuill 1.0, Nest Software, 408/441-1944, \$99.95.** Friendly, inexpensive page-layout program is missing basic features, such as kerning and importing, and suffers from some bugs and deficiencies, but for simple word processing and grass-roots page layout it's serviceable. Aug 92

★★ **MenuFonts 4.03 (4.04), Dubl-Click Software, 818/888-2068, \$69.95.** A control panel device that groups type styles in families and displays font names in their own typefaces sounds like a great idea, and it would be if there were fewer incompatibilities. May 92

★★★★ **Multiple Master Myriad 1.0, Adobe Systems, 415/961-4400, \$370.** Elegant execution and functional design combine in this two-axis Multiple Master typeface that exceeds all previous ideas of electronic font perfection. Jul 92

★★★★ **Personal Font, Signature Software, 408/458-0241, \$179.95.** Turn your handwriting into a PostScript Level 3 or a TrueType font. The results are good, although not perfect—TrueType letters were not connected on screen, but this should be corrected with TrueType 2.0. Dec 92

★★★★ **Publish It Easy 3.0, Timeworks, 708/559-1300, \$199.95.** Desktop-publishing program offers writing, editing, formatting, page-layout, drawing, and painting tools with well-thought-out interface innovations, plus an excellent database manager. Unfortunately, the program is unstable and crash-prone. Mar 93

★★★★ **QuarkXPress 3.1, Quark, 800/788-7835, \$895.** Dozens of updated features and frustration-relievers in this upgrade include new palettes and preferences, better zooming, and improved text-editing and -formatting. The program, while still not perfectly behaved, is stable, well designed, and full-featured. Jul 92

★★★★ **Renaissance 1.0, Eastman Kodak, 800/433-2839, \$695.** A strange mixture of power and oversight, this page-design and -layout software provides several slick features, including handling multiple page sizes simultaneously, but blatantly ignores common Mac conventions, such as some keyboard shortcuts. Dec 92

★★★★ **Spectacular 1.2, FontHaus, 203/846-3087, \$79.95.** Keep track of fonts efficiently and effectively with this type-specimen generator. Printing specimen sheets is a cinch. Jan 93

EDUCATION

★★★★ **American Discovery 3.0, Great Wave Software, 408/438-1990, \$49.95.** Without glitzy graphics or sound, this educational game, intended mainly for classroom use, provides an excellent drill in geography, state capitals, and state facts. May 92

★★★★ **The Castle of Dr. Brain 1.0, Sierra On-Line, 209/683-4468, \$49.95.** After applying for a job as a lab assistant with the local mad scientist, you must use logic and raw brain-power to navigate a series of rooms, mazes, and hallways on the way to your interview. Puzzles range from simple and mundane to creatively laborious. Dec 92

★★★★ **Compton's Multimedia Encyclopedia 1.00M, Compton's New Media, 619/929-2626, \$795.** The down-to-earth writing style and numerous bells and whistles of this multimedia encyclopedia on CD ROM appeal to younger readers, but the high cost and sluggish performance may be prohibitive. Apr 93

★★★★ **Eco-Adventures in the Ocean, Eco-Adventures in the Rainforest 1.0, Chariot Software Group, 619/298-0202, \$59.95.** Explore the ocean or rainforest while avoiding pitfalls and predators in these educational adventure games. Imaginary landscapes that combine features found in different environments may confuse some students. Nov 92

★★★★ **Headline Harry and the Great Paper Race 1.0, Davidson & Associates, 310/793-0600, \$59.95.** Travel through time and across the country as a journalist in this history/geography game. While not an educational masterpiece, it is lots of fun. Dec 92

★★★★ **MacGlobe 1.3.0, Brøderbund Software, 415/382-4400, \$59.95.** Besides maps and bits of fun, such as national anthems, this geography software offers an impressive quantity of demographic and economic information. While it could stand some improvement in data export, it provides a fascinating intellectual adventure for home and school use. Feb 93

★★ **Math Shop, Math Shop Jr., Advanced Math Shop 1.0, Scholastic, 800/541-5513, \$24.95.** The humdrum workbook format is converted into bits and bytes with these mathematics education games. May 92

★★★★ **The New Grolier Multimedia Encyclopedia, Grolier Electronic Publishing, 203/797-3530, \$395.** The remarkably current and scholarly text of this encyclopedia on CD ROM is suitable for sophisticated readers, while its speed, ease of use, and value are impressive. Apr 93

★★ **NihongoWare, Vol. 1, Qualitas Trading Company, 510/848-8080, \$623.** Although this Japanese language CD ROM offers solid instruction, it's so expensive and so limited in its word selection that it's not an economical choice for individual users. Jan 93

★★★★ **Number Munchers 1.1 (1.2), MECC, 612/569-1500, \$29.95 to \$69.** Fun, educational game builds arithmetic skills through arcade action. Munchers gobble your choice of multiples, factors, primes, equalities, and inequalities, but the game can't accept custom data sets. Jun 92

★★ **Picture It 1.0 (1.4), Penton Overseas, 619/431-0060, \$69.95.** If you add custom word lists, this interactive French-English picture dictionary may serve as a *continues*

Star Ratings

decent aid to a more complete curriculum, but it's buggy and of uneven quality. **Aug 92**

★★★ **The Secret Codes of C.Y.P.H.E.R. 1.0 (1.1), Tanager Software Productions, 510/430-0900, \$59.95.** Intriguing facts about mammals and a variety of alphabets provide the interest in this educational game, but the inescapable, repetitive animations are a major detractor. **Apr 93**

★★★★ **StudyWare for the SAT 3.7N (4.0), Cliffs Notes, 402/423-5050, \$49.95.** Four full SATs, a TSWE (Test of Standard Written English), and a series of drills are included with this inexpensive SAT-training program. It doesn't provide a lot of tutorial assistance, but it might be appropriate for students who need a quick brushup. **Jun 92**

★★★★ **Super Munchers 1.0, MECC, 612/569-1500, \$49.95 to \$69.** From a kid's point of view, this educational arcade game offers long-lasting appeal. The player maneuvers a cartoon Muncher around a game board, gobbling up words that fit target rules, such as Romantic composers or European countries. **Jun 92**

★★★★ **Time Treks 1.0, Earthquest, 415/321-5838, \$59.95.** An eccentric archaeologist opens portals through time, and you must close them in this educational, HyperCard-based game. Slow response time and limited animation and color are somewhat disappointing, but overall it's a fun way to browse through history. **Sep 92**

★★★★ **Transparent Language 1.04M, Transparent Language, 603/465-2230, \$139.** Without an iota of glitz or glamour (no sound, graphics, color, or buttons), this foreign-language reader is a superb tool for bolstering language skills through reading. **Oct 92**

★★★★ **Where in America's Past Is Carmen Sandiego?, Broderbund Software, 415/382-4400, \$44.95.** Travel through time and the United States while chasing those V.I.L.E. crooks in this clever educational history/geography game that's challenging for all ages. **Mar 93**

★★★★ **Where in the World Is Carmen Sandiego? Deluxe Edition, Broderbund Software, 415/382-4400, \$79.95.** The V.I.L.E. gang is at it again, stealing famous objects and fleeing to locations around the world. In this deluxe version of the well-known geography game, there are more crooks, more clues, and more countries to visit. **Oct 92**

★★★★ **Word Munchers 1.0 (1.2), MECC, 612/569-1500, \$29.95 to \$69.** Munch the words with matching vowel sounds in this educational game for grades 1 to 5+. Dazzling color graphics stand out, but the repetitive cartoon sequences get tiresome. **Jun 92**

★★★★ **World Atlas 1.2, Software Toolworks, 415/883-3000, \$79.95.** Extensive, detailed maps of countries and regions are the highlight of this atlas software. In addition, descriptive headings report interesting text-based demographic data. **Apr 92**

ENTERTAINMENT

★★★★ **4-D Boxing 1.0, Electronic Arts, 415/571-7171, \$49.95.** Authentic motion and multiple viewing angles are the best features of this entertaining boxing game, but off-disk copy protection, geometric figures, and the inability to save games in progress make it less enticing. **Sep 92**

★★ **America Alive, MediaLive/CD Tech-**

nology, 408/752-8500, \$99. QuickTime movies, color photographs and maps, text, and audio mingle in this multimedia CD ROM guide to the United States. It's a promising concept, but it doesn't yield much useful information. **Mar 93**

★★★★★ **Arthur's Teacher Trouble, Broderbund Software, 415/382-4400, \$59.95.** Every page of this delightful animated book is dense with surprises that arouse and satisfy a child's curiosity. In the words of six-year-old Alex, "It's like chocolate ice cream. You can have it more than once and it's still good." **Apr 93**

★★★★ **A-Train, Maxis, 510/254-9700, \$69.95.** Charming railroad simulation offers astonishing, and often witty detail, but the learning curve is high and the interface isn't completely Mac-like. **Apr 93**

★★★★ **Audioshop 1.0 (1.03), Opcode Systems, 415/856-3333, \$89.95.** Audiophiles will get a kick out of applying sound effects to any sound file on their Macs. You can also control the order of songs or sounds on an audio CD played on a CD ROM player. A number of quirks may confuse new users. **Sep 92**

★★★★ **Battle Enhanced Chess CD ROM, Interplay Productions, 714/553-6678, \$79.95.** Elaborately detailed cartoon characters act out little dramas of strategy and capture, complete with sound effects, in this chess game that will drive nine-year-olds mad with glee but may annoy experienced chess players. **Mar 93**

★★★★ **The Battle of Britain, Deadly Games, 215/295-2284, \$54.95.** It's August 10, 1940. The badly outnumbered British must defend their country against the invading Luftwaffe, and you're in charge. Although the graphics and sound are not spectacular, this is an entertaining, thinking person's game. **Dec 92**

★★★★ **Blade 1.1 (2.0), Leviathan Corp., 313/826-3560, \$99.95.** Surreal graphics in this fantasy martial-arts game are spectacular—a cross between Dali and Seuss—but the arcade action is extremely difficult to master. **Sep 92**

★★★★ **Capitalist Pig 1.0 (1.02), Pluma Software, 602/969-9441, \$59.95.** Terrorist attacks, embezzlement, fires—keeping a cool head is half the challenge if you are to become successful in this business-simulation game. No clear end point means that getting rich, retiring, and writing novels is not an option. **Sep 92**

★★★★ **Cogito 1.0, Inline Design, 203/435-4995, \$59.95.** Rubik's Cube fans will like this challenging game where the goal is to replicate a pattern by moving rows and columns of tiles. The deviously simple twist is that clicking on the arrows that control movement results in reactions that are more and more complex as you progress through the 120 levels. **Apr 93**

★★★★ **The Complete Annotated Alice 1.0, The Voyager Company, 310/451-1383, \$19.95.** Fans of *Alice's Adventures in Wonderland* will love the "lost" out-of-print chapter in this HyperCard book designed primarily for PowerBook users. As literary hypertext hide-and-seek, it works. **Jun 92**

★★ **Creepy Castle 1.0, Reactor, 312/573-0800, \$49.95.** Wolfman, the Bride of Frankenstein, and other ghouls from classic horror movies populate this clever arcade-style game. Still, delightful movie trivia doesn't compensate for frustrating performance delays and limited scenarios. **Jun 92**

★★★★ **Cross Country 1.0 (2.0), T-34 Microsystems, 904/396-2785, \$179.95.** No unnecessary

frills complicate this efficient, inexpensive instrument-flight trainer. It doesn't have a true aerodynamic feel, but that flaw's not critical. **Jul 92**

★★★★ **Cyberblast 2.01, Innerprise Software, 410/560-2434, \$49.95.** Aliens have overrun the 64 levels of Fastrax Labs, and it's your job to get rid of them in this arcade game. While it's not the most unusual game in the universe, it's a nice, basic shoot-'em-up, with clever execution and appealing graphics. **Sep 92**

★★★★ **Go Master 5, Toyogo, 808/396-5526, \$69.** Go has been called the most interesting board game ever invented. This excellent software version incorporates helpful learning aids and sample games. **Dec 92**

★★★★ **HardBall II, Accolade, 408/985-1700, \$54.95.** From the pitcher's windup to the batter's swing, this baseball game comes astonishingly close to natural human motion. The upgrade adds more teams, more stadiums, instant replay, and the ability to create your own league. **May 92**

★★★★ **Hellcats Over the Pacific 1.0.3, Graphic Simulations, 214/699-7400, \$69.95.** Fly a WWII-era Navy fighter, the Grumman F6F Hellcat, against enemy planes in the South Pacific with this flight simulator that offers smooth graphics, good special effects, and great documentation. **Apr 93**

★★★★ **Insanity 1.0, UV Wave, 318/868-9944, \$28.95.** Shoot your Mac with this cool control panel device that offers a choice of nine weapons, ranging from an Uzi to a pigeon. It has first-rate sound effects and detailed animation, but the novelty wears off. **Feb 93**

★★★★★ **Just Grandma and Me, Broderbund Software, 415/382-4400, \$49.95.** Mercer Mayer's Little Critter comes to life in this charming, captivating, wondrously entertaining, interactive storybook on CD ROM. **Aug 92**

✓ **Kid Pix 1.0 (2.0), Broderbund Software, 415/382-4400, \$59.95.** An entrancing, enchanting color paint program aimed at children but delightful for grown-ups, too. Hilarious sounds, hidden surprises, spectacular effects, zany and creative tools—it's a classic.

★★★★ **Kid Pix Companion, Broderbund Software, 415/382-4400, \$39.95.** Addition to Kid Pix adds clever new features, including the world's easiest-to-use QuickTime movie and presentation modules, but it's less appealing than the delightfully simple original. **Oct 92**

★★★★ **Mozart: The "Dissonant" Quartet, The Voyager Company, 310/451-1383, \$59.95.** This CD ROM includes an unusual essay on the anatomy of stringed instruments, brief discussions of general musical concepts, an analytical overview of the quartet, and a taped minilecture on Mozart's life, but sadly enough the music is limited almost entirely to the title piece. **Apr 93**

★★★★ **Nobunaga's Ambition 1.0, Koei Corp., 415/348-0200, \$59.95.** Visit the Warring States period of feudal Japan, unify the country, and usher in an era of peace. Strategy game is absorbing and challenging, but the interface can be annoying. **Jun 92**

★★ **The Orchestra: The Instruments Revealed, Warner New Media, 818/955-9999, \$79.98.** The many-branched, interwoven hypertext style of this music-education CD ROM makes the program hard to navigate and digest, despite its richness. For the price, other music-education CD ROMs present better values. **Apr 93**

★★★★ **Patton Strikes Back: The Battle of the Bulge, Broderbund Software, 415/382-4400,**

\$19.95. Military simulation game with superior graphics is simple to learn and satisfyingly complex. If only they'd skipped the off-disk copy protection. Jun 92

★★★★ **Poetry in Motion, The Voyager Company, 310/451-1383, \$29.95.** Performance videos of contemporary poets are juxtaposed with the texts of their poems and taped interviews in this intriguing CD ROM that combines the excitement of the stage with the reflective appeal of the page. Feb 93

★★★★ **Prince of Persia, Broderbund Software, 415/382-4400, \$49.95.** You need a high tolerance for frustration to negotiate the 12 mazelike levels of dungeon and palace in this arcade adventure, but amazingly realistic (although gory) animation, stunning graphics, and entertaining challenges make it all worthwhile. Sep 92

★★★ **Red Baron 1.0, Dynamix, 800/326-6654, \$69.95.** The romance of history and the realism of a flight simulator combine in this World War I flight game. Despite small annoyances, including too many dialog boxes to get to the simulation, this game will charm any aspiring ace. Nov 92

★★★★ **Richard Strauss: Three Tone Poems, The Voyager Company, 310/451-1383, \$59.95.** *Don Juan*, *Till Eulenspiegel*, and *Death and Transfiguration* are the three works included in this CD ROM, with a program written by Russell Steinberg. The musical analysis is satisfying and the lush orchestral music will appeal to both novice and experienced classical music listeners. Apr 93

★★★ **Rodney's Wonder Window, The Voyager Company, 310/461-1383, \$39.95.** Collection of 23 colorful, wacky graphics and animations by Rodney Alan Greenblatt is charming but uneven. The overall look is surreal and cartoonish, but while some modules are elaborate and sophisticated, others are simple and not particularly interesting. Mar 93

★★★ **Schubert: "The Trout" Quintet, The Voyager Company, 310/451-1383, \$59.95.** Alan Rich, classical music commentator for National Public Radio, conveys his enthusiasm for this appealing music in the lively text of this CD ROM. However, the discussion is relatively unchallenging and the musical performance, though well regarded, is not at the top of most reviewers' lists. Apr 93

★★★★ **The Secret of Monkey Island 1.0, LucasArts Games, 415/721-3300, \$59.95.** A genuinely amusing, interactive tale of swashbuckling and daring deeds using splendid 256-color graphics and an original soundtrack. Low screen resolution and irksome copy protection only slightly spoil the delight. Sep 92

★★★★ **Shanghai II: The Dragon's Eye, Activision, 310/207-4500, \$49.95.** Classic tile game is more addictive than ever; flashy enhancements include new tiles and layouts, plus an additional, entirely new game that's a variation on the tile-removal theme. May 92

★★ **Sherlock Holmes, Consulting Detective 1.0, Icom Simulations, 708/520-4440, \$69.95.** Accompany Sherlock Holmes and Watson as they investigate three CD ROM-based mysteries. Primarily made up of video scenes, this game's only slightly more interactive than TV, and the picture's not as good. Aug 92

★★★★ **A Silly Noisy House 1.0, The Voyager Company, 310/451-1383, \$59.95.** A brightly colored animated world awaits exploration; this CD ROM's simple scenes and syrupy songs are perfect for preschoolers. May 92

★★★★ **SimAnt 1.0, Maxis, 510/254-9700, \$59.95.** Marauding red ants, ant lions, spiders, even power mowers—an ant's life is likely to be short in this remarkably detailed simulation game in which the object is to have black ants amass territory in a suburban backyard. Apr 92

★★★ **SimLife, Maxis, 510/254-9700, \$69.95.** A megalomaniac's dream come true, this amazingly intricate simulation game allows players to create and control ecosystems. It's not easy, but the reward is an increased understanding of the complex interrelationships of life. Feb 93

★★★★ **So I've Heard, Volume 1: Bach and Before, The Voyager Company, 310/451-1383, \$24.95.** Engaging text by classical-music critic and lecturer Alan Rich describes nearly two millennia of western music (up to the mid-eighteenth century) in this CD ROM. It offers a unique and affordable opportunity to sample 50 or so performances, styles, and compositions. Feb 93

★★★ **Space Quest 1: Roger Wilco in the Sarien Encounter, Sierra Online, 209/683-8989, \$29.95.** As Roger Wilco, starship janitor, you must defeat the evil Sariens in this adventure game where your head is more important than your hands. Puzzles range from the obvious to the head-scratching, but for most players the game will be easy to complete. Apr 93

★★★★ **Spaceward Ho 2.0.1, Delta Tao Software, 408/730-9336, \$59.** A happy planet is a profitable planet in this absorbing, humorous strategy game of interstellar capitalism and imperialism. Aug 92

★★★★ **Spectre 1.0, Velocity Development Corp., 415/776-8000, \$59.95.** Fight enemy tanks in a 3-D arcade game that is at once basic and extremely addictive. When installed on a network, it's one of the great antiproduktivity tools of all time. May 92

★★★★ **Spelunx and the Caves of Mr. Seudo, Broderbund Software, 415/382-4400, \$49.95.** Unanticipated giggles, rich graphics, entertaining sounds, and creative learning activities fill this interactive hyperworld. We recommend it, despite its tiny bugs. Jul 92

★★★ **Super Mines 1.0, Callisto Corp., 508/655-0707, \$49.95.** You use your logic to search a minefield without setting off the mines in this fast-paced game that's easy to learn but offers 84 levels for long playability. Apr 93

★★★★ **Super Tetris, Spectrum HoloByte, 510/522-3584, \$49.95.** Teensy tiles are a very minor negative in this exceptional tile game that's more varied, more challenging, and more forgiving than the original. Oct 92

★★ **Surgeon 3, The Brain 1.0 (1.1), ISM, 410/560-0973, \$59.95.** Surgical-simulation game with realistic graphics and sound can be entertaining and educational, but it's overly intolerant of mistakes—not for the faint of heart or the easily frustrated. Sep 92

★★★ **Warlords, Strategic Studies Group, 904/494-9373, \$59.95.** A medieval fantasy world is the setting for this colorful game of strategy and conquest with beautiful graphics. Unfortunately, the computer opponents are not challenging enough for an experienced war-gamer, although human opponents may be. Dec 92

★★★★ **Wordtris, Spectrum HoloByte, 510/522-3584, \$49.95.** Tetris's falling blocks are letters in an arcade game for Scrabble lovers. Lots of variations, including modes for children, tournaments, and head-to-head play on a network, make it a super game. Jun 92

GRAPHICS

★★★ **Adobe Dimensions, Adobe Systems, 415/961-4400, \$199.** This three-dimensional-effects utility may seem very limited, with white-only light and no surface texturing, but it's a ground-breaking product. It performs its 3-D illusions within the object-oriented, resolution-independent world of PostScript and is an excellent tool for anyone who works extensively in Adobe Illustrator or Aldus FreeHand. Apr 93

✶ **Adobe Illustrator 3.0.1, Adobe Systems, 415/961-4400, \$695.** Adept transformation and reshaping capabilities and superb text-handling stand out in this object-oriented illustration program. It also includes features found in no other Macintosh draw program, such as tools to create line and bar graphs.

✶ **Adobe Photoshop 2.0.1, Adobe Systems, 415/961-4400, \$895.** With complete mastery of the bitmapped, continuous-tone environment, this product is the industry standard for image manipulation. Although it's not perfect, it's so good that if you make your living in graphic art, it's worth the price of a Mac itself.

★★★ **Aldus FreeHand 3.1 (3.11), Aldus Corp., 206/628-2320, \$595.** A pressure-sensitive freehand tool is the most remarkable new feature of this updated drawing program. Substitution for missing fonts is another good addition, but skimpy text-editing tools and incomplete support for EPS continue to diminish its value. Jun 92

★★ **Aldus Gallery Effects 1.0 (1.5), Aldus Corp., 206/628-2320, \$199.** Uninspiring collection of 16 image-editing filters has an unusually strong manual. Apr 92

★★★★ **Alias Sketch 1.0.2 (1.5), Alias Research, 800/447-2542, \$995.** The unique collection of tools makes this the only program that allows you to sit down and play with 3-D rendering. Failings include quirky navigation and sluggish performance. Aug 92

★★★★ **ArchicAD 4.02 (4.1), Graphisoft USA, 415/737-8665, \$4450.** The simple yet powerful 3-D interface in this CAD package builds on a construction metaphor. The integrated product incorporates most of the features an architect needs. Jun 92

★★ **ArtBeat Professional 1.0, Pie Practical Solutions, 201/902-9500, \$249.** Despite a smattering of unique capabilities, this inexpensive draw and paint program lacks many of the features of equivalent programs. Apr 93

★★ **AutoCAD Release 11, Autodesk, 415/332-2344, \$3500.** Customizable, bare-bones drafting upgrade partially implements a graphical user interface. Few add-ons are currently available. Dec 92

★★★★ **CA-CricketDraw III 1.0, Computer Associates International, 408/432-1727, \$249.** Although not revolutionary, this draw program boasts some original implementations, including dramatically improved gradations. May 92

★★★★ **Cachet 1.0, Electronics for Imaging, 415/742-3400, \$595.** The tools, interface, output, and documentation of this color-image editor are all quite impressive for a first version, but serious failings include slowness and disappointing sharpening. Dec 92

✶ **Canvas 3.0 (3.0.6), Deneba Software, 305/596-5644, \$399.** Discovering the complex nuances of this draw program's immense feature list isn't easy, but it's continues

Star Ratings

well worth the effort. The precision drawing functions in particular should appeal to many users.

★★★ **Claris CAD**, Claris Corp., 408/727-8227, \$599. Serious but basic CAD package has fallen behind the competition after a long period without an upgrade. Nonetheless, this is one of the fastest products available for scrolling and zooming—important for work on large, complex drawings.

★★★ **Color It 2.0.1**, Timeworks, 708/559-1300, \$299.95. Overpriced color paint program has a full range of painting and image-retouching capabilities, including 15 levels of undo and an impressive magic-wand tool, but its naming conventions are bewildering. Apr 93

★★★ **DesignCAD 2D/3D 3.0.1**, DesignCAD, 918/825-4848, \$299.95. Despite slow rendering, this general-purpose 3-D modeler with 2-D drafting capabilities represents a price and performance breakthrough in 3-D modeling programs. Nov 92

★★★★ **ElectricImage Animation System 1.5.1**, Electric Image, 818/577-1627, \$7495. The most powerful animation program for the Mac improves its documentation and rendering, and adds an intuitive project window that allows you to control all aspects of animation from a single location. Unfortunately, it still retails for the price of a European vacation for two. Feb 93

★★★★ **Expert Color Paint 1.0**, Expert Software, 305/567-9990, \$49.95. A wonderful value for novices, this color paint program offers a tidy collection of features for an astonishingly low price. Beware of low memory settings, though, or it gets buggy. Jun 92

★★★★ **Fractal Design Painter 1.2 (2.0)**, Fractal Design Corp., 408/688-8800, \$349. An expanded collection of paper textures and four new watercolor brushes add appeal to an already strong set of painting tools. Minor complaints include unsophisticated gradation and fill capabilities and an insensitive Undo command. Aug 92

★★ **Image Assistant 1.0**, Caere Corp., 408/395-7000, \$495. Besides unsatisfactorily addressing Adobe Photoshop's small list of liabilities, this image-editing software is barely able to keep up with less expensive bitmap editors. Problems include an unforgivable lack of antialiased text, no selective revert function, and an incorrectly implemented smudge tool. Apr 93

★★★★ **Infini-D 2.0 (2.5)**, Specular International, 413/549-7600, \$995. Rich combination of 3-D modeling, rendering, and animation tools at a relatively affordable price. Visualization program works well, offers a nicely integrated approach to rendering, and is generally stable. Jan 93

★★★★ **IntelliDraw 1.0**, Aldus Corp., 206/628-2320, \$299. Crowd-pleasing features such as physical and dynamic links make this automated draw program a great environment for planning and presenting, although it's less satisfying as a free-form drawing tool. Nov 92

★ **MacDraw Pro 1.0v1 (1.5)**, Claris Corp., 408/727-8227, \$399. The shallow array of integrated features in this draw program is perfect for the new or moderately experienced user, but compared with other programs in the same price range, it's slow and deficient.

★ **MacPaint 2.0**, Claris Corp., 408/727-8227, \$125. Easy-to-use black-and-white paint program takes up very little RAM, but it adds few capabilities beyond those it offered eight years ago.

★ **MacRenderMan 1.0 (1.3)**, Pixar, 510/236-

4000, \$695. This dedicated renderer provides an extremely sophisticated, albeit sometimes difficult, way to generate 3-D images. Currently the most widespread rendering scheme, it uses algorithms to create textures, bumps, lights, fog, and practically every other element of an image.

★★★★ **MiniCAD+ 4**, Graphsoft, 410/461-9488, \$795. Professionals should be delighted with this highly competent CAD package's evolution into 3-D. It has maintained its features-champion status and is easier to use. Mar 93

★★★★ **Paint It 1.0**, Timeworks, 708/559-1300, \$59.95. Straightforward color paint program lacks image-editing tools but has a versatile cast of selection and painting tools—and it's priced to sell. Apr 93

★★★★ **Ray Dream Designer 2.02 (2.04)**, Ray Dream, 415/960-0765, \$895. Experienced 3-D aficionados will find this 3-D imaging software a welcome addition to their arsenal, and beginners may find it ideal for the leap from two dimensions to three. Improved text-handling and viewing capabilities would make it even better. Sep 92

★★★ **ScanMatch 1.01 (1.02)**, Savitar, 415/243-3030, \$199. Basically half a color-calibration system. Software quickly and easily adjusts color scan files for screen display, with somewhat uneven results; those wishing to adjust images for print purposes need to use another application. May 92

★★★ **Showplace 1.1 (1.1.1)**, Pixar, 510/236-4000, \$695. Straightforward graphics application organizes shading and rendering processes into five basic components. Beginners will like the simple interface, but the feature set is small for experienced users. Jun 92

★★★★ **Sketcher**, Fractal Design, 408/688-8800, \$149. A variety of effects reproduce the styles and techniques of traditional drawing tools with this wonderful gray-scale paint and image processing program. Feb 93

★★★★ **Smoothie 1.02**, Peirce Software, 408/244-6554, \$149. Create smoother screen images with this handy utility that antialiases the edges of on-screen artwork. Although it can't accommodate sound or accept imported QuickTime movies, it's a must for anyone who uses a Mac for presentations. Nov 92

★★ **StrataType 3d 1.0**, Strata, 801/628-5218, \$295. The rulers, texture palette, custom bevels, and canned positioning schemes of this 3-D type-effects software are nice, but they can't compare with the animation skills, single-character positioning features, lighting capabilities, and superb rendering of other available programs. Mar 93

★ **Swivel 3D Professional 1.0 (2.0)**, Macro-media, 415/252-2000, \$695. Relatively unusual cross-sectional technique makes this 3-D modeler a great tool, especially for fast prototyping. It provides a quick and easy way to create a variety of shapes.

★★★ **Typestry 1.0**, Pixar, 510/236-4000, \$299. Type enters the third dimension with this reasonably priced 3-D typographic effects and animation program. There's room for improvement, but it's an exciting tool for designers, multimedia producers, and those who enjoy working with type. Nov 92

★ **TypeStyler (2.0)**, Broderbund Software, 415/382-4400, \$219.95. The 35 shapes of this product's library let you reshape PostScript or TrueType fonts to create decorative special effects such as arches and perspective. TypeStyler turns fonts into graphics, enabling you to

stretch, compress, or rotate text, as well as add colors, grays, or patterns.

★★ **Zeus 0.91 (0.92)**, Delta Tao Software, 408/730-9336, \$499. Color paint program tries hard to match capabilities found in more expensive programs, but not always successfully. It's brimming with good ideas that are poorly implemented. Aug 92

MATH / SCIENCE

★★★ **Caduceus Physics 1.0**, Scientia, 617/776-3427, \$159.95. Giant HyperCard stack consists of carefully indexed cards covering small conceptual bites of physics; it's the first in a series of programs designed to prepare students for the Medical College Admissions Test (MCAT). Jan 93

★★★★ **Data Desk 4.0**, Data Description, 607/257-1000, \$595. For finding patterns in data, this statistical-analysis program has no peer. Years of refinement have made it a unique, and uniquely valuable, tool for analysis, despite its lack of some tests found in larger programs. May 93

★★★★ **Entrypaq 3.0**, Albathion Software, 415/824-2737, \$149.95. Low-end expert-systems shell is an excellent teaching tool, but the slow performance and HyperCard interface rule it out for practical implementation. Nov 92

★★★★ **Expert Astronomer 1.0**, Expert Software, 305/567-9990, \$49.95. Draw maps of the sky from any location in the Solar System and learn about celestial objects with this astronomy software. Most effective in color, this is a great educational tool for beginners and a reference database for experts. Dec 92

★★★★ **Expressionist 3.0**, Prescience Corp., 415/543-2252, \$199.95. If you work regularly on similar topics, you can customize this equation-writing software so that it produces equations with exactly the appearance you want, letting you work at amazing speed. Mar 93

★★★★ **HiQ 1.0 (1.1)**, Bimillennium Corp., 408/866-2010, \$695. A script language, which exhibits an endearing nonchalance about data structures and typing of variables, is only one of the impressive features of this formidable numerical mathematics software. Oct 92

★★★★ **Interactive Physics II 1.0 (1.01)**, Knowledge Revolution, 415/553-8153, \$399. Motion simulation software is an improvement over traditional classroom instruction in physics. This new version greatly expands the range of problems that can be solved, and adds support for QuickTime. Dec 92

★ **JMP 2.0 (2.05)**, SAS Institute, 919/677-8000, \$695. You get lots of value for your money with this statistical-analysis program and its vast assortment of functions, including strong classical statistics and visualizations, 3-D spin features, quality-control statistics, and a manual that is a model of concise clarity.

★★★★ **MacBreadboard 1.1**, Yoeric Software, 919/644-1620, \$59.95. Useful educational engineering software simulates with excruciating detail every aspect of a digital integrated-circuit breadboard trainer. It accurately replicates and even surpasses the behavior of a physical breadboard—without burning out IC chips. Dec 92

★★★★ **Maple V**, Brooks/Cole Publishing, 800/354-9706, \$450. For functional scope and ease of use on a basic Mac (such as a Classic or Plus), this symbolic math software has no competitors. May 92

✦ **Mathematica 2.0 (2.1), Wolfram Research, 217/398-0700, \$595.** While its memory demands are high, this symbolic-math program offers a truly vast array of functions, including over 800 numerical and symbolic routines. The quality and quantity of its support literature are outstanding.

★★★★ **MathType 3.0, Design Science, 310/433-0685, \$199.** This equation-writing software makes automatic typographical decisions, which is helpful if you produce documents on a wide range of subjects. Its smooth integration with Microsoft Word is also convenient. Mar 93
 ★★★★★ **Minitab 8.2, Minitab, 814/238-3280, \$695.** These statistical-analysis tools are broad but not exhaustive. Still, they're easy to learn and easy to use, making Minitab an excellent teaching tool. The graphics and output are unfortunately typewriter-like. Jun 92

★★ **NueX 1.1 (1.3), Charles River Analytics, 617/491-3474, \$295.** Lightweight introduction to artificial neural networks and knowledge-based expert systems has some merit, but cannot be considered a serious production tool. Oct 92

★★★★ **Sequencher 2.0, Gene Codes Corp., 313/769-7249, \$2200.** While not implementing everything a DNA researcher could want, this software for manipulating DNA-sequence information does provide the things a researcher really needs. The single best feature is its raw speed. Dec 92

★★★★ **SigmaPlot for the Macintosh 4.11, Jandel Scientific, 415/924-8640, \$495.** It's a short path from raw data to publishable graphs with this scientific graphing software. The Macintosh fundamentals need polish, but the program offers unique analytic capabilities. Jul 92

★★★★ **Simulink 1.2, The MathWorks, 508/653-1415, \$3995.** If you hear the word *Bode-plot* several times a week at work, this math-simulation software is designed to make your life wonderful. Little glitches and a command-line orientation are drawbacks. Dec 92

★★★★ **StatView 4.0m, Abacus Concepts, 510/540-1949, \$595.** A nice mix of statistical prowess and operating convenience distinguish this statistical-analysis and presentation software. The printing options are outstanding. Nov 92

★★★★ **TeMath 1.0, Brooks/Cole Publishing, 800/354-9706, \$39.95.** For roughly the price of a textbook, this mathematical-exploration software provides all the help a student needs to understand what's really happening in differential and integral calculus. Apr 92

ORGANIZATION/PRODUCTIVITY

★★ **ACT 1.0, Contact Software International, 214/919-9500, \$395.** While this contact manager has several laudable features, such as customizable contact views and an integrated word processor, learning how to use it is a frustrating experience. Feb 93

★★★★ **Active Memory 2.0, ASD Software, 714/624-2594, \$199.** Personal organizer distinguishes itself by providing strong network support, although it may be overkill for a lone user. Aug 92

✦ **Address Book Plus 2.0, PowerUp Software, 415/345-5900, \$99.95.** What you see is what you get with this field-based address-book software that sorts, selects, formats, and prints names and addresses in every conceivable way. The disadvantage is that the product is

slow, especially with more than 200 addresses in a file.

★★★★ **Agent DA 2.0 (2.1.1), TeamBuilding Technologies, 514/278-3010, \$129.** Simple, flexible calendar/reminder program includes every obvious calendar function—easy navigation, extensive print options, adjustable displays, recurring events, and even a straightforward manual. Sep 92

★★★★ **Amaze Daily Planners: Cathy, The Far Side, Word-A-Day (2.0/1993), Amaze, 206/820-7007, \$59.95.** A cartoon (or word) a day makes scheduling more fun with these icon-based calendar/daily planners, but the graphics take up a lot of hard drive space, and the programs must be running in order for alarms to sound. Sep 92

★★ **Connections 2.1, Concentrix Technology, 415/358-8600, \$199.** A wider range of scheduling features, new printing options, and improved networking capabilities don't change the fact that this HyperCard-based personal information manager is just too slow. Nov 92

★★★★ **DateBook 1.5.1, After Hours Software, 818/780-2220, \$125.** Personal time manager offers a flexible approach to event scheduling and to-do-list management. This upgrade adds new features and fixes bugs that plagued the first version. Feb 93

★★★★ **DayMaker 2.0, Pastel Development Corp., 212/941-7500, \$129.95.** If you need to organize lots of disparate information, follow up on meetings with many people, keep track of your own calendar, create an archive of completed work, and print out lists of to-do items to take on the road, this free-form personal information manager is a great choice. May 93

★★★★ **Dynodex 3.0, Portfolio Software, 408/252-0420, \$89.95.** The speed and printing options of this field-based address-book manager are still its strengths, but this upgrade brings welcome improvements to the interface, including automatic formatting of phone numbers. Apr 93

★★★★ **EasyAlarms 2.0.3, Essential Software, 914/889-8365, \$99.** Complex, flexible calendar, reminder, and to-do list program includes scripting and sound recording among many other features. Nov 92

★★★★ **First Things First 2.0 (3.0), Visionary Software, 503/246-6200, \$69.95.** The nifty on-screen clock that floats serenely above your windows is the most appealing feature of this good but basic event-reminder utility. Apr 92

★★ **Hello, Atelier Systems, 619/453-4300, \$99.** Unusual combination of contact management and word processing in a compact package. This first release is hampered by several notable flaws, such as text documents that must be linked to a contact name. Jan 93

★★★★ **In Control 1.0 (2.0), Attain Corp., 617/776-1110, \$129.95.** Shrink an immense list down to a bare skeleton and expand it again using this to-do-list manager's clean interface and collapsible row-and-column format. May 92

★★★★ **Inspiration 4.0, Inspiration Software, 503/245-9011, \$295.** Watch your ideas evolve in a dynamic diagram mode and a text-based outline mode with this brainstorming tool. It works best as a vehicle for organizing and developing ideas. Feb 93

★★★★ **Intouch 2.0.4, Advanced Software, 408/733-0745, \$99.95.** Free-form database is a fast and easy way to manage contact information. Program offers flexible data entry instead of automatic formatting. Although

this version adds a handy reminder system, it falls short as a calendar planner. Feb 93

★★★★ **Nolo's Personal RecordKeeper 3.0, Nolo Press, 510/549-1976, \$34.96.** Hierarchically configured database organizes your personal affairs, including legal matters, financial records, insurance plans, family history, and more, but it is frustratingly inflexible. Jan 93

★★★★ **Now Up-to-Date 1.0.1, Now Software, 503/274-2800, \$99.** The swift performance and logical structure of this network calendar program make it easy to use, but deficiencies, such as the lack of a to-do-list function, are frustrating. Oct 92

★★★★ **Office Manager 2.1 (2.5), White Crow Software, 800/424-0310, \$99.** Simple contact- and project-management software is powerful for small databases, but reliance on HyperCard limits its usefulness for low-end Macs. Dec 92

★★★★ **Spiral 1.0, Technology Works, 512/794-8533, \$129.** Designed for taking and organizing notes, this product provides an excellent feature set, including tabs, bookmarks, and an option for automatically expanding abbreviations, but it's marred by some annoying errors in the editing and import/export processes. Mar 93

★★★★ **TouchBase 2.0 (2.0.1), After Hours Software, 818/780-2220, \$125.** Entering data is quick and easy, and there are lots of useful printing options, but this personal information manager displays a few rough edges, such as not allowing you to copy the information in the Record Summary field. Aug 92

PRESENTATION TOOLS

★★★★ **Action 1.0, Macromedia, 415/252-2000, \$495.** Entry-level multimedia integration program offers, for its price, a rich selection of features, including an excellent variety of transitions as well as gradient and patterned backgrounds. It makes producing presentations with sound and motion surprisingly easy. Feb 93

★★★★ **Adobe Premiere 2.0 (2.0.1), Adobe Systems, 415/961-4400, \$495.** A dream command post for video professionals, this QuickTime movie-editing software produces stunning special effects with little effort. Only the program's appetite for memory, disk space, and computer horsepower prevent it from being the nonprofessional's dream as well. Jan 93

✦ **Aldus Persuasion 2.1 (2.12), Aldus Corp., 206/628-2320, \$495.** For slide presentations, this product provides an all-in-one studio where each element—outline entries, slides, notes, handouts, and charts—is dynamically linked to the others. It offers layered builds and automated templates, and has a proven track record.

★★★★ **Animation Clips 1.0, Media In Motion, 415/621-0707, \$99.** Spice up a presentation with an animated stapler, a jukebox that's a work of art, or any of 58 other customizable animations from these business-oriented packages. Marred only by some choppiness and a few lesser-quality animations. Jun 92

★★★★ **CameraMan 1.0 (1.1), Vision Software International, 408/748-8411, \$149.** If you need to record continuous screen operations, this screen recorder is the best deal around. It handles 32-bit QuickDraw, takes advantage of QuickTime's long list of compression and playback capabilities, and even uses custom frame sizes. Sep 92
continues

Star Ratings

★★★ **Cinematic 1.0, Vividus Corp., 415/494-2111, \$495.** Easy-to-use program merges animation, interactivity, and presentation features, but the image- and text-handling capabilities are less than stellar. Jul 92

★★★ **DiVA VideoShop 1.0, DiVA Corp., 617/491-4147, \$599.** Instantaneous playback sets this graceful QuickTime editing software apart. Its simple beauty is slightly offset by a few rough edges, a lousy manual, and an occasionally clumsy interface. Jul 92

☑ **HyperCard 2.1, Claris Corp., 408/727-8227, \$199.** Ease of use has made this multimedia-authoring software a tool for the masses. Although color is awkwardly implemented, more add-on products have been developed for this than for any other multimedia program.

★★★ **MacroMind Director 3.1, Macromedia, 415/252-2000, \$1195.** This minor update to a powerful and versatile multimedia authoring tool adds 23 scripting commands, QuickTime importing and editing, and a utility that compiles movies into a faster playback format—but the whopping \$149 addition to the price makes it an upgrade most users can afford to miss. Feb 93

★★★ **Magic 1.0 (1.1), Macromedia, 415/252-2000, \$395.** Outstanding editing features make this multimedia-presentation software easy to master. Many of the features of more-complex programs are missing, but what it does, it does well. Aug 92

★★★ **Media-Pedia Video Clips, Media-Pedia, 617/235-5617, VHS \$195; S-VHS, Hi8, and 3/4SP \$295; BetaCamSP \$495.** Fifty-seven minutes of stock footage for use in QuickTime movies includes over 150 different segments, ranging from unremarkable to dramatic to genuinely funny. Apr 93

★★★★ **Microsoft PowerPoint 3.0, Microsoft, 206/882-8080, \$495.** This remarkable upgrade puts this presentation program ahead of the pack in terms of convenience and ease of use. Although the ready-made template collection is pretty paltry, the extensive system of master layers, reliable cross-platform compatibility, and strong on-screen presentation capabilities more than compensate. Feb 93

★★★ **Morph 1.0, Gryphon Software Corp., 619/454-6836, \$149.** With patience and practice, you can become a high-tech special-effects wizard using this image-melding movie utility that "melts" one image into another. While using it is simplicity itself, you can only morph still images, and the program suffers from some first-release glitches. Nov 92

★★ **Motion Works ProMotion 1.0 (1.02), Motion Works, 604/685-9975, \$395.** Inexpensive animation program consolidates a slew of tempting features, including flexible path tools and ambitious support for Apple events, but the capabilities are strung together with a weak and problem-ridden interface. Nov 92

★★★ **Passport Producer 1.0, Passport Designs, 415/726-0280, \$495.** Strong timing controls and good sound capabilities mix with middling text- and image-handling and a lack of even basic animation options in this partially successful entry-level multimedia program. Apr 93

★★★ **Special Delivery 1.0, Interactive Media Corp., 415/948-0745, \$399.** While this entry-level multimedia package has all the tools you need to assemble interactive screen presentations that burst with motion and sound, it has a disorienting interface and lacks

the polish and power of other similarly priced programs. Mar 93

PROGRAMMING

★★★ **EdScheme 3.4, Schemers, 305/776-7376, \$49.95.** This clear, elegant programming language is an excellent tool for learning good programming techniques, although it can't be used to create stand-alone applications. Nov 92

★★★ **MetaDesign for the Macintosh 3.0, Meta Software Corp., 617/576-6920, \$250.** This diagramming tool for structured systems analysis offers easy ways to group and ungroup symbols in diagrams and to show relationships between symbols. It excels at austere, classic flowcharts but could use some flashier features, such as shaded backgrounds, for presentations. Mar 93

★★★★ **Object Master 1.0.2, ACI US, 408/252-4444, \$395.** Successful combination of the superior object-management facilities typically found in Smalltalk as well as a first-rate programmer's editor. Plus it works with the most popular languages: C, C++, and Pascal. Jan 93

★★★★ **Prograph 2.5, TGS Systems, 902/455-4446, \$495.** Elegantly designed, object-oriented development environment simplifies Macintosh programming. The graphics-based program is conceptually more advanced than traditional object-oriented programming. Jun 92

★★★ **Serius Programmer 3.0, Serius Corp., 801/261-7900, \$395.** The graphical interface of this application-design environment provides nonprogrammers with tools for creating custom software, but the documentation lacks critical explanations. Jan 93

★★★★ **Think C 5.0, Symantec Corp., 408/253-9600, \$299.** Although not a radical improvement, this is a significant upgrade to an outstanding development tool. Beginners will not find the documentation helpful. Jul 92

★★★★ **Think Pascal 4.0, Symantec Corp., 408/252-3570, \$249.** A remarkable achievement—a programming language and environment full-bodied enough for professional programmers while still inviting for neophytes. No weak points and dozens of strengths. Aug 92

★★★★ **UserLand Frontier 1.0 (2.0), UserLand Software, 415/369-6600, \$249.** A robust scripting language distinguishes this ground-breaking desktop programming tool that can automate desktop functions, repetitive data-managements tasks, and more. Scripts can only be used on computers with copies of the program. Jul 92

UTILITIES

☑ **After Dark 2.0, Berkeley Systems, 510/540-5536, \$49.95.** Turn your screen into an aquarium or a view of a night skyline with this whimsical screen saver that includes more than 30 different modules.

★★★ **ALSoft Power Utilities 1.0.1 (1.0.2), ALSoft, 713/353-4090, \$129.95.** Buying this set of seven utilities is more economical than purchasing the included disk optimizer and resource manager (DiskExpress II and MasterJuggler) separately, but the other five utilities are unimpressive. Aug 92

★★★★ **At Ease, Apple Computer, 408/996-1010, \$59.** Sweet, simple, secure substitute for the Finder displays a clean, attractive page full of oversize icons where

a single click launches a program or document. To delete, rename, or move files, you have to return to the Finder. Mar 93

★★★ **AutoDoubler 1.0.7 (2.0), Salient Software, 415/321-5375, \$79.95.** Designed to operate transparently, this automatic file-compression utility is a practical solution for users short on disk space, but it's missing many of the features of dedicated file-compression utilities, and it provides only limited control over the process. Sep 92

★★★ **BetterWriters 1.0.1 (1.0.3), GDT Software, 604/291-9121, \$69.** Smart drivers teach your ImageWriter, StyleWriter, or DeskWriter laser printer tricks, letting it perform printing gymnastics such as inverting images and adding a variety of options for improving output. Minor incompatibilities with some common applications are inconvenient. Jul 92

★★★★ **Citadel with Shredder 1.0 (1.1), Microcom, 919/490-1277, \$149.95.** Simple, convenient set of system-security tools covers all the bases, including password protection, encryption, permanent erasure, and more. Jun 92

★★★★ **Conflict Catcher and Other Innovative Utilities 1.0, Casady & Greene, 408/484-9228, \$79.95.** Enable or disable your INITs and start-up items when you boot-up, with this INIT manager that comes with four other system-related utilities. Its ability to track down INIT-related problems makes it a worthwhile investment even if you already have another INIT manager. Mar 93

★★★ **Copyright, CSG Technologies, 412/471-7170, \$49.** If you can justify spending \$49 purely for the sake of efficiency, this straightforward utility replaces the Finder's copy function, unobtrusively copying files to or from your Mac, in the background, while you move on to more interesting things. Apr 93

★★★ **CPU 1.0j, Connectix Corp., 415/571-5100, \$99.** Indispensable items mix with trivial ones in this collection of utilities for the PowerBook. It's a relatively inexpensive way to turn any PowerBook owner into a full-fledged power user. Apr 93

★★ **Crash Barrier 1.0.1 (1.1), Casady & Greene, 408/484-9228, \$79.95.** Control panel device is supposed to intervene during system crashes. It's a great idea, but it only works for certain types of crashes. Apr 92

☑ **DiskDoubler 3.7 (3.76), Salient Software, 415/321-5375, \$79.95.** With its impressive safety features, extremely tight compression, and respectable speed, this file-compression utility is a must-have for anyone who could use more hard drive space.

★★★ **DiskFit Pro 1.0 (1.1), Dantz Development Corp., 510/849-0293, \$125.** Effective backup utility requires a time- and disk-consuming initial full backup, but subsequent incremental backups are simple and speedy. It does not support tape drives. Apr 92

★★★ **Drive 7 2.3, Casa Blanca Works, 415/461-2227, \$79.95.** Universal hard drive updater and formatter has an attractive, uncluttered interface that's so easy to use it makes hard drive maintenance almost relaxing. Jan 93

★★★★ **easyPrint 1.0, SF/O, 402/291-0113, \$29.95.** Nifty utility lets you switch printers without using the Chooser. It's a bargain for network users and those who frequently change output devices. Oct 92

❑ **Exposure Pro 1.0.2 (1.02), Baseline Publishing, 901/682-9676, \$139.95.** A floating palette in this screen-capture utility lets you edit your screen shots before you save them. It's a clever idea for those who don't own a paint program, but it creates only 72-dpi bitmaps.

★★★★ **Fastback Plus 2.6 (3.0), Fifth Generation Systems, 504/291-7221, \$189.** Even the most hardened shirker should be inspired to back up by the marvelously simple interface of this software. One warning—memory shortages can cause it to quit unexpectedly when running in the background. Apr 92

★★★★ **FolderBolt 1.02 (1.02c), Kent Marsh, 713/522-5625, \$129.95.** Three designated levels of folder protection, plus flexible options for password-handling, among other actions, are the assets of this utility. File encryption, however, is not included. Jun 92

★★ **Gofer 2.0, Microlytics, 716/248-9150, \$79.95.** Poky processing time is the trade-off for flexible text-search options without indexing by this file-finding utility. Our reviewer vetoed the trade. Jun 92

★★★★ **HAM 1.0, Microseeds Publishing, 203/435-4995, \$79.95.** Apple-menu enhancer adds submenus, allows reordering, and includes a folder of recently opened items in your Apple menu. Apr 92

★★★★ **Hard Disk Toolkit Personal Edition 1.1.2, FWB Software, 415/474-8055, \$79.** The more arcane features of the heavy-duty Hard Disk Toolkit have been stripped out of this entry-level, non-power-user version, but everything you really need to format, update, partition, and manage your hard drive is still included in the Personal Edition. Jan 93

★★★★ **INITPicker 3.0, Inline Design, 203/435-4995, \$79.95.** This INIT manager's ability to load aliased INITs over a network will interest network managers. While it disables problem INITs at start-up, it doesn't help you identify the cause of INIT conflicts that don't cause the Mac to crash at start-up. Mar 93

★★★★ **Inline Sync 1.0, Inline Design, 203/435-4995, \$129.95.** Keep the latest version of your work on both your portable machine and your desktop Mac with this file-synchronization software. It's easy to install, easy to use, easy on the wallet, and it does the job well. Mar 93

★★★★ **Kiwi Power Menus 1.0, Kiwi Software, 805/685-4031, \$39.95.** Simple little utility adds flexibility to the Apple menu by adding an unlimited number of submenus and enabling you to change the font and size in the menus. Dec 92

★★★★ **Kiwi Power Windows 1.5 (1.5.2), Kiwi Software, 805/685-4031, \$79.95.** Our skeptical reviewer found this system extension surprisingly handy. Its hierarchical menu lists all the open windows in the Finder and any applications. Jul 92

★★★★ **MacPalette II 2.2, Microspot USA, 408/253-2000, \$69.** You can print images from 8-bit and 24-bit color programs when you use an ImageWriter II with a four-color ribbon and this new driver that approximates halftones by dithering. While the results are less than state-of-the-art, so is the cost. Sep 92

★★★★ **MacTools 2.0, Central Point Software, 503/690-8090, \$149.** The consistent, 3-D-style interface makes it easy for the inexperienced user to navigate this utility package; the automated hard drive and floppy-disk repair capabilities and antivirus capabilities make it an asset for anyone. Oct 92

★★★★ **Magnet 1.0, No Hands Software, 415/321-7340, \$129.95.** Automation aids the laborious task of file management with this software. It creates "agents" or "magnets" that trigger in response to user-specified events and automatically look for files and folders to copy, move, or alias. Feb 93

★★★★ **MasterFinder 1.2.1, Olduvai Corp., 305/670-1112, \$149.** Ingenious finder utility provides rapid access to frequently used files and folders, permits operations on several files at once, and saves catalogs of offline volumes, but the many features require some effort to learn. Nov 92

★★★★ **More Disk Space 1.1 (1.2), Alysis Software Corp., 415/566-2263, \$39.95.** Automatically compress and expand files with this utility. Although it doesn't identify compressed files, and must run as a start-up application to work automatically, it does offer a measure of control that similar utilities lack. Sep 92

★★★★ **NightWatch II 2.0.1b, Kent Marsh, 713/522-5625, \$159.95.** Although skillful snoops can override the screen-locker feature of this hard drive security utility, the password protection provides a flexible and safe method of restricting access to anyone turning on your hard drive. Nov 92

★★★★ **Nok Nok 1.0 (1.0.3), Trik, 617/933-8810, \$49.95.** Plug the security holes that System 7 file sharing created, with this effective file-share monitoring utility that logs people's attempts to connect to your Mac, alerts you when someone does connect, and sets time limits for file share users. Oct 92

★★★★ **Norton Essentials for PowerBook 1.0, Symantec Corp., 310/453-4600, \$129.** Uneven collection of a dozen PowerBook utilities ranges from the unique and useful Instant Access module, which automatically turns AppleTalk on and off, to the relatively inaccurate Battery Gauge feature, which purports to tell you the status of your battery. Apr 93

★★★★ **Norton Utilities for Macintosh 2.0, Symantec Corp., 310/453-4600, \$149.** Everything—including the kitchen-sink utility package does an excellent job of diagnosing and repairing damaged hard drives and floppy disks, but the interfaces of the various components differ wildly. Oct 92

❑ **Now Utilities 3.0.2 (4.0.1), Now Software, 503/274-2800, \$149.** Despite minor imperfections, this collection of utilities, including ten separate programs and a variety of sample and support files, provides lots of highly polished bang for your buck.

★★★★ **On Location 2.0.1, On Technology, 617/876-0900, \$129.95.** Fast file-finding utility with improved functionality shows formatted files, and updates index in background. Alas, the initial indexing is time-consuming, and the search functions are incomplete. Jun 92

★★★★ **PicturePress 2.5, Storm Technology, 415/691-6600, \$199.** This image-compression software supports every useful storage mode; has new calculation features for improved image fidelity; offers utilities with practical advantages for day-to-day graphics work; and is twice as fast as version 2.0. If you work with images professionally, it's the clear choice. Mar 93

★★★★ **PowerMerge 1.0.2, Leader Technologies, 714/757-1787, \$129.** File-synchronization utility has a potentially confusing interface, but is a handy means of updating selected files so that different Macs end up with identical versions of the selected documents. Apr 93

★★★★ **Retrieve It 1.0, MVP Software, 415/599-2704, \$129.** It's great that this nonindexed file-finding utility allows you to search by file name as well as by text, but it is definitely slower than indexed searching. Nov 92

★★★★ **Shredder 1.0.1, DLM Software, 619/453-4984, \$69.** Permanently blitz your data with this quick and easy trash-management tool that writes over deleted data—in accordance with Department of Defense specifications—so that file-restoration programs can't bring it back. Jul 92

★★★★ **Silverlining 5.4, La Cie, 800/999-3919, \$149.** Extensive and detailed testing is only one of many advanced functions offered by this hard drive-management utility. The interface is lackluster and apt to confuse beginners. Jan 93

★★★★ **SnapBack 1.0, Golden Triangle Computers, 619/279-2100, \$129.** For regular day-to-day backups, this network backup software is a great choice. Its strength lies in its simplicity and its easy-to-use, one-window interface, but it requires a dedicated hard drive. Dec 92

★★★★ **SpeedyCD 1.2.2 (1.2.4), ShirtPocket Software, 602/966-7667, \$70.** Get Info gets faster with this CD ROM-access accelerator that creates a database of files from a CD and puts it on your hard drive. If you regularly browse through the same CD ROM folders, this product might save you enough time for it to be worth the \$70. Nov 92

★★★★ **Super 7 Utilities, Atticus Software, 203/324-1142, \$99.95.** Collection of seven control panels/extensions adds some ease of use to System 7, although none of its functions are essential. Modules perform tricks such as turning any menu into a tear-off palette, and randomizing the sounds that play in response to errors. Apr 93

★★ **SuperDuper 1.7, NeoConcepts, 408/899-4821, \$79.** If you're sick of duplicating disks with the Finder, this utility is an acceptable alternative, but there are other utilities that are better, cheaper, and do the same thing. Nov 92

❑ **Symantec Antivirus for the Mac (SAM) (3.0.9), Symantec, 408/253-9600, \$99.** No-holds-barred virus fighter monitors your Mac and alerts you when it sees suspicious activity. Advanced users and network managers will appreciate its customization features and extensive scanning options.

★★★★ **TimeLog 1.01 (1.02), Coral Research, 702/831-9346, \$97.** Even jaded computer users will approve of the reporting options offered by this utility for recording program-usage information. No network features included. Jul 92

★★★★ **UpDiff 1.0, KyZen Corp., 609/354-3863, \$169.** Innovative program compares two versions of a file, extracts the differences, and creates a difference file that is typically smaller than the original and can be used to update the older file. Dec 92

★★★★ **Voice Navigator SW 2.3, Articulate Systems, 617/935-5656, \$399.** Talk back to your Mac (if it has built-in sound input) with this speech-recognition software. Defining macros that respond to voice commands can be frustrating, but the product is a real boon for disabled users. Jan 93

★★★★ **Wallpaper 1.0.1 (1.0.2), Thought I Could, 212/673-9724, \$59.99.** Terrific control panel

continues

Star Ratings

device lets you design, edit, import, and display repeating patterns on your Mac's desktop. Comes with fun, creative predesigned patterns. May 92

★★★ **WindoWatch 1.52 (1.53), ASD Software, 714/624-2594, \$149.** If your primary concern is to track program and file use, this utility will handle the job nicely. Using it for the purpose of time billing with numerous programs, however, may be a maintenance nightmare. Jul 92

★★★ **WonderPrint 1.0, Delta Tao Software, 408/730-9336, \$59.** StyleWriters and DeskWriters produce halftones good enough for newsletters with this printing extension that improves the output of QuickDraw printers and accelerates printing of pictures on PostScript printers. Jan 93

★★ **Workspace 1.0, Ark Interface, 206/654-4127, \$149.** Although this novel desktop replacement is an intriguing first step toward improving the Finder, not enough functionality was added to satisfy our reviewer. Jul 92

★★★ **Zephyr Palettes for PageMaker, Zephyr Palettes for FreeHand 1.0.2 (1.3), Zephyr Design, 206/324-0292, \$79.95.** Exchange pull-down menus for palettes in PageMaker or FreeHand with these cleverly conceived, modestly priced utilities. A number of details could still be smoothed, but none are real stumbling blocks. Jul 92

VERTICAL MARKETS

★★★ **Compare-A-Loan 4.0.2, Softflair, 612/894-3357, \$79.95.** Although geared to professionals, this product for home-loan evaluation provides thorough documentation and is structured so that anyone can use it. Its reports compare payback schedules of various home-loan options. Apr 93

★★ **ConstructionMac 1.2 (2.0), Revelar Software, 801/485-3291, \$99.** With a lot of work from you, this software will organize your construction or remodeling project. Oct 92

★★ **The Desktop Lawyer, The Open University, 407/649-8488, \$99.95.** The manual included with this collection of more than 300 legal-document templates provides an excellent overview of legal concepts; too bad the directions for filling out the forms are so unclear. Apr 92

★★★★ **Diet Balancer 1.0, Nutridata Software Corp., 914/298-1308, \$69.95.** Easy-to-use personalized weight-planning tool includes a database of nutritional values and standard serving sizes, and is useful for home diet-planning. Dec 92

★★ **Expert Landscape Design, Expert Software, 305/567-9990, \$49.95.** Bare-bones drawing environment for experimenting with landscape design is inexpensive, but its usefulness is severely limited because of awkward color and pattern tools and because it doesn't identify plant types. Feb 93

★★★★ **Grade Machine 5.0, Misty City Software, 800/795-0049, \$79.** Teachers' lives get easier with this software that quickly sets up a useful electronic grade book. Program includes networking capabilities plus dozens of options for printing reports. Dec 92

★★★ **JobTracker 2.02, InfoSolutions, 814/355-2983, \$395 to \$844.** Designed specifically for publication management, this scheduling and project-man-

agement software isn't completely polished, but it manages the job competently. Dec 92

★★★ **Legal LetterWorks 1.0, Round Lake Publishing, 203/438-1048, \$79.95.** Any word processor can open the 165 legal-document templates included in this collection, and the modular form design is relatively versatile. Apr 92

★★★ **LoanLease Library 3.0.3, Softflair, 612/894-3357, \$79.95.** If you are generating a loan or a lease and need to keep track of payments, this well-documented program for loan evaluation is a worthwhile investment, despite its minor eccentricities. Apr 93

★★★ **Making the Grade 2.0, Jay Klein Productions, 719/591-9815, \$99.95.** The Macintosh version of the Apple II program Grade Busters 1/2/3, this grade-book software with dozens of reporting options is easy to learn; but if you're already spreadsheet-literate, the friendly dialog boxes and reminders may get in the way. Dec 92

★★★★ **Nolo's Living Trust 1.0, Nolo Press, 510/549-1976, \$79.95.** Gracefully guiding users through the process of drafting a living trust, this product is carefully thought out and a great value for simple trusts. Aug 92

★★★ **Nutri-Calc Plus 1.2, Camde Corp., 602/926-2632, \$225.** Designed for knowledgeable and serious users, this powerful, flexible program manages nutrition information and analyzes diets. Dec 92

★★★ **Stat-Ref 3.2a, Teton Data Systems, 307/733-9258, \$95.** Medical database on CD ROM lets you search by keyword. Because it provides access to limited sets of journal citations, it's not suitable for research, but it could effectively replace a small reference library in an office. Jan 93

WRITING TOOLS

★★ **Correct Grammar 3.0 (3.01), Wordstar International, 415/382-8000, \$99.** Illogical and inappropriate recommendations are a hallmark of all grammar checkers, but this one also violates Mac conventions in irritating ways. Aug 92

★★★ **Correct Letters 1.1 (1.0), Wordstar International, 415/382-8000, \$49.** In addition to more than 250 ready-made business letters, this HyperCard-based product boasts an excellent online Guide to Letter Writing. The disabled Find command is mystifying and inconvenient. Jul 92

★★ **Correct Writing 2.0, Wordstar International, 415/382-8000, \$49.** For those who are unsure of the elements of style, this online reference is convenient and comparatively inexpensive, but it is far from complete. Sep 92

★★★ **DocuComp II 1.0 (1.03), Advanced Software, 408/733-0745, \$179.95.** Document-management utility compares text in two versions of the same file and reports the differences in a comprehensive, easy-to-follow format. Nov 92

★★★★ **EndNote Plus 1.2 (1.2.1), Niles and Associates, 510/649-8176, \$249.** Reference database and tool for creating citations and bibliographies is now accessible from within Microsoft Word 5.0, representing a significant enhancement to this excellent product. Sep 92

★★★★ **Final Draft 2.0, MacToolkit, 310/395-**

4242, \$349. Script-writing gets simpler with this well-conceived software that automates formatting of different elements in a script, including dialogue, action, and slug lines (scene headings). Customization is easy, and macros automate typing of common phrases such as "fade to black." Apr 93

★★★ **IdeaFisher 2.0, Fisher Idea Systems, 714/474-8111, \$595.** Inspiration never comes easily, but this creativity tool with a question bank of 6000 questions and an idea bank of 61,000 words and 700,000 links might help get the juices flowing. Jan 93

★★★ **Just Joking 1.0, WordStar International, 415/382-8000, \$49.** HyperCard stack of around 2800 humorous quotations offers a serviceable selection of sayings from a diverse group of humorists, comedians, philosophers, and writers, among others. Apr 93

★★★ **LetterPerfect for Macintosh 2.1, WordPerfect Corp., 801/225-5000, \$149.** Stripped-down version of WordPerfect measures up as a serviceable low-end word processor, with clean, accurate documentation and an uncluttered interface. Jan 93

★★★★ **Microsoft Word 5.1, Microsoft, 206/882-8080, \$495.** Small, solid upgrade fine-tunes some plug-in modules and adds new modules including an icon tool bar, text annotation, and other features. The numerous minor enhancements make it worth the upgrade price, but it's not likely to give Word 5.0 users goosebumps. Mar 93

★★ **Nisus Compact 3.3 (3.31), Nisus Software, 619/481-1477, \$150.** Inexpensive price and low disk-space requirements don't compensate for this word processor's many missing features, including mail merge, macros, and word count. Memory quirks are an additional problem. Aug 92

★★★ **Plots Unlimited 1.04, Ashleywilde, 310/456-1277, \$399.** Peter loves Allison but she has a breakdown when he confesses to murder. Or maybe not. This writing tool's database contains 5600 plot twists, all linked. The interface is imperfect, leaving items in bold when they should be grayed out, and it requires too much mousing. Jul 92

★★★★ **Pro-Cite 2.0, Personal Bibliographic Software, 313/996-1580, \$395.** Valuable bibliographic database program generates large, complex bibliographies. Some features aren't easy to use, but it does have 20 predefined and 6 user-defined forms, plus flexible sorting options. Jun 92

★★★ **RightWriter for the Mac 5.0, Que Software, 317/573-2500, \$99.95.** Grammar checker looks at writing style, word usage, punctuation, and capitalization, as well as grammar. Customizable writing-style filters and multiple approaches to analysis are nice, but—as with all grammar checkers—following all of the program's advice is likely to hurt, not help, your writing. May 93

★★★★ **ShowScape 4.1, Lake Compuframes, 914/941-1998, \$429, with WordPerfect 2.0 \$679.** This script-writing software formats scripts in either screenplay format or dual-column format (for audio and video) and allows you to choose the number of shots displayed per page, but it requires you to own and work in WordPerfect. Apr 93

★ **StoryLine 1.02 (1.4), Truby's Writers Studio, 310/575-3050, \$345.** Frustrating and sometimes haphazard HyperCard-based program attempts to offer expert training in the craft of plot development. Aug 92

★★ **Taste 1.02 (1.02c), DeltaPoint, 408/648-4000, \$149.** The page-view, WYSIWYG orientation of this word processor with page-layout features makes it considerably slower than text-oriented word processors. Redraw and translator bugs are other problems. May 92

★★★ **Thunder 7 1.0.5 (1.5), Baseline Publishing, 901/682-9676, \$99.95.** The speed, customizing options, and overall feature-set of this stand-alone spelling checker and thesaurus are admirable, but before you can trust it implicitly, it needs a dictionary with greater integrity. Jul 92

★★★ **TypeReader 1.0, ExperVision, 408/428-9988, \$695.** Speed and accuracy combine with a straightforward operating style in this high-end optical character-recognition software that doesn't do everything its competition does, but is a major contender nonetheless. Feb 93

★★★ **VersionMaster 1.5, AStar Technologies, 508/486-8532, \$199.95, five users \$799.95, ten users \$1199.95.** Document-management utility helps you archive and track versions of a file by maintaining a database of altered documents. It's recommended only for workgroups that routinely follow check-out procedures and that don't need detailed reports of the changes to a file. Apr 93

★★★ **WordPerfect for Macintosh 2.1 (2.1.2), WordPerfect Corp., 801/225-5000, \$495.** Play QuickTime movies in your text files or publish and subscribe with this upgrade. It continues to provide the best desktop publishing and graphics capabilities of any word processor, but it lacks glossary- and table-creation features. Jun 92

★★★ **WordScan, WordScan Plus 1.0 (1.01), Calera Recognition Systems, 408/720-8300, \$295, \$595.** The idiosyncratic interface of these two OCR programs is only a minor inconvenience considering their relative accuracy and speed. Jun 92

★★★★ **WriteNow 3.0, T/Maker Company, 415/962-0195, \$249.** The streamlined approach of this low-end word processor will appeal to many Macintosh users, especially the storage-conscious. A nice mix of features includes impressive implementation of style sheets. Sep 92

Hardware

INPUT DEVICES

★★★★ **A¹ Mouse, Mouse Systems Corp., 510/656-1117, \$134.95.** A smooth ride and tight resolution characterize this optical device with three light-touch keys. Stronger software would have made it a more attractive package; the software's incompatibilities and limitations are a problem. Jun 92

★★★ **Acecat for Macintosh, AceCAD, 408/655-1900, \$149.** It's the hands-down winner in the digitizing-tablet price competition, but although this product works well, it lacks some of the amenities of higher-end tablets. Aug 92

★★★★ **The Bat, Infogrip, 504/766-8082, \$495.** Right- and left-hand keypads slant the little fingers down and the thumbs up, with built-in wrist rests. Our reviewer considered it the best ergonomic device she'd seen; the downside is learning to type all over again. Oct 92

★★★ **DrawingBoard II, Drawing Pad, CalComp, 800/932-1212, \$645, \$395.** Two lik-

able features of these digitizing tablets are the transparent, hinged cover for securing artwork, and a menu strip with buttons for changing drawing modes and accessing macros. Stylus problems and CalComp's haphazard tech support are drawbacks. Jul 92

★★★ **Mouse-Trak, Itac Systems, 214/494-3073, \$179.** Well-positioned, easy-to-rotate trackball with a soft wrist-pad is comfortable to use, but must be disassembled to reconfigure the buttons. Nov 92

★★★ **MouseMan, Logitech, 510/795-8500, \$129.** Bear-paw-shape mouse with three programmable buttons is handsome and solidly made. It may be too big for some hands. Jun 92

★★★ **TrackMan, Logitech, 510/795-8500, \$149.** There's a right-hand bias to this trackball with three programmable buttons and a handy click-lock feature. Jun 92

★★★★ **Turbo Mouse 4.0, Kensington Micro-ware, 415/572-2700, \$169.95.** The large buttons on either side of this trackball provide just the right measure of tactile feedback while the removable ball glides freely. The breakthrough feature, though, is the software that lets you customize many of the trackball's functions. Nov 92

★★★ **The UnMouse, Microtouch Systems, 508/694-9900, \$199.** Input device is a cursor control device, programmable keypad, and small graphics tablet in one, and can be programmed with 60 macros (although only 16 can be selected by sight). It's ergonomically better than a mouse, but not as good as a trackball. May 93

★★★ **Voice Express, MacSema, 503/757-1520, \$399.** Voice-recognition board lets you record words or phrases that trigger simple key sequences, but commands are limited to those with keyboard equivalents, and the system is weighed down by several quirky features. Apr 92

★★★ **Voice Navigator II, Articulate Systems, 617/935-5656, \$699.** Stand-alone SCSI device offers an impressive, full-featured set of tools for voice control of your Mac, but mastering them takes time and effort. Apr 92

★★★ **Z-Nix Cordless SuperMouse, Z-Nix, 714/629-8050, \$99.** Sleek and attractive cordless mouse works reliably and is attractively priced, but suffers from the same line-of-sight limitations as other infrared devices (such as TV remote controls). Dec 92

MISCELLANEOUS HARDWARE

★★★ **ACS300 Computer Speaker System, Altec Lansing Consumer Products, 717/296-4434, \$400.** Clamshell-shape high/midrange speakers come with a freestanding subwoofer and power supply. The sound is rich and smooth, but the cabling is nonstandard, and there is no on/off switch. Nov 92

★★★ **Bose RoomMate speakers, Bose Corp., 508/879-7330, \$329.** Shielded stereo speakers with a rich, bassy sound can double as regular stereo speakers. Unfortunately, they're heavy, expensive, and the highs are muddy. Jun 92

★★★ **MacSpeaker MS-1, Monster Cable, 415/871-6000, \$229.95.** Crystal-clear highs and a meaty midrange are the best features of these shielded stereo speakers. They're beautifully designed for close-up listening, but the bass sounds wimpy. Jun 92

★★★★ **Media Control Station, JLCoeper Elec-**

tronics, 310/306-4131, \$269.95. This versatile tool connects to the Mac through an ADB port and offers an easy and intuitive way to cue and edit QuickTime movies, MIDI files, multimedia playlists, and other dynamic data. Feb 93

★★★★ **The Miracle Piano Teaching System 1.0, Software Toolworks, 415/883-3000, \$499.95.** Painstakingly crafted music and piano instructor comes with keyboard, software, and 120 songs, including classical, movie-theme, and rock. The program offers encouragement and advice, and ends every lesson with a synthesized orchestra accompaniment. Oct 92

★★★★ **The Mouse Yoke, Colorado Spectrum, 303/225-6929, \$34.95.** Gadget turns an ordinary mechanical mouse into an aircraft-style steering wheel, or yoke, for use with flight simulators. Simple, elegantly executed concept uses quality materials; device is not appropriate for driving simulations or shooting games. Dec 92

★★★ **Organizer Link II (Model OZ-893), Sharp Corp., 800/321-8877, \$129.99.** If you own a 5000-, 7000-, or 8000- series Sharp Wizard, this program and cable allow you to connect it to a Mac serial port to exchange data. It's functional, but does have some minor weaknesses. Jan 93

★★★ **PhonePro 1.0.3 (1.1), Cypress Research Corp., 408/752-2700, \$950.** Application makes it relatively easy to develop a multiple-choice voice-mail system using your Mac, especially for those with programming backgrounds. The product includes a 9600-bps modem and a headset/microphone. Feb 93

★★★★ **PowerKey 2.0, Sophisticated Circuits, 206/485-7979, \$119.** Ingenious, well-designed automated power strip has four surge-protected outlets that are controlled by the keyboard's on/off switch. The equally clever software can turn on your Mac, unattended, run a QuickKeys macro (QuickKeys Lite included), and shut down again. Dec 92

★★★★ **Ringo LM, MacSema, 503/757-1520, \$189.95.** If your sole phone-line is doing double duty as a fax and voice line, this telephone-line manager is the answer to your prayers. May 92

★★★ **Yamaha TG100, Yamaha Corp. of America, 714/522-9011, \$449.** Compact, keyboardless, multitimbral MIDI synthesizer with built-in MIDI interface adheres to the life-simplifying General MIDI standard patch arrangement. Although it won't convince you that you're hearing a live orchestra, the sound is about as realistic as low-cost MIDI gets. Apr 93

MODEMS / NETWORK HARDWARE

★★★★ **Comstation 2, PSI Integration, 408/559-8544, \$399.** Unusually well designed software accompanies this fax/data modem. The simple, straightforward interface and handy QuickFax DA are positives; uninformative error messages are minor negatives. Jun 92

★★★ **Comstation 4, PSI Integration, 408/559-8544, \$499.** An otherwise solid fax/data modem for network use is hurt by an awkward process for distributing faxes, plus the need for a separate file server and fax server. Jun 92

★★ **EtherPrint, Dayna Communications, 801/531-0600, \$499.** It's possible to connect a single LocalTalk printer to an Ethernet network using this device, but continues

Star Ratings

it's an expensive option. Dec 92

★★★★ **EtherPrint Plus, Dayna Communications, 801/531-0600, \$649.** Support four LocalTalk products on an Ethernet network using this device that can also serve as an inexpensive AppleTalk router. Dec 92

★★★★ **EtherWrite, Compatible Systems Corp., 303/444-9532, \$695.** Elegant and cost-effective device with excellent network-management software allows up to six LocalTalk products to connect to an Ethernet network. Dec 92

★★★★ **PathFinder, Dayna Communications, 801/531-0600, \$899.** For simple networks, this LocalTalk-to-Ethernet router is a great value, as well as a great time-saver for beginning network managers. It uses AppleTalk only. Jan 93

★★★★ **PowerModem, PSI Integration, 408/559-8544, \$299.** Superior fax software distinguishes this fax/data modem for PowerBooks, but it's not the best choice for those who do a lot of online work that requires a high-speed data modem. Jul 92

★★★★ **PowerPort/Gold, Global Village Communications, 415/329-0700, \$499.** If you need 14,400-bps throughput, this data/fax modem is a champ. Its improved software and packaging raise the standards for PowerBook modems. Dec 92

★★★★ **QBlazer, Telebit Corp., 408/734-4333, \$599.** If portability is an important issue, this 9600-bps modem's pint size and battery power make it an attractive choice; otherwise, its high price plus the lack of Mac software and send-fax features work against it. May 92

★★★★ **QuickTel Xeba 9600, Logicode Technology, 805/499-4443, \$319.** Sleek, slanty, futuristic-looking fax modem offers all the features you'd expect, including acceptable fax software. Apr 92

★★★★ **Sportster 14,400 Fax/Data Modem, U.S. Robotics, 708/982-5001, \$599.** Several nice features, including an easily accessible power button and a front-mounted volume-control dial, make this 100 percent Mac-ready, 14,400-bps fax/data modem better than average. Feb 93

★★★★ **SupraFaxModem V.32bis, Supra Corp., 503/967-2400, \$399.95.** Send and receive faxes and data at speeds up to 14,400 bps with this attractively priced fax/data modem. The software works well; tech support is adequate. Aug 92

★★ **Ultima Home Office, Prometheus Products, 503/692-9600, \$649.** When it can reliably transmit data at high speeds and the voice bugs are fixed, this fax modem with voice mail will be worth a second look. Oct 92

★★ **Viva 14.4/Fax, Computer Peripherals, 805/499-5751, \$469.** In data mode, this 14,400-bps fax/data modem performed well, but the software bundled with it is barely adequate. Jan 93

★★ **WorldPort 9600 MNP5, U.S. Robotics, 708/982-5001, \$475.** Only slightly larger than a deck of cards, this 9600-bps modem is geared toward PC users, with a user guide that never mentions Macs and software that is only for PC compatibles. Jan 93

PRINTERS

★★ **C. Itoh ProWriter Printer, C-Tech Electronics, 714/833-1165, \$2395.** Not only is this laser printer more expensive than most personal page print-

ers, it also offers less-impressive features and so-so output. Nov 92

★★★★ **DEClaser 1152, Digital Equipment Corp., 508/493-5111, \$1299.** Four-pages-per-minute, 300-dpi, PostScript Level 2 printer offers simultaneous support for Macs and PCs, plus excellent image quality, for a groundbreaking price. The internal font set is small, and the included 2MB of memory is not enough to print complex images. May 93

★★★★ **HP LaserJet 4M, Hewlett-Packard, 800/752-0900, \$2999.** An Intel i8960 RISC processor makes printing complex images faster than ever with this 600-dpi printer, while the Canon LBP-EX print engine and microfine toner guarantee smooth curves and crisp characters. An autoswitch feature makes it a flexible option for mixed-platform offices. Feb 93

★★★★ **HP PaintJet XL300, Hewlett-Packard, 800/752-0900, \$3495.** The output of this color ink-jet printer won't satisfy demanding graphic arts professionals, but it's great for business users interested in punching up their presentations. Oct 92

★★★★ **IBM LaserPrinter 10A, IBM Corp., 800/358-5835, \$3995.** Beautifully defined text, razor-sharp line art, clear gray tones—the output from this large, awkwardly designed, 600-dpi PostScript printer is dazzling, and all for under \$4000. Aug 92

★★★★ **LZR 1560, Dataproducts Corp., 818/887-8000, \$3395.** Tabloid-size 400-dpi laser printer blazed through our standard printer speed tests and produced output noticeably better than that of 300-dpi printers. It's a good choice for a mixed network. Sep 92

★★★★ **LZR 960, Dataproducts Corp., 818/887-8000, \$2195.** This peach of a personal PostScript printer is compact, fast, and produces excellent output. Our reviewer experienced low-memory error messages, but most memory problems should be solved with the current shipping configuration of 3MB of RAM. Jul 92

★★★★ **RasterOps CorrectPrint 300, RasterOps Corp., 408/562-4200, \$8999.** The cost of high-quality, photo-realistic color printing takes a nosedive with this 300-dpi, dye-sublimation printer. The relatively small (8.1 by 8.6 inches on letter-size media) print area is the only significant flaw. Oct 92

★★★★ **RealTech Laser 400, Hardware That Fits, 409/760-2400, \$3195.** Exactly the same tabloid-size, 400-dpi printer as the Dataproducts LZR 1560, but for slightly less money. And it produces output that is perceptibly better than that of 300-dpi printers. Sep 92

★★★★ **StyleWriter, Apple Computer, 408/996-1010, \$399.** If money is tight, if you want nice-looking output, and if you have a little extra time to spare, this is a good personal printer with a new driver that makes it even better. Sep 92

★★★★ **TI microLaser Turbo, Texas Instruments, 800/527-3500, \$2349.** An enhanced version of TI's microLaser Plus, this PostScript Level 2 printer is an admirable performer and a dependable machine, but it leaves you wondering whether the extra \$500 is worth it. Jul 92

★★★★ **WideWriter, GCC Technologies, 617/890-0880, \$1699.** Large-format output comes in a reasonably priced package with this ink-jet printer that can automatically feed sheets as large as 14 by 91 inches or manually feed sheets 17 inches wide with an unlimited length. Feb 93

SCANNERS

★★★★ **HP ScanJet IIP, Hewlett-Packard, 800/752-0900, \$1095.** An elegant piece of technology, this desktop gray-scale scanner produces excellent results for a street price of around \$750. Muddled online help and a flimsy hinge are minor problems. Aug 92

★★★★ **LightningScan Pro 256, Thunderware, 510/254-6581, \$649.** A well-executed hand-held gray-scale scanner worth the cost. It creates 8-bit scans at up to 400 dpi; images scanned in two passes can be joined flawlessly. The only drawback is slow scrolling in software. Jun 92

★★★★ **Mirror 600 Color Scanner, Mirror Technologies, 612/633-4450, \$1199.** Three-pass scanner with 600-dpi vertical and 300-dpi horizontal resolution is fast, precise, and an excellent value. The only liability is its somewhat quirky software. Apr 92

★★★★ **Nikon LS-3510AF Film Scanner, Nikon, 516/547-4355, 8-bit \$9535, 24-bit \$11,316.** The bread-box-style design of this 35mm film scanner may be reminiscent of past models, but many changes make it faster and more convenient. Still, advanced users won't be satisfied with the tools for overriding automatic exposure and tone adjustments. Sep 92

★★ **PageBrush Professional, Mitsubishi International, 415/544-2781, \$795.** A brilliant idea with unfortunate rough spots. Gray-scale, hand-held scanner/mouse scans full-page or larger images and produces 300-dpi gray-scale files, but the process and software are agonizingly slow; the buttons are hypersensitive; and the product is expensive. Jun 92

★★★★ **RasterOps Expresso Personal Slide Scanner, RasterOps Corp., 408/562-4200, \$849.** Essentially a video camera mounted above an illuminated stage, this slide scanner outputs NTSC video. It's fast, convenient, and economical, but falls short for digital images; its best file looks worse than output from a 24-bit flatbed or slide scanner. Apr 92

SYSTEMS/STORAGE

★★★★ **Duo Dock, Apple Computer, 408/996-1010, \$1079.** Immensely clever desktop-Mac-size housing for the Duo laptops provides back-panel connectors, a SuperDrive, electrical and physical support for external monitors, and two expansion slots. Although the Duo Dock is easy to like, some details, such as the difficulty of installing NuBus boards, belie Apple's usual attention to detail. Mar 93

★★★★ **FastCache Quadra, DayStar Digital, 404/967-2077, Quadra 950/900/700 version \$449, Quadra 900/700 version \$299.** PD5 board provides 128K of secondary cache for a Quadra with 15ns static RAM (25ns on the 900/700 version). The average real-world speed improvement is 15 percent, although some operations benefit more from the cache card than others. May 93

★★★★ **Floptika 20/M, Procom Technology, 714/852-1000, \$585.** It is easy to recommend this floptical drive due to its speed, relatively low cost, bundled software, and lack of problems. Although it allows invalid SCSI ID addresses, it's a fine product. Sep 92

★★★★ **Freedom 120, Maxen, 619/944-0818, \$699.** Battery-powered hard drive provides three to four

NOW SHIPPING

THREE GOOD REASONS WHY YOUR CD-ROM DRIVE WAS INVENTED:

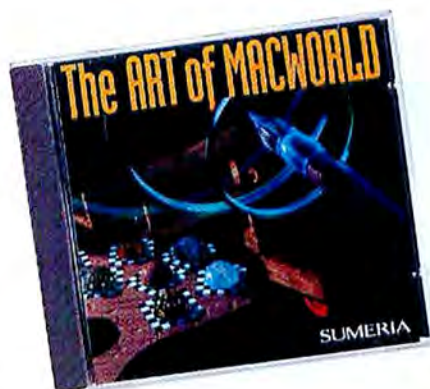
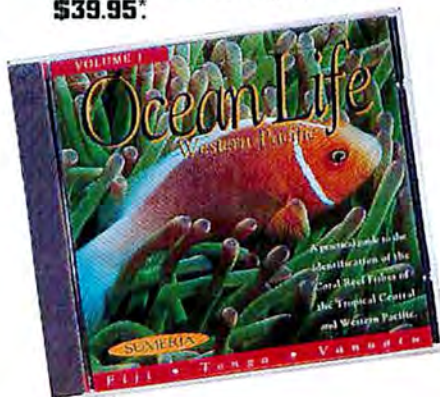


1 QuickTime™: The CD™

Just why was your CD-ROM drive invented? So you can experience interactive multimedia fun from Sumeria. **QuickTime: The CD** features the winners of the 1992 International QuickTime Film Festival. You'll find 500 megabytes of digital video from the world's most highly acclaimed QuickTime filmmakers. Categories include Narrative, Experimental, Commercial, Animation, Education, Micromovies, and more. **\$29.95***

2 Ocean Life™

In **Ocean Life**, you can explore beneath the tropical seas of the Western Pacific. Navigate the life-filled reefs and discover more than 40 species of exotic fish native to these waters. Other phyla include starfish, anemones, sea slugs, sea snakes, and more. **Ocean Life** is a video field guide, the first of its kind for the Macintosh®, complete with movies, text and graphics. **\$39.95***



3 The Art of Macworld™

From the creators of Macworld Interactive™ comes **The Art of Macworld**. This electronic photo album is the definitive collection of award-winning graphics and illustrations from the first eight years of Macworld Magazine®. **\$39.95***

So, if necessity is the mother of invention, you need to add these three disks to your CD-ROM library. To find out more, call Sumeria. We're your CD-ROM source. For many good reasons.

To Order, Call 415-904-0889.

SUMERIA

For more information or mail orders, direct your requests to: Sumeria, Inc., 329 Bryant St., Suite 3D, San Francisco, CA 94107 FAX 415-904-0888
*All orders payable in U.S. dollars. Add \$2.50 per CD for shipping and handling. Foreign orders add \$5.00 per CD for shipping and handling. California residents add applicable sales tax. Please allow 5-8 weeks for delivery.

FROM THE MAKERS OF AFTER DARK

STAR TREK

THE SCREEN SAVER

Captains Log: Stardate 1992



On our mission to prevent phosphor burn-in...

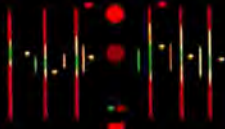


...we found ourselves surrounded by Klingons!



I asked Mr. Spock and Dr. McCoy for a full diagnosis.

Bones said the problem was burn-in, and a new screen saver was the answer.



So we beamed some tribbles into the Klingon engine room and headed for Earth to pick up a copy!

Over 15 all-new displays inspired by the original Star Trek TV series. And, it runs all After Dark displays! Now your monitor will "LIVE LONG AND PROSPER"™ with Star Trek: The Screen Saver.

STAND ALONE PRODUCT
After Dark Software Not Required

BERKELEY
SYSTEMS



2095 Rose Street, Berkeley, CA 94709 (510) 540-5535

© & 1992 Paramount Pictures. All Rights Reserved. STAR TREK™ is a registered trademark of Paramount Pictures. Berkeley Systems Authorized Jase.

Circle 218 on reader service card

hours of hard drive storage without a power cable; it performs at a respectable speed, but lacks a battery-power gauge and automatic sleep mode. The skimpy manual is the most serious problem. Sep 92

★★★★ **Infinity Floptical 21MB, Peripheral Land, 510/657-2211, \$599.** The good points of this floptical drive include extensive documentation, switchable termination, and an autoeject function, but the bad points are the odd size, the incompatibility of the bundled software with System 7, and inappropriate formatting of 800K disks. Sep 92

★★★★ **Outbound Notebook System 2030S, Outbound Systems, 303/786-9200, 4/40 \$2799, 8/80 \$3299, 14/120 \$3999.** If raw power is what you're looking for in a notebook computer, this is the hands-down choice. It's lightweight, upgradable, and performs at a level between a lici and a lllx, but the screen is only adequate. Sep 92

★★ **Performance/040 (33MHz), Impulse Technology, 404/889-8294, \$2399.** For disk-intensive tasks, this 68040 33MHz accelerator board tested slower than the native CPU and, in general, was slower than comparable accelerator boards. It is compatible with all Mac II's. Oct 92

★★★★ **PLI MiniArray 850MB, PLI MiniArray 2GB, Peripheral Land, 510/657-2211, \$6999.** These RAID storage systems contain multiple drives that work as a single unit; they're an excellent option for image processing or tasks that involve importing and exporting large files, but the price per megabyte is high. Jan 93

★★★★ **PowerBook 145, Apple Computer, 408/996-1010, \$2149 to \$2499.** Adequate but essentially outdated notebook computer is an upgraded version of the discontinued PowerBook 140 with a faster 25MHz 68030 CPU, but RAM expansion is limited, and it doesn't have a built-in video port. Feb 93

★★★★ **PowerBook 160, Apple Computer, 408/996-1010, \$2429 to \$3149.** A built-in video port and gray-scale capability are the new features Apple offers with this notebook computer. While it offers good processing speed and power, the passive matrix display doesn't cut it for all-day use as a primary screen. Feb 93

★★★★ **PowerBook 180, Apple Computer, 408/996-1010, \$4109 to \$4469.** An active matrix screen and a math coprocessor are the only differences between this notebook computer and the PowerBook 160, but the beautiful display is worth the extra \$1000. Feb 93

★★★★ **PowerBook Duo 210 and 230, Apple Computer, 408/996-1010, 210 (4/80) \$2249, 230 (4/80) \$2609.** Apple's smallest computers have the pleasing heft, size, and shape of hardbound books but pack the horsepower of 030 chips. Although the screen, keyboard, and trackball (more of a "trackmarble") feel small, these computers virtually cry out to be picked up, handled, and used. Mar 93

★★★★ **QuadFlextra, Quadram, 404/923-6666, \$495.** Remarkable super-high-density floppy drive uses an ingenious disk-formatting method to put just over 20MB on a single 3½-inch floppy disk, but it may not be as cost-efficient as other options. Apr 92

★★★★ **Quantum Passport XL 240, Quantum Corp., 800/624-5545, external chassis \$469, 240MB drive \$979.** An excellent piece of engineering, this fast, trouble-free, removable hard drive is designed to

solve the problem of how to transport data from one computer to another. The price is only somewhat discouraging. Oct 92

★★★★ **Radius Rocket 33, Radius, 408/434-1010, \$2499.** The accelerator board of choice for our reviewer, this 68040, 33MHz board is fast, reasonably priced, and compatible with a Mac II (with Rev. B ROM), lllx, lllcx, or lllci. Oct 92

★★★★ **TokaMac II FX 33, Fusion Data Systems, 512/338-5326, \$2995.** CPU and FPU tasks on a Mac lllx are faster than on a Quadra 950 with this 68040 33MHz accelerator board, but video- and disk-intensive tasks are still slower. It may be worth the cost if your lllx already has a fast video board and more than enough memory. Oct 92

VIDEO/DISPLAY

★★★★ **BookView Imperial, Computer Care, 612/371-0061, \$1399 (includes 6MB of RAM).**

This notebook-display adapter supports all common sizes of monitors, including 16-inch and 19-inch, plus both Mac and VGA. It is expensive, however, and uses 2MB of system memory for video processing. Feb 93

★★★★ **Canon ESP, Canon USA, 516/328-5970, \$4500.** No-nonsense package enables you to shoot still-video pictures, digitize the video into a Mac for touch-up, and record the modified shots back to the camera for playback through any television set. It's good for presenters who need to incorporate photographs, but it is quite expensive. Apr 93

★★★★ **Canon RC250, Canon USA, 714/753-4320, \$799.** An adequate choice for users looking for an inexpensive still-video system. Camera captures up to 50 color images per video floppy disk and hooks up to any television. Jun 92

★★ **Dycam Model 1, Dycam, 818/998-8008, \$895.** Compact, point-and-shoot, still-video camera records and downloads images in 8-bit gray-scale—as long as the battery doesn't die first. Jun 92

★★★★ **Macintosh 16" Color Display, Apple Computer, 408/996-1010, \$1599.** The display quality of Apple's 16-inch monitor is tough to beat. It has realistic color, minimal curvature, and a uniform display. Jun 92

★★★★ **Power Portrait, Sigma Designs, 510/770-0100, \$899 or \$949.** Hook your Classic or PowerBook to this 15-inch portrait-style monochrome display. Built-in QuickDraw acceleration speeds up the slow SCSI connection on the one hand and results in a few software incompatibilities on the other. Feb 93

★★★★ **PowerVision, Mirror Technologies, 612/633-4450, with no RAM \$499, with 2MB of RAM \$699, with 4MB of RAM \$999.** Separate VRAM means you don't lose system memory with this nicely priced notebook display adapter. It only supports 12-inch and 14-inch monitors, and 15-inch portrait gray-scale and black-and-white monitors. Feb 93

★★★★ **VideoSpigot, SuperMac Technology, 408/245-2202, \$499 to \$1599.** Grab video from a camcorder, video deck, TV, or monitor with this easy-to-install board and save it as a 24-bit QuickTime movie. Comes with ScreenPlay, an application that lets you choose from among several compression options, frame rates, and window sizes. May 92 **III**

Call
today for your
FREE Catalog!

Blue-light specials without the bruises!

Every product in this ad is new or offered at a special price for a limited time at Mac's Place. From the 15th of March through the 15th of May. That's it. No exceptions. Don't fight with the

other frenzied bargain hunters. **Just look for these blue pages every month for special low prices.** And call Mac's Place from the privacy and relative safety of your own home.

Ask all the questions you want. Nobody else is waiting to be helped, looking at you like you're stupid. Talk to consultants here who actually know what they're talking about.

What are you waiting for? There'll be another blue ad next month with more low prices, but these deals will be gone. So call. 1-800-367-4222.

Mac's Place

Come May 15th these great deals will be gone.



◀ Cachet

Adjust colors accurately on screen, referencing previously corrected images. The 1992 Eddy Software Product of the Year!

Efi
6071\$398.

▶ PowerBook Tools/ Inline Sync/Tesseract bundle

PBTools lets you know exactly how much PowerBook battery life remains, and sleeps your system to conserve it. **Inline Sync** updates files on your PowerBook and desktop Mac to the latest versions. **Tesseract** has a simple but challenging premise - clear the board of colored tiles by jumping one over another in as few moves as possible.

Inline Design ◉
6051\$92.



◀ Public Utilities

Fix problems before they put you and your data in a fix. Works in the background. Voted an Eddy in '92 for Best Protection Program.

Fifth Generation Systems ◉
5661\$68.

▶ AppleTalk Remote Access

Need a file from your Mac but you're off-site? **Remote Access** connects one Mac to another via modem. File sharing lets you access the files you need.

Apple
4610\$149.



◀ SuperView

Connects your PowerBook 140 or 170 to desktop displays, video projection systems, and TVs. Get **Magnet FREE**, and automate and synchronize tasks.

SuperMac/No Hands Software
5599\$449.

◀ Supra FAXModem V.32bis MacPac bundle

Get 14,400 bps communications with up to 57,000 bps throughput, plus MacIntercomm Lite FREE.

Supra/Mercury ◉
4017/6066\$329.



▶ MacTransportable MultiDisk 150

Enjoy all the benefits of a Bernoulli with disks of varying capacities. Use 35MB, 65MB, 105MB, and 150MB disks, read and write 90MB, and read 44MB.

IOMEGA ◉
5609\$799.



1-800-367-4222 US & Canada • Fax your P.O. 1-206-881-3090 • accepted

The symbol ◉ denotes a manufacturer's Money Back Guarantee



Final Draft 2.0

Write movie scripts, TV episodes, and stage plays. Powerful word processing and professional script formatting let you focus on content, not appearances. Formatting rules are based on film industry standards. Margins, scene numbers, page breaks, 'more' and 'continued' inserted automatically. Built-in character list lets you type just a few letters of a name; the rest is added instantly.

MacToolkit

6034\$258.



Kai's Power Tools

Get 33 powerful generators and filter plug-ins for Adobe Photoshop, Fractal Design Painter, and others. Includes the Gradient Designer, Texture Explorer, Gradients on a Path, and four Fractal Generators. "A landmark plug-in for Adobe Photoshop...together a creative explosion!" says Jeff Parker, Adobe Photoshop Product Manager.

HSC Software

5854\$79.



Stacker for Macintosh

The first safe and transparent software for doubling your hard disk capacity. Install it with a few mouse clicks. Patented LZS technology stores your data more efficiently without changing the way your Mac works - you just have more disk space available. It's 100% compatible with all your applications. Supports all hard disks and removable cartridges. No special hardware required.

Stac

6062\$69.



ALERT!

This desktop diagnostic software helps you find the cause of system crashes and frozen screens before they happen. Receive a FREE two-year subscription to a conflict database updated by user groups worldwide. A responder module lets consultants, MIS managers, and end users diagnose and repair software conflicts over a network without mounting the remote volume of the Mac being analyzed.

MAXA Corporation

6052\$118.

Lotus 1-2-3 Presentation bundle

A great deal at only \$128! Lotus 1-2-3 for Macintosh lets you blast through any spreadsheet project. A two-time winner of MacUser's Best New Word Processor award, WriteNow includes a 135,000-word spell checker and a 1.4 million-word DA thesaurus. If you're not satisfied with your charts, DeltaGraph will give them new life with 120 chart types.

Lotus Development/ T/Maker/ DeltaPoint

5964\$128.

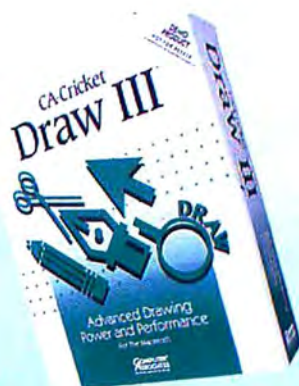


Cricket Draw III

The object-oriented bezier drawing program for all ability levels. Just double-click on an object to reveal its attribute dialog. Professional Color Toolkit (a control panel file) offers commercial-quality color support by simulating Pantone colors. Includes Postscript support, full-featured text processing, and special text effects like rotation and shadows.

Computer Associates

4218\$142.

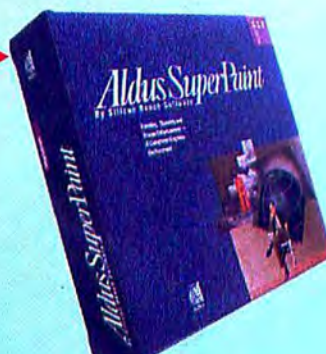


SuperPaint 3.0

It combines painting, drawing, and image enhancement in one powerful, easy-to-use graphics program. With 24-bit color, textures, gradients, and full color TIFF and EPS graphics support, SuperPaint is ideal for anything from the simplest business illustrations to sophisticated full-color art. A six time winner of Macworld's "Readers Choice Award!"

Aldus

3545\$88.



Painter 2.0/ArtZ bundle

Create original art or apply fantastic effects to other artwork, including scanned images with new Painter 2.0. New features include color separation, spatter airbrush, Cubist effect, and multiple light sources. Used with the ArtZ 6" x 8" tablet, the effects are astonishing. The latest from the premiere tablet maker, ArtZ's stylus is cordless, batteryless, and detects 120 levels of pressure.

Fractal Design Corporation/ Wacom Technology Corp.

5657/5355\$538.



These great deals expire May 15, 1993!

Mac's Place 



Spectre Supreme

Face enemies like smart acid pools, cloaked robots, and deadly orbiter gauntlets. Need a breather? Duck through the transporter gates to negative cyberspace. Stunning QuickTime visuals.

Velocity Development Corp.

5951\$45.



Bill Elliott's NASCAR Challenge

Capture the thrill of stock car racing. Bit map graphics and a scaling technique create great car detail as you race against NASCAR's finest drivers on eight NASCAR tracks.

Konami

5942\$28.



Out of This World

Thrown through space and time by a nuclear accident, outwit and overcome monsters and earthquakes. "Highest rated game ever" - Computer Game Review

Interplay

6067\$34.



Capitalist Pig

Build and run your own business under authentic economic conditions in this exciting simulation. Packed with sound, animation, and fun.

Pluma Software

4640\$30.



A-Train Bundle

Design a railroad in this award-winning simulation. It's a great value with the program, additional construction kit, and strategy guide. Four stars from Macworld

Maxis

6059 A-Train Bundle\$58.

6060 SimCity Bundle\$38.



Year 2 Learn, PEANUTS

Match wits with Snoopy and the Peanuts Gang. Enjoy math, geography, reading, coloring, and Flying Aces games. Voice narration, zany sounds, increasing levels of difficulty for all kids.

Image Smith

5911\$39.

Infinity Removable 88RW44

Read and write to 44MB and 88MB cartridges. Enjoy an average access time of 20ms, the ability to transport data easily, and compatibility with over four million SyQuest 44MB cartridges.

PLI

5728\$628.

PixelPlay

Have fun watching your favorite QuickTime movies while your screen sleeps. Includes its own application, an After Dark module, and ten Warren Miller action clips.

Silicon Sports

5901\$34.



Soft PC Professional 3.0

Do the PC one better by bringing PC programs to the Mac. Emulates 80286 and 80287 in real and protected modes, and VGA graphics with 256 colors.

Insignia

5925\$168.



Power Pak Briefcase

This rugged carrying case has all the organizational features you need in a convenient smaller size bag. It protects your portable and holds all your essentials.

Tenba

6072\$68.



Morph

It's the hottest image effect of the nineties - transformation. Create amazing transitions. Eddy finalist for Best Special Effects Program. 1992 Byte Award of Distinction.

Gryphon Software

5680\$85.



Sony Storage

Superior performance for all your storage needs.


Sony

3.5" MO Rewritable 128MB 4478\$48.

DD/HD Bulk 50 Pack 3331\$49.



1-800-367-4222 US & Canada • Fax your P.O. 1-206-881-3090 •     accepted

The symbol  denotes a manufacturer's Money Back Guarantee

DataPlace Hard Drives

Great prices on the most reliable drives around! All drives come with DP Formatter Plus, Kaboom! SE, MacTools 2.0, and Stuff It SpaceSaver.

Mac's Place

DP+ 127MB Quantum External Drive
5279 \$398.

DP+ 44MB Removable w/ Cartridge
4197 \$398.

Stingray 2.0

This platinum trackball is designed to work with your hand. Its low profile offers a natural position, reducing strain on the hand, wrist, and forearm.

CoStar

5959 \$88.

ACCURA + FAX 144

Everything you need is here to send and receive data and Group 3 faxes - data communications and fax software, cables, the fax modem itself, and the great Hayes quality.

Hayes Microcomputer Products
6068 \$358.

ArtZ/Sketcher 1.0 Bundle

The ArtZ tablet stylus acts as a pen or brush on your screen. Sketcher is the gray scale paint program dubbed best new graphics program by MacUser.

Wacom Technology Corp./
Fractal Design

5355/6070 \$398.

FrameMaker Competitive Upgrade

Everything you need to create, edit, revise, and distribute memorable documents is here. Call Mac's Place to switch from your word processing or page layout program.

Frame Technology

5347 \$298.

TCP Connect II Extended

It's called "the most complete, feature-laden product on the market" by MacWEEK. Includes e-mail, network news reader, file transfer client and server, and terminal emulation.

InterCon

5338 \$398.

DOS Mounter Plus

Mount MS-DOS files on your desktop as if they're Mac files. Works with external Apple 5.25", removable media, magnetooptical, and SuperDrive.

Dayna Communications

5939 \$54.

Safe Deposit

Get a real-time automatic backup program for all Macs and maintain up-to-date copies of files and folders on any Mac-compatible disk or file server.

Dayna Communications

5974 \$118.

IT'S EASY TO ORDER!

Ordering Options

- Call 1-800-367-4222 anywhere in the USA or Canada. Call (206) 883-8312 for international orders.
- Fax your order to 206-881-3090.
- Mail your order to 8461 154th Ave. NE, Redmond, WA 98052. For electronic orders, use Compuserve (76635,660), GEnie (MACSPACE), or America Online (Mac's Place). Mac's Place uses CE Software's QuickMail to check our mail regularly.

Ordering Hours

- Mac's Place is open from 6 a.m. to 10 p.m. M-F Pacific Standard Time, and 6 a.m. to 6 p.m. on Sat., 7 a.m. to 6 p.m. on Sun. (For you East Coasters, this means you can call us until 1 a.m. weekdays and still receive your in-stock item that morning!)

Fax, Electronic, and Mail Orders

We must have the following information to process your order.

- For all orders: your day and evening phone numbers, fax number (if available), full shipping address, type of Mac you own (so we can make sure your purchase is compatible with your system), what prompted your order (magazine ad, catalog, friend, etc.).
- For credit card orders: full credit card number and expiration date, name as it appears on card, address where you receive your credit card bill.
- Missing information can delay your order. Don't hesitate to call if you have questions.
- No sales tax (except WA residents add 8.2%, OH residents add 6%, to total, including shipping).

Payment Options

- VISA, MasterCard, American Express, OPTIMA, and Discover Card gladly accepted.

- Your credit card is never charged until your product ships.
- Most personal and company checks are approved quickly to ensure immediate shipment. For non-standard checks and checks over \$1,000, allow ten working days for clearance.
- Returned checks are subject to a service charge of \$15 dollars.
- Government, school, and institutional P.O.s clear immediately. Corporate P.O.s are subject to credit approval for first order.


Shipping Information

- All in-stock items ship same-day, (barring system failure, etc.) to your doorstep, for just \$3 (USA) via Airborne Express overnight service. Rural locations may require an additional day for delivery. Areas not serviced by Airborne Express will be sent via Priority Mail.
- Our \$3 shipping charge includes insurance at no extra charge.
- When a partial order is shipped, we pay freight on additional shipments.
- International orders will be charged full shipping rates.

International Orders

- Call 206-883-8312 for our international sales line.
- We ship throughout the free world via Airborne Express International.
- International orders will be charged full shipping rates.
- Mail, fax, or electronic orders gladly accepted.

Returns

- All products carry a 120-day limited warranty from Mac's Place.
- Defective software is replaced immediately with like items.
- Defective hardware items repaired or replaced at our discretion.
- Some hardware items carry one-, two-, or five-year warranties.
- Products with the  symbol carry a manufacturer's 30- or 60-day Money Back Guarantee.
- No returns accepted on special order products.



CD-ROM Expo—the place to be in '93

Announcing the 7th Annual

CD-ROM Expo

October 27 - 29, 1993

World Trade Center, Boston

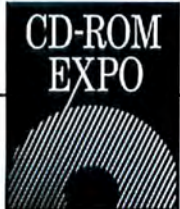
If you're just finding out about compact-disc computing applications, are a multimedia enthusiast, or a long-time pioneer of CD-ROM and related technology, CD-ROM Expo is for you.

At CD-ROM Expo you have the opportunity to meet face to face with industry leaders and developers, gain valuable hands-on experience at exciting workshops, learn about the latest developments in multimedia platforms and participate in one of the fastest growing segments of information technology.

Regardless of the environment or how specialized the application, CD-ROM technology has proven to be the most efficient medium for integrating text, image and sound helping thousands of organizations to distribute and access all forms of information.

To keep up with the latest developments on CD-ROM Expo 1993 fill out the coupon below.

Mail to: CD-ROM Expo '93, 260 Milton Street, Dedham, MA 02026 or fax to (617) 361-3389.



Yes, I'd like more information about the 7th annual CD-ROM Expo, October 27 - 29, 1993.

I'm interested in: ☐ exhibiting ☐ attending

NAME _____ TITLE _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

TELEPHONE _____

Send to: CD-ROM Expo '93, 260 Milton St., Dedham, MA 02026 or fax to: 617-361-3389.

MSF

THE MAC SOLUTIONS HOUSE

ADVANCE BUSINESS CENTER

HOURS (Pacific Time):
Mon-Fri. from 8:00 AM
Saturday 9am to 2pm

1 (800) 962-2297

SERVICE

- Member of the Better Business Bureau
- Toll-Free Ordering & Technical Support
- Education, Government & Technical P.O.'s



SUPPORT

- All Peripherals backed by a 30-Day satisfaction money-back guarantee (see details at bottom)
- Buy with Confidence, as ABC is a strong, rapidly growing company with both Mac & PC experience



SALES & LEASING

FOR BUSINESS LEASING, CALL THE EXPERTS AT ABC FIRST!

- THREE GREAT REASONS TO LEASE FROM ABC:
1. LEASING IS TAX DEDUCTIBLE
 2. LEASING PROTECTS FROM OBSOLESCENCE

SUPERMAC

radius

E-MACHINES

Xerox

Quark

ADOBE

CLARIS

ASANTE

RASTEROPS

UMAX

DAYSTAR

COMPACTOR

NEC

Microsoft

SII

WACOM

newgen

**HEWLETT
PACKARD**

PLI

Quantum

AE

ARTISER ENGINEERING



WACOM

ARTZ Graphics Tablet.....\$299
6"x8" Pad w/Pressure Sensitive Cordless Pen
12"x12" Electrostatic Tablet.....\$695
12"x18" Electrostatic Tablet.....\$1039

MAXA

New! ALERT



\$119
helps you find
the source of
software conflict!

New! SNOOPER 2.0



w/Virex!
\$119
w/Virex and
Nubus board
\$149

PLI



PLI 88 MB/44MB

SYQUEST DRIVE.....\$649

PLI 44 MB SYQUEST DRIVE.....\$479

PLI CD ROM DRIVE.....\$639

FAST MULTISESSION, PHOTO CD

SEIKO INSTRUMENTS



SEIKO CM 1445 14"
Trinitron Color Monitor

\$450



SUPERMAC

SUPERMAC 17-T BUNDLE
Multi-Res Trinitron w/Spectrum 24 Series II
Card

\$1895 or \$69 p/m*

SUPERMAC 20-T.....\$2395

19" Multi-Res Trinitron Color Monitor

DATAPRODUCTS



LZR 1560\$3095

- Handles Monarch, 11 x 14, standard, legal, & Tabloid
- 400 DPI & 300 DPI
- Two paper trays (up to 3)
- TRUE ADOBE POSTSCRIPT

HARD DRIVES

QUANTUM

127MB Int. HD...\$295

240MB Int. HD...\$449

MAXTOR

120MB Int. HD...\$269

213MB Int. HD...\$389

FUJITSU 520MB Int. HD...\$889

ALL THE NEW MACS AT ABC!

Mac Systems

All ABC Systems are Available with ABC Software Bundle: Symantec's GreatWorks Integrated Software, Not on Utilities, MAXA Snooper and Casa Blanca Works Drive?



NEW! QUADRA 800 SYSTEM

NEW! Mac Quadra 800 with 16MB RAM & 320MB Hard Drive, 24-Bit VRAM & SuperMac 17-T Trinitron Color Monitor, NewGen 660P 600 DPI Laser Printer, UMAX UC 840 800 DPI 24 Bit Color Scanner w/PhotoShop, Suntouch Extended Keyboard, Quark XPress, Aldus FreeHand, and the ABC Software Bundle

\$299 mo.*

NEW! CENTRIS 650 SYSTEM

NEW! Mac Centris 650 (25MHz) '040 w/FPU, 8MB RAM & 230 MB Hard Drive, CD ROM Player w/Photo CD, EtherNet & 3 Expansion Slots, 24-Bit Color VRAM & SuperMac 17-T Trinitron Color Monitor, Suntouch Extended Keyboard, and the ABC Software Bundle

\$4949/

\$179 p/m*

NEW! Mac CENTRIS 610

'040 System at Scorchingly Low Price!

NEW! Mac Centris 610 (twice the speed of a 160 or 11xv1) 4/80, Seiko 14" Trinitron Color Monitor, Suntouch Ext. Keyboard & ABC Software Bundle

\$2449/

\$89 p/m*

MAC IIvx CD ROM SYSTEM

Mac IIvx (4MB RAM, 80MB Hard Drive, CD ROM Player w/Photo CD, VRAM for 32,000 colors, 3 NuBus Slots, Seiko 14" Trinitron Color Monitor, Suntouch Extended Keyboard, & ABC Software Bundle

\$2995/

\$111 p/m*

NEW! Mac LC III SYSTEM

NEW! Mac LC III (Speed like the IIcx!) 4MB RAM, 80MB Hard Drive, Seiko 14" Trinitron Color Monitor, Keyboard & ABC Software Bundle

\$1995/

\$74 p/m*

NEWGEN



PS 440B 400 DPI B-Size
Laser Printer

\$3295/

\$121 p/m*

660B (600 DPI B-Size).....\$ CALL

1200B (1200x600 DPI B-Size).....\$ 4995

660P (600 DPI).....\$ 1795

880P (800 DPI).....\$ 1995

CALL FOR OTHER NEW
NEWGEN MODELS



NEW!! HP

LASERJET 4M
600DPI LASER PRINTER

\$2095/

\$79 p/m*



NEW!! HP COLOR
DESKWRITER 550C

\$749

HP DESKWRITER.....\$ 399



SEIKOSHA MAC PRINTER

ImageWriter II Compatible.....\$ 235

Ask About New Wide Carriage Model Too!



PowerBooks

Make ABC your One Stop
PowerBook & Duo Center!

All ABC PowerBook Packages Below Include ABC Software Bundle: Symantec's GreatWorks, Not on Utilities, MAXA Snooper and Casa Blanca Works Drive?

NEW!! POWERBOOK 165c (COLOR!)

NEW! PowerBook 165c COLOR screen w/4MB/80 Hard Drive, 33MHz Processor w/FPU, PSI 14,400 BPS Data/FAX Modem w/OCR Software, ABC Software Bundle, Targus Leather Case, and Panasonic Surge Suppressor

\$3989/

\$149 mo.*

POWERBOOK 180 SYSTEM

PowerBook 180 (33MHz w/FPU, 8MB RAM & 120MB HD, ACTIVE MATRIX Gray Scale Screen, PSI 14,400 BPS Data/FAX Modem w/OCR Software, ABC Software Bundle, Targus Leather Case, and Panasonic Surge Suppressor

\$5189/

\$186 mo.*

POWERBOOK 160 SYSTEM

PowerBook 160 (25MHz, 4MB RAM & 80MB Hard Drive), ABC Software Bundle, Targus Leather Case

\$2849/

\$106 mo.*

POWERBOOK ACCESSORY CENTER

PowerBook 40MB Int. Hard Drive Upgrade.....\$ 195

PowerBook 40MB Ext. Hard Drive (w/Battery!)\$ 249

CONNECTIX CPU (Great Battery-Saving Utility, etc.).....\$ 49

Pilot Book-Endz PowerBook Docking System\$ 129

Sophisticated Circuits Numeric Keypad (w/Function Keys!)...\$ 89

Sigma PowerPort II Monitor.....\$ 639

Targus Deluxe Leather PowerBook Case.....\$ 129

Targus NEW! PowerBook Case.....\$ 49



UMAX

UMAX UC840
800 DPI COLOR SCANNER

\$1249/48 mo.*

NEW!! UMAX UC1260 1200 x 600 DPI COLOR SCANNER.....\$ CALL

UMAX UC630 600 DPI COLOR SCANNER.....\$ 1125/43 mo.*



PSI

PSI POWERMODEM IV.....\$ 329

14,400 Data, 14,000 Fax Send/Receive

Completely Internal PowerBook Modem

PSI COMSTATION V.....\$ 399

14,400 Data/14,000 Fax in Sleek, Tiny

External Modem w/Fax OCR Software!

*per month on lease... Call for details.

Without Malicious Call Customer Service at (310) 325-1422 to obtain a return authorization. Returned products must be in original condition and packaging and must be sent back within 30 days of purchase date. 15% Restocking Fee on special and used Printers and Copiers. No Returns on Opened Software Packages. No Refunds on Freight. Conditions Prices and Information are subject to change without notice. All

Items subject to availability. We reserve the right to refuse to sell to any one. Credit Cards: We accept Visa, MasterCard, American Express, Discover, and Discover. Not responsible for typographical errors. All information presented believed accurate at time of printing.

1 (800) 962-2297
INTERNATIONAL SALES: (310) 325-2667

(800) 733-4242
3101 275-1422 / Fax (310) 325-2667
10000 Ave. U.S. Torrance, CA 90503

ADVANCE BUSINESS CENTER

Circle 227 on reader service card

Lowest Prices
Great Service

MAC DEPOT™

1-800-222-2808

Overnight Delivery
30-Day MBG

HARDWARE

ACCELERATORS

DAYSTAR - 30 DAY MONEY BACK GUARANTEE

CHARGER FOR PHOTOSHOP	819.00
FASTCACHE QUADRA 700/900	259.00
POWERCACHE 33MHZ	439.00
POWERCACHE 40MHZ	599.00
POWERCACHE 50MHZ	779.00
33MHZ Turbo D40	1379.00
FASTCACHE IICI 64K	299.00
FASTCACHE IICI 32K	165.00

30-Day Money Back Guarantee



Turbo PS/440B

- Canon Engine
- RISC Processor
- SCSI Port
- 6MB RAM
- Auto-Switching

Super Low Price!

\$3295

RADIUS

ROCKET 25 & 24X COMBO	1919.00
ROCKET 33MHZ	1979.00
ROCKETSHARE	399.00
SCSI-2 BOOSTER	245.00

INPUT DEVICES

ZNIXCOMPUTER, INC. (EXCLUSIVE)	
CORDLESS MOUSE	49.00
(BUNDLED W/ NORTONUTILITIES)	
KENSLINGTON	
NOTEBOOK KEYPAD	78.00
KEYPAD W/ SOFTWARE	97.00
TURBO MOUSE 4.0	99.00



**Affordable
Trinitron**



**CM1445
\$459!**

WACOM - 30 DAY MONEY BACK GUARANTEE

ARTZ 6XB TABLET	349.00
6X9 TABLET	449.00
12X12 TABLET (STANDARD)	649.00
12X12 TABLET (ELEC-STATIC)	719.00
12X18 TABLET (ELEC-STATIC)	1149.00

MODEMS & FAXES

GLOBAL VILLAGE	
POWERPORT BRONZE	189.00
POWERPORT SILVER	365.00
POWERPORT GOLD	419.00
TELEPORT BRONZE	189.00
TELEPORT SILVER	359.00
TELEPORT GOLD	419.00

FAX your order in:
(310)-214-0932

External 14.4



\$309



**Lowest
Prices!**

Powerbook 14.4



\$269

All modems are supplied with data and fax software.

PSI

POWERMODEM	129.00
POWERMODEM IV	289.00
COMSTATION 1	155.00
COMSTATION 2	279.00
COMSTATION 3	399.00
COMSTATION 4	329.00
COMSTATION 5	469.00

SUPRA

FAX/MODEM V.32BIS	349.00
POWERBOOK 14.4 FAX MODEM	299.00

PRINTERS & SCANNERS

DATAPRODUCTS	
LZR 960	1595.00
LZR 1560 (11X17)	3179.00

GCC TECHNOLOGIES

PLP II	CALL
BLP ELITE	CALL
WIDEWRITER	CALL
WRITEMOVE II	CALL

HEWLETT-PACKARD

DESKWRITER	379.00
DESKWRITER C	499.00
DESKWRITER 550C	729.00
LASERJET 4M	1999.00
SCANJET IIC	1269.00
SCANJET IIP	699.00

NEWGEN - 30 DAY MONEY BACK GUARANTEE

TURBO PS/300P	1239.00
TURBO PS/400P	1659.00
NEW! TURBO PS/660P	1989.00
NEW! TURBO PS/880P	CALL
TURBO PS/660 (600DPI)	2495.00
TURBO PS/880 (800DPI)	3195.00
TURBO PS/660B (11X17)	CALL

MONITORS & VIDEO BOARDS

E-MACHINES	
FUTURA SX	499.00
FUTURA MX	879.00

FUTURA LX

POWERLINK PRESENTER	979.00
POWERLINK DESKNET	499.00
T16II MONITOR	659.00
T19II MONITOR	1299.00
T19II MONITOR	2399.00

RADIUS

PRECISIONCOLOR 8XJ	489.00
PRECISIONCOLOR 24X	1599.00
PRECISIONCOLOR 24XP	489.00
PRECISIONCOLOR 24XK	819.00
PRECISIONCOLOR 20S DISPLAY	2399.00
VIDEOVISION	1949.00

SEIKO

CM1445 14"	459.00
CM1760LR 17"	1145.00
CM2070LR 20"	2299.00

SUPERMAC

SPECTRUM 24 PDG PLUS	1519.00
SPECTRUM/24 SERIES IV	875.00
THUNDER STORM	839.00
VIDEOSPIGOT NUBUS	369.00
SUPERMATCH 171	1059.00
NEW! PHOTOSPEED	3509.00
SUPERMATCH 20T	2399.00
SUPERMATCH 21	2399.00

SOFTWARE

BUSINESS

CAERE	
IMAGE ASSISTANT	335.00
OMNIPAGE	449.00
OMNIPAGE DIRECT	249.00
OMNIPAGE PRO	629.00
PAGE KEEPER	629.00
CHIPSOFT	
MACINTAX/QUICKEN BUNDLE	65.00

UC630

(600 DPI)

\$1129

U MAX

COLOR SCANNERS

UC1200S

UC630

WITH ADOBE PHOTOSHOP

WITH ADOBE PHOTOSHOP

WITH ADOBE PHOTOSHOP

WITH ADOBE PHOTOSHOP

WITH ADOBE PHOTOSHOP

WITH ADOBE PHOTOSHOP

WITH ADOBE PHOTOSHOP

WITH ADOBE PHOTOSHOP

WITH ADOBE PHOTOSHOP

WITH ADOBE PHOTOSHOP

WITH ADOBE PHOTOSHOP

WITH ADOBE PHOTOSHOP

WITH ADOBE PHOTOSHOP

WITH ADOBE PHOTOSHOP

WITH ADOBE PHOTOSHOP

WITH ADOBE PHOTOSHOP

WITH ADOBE PHOTOSHOP

WITH ADOBE PHOTOSHOP

WITH ADOBE PHOTOSHOP

WITH ADOBE PHOTOSHOP

WITH ADOBE PHOTOSHOP

WITH ADOBE PHOTOSHOP

WITH ADOBE PHOTOSHOP

WITH ADOBE PHOTOSHOP

WITH ADOBE PHOTOSHOP

WITH ADOBE PHOTOSHOP

WITH ADOBE PHOTOSHOP

WITH ADOBE PHOTOSHOP

WITH ADOBE PHOTOSHOP

WITH ADOBE PHOTOSHOP

WITH ADOBE PHOTOSHOP

OUR POLICIES

30-day MBG applies to designated manufacturers only. Call customer service at (310) 214-0000 for a Return Authorization. All returns without an authorization number (RA #) will be refused. Returned products must be in original condition and packaging and must be sent back within 30 days of our invoice date. No refunds for freight charges. Prices and availability of product are subject to change without notice. Personal checks require up to 10 working days to clear. Include name, address and telephone numbers (no P.O. Boxes please). If ordering by credit card, include expiration date and billing address. California residents (only) add 8.25% for sales tax.

ESTABLISHED 1985

MAC DEPOT™

1-800-222-2808

4453 REDONDO BEACH BLVD.
LAWDALE, CA 90260
Canada Toll-Free: 1-800-548-2512



\$435

Call for more details

Bundle includes:
NEC CDR-25, 10 interactive
CD-ROM titles, and 1 pair
amplified speakers.

CLARIS - 30 Day MBG

CLARIS WORKS	189.00
FILEMAKER PRO	259.00
MACWRITE II	89.00
MACPROJECT PRO	389.00

MICROSOFT - 30 Day MBG

WORKS 3.0	159.00
OFFICE 3.0	469.00
WORD 5.1	289.00
EXCEL 4.0	289.00



**CORDLESS MOUSE
FREE!**

\$49!

DTP & GRAPHICS

ADOBE - 30 Day MBG (Except fonts)	
DIMENSIONS	99.00
ILLUSTRATOR w/DIMENSIONS	359.00
PHOTOSHOP 2.0	545.00
SUPER ATM	99.00

ALDIS - 30 Day MBG

FREERHAND 3.1	389.00
INTELLIDRAW	195.00
PAGEMAKER 4.2	489.00
PERSONAL PRESS	99.00
SUPERPAINT 3.0	130.00

CLARIS - 30 Day MBG

MACDRAW PRO 1.5	249.00
GRYPHON - 30 Day MBG	
MORPH	95.00

QUARK - 30 Day MBG

QUARK X PRESS 3.1	579.00
-------------------	--------

UTILITIES

APPLE	
APPLESHARE 3.0	989.00
APPLETALK REMOTE ACCESS	169.00
AT EASE	49.00
PC EXCHANGE	79.00
SYSTEM 7.1	89.00

FWB - 30 Day MBG

HARD DISK TOOL KIT	124.00
HD TOOL KIT PERSONAL	52.00

5TH GENERATION - 30 Day MBG

AUTODOUBLER	59.00
-------------	-------

SYMANTEC - 30 Day MBG

NORTON ESSENTIALS	75.00
SAM V3.5	75.00

USE OUR TOLL-FREE INTERNATIONAL PHONE LINES
Australia 0314-800-125-712, Canada 1-800-548-2512,
Denmark 0434-0297, France 19-0590-1099, Italy 1678-
7466, Japan 0331-11-1351, Netherlands 06-022-5613,
Norway 050-12029, Switzerland 046-05-3420, United
Kingdom 0400-89-1174

Circle 144 on reader service card

TELL US YOUR NEEDS...

PRINTERS



\$1195

TI MicroLaser Plus

NEC SilentWriter Model 95

\$1495



Texas Instruments

MicroLaser Plus w/AppleTalk 1,195
MicroLaser XL Turbo 2,789

Lexmark IBM

LaserPrinter 6P 1,549
LaserPrinter 6A 1,729
LaserPrinter 10L 1,719
LaserPrinter 10A 2,219

NEC

SilentWriter Model 95 1,495

Panasonic

Postscript KX-P4455 1,979

COSTAR CORP.

\$185

CoSTAR LabelWriter II



LabelWriter II 185
LabelWriter II Plus 250
AddressExpress 689
AddressWriter 465

We also stock LabelWriter II and LabelWriter II Plus labels. Please call us for best pricing and quantity discounts.

\$85

CoSTAR Stingray Turbo Mouse



MISCELLANEOUS

SIMMs Installation Toolkit 8
Maxima 2.0 44
Optima / 32 149
Virtual 3.0 139
LC Video-RAM 512K 50
Quadra Video RAM (256K-80ns) 31
Mac 101 Keyboard 120
Kensington Turbo Mouse 106
LC 16mhz Math Co-Processor 59
Classic II Math Co-Processor 59
TechWorks Cache Card IIci 145
Tech Works IIsi PDS Adaptor (20MHz) . 95

LB INDUSTRIES



Wrist saver: 12
Wristwaver Mousepad 12
Wristwaver/Mousepad bundle 20
Your choice of Royal Blue, Red, Black, Gray, Navy

MISC. HARDWARE

Rasterops 24STV Video Display Brd ... 789
Video Spigot NuBus 469
Video Spigot IIsi 379
Video Spigot LC 399
Video Spigot Pro NuBus 1,369
Video Spigot Pro IIsi 1,285

MODEMS

DOVE COMPUTER



DoveFax PB 99
The DoveFax PB features a 9600 bps send/4800 bps receive Group III fax modem and a 2400 bps Hayes compatible data modem for the PowerBook



DoveFax Pro + V 489
The DoveFax Pro+ Voice features a 14.4 kbps send/receive personal fax machine, a 14.4 kbps data modem plus a voice answering system for your Macintosh.

DoveFax 144E 299
The Dove Fax 1443 is an external Group III S/R fax modem with fax software and 14.4 kbps modem with v.42bis.

COMPARE OUR SHIPPING PRICES

AIRBORNE EXPRESS OVER NIGHT **\$6** AND UP • UPS GROUND **\$5** AND UP
Orders received before 7:30 PM Eastern time weekdays ship the same day. •
We export to most countries in the world. 2-3 days delivery to most countries.
• Prices subject to change. Quantity pricing for dealers. • All returns require approval and are subject to a restocking fee.
American Express, Visa, MasterCard, & Discover Cards gladly accepted.
Your card is not charged until the order is shipped.

FAX YOUR ORDER 24 HOURS A DAY (206) 454-7302

THE LLB COMPANY, INC.

300 - 120TH Ave. NE • Bldg 1, Suite 120 • Bellevue, WA 98005 • (206) 454-7258



1-800-848-8967

7:00 A.M. to 6:00 P.M. M-F • 9:00 A.M. to 4:00 P.M. Sat. • Pacific Standard Time

GET THE BEST SOLUTION

MORE MODEMS



\$349

Supra v.32bis S/R Fax

Supra

v.32bis S/R Fax 14.4	305
v.32bis S/R Fax 14.4w/cbl & SW	349
2400 Modem ONLY (NO CABLE)	74
Fax 2400/9600/9600	169

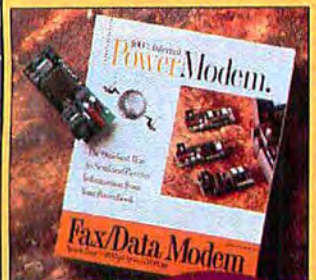
Global Village

PowerPort Gld 14.4/96	438
PowerPort Silver 96	375
PowerPort Bmz 24/96	208
Teleport Gold 14.4/14.4	438
Teleport Silver 96	375
Teleport Bronze 24/96	208

Zoom Modems

AMX 2400 bps Modem	68
FXV 2400/9600 S/R Fax	139
VFXV 32 bis 14.400 fax	279

PSI Modems



\$188

PowerModem for PB

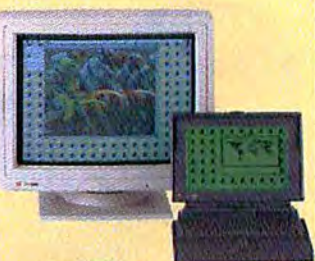
Power Modem for PB 24/96/48	188
Power Modem III for PB 96/96	375
Power Modem IV for PB 14.4	438

POWERBOOK MEMORY

2 MB Upgrade- PB100/140/170	85
4 MB Upgrade- PB100	195
6 MB Upgrade- PB100	249
4 MB Upgrade- PB140/170	195
6 MB Upgrade- PB140/170	239
4 MB Upgrade- PB160/180	199
6 MB Upgrade- PB 160/180	279
8 MB Upgrade- PB 160/180	385
10 MB Upgrade- PB 160/180	465
4 MB Upgrade - PBD40 210/230	210
8 MB Upgrade PBD40 210/230	379

POWERBOOK ACCESSORIES

Carrying cases Black/Blue/Teal	75
140/170/160/180 Replmnt Battery	79
External Battery Charger (PB100)	145
Battery Chgr (PB140/170/160/180)	149
Automobile Powerbook Adapter	69
CPU- Connectix Powerbook Utilities	45
PowerBook Installation Kit	7 ⁵⁰



\$799

BookView Imperial

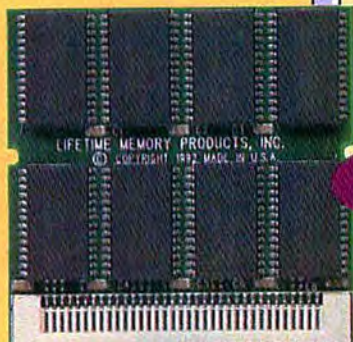
BOOKVIEW™ IMPERIAL

BookView Imperial provides the ability to use a variety of large screen displays, up to 19" monitors, adding even more flexibility to the PowerBooks.

Bookview Imperial offers the following:

- 8-bit color (256 color) upto 19" monitors
- Interface to most monitors
- Adapter fits in PowerBook Case
- Piggyback Apple 2MB RAM card, for 8 MB total RAM
- 1 year warranty
- Low power Consumption.

SIMMS FOR YOUR NEW POWERBOOK DUO

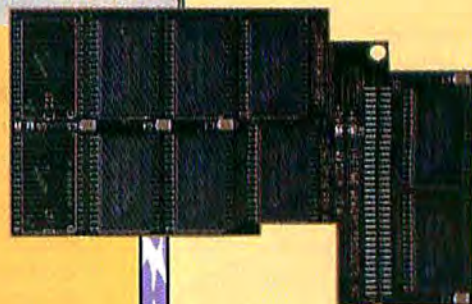


\$210

4 MB Upgrade- PB DUO 210/230

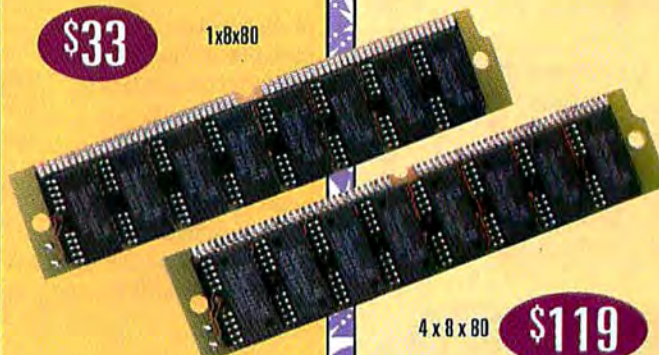
\$379

8 MB Upgrade- PB DUO 21/0230



\$33

1x8x80



4 x 8 x 80

\$119

1x8x80	33
1x8x70	35
1x8x60	37
1x8x100	31
1x8x80 (fx)	35
1x8x70 (fx)	37
2x8x80	61
2x8x70	63
4x8x80	119
4x8x70	121
4x8x80 (fx)	122
4x8x70 (fx)	124

4x8x80 (11/11x)	133
4x8x70 (11/11x)	135
8x8x80	299
8x8x80 (fx)	299
16x8x80 (High Profile)	475
16x8x80 (Low Profile)	599
16x8x80 (fx)	489
1 MB Classic Expansion Card	59
3 MB Classic Expansion Card	115
1x9x70 (PC)	38 ⁵⁰
4x9x70 (PC)	130
Mac Portable 3MB	410
Mac Portable 4MB	449

THE LLB COMPANY, INC.

300 - 120TH Ave. NE • Bldg 1, Suite 120 • Bellevue, WA 98005 • (206) 454-7258



1-800-848-8967

7:00 A.M. to 6:00 P.M. M-F • 9:00 A.M. to 4:00 P.M. Sat. • Pacific Standard Time

ORDER TODAY...

PLI DRIVES



PLI Infinity 88 Turbo **\$639**

PLI Super Floppy	319
Infinity Floptical 21 MB	379
Infinity 40 Turbo	519
Infinity 88 Turbo	639
Infinity 88RW44	699



PLI Multi-Session
CD-ROM **\$699**

PLI Multi-Session CD-ROM	699
Infinity 3.5" 128 Optical	1,279
Infinity 600 MB Optical	2,629
Infinity MaxOptical 1GB	3,599



PLI 85 MB Turbo
External HardDrive **\$439**

85MB Turbo External	439
170 MB Turbo External	539
212 MB Turbo External*	649
425 MB Turbo External*	1,379
520 MB Turbo External*	1,449
1 GB Turbo External*	1,949
Quick SCSI NuBus Card	359

*Quick SCSI will increase the performance of these drives

REMOVABLE MEDIA



\$16

Datalife Mini Cartridge—
Starting at...

Verbatim

Datalife 3-1/2" Micro disks	
09900 2SD Qty. 10	8 ⁹⁰
87573 2SHD Qty. 10	13 ⁹⁰

Verbatim Brand Optical Disks

3-1/2 Rewritable 512 B/S	45
5-1/4" Rewritable 512 B/S	139
5-1/4" Rewritable 1024 B/S	139

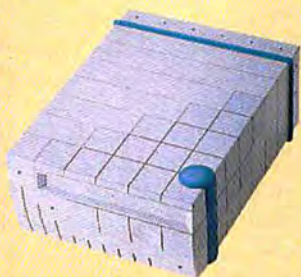
Datalife 8mm/4mm

Computer Grade Data Cartridges	
8MM DC 112Meters/367 Feet	12 ⁹⁰
4MM DC 90Meters/295 Feet	16 ⁹⁰
4MM DC 50 Meters/197 Feet	13 ⁹⁰

Datalife Mini Cartridges

DC2000 Formatted w/QIC 40 Format	16
DC2080 Formatted w/QIC 80 Format	19
DC2120 Formatted w/QIC 80 Format	21

PINNACLE MICRO



650MB Optical Drive	2,875
PMO 130	1,559

A Special Message for You

As you review these pages you will see lots of competitive prices. The LLB Company offers more — quality products, service, and availability — all backed by knowledgeable sales associates.

We constantly monitor the market, follow up on latest technologies and product developments to bring you the new products at competitive prices that you have come to expect from the LLB Company.

As we expand our product line, we never fail to remember that we exist because of the loyalty of our clients. We hope to continue to earn your trust by doing what we are good at — delivering to you, on time, what you need at a competitive price.

— Almas Kabani, President

SCANNERS

Microtek

ScanMaker II Color	889
Scan Maker IIXE Color	1,179

\$889

ScanMaker II



\$879



UMAX®

ScanOffice	879
------------------	-----

UMAX OA-1 600 dpi (interpolated to 1200 dpi), 256 grayscale scanner. The total scanning solution for the office.

UC840	1,369
-------------	-------

The UMAX UC840 captures 16.8 million colors with a variable scanning resolution from one to 800 dots per inch. The UC840 merges award-winning technology with state-of-the-art craftsmanship, presenting crisp and clear images.

COMPARE OUR SHIPPING PRICES

AIRBORNE EXPRESS OVER NIGHT **\$6** AND UP • UPS GROUND **\$5** AND UP

Orders received before 7:30 PM Eastern time weekdays ship the same day. •

We export to most countries in the world. 2-3 days delivery to most countries.

• Prices subject to change. Quantity pricing for dealers. • All returns require approval and are subject to a restocking fee.

American Express, Visa, MasterCard, & Discover Cards gladly accepted.

Your card is not charged until the order is shipped.

FAX YOUR ORDER 24 HOURS A DAY (206) 454-7302

THE LLB COMPANY, INC.

300 - 120TH Ave. NE • Bldg 1, Suite 120 • Bellevue, WA 98005 • (206) 454-7258



1-800-848-8967

7:00 A.M. to 6:00 P.M. M-F • 9:00 A.M. to 4:00 P.M. Sat. • Pacific Standard Time

GET IT TOMORROW!

MASS Microsystems



Diamond Drive™ External Hard Drives

Diamond Drive high performance hard drives give you the ultimate high capacity storage solutions at an affordable price.

120 MB	479
210 MB	629
510 MB	1,359
1000 MB	2,289
1800 MB	2,709

HitchHiker Hard Drive



\$779

HitchHiker for the PowerBook

HitchHiker™ Ultra-Compact Hard Drives

Pocket size external enclosure, platinum color. Weighs less than 10 ounces.

80 MB	599
120 MB	739

HitchHiker Drives for the PowerBook

80 MB	629
120 MB	779

DataPak External SyQuest Drives

44 MB	509
88 MB (R/W 44 MB)	678

DataPak External Magneto-Optical Drives

128 MB	1,429
650 MB	3,059

DataPak CD-ROM Drive

Zero-footprint enclosure, system cable, external active terminator, Audio CD software, CD Caddy.

CD ROM - MultiSession	699
-----------------------------	-----

FWB, INC.



FWB

PocketHammer 100

\$705

PocketHammer 100	705
PocketHammer 240	1,139
hammer240is	899
hammerDisk130 Optical	1,579
hammerDisk44	719
hammerDisk88	839
hammerPB120	789



SyQuest 44MB Cartridge

\$63

MORE REMOVABLE MEDIA

SyQuest 44MB Cartridge	63
SyQuest 88MB Cartridge	99
Optical Cart/Verbatim (Single) 256MB .....	.95
Optical Cart/Verbatim (Single) 128MB .....	.45
Optical Cart/Komag (Single) 128MB .....	.45
Bernoulli 40MB Cartridge (3 Pack)	270
Bernoulli 90MB Cartridge (3 Pack)	435
Floptical Disc 21 MB	24

ASANTÉ

Maccon + IIfix/Thin (64)	169
Maccon + Thick/10Base T (64k)	169
Maccon + Thick/Thin/10Base T (64k)	239
Maccon + 30le Thick/Thin (64k)	169
Maccon + Thick/Thin/10Base T (64k)	249
Maccon + IIsi Thick/Thin/10 T w/FPU	299
Maccon + LC En 10LC to 10Base T	169
Maccon + LC/LCII Thin w/FPU	289
Maccon + LC 10Base T w/FPU	169
Maccon SE Thick/10Base T (32k)	169
IIsi/SE30 Frien Net/10Base T (16k)	239
IIsi/SE30 Thick/Thin w/FPU (16k)	169
IIsi/SE30 Thick/10Base T (16k)	179
10T Hub w/12 10T Thick/Thin/10 T	499
Hub 1012 & View/Mac 2.0	1,349
10Base T Hub w/8 Thin Port	258
SCSI Ethernet Thick/Thin/10Base T	290
SCSI Ethernet for PB, 10Base T	290
SCSI Ethernet 10 T (w/SCSI Cable)	259
SCSI Ene/PB Thick/Thin/10 T w/Cable	359
MAU 10Base T Media Attachment	89
Friendly Net Adaptor - 10Base T	89
Friendly Net Adaptor - Thin	89
Friendly Net Adaptor - Thick	89
Asante Print	349
Asante Print Thick/Thin	359

ACCELERATORS

New Life Classic (16MHz)	569
Quadra Overdrive for Quadra 900	239
Novy Quick 30 Mac Plus (25MHz)	525
Novy Quick 30 Mac SE (25MHz)	525

DAYSTAR
DIGITAL

ComboCache IIsi	209
ComboCache IIsi w/FPU	299
DualPort IIsi w/20MHz FPU	169
Equalizer LC	169
Equalizer LC w/FPU	239
RAM Power Card	429

DAYSTAR DIGITAL



Universal PowerCache

The PowerCache is an award winning design that gives you affordable 68030 performance and the best in compatibility. Just plug it in and go... no downtime and it works with everything.

33MHz	389
33MHz w/FPU	479
40MHz	559
40MHz w/FPU	649
50MHz	739
50MHz w/FPU	869
Adaptor (All Mac LC and II's, PDS)	41
Adaptor (All Mac SEs and Classics)	85



NEW! Turbo 040 Accelerators

Get the maximum in 68040 acceleration with all the compatibility of the PowerCache. The effective way to increase your productivity up to four times as fast! Optional 128k cache boosts performance another 4-50%.

25 MHz Turbo 040	1,129
33MHz Turbo 040	1,389
FastCache Turbo 25	259
FastCache Turbo 33	345
FastCache IIsi	279
FastCache IIsi w/FPU	349
FastCache IIsi	205
FastCache Quadra 700/900	269
FastCache Quadra 700/900/950	409

DAYSTAR
DIGITAL

THE LLB COMPANY, INC.

300 - 120TH Ave. NE • Bldg 1, Suite 120 • Bellevue, WA 98005 • (206) 454-7258



1-800-848-8967

7:00 A.M. to 6:00 P.M. M-F • 9:00 A.M. to 4:00 P.M. Sat. • Pacific Standard Time

SAY YOU SAW IT IN **MACWORLD.**

To purchase products advertised in this issue call the phone numbers below or use the reader service number for our Fast Facts Product Information Card located on the next page.



Page No.	Advertiser	Reader Svc. No.	Phone	Page No.	Advertiser	Reader Svc. No.	Phone	Page No.	Advertiser	Reader Svc. No.	Phone
138	Adobe Systems	134	800/833-6687	12	GDT Software	42	800/663-6222	149	P.S.I. Integration Inc.	61	800/622-1722
234	Advanced Business Center	227	800/274-7747	167	Graphsoft	46	410/461-9488	13	Pinnacle Micro	238	800/553-7070
36	After Hours Software	318	800/367-8911	258-265	Hardware That Fits	321	800/364-WORLD	303	PORT	123/320	800-242-3133
14	Agfa Scanners	83	800/685-4271	207	Helix Technologies	316	800/36HELIX	305	Printer Connection	—	714/758-8832
34	AGIO	—	800/688-2446	209	Helix Technologies	131	800/36HELIX	191	Prometheus Products	288	800/477-3473
21	Aldus	—	—	211	Helix Technologies	315	800/36HELIX	33	RasterOps	—	800/SAYCOLOR
153	Aldus	—	—	74	Hewlett Packard	—	—	192-193	River Computer	—	802/496-7650
266	Alliance Peripheral Systems	31	800/235-2752	196	Icom Simulations	—	800/877-4266	301	SafeWare Insurance Agency, Inc.	197	800/848-3469
8	Anthro	—	800/325-3841	145	Image Club	—	—	16	ScanCo	—	800/722-6263
178	Apple	—	—	304	Innovative Data Design	129	510/680-6818	301	Secure-It	239	800-451-7592
26	Apple	—	800/795-1000	155	Insignia Solutions	72	800/848-7677	210	Sigma Designs	176	800/845-8086
38-39	Apple	—	—	274	International Mac Specialists	—	800/643-3591	16	Sophisticated Circuits	237	800-827-4669
448	Apple	—	—	203	Iomega	240	801/967-0326	35	Statsoft	99	918/583-4149
175	Applied Engineering	167	800/554-MACS	8C	Kensington	—	800/535-4242	227	Sumeria	—	415/904-0889
133	AT & T Paradyne	265/311	800/554-4996	204	Key Tronic	249	800/262-6006	28	SuperMac Technology	88	800-334-3005
62	Attain Corporation	6	617/776-1110	67-72	La Cie	246	800/999-1182	184-185	Supra	—	800/967-8772
228	Berkeley Systems	218	800/248-0800	270-271	La Cie	—	800/999-1182	169	Symantec	—	—
60	Bitstream	307/308	617/497-7512	82	LaserMaster	43	800/950-6868	182-183	Syquest	234	800/245-2278
247	BottomLine Distribution	305	900/420-3636	236-239	LLB Company	314	800/848-8967	163	Systat	29	708/864-5670
248-249	BottomLine Distribution	306	900/420-3636	252	Mac and More	85	800/530-5050	176W	Techworks	—	800/944-8244
147	Brother International	294	908/356-8880	272	MAC & PC USA	245	800/858-7436	59	Tektronix	143	800/535-6100
302	Casady & Greene	32	800/359-4920	256-257	Mac Products USA	175	800/MAC-USA1	20	Teleware	84	800/322-6962
233	CD Rom Expo	—	—	170-173	Mac Zone, The	70	—	131	Texas Instruments	313	800/527-3500
41	Chiron America, Inc.	64	800/441-0222	229-232	Mac's Place	209	800/367-4222	84-85	WordPerfect	—	800/526-7820
17A	Clarix	—	—	80	MacAcademy	106	800/527-1914	86-87	Wordperfect	—	800/526-7820
44A	Clarix	—	—	268	MacCenter	—	800/950-0950	88-89	Wordperfect	—	800/526-7820
250-251	Club Mac	96	800/258-2622	46-53	MacConnection	—	800/800-3333	214	ZyXEL USA	107	800/255-4101
31	Computer Associates	10	800/CALL-CAI	235	MacDepot	144	800/222-2808				
161	Contemporary Cybertics Group	322	804/873-9000	18-19	MacDirect	58	800/621-8467				
27	Contemporary Cybertics Group	188	804/873-9000	273	MacLand	40	800/888-8779				
40	Costar Corporation	196	800 4 COSTAR	254-255	MacNews	—	800/243-9383				
157	Curtis Manufacturing	20	603/532-4123	10-11	MacroMedia	—	800/945-9063				
26	Dantz Development	26	510/849-0293	56-59	MacWarehouse	150	800/255-6227				
34	Data Desk	108	607/257-1000	212	Macworld CD Ventures	—	800/821-1177				
201	Dataviz	36	800/733-0030	300	Macworld CD Ventures	217	800/631-1700				
186	DataWatch	201	919-490-1277	178	Mainstay	5	818/991-6540				
206	DCA	274	800/348-3221	208	Mannesmann Tally	273	800/843-1347				
197	Deneba Software	57	800/6CANVAS	61	Mathsoft, Inc.	34	800/628-4223				
269	DGR Technologies	286	800/235-9748	151	MAXA Corporation	270	800/788-MAXA				
63	Digital Equipment Corp.	—	800/DEC-INFO	137	MicroNet Technology	139	714/837-6033				
30	Digital Vision	242	800/346-0090	22	MicroNet Technology	113	714/837-6033				
253	Dr. Mac	177	800/825-6227	IFC-1	Microsoft	—	—				
54-55	Eastman Kodak	287	800/242-2424	76-77	Microsoft	—	—				
246	Educational Resources	28	800/624-2926	141	Microtek Lab, Inc.	146	800/654-4160				
306-307	Educorp	157	800/843-9497	159	Mirror Technologies	122	800/643-0625				
190	Engineered Software	12	919/299-4843	180	Mirror Technologies	304	800/643-0628				
6-7	Envisio	256	612/628-6288	199	Mirror Technologies	125	800/643-0629				
194	Envisio	204	612/628-6288	2-3	NEC Technologies	17	800/NEC-INFO				
24	Epson America Inc.	—	800/BUY EPSON	IBC	NEC Technologies	16	800/NEC-INFO				
244-245	Express Direct	81	800/535-3252	189	NEC Technologies	180	800/NEC-INFO				
9	Fifth Generation Systems	135	800/477-8212	127	No Hands Software	299	800/598-3821				
32	Fractal Design	190	408/688-8800	29	NoRad Corporation	309	800/262-3260				
43	FreeSoll Company	3	412/846-2700	301	Nordic Software	168	402-488-5086				
143	GCC Technologies	261/262800-422-7777		190	Novy Systems	202	800-638-4784				
				78	Now Software	49	800/237-3611				
				165	Now Software	317	800/237-3611				
				135	nView Corp.	117	800/736-8439				

**TURN TO THE MACWORLD
SHOPPER ON PAGE 275
TO FIND ADDITIONAL
ADVERTISERS**

FASTFACTS

JUST FOR YOU. FREE PRODUCT INFORMATION FROM MACWORLD.

There's no cost; no obligation. Simply fill out the form and circle the numbers on the card below for the products which interest you.

Mail the card. We pay the postage!

Numbers for advertised products can be found in the ad and in both the Product Index and the Advertiser Index.

FASTFAX

For faster results just fax this sheet to 413/637-4343.
Please include your fax number where indicated.

Recycled Paper ♻ Contains 10% Post Consumer Waste



Free Product Info

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110
111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130
131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150
151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170
171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190
191	192	193	194	195	196	197	198	199	200

201	202	203	204	205	206	207	208	209	210
211	212	213	214	215	216	217	218	219	220
221	222	223	224	225	226	227	228	229	230
231	232	233	234	235	236	237	238	239	240
241	242	243	244	245	246	247	248	249	250

251	252	253	254	255	256	257	258	259	260
261	262	263	264	265	266	267	268	269	270
271	272	273	274	275	276	277	278	279	280
281	282	283	284	285	286	287	288	289	290
291	292	293	294	295	296	297	298	299	300
301	302	303	304	305	306	307	308	309	310
311	312	313	314	315	316	317	318	319	320
321	322	323	324	325	326	327	328	329	330
331	332	333	334	335	336	337	338	339	340
341	342	343	344	345	346	347	348	349	350
351	352	353	354	355	356	357	358	359	360
361	362	363	364	365	366	367	368	369	370
371	372	373	374	375	376	377	378	379	380
381	382	383	384	385	386	387	388	389	390
391	392	393	394	395	396	397	398	399	400

MACWORLD



Free Macworld Shopper Info

401	402	403	404	405	406	407	408	409	410
411	412	413	414	415	416	417	418	419	420
421	422	423	424	425	426	427	428	429	430
431	432	433	434	435	436	437	438	439	440
441	442	443	444	445	446	447	448	449	450
451	452	453	454	455	456	457	458	459	460
461	462	463	464	465	466	467	468	469	470
471	472	473	474	475	476	477	478	479	480
481	482	483	484	485	486	487	488	489	490
491	492	493	494	495	496	497	498	499	500
501	502	503	504	505	506	507	508	509	510
511	512	513	514	515	516	517	518	519	520
521	522	523	524	525	526	527	528	529	530
531	532	533	534	535	536	537	538	539	540
541	542	543	544	545	546	547	548	549	550
551	552	553	554	555	556	557	558	559	560
561	562	563	564	565	566	567	568	569	570
571	572	573	574	575	576	577	578	579	580
581	582	583	584	585	586	587	588	589	590
591	592	593	594	595	596	597	598	599	600

Please print or type all information

Name _____

Title _____

Co. _____

Address _____

City _____

State _____ Zip _____

Phone _____

Fax _____

☐ Check box and fill in the appropriate information to subscribe to Macworld. You will be billed \$24.95 for a 1-year (12 issue) subscription (U.S. only).

Expires July 19, 1993 S1 May 1993



Free Product Info

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110
111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130
131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150
151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170
171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190
191	192	193	194	195	196	197	198	199	200

201	202	203	204	205	206	207	208	209	210
211	212	213	214	215	216	217	218	219	220
221	222	223	224	225	226	227	228	229	230
231	232	233	234	235	236	237	238	239	240
241	242	243	244	245	246	247	248	249	250

251	252	253	254	255	256	257	258	259	260
261	262	263	264	265	266	267	268	269	270
271	272	273	274	275	276	277	278	279	280
281	282	283	284	285	286	287	288	289	290
291	292	293	294	295	296	297	298	299	300
301	302	303	304	305	306	307	308	309	310
311	312	313	314	315	316	317	318	319	320
321	322	323	324	325	326	327	328	329	330
331	332	333	334	335	336	337	338	339	340
341	342	343	344	345	346	347	348	349	350
351	352	353	354	355	356	357	358	359	360
361	362	363	364	365	366	367	368	369	370
371	372	373	374	375	376	377	378	379	380
381	382	383	384	385	386	387	388	389	390
391	392	393	394	395	396	397	398	399	400

MACWORLD



Free Macworld Shopper Info

401	402	403	404	405	406	407	408	409	410
411	412	413	414	415	416	417	418	419	420
421	422	423	424	425	426	427	428	429	430
431	432	433	434	435	436	437	438	439	440
441	442	443	444	445	446	447	448	449	450
451	452	453	454	455	456	457	458	459	460
461	462	463	464	465	466	467	468	469	470
471	472	473	474	475	476	477	478	479	480
481	482	483	484	485	486	487	488	489	490
491	492	493	494	495	496	497	498	499	500
501	502	503	504	505	506	507	508	509	510
511	512	513	514	515	516	517	518	519	520
521	522	523	524	525	526	527	528	529	530
531	532	533	534	535	536	537	538	539	540
541	542	543	544	545	546	547	548	549	550
551	552	553	554	555	556	557	558	559	560
561	562	563	564	565	566	567	568	569	570
571	572	573	574	575	576	577	578	579	580
581	582	583	584	585	586	587	588	589	590
591	592	593	594	595	596	597	598	599	600

Please print or type all information

Name _____

Title _____

Co. _____

Address _____

City _____

State _____ Zip _____

Phone _____

Fax _____

☐ Check box and fill in the appropriate information to subscribe to Macworld. You will be billed \$24.95 for a 1-year (12 issue) subscription (U.S. only).

Expires July 19, 1993 S2 May 1993

FACTS, FAST!

FREE PRODUCT INFORMATION. Get valuable information about the products that interest you. There's no cost; no obligation. Just fill out this **FASTFACTS** Information form. Circle the numbers for the desired products.

Then mail the card. We pay the postage! For even faster results fill out and send the card via our **FASTFAX**.

Now fast...get the facts, the competition's gaining on you.

MACWORLD



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

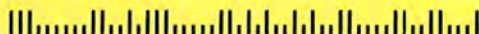
BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 215 PITTSFIELD, MA

POSTAGE WILL BE PAID BY ADDRESSEE

MACWORLD

Reader Service Department
P.O. Box 5299
Pittsfield, MA 01203-9906



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 215 PITTSFIELD, MA

POSTAGE WILL BE PAID BY ADDRESSEE

MACWORLD

Reader Service Department
P.O. Box 5299
Pittsfield, MA 01203-9906





A QUICK & EASY **PRODUCT INDEX** FROM **MACWORLD**.

Simply use this index to find the page or advertiser of the products which interest you. Then, use the reader service number for our FastFacts Product Information Card located on the preceding page.

Page No.	Advertiser	Reader Svc. No.	Page No.	Advertiser	Reader Svc. No.	Page No.	Advertiser	Reader Svc. No.	Page No.	Advertiser	Reader Svc. No.
SOFTWARE			MULTIMEDIA			135 nView Corp. 117			ACCESSORIES		
BUSINESS			10-11 MacroMedia —			210 Sigma Designs 176			FURNITURE		
36	After Hours Software	318	POWERBOOK			HARD DISKS/STORAGE			MISCELLANEOUS		
62	Attain Corporation	6	78	Now Software	49	266-267	Alliance Peripheral Systems	31	8	Anthro	—
44A	Clarix	—	169	Symantec	—	41	Chinon America, Inc.	64	16	ScanCo	—
34	Data Desk	108	SECURITY			250-251	Club Mac	96	266-267 Alliance Peripheral Systems 31		
207	Helix Technologies	316	301	Secure-It	239	161	Contemporary Cybernetics	322	40	Costar Corporation	196
209	Helix Technologies	131	STATISTICAL			27	Contemporary Cybernetics	188	157	Curtis Manufacturing	20
211	Helix Technologies	315	34	Data Desk	108	269	DGR Technologies	286	29	NoRad Corporation	309
155	Insignia Solutions	72	35	Statsoft	99	258-265	Hardware That Fits	321	303	PORT	123 / 320
10-11	MacroMedia	—	163	Systat	29	274	International Mac Specialists	—	16	ScanCo	—
178	Mainstay	5	UTILITIES			203	Imega	240	MAIL ORDER		
76-77	Microsoft	—	138	Adobe Systems	134	236-239	LLB Company	314	234	Advanced Business Center	227
127	No Hands Software	299	228	Berkeley Systems	218	256-257	Mac Products USA	175	266-267	Alliance Peripheral Systems	31
35	Statsoft	99	302	Casady & Greene	32	273	MacLand	40	247	BottomLine Distribution	305
163	Systat	29	26	Dantz Development	26	137	MicroNet Technology	139	248-249	BottomLine Distribution	306
20	Teleware	84	186	DataWatch	201	22	MicroNet Technology, Inc.	113	250-251	Club Mac	96
84-85	WordPerfect	—	9	Fifth Generation Systems	135	199	Mirror Technologies	125	269	DGR Technologies	286
86-87	Wordperfect	—	12	GDT Software	42	13	Pinnacle Micro	238	253	Dr. Mac	177
88-89	Wordperfect	—	196	Icom Simulations	—	182-183	Syquest	234	246	Educational Resources	28
CAD/CAM			155	Insignia Solutions	72	EXPANSIONS/UPGRADES			258-265	Hardware That Fits	321
190	Engineered Software	12	151	MAXA Corporation	270	6-7	Envisio	256	274	International Mac Specialists	—
167	Graphsoft	46	165	Now Software	317	INPUT DEVICES			236-239	LLB Company	314
304	Innovative Data Design	129	78	Now Software	49	8C	Kensington	—	252	Mac and More	85
61	Malthsoft, Inc.	34	169	Symantec	—	204	Key Tronic	249	272	MAC & PC USA	245
CD ROM			WORD PROCESSING			16	Sophisticated Circuits	237	256-257	Mac Products USA	175
306-307	Educorp	157	17A	Clarix	—	MISCELLANEOUS			170-173	Mac Zone, The	70
212-213	Macworld CD Ventures	—	84-85	WordPerfect	—	8C	Kensington	—	229-232	Mac's Place	209
300	Macworld CD Ventures	217	86-87	Wordperfect	—	MODEMS			268	MacCenter	—
227	Sumeria	—	HARDWARE			133	AT & T Paradyne	265 / 311	46-53	MacConnection	—
COMMUNICATION			BOARDS			149	P.S.I. Integration Inc.	61	235	MacDepot	144
201	Dataviz	36	175	Applied Engineering	167	191	Prometheus Products	288	273	MacLand	40
206	DCA	274	6-7	Envisio	256	184-185	Supra	—	254-255	MacNews	—
43	FreeSoft Company	3	190	Novy Systems	202	214	ZyXEL USA	107	56-58	MacWarehouse	150
DATA MANAGEMENT			149	P.S.I. Integration Inc.	61	NETWORKING			159	Mirror Technologies	122
36	After Hours Software	318	28	SuperMac Technology	88	176W	Technworks	—	199	Mirror Technologies	125
207	Helix Technologies	316	176W	Technworks	—	POWERBOOKS			305	Printer Connection	—
209	Helix Technologies	131	CD ROM			208	Mannesmann Tally	273	192-193	River Computer	—
211	Helix Technologies	315	306-307	Educorp	157	PRINTERS			TRADESHOWS/CONFERENCES		
EDUCATIONAL			2-3	NEC Technologies	17	248-249	BottomLine Distribution	306	233	CD Rom Expo	—
246	Educational Resources	28	COMPUTER SYSTEMS			147	Brother International	294	TRAINING		
301	Nordic Software	168	17B	Apple	—	40	Costar Corporation	196	80	MacAcademy	106
ENTERTAINMENT			26	Apple	—	63	Digital Equipment Corp.	—	SERVICES		
302	Casady & Greene	32	38-39	Apple	—	143	GCC Technologies	261/262	TRADES		
301	Nordic Software	168	44B	Apple	—	74	Hewlett Packard	—	SHOWS		
FONTS			247	BottomLine Distribution	305	82	LaserMaster	43	CONFERENCES		
138	Adobe Systems	134	244-245	Express Direct	81	208	Mannesmann Tally	273	TRAINING		
60	Bitstream	307/308	301	Safeware Insurance Agency, Inc.	197	189	NEC Technologies	180	TRADES		
GRAPHICS/DTP			DIGITIZERS/SCANNERS			305	Printer Connection	—	SHOWS		
153	Aldus	—	14-15	Agfa Scanners	83	59	Tektronix	143	CONFERENCES		
21	Aldus	—	24	Epson America Inc.	—	131	Texas Instruments	313	TRAINING		
31	Computer Associates	10	18-19	MacDirect	58	VIDEO			TRADES		
197	Deneba Software	57	141	Microtek Lab, Inc.	146	28	SuperMac Technology	88	SHOWS		
30	Digital Vision	242	180	Mirror Technologies	304	SERVICES			TRADES		
54-55	Eastman Kodak	287	DISPLAY			TRADES			SHOWS		
32	Fractal Design	190	244-245	Express Direct	81	TRADES			SHOWS		
145	Image Club	—	18-19	MacDirect	58	TRADES			SHOWS		
304	Innovative Data Design	129	254-255	MacNews	—	TRADES			SHOWS		
76-77	Microsoft	—	159	Mirror Technologies	122	TRADES			SHOWS		
127	No Hands Software	299	IBC	NEC Technologies	16	TRADES			SHOWS		
MISCELLANEOUS			DISPLAY			TRADES			SHOWS		
12	GDT Software	42	244-245	Express Direct	81	TRADES			SHOWS		
151	MAXA Corporation	270	18-19	MacDirect	58	TRADES			SHOWS		



- FREE 2-year Warranty
- FREE Data Recovery
- FREE Technical Support



PLI Infinity 88RW44 Removable
Finally, one drive READS and WRITES BOTH 88 & 44 cartridges!



PLI Infinity Optical 3.5"
138MB on one 3.5" cartridge
"The fastest 3.5" drive on the market"

WE CARRY THE FULL LINE OF
PLI STORAGE DEVICES

Infinity 44 Removable \$499
With cartridge

Infinity Optical 5.25" \$2,695
600MB on 1 cartridge. New Sony mechanism, 1MB buffer & SCSI-2 compatible

Infinity Maxoptical 1GB \$3,495
600MB & 1GB capacity, "Super fast" 35ms seek time. Supports rewritable optical cartridges and it does WORM!

MiniArrays Call
Lightning fast data transfer • Available in 240MB to 4GB capacities • Includes Free QuickSCSI • Call for best pricing

Multi-Session CD-ROM \$695
"Smooth animation, multimedia sensation!"

**AUTHORIZED DIRECT PLI
RESELLER**

Apple, Mac and trademarks of Apple Computer. Prices subject to change without notice. All returned orders may be subject to a maximum 15% restocking fee plus return shipping. Call for RMA before returning. All warranties on Macintosh or Apple brand products sold by Express Direct will be honored by Express Direct or its authorized agents only. All other manufacturer's warranties will apply.

**CALL EXPRESS DIRECT
800-535-3252**

Express Direct is the Mac- Call us for the Best Price, Comp



The Hi-Res People

NewGen Turbo PS/660p \$1,895

Canon engine • 35 Fonts • RISC PostScript Processing • 8MB RAM, expandable to 32MB • PC-Mac autoswitching

NEW!



NewGen Turbo PS/300p
Canon Engine • 35 Fonts

Special Price!

"Superior image quality"
- MacUser, Sept '92

**MacUSER
LABS**

600 dpi • 11"x17"

Introductory Price!



NewGen Turbo PS/660 B • Canon engine
• RISC Processor • SCSI ports • Ethernet avail.
• 12MB RAM • 35 fonts • PC-Mac autoswitching

100% Compatibility Guaranteed

All Newgen Printers are guaranteed to be fully compatible with your system. Call for details.

800 dpi **Call**

NewGen Turbo PS/880 • Canon engine
• RISC Processor • SCSI & Ethernet ports
• 12MB RAM • 35 fonts • PC-Mac autoswitching

AUTHORIZED DIRECT NEWGEN RESELLER

Apple Macs

NEW Mac IIvx, 4/80	\$1,695
Mac Centris 610/650	NEW
Mac Quadra 800, 8/230	\$3,995
Mac Quadra 950, 8/0	\$4,645
Mac PowerBooks & Duo's	CALL

We specialize in Custom Configurations



All Macs aren't created equal. We install PLI internal drives complete with 2-yr warranties. Plus all our Macs are SNOOPER Tested for added value and security!



24MB Ram, 525 MB PLI HD • Trinitron 16" Color display with accelerated 24-bit color card • Apple ext. keyboard • NewGen 11x17" laser printer • UMax 600dpi color scanner • PLI 44MB removable **Complete System \$14,195**

Store that gives you more! lete Support and Expert Advice.



E-MACHINES

1-Page & 2-Page

MW EDITORS' CHOICE

"Excellent"
- MacWorld, Sept '92

E-Machines ColorPage T16 II

- 16" Sony Trinitron
- Four Resolutions:
- Presentation (640x480),
- 1-Page (832x624) and
- 2-Page (1024x768 & 1152x870)



Call

Quadra-Ready!



E-Machines
T19 II
19" Dual-Mode
Sony Trinitron
• 1024 x 808
• 1152 x 870

\$2,295

"Of the larger monitors, the E-Machines T19
...[was] the best." - MacWorld, Sept '92

New PowerLink

E-Machines PowerLink Presenter turns
the Duo into a presentation machine
with flicker free video output to:

- SVGA &
large screen
Mac displays
- LCD panels
- Televisions



New for
Duo!

\$499

#1

**WORLDWIDE
RETAILER**

Nobody sells more E-Machines than Express
Direct. So nobody can give you better
advice, better support or a better price.

Nobody Takes Care of You Like Express Direct.

We value our customers and we prove it with the most progressive Service and Support Policy in the business. If you ever have a problem, we take care of it - immediately. Here's what we offer:

- FREE No Down-Time Guarantee.** Free ExpressCave for 30 days. Ask for details.
- Full One-Year Warranties.** Manufacturer's warranties cover most products.
- Unlimited Toll-Free Technical Support.** Got a question or problem? Call us!
- Expert Advice from Knowledgeable Sales Professionals.** We're here to help.
- Flexible Payment Options & Leasing Terms** Available for those who qualify.

1801 W. Larchmont Ave.
Chicago, IL 60613 USA 312.549.0030



UMAX®

Color Scanners

**600, 800 &
1200 dpi
Scanners**

\$1,095

Ask about
SPECIAL
Calera WordScan
OCR Software
Bundle!

UMax UC630 Color Scanner
600 dpi • 24-bit Color • With full Photoshop

Kai's POWER TOOLS™
for Adobe Photoshop

FREE KPT
\$149 Value



**Special
Price!**

UMax UC840 Color Scanner
800 dpi • 24-bit Color • With full Photoshop



Call

UMax UC630, UC840, & 1200S
Transparency Option

User-installable option for high-resolution
scanning of slides, transparencies and x-rays

**AUTHORIZED DIRECT UMAX
RESELLER**

Express Hours (central time):
M-F 8am-7pm; Sat 10am-2pm
24hr Fax, 7 days/week

**EXPRESS
DIRECT**

"The Mac Systems Company"

800-535-3252

International Orders Shipped Daily
FAX 312.549.6447

Call today for your **FREE** Educational Macintosh Catalog!

Spring 1993 Edition!

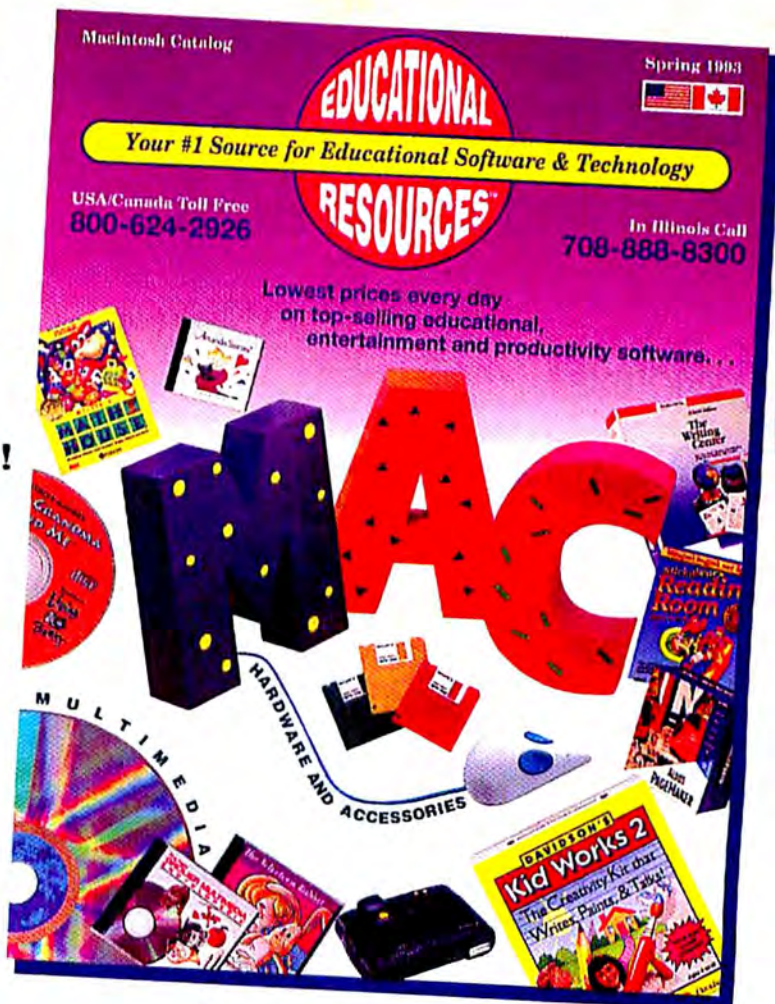
800-624-2926

USA/Canada

708-888-8300

Illinois

SAVE UP
TO 60%
EVERY
DAY!



FREE CATALOG • 800-624-2926

TOP
SELLER



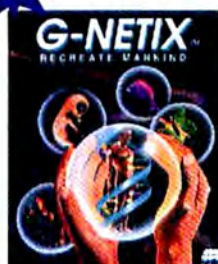
\$33⁹⁵ MAC
School Version \$59.95
Lab Pack \$134.95
Hard drive required.

NEW



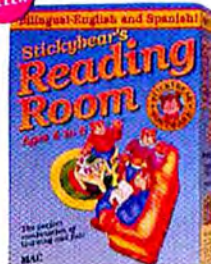
\$119⁹⁵ MAC
(Retail \$229.00)

NEW



\$39⁹⁵ MAC
(Retail \$69.95)

TOP
SELLER



\$34⁹⁵ MAC
(Retail \$59.95)
School Version \$55.95
Lab Pack \$104.95
Hard drive recommended.

NEW
CD-ROM



\$39⁹⁵ MAC
CD-ROM

NEW
CD-ROM

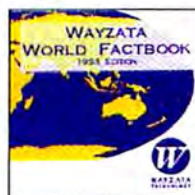


\$39⁹⁵ MAC
CD-ROM



Word Cross \$25.95
Word Link \$27.95
Word Bingo \$20.95
Teacher's Toolkit \$62.95

NEW
CD-ROM



\$32⁹⁵ MAC
CD-ROM
(Retail \$49.95)

NEW
CD-ROM



\$32⁹⁵ MAC
CD-ROM
(Retail \$49.95)

Educational Resources • 1550 Executive Drive, Elgin, IL 60123 • FAX 708-888-8499/8689



• Checks & School P.O.s welcome • \$25 min. on charge cards • Free shipping over \$400 in U.S. • Under \$400 add 5% shipping with \$5 min.
• Canada under \$200 add 10% with \$6 min. / over \$200, add 5% - also add 7% GST • Prices effective through July 31, 1993

Macintosh Systems



POWERBOOK 145	POWERBOOK 160	POWERBOOK 180	POWERBOOK 165c	POWERBOOK Duo 210	POWERBOOK Duo 230	COLOR CLASSIC	MACINTOSH LC III	MACINTOSH IIfx	CENTRIS 610	CENTRIS 650	QUADRA 800	QUADRA 950
CONFIGURATION												
4MB RAM 40MB DRIVE \$1985	4MB RAM 40MB DRIVE \$2270	4MB RAM 80MB DRIVE \$3840	4MB RAM 80MB DRIVE \$3125	4MB RAM 80MB DRIVE \$2099	4MB RAM 80MB DRIVE \$2439	New! WITH KEYBOARD 4MB RAM 80MB DRIVE \$1389	4MB RAM 80MB DRIVE \$1249	4MB RAM 80MB DRIVE \$1675	4MB RAM 80MB DRIVE \$1675	4MB RAM 80MB DRIVE \$2389	8MB RAM 230MB DRIVE \$3949	8MB RAM DRIVE OPTIONAL \$4599
4MB RAM 80MB DRIVE \$2349	4MB RAM 120MB DRIVE \$2945	4MB RAM 120MB DRIVE \$4179	4MB RAM 120MB DRIVE \$3499	4MB RAM 120MB DRIVE \$2475	4MB RAM 120MB DRIVE MODEM \$2999	4MB RAM 80MB DRIVE \$1399	4MB RAM 120MB DRIVE \$1399	5MB RAM 80MB DRIVE CD-ROM \$2049	8MB RAM 230MB DRIVE CD-ROM \$2575	8MB RAM 230MB DRIVE CD-ROM \$3499	8MB RAM 500MB DRIVE \$4899	8MB RAM 520MB DRIVE \$5439
SPECIFICATIONS												
25MHz 68030 FPU OPTION	25MHz 68030 FPU OPTION	33MHz 68030 BUILT-IN FPU	33MHz 68030 BUILT-IN FPU	25MHz 68030 FPU OPTION	33MHz 68030 FPU OPTION	16MHz 68030 FPU OPTION	25MHz 68030 FPU OPTION	33MHz 68030 FPU OPTION	20MHz 68040 No FPU	25MHz 68040 FPU OPTION	33MHz 68040 BUILT-IN FPU	33MHz 68040 BUILT-IN FPU
10" MONO PASSIVE MATRIX	10" 16-GRAY BACKLIT LCD	10" 16-GRAY ACTIVE MATRIX	10" COLOR PASSIVE MATRIX	9" 16-GRAY VIDEO OUT	9" 16-BIT GRAY VIDEO OUT	10" 3-BIT TRINITRON TUBE	VIDEO OUTPUT 8-24BIT 12 TO 14"	VIDEO OUTPUT 8-24BIT 12 TO 14"	VIDEO OUTPUT 8-BIT 12 TO 16"	VIDEO OUTPUT 8-BIT 12 TO 16"	VIDEO OUTPUT 8-BIT 12 TO 16"	VIDEO OUTPUT 16-BIT 12 TO 16"
1 PDS	1 PDS	1 PDS	1 PDS	Dock CONNECTOR	Dock CONNECTOR	1 PDS	1 PDS	1 PDS 3 NUBUS	1 PDS	1 PDS 3 NUBUS	1 PDS 3 NUBUS	1 PDS 5 NUBUS



BOTTOM LINE

DISTRIBUTION

1-900-420-3636

\$2 PER MINUTE

24-Hour International Fax Line 512-476-6399 • 1219 West 6th Street • Austin, Texas, 78703

FULL-TIME INTERNATIONAL SALES REPRESENTATIVES OFFER LANGUAGE INTERPRETATION IN GERMAN, FRENCH, ITALIAN, SPANISH, JAPANESE, ARABIC, RUSSIAN, GREEK AND CANTONESE.

- ΕΞΥΠΗΡΕΤΟΥΜΕ ΔΙΕΘΝΕΙΣ ΠΑΡΑΓΓΕΛΙΕΣ
- NOUS ACCEPTONS DES COMMANDES INTERNATIONALES
- 日本語での国際取引も扱っております。

- SE HACE PEDIDOS INTERNACIONAL
- INTERNATIONALE HÄNDLERKONDITIONEN
- MBI TOBOPUM ΠΟ-ΠΥCCKO

INTERNATIONAL ORDERS

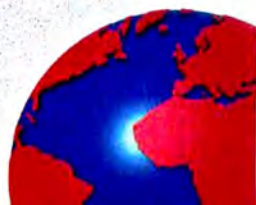
BOTTOM LINE UNDERSTANDS THE SPECIAL NEEDS OF THE INTERNATIONAL MACINTOSH USER AND RESELLER, AND WE EXTEND THE EXTRA LEVEL OF SUPPORT INTERNATIONAL CLIENTS REQUIRE. WE HAVE A 24-HOUR INTERNATIONAL FAX LINE, AND WE STOCK 220-VOLT VERSIONS OF MOST HARDWARE. BOTTOM LINE OFFERS DISCOUNTED RATES WITH DHL, UPS AND FEDERAL EXPRESS, AND CUSTOMS BROKERAGE THROUGH THE COURIER. DELIVERY TIME TO MOST COUNTRIES IS TWO TO THREE DAYS.

Circle 305 on reader service card

HOW TO ORDER: CALL 900-420-3636. \$2 MINUTE PHONE CHARGE. **PAYMENT:** VISA, MASTERCARD, DISCOVER AND CREDIT CARD SURCHARGES, CHECKS, AND C.O.D.'S. \$6,000 MAXIMUM ON C.O.D.'S. TEXAS RESIDENTS ADD 8% SALES TAX. **PRICES** AND ITEMS SUBJECT TO CHANGE AND AVAILABILITY. **INTERNATIONAL:** 5% SURCHARGE ON INTERNATIONAL ORDERS. **MAIL IN ORDERS** ACCEPTED. **TERMS:** YOU ARE NOT CHARGED UNTIL YOUR ORDER IS SHIPPED. PHONE CHARGES CANNOT BE REFUNDED. **SHIPPING:** MINIMUM \$5-UPS Ground, Blue, Red, Federal Express. **RETURNS** MUST BE IN ORIGINAL CONDITION AND PACKAGE AND REQUIRE AN RMA#. SEAL MUST NOT BE OPENED ON SOFTWARE. RETURNS MAY BE SUBJECT TO A RESTOCKING FEE. ASK FOR DETAILS WHEN ORDERING. BOTTOM LINE DISTRIBUTION CANNOT BE RESPONSIBLE FOR ERRORS IN TYPOGRAPHY OR PHOTOGRAPHY. ALL BRANDS AND PRODUCT NAMES ARE TRADE MARKS OF THEIR RESPECTIVE HOLDERS.



Ad Code: BW35



BOTTOM LINE

DISTRIBUTION



Back by Popular Demand... The Top Ten



SONY DISPLAY
CPD-1304 \$599
CPD-1604 \$1025



TEXAS INSTRUMENTS
MICROWRITER PS17 \$849
MICROWRITER PS35 \$1099



SyQUEST
44MB Disk \$59
88MB Disk \$94



SUPRA MODEMS
V.32 BIS MODEM \$269
V.32 BIS MAC PACK \$309

GCC WRITE MOVE II.....\$519

Portable inkjet printer designed for PowerBook

E-MACHINES POWERLINK PRESENTOR.....\$409

Connects PowerBook Duo to television display

ARTZ & PAINTER BUNDLE.....\$499

Wacom ARTZ digitizing tablet with Painter v.2.0

RADIUS PRO PERFORMANCE PACK.....\$2999

Rocket 33, 24x interface, and RocketShare bundle

KENSINGTON TURBO MOUSE 4.0.....\$99

Trackball cursor with control enhancement software

MACINTAX WITH QUICKEN.....\$57

Income tax calculator & Budget manager software bundle

TURBO 040 ACCELERATOR

Accelerates CPU functions with 68040 supplement

25MHz Turbo 040.....\$1099

33MHz Turbo 040.....\$1339

FASTCACHE TURBO 25.....\$245

128K cache for 25MHz Turbo 040

FASTCACHE TURBO 33.....\$329

128K cache for 33MHz Turbo 040

UNIVERSAL POWERCACHE

ALL DAYSTAR POWER CACHES INCLUDE ADAPTOR

Choose any DayStar model:

33MHz POWERCACHE.....\$405

33MHz POWERCACHE WITH 68882 FPU.....\$489

40MHz POWERCACHE.....\$569

40MHz POWERCACHE WITH 68882 FPU.....\$649

50MHz POWERCACHE.....\$735

50MHz POWERCACHE WITH 68882 FPU.....\$859

FASTCACHE QUADRA 128K.....\$399

128K Static RAM cache for Quadra 700/900/950

FASTCACHE IISI 64K.....\$265

64K Static RAM cache for IISI

FASTCACHE IICI 64K.....\$195

64K Static RAM cache for IICI

CHARGER.....\$795

Nucius accelerator for Adobe Photoshop functions

ROCKET 040 33.....\$1979

33MHz 68040 accelerator

ROCKET 040 25i.....\$955

25MHz 68040 accelerator

ROCKET SHARE.....\$399

Allows multi-processing with one or more Radius Rocket

VIDEOVISION.....\$1899

Color interface with video capture

PRECISION COLOR 24XP.....\$475

Accelerated 24-bit interface for 16" displays

PRECISION COLOR 24KK.....\$789

Accelerated 24-bit interface for 20" displays

PRECISION COLOR 24X.....\$1399

Accelerated 24-bit interface for 21" display

PRECISION COLOR 8XJ.....\$475

Accelerated 8-bit color interface, upgradeable

NEW! PRECISION COLOR DISPLAY 20i.....\$2569

Two-page, 20-inch color display

FULL PAGE DISPLAY 17".....\$565

Full-page, 17-inch monochrome portrait display

PRECISION COLOR PIVOT.....\$915

Full-page Multisync color display portrait & landscape

MONOCHROME TWO-PAGE DISPLAY 19".....\$869

Two-page, 19-inch monochrome landscape display

MONOCHROME TWO-PAGE DISPLAY 21".....\$1125

Two-page, 21-inch monochrome landscape display



NEC SilentWriter 95f

300DPI, Postscript Level 2
Auto PC/Mac Switching, 6ppm

\$1359

RASTEROPS

CORRECTPRINT 300i
300 DPI Dye Sublimation

\$7499

QMS 860 HAMMERHEAD

600 DPI, 8ppm, Tabloid 11x17,
RISC, 12MB RAM

\$3975

HP DeskWriter

HP 550C \$715
Monochrome Inkjet 300 DPI

\$375

TI MicroLaser

PS/17 \$1175 PS/35 \$13199ppm,
Turbo - Postscript Level 2, RISC

\$1474

GCC PLP II

300 DPI
Personal Laser Printer

\$769



COLORPAGE T-16 II.....\$1249

Two-page, 16-inch Trinitron display

COLORPAGE T-19 II.....\$2269

Two-page, 19-inch Trinitron display

FUTURA SX.....\$479

Accelerated 24-bit color NuBus interface for 16" display

FUTURA MX.....\$825

Accelerated 24-bit color NuBus interface for 19" display

FUTURA LX.....\$859

Accelerated 24-bit color NuBus interface for 21" display

DOUBLECOLOR LX.....\$619

8-bit color interface for 21" display

DOUBLECOLOR LC.....\$389

8-bit color interface for 16" display with LC

DOUBLECOLOR SX.....\$345

8-bit color interface for 16" and 4-bit color for 19" display

POWERLINK DESKNET.....\$579

Minidock add expansion ports to PowerBook Duo

GLOBAL VILLAGE TELEPORT GOLD.....\$419

14400bps Send/Receive Fax/Data Modem

GLOBAL VILLAGE TELEPORT SILVER.....\$346

9600bps Send/Receive Fax/Data Modem

GLOBAL VILLAGE TELEPORT BRONZE.....\$192

24/96 Send/Receive Fax/Data Modem

PRACTICAL PERIPHERALS PM14400 FXSA.....\$405

14400bps Send/Receive Fax/Data Modem

TWINCOM 24/96.....\$125

24/96 Send/Receive Fax/Data Modem

PRCEON 14400.....\$279

14400bps send/receive fax/data modem

PSI COMSTATION FOUR.....\$315

9600/4800 send/receive fax/data modem

SUPRA V.32BIS / MAC PACKAGE.....\$285 / \$319

V.32bis send/receive fax/data modem / with cable, software

SUPRA 144PB / PLUS.....\$275 / \$375

PowerBook internal 14400 fax/data modem / with voice

ARTZ TABLET.....\$299

6 x 8 pressure-sensitive digitizing tablet

6 x 9 STANDARD TABLET.....\$435

6 x 9 pressure-sensitive digitizing tablet

12 x 12 STANDARD TABLET.....\$635

12 x 12 pressure-sensitive digitizing tablet

12 x 12 ELECTROSTATIC TABLET.....\$695

12 x 12 pressure-sensitive digitizing tablet

12 x 18 STANDARD TABLET.....\$959

12 x 18 pressure-sensitive digitizing tablet

12 x 18 ELECTROSTATIC TABLET.....\$1010

12 x 18 pressure-sensitive digitizing tablet

18 x 28 STANDARD TABLET.....\$2515

18 x 28 pressure-sensitive digitizing tablet

PAINTER V.2.0.....\$225

MacUser 1991 Eddy Award-Winning Digital Paint Software

Special price with purchase of Wacom tablet

LZR 960.....\$1579

Laser printer with RISC processor, 2MB onboard

LZR 965.....\$1999

Laser printer with 800 x 600 dpi, 8MB onboard

LZR 1560.....\$3025

Laser printer with 4MB onboard, prints tabloid size

LZR 1555.....\$3059

Laser printer with RISC processor, 4MB onboard

JOLT.....\$4149

Laser printer, full-color, with RISC processor

LZR 960 & 965 PAPER CASSETTE.....\$39

Optional letter or legal tray for LZR 1560 and LZR 1555

LZR 1560 & 1555 PAPER CASSETTE.....\$69

Optional letter or legal tray for LZR 1560 and LZR 1555

LZR 1560 4MB UPGRADE.....\$309

LZR 960 4MB UPGRADE

LZR 960 4MB UPGRADE.....\$349

LZR 960 8MB UPGRADE

LZR 960 8MB UPGRADE.....\$599

BOTTOM LINE 1-900-420-3636

\$2 per minute

24-HOUR INTERNATIONAL FAX LINE 512-476-6399 • 1219 WEST 6TH STREET • AUSTIN, TEXAS 78703

BW35



DIGITAL FILM.....\$4499
On-line, digital-video editing system

NEW! THUNDER II / LIGHT.....\$3775 / \$2789
Accelerated QuickDraw & 24-bit color interface for 21" display
Accelerated QuickDraw & 24-bit color interface for 19" display

THUNDERSTORM PRO.....\$2789
Graphics accelerator bundled with Thunder/24

SPECTRUM/24 SERIES IV.....\$759
Accelerated 24-bit color interface for 21" display

THUNDER/8 / THUNDER/24.....CALL
Thunder/8 - Accelerated 8-bit color interface
Thunder/24 - Accelerated 24-bit color interface

NEW! SUPERMATCH Hi-Res 20-T.....\$3025
Two-page, 20-inch Trinitron high-resolution display

SUPERMATCH 20-T.....\$2325
Two-page, 20-inch Trinitron multimode display

SUPERMATCH 20.....\$1399
Two-page, 20-inch color display

SUPERMATCH 17-T.....\$1069
Full-page, 17-inch Trinitron display

SPECTRUM/24 PQD PLUS.....\$1409
Accelerated 24-bit color interface for 21" display

PHOTOSPEED / PRO.....\$2999 / \$3799
CD-ROM compatible accelerated QuickDraw
CD-ROM compatible accelerated QuickDraw & 24-bit color interface

PLATINUM 20 / 21 TWO-PAGE.....\$869 / \$979
Two-page, 20-inch / 21-inch gray-scale display

PAINTBOARD LI.....\$789
Accelerated 24-bit color interface for up to 20" displays

PROCOLOR 32.....\$2995
32-bit True-Color Interface

PHOTOPRO.....\$749
RISC adapter accelerates Photoshop functions

24SX / 24MX / 24MXD.....\$605/\$1135/\$1135
Accelerated 24-bit color interface for 13" / 16" with Mac II / 21" with Quadra

24STV / 24XLTV.....\$755 / \$2548
Accelerated 24-bit color for 13", video display/capture
Accelerated 24-bit color, video display/capture

8XL / 24XL.....\$899 / \$1699
Accelerated 8-bit color interface, upgradeable to 24-bit
Accelerated 24-bit upgraded color interface

COLORBOARD 264/SE30.....\$685
24-bit color interface for 13" display with SE30

CORRECTCOLOR CALIBRATOR.....\$1815
Calibrates displays with interface cards

21" COLOR DISPLAY.....\$2569
Two-page, 21-inch color display

20" MULTI-SCAN TRINITRON.....\$2125
Two-page, 20-inch Trinitron display

20" MULTIMODE HITACHI.....\$1325
Two-page, 20-inch Trinitron display

CORRECTPRINT 300i.....\$7499
Dye sublimation printer offers 300 cpi output

INFINITY 88 TURBO EXTERNAL.....\$545
88MB SyQuest removable cartridge drives

INFINITY 40 TURBO EXTERNAL.....\$409
44MB SyQuest removable cartridge drives

INFINITY 88 RW44 EXTERNAL.....\$619
88MB SyQuest reads and writes to 44MB cartridges

INFINITY 128MB 3.5" OPTICAL.....\$1299
Removable, rewritable optical cartridge drive

INFINITY 128MB 3.5" OPTICAL INTERNAL.....\$1175
Removable, rewritable optical drive, internal for Quadra

4GB DAT DRIVE.....\$1489
4GB DAT back-up drive with Retrospect

QUICK SCSI CARD.....\$309
SCSI-2 NuBus host adapter card with cable

MINIARRAY 480.....\$2529
Fast 480MB fixed hard drive with QuickSCSI

850MB MINIARRAY.....\$3519
Fast 850MB fixed hard drive with QuickSCSI

1.0GB MINIARRAY.....\$2775
Fast 1.0GB fixed hard drive with QuickSCSI

INFINITY OPTICAL 5.25" 600MB SONY.....\$2699
Removable, rewritable optical cartridge drive

INFINITY MAXOPTICAL 1GB.....\$3499
1.0GB Optical disk drive, WORM compatible

CD-ROM DRIVE.....\$619
Multi-Session Photo CD Compatible Drive

MICROTEK SCANMAKER II.....\$835
Color flatbed scanner, 600 x 300 dpi

MICROTEK SCANMAKER IIXE.....\$1075
Color flatbed scanner, 600 x 300 dpi, PhotoShop

UMAX 630.....\$1075
Color flatbed scanner, 600 x 300 dpi, PhotoShop

UMAX 630 WITH TRANSPARENCY.....\$1725

UMAX 840.....\$1349
Color flatbed scanner, 800 x 400 dpi, PhotoShop

UMAX 840 WITH TRANSPARENCY.....\$1973

UMAX SCAN OFFICE.....\$825
Grayscale flatbed scanner, PhotoShop

UMAX TRANSPARENCY ADAPTER.....\$679
Adds transparency scan capability to Umax scanner

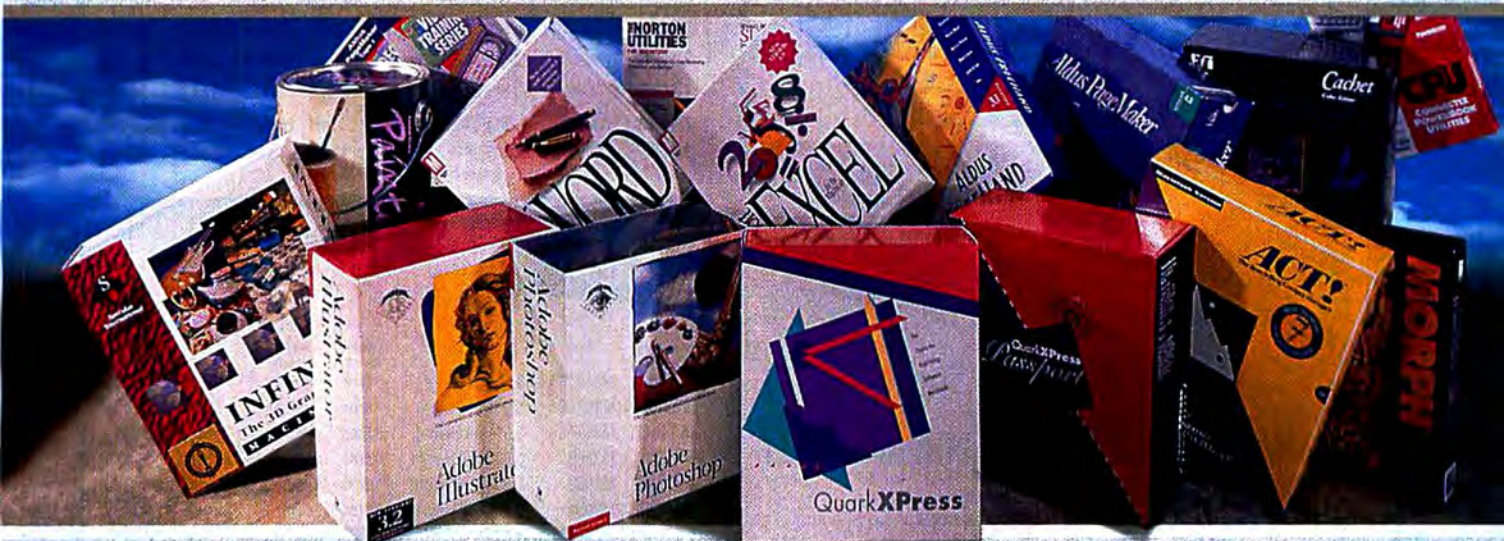
AGFA ARCUS.....\$2999
Color flatbed one-pass scanner, 1200 x 1200 dpi, PhotoShop

AGFA ARCUS WITH TRANSPARENCY.....\$3799

SHARP JX320.....\$999
Color flatbed scanner, 300 x 300 dpi, PhotoShop

SHARP TRANSPARENCY ADAPTER.....\$849
Adds transparency scan capability to Sharp scanner

HP SCANJET IIC.....\$1299
Color flatbed scanner, 400 x 400 dpi



MS WORD 5.1
\$269

MS EXCEL 4.0
\$289

QUARK XPRESS
\$499

MORPH
\$81

EFI CACHET 1.1
\$409

INFINI-D
\$689

DISPLAYS

BUNDLE - 20" COLOR DISPLAY w/ 8-BIT CARD.....\$1739
BUNDLE - 20" COLOR DISPLAY w/ 24-BIT CARD.....\$2099

APPLE 14" / 16" RGB DISPLAY.....\$515 / \$1199

NEC MultiSync 3FG / 4FG.....\$629 / \$755

NEC MultiSync 5FG / 6FG.....\$1349 / \$2375

SEKO CM-1445.....\$449

SIGMA DESIGNS ERGO VIEW 17".....\$1249

SIGMA DESIGNS POWER PORTRAIT.....\$599

PRINTERS

APPLE STYLEWRITER II.....\$319

APPLE LASERWRITER SELECT 300 / 310.....\$785 / \$1025

APPLE PERSONAL LASERWRITER NTR.....\$1525

APPLE LASERWRITER II / IIG.....\$1749 / \$2189

APPLE LASERWRITER PRO 600 / 630.....\$1759 / \$2375

GCC BLP ELITE.....\$1179

GCC PLP II / IIS.....\$769 / \$1099

GCC WIDE WRITER 360.....\$1449

HEWLETT PACKARD LASERJET 4M.....\$1989

LASER MASTER MAX WRITER 400.....CALL

TEKTRONIX COLOR QUICK INKJET.....\$1651

MODEMS & FAX MODEMS

DOVEFAX / DOVEFAX PLUS.....\$165 / \$219

LOGICODE QUICKTEL XEBA 96/96 V.42 BIS.....\$386

PRACTICAL PERIPHERALS PM9600SA.....\$455

PROMETHEUS 24/96 / 96/96 S/R FAX.....\$259 / \$599

ZOOM AFX EXTERNAL 96/48 S/R FAX.....\$99

SOFTWARE

ACT! CONTACT MANAGER.....\$219

ADOBE ILLUSTRATOR V.3.2.....\$335

EVEREX

EMAC METRO
CD-ROM \$279
With 5 Titles \$459



ADOBE PHOTOSHOP.....\$499

ALDUS FREEHAND V.3.1.....\$369

ALDUS Pagemaker v.4.2A.....\$475

CANVAS V.3.0.....\$239

CLARIS WORKS V.1.0.....\$184

FILEMAKER PRO V.2.0.....\$244

FRAGMENT DESIGN PAINTER V.2.0.....\$249

MACACADEMY VIDEO TRAINING.....\$36

MACROMIND DIRECTOR V.3.1.....\$849

MICROSOFT OFFICE V.3.1.....\$489

MS PROJECT / WORKS.....\$429 / \$159

MINICAD V.4.0.....\$469

NORTON UTILITIES MAC V.2.0.....\$88

OMNI-PAGE.....\$449

PIXAR TYPESTY.....\$159

RETROSPECT V.1.3.....\$131

STRATAVISION 3D V.2.6.....\$549

TYPESTYLER V.2.0.....\$122

WORDPERFECT V.2.1.....\$265

ACCELERATORS AND CACHE

AE QUICKSILVER IISI WITH FPU.....\$245

AE TRANSWARP LC 33MHz WITH FPU.....\$895

NEWTECH TECH VARIABLE QUADRA OVERDRIVE.....\$259

DRIVES & TAPES

INTERNAL / EXTERNAL KIT.....\$29 / \$99

APPLIED ENGINEERING 1.44 / PLUS.....\$209 / \$283

BERNARDINI PRO 90MB WITH INTERFACE.....\$539

DGR 128REM TURBO 3.5" MO.....\$1199

DGR 256REM 3.5" MO.....CALL

FIATISU 520MB.....\$869

FIATISU 1.2GB.....\$1289

NEC CDR-37 / CDR-74 CD-ROM.....\$406/\$849

QUANTUM 127MB ELS.....\$319

QUANTUM PRODRIVE 240MB.....\$399

QUANTUM 525MB PRO.....\$999

ALL SEAGATE DRIVES.....CALL

TOSHIBA 1.2 GB HALF-HEIGHT DRIVE.....\$1275

TOSHIBA 3401A CD-ROM.....\$685

NetWorking

ASANTE 10BASET Hub.....\$239

ASANTE MACCON IIIE 64K.....\$159

SNOOPER
WITH VIREX \$109
SNOOPER
WITH NuBUS \$139



DAYNA ETHERPRINT / PLUS.....\$329/\$599

FARALLON STAR CONTROLLER.....\$799

FARALLON TIMBUKTU REMOTE ACCESS PACK.....\$849

SHIVA FASTPATH 5.....\$1850

SHIVA NETBRIDGE / TELEBRIDGE.....\$315/\$405

INPUT/OUTPUT

APPLE EXTENDED KEYBOARD.....\$170

DGR TECH EXTENDED KEYBOARD.....\$99

• ALL FOREIGN LANGUAGE LAYOUTS NOW AVAILABLE

KB-105K EXTENDED KEYBOARD.....\$89

KENSINGTON POWERBOOK KEYPAD.....\$95

KEYTRONIC MACPRO PLUS KEYBOARD.....\$115

BOTTOM LINE 1-900-420-3636
\$2 per minute

24-HOUR INTERNATIONAL FAX LINE 512-476-6399 • 1219 WEST 6TH STREET • AUSTIN, TEXAS 78703
Circle 306 on reader service card
BW35

CLUBMAC 88c Reads & Writes 44mb Cartridges



FEATURING CLUBMAC 88c REMOVABLE*



SyQuest® REMOVABLE TECHNOLOGY

SyQuest Drives include a TWO Year Warranty, one cartridge & necessary cables. SCSI Director™ Formatting Utility • SyQuest Cartridges carry a ONE Year Warranty.

ClubMac 88c External (SQ5110C)	\$579
ClubMac 88c Internal	\$559
ClubMac 88c Dual	\$1045
* ClubMac 88c will read and write 44mb cartridges, but will not format 44mb cartridges.	
CLUBMAC 44MB REMOVABLES	
ClubMac 44mb External (SQ555)	\$385
ClubMac 44mb Internal	\$345
ClubMac 44mb Dual	\$695
CLUBMAC 88MB REMOVABLES	
ClubMac 88mb External (SQ5110)	\$489
ClubMac 88mb Internal	\$469
ClubMac 88mb Dual	\$875
SYQUEST REMOVABLE CARTRIDGES	
44mb Cartridge	\$63
88mb Cartridge	\$97

Quantum



Unformatted Capacity	Model	Average Access	Actual MAC Capacity	Internal	External
GO-DRIVE SERIES (2.5" HARD DRIVES DESIGNED FOR NOTEBOOKS)					
80mb	GO-80	17ms	80mb	\$299	\$399
120mb	GO-120	17ms	120mb	\$389	\$489
ELS SERIES (3.5" LOW PROFILE AND LOW POWER)					
42mb	ELS42	19ms	40mb	\$175	\$235
85mb	ELS85	17ms	82mb	\$199	\$259
127mb	ELS127	17ms	124mb	\$269	\$329
170mb	ELS170	17ms	160mb	\$299	\$359
LPS SERIES (3.5" LOW PROFILE)					
105mb	LPS105	11ms	100mb	\$255	\$315
240mb	LPS240	10ms	234mb	\$399	\$459
525mb	LPS525	10ms	525mb	\$909	\$969
PRODRIVE SERIES (3.5" HALF HEIGHT)					
425mb	PRO425	9ms	406mb	\$879	\$939
700mb	PRO700	10ms	700mb	\$1195	\$1255
1.0GIG	PRO1050	10ms	1001mb	\$1339	\$1399
1.2GIG	PRO1225	10ms	1165mb	\$1495	\$1555

ELS, LPS, PRO drives carry a TWO Year Warranty. Go-Drives carry a ONE Year Warranty.

CONNER

Unformatted Capacity	Model	Description	Average Access	Actual MAC Capacity	Internal	External
85mb	CP30080E	3.5" Low Profile	17ms	82mb	\$199	\$259
170mb	CP30170E	3.5" Low Profile	17ms	160mb	\$289	\$349
212mb	CP30200	3.5" Low Profile	12ms	206mb	\$369	\$429
540mb	CP30540	3.5" Low Profile	10ms	515mb	\$899	\$959

Conner drives carry a ONE Year Warranty.

Maxtor

UP TO TWO YEAR WARRANTY



Unformatted Capacity	Model	Average Access	Actual MAC Capacity	Internal	External
XT SERIES (3.5" LOW PROFILE)					
120mb	7120XT	15ms	121mb	\$239	\$299
207mb	7213	15ms	202mb	\$355	\$415
LXT AND MXT SERIES (3.5" HALF HEIGHT)					
330mb	LXT-340	15ms	324mb	\$589	\$649
535mb	MXT-535	8.5ms	521mb	\$975	\$1035
1240mb	MXT-1240	8.5ms	1150mb	\$1599	\$1659
PANTHER SERIES (5.25" FULL HEIGHT)					
1.2GIG	PO-12S	13ms	997mb	\$1295	\$1395
1.7GIG	PO-17S	13ms	1433mb	\$1595	\$1695

Maxtor 3.5" Drives carry a ONE Year Warranty. Maxtor 5.25" Drives carry a TWO Year Warranty.

Seagate

FEATURING THE ... ELITE SERIES



Unformatted Capacity	Model	Description		Average Access	Actual MAC Capacity	Internal	External
1.6GIG	ST41651N	5.25" Full Ht	Wren-8	15ms	1350mb	\$1679	\$1779
2.1GIG	ST42100N	5.25" Full Ht	Wren-9	12.9ms	1900mb	\$1869	\$1969
1.6GIG	ST41600N	5.25" Full Ht	Elite-1	11.5ms	1307mb	\$1839	\$1939
2.4GIG	ST42400N	5.25" Full Ht	Elite-2	11ms	2050mb	\$2539	\$2639
3.4GIG	ST43400N	5.25" Full Ht	Elite-3	11ms	2750mb	\$3429	\$3529

Seagate Drives carry a ONE Year Warranty.

FIVE YEAR WARRANTY

FUJITSU

Unformatted Capacity	Model	Description	Average Access	Actual MAC Capacity	Internal	External
425mb	M2623SA	3.5" Half Height	9ms	405mb	\$895	\$955
520mb	M2624SA	3.5" Half Height	9ms	496mb	\$945	\$1005
1.1GIG	M2694	3.5" Half Height	8.5ms	995mb	\$1695	\$1755
1.2GIG	M2266	5.25" Full Height	14.5ms	1029mb	\$1375	\$1475
2.0GIG	M2652	5.25" Full Height	14.5ms	1600mb	\$2295	\$2395
2.4GIG	M2654	5.25" Full Height	11.5ms	2000mb	\$2499	\$2599

ClubMac TAPE BACKUP Systems

Capacity	Model	Description	Media	Internal	External
155mb	Teac MT2ST/N50	Analog	CT600N	\$429	\$449
600mb	Teac MT2ST/F50	Analog	CT600F	\$629	\$649
250mb	Archive Viper 250	Analog	DL6250	\$479	\$499
500mb	Archive Viper 500	Analog	DL6250	\$709	\$729
2.0GIG	Archive Python	DAT, DDS	4mm	\$1129	\$1149
3-5GIG	Archive Turbo DAT	DAT, DDS-DC	4mm	\$1339	\$1359
2.0GIG	HP 35470A	DAT, DDS	4mm	\$1329	\$1349
3-5GIG	HP 35480A	DAT, DDS-DC	4mm	\$1529	\$1549

Includes RetroSpect v.2.0c Backup Software, One Tape and ONE Year Warranty.

Bundled with RetroSpect v.2.0c Backup Software

ClubMac OPTICAL Drives

Model		Capacity	Description	Seek	External
CMO-OD3000	Teac	128mb	3.5" Half Ht	45ms	\$989
CMO-LF3004	Panasonic	128mb	3.5" Half Ht	45ms	\$1129
CMO-3100E	Ricoh	128mb	3.5" Half Ht	45ms	\$1075
CMO-3051E	Ricoh	594/652mb	5.25" Full Ht	28ms	\$2345
NEW!!	Sharp	594/652mb	5.25" Full Ht	30ms	\$2295
TAHITI II	MaxOptix	650/1.0GIG	5.25" Full Ht	35ms	\$3195
128mb Cartridge		3.5" Single Sided			\$39
594/652mb Cartridge		5.25" - 512/1024 bytes/sec			\$99

All ClubMac Opticals include ONE cartridge and ONE Year Warranty.

NEC

BRIGHTEN YOUR VISION with NEC's award winning peripherals for Macintosh computers

NEC MULTISPIN CDR-74

World's first multi-speed CD-ROM reader, the Multimedia (MPC) and QuickTime compliant NEC CDR-74. NEC CDR-74 features:

- 280ms access time
- 300KB data transfer
- 256K cache memory
- SCSI-1/SCSI-2 Embedded I/F
- Kodak's Photo CD Technology
- MultiSpin technology: spins CD twice as fast when accessing data

NEC MULTIMEDIA GALLERY

- QuickTime compatible NEC CDR-74 CD-ROM reader with MultiSpin technology
- Amplified stereo speakers & headphones
- 6 software titles
 - Just Grandma and Me • Color It!
 - Great Wonders of the World, Volume 1
 - Sherlock Holmes, Consulting Detective
 - The New Gracilar Multimedia Encyclopedia
 - The Software Toolsworks U.S. Atlas



NEC CD EXPRESS (CDR-25) \$349

CD Express is the easiest, most complete, and most affordable way for your family to experience the world of advanced interactive CD-ROM technology.

- CDR-25 Multimedia PC compliant CD-ROM reader
- Stereo speakers
- 10 software titles
 - The Software Toolsworks World Atlas
 - Publish It! • Total Baseball
 - The Family Doctor • Best of the Bureau
 - Great Cities of the World, Volume 2
 - Discs Books Asap's Fables
 - Lucasfilm Game Favorites
 - Interactive Storyline
 - The Manhole CD-ROM

GREAT VALUE



MULTISYNC FG COLOR MONITORS

MULTISYNC 3FGx

- 15" multiple frequency color monitor
- High contrast polished screen
- Resolution up to 1024 X 768

\$609

Get a \$100 rebate when you buy the NEC MacFG 24Xp Color Display Interface Card and a 15" or 17" MultiSync FG Series Color Monitor

MULTISYNC 4FG

- 15" multiple frequency color monitor
- AccuColor Control System
- MPR II compliant
- Advanced digital controls
- Resolution up to 1024 X 768

\$729

MultiSync 3FGx (15" Color) **\$609**

MultiSync 4FG (15" with AccuColor) **\$729**

MultiSync 5FG (17" with AccuColor) **\$1299**

MultiSync 6FG (21" with AccuColor) **\$2349**

MacFG 24Xp (24-bit video card for NEC 15" & 17") **\$495**

MacFG 8X **\$639**

MacFG 24X **\$1199**

VIDEO CARDS

LASER PRINTERS



MacUser
★★★★
September '92

MODEL 95F

• 6 ppm • 35 fonts • 2 MB RAM

LESS MFG REBATE **-\$250**

\$1119*

Adobe PostScript Level 2 • Parallel, Serial, AppleTalk Interface

Auto Interface Monitor Switching • 250 sheet Paper Capacity • Envelope Feeder

MODEL 97F

• Adobe PostScript Level 2 • 10 ppm • 35 fonts

• 2 MB RAM • HP LaserJet III Emulation

• Parallel, Serial, AppleTalk

• Auto Interface Monitor Switching

• 250 sheet Paper Capacity • Envelope Feeder

Built-In POSTSCRIPT FAX

MODEL 95Fx **\$1599***

• Model 95Fx combines the Model 95 printer with a built-in plain paper fax

• Fax from any MAC or DOS/Windows PC using the software included with the printer

• The Model 95Fx can send & receive faxes to/from any standard fax machine or other Model 95x

MODEL 97Fx

\$1949*

* Less Manufacturer's Rebate, Offer Expires 4/30/93



HP SCANJET IIC COLOR SCANNER

\$1295

- 400 x 400 dpi (300 dpi via interpolation)
- Single-pass scanning delivers superior image quality in 24-bit color & 8-bit grayscale modes
- HP AutoPage technology improves OCR accuracy
- Three Dimensional Scanning

AUTO. DOC. FEEDER **\$499**

ScanFast! **\$69**

BUY AN AUTO. DOC. FEEDER & GET UP to \$100 from HP
OFFER EXPIRES 4/30/93

HP SCANJET IIP GRAYSCALE SCANNER

\$695

- 300 x 300 dpi (600 dpi via interpolation)
- 8-bit grayscale provides high quality reproductions of photographs and illustrations
- HP AutoPage technology improves OCR accuracy

AUTOMATIC DOCUMENT FEEDER **\$279**



HEWLETT
PACKARD
Authorized Scanner Dealer



CACHE CARDS

FastCache IIsi **\$279**

FastCache IIsi with 68882 **\$349**

FastCache IIsi **\$199**

FastCache Quadra-Q700/900 **\$249**

FastCache Quadra-Q700/900/950 **\$375**

EXPANSION BOARDS

DualPort IIsi **\$165**

PowerMath LC **\$115**

33 MHz TURBO 040

FastCache TURBO 33 **\$1345**

CHARGER **\$335**

POWERCACHE **\$759**

(Classic, SE, LC, SE/30, II, IIfx, IIsi, IIfx, Performa)

33 MHz PowerCache* **\$375**

40 MHz PowerCache* **\$545**

50 MHz PowerCache* **\$715**

Equalizer LC **\$169**

PowerCache Adapter **\$41**

*PowerCache Adapter not included



QMS

QMS-860 Hammerhead **\$3939**

QMS-PS 410 **\$1439**

EPSON

ES-600C **1200 dpi \$859**

- 300 x 300 dpi optical resolution, 1200 via interpolation
- Single or multi-pass scanning • 8-bit grayscale and 24-bit color

ES-800C **1600 dpi \$1119**

- 400 x 400 dpi optical resolution, 1600 via interpolation
- Single or multi-pass scanning • 8-bit grayscale and 24-bit color

INTERFACE KIT (Full Adobe Photoshop & ScanTastic) **\$239**

ScanFast! **\$69**

CALL CLUBMAC FOR THE LATEST MAC MEMORY PRICES

Warranty: All items manufactured by ClubMac are returned to ClubMac for warranty repair. All other items carry manufacturer's warranty. Money Back Guarantee: All products manufactured by ClubMac carry a 30 day money back guarantee. ClubMac extends all other manufacturers' return policies to its customers. Non-ClubMac products carry 30 day money back guarantee when stockied. Return: Call for RMA number. Any product that is returned WITHOUT an RMA number will be refused. ALL PRODUCT INFORMATION AND PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE. NOT RESPONSIBLE FOR TYPOGRAPHICAL ERRORS.

SUPERMAC

DISPLAYS

SuperMatch 21 Two-Page (9771) **\$2449**

SuperMatch 20 Dual-Mode Trin. (9751) **\$2449**

SuperMatch 20-T Multimode Trin. (9752) **\$2449**

SuperMatch 20 Color (9782) **\$1479**

SuperMatch 17 Multimode (9730) **\$1149**

SuperMatch 17-T Trinitron (9735) **\$1049**

Platinum 21 Two-Page Display (9761) **\$989**

ACCELERATORS / GRAPHIC CARDS

ThunderStorm **\$815**

Spectrum/24 Series IV **\$815**

Spectrum/24 PDQ Plus **\$1515**

Spectrum/8-24 PDQ NuBus or IIsi **\$815**

QUICKTIME MOVIE MAKING

VideoSpigot NuBus* IIsi* **\$369 / 329**

Spigot & Sound NuBus* **\$479**

VideoSpigot Pro NuBus** IIsi** **\$1069 / 1229**

Spigot & Sound Pro NuBus** **\$1069**

* FREE Adobe Premiere 2.0 LE

** FREE Adobe Premiere 2.0 Full Version

radius

RADIUS VIDEO CARDS

VideoVision (Basic System) **\$1625**

VideoVision (Presentation) **\$1929**

(Presentation package includes Adobe Premiere 2.0)

PrecisionColor 8XJ **\$489**

PrecisionColor 24X **\$1629**

PrecisionColor 24XP / 24XK **\$489/819**

Color Pivot / Mono Pivot **\$499/249**

Two Page Display / Full Page **\$375/189**

PowerView **\$489**

ACCELERATORS

Radius Rocket 25i / 33 **\$1199/1949**

RocketShare **\$399**

SCSI-2 Booster **\$249**

RADIUS DISPLAYS

Color Display/21 **\$2319**

PrecisionColor Pivot **\$935**

PrecisionColor 20 or 20/S **\$2319**

PrecisionColor/19 **\$2029**

Full Page Display **\$569**

Monochrome Pivot **\$699**

Two Page Display/19 **\$879**

Two Page Display/21 / 21E **\$1149 / 1299**

RASTEROPS

GRAPHIC DISPLAYS

21" Color (2168) **\$2519**

20 Multimode Color (2085H) **\$1299**

20T MultiScan Trinitron (2075M) **\$2089**

21" Mono/Grayscale (2110) **\$999**

15" Mono/Grayscale Portrait (1510) **\$499**

COLOR DISPLAY ADAPTERS

RasterOps 24XLI **\$1889**

PaintBoard 24 / Li **\$1449 / 815**

RasterOps 24Sx **\$619**

MULTIMEDIA

RasterOps 24XLTV **\$2639**

MediaTime / VideoTime **\$1499 / 1135**

RasterOps 24STV **\$729**

PhotoPro NuBus **\$589**

Video Expander NTSC **\$529**

ClubMac

1-800-258-2622

3 Musick • Irvine, CA 92718

Sales, Info, Int'l (714)768-8130

Tech Support (714)768-1490

24-Hour Fax (714)768-9354

1-800-258-2622
1-800-CLUBMAC
1-800-258-2622

Mac and MORE^{INC.}

Your Mail Order SuperStore™

800-436-5088

813-886-9534 International

813-881-0634 FAX

5414 Beaumont Ctr Blvd; Tampa FL 33634

Apple's New Macs Buy, Rent, or Lease them from Mac and MORE!

Mac and More is one of the largest resellers of Macintosh systems in the U.S! With a complete line of systems, peripherals, and software, Mac and More can deliver your Mac solutions. No one can do better! We are authorized resellers for every popular disk drive and peripheral manufacture. And we offer the most competitive pricing around!

To insure that you get the finest system, every CPU that we configure is **SNOOPER** tested to assure proper working order. Ask about our special Snooper Bundle so you can keep your system in tip-top shape. Snooper 2.0 is the hardware Diagnostic for the Macintosh.

**Call today for your
free Catalog!**



May Special

**from
\$399**



ETC DataPress

Hardware Data Compressor and

SCSI Bus Expander (internal or external)

The ETC DataPress is the only hardware data compressor for your Mac. It is 7 to 10 times faster than software compression alone.

Plus, it is the first peripheral to expand your SCSI bus. Now you can put more than 7 SCSI devices on one Mac. Need more details? Call!

Open 7 Days a Week
9:00 - 10:00 Mon-Fri
10:00 - 6:00 Sat
12:00 - 6:00 Sun



Slow The Wind

At our place the wind has a will all its own. Some days it just tags along like an uninvited guest. Other days it whips around with a fury. But when we plant trees we slow the wind and control its destructive ways. Trees hold our precious topsoil, provide us with shelter from the storm, conserve energy, and bring joy and beauty on a bright summer's day.

You can create calm and beauty where you live, too. Join me and plant a tree. For your free booklet, write: Conservation Trees, The National Arbor Day Foundation, Nebraska City, NE 68410.



**The National
Arbor Day Foundation**

GUARANTEED LOWEST PRICES!

If you find **any** of the products listed here or in our catalog advertised for less in this magazine, **we'll meet or beat that price!**

- The Lowest prices
- The Widest Selection
- Expert Mac Advisors

- Money Back Guarantees
- Overnight Delivery Only \$3
- Easy Methods of Payment
- Corporate, Government and Educational Accounts
- International Accounts
- International Dealers & Distributors

CALL NOW FOR YOUR FREE CATALOG!



ACT!

The professional way to manage your contacts and activities!

ACT! for Macintosh, the newest addition to Contact Software International's best selling line of contact managers, includes tightly linked, powerful features, such as: contact database to keep up-to-the-minute files; activity scheduler to schedule unlimited calls, meetings and to-do's with a few mouse clicks; and easy rescheduling using "drag and drop" capability. Just send in your original program disk or fax manual cover from current contact management-address book, calendar or other P.I.M. software. Item # CONT10

ACT! without upgrade # CONT11 \$244



OFOTO 2.0

Ofoto Version 2 sets a new standard for ease of use and accuracy when scanning line drawings, art, and images — color, grayscale, and black and white. High-fidelity scans with the click of one button. Out-of-focus or under and over-exposed problem originals are no longer a problem. Ofoto can even fix photographs that have been taken with the wrong film. Don't "correct" your scan; get it right the first time with Ofoto Version 2! Item # LS11

FREE ABATON SCANNER



TYPE READER 1.0

New Technology That Makes Other OCR Obsolete!

Not only is TypeReader more accurate and easy to use, it even retains document formatting such as tables, column, tabs, type styles, and sizes! And if you buy TypeReader for its retail price of \$695, you'll set the Abaton Transcribe 300 Flatbed Scanner FREE (while supplies last). Item # EXP11



FINAL DRAFT

Final Draft is designed specifically for writing movie scripts, TV episodes and stage plays. It combines powerful word processing with professional script formatting in one complete package, allowing you, the writer, to focus on the package instead of how it looks. There is no need to worry about learning script formatting rules. Final Draft formats and paginates to Film Industry standards. The only thing you'll need to write like the pros...are ideas. Item #MACT10

ACT	\$244
Adobe Fonts	SCALL
After Dark	\$32
Capitalist Pig	\$31
Datebook 1.5	\$77
DeskWriter Ink Refills	\$11
Drawing Board II	\$399
FileMaker	\$259
Hard Drives	SCALL

Illustrator	\$348
Infini-D	\$679
MacIntercom	\$78
MacProPlus Keyboard	\$119
Microsoft Excel	\$294
Microsoft Word 5.1	\$295
NEC Various products	SCALL
Norton Utilities	\$99
Painter	\$249

Pagemaker	\$489
PowerPoint	\$319
Quark3.1.1	\$548
Sketch	\$699
Stuffit	\$63
SyQuest 44Meg	\$66
Touchbase	\$73
TimesTwo	\$95

POLICIES Credit card is not charged until order is shipped. **Shipping:** \$3 in Continental U.S.A. UPS overnight guaranteed (subject to credit approval). *Hardware over 10 lbs actual or dimensional weight will be shipped ground. **Money Back Guarantees & Returns:** call for RAE before return. Retain original packaging. Restocking fee may apply. Low price guarantee good at time of purchase only.



SMARTCOM II

Get \$40 back directly from Hayes when you buy Smartcom II and any Hayes modem. Just send in your UPC codes and receipt to Hayes. You bought the best modem - now get the best software to get the best from your modem. Whether you need powerful communications software with a wide range of features, or a program for the newcomer to communications. There's even software that lets you share modems and other devices along AppleTalk network. Item # HAY10 Offer good on products purchased between 10-1-92 and 3-31-93.



SNOOPER 2.0 WITH VIREX SOFTWARE

Diagnostic Software Finds the Problem. Diagnose from your desk with SNOOPER. Performs over 250 tests, checks all your hardware and finds any problems. Runs on all Macs. This vital utility is easy to use and saves time and money. Buy now and get complete VIREX virus protection package FREE. Item # MAXA 16

SNOOPER 2.0 WITH VIREX NUBUS KIT: Item # MAXA 17 \$178



ALIAS SKETCH!™ V.1.5

for 3D Illustration and Design

A breakthrough product for illustrators, graphic designers, package designers and other creative professionals. An essential partner for the 2D illustration and paint programs you already own, Sketch! brings you the power to draw freeform curves and shapes in 3D space using 2D techniques you've already mastered. Import outlines directly from your favorite 2D illustration programs. Assign materials, lights and render final artwork. You can even match the perspective of the original image! Sketch! exports PICT, TIFF, EPS, DXF, IGES AND RIB. Items # ALIS10-80. MacUser Editor's Choice Award Finalist for Best 3D Program.



PHONEPRO

ProPhone is a complete development environment to create and run virtually any type of phone application (i.e. voice mail systems that put messages in QuickMail and MicrosoftMail). User friendly. Item # CYP13

FAXPRO II \$665

FaxPro II is the 2nd generation network fax system that builds upon the award winning original. New features include auto fax PICT/TIFF conversion; auto laser printing of received faxes; operates on any network. Item # CYP12

Dr Mac

■ WE TAKE CARE OF YOU ■

1-800-825-6227

Fax: (818) 504-9380 or (818) 504-2159

1050 Randall Street, Sun valley, CA 91352 • (818) 504-1800

Circle 177 on reader service card

Our **New** Prices Have the

MAGNAVOX
A Philips Company



\$399

Magnavox 14" Color for all Macs
14" display with 24-bit color card \$829

SIGMA DESIGNS

TRINITRON



\$1245

Sigma Designs 17" Color Trinitron
17" Multi-resolution display

PROCOM TECHNOLOGY

STORAGE!



\$469

44MB REMOVABLE

Procom 44 MB Removable with cartridge
See below for complete line of storage products

Displays & Cards

PHILIPS



Philips 20" Trinitron Multi-frequency display, meets MPRII

\$2,195

Philips/Magnavox 14" display 399
Philips 15" color display 599
Philips 17" Trinitron display 1095
Philips 21" color display 2695
8-bit & 24-bit Accelerated Color Cards available for all displays. Call for prices.

LAPIS COLOR

Cards

For Mac Plus, Classic, SE, SE/30, LC, LC II, IIsi, II-family & Quadras



Call

8-bit card for SE/30, II's & Quads
8/16-bit for SE/30, II's & Quads
24-bit for SE/30, II's & Quads
LC-TV lets LC's work w/any TV
Lapis 15" portrait grayscale display
Call for New Pricing and
Let us help you pick the right card!

Great for SE/30's

Networking

Dayna



\$329

Ethernet Interfaces in Thin or 10baseT
DaynaPort, Mac II family, IIsi 149
DaynaPort, Mac LC, LC II, SE/30 149
MiniHub/Hub12 239/679
PathFinder Router 629

Memory Upgrades

Marco Memory Products

SIMMs

1 MB SIMM, 70ns 35
4 MB SIMM, 70ns 124
16 MB SIMM, 70ns 569
8 MB SIMM, 70ns (PB180&160) 369
Memory for new Macs Call

Lifetime warranty on all SIMMs!
Due to federal tariffs, SIMM prices may change significantly. Call for latest prices!

JetFill

Refills for Apple, Cannon, HP Ink Jet Printers. All in stock. Call for pricing.

Drives & Storage

Multi-Media CD-STATION!



\$739

Procom CD-Station Super fast 200ms access time CD-ROM includes 7 popular CD titles, stereo speakers & headphones.

Removable Drives
88 Read/Write 44 599
21MB Floptical 399
3.5" 128MB Optical, Sony Mech. 1495
5.25" 650MB Optical 2795
2GB DAT Backup 1499

Procom Technology manufactures high performance, high quality computer storage devices. All Procom products are fully formatted, tested and backed by 1-5yr warranties along with MacNews' own 30 day MBG. Call for more info.

Printers

Newgen 400dpi/600dpi 1649/1895
Newgen 11x17" 600dpi 3795
Apple LaserWriter IIfx/IIG 2395/3195

WACOM

12 x 12 Standard/Electrostatic 649/719
12 x 18 Standard/Electrostatic 979/1095
18 x 25 Standard 2725

radius

NEW Precision Color Pivot
15" Portrait/Landscape compatible with Quadra & Centris on-board video



\$929

New Radius PrecisionColor 20S 2345
Radius MonoPivot 699
Radius 24Xp/24Xl/24X 495/795/Call
VideoVision with Premier 1899
Radius Rockets/RocketShare Call

SIGMA DESIGNS

PowerPortrait 15" display (for SCSI) Call
PageView gray scale 15" display 499
ColorMax 15" display 749
ColorMax 17" Trinitron display 1245
21" SilverView Pro (mono/GS) 1099
21" SilverView Portrait (12"x 16") 1099
Sigma Designs Interface cards Call

Mac News
1-800-243-9383

Sales Hours: M-TH 8am-7pm; Fri til 6pm; Sat 10am-2pm (CT)



The Good News is we've got a Great Selection of Quality Products - all at Unbeatable Prices!

Apple, Mac are trademarks of Apple Computer. Prices subject to change without notice. All returned orders may be subject to a minimum 15% restocking fee plus return shipping. Call for RMA before returning. All warranties on Macintosh or Apple brand products sold by MacNews will be honored by MacNews or its authorized agents only. All other manufacturer's warranties still apply.

Competition Seeing Red!

TEXAS
INSTRUMENTS

TURBO

Ask about
TI's NEW
Low-cost
Laser Printers



Call

TI TURBO 9ppm, RISC, 35 FONTS
TI microLaser PS-17 \$1,199

MICROTEK

24-BIT
COLOR

Ask about
\$75
REBATE!



\$859

Microtek ScanMaker II 1200 dpi with Photoshop LE
Transparency Option now available. Call for price.

Macintosh

LC III

CALL
ABOUT
THE
NEW
MACS



\$1099

Mac LC III 4/40 (price is for CPU only)
LC III with 14" color display & keyboard \$1,645

Modems

Hayes

All Modems
\$3 Fed Ex!

Hayes Acura 144 Fax Modem

14,400 Data, 14,400 Send/Receive Fax
— up to 57,600 bps with V.32bis data
compression.



\$299

Hayes Acura 24 Modem 74
Hayes Acura 9696 Fax Modem 249

Scanners

TAMARACK

1200 dpi



\$1995

Tamarack Artiscan 1200C
For high-end prepress scanning, lightning
fast, true optical 1200 dpi, 24-bit color
with full Photoshop 2.01

Tamarack Artiscan 8000C 1295
800dpi, 24-bit color w/full Photoshop 2.01

MICROTEK

NEW ScanMaker IIx 1099
1200 dpi, 24-bit color with full Photoshop
Transparency Opt. for II & IIx Call
Microtek ScanMaker 1850S 995
24-bit, 35mm slide scanner, full Photoshop

NEW
Cool Tools!

Kai's POWER TOOLS



Kai's
Power
Tool's
powerful &
easy to use.

\$89

The Ultimate Plug-in
filters for Adobe Photoshop

"Adobe Photoshop & Kai's Power Tools
together are a creative explosion! They are
tools that no one should be without."
— Jeff Parker, Adobe Photoshop Product Mgr.

OCR

★★★★½



OmniPage
Direct
Optical
Character
Recognition
Software

\$259

Software that's so fast and easy to use,
one "click" is all you do to enter both text
and numbers directly into documents and
spreadsheets without retyping

OmniPage Professional OCR 629
Image Assistant 329

Mac CPU's

Mac LC III, 4/80	1245
NEW Mac IIvx, 4/0	1395
Centris 610/650	NEW
Quadra 800 8/230	3995
Quadra 950 8/0	4795
PowerBooks 160, 180 & Duos	Call

Mac Systems

Macs

IIx Color System

Mac IIvx, 4MB
RAM/80HD,
14" Color
Display, Apple
Keyboard,
Mouse,
System 7



\$2,195

Centris 650 System \$3,849
Mac Centris 650 4+MB/80HD,
17" Trinitron Color Display, Apple
Keyboard, Mouse, System 7

Quadra Accelerator

128k, copy back cache card speeds up the Quadra
700, 900 & 950 fast made by up to 25%
QuadCache 25 for 700 & 900 269
QuadCache 33 for 950 349

Supra

Supra V.32 bis
Fax/Receive
Modem



All Modems
\$3 Fed Ex!

14,400 Data,
14,400 Send/
Receive Fax — up to
57,600 bps with
V.32bis data com-
pression.

\$339

SupraFAX Modem Plus 149
SupraFAX Modem V.32 299

Wacom ArtZ
6" x 8" ADB
pressure-
sensitive
Tablet



\$299

Mac  News

1555 SHERMAN AVENUE

SUITE 361 • EVANSTON, IL. 60201

1-800-243-9383

24hr Fax 312-871-4556 • International Orders Welcomed

MAGIC HARD WORKING TOOLS FOR YOUR MACINTOSH

ALL MAGIC DRIVES INCLUDE A 1, 2, 3, OR 5-YEAR WARRANTY & A 30-DAY MONEY-BACK GUARANTEE.

MACPRODUCTS HAS BEEN CONTINUOUSLY SHIPPING MACINTOSH DRIVES LONGER THAN ANY OTHER COMPANY!

MAGIC CD-ROM DRIVE

"THE HIGHEST SCORING CD-ROM DRIVE OVERALL WAS THE MAGIC CD..." -MACUSER MAGAZINE MARCH'93

"IT'S NOT JUST SPEED BUT ALSO FEATURES AND BUNDLED ACCESSORIES, INCLUDING CD-ROMS, THAT PROMPT US TO RECOMMEND THE MAGIC CD..." -MACUSER MAGAZINE MARCH'93



MAGIC 45R SYQUEST REMOVABLE

"THE MAGIC 45R IS ONE OF BEST SYQUEST DRIVES AVAILABLE, OFFERING HIGH SPEED AND HIGH QUALITY" -MACUSER MAGAZINE JULY '90

MAGIC 128REM 3.5" OPTICAL

"THE BEST DESIGN & CONSTRUCTION FOR THE MONEY" -MACUSER MAGAZINE, JULY 1992

WINNER OF THE 1992
MACWORLD MAGAZINE
EDITOR'S CHOICE AWARD!
-NOVEMBER 1992



ALL MAGIC
EXTERNAL DRIVES
INCLUDE CASE
WITH 40-WATT
POWER SUPPLY,
MAC CABLES, &
NEW ANUBIS™
DRIVER SOFTWARE.

- * 1 Year Warranty
- ** 2 Year Warranty
- † 3 Year Warranty
- †† 5 Year Warranty



MAGIC HARD DRIVES

MAGIC HARD DRIVES

85MB Quantum ELS**	\$219
127/170MB Quantum ELS**	\$259/\$319
120MB Quantum Pro**	\$289
240/525MB Quantum Pro**	\$499/\$979
1.2GB Quantum Pro**	\$1399
80/120MB Quantum PB Go*	\$349/\$410
1.2/2.1GB Fujitsu††	\$1395/\$2499
1.2GB Toshiba†	\$1299
1.2/2.1GB Seagate††	\$1999/\$2799
1.5GB Micropolis††	\$2099

MAGIC HARD DRIVE KITS

Internal Kit.....	\$29
External Kit.....	\$99

MAGIC CD-ROM

Toshiba 200ms XM3401*	\$599
multi-spin, multi-session, photo CD compatible	
Toshiba XM3401* & 6 CD Pack.....	\$649

MAGIC 256/128 OPTICAL

3.5" Optical Disk Included With All Magic Optical Drives	
256MB REM MOST Optical*	Call
128MB Epson* Int/Ext.....	\$1099/\$1199
128MB Fujitsu* Int/Ext.....	\$949/\$999
256/128MB 3.5" Cartridges.....	\$99/\$59

MAGIC 45R & 88R

45R/88C SyQuest Drive**	\$399/\$549
SyQuest 45 & 88 Cartridges	\$69/\$99

MAGIC TAPE

Tape Included With All Magic Tape Backup Drives	
150/250MB Tape Backup*	\$599
525/600MB Tape Backup*	\$999
2.0GB DAT Backup*	\$1299
2.3/5.0GB 8mm Backup*	\$2895/\$3799

\$99

DOUBLE YOUR STORAGE POWER!
MAGIC SCSI II COMPRESSION CARD WITH
PURCHASE OF ANY MAGIC REMOVABLE DRIVE

MAGIC COMMUNICATIONS

MAGIC NETWORKING

MagicNet (localtalk) singles.....	\$14
MagicNet (localtalk) 10-pack, ea.....	\$9

MAGIC MODEMS ▶ NOW INCLUDES MICROPHONE LTD. ED.

MAGIC AMX MODEM
2400bps modem. 100% Hayes compatible...\$69

MAGIC VX MODEM
2400bps modem with compression to 9600bps.
Hardware V.42bis & MNP5.....\$139

MAGIC VX V.32 MODEM
9600bps modem with compression to 38400bps.
Hardware V.32/V.42bis & MNP5.....\$199

MAGIC VX V.32BIS MODEM
14400bps modem with compression to 57600bps.
Hardware V.32bis/V.42bis & MNP5. Includes
software and cable.....\$249

MAGIC FAXMODEMS ▶ NOW INCLUDES MICROPHONE LTD. ED. & STP SOFTWARE

MAGIC AFX & PKT FAXMODEMS
2400bps modem. 9600/4800bps, class 1, Group
2 & 3 fax, software\$79, pocket version \$119

MAGIC FX FAXMODEM
2400bps modem. 9600bps send & receive, class
2, Group 3 fax, software.....\$139

MAGIC VFX FAXMODEM
2400bps modem. 9600bps, class 2, Group 3 fax,
V.42bis & MNP5, software.....\$169

MAGIC VFX V.32BIS FAXMODEM
14400bps modem. 14400bps, class 2, Group 3
fax, V.42bis/V.32bis & MNP5, software ...\$269



ALL MAGIC MODEMS INCLUDE
A 2 YEAR WARRANTY AND 30
DAY MONEY BACK GUARANTEE



MAGIC HARD WORKING TOOLS FOR YOUR MACINTOSH

EXTERNAL 2400 BAUD,
9600 BAUD, & 14400 BAUD
MODEMS AND FAXMODEMS

ADVANCED V.42BIS, V.32BIS,
& MNP 5 ERROR CHECKING
AND DATA COMPRESSION
CAPABILITIES

MAGIC AFX-24/96
POWERBOOK FAXMODEM
MOUNTS INTERNALLY IN ANY MACINTOSH
POWERBOOK - GROUP 3, CLASS 1 FAX

\$119

14400 BPS
POWERBOOK FAXMODEM
MOUNTS INTERNALLY IN ANY MACINTOSH
POWERBOOK. MNP-10. WITH SOFTWARE.
CELLULAR COMPATIBLE \$399

\$299

NEW!

LEASE

LEASE A COMPLETE
MACINTOSH SYSTEM AT
AFFORDABLE RATES.
CALL FOR DETAILS.

MAGIC RAILGUN 030 ACCELERATORS - INCREDIBLE PERFORMANCE FOR YOUR MACINTOSH SE, PLUS OR CLASSIC.

ACCELERATORS AVAILABLE WITH BUILT-IN LARGE SCREEN VIDEO OUTPUT

MAGIC PERFORMANCE UPGRADES FOR THE MACINTOSH LC, IISI, IICI, CLASSIC II & SCSI



RAILGUN 030 PRO SYSTEM NOW AVAILABLE IN 220 VOLT!

RAILGUN™ 030 SYSTEM V. MOBIUS 030

HARDWARE FEATURES	RAILGUN 030 PRO SYSTEM WITH 19" DISPLAY	MOBIUS 030 SYSTEM WITH 19" DISPLAY
CPU SUPPORT	SE, CLASSIC, PLUS	SE, CLASSIC
PROCESSOR	25MHz MOTOROLA 68030	25MHz MOTOROLA 68030
68882 CHIP	BUILT-IN FPU	\$95 OPTION
VIDEO PATH	32-BIT VIDEO BUS	16-BIT VIDEO BUS
VIDEO CLOCK	16, 25, 33, & 40MHz	8MHz
MONITOR RES.	1152 x 876	1024 x 768
VIDEO SUPPORT	OVER 57 DISPLAYS	4 DISPLAYS
VIRTUAL RAM	\$49 OPTION	\$99 OPTION
EXPANSION PORT	YES	NO
ETHERNET SUPPORT	YES	NO
BASE PRICE	\$999	\$1290

RAILGUN 030 OUTPERFORMS MOBIUS 030 IN TEST AFTER TEST! 11% FASTER IN RAW PROCESSING POWER & 79% FASTER IN VIDEO THROUGHPUT!



RAILGUN 030 PRO SYSTEM

030 Accelerators with Built-in 32-bit Video Output, 68882 Math CoProcessor, PMMU, & Display for your Macintosh SE, Classic* or Plus* System Monitor19" 15"
 16MHz RailGun PRO\$899.....\$699
 25MHz RailGun PRO\$959.....\$799
 50MHz RailGun PRO **\$1299.....\$1099
 *Add \$99 for Classic or Plus Version
 ** 50MHz version includes Virtual 3.0

RAILGUN 030

030 Accelerators for your Macintosh SE, Classic* or Plus*. Optional 68881/2 Math FPU, Built-in SCSI accelerator. Easy user installable design.
 Magic RailGun 16MHz\$399
 Magic RailGun 25MHz\$449
 Magic RailGun 50MHz\$499
 ▶ Math CoProcessor Upgrade\$49/\$99
 ▶ Virtual 3.0 Virtual RAM software\$49
 *Add \$99 for Plus or Classic version

MAGIC ACCELERATORS

The Magic Math 030 adds System 7 Virtual memory capabilities and built-in math coprocessor to your Macintosh LC & Classic II.
 Magic Math LC CoProcessor\$39/\$59
 Magic Math Classic II CoProcessor\$39/\$59
 Magic IISI Dual Slot Card with FPU\$99
 Magic Cache IICI / IISI 64k\$159

MAGIC MEMORY UPGRADES

MAGIC HARD WORKING TOOLS FOR YOUR MACINTOSH

MACINTOSH RAM

1MB SIMMs	Starting at \$29
2MB SIMMs	\$65
4MB SIMMs	\$119
16MB SIMMs	\$549
4MB Classic Upgrade	\$99
LC VRAM	\$59
Quadra VRAM	\$29

CALL MACPRODUCTS USA FOR NEW MACINTOSH SIMMS.

ALL MAGIC MEMORY UPGRADES INCLUDE A FULL LIFETIME WARRANTY

POWERBOOK RAM

4MB PB 140, 145, & 170	\$179
6MB PB 140, 145, & 170	\$249
4MB / 6MB PB 160 & 180	\$229 / \$329
8MB / 10MB PB 160 & 180	\$399 / \$499
4MB / 8MB PB 210 & 230	\$229 / \$349
12MB PB 210 & 230	Call
16MB PB 210 & 230	\$1999

PRINTER RAM

GCC PLP II/S 1MB	\$49
LZR960/Realtech/Quickor 8MB	\$499
NEC Silentwriter 2 M90 2MB	\$249
NEC Silentwriter M95/97 2MB	\$129
NEC Silentwriter M95/97 4MB	\$199
QMS PS-410/815 4MB	\$239/\$349
TI 1MB / TI Turbo 4MB	\$49/\$279



MACPRODUCTS USA APPRECIATES THE SPECIAL NEEDS OF THE INTERNATIONAL MACINTOSH CLIENT. CALL MACPRODUCTS USA, OR CONTACT OUR 24-HOUR FAX LINE, TO PLACE AN ORDER FROM ANYWHERE AROUND THE WORLD.

DIAL OUR FIRST CLASS BBS FOR LATEST SOFTWARE UPDATES. FREE BBS ACCESS SOFTWARE WITH EVERY MAGIC PURCHASE. 512-472-1794 • VTI 00-8-1-NONE

MAC

PRODUCTS USA

HARD WORKING SINCE 1985

1 800 MAC USA 1

FAX 512-499-0888
 TEL 512-472-8881
 JAPAN 81-93-533-5262
 SINGAPORE 65-287-5181
 CUSTOMER SERVICE
 TECHNICAL SUPPORT

608 WEST 22ND
 AUSTIN, TEXAS 78705
 JAPAN 81-3-3463-8017
 CANADA 800-624-9307
 512-472-8881 EXT 403
 512-472-8881 EXT 403

TERMS & CONDITIONS: Corporate & Educational purchase orders accepted. MasterCard, Visa, Discover & COD accepted. Prices subject to change & availability. Texas residents add 8% sales tax. MacProducts cannot be responsible for errors in typography or photography. MacProducts offers a 30-Day Money Back Guarantee on all Magic® Products, excluding Original Shipping. Call for RMA before returning merchandise. Returns subject to a restocking fee. All brands & product names are trademarks of their respective holders.

W35

Circle 175 on reader service card



WE WANT TO BE YOUR MACINTOSH SOLUTIONS PARTNER (...WE'RE REALLY NOT INTERESTED IN A ONE-SHOT SALE)

In these difficult economic times, value is the most important criteria for making a purchasing decision. We're in our eighth year of providing the best value in the Mac market. Sure, there are some companies that can give you a better price on a particular product...but will they stand behind it (and by you...and will they even still be in business)? We will. We're a subsidiary of a financially-sound public company, and have been members of the Better Business Bureau since 1987.

We offer you the best overall value, customer service, technical support, and financing options...because we're interested in being your total solutions partner...and because we'll be around to help you.

We've become known as America's one-stop source for Macintosh solutions. Why? Because our friendly sales and customer service teams have always been more interested in solving your computing challenges than in making a quick buck. From time to time, they have to talk a customer out of buying more equipment than they really need. That's because we believe in building relationships and providing total solutions...and that's why we're America's largest mail order seller of Mac hardware.

Réal Provencher
Réal Provencher, President

HARDWARE THAT FITS



E-MACHINES



SUPERMAC

Monitors: all sizes, brands & prices

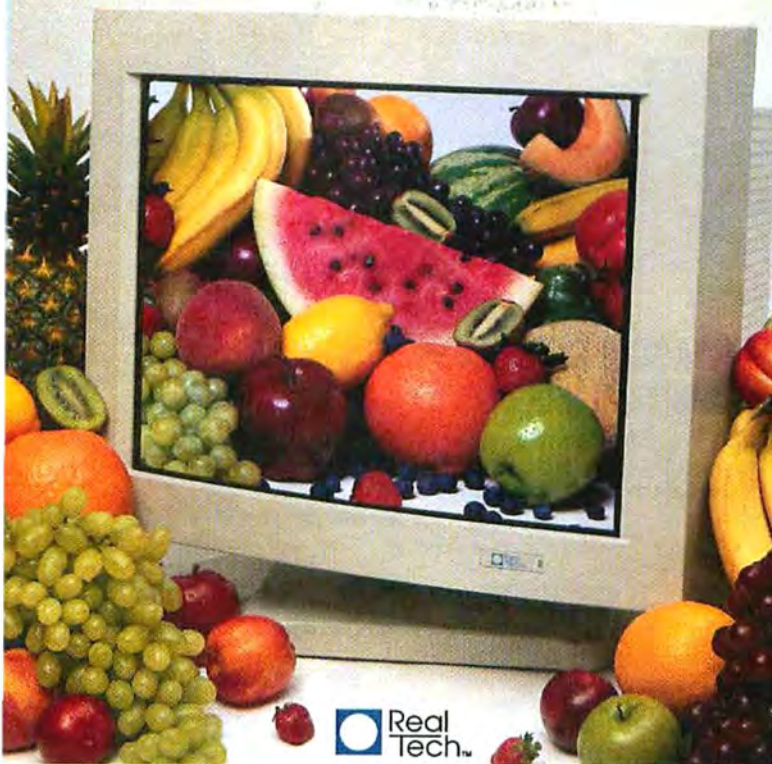
Need help choosing a monitor? Not sure if you need one that auto-syncs? Call our friendly sales team. They're happy to answer your questions.

	Price	Tube type	640 x 480	640 x 870	832 x 624	1024 x 768	1152 x 870	Auto-syncing	Anti-glare
A. Radius 21" Color	\$3,069	Hitachi					■		■
NEC 21" 6FG Color	2,429	NEC	■		■	■	■	■	
SuperMac 21" Mono/Grayscale	989	—					■		■
B. SuperMac 20" (SuperMatch)	\$1,499	Hitachi				■			■
C. RasterOps 20" Trinitron Multi-Mode	2,329	Trinitron	■		■	■	■	■	■
D. RealTech 20" Trinitron Multi-Mode	1,895	Trinitron	■		■	■	■	■	■
Radius Precision Color 20"	2,389	Trinitron	■		■	■	■	■	■
RasterOps 20" Hitachi Color	1,469	Hitachi	■		■	■	■	■	■
* SuperMac 20" (SuperMatch Dual-Mode)	2,499	Trinitron				■	■		■
E-Machines 19" Color (T19 II)	2,399	Trinitron				■	■	■	■
E. Mitsubishi 17" Diamond Pro	\$1,199	Trinitron	■		■	■	■	■	■
F. NEC 17" 5FG Color	1,329	NEC	■		■	■	■	■	
G. Sony 17"	1,149	Trinitron	■		■	■		■	■
H. RealTech 17" Multi-Mode	995	Hitachi	■		■	■		■	■
I. Seiko Instruments 17" CM1760LR	1,249	Trinitron	■		■	■		■	■
J. RasterOps 16" (RasterOps Sweet 16)	\$1,249	Panasonic			■				■
* E-Machines 16" Color (ColorPage T16)	1,299	Trinitron	■		■	■		■	■
K. NEC 15" 4FG Color	789	NEC	■		■	■		■	
L. Radius 15" Precision Color Pivot	\$959	Non-Trinitron	■	■	■	■		■	■
M. Sigma 15" Grayscale (PageView GS)	579	Phillips		■					■
N. RealTech 15" Grayscale	449	—		■					■
Sigma 15" Grayscale (Power Portrait)	659	Phillips		■					■
NEC 15" 3FGX Color	669	NEC	■		■	■		■	
O. Seiko Instruments 14" Color (CM1445)	\$499	Trinitron	■						■
P. Sony 13" Color	689	Trinitron	■						■

* shown above

Your Hardware That Fits partner will tell you which monitors are on-board compatible, and which ones require a card.

Your one-stop source for



Real Tech 20" Trinitron Color Monitor

\$1,895

Lease: \$52/mo.

- Auto-syncing
- 24- or 8-bit color
- Multi-mode display
- 7 factory pre-set resolutions
- 7 programmable settings
- 1024 x 768 standard resolution
- Trinitron® tube from Sony

1024 x 768 standard resolution; will auto-sync to 640 x 480, 832 x 624, 1024 x 768, and 1152 x 870. Multi-level bit depth support provides accurate screen display for all applications. Will interface with Quadras, and with popular video cards.

“ In the graphic design business, the desktop publishing hardware is changing so rapidly that it can be confusing what to buy — Jon’s knowledgeable and friendly help guided me toward the right decision for my company. ”

— Elaine Kropveld
EKlectic Images

Real Tech 17" Multi-Mode Color Monitor



\$995

Lease: \$27/mo.

- Multi-mode
- Auto-syncs to 1024 x 768
- 832 x 624 standard resolution
- Quadra-ready



**TOLL-FREE
TECH SUPPORT:**

1-800-364-MACS



\$1029

Lease: \$28/mo.



\$489

Lease: \$60/mo.

WACOM CORDLESS DIGITIZING TABLETS

Precise, real-time control over graphic input...brings back the delight of freehand drawing!

Cordless, pressure sensitive stylus translates your penstrokes into line width, spray density, color changes, and other programmable effects. Paint, draw, trace, and point as naturally as if you were writing.

The standard tablet has a plain surface. The electrostatic tablet is ideal for video graphics, photo retouching, and print pre-press work.

Wacom ArtZ Graphics Tablet
6" x 8" High Speed ADB ...**\$319**

Wacom (SD Series)
6" x 9" Standard**\$489**
12" x 12" Standard.....**689**
12" x 12" Electrostatic.....**759**
12" x 18" Standard**1029**
12" x 18" Electrostatic**1099**

You can always count on our tech team. We receive dozens of customer letters praising their helpfulness and friendly attitude. They're always ready to help when you have a problem.

Seated, left to right: Paul and Craig. Standing: Chris, Tom, Dan, Mike, and Dave.



CUSTOMER SERVICE

When you order from us, you get computer experts, not clerks!

All of our salespeople have a minimum of three years of computer experience. They're trained in Apple's intensive program, as well as our own. They're ready to help you (with a smile!) both before and after the sale.

TECH SUPPORT

Our tech team is well trained, well informed, and well known for their ability to solve customers' problems with a minimum of inconvenience to the customer. We have the best tech support in the business. And it's toll-free: **1-800-364-MACS.**

FINANCING OPTIONS

We've made it easier than ever to own our productivity-enhancing products.

- VISA and MasterCard
- corporate P.O. accounts (call for information)
- business leasing available

All prices are subject to change without notice. ©1993.

GUARANTEE

Our famous guarantee: If you don't like it, we'll buy it back. If you're not 100% satisfied, call for your RMA number and return the product within 30 days of the ship date. We'll refund your purchase price (minus consumables for printers).

RealTech and the RealTech logo are trademarks of MSI. All other trademarks used in this ad are the properties of their respective owners.

BUSINESS LEASING OPTIONS

- 1 **True Lease**...with 10% buy-out option
- 2 **Installment Lease**...with \$1.00 buy-out option
- 3 **Speed Lease**...90- or 180-day terms, with buy-out or conversion to other leases
- 4 **20/20 Lease**...10% security deposit, 20 equal payments, 10% buy-out
- 5 **90-day Deferred Lease**...no payment for 90 days; first and last payment in advance

**All leases are subject to credit approval. All lease payments in our ads are based on the "True Lease" program at 48 months. Prices, lease prices, and rates are subject to change without notice.*

NOTE: Minimum lease payment is \$50 per month.

Toll-free information: 1-800-364-LESS

HARDWARE THAT FITS • 610 S. Frazier • Conroe, TX 77301



Printed on recycled paper to show our concern for the environment.

1-800-364-WORLD

TOLL-FREE
TECH SUPPORT:

1-800-364-MACS



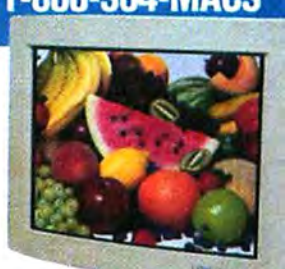
A **radius**



B **SUPERMAC**



C **RASTEROPS**
THE ART & SCIENCE OF COLOR™



D **Real Tech™**



E **MITSUBISHI**



F **NEC**



G **SONY**



H **Real Tech™**



I **SII**
Seko Instruments



K **NEC**



M **SIGMA DESIGNS**

Don't know which card
is compatible with
your CPU & monitor?
Call us toll-free.

	Price	Maximum resolution	Accelerated
RASTEROPS			
ProColor 32	\$3,219	1152 x 870	■
PaintBoard 24	1,599	1152 x 870	■
8XL	479	1152 x 870	■
PaintBoard Li (24)	829	1024 x 768	■
245TV*	799	640 x 480	■
MediaTime*	1,599	640 x 480	■
SUPERMAC			
Spectrum/24 PDQ Plus	\$1,549	1152 x 870	■
Spectrum/8 NuBus	419	1152 x 870	■
Spectrum/24 Series IV	829	1024 x 768	■
Spectrum/8*24 PDQ	829	640 x 480	■
Spectrum/8*24	579	640 x 480	■
Video Spigot*	369	160 x 120	■
Video Spigot & Sound*	479	160 x 120	■
RADIUS			
Precision Color 24X	\$1,649	1152 x 882	■
Precision Color 8X	499	1152 x 882	■
Precision Color 24XK	829	1024 x 768	■
Precision Color 24XP	499	832 x 624	■
Video Vision*	1,979	640 x 480	■
E-MACHINES			
ColorLink DC/T (8-bit with Ethernet)	519	1024 x 768	■
ColorLink SX/2 (24-bit with Ethernet)	649	1024 x 768	■
Futura SX24	499	1024 x 768	■
DoubleColor LX (8)	699	1152 x 870	■

*24-bit; captures up to 30 frames per second



N **Real Tech™**



L **radius**



P **SONY**

monitors!

Hours: 8 am-7 pm Central Standard Time

30-DAY MONEY-BACK GUARANTEE on all hardware (except printer consumables and special-order items). Before returning merchandise, call our Customer Service Dept. toll-free to receive a returned merchandise authorization number (RMA), which must be included with any products you return. No C.O.D. returns, please. Thank you for your cooperation. ALL PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE. Hardware That Fits is located at 610 S. Frazier in Conroe, Texas 77385.

Toll-free phone ordering
(or fax 24 hours a day)

FAX:
1-409-539-4141

Scanners

Flatbed desktop scanners for 24-bit color, 8-bit grayscale, and black/white images. Ideal for mid-range output or position prints for mockups/presentations.

	Price	DPI	Brightness & contrast levels	Scanning area	Flat art	Transparencies	Slides	Software
MICROTEK								
Scanmaker II	\$909	600	14	8.5 x 13.5	■			Includes limited version of Adobe Photoshop
Scanmaker IIxE	1,179	600	14	8.5 x 13.5	■			Includes full version of Adobe Photoshop
Scanmaker 1850 Slide Scanner	1,569	1850	14	2.5 square inches				Includes full version of Adobe Photoshop
Transparency Option		(1850)	(14)			■		
REALTECH								
Scan 800	\$1,099	800	200	8.5 x 11.75	■			Includes Scan-Match color calibration software
Optional Adobe Photoshop	200							
Scan 800 with Transparency Option	1,595	800	200	8.5 x 11.75	■	■		
UMAX								
UC 630	\$1,179	600	51	8.5 x 14	■			Includes full version of Adobe Photoshop
Transparency Option	729	(600)	(51)	6 x 9	■	■	■	
UC 840	1,329	800	51	8.5 x 14	■			Includes full version of Adobe Photoshop
Transparency Option	729	(800)	(51)	6 x 9	■	■	■	

SII Seiko Instruments Personal ColorPoint PSE

Prints full-bleed comps on plain laser paper (up to 10.1x14.33) or transparency film. 300 dpi color thermal printer uses 16 MHz RISC processor. 5 Mb RAM standard, upgradable to 9 or 21 Mb. Adobe PostScript® compatible. Includes AppleTalk, parallel, and RS-232 interfaces, plus an optional SCSI port. Continuously polls all interfaces;

reconfigures automatically. 17 resident fonts.

\$2,699
Lease: \$73/mo.



RASTEROPS THE ART & SCIENCE OF COLOR® RasterOps CorrectPrint 300i Dye Sublimation Printer with 36 Mb

Uses a 4-color (CMYK) dye sublimation thermal process at 300 dpi for photographic-quality output. Prints on special sheetfed paper or transparencies, not on rolls. 8.1" x 11" image size on legal paper. Uses a RISC controller, 35 resident fonts, three interfaces, including TCP/IP.

\$8,099 Lease: \$222/mo.

RealTech Color 350

Prints 11x17 (OB size)* 300 dpi edge-to-edge comps for about \$1.13 per page. (Letter-size output, approx. 69¢ each.) Creates true black text—uses 4 colored ink sheets (CMYK). RISC processor. 10 Mb of RAM, upgradable to 18 or 34 Mb. 3 standard interfaces. 39 resident fonts. Adobe PostScript® compatible; PANTONE® approved** color matching.

\$5,995
Lease: \$164/mo.



*with additional memory
**PANTONE is a Pantone, Inc. check standard trademark for color



The photo above is a 300 dpi image of an 8 x 10 transparency. It was scanned on the RealTech Scan 800 with the Transparency Option (shown below), then adjusted with ScanMatch and color-corrected with Adobe Photoshop.



MICROTEK



Real Tech Scan 800 with Transparency Option



MICROTEK



If you're looking for PRINTERS you'll get the best value & highest quality from us

How many pages do you print each month? What page-per-minute speed do you require? We only sell printers that can handle your needs. If you don't see what you want listed here, please call us toll-free.

LETTER SIZE

Real Tech Laser	\$1595
NEC Silentwriter 95	1399
NEC Silentwriter 95fx	1879
NEC Silentwriter 97	1719
NEC Silentwriter 97fx	2199
NewGen PS660	2699
NewGen PS880P	2119
Texas Instruments PS17	1249
Texas Instruments Turbo	1595

TABLOID SIZE

Real Tech 400	\$3195
NewGen 660B	4059
QMS 860	4279
NewGen 660B with Ethernet	4499

COLOR

Real Tech Color 350	\$5995
Seiko Instruments Personal ColorPoint PSE	2699
QMS 210	4699
RasterOps Correct Print 300i	8099



**DO YOU FEEL THE NEED
FOR SPEED? CALL, AND
WE'LL MATCH YOU WITH
THE RIGHT ACCELERATOR.**

DAYSTAR DIGITAL



NEW! Turbo 040 Accelerators

Get the maximum in 68040 acceleration and 100% compatibility. For Mac IIci and IIs; includes math chip.

25 MHz Turbo 040 \$1099
33 MHz Turbo 040 1349

25 MHz FastCache
Turbo 040 259

33 MHz FastCache
Turbo 040 339

Universal PowerCache Accelerators
Math chip available.

33 MHz Accelerator \$379

40 MHz Accelerator 549

50 MHz Accelerator 719

PowerCache Adapter 40

Charger (Photoshop Accelerator)

Includes PicturePress 2.5,
Charger Plug-ins, and Kodak
Photo CD access with clip art
images.

Charger \$799

RADIUS



For the Mac II family. Includes
QuickDraw and display-list
acceleration software.

Radius Rocket 25i \$1239

Radius Rocket 33 2069

SCSI II Booster 249

Rocket Share 419

FUSION DATA SYSTEMS



Applied Engineering®



CARDS AND HUBS



Asanté 10T Hub/8 (Ethernet concentrator)

Lets you use inexpensive unshielded twisted-pair (UTP) telephone wire instead of expensive coaxial cable for local area networks.

10Base-T Hub/8 \$265

Asanté EN/SC (SCSI-to-Ethernet adapter). For
Macs without available slots.

EN/SC \$339

Asanté MacCon 3 Ethernet card. Automatically
configures to media used.

MacCon 3 Card \$216

DaynaPORT E/II-T NuBus Card

Connects Mac II computers to thick, thin, fiber optic
or 10Base-T Ethernet cable systems.

Includes an RJ-45 jack for 10Base-T wiring.

DaynaPORT E/II-T NuBus Card \$149

DaynaPort E/Z. Ideal for Macs that don't have a
slot for a network interface card.

DaynaPORT E/Z \$269

MODEMS

Zoom 9600 v.32/42 bis \$259

Supra v.32 289

Supra v.32 bis 14,400 359

SupraFax Modems include STF and
Microphone software, and are backed
by a 5-year warranty.

SupraFax Modem Plus 179

SupraFax 144 PB 299

MassMicro FM 24/96 Network 359

MassMicro FM 24/96 Personal 165

Global Village TelePort-Gold 459

Global Village TelePort-Silver 399

Global Village TelePort-Bronze 209

BRIDGES AND ROUTERS



Shiva

FastPath SR Router/Gateway \$1669

NetBridge 589

EtherGate Router 1239

NetSerial 269

NetModem/E 1409

NetModem v.32 (for LocalTalk) 989

Hublet 199

LanRover/L 579

LanRover/E (4-port) 1659

TeleBridge 589

Dayna EtherPrint

Supports AppleTalk Phase 1
and Phase 2 protocols; divide
your network into multiple
zones.

Dayna EtherPrint \$335

Dayna EtherPrint Plus 439



STORAGE OPTIONS



PERIPHERAL LAND

44 Mb Turbo Drive \$499

88 Mb Turbo Drive 669

128 Mb 3.5" Magneto-Optical Drive 1399

88 Mb Turbo Read/Write 44 689

CD ROM Multi-Session-Int 589

CD ROM Multi-Session-Ext 649

1 Gb MaxOptical 5.25" Erasable Drive 3549

1 Gb Infinity MiniArray Drive-Ext 2889

2 Gb Infinity MiniArray Drive-Ext 4039

Quick SCSI Accelerator 339



MASS MICROSYSTEMS

21 Mb Floptipak Drive \$459

45 Mb DataPak Removable Cartridge Drive 549

88 Mb DataPak Removable Cartridge Drive 659

128 Mb 3.5" DataPak Magneto-Optical Drive 1559

120 Mb DiamondDrive 589

210 Mb DiamondDrive 809

1-800-364-WORLD

TOLL-FREE TECH SUPPORT:

1-800-364-MACS

Printing solutions.

Laser printers.

The right printer can do wonders for your productivity. Do you need speed? Adobe PostScript Level 2? Do you need to print a lot of pages each month?

Dpi
Engine speed
RAM

Interpreter
Microprocessor

Duty cycle
Paper trays

SCSI port
Interfaces

Resident fonts
Misc.

Do you need to print complex graphics on a daily basis or large quantities of high-quality, time-sensitive documents? We can recommend the right printer for your needs.

NEC Silentwriter Model 95

\$1,399

Lease: \$38/month

- 300 dpi
- 6 pages/min.
- 2 Mb RAM (expandable to 5 Mb)

- Adobe PostScript Level 2
- Motorola 68000 processor

- 6,000 pages per month
- Built-in envelope feeder & 250-sheet tray; optional 2nd tray available in letter or legal sizes

- No SCSI port
- Appletalk RS-422, parallel, and RS-232C

- 35 Micro-fine toner and NEC's patented "Sharp Edge" technology create sharp black print quality

NEC



RealTech™



- 300 dpi
- 9 pages/min.
- 2 Mb RAM (expandable to 10 Mb)

- Adobe PostScript Level 2
- Weitek RISC processor

- 5,000 pages per month
- Optional 2nd paper tray & cassette feeder are available for \$250 (for both)

- SCSI port
- Appletalk RS-422, parallel, and RS-232C

- 35 ATM font rendering technology builds raw type characters 4 to 5 times faster, enabling the RealTech Laser to print complex documents faster than other printers in its price range.

RealTech Laser

\$1,595

Lease: \$44/month

★★★★ 1/2

Reprinted from MacUser, Sept. 1992. Copyright ©1992, Ziff Communications Co.

"The RealTech features not just a genuine Adobe interpreter, but also a PostScript Level 2 raster image processor (RIP), which earns it more than a few points for forward compatibility."

— PUBLISH MAGAZINE, Feb. 1992

Texas Instruments MicroLaser XL Turbo

\$2,795

Lease: \$77/month

- 300 dpi
- 16 pages/min.
- 2.5 Mb RAM (expandable to 10.5 Mb)

- Adobe PostScript Level 2
- Weitek RISC processor

- 25,000 pages per month
- Optional 2nd paper drawer

- Optional SCSI port
- Appletalk RS-422, parallel, and RS-232C

- 35



TEXAS INSTRUMENTS

Texas Instruments MicroLaser Plus

\$1,249

Lease: \$34/month

- 300 dpi
- 9 pages/min.
- 1.5 Mb RAM (expandable to 4.5 Mb)

- Adobe PostScript Level 1
- Motorola 68000 processor

- 10,000 pages per month
- Optional 2nd paper drawer and envelope feeder

- Optional SCSI port
- Appletalk RS-422, parallel, and RS-232C

- 17 Available with 35 resident fonts (\$1349)

newgen

- 600 dpi
- 8 ppm (letter size); 4.6 ppm (tabloid size)
- 12 Mb RAM (expandable to 96 Mb)

- PostScript compatible
- Weitek XL-8220 RISC processor

- 10,000 pages per month
- Optional 2nd paper drawer

- SCSI port
- AppleTalk RS-422, parallel, RS-232C

- 35

NewGen 660B

\$4,059

Lease: \$111/month

The only 11x17 printer with Adobe PostScript Level 2 for less than \$3500.



- Choice of 300 or 400 dpi
- 15 ppm (letter size); 8 ppm (tabloid size)
- 4 Mb RAM (expandable to 16 Mb)

- Adobe PostScript Level 2
- Weitek RISC processor (and ATM font rendering technology)

- 30,000 pages per month
- Two paper trays included (one tray for letter size; one tray for tabloid size.)

- SCSI port
- Three interface ports: Appletalk RS-422, IBM PC parallel, and RS-232C.

- 35

Jeanne is thrilled that she can print proofs of her company newsletter on tabloid-size paper. No more tiling!

★★★★ MACWORLD MAGAZINE September 1992

"...be forewarned: PostScript-clone printers still have a long way to go before they can rival true Adobe PostScript printers."

Quote from MacUser September 1992 issue, "Personal PostScript Printers" by Bruce Fraser.

RealTech™
RealTech
Laser 400

\$3,195

Lease: \$88/mo

QMS 860 Hammerhead™

\$4,279

Lease: \$117/mo

- 600 dpi
- 8 ppm (letter size); 4.6 ppm (tabloid size)
- 12 Mb RAM (expandable to 32)

- Adobe PostScript compatible
- Intel 80960CA RISC processor

- 10,000 pages per month
- Optional 2nd paper cassette

- SCSI port
- Optional Ethernet
- 39 fonts

Three interface ports: Appletalk RS-422, IBM PC parallel, and RS-232C.



1-800-364-WORLD

TOLL-FREE
TECH SUPPORT:

1-800-364-MACS

Customized solutions.



We can help you solve the equation of price, quality, and affordability.



\$2,859
Lease: \$78/month

PowerBook Duo 230 8/80
8 Mb of RAM, 80 Mb hard drive 33 MHz 68030 microprocessor, FPU.

\$4,639
Lease: \$127/month

Macintosh IIvx Business Solution
Macintosh IIvx, 5 Mb of RAM, 230 Mb hard drive, SuperMac 21" Platinum monitor w/video card, cache card, and Key Tronic MacPro Plus extended keyboard.

\$6,399
Lease: \$175/month

Quadra 700/Trinitron Intermediate Graphics Solution
Quadra 700, 8 Mb of RAM, 520 Mb hard drive, RealTech 20" Trinitron monitor w/PaintBoard Li and Key Tronic MacPro Plus extended keyboard.

\$8,819
Lease: \$241/month

Quadra 950/Trinitron High-end Graphics Solution
Quadra 950, 8 Mb of RAM, 520 Mb hard drive, RasterOps 20" Trinitron monitor w/RasterOps PaintBoard Li and Key Tronic MacPro Plus extended keyboard.

Your choice of
CPU & HARD DRIVE
+
your choice of
MONITOR
+
your choice of
PERIPHERALS
+
OUR GREAT VALUES
+
OUR GREAT SERVICE
=
100% SATISFACTION

Talk to one of our friendly systems consultants. They'll help you figure out the right solution for your business. We can configure any combination of CPU and hard drive with the monitor and peripherals of your choice (even if you don't see it in this ad). That's why we've come to be known as your

**ONE-STOP SOURCE
FOR CUSTOM
SOLUTIONS**

POWERBOOK SYSTEMS

PowerBook Duo 210 8/80.....	\$2499
PowerBook Duo 230 8/80.....	2859
PowerBook 160 8/40.....	2679
PowerBook 165c 4/80.....	3399
PowerBook 180 8/80.....	4359

POWERBOOK PORTABLE DOCKS

PowerLink Presenter (8-bit)	\$469
Designed for presentations. Connects the PB Duo to almost any type of video screen. The ideal travel dock.	
PowerLink DeskNet (8-bit)	659
Connects to Ethernet networks, color displays, external SCSI devices, etc.	



QUADRA 800 SYSTEM

Quadra 800, 8 Mb of RAM, 230 Mb hard drive, 20" Real Tech Trinitron monitor, RasterOps Paintboard Li, and MacPro Plus extended keyboard	\$6979
---	--------

CENTRIS 610 SYSTEM

Centris 610, 4 Mb of RAM, 80 Mb hard drive, Seiko Instruments 14" Color CM1445 monitor, and MacPro Plus extended keyboard	\$2415
---	--------

CENTRIS 650 SYSTEMS

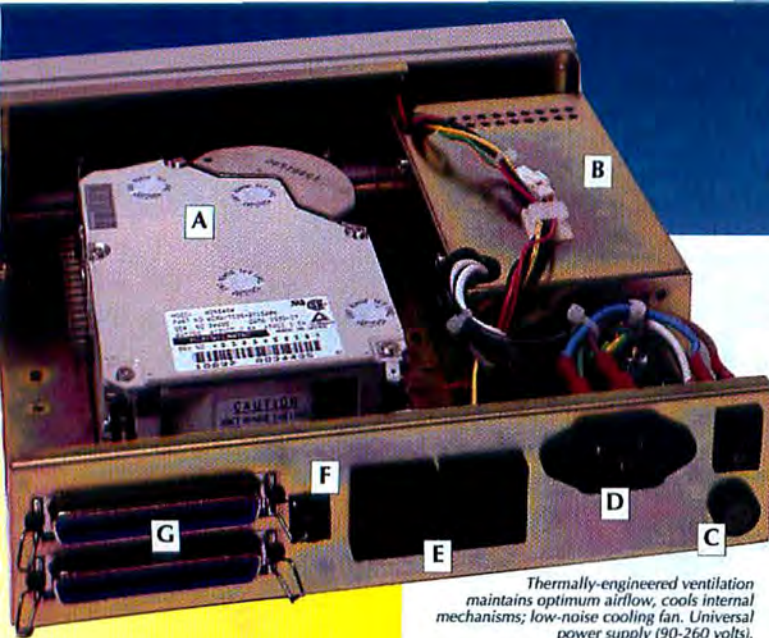
Centris 650, 8 Mb of RAM, 80 Mb hard drive, Sony 17" Color monitor, and MacPro Plus extended keyboard	\$4075
Centris 650, 8 Mb of RAM, 230 Mb hard drive, 20" Real Tech Trinitron monitor, RasterOps Paintboard Li, and MacPro Plus extended keyboard	\$5695

Toll-free ordering in the U.S. and Canada, too!
Hours: 8 am-7 pm Central Standard Time

30-DAY MONEY-BACK GUARANTEE on all hardware (except printer consumables and special-order items). Before returning merchandise, we must ask that you call our Customer Service Dept. toll-free to receive a returned merchandise authorization number (RMA). This number must be included with any products you return. No C.O.D. returns, please. Thank you for your cooperation. ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

HARDWARE THAT FITS

HARD DRIVES



Thermally-engineered ventilation maintains optimum airflow, cools internal mechanisms; low-noise cooling fan. Universal power supply (90-260 volts).

Why our drives are superior

- Fast access times
 - top-level warranties
 - optimum MTBF
 - and...
- A. We use the highest quality name-brand mechanisms available; fully tested and burned in.
- B. Shielded 40 watt power supply (65 watt for FH drives) keeps the drive free of interference, your data free of corruption.
- C. External fuse keeps fuse replacement simple.
- D. Power cable plug-in.
- E. Two switched outlets provide power to additional peripherals, allowing one-step system power-up.
- F. Easy-to-use pushbutton SCSI I.D. selector switch.
- G. Two 50-pin SCSI terminators for simple configuration.
- (Not shown) Premium double-shielded 26-inch Mac-to-SCSI cable prevents electronic interference.

CONNER

FUJITSU

hp HEWLETT PACKARD

MAXOPTIX

Maxtor®

MICROPOLIS

Quantum

Seagate

TOSHIBA

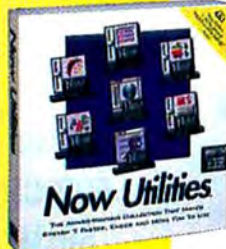
YOU'VE BEEN BUYING FROM US SINCE 1985.

To a lot of you, we've become a trusted business partner. So when you told us we needed to offer you more storage options, we listened. Our systems engineers have worked tirelessly to design the best possible enclosure with name-brand mechanisms. **The result? These drives are the value you've been looking for—priced right, and built with the quality your irreplaceable data demands.**

During the past eight years, we've become America's one-stop source for Macintosh solutions. Now we can be your one-stop source for storage solutions, too. Because we're the company you can trust to give you the very best...

- **QUALITY**
- **SERVICE**
- **VALUE**

Stack up our drives against the "best of the best" and they'll come out on top. You can trust us to always bring you the highest-quality Mac hardware!



Limited time offer!

Included **FREE** with your drive...award-winning **NOW Utilities (Version 4.0.1)**.

Includes 7 powerful utilities: Startup Manager, Super Boomerang, WSIWG Menus, Now Profile, and much more. Use NOW to maximize System 7's capabilities, and to simplify using your Mac.



SCSI-2 CARD

Allows all Macs to communicate with newer, high-performance hard drives at substantially faster transfer rates. Sustained transfer rate of up to 4.4 Mb per second, plus a burst transfer rate of 6 Mb per second (6/10 on a Quadra). Mirroring capabilities.

SCSI-2 Card.....\$299

Need a really big drive, with a LOT of storage capacity? These drives offer big performance.

	Model number	Price (Internal)	Price (External)	Formatted Mac capacity	Avg. access time	Transfer rate*	MTBF** (hours)	Form factor	Warranty (years)
1.1 - 3.6 Gb									
Fujitsu 1.2	M2266	\$1395	\$1495	1079 Mb	14.5 ms	3.0 ¹	200,000	5.25 FH	5
HP 1.2	C2247	1589	1659	1000 Mb	10.5 ms	5.25 ¹	300,000	3.5 HH	5
Micropolis 1.2	2112	1729	1799	1005 Mb	10 ms	5.0 ¹	300,000	3.5 HH	5
Quantum 1.2	PRO1225	1599	1669	1200 Mb	10 ms	2.9 ¹	350,000	3.5 HH	2
Seagate 1.2	ST41200N	1369	1469	999 Mb	15 ms	3.0 ¹	150,000	5.25 FH	1
Toshiba 1.2	MK-538FB	1399	1469	1200 Mb	12.5 ms	4.0 ¹	200,000	3.5 HH	5
Maxtor 1.24	LXT-1240	1999	2069	1240 Mb	9 ms	4.5 ¹	300,000	3.5 HH	3
Conner 1.3	CP31370	\$2099	\$2199	1030 Mb	10.5 ms	6.0 ¹	250,000	3.5 HH	1
Micropolis 1.5	M152B	2299	2399	1341 Mb	14.5 ms	2.9 ¹	150,000	5.25 FH	5
Micropolis 1.6	M154B	2379	2479	1748 Mb	14 ms	4.75 ¹	150,000	5.25 FH	5
Seagate 1.6	ST41651N	1899	1999	1352 Mb	15 ms	4.0 ²	150,000	5.25 FH	1
Fujitsu 2.0	M2252	\$2449	\$2549	1752 Mb	11 ms	4.75 ²	200,000	5.25 FH	5
Micropolis 2.0	M1924	2649	2749	2100 Mb	11.5 ms	4.76 ²	250,000	5.25 FH	5
Seagate 2.1	ST42100N	1999	2099	1900 Mb	12.9 ms	3.9 ²	300,000	5.25 FH	1
Seagate 2.4	ST42400N	2879	2979	2050 Mb	11 ms	4.5 ²	300,000	5.25 FH	5
HP 2.4	C3010	2899	2999	2000 Mb	11.5 ms	5.25 ²	300,000	5.25 FH	5
Seagate 3.4	ST43400N	3999	4099	2750 Mb	11 ms	6.0 ²	300,000	5.25 FH	5
Micropolis 3.6	M1936	4299	4399	3022 Mb	12 ms	6.0 ²	250,000	5.25 FH	5

* Transfer rate (or throughput) depends on your Mac CPU and system configuration. For more information, ask your Hardware That Fits sales partner. **MTBF=Mean Time Between Failure FH=Half Height FH=Full Height

¹ SCSI-2 ² SCSI-2 Fast These drives are most efficient when used with a Macintosh Quadra 800, 950 or a RealTech SCSI-2 card.

1-800-364-WORLD

TOLL-FREE
TECH SUPPORT:

1-800-364-MACS

from HARDWARE THAT FITS



REMOVABLES*

REALTECH® FLOPTICAL®
21 Mb Drive (includes 1 disk) ...\$339
Drive w/Diskette 5-pack\$399

REALTECH MAGNETO-OPTICAL
128 Mb Drive (includes 1 disk) \$1069
Drive w/Diskette 5-pack\$1229

Maxopic Tahiti 11m Drive
(652/1.0 Gb capacity; 35 ms access time; 1 yr. warranty)\$3269

REALTECH TAPE BACKUP
Includes Retrospect 2.0 backup software.
TEAC 155 Mb Drive.....\$499
TEAC 600 Mb Drive.....\$749

REALTECH DAT
DDS-DC Drive (2-5 Gb capacity; 1 yr. warranty; includes Retrospect 2.0 backup software)\$1399
The RealTech DAT Drive uses industry-standard DDS-DC compression on a 90-meter tape. Depending on your data, storage capacities may vary from 4 to 8 Gb.

SYQUEST®
44 Mb Drive.....\$389
88c Mb Drive.....\$99

BERNOULLI®
90 Mb Drive.....\$Call
150 Mb Drive.....\$859

* Includes one disk or tape

REMOVABLE MEDIA

21 Mb Floptical Diskette.....\$22
5-pack of Floptical Diskettes.....\$95
128 Mb Optical Diskette.....\$49
5-pack of Optical Diskettes.....\$209
652 Mb M-O Cartridge.....\$99
1.0 Gb ZCAV M-O Cartridge.....\$239
155 Mb TEAC Tape.....\$19
600 Mb TEAC Tape.....\$28
60-meter DAT Tape.....\$13
90-meter DAT Tape.....\$16
44 Mb Syquest Cartridge.....\$63
88 Mb Syquest Cartridge.....\$97
90 Mb Bernoulli Cartridge.....\$Call
150 Mb Bernoulli Cartridge.....\$Call

DRIVE SOFTWARE

REALTECH DRIVE UTILITIES
Included with your drive, for efficient operation. Disk partitioning; password protection; diagnostic testing; multiple SCSI-bus support; extensive on-line help; and more. System 7.01.

Do you need a fixed hard drive, or the flexibility of a floptical? Call us; we can explain your options.

		Model number	Price (Internal)	Price (External)	Formatted Mac capacity	Avg. access time	Transfer rate*	MTBF** (hours)	Form factor	Warranty (years)
40 - 120 Mb										
Quantum 42 ELS	ELS42		\$189	\$259	40 Mb	19 ms	1.4	250,000	3.5 LP	2
Conner 85	CP-30080E		225	295	82 Mb	17 ms	1.5	150,000	3.5 LP	1
Quantum 85 ELS	ELS85		219	289	82 Mb	17 ms	1.4	250,000	3.5 LP	2
Conner 120	CP-30100		279	349	116 Mb	19 ms	1.5	150,000	3.5 LP	1
Maxtor 120	7120XT		269	339	121 Mb	15 ms	1.5	150,000	3.5 LP	2
120 - 250 Mb										
Quantum 127	ELS127		\$289	\$359	124 Mb	17 ms	1.4	250,000	3.5 LP	2
Conner 170	CP-30170E		299	369	160 Mb	9 ms	1.5	150,000	3.5 LP	1
Quantum 170 ELS	ELS170		319	389	160 Mb	17 ms	1.4	250,000	3.5 LP	2
Conner 212	CP-30200		379	449	206 Mb	12 ms	2.5 ¹	150,000	3.5 LP	1
Maxtor 213	7213		379	449	202 Mb	15 ms	2.8	150,000	3.5 LP	2
Quantum 240	LPS240		419	489	234 Mb	10 ms	1.4	250,000	3.5 LP	2
Maxtor 245	7245		429	499	245.6 Mb	15 ms	3.0	150,000	3.5 LP	2
Seagate 248	ST3283N		519	589	235 Mb	12 ms	3.0 ¹	250,000	3.5 LP	1
320 - 570 Mb										
Maxtor 340	LXT-340		\$649	\$719	324 Mb	15 ms	2.1 ²	150,000	3.5 HH	2
Fujitsu 425	M2623FA		899	969	405 Mb	9 ms	2.7 ¹	200,000	3.5 HH	5
Seagate 426	ST1480N		919	989	426 Mb	14 ms	2.6 ¹	150,000	3.5 HH	1
Fujitsu 520	M2624FA		939	1009	496 Mb	9 ms	2.7 ¹	200,000	3.5 HH	5
Quantum 525 LPS	LPS525		989	1059	500 Mb	10 ms	3.2 ¹	250,000	3.5 LP	2
Seagate 525	ST1581N		1029	1099	525 Mb	14 ms	4.0 ¹	150,000	3.5 HH	1
Maxtor 540	MXT-540		999	1069	546 Mb	9 ms	5.5 ²	300,000	3.5 HH	2
Conner 540	CP-3540		979	1049	515 Mb	12 ms	5.5 ²	150,000	3.5 HH	1
Micropolis 560	2105S		1129	1199	560 Mb	10 ms	5.0 ²	300,000	3.5 HH	5
660 Mb - 1.05 Gb										
Seagate 663	ST4766N		\$1119	\$1219	645 Mb	15.5 ms	1.8	150,000	5.25 FH	1
Seagate 676	ST4767N		1519	1619	645 Mb	11.9 ms	3.0 ¹	150,000	5.25 FH	1
HP 677	97556		1469	1569	620 Mb	13.5 ms	2.8 ¹	150,000	5.25 FH	5
Quantum 700	PRO700		1249	1319	700 Mb	10 ms	2.9 ¹	350,000	3.5 HH	2
Toshiba 877	MK-438FB		1099	1169	830 Mb	12.5 ms	3.0 ²	200,000	3.5 HH	2
Quantum 1050	PRO1050		1419	1489	1000 Mb	10 ms	2.9 ¹	350,000	3.5 HH	2
HP 1050	97558		2099	2169	987 Mb	13.5 ms	2.8 ¹	150,000	5.25 FH	5
Seagate 1050	ST11200N		1649	1719	1000 Mb	10.5 ms	5.1 ¹	200,000	3.5 HH	1

* Transfer rate (or throughput) depends on your Mac CPU and system configuration. For more information, ask your Hardware That Fits sales partner. **MTBF=Mean Time Between Failure LP=Low Profile HH=Half Height FH=Full Height

¹ SCSI-2 ² SCSI-2 Fast These drives are most efficient when used with a Macintosh Quadra 800, 950 or a RealTech SCSI-2 card.

150 Mb Bernoulli Cartridge Drive



Toll-free phone ordering
(or fax 24 hours a day)

FAX:
1-409-539-4141

Toll-free ordering in the U.S. and Canada, too!
Hours: 8 am - 7 pm Central Standard Time

30-DAY MONEY-BACK GUARANTEE on all hardware (except leases, printer consumables and special-order items). Before returning merchandise, we must ask that you call our Customer Service Dept. toll-free to receive a returned merchandise authorization number (RMA). This number must be included with any products you return. No C.O.D. returns, please. Thank you for your cooperation. ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

Circle 321 on reader service card

Great Prices. Priceless Support!

Drive Home a Bargain APS Quantum 85 ELS, \$199



External
Q 85 ELS
\$269

APS'S NEW QUANTUM ELS-85 drives deliver a long, trouble-free life with power requirements compatible with internal installation in Mac Classics, LCs and si models as well as most

other Macs. The APS Quantum ELS-85 delivers the best price/performance ratio available in low to medium capacity drives. Get Quantum's two-year warranty and APS's legendary service and support.

Quantum <small>MW EDITOR'S CHOICE</small>		
MB	INTL	EXTL
240	\$459	\$539
525	959	1029
1225	1499	1569
ELS Low Profile Drives <small>MW EDITOR'S CHOICE</small>		
42	\$159	\$219
85	199	269
127	299	369
170	339	399

Fujitsu <small>MW EDITOR'S CHOICE</small>		
MB	INTL	EXTL
520	\$949	\$1049
1.2G 5.25	1399	1499
1.2G 3.5	1799	1899
2.0G	2299	2399

Micropolis		
MB	INTL	EXTL
560	\$1299	\$1369
1.2G	1699	1799
2.0G	2699	2799
Includes Micropolis 5-Year Warranty		

Toshiba		
1.2G	\$1399	\$1499
213	699	829†
†Battery-Powered portable case for PowerBooks		

Maxtor		
120	\$229	\$309
213	349	409
340	599	669
540	1099	1199
1.2G	1499	1599
1.7G	1799	1899

APS PowerBook Companion Cases <small>MW EDITOR'S CHOICE</small>		
The Perfect Home for Your Original PowerBook Drive		
AC only		\$79
AC/DC (Battery-Powered)		169

Quantum <small>MW EDITOR'S CHOICE</small>		
PowerBook Go•Drives		
MB	INTL	EXTL
80GRS	\$349	\$499†
120	399	529†
160GRS	599	729†
†Battery-Powered portable case for PowerBooks		

APS SCSI Boy \$29	
 <p>The Ultimate PowerBook Necessity Rugged Palm-Sized 25-30 PowerBook SCSI Adapter Never Get Caught with the Wrong Cable Again!</p>	

APS Technologies

TEAC I55: Your choice for personal tape back up

MW
EDITORS'
CHOICE



External
TEAC I55
\$499

MACWORLD HAS SELECTED this TEAC I55 tape unit as its Editors' Choice in the personal back up category. With a back-up rate of 4.5MB per minute, this compact tape unit backs up 145MB per

60-meter cassette. Each unit includes Retrospect by Dantz, one 60m tape and a premium SCSI cable. With TEAC's one-year warranty and APS's legendary service and support, what more could you ask?

30-Day
Money-Back
Guarantee

Unlimited
Toll-free
Technical
Support

SyQuest

Model	INTL	EXTL
SQ555 44MB	\$349	\$389
SQ5110 88MB	469	489
SQ5110c44/88MB	569	599

New! The SyQuest 5110c reads and writes 44 and 88MB cartridges!



New!

DAT

Model	INTL	EXTL
APSTurboDAT	\$1699	\$1799
APSDAT	1149	1249

All APS Tape
Drives Include
Retrospect
by Dantz



TEAC

155MB Tape Back-up	\$499
600MB Tape Back-up	799

Epson MO

Model	INTL	EXTL
128MB	\$1099	\$1199

128MB Magneto Optical Drive

MacWorld Best Buys

PowerBook Modem \$69
APSModem, 2400 baud data, 9600 baud fax send, 4800
baud fax receive, installation instructions—compatible
with PowerBook 100 through 180

Quantum 42MB \$159/219
40.1MB formatted capacity, 1MB/sec. transfer rate,
two-year warranty, \$1.97 per MB

Maxtor 120MB \$229/309
121.2MB formatted capacity, 1MB/sec. transfer rate,
two-year warranty, \$1.89 per MB

Maxtor 213MB \$349/409
202.8MB formatted capacity, 1.3MB/sec. transfer rate,
two-year warranty, \$1.72 per MB

Maxtor 340MB \$599/669
324.7MB formatted capacity, 1.7MB/sec. transfer rate,
two-year warranty, \$1.84 per MB

SyQuest 44MB \$349/389
42MB formatted capacity, 0.6 MB/sec. transfer rate,
two-year mechanism warranty, one-year cart warranty

Disk-For-Disk
Replacement
Warranty

24-Hour
BBS with
Our Latest
Software

Bright,
Knowledgeable
Sales
Associates

30-day money-back guarantee • All drive products carry a 10-day money-back guarantee. Your risk in the transaction is the cost of shipping.
• Disk-for-disk replacement warranty • SyQuest, Quantum, Maxtor and DAT drives are warranted for two years. Maxtor 12, 117MB and Fujitsu drives are warranted for five years. WREN, Quantum 127 drives, TEAC drives, all CD-ROMs, MOs and SyQuest carts are warranted for one year. Toshiba 810 is warranted for three years.
• Prices and specifications subject to change without notice. Refund orders subject to rescheduling.

• All hard drives include brackets, cables, cords and LEDs required for operation with the specified Macintosh. All hard drives come preformatted with Apple's latest software. All perform System software: at least 9.2MB of unformatted publicly-distributable software and APS Technologies' ALLIANCE POWER TOXAS SCSI format hard disk partitioner.
• Toll-free technical support as often or for as long as you need. Regular hours are 8am to 8pm Monday thru Friday. 10am to 4pm Saturday, Central Time.

M-F 7AM-9PM CST. SAT 10AM-4PM CST.
Visa/Master Card, Discover, American Express: No Surcharge
APS Technologies, 2900 S. 29th Hwy., Independence, MO 64057
International: 1-816-478-8300. FAX: 1-816-478-4596 (24 Hours).
Toll Free UK: 0800-897-545. Australia: 0014-800-125-875.

1-800 235-2752

Circle 31 on reader service card

APS
TECHNOLOGIES

**#1 IN
SERVICE**

MACCENTER[®]

The Center Of The Macintosh Universe[™]

PRINTERS

**TEXAS
INSTRUMENTS**

NEW! \$899!
microWriter

- 300 dpi
- 5 ppm
- PostScript
- 2MB upgrade-able to 4MB
- 250 sheet input tray
- AppleTalk included
- Mac or PC compatible



microlaser Plus PS17 \$1199
microlaser Plus PS35 \$1329
microlaser Turbo \$1499

NEC

MacUser
★★★★



\$1129*

Silentwriter Model 95f \$1129
Silentwriter Model 95fx \$1599
* with \$250 End User Rebate

SIMMs

4 Meg 80ns **\$114**
(with trade in)
1 Meg 80ns **\$32**
2 Meg 80ns **\$59**
6 Meg PowerBook Memory **\$199**
LIFETIME WARRANTY

HARD DRIVES

MICROPOLIS[®] Drives

648 Meg 3.5" 10 ms	\$1299	\$1399
1.21 Gig 3.5" 10 ms	\$1699	\$1799
1.60 Gig 11.5 ms	\$2399	\$2499
2.00 Gig 14 ms	\$2299	\$2399
2.44 Gig 11.5 ms	\$2699	\$2799

TOSHIBA Drives

1.4 Gig 3.5" 12.5 ms	\$1399	\$1499
----------------------	--------	--------

FUJITSU Drives

520 Meg 3.5" 9.0 ms	\$949	\$1049
1.10 Gig 3.5" 8.5 ms	\$1799	\$1899
2.00 Gig 11.5 ms	\$2249	\$2349
2.40 Gig 11.5 ms	\$2499	\$2599

TOSHIBA CD-ROM Drive

Fastest CD ROM Available!
195ms access time **\$649**

SYQUEST DRIVES

**Eagle[™]
SyQuest**



Eagle 44	\$399	Buy an Eagle 44 and get 2 44MB cartridges for \$89! Buy an Eagle 88 or 88C and get 2 88MB cartridges for only \$139!
Eagle 88	\$499	
Eagle 88C	\$599	
44 Meg Cartridge	\$65	
88 Meg Cartridge	\$99	



FWD Hard Disk Toolkit PE
included with all drives



OPTICAL DRIVES

**256 MB
3.5"
Optical**



PUMA[™]
captured, but not tame[™]

Puma 256 MB 3.5" Drive \$1799
Puma 128 MB 3.5" Drive \$999
128/256 Meg 3.5" Cartridge \$59/199
Puma 256 reads & writes ISO/ANSI standard 128 MB cartridges and a true, non-compressed 256 MB format.

MACCENTER[®]

4930 South Congress, Suite 303
Austin, Texas 78745



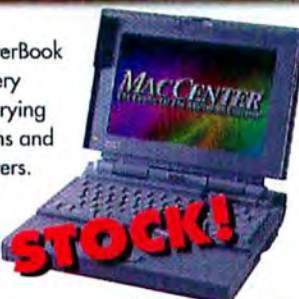
800 950 0950

International Orders:
512-445-5114

FAX 512-444-3726

MAC SYSTEMS

We Stock PowerBook
Batteries, Battery
Chargers, Carrying
Cases, Modems and
Display Adapters.



IN STOCK!

PowerBook 160 4.40 \$2299

PowerBook 180 4.80, 4.120 Call!
PowerBook 160, 165c, 210, 230 Call!
Quadra 800 Call!
Quadra 950 Call!

Accessories

PowerBook 140-180 Batteries (3 hr) \$69.95
Apple PowerCase II \$79.95
Full Cycle Battery Charger \$129

We also stock Ilvix, Centris
and ALL Quadra models.

International

United Kingdom 0800-89-5074 France 05-90-1430
Germany 0130-81-4748 Mexico 95-800-292-702980

DON'T SEE WHAT YOU WANT? CALL US, IT'S IN STOCK!

BREAK THE BOUNDARIES.

DGR 256REM - 1993 MacUser Bottom Line Picks

DGR 128REM - 1992 MacUser Bottom Line Picks

SETTING THE STANDARD FOR EXCELLENCE

**MacUser
LABS**
Bottom Line Pick

► **128REM Turbo Epson**

768 Kb/s Transfer Rate
34 ms Average Seek Time
< 1 ms Short Seek Time

► **256REM MOST**

1.23 Mb/s Transfer Rate
35 ms Average Seek Time
12 ms Short Seek Time
"The DGR 256REM was not only the fastest drive we tested, but it can also store 256 megabytes of data on a single cartridge - and it is able to read from and write to 128-megabyte cartridges."
MacUser Labs, April 1993



► **Ready to Use**

All DGR optical drives come complete with a cartridge, cabling and driver software

► **Customer Support**

30-day Money-back Guarantee
One-year Warranty
Toll-Free Technical Support



In July 1992, MacUser Labs tested every optical drive on the market, and chose the DGR 128REM as MacUser Bottom Line Pick.

They were so impressed, in fact, that in 1993 they made DGR Technologies the standard of excellence by which all other drives were judged.

The result? Only more applause for DGR Technologies, the critical award winner year after year. And, more applause for optical technology, offering "virtually unlimited storage capacity." Without compromise. Because optical storage technology means the ultimate in high-capacity performance and reliability.

Just ask the critics.

Call DGR Technologies, and break the boundaries.

800-235-9748

128REM TURBO
\$1199

256REM
\$1799

DGR CARTRIDGE
128MB 256MB
\$59 \$99



DGR
Technologies

Our lot has great selection

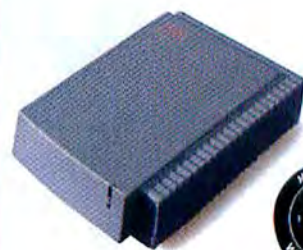


Internal, ZFP™, ZFP+™, Cirrus™ & Tsunami™ Drives

Our hard drives features a wide selection of capacities and quality brand-name mechanisms—all at very affordable prices. All drives have switchable active termination, efficient, quiet fans and universal power supplies.*

	Closeout!		Closeout!	
Quantum	Internal	ZFP	Cirrus	Tsunami
40MB (3 1/2")	\$179	\$239	\$289	\$339
85MB (3 1/2")	\$209	\$269	\$319	\$369
120MB (3 1/2")	\$349	\$409	\$459	\$509
127MB (3 1/2")	\$279	\$339	\$389	\$439
170MB (3 1/2")	\$309	\$369	\$419	\$469
240MB (3 1/2")	\$419	\$479	\$529	\$579
525MB (3 1/2")	\$939	\$999	\$1049	\$1099
700MB (3 1/2")	\$1199	\$1259	\$1309	\$1359
1.05GB (3 1/2")	\$1339	\$1399	\$1449	\$1499
1.2GB (3 1/2")	\$1589	\$1649	\$1699	\$1749
80MB (2 1/2") for Powerbook	\$299	See PocketDrive		
120MB (2 1/2") for Powerbook	\$449	See PocketDrive		
160MB (2 1/2") for Powerbook	\$549	See PocketDrive		

Seagate	Internal	ZFP+	HP	Internal	ZFP+
1.6GB (5 1/4")	\$2299	\$2449	1.6GB (5 1/4")	\$2459	\$2609
2.1GB (5 1/4")	\$2949	\$3099			
2.4GB (5 1/4")	\$3299	\$3449			



PocketDrive™

Pack it in your pocket, purse or briefcase. PocketDrives offer convenient desktop connection at a great price.

40MB (2 1/2") incl. T-connector	\$299
80MB (2 1/2") incl. T-connector	\$499
120MB (2 1/2") incl. T-connector	\$599
160MB (2 1/2") incl. T-connector	\$729



Optional PocketDock Cable	\$59
Extra T-Connector	\$59
110V Accessory Kit	\$69

Powerbook Internals

Pack more power in your Powerbook. Comes with brackets and instructions.

80MB Powerbook Internal	\$299
120MB Powerbook Internal	\$449
160MB Powerbook Internal	\$549

Silverlining™

Hailed as one of the most powerful and useful hard disk management software available, Silverlining offers unique features found no where else! Give your hard disk a Silverlining.

Silverlining	\$149
--------------	-------

The drives you love from the company you trust, La Cie, a Quantum company.

and a friendly sales staff.

FREE!
Cleaning Cartridge
\$19.95 value*



Cirrus Optical

Our quiet Cirrus Optical drives offer 128MB removable media storage, compact portability and fast 38ms performance. Includes one free cartridge (\$79 value).

	Internal	External
128MB 3 1/2" Optical Drive with Retrospect	\$1399	\$1499
128MB Optical Disk		\$79

*While supplies last

Cirrus Backup

Our Cirrus backup solutions have the power to handle large backup jobs. Includes Retrospect™ and 1 free tape.

	Internal	External
155MB Tape Drive		\$629
600MB Tape Drive	\$799	\$919
1.3-2.0GB DAT	\$1439	\$1559
4-8GB Comp.DAT	\$1549	\$1649

88C
Now Available!



ZFP Removable

Our 44-88MB removable media drives deliver Syquest technology in a zero footprint case. Includes 1 free cartridge.

44MB Drive	\$599
88MB Drive (88C)	\$719
44MB Cartridge	\$79
88MB Cartridge	\$119

ExpressDrive™

Here's tight security and portability. La Cie Express Drives offer removable drive convenience and Quantum quality.

ExpressDrive Chassis	\$399
50MB Quantum LPS Drive	\$349
100MB Quantum LPS Drive	\$419
120MB Quantum LPS Drive	\$469
240MB Quantum LPS Drive	\$819



Silverscanner II™

One look at the image above should convince you that our next generation Silverscanner can really perform! Superior line art, detailed gray-scale and gorgeous color are the trademarks of this one pass, 24bit, high resolution, feature-packed scanning machine. Just scan it!

La Cie Silverscanner II

with Color It!
and Read-It O.C.R. Pro! **\$1599**

with Photoshop
and Read-It O.C.R. Pro! **\$1999**

with Photoshop, ColorStudio
and Read-It O.C.R. Pro! **\$2099**

La Cie Silverscanner **Closeout!**

with Color It!
and Read-It O.C.R. Pro! **\$999**

with Photoshop
and Read-It O.C.R. Pro! **\$1349**

with Photoshop, ColorStudio
and Read-It O.C.R. Pro! **\$1449**

Test us for real and call now for fast, friendly service!

800-999-1423

International 503-520-9000 Fax 503-520-9100 6 a.m.-6 p.m. PST Mon.-Fri. VISA, MasterCard, C.O.D. and approved purchase orders accepted*



*Call for details on terms, conditions, limited money back guarantee and free offers. System 7.0.1 software included only with certain configurations. ZFP- Drives do not have switchable termination. Prices do not include shipping and only apply to products shipped within the continental United States. Please contact La Cie for international distribution. Add sales tax where applicable. ZFP, ZFP+, Cirrus, Tsunami, PocketDrive, PocketDock, ExpressDrive, Silverscanner, Silverscan, Silverline, La Cie and the La Cie logo are trademarks of La Cie, Ltd., a Quantum Company. All other trademarks are the property of their respective companies. All prices, specifications, terms, descriptions, products and services herein are subject to change without notice or recourse. © Copyright 1992-93 La Cie, Ltd. 6700 SW Creekside Place, Beaverton, OR 97005. Phone: (503) 520-9000, Fax: (503) 520-9100. All rights reserved. Printed in U.S.A.

BEST!
Macworld
Hard Drive
under 80 MB

BEST!
Macworld
Hard Drive
80-200 MB

BEST!
Macworld
Hard Drive
over 200 MB

BEST!
Macworld
Color Scanner
Silverscanner

FCC
Certified!

TOLL-FREE!
Technical
Support

TOLL-FREE!
Customer
Service

FREE!
Silverlining™

Switchable
Termination!

Universal
Power
Supply!

30 Day
Money Back
Guarantee



800-392-5838

TO PLACE AN ORDER

5761 E. LA PALMA AVE, SUITE 182-ANAHEIM, CA-92807
HOURS M-F 6AM-6PM-SAT 9AM-1PM PST



Model	
External SyQuest 44mb (*One Cartridge Inc.)	\$389
External SyQuest 88mb (*One Cartridge Inc.)	\$489
External SyQuest 88mb C** (*One Cartridge Inc.)	\$589
Internal 44mb SyQuest (for Quadra 900&950)	\$349
Internal 88mb SyQuest (for Quadra 900&950)	\$469
Internal 88mb C SyQuest (for Quadra 900&950)	\$559
External SyQuest Dual 44mb (*One Cartridge Inc.)	\$725
External SyQuest Dual 88mb (*One Cartridge Inc.)	\$895
External SyQuest Dual 44/88mb (*One 44 & One 88 Cartridge)	\$895
External SyQuest Dual 88C mb (*One Cartridge Inc.)	\$1075
External SyQuest Dual 44/88C mb (*One 44 & One 88 Cartridge)	\$999
SyQuest 44mb Cartridge/10 Pack	\$63/\$62
SyQuest 88mb Cartridge/5 Pack	\$97/\$480
All SyQuest Drives come with FWB™ HDT Formatting Software. SyQuest carries a TWO year Warranty on Drives and ONE year on Cartridges. *READS AND WRITES 44 AND 88 CARTRIDGES. Does not format 44 cartridges.	

Quantum

"An Apple Authorized Brand"

Unformatted Capacity	Speed	Size	Internal	External
ELS 42mb	19ms	3.5"TH	\$175	\$235
ELS 85mb	17ms	3.5"TH	\$209	\$269
ELS 127mb	17ms	3.5"TH	\$279	\$339
ELS 170mb	17ms	3.5"TH	\$309	\$369
LPS 105mb	10ms	3.5"TH	\$249	\$309
LPS 240mb	10ms	3.5"TH	\$399	\$459
LPS 525mb	10ms	3.5"TH	\$899	\$959
Pro 425mb	9ms	3.5"TH	\$859	\$919
Pro 700mb	10ms	3.5"TH	\$1179	\$1239
Pro 1.0gb	10ms	3.5"HH	\$1349	\$1409
Pro 1.2gb	10ms	3.5"HH	\$1579	\$1639
*GO-80mb	16ms	2.5"PB	\$299	\$399
*GO-120mb	16ms	2.5"PB	\$399	\$499
*GO-160mb	16ms	2.5"PB	\$499	\$599

TWO year Warranty. *ONE year Warranty on GO drives. FWB™ HDT Formatting Software Included.

MICROPOLIS

Unformatted Capacity	Speed	Size	Internal	External
1.0gb	10ms	3.5"HH	\$1635	\$1695
2.0gb	12ms	5.25"FH	\$2695	\$2795

Fast SCSI-2 Drives. FIVE year Warranty.FWB™ HDT Formatting Software Included.

CONNER

"An Apple Authorized Brand"

Unformatted Capacity	Speed	Size	Internal	External
85mb	17ms	3.5"TH	\$209	\$269
120mb	19ms	3.5"TH	\$279	\$339
170mb	13ms	3.5"TH	\$309	\$369
212mb	12ms	3.5"TH	\$415	\$475
540mb	12ms	3.5"HH	\$979	\$1039

TWO year Warranty.

FWB™ HDT Formatting Software Included.

NEC

MultiSync 3FGx - 15" Monitor	\$615
MultiSync 4FG - 15" Monitor	\$735
MultiSync 5FG - 17" Monitor	\$1305
MultiSync 6FG - 21" Monitor	\$2355
FG8x 8-bit board	\$645
FG24x 24-bit board	\$1205
FG24xp 24-bit board	\$495
CD-ROM CDR-37	\$425
CD-ROM CDR-74	\$625
SilentWriter 95F Printer	\$1385
SilentWriter 95FX Printer	\$1855
SilentWriter 97F Printer	\$1755
SilentWriter 97FX Printer	\$2199
ColorMate PS-40 Color Printer	\$4399



NEC MultiSync 4FG Monitor
• 15" Multi-Frequency Color Monitor
• AccuColor Control System
• Up to 1024x768 resolution



August 1992

\$735



NEC SilentWriter Model 95F Laser Printer
• PostScript Level 2
• Envelope feeder and cassette included
• 3-year on-site warranty (Limited time offer)



September 1992

\$1385

WE HAVE THE MOST COMPETITIVE PRICING!

CHECK US OUT!

MACINTOSH SIMMS

1x8/2x8/4x8/16x8@80ns	\$32/\$62/\$125/\$525
Quadra 700/950	
4x8/16x8	\$125/\$525
Powerbook 140/170	
4mb/6mb/8mb	\$179/\$255/\$355
Powerbook 160/180	
4mb/6mb/8mb/10mb	\$225/\$295/\$395/\$445
Duo 210/230	
4mb/8mb	\$299/\$499
PC 1x9/4x9	\$39/\$139
NEW MACINTOSH SIMMS	\$CALL

MAGNETO OPTICAL DRIVES

TEAC

Model	Speed	Size	External
128mb	45ms	3.5"HH	\$989
128mb cartridges (Tosoh)			\$29

IIICOH

Model	Speed	Size	External
650mb	28ms	5.25"FH	\$2375
128mb	45ms	3.5"HH	\$1075
128mb/650mb Cartridge			\$29/95

Maxtor

Model	Speed	Size	External
Tahiti II	35ms	1.0gb	\$3195
1.0gb Optical Glass Cartridge			\$225
All MO drives come with FWB HDT software, ONE MO cartridge and have a ONE year Warranty.			

TAPE BACK-UP DRIVES

ARDAT

Model	External
2.0gb	\$1185
4.0gb - 8.0gb HC	\$1385
4.0gb - 8.0gb HC Turbo	\$1485
90m / 60m Tape	\$19/\$16

TEAC

Model	External
600mb Tape Backup Drive	\$685
150mb Tape Backup Drive	\$485
600mb / 150mb Tape Cassette	\$25/\$20
All tape backup drives come bundled with FREE Retrospect V.1.3, one tape and have a ONE year Warranty.	



International inquiries welcomed. Foreign Languages Spoken. C.O.D., Cashiers, Company & Personal Checks accepted upon credit approval. Fortune 500, Educational and Govt. PO's Welcomed All returns require an RMA number and are subject to restocking fee. MPC doesn't guarantee product compatibility. Prices, Terms and Availability subject to change without notice. Product names in this advertisement are TM or © of their respective companies.

TOSHIBA

Unformatted Capacity	Speed	Size	Internal	Ext.
830mb	12.5ms	3.5"HH	\$1039	\$1099
1.2gb	12.5ms	3.5"HH	\$1439	\$1499
213mb NEW!	12ms	2.5"PB	\$669	\$769
CD-ROM				
600mb NEW!	200ms	3.5"HH	\$585	\$635
Toshiba carries a THREE year Warranty on drives. ONE year Warranty on CD Rom. FWB HDT Formatting Software included.				

FUJITSU

Unformatted Capacity	Speed	Size	Internal	External
425mb	9ms	3.5"HH	\$849	\$909
520mb	9ms	3.5"HH	\$899	\$959
1.2gb NEW!	9ms	3.5"HH	\$1699	\$1759
1.2gb	15ms	5.25"FH	\$1399	\$1499
2.0gb	15ms	5.25"FH	\$2299	\$2399
2.4gb	12ms	5.25"FH	\$2499	\$2599

FIVE year Warranty.

FWB™ HDT Formatting Software Included.

Maxtor

Unformatted Capacity	Speed	Size	Internal	External
120mb	15ms	3.5"TH	\$255	\$315
213mb	15ms	3.5"TH	\$375	\$435
340mb	15ms	3.5"HH	\$625	\$685
535 mb	12ms	3.5"HH	\$955	\$1015
540 mb NEW!	9ms	3.5"HH	\$1055	\$1115
1.2gb NEW!	9ms	3.5"HH	\$1655	\$1715
1.2gb	13ms	5.25"FH	\$1395	\$1495
1.7gb	13ms	5.25"FH	\$1695	\$1795

ONE year Warranty on 3.5" Drives and TWO Years on 5.25" Drives and 120mb/213mb Drives.

FWB™ HDT Formatting Software Included.

MAC SYSTEMS

Classic Color 4/80 NEW!	\$1499
LC III 4/80 - 4/160 NEW!	\$1349/\$1499
IIIX 4/80 - 4/230 - 5/80 w/CD-Rom	\$1799/\$2149/\$2199
Centris 610 4/80 w/Ethernet NEW!	\$1899
Centris 650 4/80 w/Ethernet NEW!	\$3069
Quadra 700 4/0 - 950 8/0	\$2299/\$4949
Quadra 800 8/230 NEW!	\$4249
Apple Adjustable Keyboard NEW!	\$219
Apple 14"/16" Color Monitor	\$529/\$1279
Color One Scanner NEW!	\$1319
StyleWriter II NEW!	\$339
Apple LaserWriter Pro 600/630	\$2099/\$2469
Apple LaserWriter IIF/IIG	\$1819/\$2249

MICROTEK

ScanMaker II w/Adobe Photoshop LE	\$895
ScanMaker IIx w/Adobe Photoshop FV	\$1175

WE ALSO FEATURE THESE FINE BRANDS:



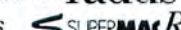
DAYSTAR · GCC

TECHNOLOGIES



radius

TECHNOLOGIES



Robotics

TECHNOLOGIES



Dataproducts

TECHNOLOGIES



TEXAS INSTRUMENTS

TECHNOLOGIES



UMAX

TECHNOLOGIES



ASANTÉ

TECHNOLOGIES



AE

TECHNOLOGIES



HEWLETT-PACKARD

TECHNOLOGIES



WACOM

TECHNOLOGIES



MacLand®

HARD DRIVES

Hard Drives



Quantum

INTERNAL

42MB	(Reg. \$299)	\$189
85MB	(Reg. \$399)	\$219
120MB	(Reg. \$449)	\$289
127MB	(Reg. \$499)	\$289
170MB	(Reg. \$599)	\$329
240MB	(Reg. \$699)	\$429



EXTERNAL

42MB	(Reg. \$399)	\$249
85MB	(Reg. \$499)	\$279
120MB	(Reg. \$549)	\$349
127MB	(Reg. \$599)	\$349
170MB	(Reg. \$699)	\$389
240MB	(Reg. \$799)	\$499

MacLand/Bernoulli 150 MB	\$999	\$799
Cartridges (35, 65, 105, 150 MB)		CALL
MacLand 21 MB Floptical Drive	\$549	\$399

NEW!

Quantum

THREE YEAR WARRANTY!

	INTERNAL	EXTERNAL
525 MB	(Reg. \$1,257) \$949	(Reg. \$1,337) \$1,029
700 MB	(Reg. \$1,589) \$1,199	(Reg. \$1,689) \$1,299
1 GIG	(Reg. \$1,889) \$1,349	(Reg. \$1,989) \$1,449
1.2 GIG	(Reg. \$2,081) \$1,499	(Reg. \$2,181) \$1,599



MacLand carries the **FULL LINE** of FWB quality hard disk drives. Please call for our latest pricing.

All MacLand Drives are pre-tested, pre-formatted, and come complete with FWB's Personal ToolKit (a \$79 Value) and cables. Internal hard drives also include bracket kits to fit your particular Mac.

SyQuest

All MacLand Removable Hard Drives come with our own installation and reference manual, DiskMaster Plus™ formatting utility software, cables, and a two-year warranty. Cartridge not included.

44 Megabyte Hard Drives **\$349**

Cartridges:

10 Pak-ea.

\$60

5 Pak-ea.

\$62

Singles

\$64



88 Megabyte Hard Drives **\$429**

Cartridges:

10 Pak-ea.

\$92

5 Pak-ea.

\$95

Singles

\$97



MacLand 88c Hard Drives **\$499**

This new drive will read and write to both 44 and 88 megabyte cartridges!*

* The 44 megabyte cartridge will need to be pre-formatted by a 44 megabyte drive in order to operate in the 88c drive. MacLand is offering these pre-formatted 44 megabyte cartridges exclusively for **only \$69** per cartridge!

AIRBORNE EXPRESS.

MacAcademy
Video
Training
Tapes

**\$39
each**

Memory

1MB 70ns	\$35
2MB 80ns	\$69

4MB 70ns	\$129
LC/VC II VRAM upgrade	\$65

Quadra VRAM
upgrade **\$49**

Please call for other
upgrades

Circle 40 on reader service card

ATTENTION: BUSINESS, GOVERNMENT,
EDUCATIONAL INST., MILITARY
• Price in your B.O.B. for same day shipment • P.O.'s accepted on
• All shipments are FOB origin • Prices do not
include freight • Excludes items related to established accounts.
• (617) 550-0100 for details and pricing!

1-800-888-8779
24HR. FAX: (602) 345-2217

MacLand®

4685 S. Ash
Tempe, AZ 85282
(602) 820-5802



C.O.D.'s payable with Cashier's Check or
Money Order.
All shipments made by Airborne Express, which is a 12 day service. Call for shipping costs. Products
purchased in store are subject to 20% discounting for all
prices subject to change without notice. All prices
subject to availability.

Removable Hard Drives

Videos

International Mac Specialists • 15502 Mosher Avenue
Tustin, CA 92680 • Int. (714) 259.7636
24 hour FAX (714) 259.7850 AppleLink®: IMS.TUSTIN

ORDERS (800) 643.3591

• Unformatted Capacity • Model		• Form Factor	• (ms)	• Int.	• Ext.
FUJITSU					
425MB	M2623FA	3.5 HH	9	\$839	\$899
520MB	M2624FA	3.5 HH	9	\$945	\$1005
1.1GB	M2694SA	3.5 HH	8.5	\$1695	\$1760
1.2GB	M2266SA	5.25 FH	14.5	\$1395	\$1495
2.0GB	M2652SA	5.25 FH	14.5	\$2395	\$2495
2.4GB	M2654SA	5.25 FH	14.5	\$2595	\$2695
• Five year warranty					
QUANTUM					
42MB	ELS42	3.5 1"	19	\$175	\$235
85MB	ELS85	3.5 1"	17	\$215	\$275
127MB	ELS127	3.5 1"	17	\$289	\$349
170MB	ELS170	3.5 1"	17	\$319	\$379
240MB	LPS240	3.5 1"	10	\$439	\$499
525MB	LPS525	3.5 1"	10	\$939	\$999
700MB	PRO700	3.5 HH	10	\$1195	\$1255
1.0GB	PRO1050	3.5 HH	10	\$1365	\$1425
1.2GB	PRO1225	3.5 HH	10	\$1595	\$1655
80MB	Go•Drive	2.5	17	\$325	\$425
120MB	Go•Drive	2.5	17	\$439	\$539
160MB	Go•Drive	2.5	17	\$519	\$619
• ELS, LPS, PRO drives have two year warranty					
• GO•drives have one year warranty					
SYQUEST					
44MB	IMS 44MB External				\$389
88MB	IMS 88MB External				\$489
2/44	Dual SyQuest 44MB				\$729
2/88	Dual SyQuest 88MB				\$899
• Drives ship with one cartridge					
• Drives have two year warranty					
MAXTOR					
120MB	7120	3.5 1"	15	\$265	\$325
207MB	7213	3.5 1"	15	\$385	\$445
330MB	LXT-340	3.5 HH	15	\$635	\$695
535MB	LXT-535	3.5 HH	12	\$975	\$1035
540MB	MXT540SL	3.5 HH	8.5	\$1122	\$1162
1.2GB	MXT1240S	3.5 HH	8.5	\$1656	\$1716
1.2GB	PO-12S	5.25 FH	13	\$1425	\$1525
1.7GB	P1-17S	5.25 FH	13	\$1725	\$1825
• 3.5" drives have one year warranty					
• 5.25" drives have two year warranty					
SEAGATE					
1.2GB	ST11200N	3.5 HH	10.5	\$1545	\$1605
2.1GB	ST42100N	5.25 FH	12.9	\$1945	\$2045
1.6GB	ST41600N	5.25 FH	11.5	\$1999	\$2099
2.4GB	ST42400N	5.25 FH	11	\$2879	\$2979
3.4GB	ST43400N	5.25 FH	11	\$3929	\$4029
• Drives have one year warranty					
MICROPOLIS					
660MB	1624	5.25 HH	14.5	\$1269	\$1395
1.0GB	2112	3.5 HH	10	\$1689	\$1749
2.0GB	1924	5.25 FH	10	\$2849	\$2949
• Drives have five year warranty					

SIGMA DESIGNS MONITORS

ColorMax 15
for PowerBook 160, 180 and
Duo computers \$799

Power Portrait
for Mac Plus, Classic, Classic
II, SE, SE/30 & PowerBook
computers \$649

• Call for information about other
Sigma Designs products
• Power Portrait™ shown.



EXTERNAL DRIVE HOUSINGS



Full Height \$145

Half Height \$85

• Closed or Open Front Bezel.
• Includes all necessary cabling &
"SCSI Specialist" formatting software.
• 110/220 VAC auto switching power
supply.
• Full Height cabinet will hold two 3.5" or
5.25" HH drives.

DAYSTAR

PowerCache
33MHz \$390
40MHz \$560
50MHz \$740
PowerCache Adapter \$45

FastCache
Turbo 25/128k \$264
Turbo 33/128k \$350
Quadra 700/900 \$254
Quadra 950 \$394
25MHz Turbo 040 \$1119
33MHz Turbo 040 \$1379

UMAX

Color Scanners
UC630 Call
UC840 Call
UC1200S Call
Transparency Adapter Call

WAYCOM

Graphics Tablets
6"x 8" ADB
w/pressure pen \$319
6"x 9" Standard \$479
12"x 12" Standard \$679
12"x 18" Standard \$999

TWINCOM

Modems
24/96 PowerTwin
Int. 2400/data. 9600/
send 4800/receive fax \$129
14.4 PowerTwin
Int. 14.4 data/fax \$299

• Modems ship w/software
and all necessary cabling.
• UMAX scanners ship with
Adobe PhotoShop software.

PSI

Modems
COMstation One \$139
COMstation Two \$239
COMstation Four \$349
COMstation Five \$419
PowerModem I \$129
PowerModem II \$229
PowerModem III \$319
PowerModem IV \$379

POWERBOOK ACCESSORIES

PowerBook Cable
HDI-30 ~ 50 Centronics \$39
Power Pad (keypad) \$89
PowerBook Memory (Call)
PowerBook Battery
for 140/145/160/170/180 \$65
Battery Charger \$99

TOSHIBA
205MB
MK224FB-S
2.5"
HARD DRIVE
... \$699

IMS MEDIA

MO Cartridge 600MB 5.25 \$99
MO Cartridge 128MB 3.5 \$40
• 512 bytes/sector
• ISO standard

SYQUEST

SQ-800 Cartridge 88MB 5.25 \$99
SQ-400 Cartridge 44MB 5.25 \$64
• SyQuest cartridges have one year warranty

EPSON

128MB MO
OMD-5010 3.5 HH
\$999

• 46.3ms average access time
• 38ms average seek time
• MO drives carry
manufacturers warranty

IMS Hard Drives ship with SCSI Specialist formatting software and all necessary cabling. No surcharge for Visa/Mastercard. Prices and product availability subject to change without notice. Not responsible for typographical errors. Apple, the Apple logo, and Macintosh are registered trademarks of Apple Computer, Inc. All brand names and product names are trademarks or registered trademarks of their respective owners.

Billboard Products

Hardware

Computer Systems
LA Computer
818.719.0007276

Monitor
Panelight
800.726.3599276

Peripherals
Aura Systems
800.241.2872276

Peripherals
Axion
800.8.AXION.1277

System Upgrade
MicroMac
714.362.1000277

Software

Accelerators
Digital Eclipse
800.289.3374277

CAD/CAM
Douglas Electronics
510.483.8770278

CD ROM
Metatec
800.637.3472277

Games
Amtex
613.967.7900277

Music
ARS Nova
800.445.4866278

Screen Saver
MIFP
800.697.6437278

Utilities
Casa Blanca Works
415.461.2227279

Utilities
Teletypesetting
617.734.9700278

Services

On-Line Services
Delphi
800.695.4005279

Accessories

Batteries
BTI
800.982.8284279

Printer Refills
DGR Technologies
800.235.9748279

Catalog Products

Hardware

Bar Code280
Computer Systems280
Disk Drives286
Memory Upgrade286
Peripheral Outlet287
Memory Direct288
MAC Xtra289
Monitors290
Peripherals290
Printers291

Software

Astrology291
Bar Code291
BBS292
CAD/CAM292
Clip Art292
Communications292

Cooking293
Custom Development293
Databases294
Educational294
Entertainment294
Fonts294
Genealogy294
Graphics294
Graphics Translators295
HyperCard Stacks295
Languages295
Lottery295
Maps295
Medical295
Music/Midi296
Property Management296
Real Estate296
Religion296
Sales/Marketing296
Scientific296

Shareware296

Services

Computer Insurance297
Computer Repair297
Data Recovery297
Desktop Publishing297
Disk Duplication297
Education297

Employment298
Printer Supplies298
Slides298

Accessories

Cases298
Covers298
Late to Classify299

Macworld Shopper Advertising Sales Staff

Carol Johnstone,	Account Manager, MW Shopper	415.978.3152
Shannon Smith,	Account Manager, MW Shopper	415.974.7414
Niki Stranz,	Account Manager, MW Shopper	415.978.3105

800.888.8622

Peripherals

INSTANTLY ADD A LARGE SCREEN TO YOUR MAC



- Supports widest range of monitors.
- 256 colors, 16 colors, Mono/Grayscale.
- No messy installation.
- Works with almost any MAC including Outbound.
- Rated best SCSI Video Adapter - MacWorld (2/93).

Prices Start at \$395.

CALL TODAY 1-800-241-2872

aura systems • 6150A Yarrow Drive • Carlsbad, CA 92009 • (619) 438-7730 • Fax: (619) 438-7758

CIRCLE 577 ON READER SERVICE CARD

Computer Systems

MAC PROFESSIONAL

One Year Warranty. We only sell brand new products.
19801 Ventura Blvd., Woodland Hills, CA 91364 No tax outside CA. Dealers & international orders welcome.

(818) 719-0007

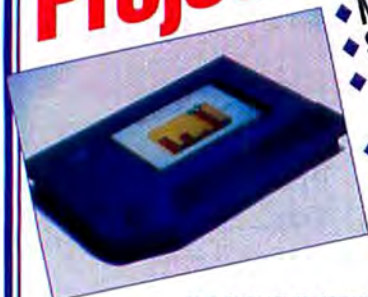
We guarantee
best pricing.

FAX (818) 719-9115

Quadra 950 8 MB	\$4477	Power Book 180 6/60	\$3837	Sony 1320	\$ 377
Quadra 950 16/520	\$5577	Power Book 180 6/120	Call	Sony 1430 Trini	\$ 597
Quadra 800 8/520	\$4277	Power Book 160 All Models	Call	Sony 1604 Trini	\$1017
Quadra 800 8/230	\$3877	Power Book 145 All Models	Call	Apple 14" Trini	\$ 507
MAC II VX 4/80	\$1777	Power Book 210 4/80	\$1977	NEC 4FG 15"	\$ 737
MAC II VX 5/80 W/CD	Call	Power Book 230 4/80	\$2477	NEC 5FG 17"	\$1337
MAC II VX 8/230	\$2077	Duo Dock/Mini	Call	NEC 6FG 21"	\$2377
Centris 610 4/80	\$1677	All Power Book Accessories	Call	E Machine T16 II	\$1297
Centris 650 8/230	\$3147	Style Writer II	\$ 339	Complete Product Line of Radius, SuperMAC, Raster Ops and E Machine are in Stock.	
Centris 650 8/80	\$2877	Apple Color Printer	Call	UMAX UC 630 600 Dpl	\$1087
MAC II SI 17/170	\$1577	Laser Writer Pro 600	\$1947	UMAX UC 840 800 Dpl	\$1337
MAC LC II 4/80	\$ 997	Laser Writer Pro 630	\$2347	UMAX UC 1260 Color	Call
MAC LC III	\$1277	HP Desk Writer 550 Color	\$ 697	Color One Scanner	Call
Color Classic 4/80	\$1377	HP 4M 6 MB Postscript	\$1947		

CIRCLE 580 ON READER SERVICE CARD

Monitors

LCD Projection...
Project Your Mac

- ♦ Mac / PC / Video Projection
- ♦ Stand-alone & Overhead
- ♦ All Major Brands & Accessories
- ♦ Expert Technical Support
- ♦ Money Back Guarantee

Panelight
DISPLAY SYSTEMS, INC.1040 Ferry Building, Box 263
San Francisco, CA 94111Hours: 6:30 to 5:30 PST, 9:30 to 8:30 EST Auth. Distributors for Leading Active & Passive Matrix LCD Projection Panels for
PC/Mac/Hi-Res. & Video / MultiMedia MC/VISA/AMX, Fortune 1000 & Institutional, POs, COO. * With Various Models

BUY-LEASE-RENT

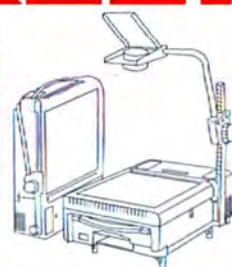
FREE!

Save Big On All Major Brands-Call NOW:

Special Pricing on New Models

1-800-726-3599

IN SAN FRANCISCO CALL: 415-772-5800

OVERHEAD
PROJECTOROrder Now and Receive a \$530
Hi-Brightness LCD-Friendly
Portable Overhead Projector FREE!*

CIRCLE 578 ON READER SERVICE CARD

Direct Response. Direct Results.



"The Macworld Billboard has played a key role in
MacOutlet's success as one of the nation's largest
dealers in graphics technology."

Steve Glovin
President, MacOutlet

MACWORLD
SHOPPER®

Peripherals

If You Have More Than One of These...



You Need...

3 Serial Ports For Your Mac!

Now it's easy to connect up to three serial devices to each Port on your Mac. The AXiON Electronic Switch™ allows up to three serial devices to share a single serial port, on any Mac®, with "point and click" control through the Control Panel or Comm Toolbox compatible driver tools!

- Auto-Switch™ with Comm ToolBox savvy applications...it's automatic!
- Supports LocalTalk on Printer Port
- Easy to install & use
- Use with DUO® Powerbooks to solve the single Port limitation!



AXION

1150 Kifer Rd., Suite 203

Sunnyvale, CA 94086

1-(800)-8-AXION-1 ■ 1-(408) 522-1900

1-(408) 522-1908 Fax

CIRCLE 594 ON READER SERVICE CARD

System Upgrade

Recycle Your Mac!

**MicroMac Upgrade
System
only \$699!**

Benefits:

- Multiply your screen size and accelerate your Mac by converting to a modular system
- Save desktop space with state-of-the-art slimline enclosure
- Extend the life of your Mac with new universal power supply and fan

Options:

- Add crisp 15" full page display for only \$299
- Add 68882 math co-processor for \$75
- Add Virtual 3.0 software for \$80

For a limited time only – order today!

MicroMac Technology

Phone: 714.362.1000 FAX: 714.362.5428

27111 Aliso Creek Rd, Suite 145, Aliso Viejo, CA 92656-3366



The MicroMac Upgrade System, used by some of the largest Mac sites, is a 68030-based repackaging solution for your older Mac that you can assemble in one hour.

MicroMac Upgrade System

Accelerators



ACCELERATE YOUR POWERBOOK

Boost the performance of your PowerBook with an F-Series™ Upgrade from Digital Eclipse.

The F/25 speeds up PowerBook 140s by 60% (to 25MHz) and includes a 68882 math coprocessor. The F/25 effectively transforms a 140 into a 170 but without the active matrix screen. The F/33 effectively transforms a Powerbook 160 into a 180 (to 33MHz) and includes a 68882 math coprocessor.

INTRODUCTORY OFFER F/25 - \$399 F/33 - \$439
Free round-trip, 2nd day air shipping included.

DIGITAL ECLIPSE

5515 Doyle Street N^e 1, Emeryville, CA 94608

1-800-289-3374, 510-547-6101, Fax: 510-547-6104, ALINK: DESI

CD ROM

NautilusSM

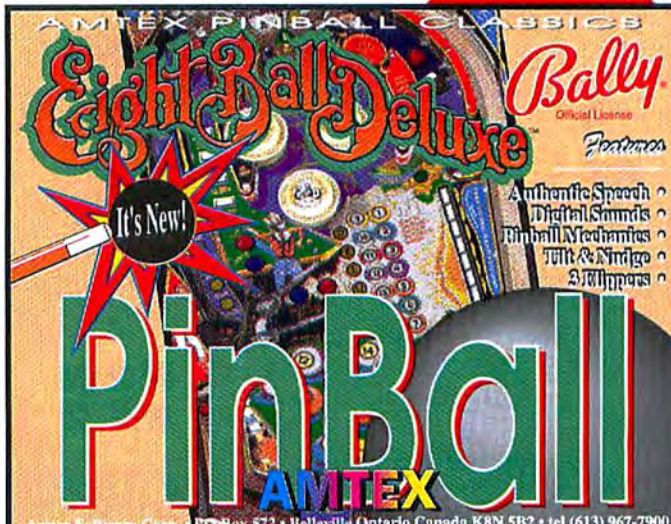
The Multimedia Magazine

Experience hundreds of megabytes of information including photographs & sound effects, music & MIDI files, games & shareware, publishing tools & multimedia. Call **1 800 637-3472** to order your **Introduction to Nautilus** CD ROM for only the shipping charge of \$4.95. Then, if you like Nautilus, subscribe and receive a new CD ROM mailed to you every month!

1 800 637-3472 (Int'l customers: 614 766-3165)
Monday-Friday: 8:30 a.m. to 5:30 p.m. EST
VISA/MasterCard accepted.
Available for Macintosh or Windows.



Games



CIRCLE 590 ON READER SERVICE CARD

CIRCLE 584 ON READER SERVICE CARD

Screen Saver



Version 2.0 w/Darkside™
Use Alone or With After Dark!

SCREENSAVOR™
THE BEST PLACE TO GO AFTER DARK™

You need a vacation! ScreenSaver is a great addition to After Dark™, Intermission™, or Star Trek™ TSS. Instead of toast, ScreenSaver displays sharp, full-color photos by renowned photographers. It's no slide show! Customize display effects. Expand your collection with our growing library of add-on images: NASA/space, animals, vistas, trains, planes and

ScreenSaver Starter Kit only \$49.95
Includes a special 12 image sampler.
Requires Mac LC or higher/4MB

Image at top: Western Images Image Set-Ray Adkins. Lower left: Shuttle Into Space-Space Flight, Set #2. Lower right: Wile Side Set #1. Products mentioned are trademarked by their respective manufacturers.

ORDER NOW! 1-800-697-6437
on FAX (503) 292-0041

CIRCLE 587 ON READER SERVICE CARD

Music



SOMETHING FOR EVERYONE!

NEW!

SONGWORKS
New! Your songwriting partner automatically notates your melody, suggests chords, invents endless tune ideas, aligns lyrics, plays, transposes, prints, \$125.00

PRACTICA MUSICA
Your personal music tutor provides ear training and music theory from beginning to advanced. Includes textbook, \$125.00

Both programs compatible with MIDI (but MIDI is not required.)

ARS NOVA • 1-800-445-4866 • Box 637 • KIRKLAND, WA 98083

CIRCLE 595 ON READER SERVICE CARD

CAD/CAM



Electronic Design

- Schematic Capture
- Digital Simulation
- Parts Placement
- Manual Routing
- AutoRouting
- Board Manufacturing
- Photoplotting

Douglas CAD/CAM

Douglas Electronics, Inc.
2777 Alvarado Street
San Leandro, CA 94577
(510) 483-8770
FAX (510) 483-6453

CIRCLE 589 ON READER SERVICE CARD

Easy Access



Great values are just
a phone call away

MACWORLD SHOPPER®

Utilities



Top Rated
(CT Magazine)

TScript

PostScript® Language Interpreter and Utilities

- Outputs PostScript® documents to Apple (incl. StyleWriter, Laser LS), HP, GCC, Canon (incl. CJ-10), Epson, and others
- Converts PostScript® into TIFF & PICT, variable resolution up to 2400 dpi color

- Supports all PostScript® and TrueType fonts
- Previews PostScript® files, incl. color, interactive PS editor
- Chooser selectable & AppleTalk compatible
- System 7 compatible

T-Script 145, Basic 85, Deluxe 495

New v3.2

Macworld Booth #543

TeleTypesetting
311 Harvard St., Brookline, MA 02146
(617) 734-9700 Fax: (617) 734-3974

CIRCLE 591 ON READER SERVICE CARD

Good buys!



Great values are just
a phone call away

MACWORLD SHOPPER®

Utilities

Simplified Removable Sharing...

Easily share removable devices on your network!

DriveShare is the easy and secure way to share removable cartridges. It works with nearly all cartridge drives, including SyQuest, Bernoulli, opticals and even most CD-ROMs.

- ✓ No complicated users, groups, or passwords are necessary; just two mouse clicks and you're done!
- ✓ Cartridges can be ejected and reinserted at any time. You don't need to turn File Sharing off and on to change cartridges.
- ✓ Any user can send any cartridge to any Client. You can even be a Server and a Client simultaneously!

415.461.2227 Fax 415.461.2249



Casa Blanca Works

148 Bon Air Center Greenbrae, CA 94904

CIRCLE 599 ON READER SERVICE CARD

On-Line Services

Get on the Internet!

**5 Hours
FREE!**

DELPHI is now connected to the Internet! With over 4 million users, the Internet is the fastest growing and most talked about online resource in the world.

- **YOURNAME@delphi.com** — use DELPHI's real-time e-mail connection to send messages or subscribe to mailing lists.
- **Telnet** — connect to colleges, companies, and other networks.
- **FTP** — transfer files immediately from other hosts.



Here's How:

Dial by modem

1-800-365-4636

At Password,

type MCW35

Questions? 1-800-695-4005

CIRCLE 575 ON READER SERVICE CARD

User Friendly



*Great values are just
a phone call away*

**MACWORLD
SHOPPER®**

Printer Refills

The Economical Inkjet Printer Refill

Introducing JetInc.™ from DGR Technologies.
The economical refill for your Apple StyleWriter & Hewlett Packard DeskWriter inkjet printer.

Colors Available: Black,
Brown, Blue, Red, & Green

Black Refill Twin Pack

\$15.99

plus shipping & handling



DGR Technologies

1-800-235-9748

Tel (512) 476-9855 • Fax (512) 476-6399

1219 West 6th Street, Suite 205 • Austin, TX 78703

DP35



CIRCLE 593 ON READER SERVICE CARD

Batteries

POWERCHARGER/HIGH CAPACITY BATTERY FOR MAC POWERBOOKS

- Portable full cycle conditioner charger
- Includes both AC adaptor and automobile cigarette light adaptor
- Discharges and recharges both original and BTI's batteries for Macintosh PowerBook 140, 145, 160, 180, and 165C.

MC-170	High Capacity Battery*	\$69.95
MC-CHR	PowerCharger	\$129.95
MC-KIT	Starter-Kit (one MC-170 and One MC-CHR)	\$149.95

* 25% higher capacity than original Macintosh 140/170 batteries



BATTERY TECHNOLOGY, INC.

5700 Bandini Boulevard, Commerce, CA 90040

(213) 728-7874 (800) 982-8284 Fax: (213) 728-7996

Dealers - Products available through Ingram Micro

CIRCLE 592 ON READER SERVICE CARD



Hardware

Bar Code

WORTHINGTON
DATA SOLUTIONS

BAR CODE READERS

BAR CODE READERS

- Top rated by Independent review!
- Optional Magstripe Input
- 1 or 2 scanners per reader
- Complete with Laser Scanner - \$1389
- Complete with Steel Wand - \$399



PORTABLE BAR CODE READERS

- Battery Operated Reader
- 64K or 256K Memory
- 2x16 LCD, 32 Key Keyboard
- Complete 64K Unit with Laser - \$1734
- Complete 64K Unit with Wand - \$799



"The WDP Reader is highly reliable and easy to use."
Brett Fifeild, Bitstream Inc.

- For all Macintosh models. European Keyboards Supported
- Attaches through ADB as Second Keyboard
- Wand, CCD or Laser input
- 2of5, UPC/EAN, 128, MSI, Code 39
- 2 year warranty
- Same day shipping, Free UPS Blue
- 30 day money back guarantee

Call Toll Free in the USA or Canada

800-345-4220

 Rütlistrasse 6
9050 Appenzell, Switzerland
71 87 51 15
71 87 51 17 Fax

 3004 Mission Street
Santa Cruz, CA 95060
408-458-9938
408-458-9964 Fax

BAR CODE & MAGNETIC STRIPE READERS FOR MACINTOSH PLUS, SE & II

Connects on keyboard or ADB
Requires no additional program or port
Does not affect keyboard or mouse
Industrial quality, heavy-duty units
Also available

SmartCard encoder/reader
Magnetic encoder
Code 39 UPC & Printing Software
Portable Bar Code Reader

TPS Electronics
4047 Transport Street
Palo Alto, CA 94303
415-856-6833 800-526-5920
Telex: (Graphnet) 371 9097
FAX: 415-856-3843

CIRCLE 441 ON READER SERVICE CARD

Call
800.888.8622
to reserve your space
in the MACWORLD
Shopper® today!

Computer Systems



ELITE COMPUTERS & SOFTWARE, INC.

Buy • Sell • Trade • Rent • Lease • Repair • Service • New & Used
"Macintosh Asset Remarketing Specialists Since 1987"

SuperMac SuperView \$349
Mac Plus / Classic \$Call
SE30 2-40 & 4-80 \$Call
Mac LC / LC II / LC III \$Call
Mac IISI / Mac II 2-40 \$Call
Mac IIX / IICX 4-80 \$Call
Mac IICI / Mac IICX \$Call
"Corporate, Government & Educational PO's Welcome"

Phone: 408-725-1556 • Fax: 408-973-1483

ECS • P.O. Box 756 • Cupertino • CA • 95015-0756 • Hours: Mon - Fri 8:30-5:30 Sat 12-5 • 1 year limited warranty on all Mac CPUs. Prices are subject to change without notice. These are cash prices. Quantities are limited.

CIRCLE 493 ON READER SERVICE CARD

Try us FREE for MACS

800-858-4MAC
G.T. industries

Calif (818) 785-2800

FAX (818) 785-3100

Gulf Technology

15500 Erwin St. #1013

Van Nuys Ca. 91411

 High Inventory
Exporting specialists

PowerBooks 160, 165c, 180, Duo's

Prices too low to be advertised. \$Call free

Quadra 700, 800, 950's

Custom Configurations available. \$Call free

Mac IIX All Configurations \$Call Free

Mac LC II & III \$All Time Low

Mac Classic II & Color \$Call

Centris 610 & 650 \$Too Low

 Monitors, Printers & Accessories
ALL BRANDS available

TRY US on SOFTWARE

CIRCLE 430 ON READER SERVICE CARD

Computer Systems

BIG MAC

 Computers, Inc.
DIVISION OF WCN

POWER BOOKS

165C 4/80	3095
165C 8/120	3595
165C 14/232	4095
160 4/40	2195
160 4/80	2430
160 4/160	2775
180 4/80	3795
180 4/120	4150
180 14/230	4895
DUO 2104/80	2070
DUO 2304/80	2395
DUO 2304/160	2795
DUO Dock	1050

MAC IIX

4/80	1785
8/200	2250
8/200-CD	2795

QUADRA'S

950 8/0	4595
950 8/200	4895
950 16/525	5595
950 64/1.2	7395
700 4/0	2225
700 8/200	2595
800 8/230	3795
800 8/500	4350
800 24/500-CD	5376
800 8/0	3600

CENTRIS

650 4/80	2385
650 8/80	2775
650 16/230	3695
650 24/500-CD	5095
610 4/80	1725
610 8/200	2095

In Business Since 1987. All products 1 Yr. Warranty

LC III 4/80	1299	Select 300	785	DEMO	MAC'S
LC III 8/200	1799	Select 310	1025	700 4/0	CALL
LC II 4/40	840	Style Writer II	349	900 4/0	3495
SI CLASSIC CLR		PRINTER		IIFX 4/80	2395
Si 3/40	899	HP Desk Writer	395	IICI 5/80	1850
Si 5/200	1399	HP DW550C	729	IICX 4/80	1299
Classic Clr 4/80	1399	HP Laser 4M	1895	LC 2/40 W/Key	750
APPLE MONITOR		Digital P.S.	1095	SE30 2/40	1350
13"/14" Color 450/499		NewGen	CALL	P.B. 140 4/40	1550
16" Color	1230	Brother 10ppm	1395	P.B. 170 4/40	1995
APPLE KYBD		SCANNERS		Portable 2.40	750
Adj. Keyboard	209	MicroTeck IIXE	1130	EXCHANGE	
Ext. Keyboard	155	UMax 630	1070	YOUR	
Gen. Extended	99	HP ScanJet IIC	1250	MAC	
APPLEPRINTERS		LOGIC BOARDS			
Pro 630	2350	IIF/IIG	895/1195	900 to 950	2295
Pro 600	1975	IIFX	1695	P.B. 100 to 140	950
IIF/IIG	2120/2590	700/900	1595/1795	P.B. 140 to 160	1199
		950/800	2595	P.B. 170 to 180	1995
		NT/NTX	295/595	40MB to 80MB	250
				20MB to 40MB	120

10837 Santa Monica Blvd. Los Angeles, CA 90025
Tel: (310) 470-7099 • Fax: (310) 470-8099

Call for APPLE 3rd party products International Orders
Visa MC & AmEx Welcome Next Day Shipping for USA & International
SuperMAC • Radius • RasterOps • E-Machine • DayStar

CIRCLE 453 ON READER SERVICE CARD

Computer Systems

Perfection Is Our Business

Entry Mac	PowerBooks
Clr Classic 480 \$1321	PB 165c 4/80 \$3020
Classic II 4/80 \$958	PB 165c 4/120 \$3339
LC II 4/40 \$878	PB 160 4/40 \$2148
LC II 4/80 \$1012	PB 160 4/80 \$2478
LC III 4/80 \$1225	PB 160 4/120 \$2797
	PB 180 4/80 \$3650
	PB 180 4/120 \$3970
Mid Range	Color Ptr/Scan
Ilvix 4/80 \$1599	Color PTR \$2079
Ilvix 5/80 w/CD \$1974	Ap CLR SCR \$1199
Centris 610 4/80 \$1569	
Centris 650 4/80 \$2278	
Quad 800 \$2200/3743	
Quad 950 \$2444/3743	
Keyboards	Memory
Ap Std KB II \$84	1 MB SIMMS \$39
Ap Ext KB II \$149	2 MB SIMMS \$49
Ap Std KB \$194	4 MB SIMMS \$79
Ap Mouse \$71	8 MB PB \$98
Monitors	Hard Drive
Apple 12" Mon \$193	4 MB PB \$Call
Apple 14" Col \$479	6 MB PB \$Call
Apple 16" Col \$1178	8 MB PB \$Call
Apple 21" Col \$2879	10 MB PB \$Call
Printers	Hard Drive
LW Select 300 \$727	40 MB Int HD \$159
LW Select 310 \$959	80 MB Int HD \$199
LW Pro 600 \$1864	120 MB Int HD \$229
LW Pro 630 \$2246	200 MB Int HD \$249

MacExpress
U.S.A.
(310)498-9460
Fax # (310) 498-2590
Since 1988

1-800-334-KIWI

Call for lowest prices
on NEW Macs including
newly released models.

Classic II
Color Classic
Mac LC II
Mac LC III
Mac Ilvix
Mac Centris
Powerbooks

All items new. 1 Year Warranty.
Most products in stock today.
Visa & Mastercard no surcharge.
In business since 1988.

Better Business Bureau member.
Kiwi Computers is not affiliated with Kiwi Software Inc.

KIWI COMPUTERS
P.O. Box 67381
Los Angeles, CA 90067
US & Canada (800)334-5494
In California (310)553-4507
Fax (310)286-9667
Mon-Fri 7:30am-5pm, Sat 9am-2pm PST

Used Macs



Mac Ilvix 4/0
NEW \$2299.

Used Systems

Mac II 1/0 (six slots).....	\$699.
Mac SE 1/20 (minus keybd).....	\$499.
Mac Portable 2/40.....	\$799.
Mac Ilvix 1/0.....	\$999.
Mac Ilvix 0/0.....	\$1599.
Mac Classic 1/0.....	\$569.
Mac Ilvix 1/0.....	\$1299.
Mac LC 2/0.....	\$599.

Used Printers

Laserwriter.....	\$599.
Laserwriter Plus.....	\$699.
Personal Laserwriter LS.....	\$499.
Personal Laserwriter NT.....	\$799.
Laserwriter II NT.....	\$999.

Upgrades

Mac Ilvix to Ilvix logic board.....	\$999.
Laserwriter to L'writer Plus.....	\$199.
SE FDD ROM upgrade.....	\$99.
Ilvix to Ilvix upgrade.....	\$799.
512ke to Mac Plus.....	\$179.
Ilvix to Quadra 700.....	Call.
Ilvix to Quadra 700.....	Call.

Mac LC 2/40 \$849.

Includes Color Mon., keybd,
800k floppy, mouse

Parts

Laserwriter Parts.....	Call.
1.44 floppy mech.....	\$249.
800k floppy mech.....	\$89.
Plus power supply.....	\$89.
SE/SE-30 analog bd.....	\$119.
Portable logic bd.....	\$249.
LC logic bd.....	\$349.
SE logic bd (less ROM).....	\$149.
Plus logic bd. (less ROM).....	\$149.
Nubus Ethernet bd.....	\$99.
Mac Portable keypad.....	\$39.
8-bit video bd.....	\$99.
Portrait & 2-page video bd.....	\$25.
L'writer lnt logic bd.....	\$229.
Plus/SE CRT.....	\$49.
PowerBook FAX Modem.....	\$69.

Shreve Systems

1200 Marshall
Shreveport, La 71101
FAX 318-424-9771
Tech. 318-424-7987

800-227-3971

Macintosh

NEW! LC III 4/80 & 4/160	\$1259/\$1389
NEW! Classic II COLOR 4/80	\$1399
II SI 3/40, 5/80, & 8/160	CALL
CENTRIS 610 4/80 (No Ethernet)	\$1629
CENTRIS 610 8/230 / with CD	\$2189/\$2499
CENTRIS 650 8/80 & 8/500	\$2729/\$3699
Ilvix 4/80 & 4/230	\$1679/\$1999
Quadra 700 8/0 & 8/240	\$2199/Call
Quadra 800 8/230 & 8/161G	\$3749/\$4999
Quadra 800 8/500 / with CD	\$4349/\$4699
Quadra 950 8/0 & 8/161G	\$4549/\$5799
Quadra 950 64/1.2 GB	\$7699

Powerbooks	Printers
145 4/80 \$2279	StyleWriter II \$329
160 4/80 \$2479	L'Writer Pro 600 \$1979
160 4/120 \$2799	L'Writer Pro 630 \$2439
165 color 4/120 \$3599	Color Printer \$2129
180 4/80 \$3649	
180 4/120 \$3979	
DUO 230 4/80 \$2199	1320 \$339
DUO 230 4/120 \$2599	1304s CALL
	1604s \$979
	1430 Digital \$599

RasterOps	Radius
20" Multiscan \$1299	Full Pg Mono \$579
Paintboard II \$799	19" Mono \$849
24 STV \$759	21" Mono \$1089
Videotime \$1119	19" Color Call
Sweet 16" Color \$1799	20s Color Call
20T Multimode \$1769	21" Color \$2799

SuperMac	Specials
T-Storm Pro \$2789	NEC 4016" \$549
Thunder 24 \$2199	1 GIGHD \$1099
20T Trinitron \$2399	80MB APPLE HD \$229
21" Display \$2299	Color OneScan \$899
20" Hitachi \$1499	ScanMaker IIXe \$1179
17" Trinitron \$1199	ScanMaker 1850 \$1449
Spigot Pro \$1199	

QMS	Specials
PS-410 \$1399	NEC 4016" \$549
PS-815 \$2599	1 GIGHD \$1099
PS-815MR \$3499	80MB APPLE HD \$229
PS-860 \$3799	Color OneScan \$899
Color 10p \$4199	ScanMaker IIXe \$1179
Script 10 \$4699	ScanMaker 1850 \$1449

International Experts!
We specialize in out of country orders.

Micro USA
(800) 227-6888

FAX US AT (310) 473-5236
(310) 473-2535
Prices Subject to Change without notice.

CIRCLE 427 ON READER SERVICE CARD

"I saw it in the
MW Shopper"

Mac One
Your #1 Export Source!
320 Post Ave. Westbury, N.Y. 11590
Personal Service, Honest Prices & Reliable Delivery
516.997.4153 • Fax 516.997.4154
Sales Office Open: Weekdays 10am-5pm EDT in N.Y.
Fax Lines: Open 24 Hours

CIRCLE 410 ON READER SERVICE CARD

Latest Apple Products
Fax or Call for Discount Prices!
• Apple • Asante • DayStar • E-Machine • HP • Microtek • NewGen • PII •
Quantum • QMS • Radius • RasterOps • SuperMac • Supra • SyQuest •
Texas Instruments • Ultra • Vacom ... Just to name a few!
Need A Price Quote Right Now?
Get Worldwide 24 hour Service via
your own fax machine! Call our Fax Hotline NOW!
Instant Fax delivery of our Latest Prices & Specials
You Must Call from a Fax Machine for this service!
FAX HOTLINE: 516.997.7452
(Listen and Follow the Voice Instruction Prompts)

INTERNATIONAL COMPUTER & NETWORKING
WANTED! MAC EQUIPMENT
Tel. (310) 441-9181 & Fax (310) 479-0124
WE BUY & SELL
MACS
We pay top \$dollars\$ for used Macs & Peripheral devices.
We also sell refurbished Mac systems for low prices!

CIRCLE 439 ON READER SERVICE CARD

CIRCLE 425 ON READER SERVICE CARD

Continued...

Computer Systems

Close-Out
CPU'S

Mac
S · A · L · E
INTERNATIONAL

Reduced
Lasers

**LASER
BLOW-OUT**

QMS PS-410 - \$799.00

Like NEW, 300 dpi PostScript, Mac + IBM autoswitch, Factory Sealed/wrnty, (List - \$1,995.00)

- FINAL PRICE REDUCTIONS! USED EQUIPMENT -

Classic II 4/40 - \$749.00

Mac SE 1/20 - \$499.00

Classic 2/40 - \$599.00

Stylewriter - \$199.00

QMS ColorScript 100 - \$1,599.00

(List \$9,995.00) 300 dpi Color Laser/PostScript

Powerbooks: 100/140/170 - Call

Mac LC/LC II/si/ci - Call

Apple Laserwriter IINTX - \$1,195.00

Radius Pivot Color/Mono - \$599.00/375.00

Apple Personal Laserwriter LS - \$599.00

Apple Laserwriter IINT - \$995.00

Radius TPD Mono - \$599.00

*Call
For Other
Specials and
Latest Pricing*

▶ New Equipment Specials:

Apple Ili Cache Cards - \$35.00
Stylewriter - \$249.00

Classic 2/40 - \$699.00
Classic II 4/40 - \$899.00

Radius Pivot Color/Mono - \$799.00/475.00
PowerBook 170 4/40 w/modem - Call

WE WANT TO BUY YOUR NEW/USED MAC EQUIPMENT

New and Used Mac's

Bought and Sold

1-800-729-7031

Entire Mac Line

Latest Models In Stock

Prices represent "2% Cash Discount!" - off Full Price.

LIMITED QUANTITIES

Returns at discretion of Mgmt./15% Restocking fee.

CIRCLE 401 ON READER SERVICE CARD

WANTED: USED MAC'S

WE BUY YOUR USED MAC EQUIPMENT FOR TOP DOLLAR, CASH! WE SELL REFURBISHED MAC'S AT DISCOUNT! CALL FOR QUOTE. **RENTX INC.** (800) 545-2313, (617) 423-5567

CIRCLE 521 ON READER SERVICE CARD

Free Catalog Used Macintosh Computers

While all the others come and go, we keep doing what we do best. We've been refurbishing and selling used computers for ten years. Our quality control department assures you the best machine available for the money—or your money-back—guaranteed.

Call Anytime
1-800-821-3221

PO Box 4059
Logan, UT 84323-4059
Fax: (801) 755-3311

Sun
Remarketing, Inc.

MacBYTE

Buy • Sell • Trade Macintosh Computers

Preowned Macs with Warranty
Cash For Your Mac or Peripheral
Low & High End Custom Setups
FAX 310-317-1583

800-432-BYTE

Open Monday - Saturday
22775 PCH, Malibu, CA 90265

CIRCLE 428 ON READER SERVICE CARD

ADVANCED SYSTEMS

MAC

CPU's, Printers,
Monitors, Drives,
SuperMac, Radius,
Sony, Scanners,
Microtek, E-Machine,
Multimedia



New Systems International Orders Welcome
Tel (310) 314-7372 Fax (310) 314-7512

CIRCLE 470 ON READER SERVICE CARD

**Great Prices on
Used Macs**

**Big Savings
CPU's
Drives
Monitor
Modem
Much
More
Call 1-800-821-3221**

Super Savings
Don't get higher than necessary.
Here's the cheapest Macintosh price
ever. Only \$395

CIRCLE 424 ON READER SERVICE CARD

Computer Systems



Computer Design & Graphic Systems™

Specialists in Graphic System Configurations ▶▶▶▶▶

CGG CUSTOMERS...
THANK YOU!
#1 Supplier to the Graphics Industry

CPU'S	MONITORS	PRINTERS	STORAGE/MISC.	DISPLAY CARDS	SCANNERS
CALL FOR UPDATED PRICING MAC LC II 486... \$1319 MAC II vx 580... \$1729 Centris 610 & 650... \$1770 MAC II vx CD-ROM... CALL PowerBook Duo 8 & 160... CALL Quadra 700... \$2249 Quadra 800... CALL PowerBook 160 & 165c... CALL New Macs Are In!!!!	15" Portrait Gray Scale... \$399 Seko 14" color Trinitron... \$499 E-Machines T16 II m... \$1289 SuperMac 17" Trinitron... \$1099 New Apple 14" Color... \$549 NEC 3FGX... \$669 SuperMac 20" color... \$1499 Magnavox Pro 14" color... \$399 RasterOps 20" color... \$1399 Radius 20" Precision 20... \$2649	GCC BLP Elite... \$1049 GCC PLP II Laser... \$799 Canon 820 color... \$1979 NewGen PS600 11x17... \$3695 HP LaserJet 4m (800 dpi)... \$1999 QMS 660 11x17 600dpi... \$3999 NEO Silentwin 97 or 95... CALL TI Microblaser Turbo... \$1550 Dataproducts LZR 966... \$2400 All Dye Sub printers now avail.	128 Optical Media Special... \$40 Apple 40 and 80 meg HD... \$189 All CD-ROM drives... In Stock Microtech Gen. 650 opt... \$1989 PU 128 optical drive... \$1299 Quantum 240S int. (in stock) \$449 Honmai FMFi 3.5" 1gg... \$1999 Fiske 520 meg 3.5" int... \$890 Fujitsu 1.2 gld... \$1399 Pinnacle PMO 650 optical \$2789	SuperMac 24 Series IV... \$789 SuperMac 8+24 PDC... \$799 SuperMac Thunder 24... \$2299 SuperMac Thunder Pro... \$2799 Radius ProColor 80k... \$799 E-Machines Future SX... \$499 E-Mach Future MX 24 bit... \$769 Lapis Hubus 8M6 color card \$369 RasterOps Paintboard L... \$799 RasterOps 24 MxTV... \$1579	SCANNERS HIGH END SCANNERS - CALL UMAX UC840 (600 dpi)... \$1299 Microtek ScanMaker II XE... \$1149 UMAX true 1200 dpi... \$2999 Microtek ScanMaker II... \$679 Sharp JX-020... \$1099

Lowest Prices on Graphic Software! E-MACHINES GCC TECHNOLOGIES FWB NEC PLI QMS rad is SUPERMAC RasterOps

FREE SHIPPING! ... call for details Over 2,700 products for the serious Graphics User!

d&g Specialists in Graphic System Configurations

12734 Kenwood Park • Suite 63 • Ft. Myers, FL 33907

800 741 6227

LOCAL: 813-278-3180 • SUPPORT: 813-278-4884 • FAX: 813-278-5181

CIRCLE 419 ON READER SERVICE CARD

CRA 300 South 13th Street
Waco, TX 76706
1 (800) 375-9000

We Buy and Sell New and Used Systems Any Quantity
Phone 817-754-2120 / FAX 817-754-2345

New Macintosh CPU's (LC, SE, CI, FX, Quadra 700, 900 & 950, Powerbook 100, 140, 170)
Used & Demo Macintosh CPU's (SE, SE30, Portable, II, Cx, X, Ci, Fx)

CLEARANCE SPECIALS

Apple LaserWriter IIxt, Nix, JIIg	Call	FastPath 4 Ethernet Router NEW	\$1199
Mitsubishi G370-10U Color 300dpi		Howtek Scanmaster w/Trans Opt. NEW	\$3999
w/Freeform of the Press Postscript driver	\$3999	HP Scan Jet 400dpi 16GS DEMO	\$899
QMS Colorscript 100-10 DEMO	\$5500	Laserwriter Plus Upgrade Romms NEW	\$399
QMS PS Jet Plus 8ppm Postscript Laser	\$1799	Maxtor 650 meg SCSI NEW	\$1499
Supermac 19" Color New & Used	\$1999	Minus & Agfa Film Recorders	Call
E-Machines Color Page 15" w/8 Bit	\$1100	Wren Hard Drive Blowout	Call
Mitsubishi 16" 1024 X 768 w/8bit	\$1599	Mac Ix 5440	\$2399
RasterOps Trinitron, 8 & 32bit	From \$2299	Mac II w/430 Accelerator	\$3499
Sony 1608 Industrial Trinitron NEW	\$2699	Adobe Type Manager	\$54
Sony 19" Trinitron DEMO	\$1999	DiskFit v.1.5	\$45
600 X 600 DPI Postscript Laser	\$2499	MacDraw II (w/Free Pro Upgrade)	\$279

CIRCLE 467 ON READER SERVICE CARD

QUADRA 950

NEOVIEW 800/880-8888
8760 RESEARCH BLVD AUSTIN TEXAS 78758

"I saw it in the
MACWORLD SHOPPER®"

Continued...

MACWORLD SHOPPER®

Computer Systems

COMPU.D



800-929-9333

6741 Van Nuys Blvd.,
Van Nuys, CA 91405

TEL: (818) 787-3282

FAX: (818) 787-2111

WE WILL TRY TO BEAT ALL VERIFIABLE PRICES! EXPORT REPS. ON CALL.

MACINTOSH

950 8-0/200 - \$4499/4850
*950 64/1.2GB - \$7699
*800 8/230 - \$3899
*800 72/1.2GB - \$7199
700 4-0/200 - \$2195/2550
700 20/525 - \$3499
Centris 650 8/230 - \$3199
*650 72/1.2GB - \$5649
*Centris 610 4/80 - \$1649
*610 8/525 - \$2499
*IIVX 4/80 - \$1649
*IIVX 4/230 - \$1999
LCIII 4/80 - \$1269
LCIII 4/200 - \$1449

MACINTOSH

Clr. CLASSIC 4/80 - \$1379
Clr. CLASSIC 4/200 - \$1569
IISI 3/40 - \$899
IISI 5/200 - \$1329
* Internal CD 300 - \$399
APPLE ORIGINAL HD
40/80MB 3.5" - \$118/189
160/230MB - \$295/489
Fujitsu 1.2 GB - \$1445
20/40MB 2.5" - \$69/139
80/120MB 2.5" - \$349/469

POWERBOOK

145 40/80 - \$1829/2130
160 40/80 - \$2189/2429
160 160/200 - \$2699/2830
170 40/120 - \$1999/2390
180 40/80 - \$3550/3695
180 120/210 - \$3899/4099
165 Color 4/80 - \$3149
165 Color 4/120 - \$3399
DUO 230 4/160 - \$2679
DUO DOCK - \$989
PB 2400B Fax/Modem - \$89

MONITORS

Apple 14" CLR - \$489
SONY 16" CLR - \$989
SONY 20" CLR - \$1999
Radius 20" - \$2199
Precision Pivot - CALL
Precision 19" - \$1579
SuperMatch 20" - \$1399
SuperMatch 21" - \$2399
RosterOps 20" Clr. - \$1299
NEC 3FGX/4FG - \$599/699
NEC 5FG - \$1199
NEC 6FG - \$2299
20" Trinitron Multi-Scan - \$1849

PRINTERS & SCANNERS

APPLE Pro 600 - \$1999
APPLE Pro 630 - \$2379
APPLE IIG - \$2049
Clr. Printer - \$2189
IIF Upgrade - \$899
IIG Upgrade - \$1249
HP LaserJet 4M - \$1895
QMS PS-860 - \$3849
SPECIALTY CARDS
Thunder 24 - \$2199
Thunder II Light - \$2669
Thunder II - In Stock
Rocket 040 33 - \$1899
DAYSTAR 040 - In Stock

WE ALSO DISTRIBUTE FULL LINE OF
 & PRODUCTS.

* Above prices are subject to change without notice! * CALL US FOR LARGE VOLUME ORDERS WITH BETTER DISCOUNTS! * We buy your excess inventory!

CIRCLE 434 ON READER SERVICE CARD

IF YOU'RE HAVING A
**MAC
 ATTACK**

Hours:
 Weekdays 10 a.m. - 8 p.m. est
 We accept Visa / MC / AMEX
 Cash discounts.

Let Mac•In•Stock Satisfy It!

Our competitive prices include:

1. Service

Work with a Mac pro,
 not an order taker.
 Expert help ensures the
 right choices for your
 needs and budget.

2. Selection

Classic II or Quadra.
 Custom or standard.
 Apple or third party.
 We'll help you build
 your system, your way.

3. Safety

Mac•In•Stock is the only
 dealer who will bench
 test your system, and use
 double boxes for
 safe shipment.

4. Support

Tech support is toll free.
 Repairs or replacements
 are handled via Federal
 Express (in and out
 at our expense).

Int'l: 305/321-0906
 Fax: 305/321-0905

800-944-6227

Mac•In•Stock

CIRCLE 457 ON READER SERVICE CARD

MACMARKET

800-223-4-MAC

- Toll free technical support
- Free Shipping for all CPU Repairs in U.S.
- Free Shipping in California

We only sell
 New Systems
 with a full one year warranty

- Visa, MC & Discover add 2%
 - You are not charged until your order is shipped
 - Prices are subject to change without notice
- In California call:

TEL: 818-708-6388

FAX: 818-708-6399

Quadra 950

8Mb/230Mb 4995	64Mb/1Gb 7885
12Mb/1Gb 8695	256Mb/2Gb 14995

Quadra 800

8Mb/230Mb 3925	40Mb/500Mb 5675
24Mb/500Mb/CD 5495	72Mb/1Gb 7259

Centris 650

8Mb/230Mb 3149	24Mb/500Mb 4265
24Mb/230Mb/CD 3995	40Mb/1Gb 5150

Centris 610

4Mb/80Mb 1650	12Mb/230Mb 2355
12Mb/230Mb/CD 2849	20Mb/500Mb 3185

IIVX

4Mb/80Mb 1685	20Mb/230Mb 2469
8Mb/230Mb/CD 2525	20Mb/500Mb 3049

LCIII

6Mb/80Mb 1330	8Mb/160Mb 1545
8Mb/230Mb/14" Color Monitor/Ext. KB	..... 2095

We also carry: UMAX-MICROTEK-HP-RADIUS-GCC-ASANTE-LAPIS

CIRCLE 420 ON READER SERVICE CARD

PowerBook 180

4Mb/80Mb 3895	6Mb/120Mb 4125
8Mb/160Mb 4495	14Mb/200Mb 4925

PowerBook 165c

4Mb/80Mb 3255	6Mb/120Mb 3695
8Mb/160Mb 3995	14Mb/200Mb 4395

PowerBook 160

4Mb/80Mb 2549	6Mb/120Mb 2849
8Mb/160Mb 3175	14Mb/200Mb 3795

Duo

(210)4Mb/80Mb 1895	(230)8Mb/80Mb 2695
(230)12Mb/120Mb 3050	Duo Dock 1029

Apple Printer

StyleWriter II 335	LaserPro 600 1995
Select 300 795	LaserPro 630 2495
Select 310 1049	Color Printer 2111

Apple Monitor

Color Display 14" 495	16" Color 1249
-----------------------	----------------------

SuperMac

Thunder 24 2150	Thunder 8 1099
Thunder II 3899	Spec. 8.24 599
Spec. 24 IV 769	Spec. 8 SeriesIII 419
Spec. 24 PDQ+ 1479	20" Color 1479
20T Color 2445	Platinum 21 975

UMAX

UC 630 1095	UC 1200 2850
UC 840 1195	UC 1260 2450

Sony

1320/1430 379/555	1604s 1045
-------------------------	------------------

NewGen

400P/660P 1575/1745	880P 1895
440B/660B 3149/3625	1200P Call

PLI

88 Mb w/cart. 575	Optical 128M 1299
88 Mb R/W 675	4GB DAT Ext. 1549
21Mb Floptical 399	4GB DAT Int. 1399

Mail Order can save you time - and money

Computer Systems

WE WELCOME INTERNATIONAL & DEALERS

SYSTEMS

Centrix 610	Call
Centrix 650	2395
Mac II VX W/CD ROM	Call
Quadra 700 4-220	2549
Quadra 800 4-520	4745
Quadra 950 8-1.2 G.	5885
Quadra 950 8-2 G.	6945
Powerbook 165 c	In Stock
Powerbook 160	In Stock
Powerbook 180 4-80/120	In Stock
LC III	1289

**WE TRADE YOUR
OLD MAC
FOR A NEW MAC**

UPGRADE

IIcx TO IIci	775
IIci TO QUADRA 700	995
Q 900 TO Q 950	2030
PB 140 TO PB 160	1135
PB 140 TO PB 165C	2045
PB 170 TO PB 165C	1445
PB 170 TO PB 180	2195

SPECIALS

AGFA Arcus 1200 dpi	2985
UMAX UC 800/1200	1325/2985
Printer 800/1200 dpi	1990/4445
Quadra 950 64-1.2G 2Mb Vram	
19" Super Mac Monitor	9790

INTERNATIONAL COMPUTER & NETWORKING

Tel. (310) 441-9181
FAX (310) 479-0124

10835 Santa Monica Blvd., Suite 204A, LA, CA 90025

CIRCLE 402 ON READER SERVICE CARD

'A name to remember.'

ESTABLISHED 1981

MACINTOSH CPUs	CENTRIS
LC III 4/80	1249, 610 4/80 1675.
Clr. Classic 4/80	1349, 610 8/230+CD 2599.
IIISI / IIci	Call 650 8/230 3175.
IIIX 4/80	1745, 650 8/80 2875.
IIIX 5/80cd	2145.
POWERBOOK'S	
IIIX 4/230	2049, 145 4/40 1995.
QUADRA'S	
700 4/120	2595, 165c 4/80 3175.
800 8/230	3995, 180 4/80 Call
800 8/1000	5395, Duo 210 4/80 2095.
950 8/240	5195, Duo 230 4/80 2475.
950 64/1.2GB	7550, Duo Dock Call

SUPERMAC	RADIUS
SuperMatch 20 2425.	Precision 19" 1995.
SuperMatch 20T 2475.	Precision 20s 2295.
SuperMatch 21" 2495.	Preci. 24XK 799.
Thunder 24	2195.
Thunderstorm	795, JX-320+adobe 995.
Thu. storm Pro	2745, JX-450+GPIB 3750.
Apple printers	JX-610+GPIB 9350.
StyleVri. II	349.
Pro 600	1775, UC-630+adobe 1095.
Pro 630	2395, UC-840+photo 1195.
Select 300	779, UC-1200 shop 3195.
Select 310	1025, Transpac unit 689.

HP printers	Microtek
Laser 4M	1995, TrueLaser 300 1150.
Laser IIISI	3795, Scanmaker II 875.
DeskW.550c	699, Sca. maker IIXE 1145.
QMS	PLI

PS-410+toner	1299, Floptical 21MB 399.
815MR	2895, MO 128 optical 1299.
825MR	3895, MiniArray 480 1799.
CS 30i color	6595, MiniArray 1Gig 4495.

SONY 20" Two page
Trinitron Color 8Bit \$2395.
24Bit \$2695.

DEALERS & INTERNATIONAL SALES WELCOME.

Best Prices, Service, Delivery! No credit please

DATA MICRO COMPUTER
TEL: (310) 398-3300
FAX: (310) 391-2488
3487 Grand View Blvd. LA, CA 90066

CIRCLE 508 ON READER SERVICE CARD

ACCESS II

800-662-5606

NEW MACS NOW ON SALE

POWERBOOK	MAC CPUs (AVAILABLE IN OTHER CONFIGURATIONS)	SUPERMAC
145 4/40 \$1999	CLASSIC II 4/80 \$1059	20" TRINITRON \$2599
145 4/80 \$2349	IIIVX 4/80 \$1759	20" HITACHI \$1499
160 4/40 \$2299	COLOR CLASSIC \$1369	17" TRINITRON \$1159
160 4/80 \$2649	LC II 4/80 \$1099	21" PLATINUM MONO \$1079
160 4/120 \$2949	LC III 4/80 \$1299	MONO INTERFACE \$349
180 4/80 \$3849	LC III 4/160 \$1449	SPECTRUM 8/11 \$419
180 4/120 \$4199	IIci 5/0 \$1849	SPECTRUM 24/IV \$839
165c 4/80 \$3299	IIci 5/230 \$2299	SPECTRUM 24PQ+ \$1619
165c 4/120 \$3649		THUNDERSTORM \$839
POWERBOOK Duo	QUADRA	VIDEOSPIGOT \$399
210 4/80 \$2149	800 8/230 \$4099	
230 4/80 \$2499	800 8/500 \$4759	
230 4/120 \$2799	950 8/230 \$4949	
Duo MINIDOCK \$999	950 8/500 \$5349	
Duo DOCK \$999		

WE DEAL EXCLUSIVELY IN NEW AND USED MAC SYSTEMS AND PERIPHERALS.
DON'T BUY OR SELL UNTIL YOU TALK TO US.

INTERNATIONAL ORDERS WELCOME TEL. 603-890-3333 / FAX 603-890-3155

26 KEWAYDIN DRIVE • SALEM, NH 03079 PRICES & AVAILABILITY SUBJECT TO CHANGE

CIRCLE 409 ON READER SERVICE CARD

**Increase
Your Reach,
Increase
Your Sales
and Hit
Your Market
in
The
Macworld
Shopper!**

**Macs for Less!
Guaranteed!**

All CPU's! All New!

Buy from us,
or you'll pay too Much!

1-(800) 460-0085

CIRCLE 433 ON READER SERVICE CARD

the mac store

Best Prices In Canada Since 1989

No Customs Hassles

The Best Warranty In The Business

Same Day Repair/Replace

Satisfaction Or Money Refunded

True Mac Experts On Staff

All Major Hardware, Software

Service Contracts

(416) 466-8107 (800) 268-7805

CIRCLE 426 ON READER SERVICE CARD

NuBus Expansion Chassis

- External chassis add 4 or 8 more NuBus slots to your Macintosh
- Compatible with Macintosh SE/30, II, Centris, & Quadra models
- More cost effective than another Macintosh for slot expansion
- Provide application flexibility on smaller Macintosh platforms

- Data acquisition
- Multi-media
- Signal processing
- Multi-processors

Expense NB8 and Expense NB4 come complete with NuBus slots, power supply, SCSI support, interface card, and cable.



Second Wave Inc.

The Expansion Chassis Company Phone: 512-343-9661
9430 Research Blvd. II-260, Austin, TX 78759-6541 FAX: 512-343-9663

CIRCLE 446 ON READER SERVICE CARD



Continued...

Computer Systems

COMPUTER REVELATIONS... "Best Selection... Best Prices... Best Service!"
1-800-275-9924


Mac LC II
4MB/40HD \$949
4MB/60HD \$1029
4MB/160HD \$1199

Mac IISI
3MB/40HD \$899
3MB/60HD \$1099
3MB/160HD \$1299

Duo Dock
Duo Dock Call
Mini Dock Call

Apple Laser
Pro 600 Call
Pro 630 Call

Mac IICI
5MB/0HD \$1899
5MB/80HD \$2099
5MB/230HD \$2499
5MB/525HD \$2899

Quadra 700
4MB/0HD \$2399
4MB/80HD \$2699
4MB/240HD \$2899

Quadra 950
8MB/0HD \$4999
8MB/230HD \$5399
8MB/525HD \$6249
8MB/1.2GB \$6799

Ilivx
5MB/80HD CD Call
5MB/240HD CD Call
4MB/80HD \$1799
4MB/230HD \$2099

SuperMac
17" Color \$1039
20" Color \$1459
Thunder 24 \$2299
Spectrum 8-24 \$ 839

Duo's
210 4/80 \$2099
230 4/80 \$2449
230 4/120 \$2749

Powerbook
145 4/40 \$1995
145 4/80 \$2299
160 4/40 \$2299
160 4/80 \$2599
160 4/120 \$2669
180 4/80 \$3749
180 4/120 \$4049

H. P.
Deskwriter \$399
Deskwriter C \$509
Deskwriter 550 \$719
Laser 4M \$2099
Scanner IIC \$1379

Umax
Umax 630 \$1129
Umax 840 \$1399
Umax 1200s \$2999
Trans Adat \$699

Apple
14" Color \$529
16" Color \$1199

Microtek
Microtek II \$899
Microtek IIx \$1149

Nec
Model 95 \$1429
3FGX \$609

Price subject to change due to market conditions.

Apple original 40mb \$155
Apple original 80mb \$275

Compatible Extended Keyboards
\$99.00
LC III
Color Classic
Centris 610
Quadra 800
Call For Price!

New and Used, Bought and Sold

 Call For
Specials

 ASK
ABOUT
OUR
1 YR.
WARRANTY

 COMPUTER REVELATIONS INC.
1461 Lakeland Avenue
Suite 5 Bellerose NY
516 244-8590 fax 516 244-8594

HP•GCC•NEC•Radius•Supermac•EMachine•RasterOps•Qms•TI•Sony•Quantum, Psi

CIRCLE 474 ON READER SERVICE CARD

Disk Drives

Memory Upgrade

SATURAE

"BIG HARD DRIVES"

"If you can afford the best, the top performers are...Saturnae ProLine 500,"
—MacWorld, March 1993

"Pick the ProLine if speed and warranty are your top concerns,"
—MacUser, April 1992

Saturae Corporation
800 - SATURAE
800-728-8723

International Orders (617) 661-8166
Fax Orders (617) 661-8662
Tech Support (800) 373-3063

CALL US! 9AM to 8PM EST Mon-Fri
VISA and MC Accepted No Surcharge
AmEx Accepted, POs Accepted on Approval
148 Richdale Avenue Cambridge, MA 02140

PROLINE

Model	Internal	Capacity	Seek/Rev	Internal	External
220	254ms	35"	12.5ms	14-20Mbit	
402	425ms	35"	12.5ms	14-20Mbit	
1003	1.2ea	35"	10.5ms	24-42Mbit	
1290	1.8ea	7H	13.5ms	23Mbit	
1650	2.1ea	7H	11.5ms	24-42Mbit	
1910	2.4ea	7H	11.5ms	24-42Mbit	

PROLINE

Model	Internal	Capacity	Seek/Rev	Internal	External
500	520ms	5.5"	12.5ms	18-24Mbit	
1030	1.2ea	5.5"	12.5ms	24-42Mbit	

EDGE

Model	Internal	Capacity	Seek/Rev	Internal	External
1000	1.2ea	3.5"	5.5ms	33Mbit	
1600	2.0ea	3.5"	5.5ms	24-42Mbit	

SENTRY

Model	Internal	Capacity	Seek/Rev	Internal	External
250	Sanyo 1/4"	Tape Drive			
525	Sanyo 1/4"	Tape Drive			
2000	Hewlett Packard	DAT Drive			
5000	Hewlett Packard	DAT Drive			

HEWLETT PACKARD

Model	Internal	Capacity	Seek/Rev	Internal	External
789					
1,069					
1,719					
2,049					
2,639					
2,999					

FUJITSU

Model	Internal	Capacity	Seek/Rev	Internal	External
999					
1,079					
1,639					

RARE (DEC)

Model	Internal	Capacity	Seek/Rev	Internal	External
1,799					
2,869					

TAPE BACKUP

Model	Internal	Capacity	Seek/Rev	Internal	External
649					
799					
1,449					
1,699					

ACADEMY

Model	Internal	Capacity	Seek/Rev	Internal	External
85	85ms	17H 17ms	8-12Mbit		
127	127ms	17H 17ms	8-12Mbit		
170	170ms	17H 17ms	8-12Mbit		
240	240ms	17H 17ms	15-20Mbit		
502	525ms	17H 17ms	15-20Mbit		
1170	1225ms	5.5"	10ms	18-24Mbit	

ACADEMY II

Model	Internal	Capacity	Seek/Rev	Internal	External
830	870ms	5.5"	12.5ms	12-24Mbit	

VISION

Model	Internal	Capacity	Seek/Rev	Internal	External
128	3.5"	30ms	Fujitsu		
128w	3.5"	35ms	MOST		

MAGNETO-OPTICAL

All drives come complete with software, cables and one of the best installation manuals in the industry. ProLine, Academy II and EDGE drives have a five year warranty. Academy and SENTRY tape drives have two year warranties. HP 345 and Vision MD drives have a one year warranty. Vision drives include one cartridge. Tape Backup drives include one cartridge and "Retrieved" backup software. Prices subject to change—call for current pricing. 30 day money-back guarantee on all 3.5" drives. We offer 10% off technical support from 9AM to 6PM Mon-Fri. All hard drives have a 48-hour turnaround time on warranty repair for the first year.

ProLine and EDGE drives include CS6's COPYright™ SOFTWARE

CIRCLE 449 ON READER SERVICE CARD

Dynamic Engineering

 435 Park Dr., Ben Lomond, Ca. 95005
(P)408-336-8891 (F)408-336-3840

PowerBook

RAM, Modem, Hard Disk, Monitor, SW

PB Coprocessor \$299

PB Proc/Coproc-33 \$725

PB RAM 6Mb - \$239

SIMM 1/4 - \$32/118

Portable Upgrade!

ADD 1-8 Mb reuse your RAM

120 Mb HDD for Portable

M/C Visa COD P.O.

(800) 487-4655

CIRCLE 555 ON READER SERVICE CARD

Memory Upgrades

25MHz 68030 PERFORMANCE ONLY

\$299!

Get the performance of a IICI or IIfx
for your Plus or SE with the
MicroMac 25MHz or 32MHz 68030 MultiSpeed accelerator.

- ✓ Up to 820% performance increase
- ✓ Fully compatible with System 6 and System 7
- ✓ Four SIMM slots for 32-bit memory expansion
- ✓ Up to 16MB of physical or virtual memory
- ✓ with optional Connectix Virtual 3.0 software
- ✓ 68882 Math co-processor socket

32MHz 68030 now
available for only
\$398!

The MicroMac MultiSpeed accelerator
simply connects to the Plus processor
or plugs into the SE's PDS slot and
increases performance up to 820%.

MacUpgrade Specialists (800) 266-3622

Fax: 714.362.5428

CIRCLE 442 ON READER SERVICE CARD

MEMORY DIRECT

"Don't pay Retail... buy direct"



Out of Memory?

 Call
Memory Direct

1 Meg Simms —\$28.

**Now Memory Upgrades
for the New Performa!**

44 meg Syquest w/ctrge \$414.

88 meg Syquest w/ctrge \$559.

See our 1 page ad in this section!

800-486-2447

CIRCLE 524 ON READER SERVICE CARD

Call
800.888.8622 to
reserve your
space in
the
**MACWORLD
SHOPPER®**
today



PERIPHERAL

SIMMs

PowerBook
Memory

Quadra
Memory

Video RAM

Cache Cards

Accelerators

ORDER BY
6:30 PM CST
FOR SAME DAY
SHIPPING*

*some restrictions apply

OVERNIGHT DELIVERY
from \$8.00

Call for memory for the
Centris 610, 650, LC III,
and the Quadra 800!

SIMMs

1 Megabyte	CALL FOR
2 Megabyte	CURRENT
4 Megabyte	PRICING
8 Megabyte	ON ALL
16 Megabyte	SPEEDS

Video RAM

4 Bit to 8 Bit Upgrade (Mac II/IIx cards)	24.00
256K Q700/900 VRAM	29.00
256K Q950 VRAM	32.00
512K Mac LC VRAM	59.00
Mac IIx	CALL

TOLL
FREE
TECH
SUPPORT

POWERBOOK MEMORY

	PowerBook 100	140/170	160/180	Duo 210/230
2 Megabyte Module	89.00	89.00	CALL	—
4 Megabyte Module	189.00	159.00	CALL	CALL
6 Megabyte Module	289.00	249.00	CALL	—
8 Megabyte Module	—	—	CALL	CALL
10 Megabyte Module	—	—	CALL	—

Up to 50MHz 68030 Accelerator and Monitor Combo



- "ImagePro" SE, Classic, Plus, 512Ke.
- 16, 25, 33, 40, and 50MHz speeds available
- Works with your monitor or ours
- System 7/Virtual compatible.
- Add up to 16 Megabytes of RAM.
- Includes 68030 Math CoProcessor.
- Optional Display- 15, 19, or 24 inch.

800/256-6581

Ilisi 2-slot Card and 68082 \$119

68082 33MHz

MATH COPROCESSOR FOR THE
MAC IIx AND Duo DOCKS
\$139.00

QUADRA MEMORY

256K VRAM Quadra 700/900	\$29.00
256K VRAM Quadra 950	32.00
16 MB SIMMs Quadra 700	CALL
16 MB SIMMs Quadra 900/950	CALL

LIFETIME WARRANTY ON
MEMORY PRODUCTS

68082 FPU Boards

20 Mhz for Macintosh LC	\$ 69.00
20 Mhz w/2 slots for Mac Ilisi	119.00
20 Mhz for Mac Classic II	69.00

Cache Cards, Etc.

Ilisi 64K Cache Card	\$ 139.00
Ilisi 64K Cache Card	129.00
Ilisi 2-slot Card and 68082	119.00

FPUs (chip only)

Ideal for upgrading your Daystar Accelerator

68082 16 Mhz	\$ 55.00
68082 20 Mhz	59.00
68082 25 Mhz	109.00
68082 33 Mhz	135.00
68082 50 Mhz	175.00
68081 16 Mhz	45.00

Miscellaneous

T.I. MicroLaser 1 MB	\$ 49.00
Virtual 3.0	129.00
with accelerator	99.00
Mac Classic 1 MB Bd	55.00
68051 16 Mhz PMMU	79.00
Mac Portable RAM	CALL
NeXT Memory	CALL

68030 SUPER-FAST Accelerators

"Quik30" for Mac SE, Plus, 512Ke
and Classic

- Speeds of up to 33MHz
- System 7/Virtual compatible
- Add up to 16 Megabytes of RAM
- Includes 68030 Math CoProcessor

only \$529.00 for 25MHz version

PRICES SUBJECT TO CHANGE AND AVAILABILITY.

327 East 14th, PO Box 2329
Ada, Oklahoma 74820
International Calls 405/332-6581
FAX 405/436-2245

PERIPHERAL OUTLET

CIRCLE 454 ON READER SERVICE CARD

MEMORY DIRECT!

"Don't pay Retail... buy direct"

DAYSTAR**Power Cache**

		W/math chip
33mhz	\$545	\$660
40mhz	\$745	\$909
50mhz	\$1069	\$1279

**Out of Memory ?****Call
Memory Direct****QUADRA**

256K Vram 700/900	\$30
256K Vram 950	\$32
1 Meg 70 ns	\$32
4 Meg 70 ns	\$106
8 Meg 70 ns	\$289
16 Meg Q700	\$535
16 Meg Q900,950	\$485

HARD DRIVES**CONNER**

	Int.	Ex.
42 Meg	\$209	\$279
85 Meg	\$279	\$345
120Meg	\$369	\$429
170Meg	\$409	\$474
212Meg	\$619	\$700

SYQUEST

44 Meg Kit W/ctrge	\$414
88 Meg Kit W/ctrge	\$559

Ar DAT

Tape 2.1 \$1400

FUJITSU

	Int.	Ex.
425 Meg	\$975	\$1039
520 Meg	\$1075	\$1175
1.2 Gig	\$1700	\$1779
2.06 Gig	\$2799	\$2879

RasterOps

24-bit cards	
24 XLI	\$2059
24 paintboard	\$1649
paintboard Li	\$849
24 SX	\$675
Colorboard	
264 se30	\$2059

8-bit cards	
8XLI	\$999
8XL	\$499

CLEAR VUE

GSXL	\$479
XL	\$329
GS30	\$669

If you're tired of running out of memory
& bombing or want to run two programs
at one time, call Memory Direct for less!**SIMMS**

1x8 80 ns	Call	8x8 70 ns	Call
1x8 70 ns	Call	16x8 70 ci si	Call
2x8 80 ns	Call	16x8 70 ns fx	Call
2x8 70 ns	Call	16x8 low profile	Call
4x8 80 ns	Call	16 Radius Rocket	Call
4x8 70 ns	Call	Powerbook	
		140/170 6 meg	Call

Because of recent price
fluctuations we can't list
prices for simms.**MEMORY UPGRADES
NOW AVAILABLE FOR
POWERBOOK 160/180
& DUO 210/230
4•6•8•10 MEG****SUPERMAC**

Spect. 24 PDQ plus	\$1644
Spect. 24	\$999
Spect. 8.24	\$575
Spect 8	\$499
Monochrome Card	\$349

Supermatch

21" 2 Pg	\$2725
20" Trin	\$2474
20" D.Trin	\$2449
20"	\$1489
17" Mult	\$1079
17" Trin	\$1075

Platinum

21" 2 pg	\$999
20" 1 f. pg	\$899

ASANTE

MC3NB	\$209
MC+II E64	\$169
MC+II ET64	\$169
MC3 II SI	\$209
MC+LC II	\$209
MC3 SE	\$209
EN/SC	\$319
Friendly net Adapters	
all types	\$99
10T HUB/12	\$499
10T HUB/8	\$259

800-486-2447**FAX (714)847-5043**

7911 Professional • Huntington Beach, CA 92648

7AM TO 7PM
MON-FRI
9AM TO 3PM
SAT

Prices reflect specials only. Call for complete catalog. American manufacturers upon request. Prices subject to change.

Corporate PO's Government PO's
Educational PO's Dealer PO's**Lifetime Warranty!****Highest Quality
Same Day Shipping**

VISA

MasterCard

American Express Card

DISCOVER

MAC Xtra is STAMPING OUT HIGH COSTS!

MEMORY UPGRADES

1x8x80	30
1x8x70	32
1x8x100	28.50
2x8x80	59.50
2x8x70	61.50
4x8x80	115
4x8x70	117
4x8x80 II/II	125
4x8x70 II/IIx	127
8x8x80	279
16x8x80 (High profile)	470
16x8x70 (Low profile)	555
1x8x80fx	33
1x8x70fx	35
4x8x80fx	117
4x8x70fx	119
8x8x80fx	269
16x8x80fx	495

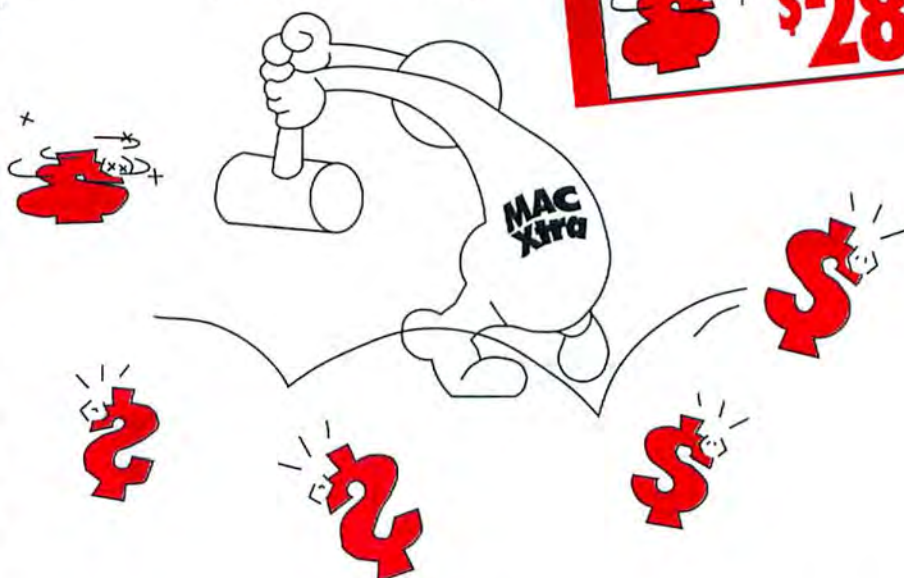
Classic Expansion Cards

1MB	47
3MB	112
512K VRAM	49
256K VRAM	27
1x9x70	39.75
4x9x70	135
TI Microlaser Upgrade	40
Tool Kit (Simms Inst.Kit)	7
Tool Kit (PowerBook)	6.50

SYQUEST CARTRIDGES

SyQuest 44MB Cart	63
SyQuest 88MB Cart	99

(Formerly MAC EXPRESS)



POWERBOOK MEMORY

PB100/140/170-2MB	80
PB100/4MB	189
PB100-6MB	241
PB140/170-4MB	169
PB140/170-6MB	210
PB160/180-4MB	204
PB160/180-6MB	290
PB160/180-8MB	369
PB160/180-10MB	439
PBDUO 210/230-4MB	215
PBDUO210/230-8MB	399

SHIPPING

Overnight Delivery:\$7
UPS:\$6

International Orders

Phone: (206) 455-0786
Fax: (206) 455-3448

24 Hours a Day

CALL: 1-800-553-4230

We accept MasterCard, VISA & Discover

Prices subject to change

Returns subject to approval and restocking fee

To enhance our identity and avoid confusion, MAC EXPRESS is now MacXtra. We will honor all warranties given under our previous name.

1075 Bellevue Way N.E., Suite 114 Bellevue, WA 98004
Phone: (206) 455-0786 Fax: (206) 455-3448

MAC Xtra



Memory Upgrades

MEMORY

CALL US LAST FOR LOWEST PRICES ON ALL MAC MEMORY, 1MB TO 16MB. ALL POWER BOOKS & DUO DOCKS LIFE TIME WARRANTY M.C., VISA & DISCOVER P.O.'S WELCOMED

1-800-662-SIMM (7466)
SERVING THE INDUSTRY SINCE 1963

DATA MEMORY SYSTEMS
508-683-2325 FAX 508-975-5232

CIRCLE 447 ON READER SERVICE CARD

Monitors

NEW



\$1295

20" MultiSync Color Monitor

Mac or IBM compatible
72dpi (1024 x 768)
82dpi (1152 x 870)

1 Year Warranty
30 day money-back guarantee

510/838-1031 Phone
510/838-0689 FAX

Dealer Pricing available

CIRCLE 412 ON READER SERVICE CARD

Reach
500,000
Shoppers
in the
MACWORLD SHOPPER®

9-Track Tape Subsystem For the Macintosh™



Exchange data files between your Macintosh and any mainframe or mini-computer using IBM compatible 1600 or 6250 BPI 9-track tape.

Unit can also be used for disk backup. Transfer rate is up to 16 megabytes per minute via your SCSI interface. Subsystem includes, tape drive, software, and complete documentation. For more information, call us today!

QUALSTAR®

9621 Irondale Avenue
Chatsworth, CA 91311
FAX: (818) 882-4081
Telephone: (818) 882-5822

Macintosh is a trademark of Apple Computer, Inc.

CIRCLE 436 ON READER SERVICE CARD

us radius radius radius

MONITORS

PrecisionColor/20S\$2287
TPD 19"/TPD 21"\$865/\$1113
Full Page Display\$555

COLOR CARDS

Precision 8X/24XP\$469/\$475
Color Pivot Interfaces\$475
PowerView\$479

ACCELERATORS

Rocket 25i/33\$1190/\$1980

NEW PRODUCTS

Pivot/PrecisionColor Pivot\$669/\$919
VideoVision w/ Adobe Premiere\$1875

SPECIALS

24X & PrecisionColor/20S Bundle \$3250*
PrecisionColor 8X/24X card ..\$665/\$999*
21" Color Monitor\$2150
Color Pivot & Color Int. (new)\$1299

MACS, INC.

* Call for details
Interested in products not listed?
CALL US FOR THE BEST PRICES
AVAILABLE ANYWHERE!
SAME DAY SHIPPING

(505)345-7112
24 Hour Fax Line (505) 345-7075

CIRCLE 437 ON READER SERVICE CARD

Peripherals

SUPER DRIVES SOURCE

QUANTUM		FUJITSU		SYQUEST	
ELS42S	\$179.00	LPS105S	\$269.00	425MB	\$869.00
ELS85S	\$219.00	LPS120S	\$319.00	520MB	\$975.00
ELS127S	\$279.00	LPS240S	\$449.00	1.2 GIG	\$1499.00
ELS170S	\$319.00	LPS525	\$999.00	2.0 GIG	\$2499.00
PD425S	\$869.00	G040S	\$249.00		
PD700S	\$1199.00	G080S	\$369.00		
PD1050S	\$1399.00	G0120S	\$489.00		
PD1225S	\$1649.00				

MEMORY UPGRADES

IMX8 70ns	\$32.00	2MX8 70 ns	\$72.00
4MX8 70ns	\$129.00	256X8 80 ns	\$10.00

MACINTOSH, PERFORMA, QUADRA, POWERBOOK
POWERBOOK DUO, LASERWRITER

CALL FOR CONNER, MAXTOR, MICROPOLIS, SEAGATE, RADIUS, RASTEROPS, SUPER MAC

COMPUTERS 4 LESS INC.

1-800-466-5782

FAX: 1-714-634-0409

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

Turn back.

Epson® now makes color scanners.

Call 1-800-BUY-EPSON
ask for representative 76

CIRCLE 422 ON READER SERVICE CARD

Increase your Reach, Increase
Your Sales and Hit Your Market
in the **MACWORLD Shopper®**

Peripherals

Printers

ERGONET, Corp.
2525 Winter St. N.E.
Mpls., MN 55413

ERGONET™

800-982-1453

Fax: 612-623-4796
Tech Support: 612-623-4691

FUJITSU

45 MB LPS	165	225
520 MB.....	895	995
1.2 Gig 3.5"...	1685	1745
2.06 Gig.....	2225	2325

CONNER

85 MB LPS	235	295
212 MB LPS	365	425
540 MB	885	945

Quantum PowerBook Drives

14"

Sony 1304s Trinitron.....	655
Seiko 1445 Trinitron.....	499
Sony 1320 Trinitron.....	395
CTX Color.....	305

17"

Sony 1604s Trinitron.....	1095
Seiko 1760LR Trinitron.....	895
GoldStar 1620 Color.....	755

All The Latest Mac Computers

Hours: Mon. - Fri. 8:00 am - 6:00 pm
Sat. 10:00 am - 2:00 pm CST

20"

NEC 6FG.....	2395
Sony 1936 Trinitron.....	2175
Seiko 2070LR Trin.....	1895
PinPoint 2000 Trin.....	1895
Hitachi 2085 Color.....	1395

True Dual/Full Page

21" RasterOps 211.....	975
Sigma Designs.....	456
RasterOps video.....	435

30 Day Money-Back

CIRCLE 450 ON READER SERVICE CARD

Printers

GCC BLP Elite.....	1255
Hewlett Packard 4M ..	2095

Scanners

Sharp JX320.....	995
Umax UC-630.....	1095
Umax UC-840.....	1255
Umax UC-1200.....	2925

Optical Drives

Ricoh 128 MB.....	1145
Fujitsu 128 MB.....	1145
Ricoh 600 MB.....	2065
Maxoptics 1.0 Gig.....	3195
Archive 4320 Dat.....	1249

MAC PRINTERS!

QMS • Newgen • HP

QMS 860/600dpi	\$ 4095
QMS ColorScript 210	4345
QMS ColorScript 230	6995
Newgen PS 1200B/1200dpi	4575
Newgen PS 660B/600dpi	3795
Newgen PS 880/800dpi	3275
Newgen PS 400P/400dpi	1695
HP LaserJet 4M/600dpi	Call

Serving your computer needs for over 10 years!

U-PUBLISH Call Today!

Tel. (619) 292-8066 Fax. (619) 292-5167

Orders: 1-800-233-3368

CIRCLE 415 ON READER SERVICE CARD

Software

Astrology

Bar Code

Predict The Future!

With **Io Forecast**—a powerful Transit Interpreter. Produces amazingly accurate predictions for any time period. The ideal tool for professional astrologers and serious students. Satisfy your curiosity. Astonish your friends! Only \$199.⁵⁰ plus shipping. (Call for FREE catalog).

Time Cycles Research

27 Dimmock Road Waterford CT 06385

Voice (203) 444-6641

Fax (203) 442-0625

CIRCLE 411 ON READER SERVICE CARD

BAR CODES

- Labeling Software — Bar Codes, Images, Text — Flexible Design
- Complete — Nothing Else to Buy
- Code 39, UPC/EAN and PostNet
- Not HyperCard Dependant
- Simple, Easy-to-Use, Plug & Play

WORTHINGTON
DATA SOLUTIONS



* WORTHINGTON DATA *

- 42 PostScript Type 1 Fonts.
- Generate film masters from PageMaker, Illustrator, Quark, WriteNow, etc.
- \$199 includes Labeling Program and Fonts
- 30 day money back guarantee

800-345-4220 OR 408-458-9938

Bar Code

The Experts' Choice

FOR BAR CODE
GENERATION

FOR LABEL PRINTING

MacBARCODA

- Generates bar codes in EPSF
- Compatible with all the popular page-makeup packages
- UPC, Code39, Interleaved 2of5, EAN, ISBN and ISSN
- All the vital features necessary for quality bar code production
- Full control over magnification, truncation and bar width reduction
- Automatic check digit verification
- No messing with fonts or film



Acknowledged as the
best by imagesetter
manufacturers and
end users in 35
countries of the world.

ComputaLabel

ComputaLabel Inc., 28 Green St. Newbury MA 01951 Tel 800-289-0993 Fax 508-462-9198



- Postscript® label printing package
- Any label size & sheet layout
- Create labels using text, PICT & EPS graphics, bar codes and lines
- Incrementing bar codes & numbers
- Variable content and quantity
- Imports from ASCII text files
- Bar codes include UPC, Code128, Code39, EAN, Postal Codes & ISBN

CIRCLE 544 ON READER SERVICE CARD

Keystrokes to Bar Code ...in seconds!



"This is the best product of its kind, and it's reasonably priced too."
★★★★½ —MacUser review

- Special added value... now includes a full featured professional labeling program!
- Code 39 • ISBN • POSTNET/FIM Interleaved 2 of 5 • UPC/EAN
- Fonts compatible with virtually any Macintosh® application

Call the Bar Code Experts

Bear Rock TECHNOLOGIES 800 232-7625

4140 Mother Lode Dr. Ste. 100 • Shingler Springs, CA 95682
916 672-0244 • Facsimile 916 672-1103

BBS

TeleFinder™
GROUP EDITION BBS

The leading Macintosh Bulletin Board System in business and education. First in quality and performance. "The most useful BBS we've seen" *MacUser (UK)*.

- Multi-user, E-mail, ZMODEM file transfer, conferences, find file, and graphic user interface.
- Use modem or AppleTalk with NetConnect.
- Supports Mac and PC users.
- Comm Toolbox and System 7 savvy.
- TeleFinder is \$425.95 for unlimited users. Includes host and user communication software. Call for free demo!

Spider Island Software

4790 Irvine Blvd #105-347 Irvine, CA 92720
tel (714)669-9260 fax (714)669-1383
bbs (714)730-5785

CIRCLE 435 ON READER SERVICE CARD

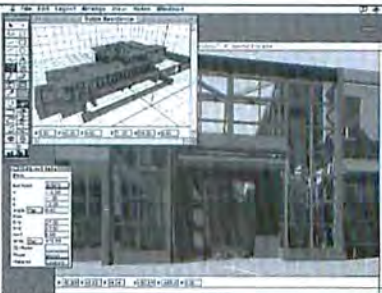
CAD/CAM

DesignWorkshop™
Intuitive 3D CAD

- Sketch in live 3D perspective with 3D crosshair
- Dynamic 3D viewing, fast shading, sections
- 3D direct manipulation means 75% fewer commands
- Floating-point precision with Mac-style ease of use
- Create, move & resize openings as easily as rectangles
- Import/export Claris CAD, ArchiCAD 3D, DXF, etc.
- 32 bit color, QuickTime sun studies, walkthroughs
- The fastest legal way to model your project
- Only \$895, with 90 day satisfaction guarantee
- Call 503-345-7421 or fax 503-346-3626

Artifice, Inc. Box 1588
Eugene, OR 97440

CIRCLE 413 ON READER SERVICE CARD



Clip Art

Logo
Design
Software

Logo SuperPower™ is a large graphic database. You use one or more "design elements" and modify them to create world-class logos like those shown here in minutes. There are over 2,000 design elements in 4 modules.

SuperPower (660+ design elements).....\$119
Upgrade 500 (500 new design elements).....\$99
Upgrade 450 (450 more new elements).....\$89
Upgrade 400 (400 more new elements).....\$79

Buy any portion, or buy them all for just \$279.00.
Buy 1 now - buy the rest within 30 days - get all for \$279

For the Mac: Requires Illustrator or FreeHand.
To order, or for information, call
(800) 648-5646

Decathlon Corp. • 4100 Executive Park Dr.
Cincinnati, OH 45241
Phone (513) 421-1938

CIRCLE 533 ON READER SERVICE CARD

CAD/CAM

Design & Drafting
CAD Symbol Libraries2D / 3D
&
Isometric

- Symbols Front/Slide/Top & Isometric Views
- Residential
- Commercial
- Architectural
- Site Planning
- Fire Protection
- Stage Lighting
- Interior Design
- Electronic Parts
- Restaurant Design
- Night Club Design
- Dance Floor Lighting

• MinCAD™
• Blueprint™
• MacDraw II™
• PICT/EPG

Design & Drafting Services
Phone (708) 499-0107
P.O. Box 464 Oak Lawn IL 60453

CIRCLE 414 ON READER SERVICE CARD

Professional
CAD Symbol Library

Over 3,000 CAD Symbols in One All-Inclusive Package
Architectural (Residential & Commercial), Interior Design & Site Planning, The "Plumbing & Heating Supply House", The "Hardware Store", The "Electronics Shack", Welding, General Drawing Aids, Cartographic, 180+ Page User's Manual, And Much More, All for \$149.95!

Advanced System Design, Inc.
1210 Stagecoach Blvd., P.O. Box 3131
Evergreen, Colorado 80439
(303) 674-2222 to Order
Compatible with
• Claris CAD™
• MacDraw II™
• PowerDraw™ and
• Canvas™

CIRCLE 409 ON READER SERVICE CARD

Introducing a New Concept in Font Format 520 Original Images
Vol. 1: Ornaments ♦ Vol. 2: Corners ♦ Vol. 3: Art Deco ♦ Vol. 4: Images
Use in any program that supports font menus
Scalable to any size your program allows
Open/modify outlines in Freehand or Illustrator
Call for Brochure or Send \$10.00 for Sample Disk
P.O. Box 25676 Los Angeles, CA 90025 310 444-9934 FAX 310 444-7897

CIRCLE 448 ON READER SERVICE CARD

An Introductory Offer From NETWORK WORLD

**Because In Your Job, A
Picture Is Worth Much
More than 1,000 Words.**

- The first clip-art library created for networking and computer professionals
- Over 170 professionally drawn symbols for Computing, WANs, LANs, Telephony, Personal Computing and Patching and Cabling
- Works with many drawing programs for the MAC including MacDraw®, Canvas® and SuperPaint®
- PICT symbols can be pasted into a variety of word processing, page layout and presentation documents
- Also available for DOS and Windows
- Offered at the low, introductory price of \$99.95

Clip Art for Building Networks™
NetDraw

Call 800-643-4668 To
Order Today!

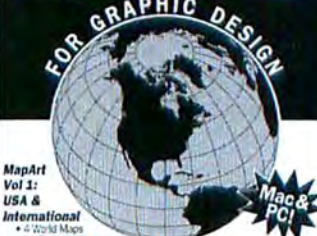
CIRCLE 461 ON READER SERVICE CARD

Your Exclusive Source for
Native American & Southwest
Clip Art for Mac & PC - featuring
500 Images & 125 Borders!

THE SANTA FE
COLLECTION

Entire Collection
EPS - \$179
Paint - \$49
Sampler - \$15
Call about our
FREE Mousepad offer:
800-245-7824
RT Computer Graphics
602 San Juan de Rio
Rio Rancho, NM 87124
Tel (505) 891-1600/Fax (505) 891-1350

CIRCLE 458 ON READER SERVICE CARD

MAPS
FOR GRAPHIC DESIGN

MapArt
Vol 1:
USA &
International
• 4 World Maps
• 14 Regions (Europe, Africa, SE Asia, etc.) with country borders, names, & major cities
• 30 Countries with state or province borders, names & major cities
Over 5 mb on Disk or CD-ROM! EPS or PICT

MapArt Vol 2: US States by County
All 50 states and 3,000+ counties with state lines, county lines & names. EPS or PICT

MapArt Vol 3: Global Perspectives
15 views of the globe. EPS or PICT

MapArt Vol 4: Metro Areas - USA
25 US metro areas with metropolitan, racial, airports, etc. EPS only

MapArt Vol 1, 2, 3, & 4 Bundle!
All 4 volumes listed above in EPS format. Available on Disk or CD-ROM!

Call for FREE 16 Page
Illustrated Catalog: **800-334-4291**

Cartesia Software 5 South Main Street, PO Box 757
Lumberton, NJ 08030 • Voice: 908-397-5812 • FAX: 908-397-5724

FOR PROMPT RESPONSE PLEASE CALL OR FAX US DIRECTLY

CIRCLE 417 ON READER SERVICE CARD

Clip Art

LifeART™ Collections
Professional Medical Clip Art

Full Color & B/W Collections!

- Editable in MacDraw & SuperPaint
- FREE file translation utility provides EPS, PICT Vector & PICT Raster in every Collection

Over 2000 Medical and Health images available!

Collections starting at \$89.00 for 150 images

FREE Catalog
800-777-8930

TechPool Studios
Cleveland, Ohio
Phone: 216-291-1922
Fax: 216-382-1915

CIRCLE 415 ON READER SERVICE CARD

NEW! (in color!) **ARTBEATS**

Marble & Granite

40 hi-res TIFF images, 120 PICT images, 160 seamless tiles and floor tiles. Double CD-ROM-\$349

800-444-9392 or 503-863-4429

ARTBEATS, Box 1287, Myrtle Creek, OR 97457

Perfect Body Parts.
99¢ Each.

MediClip... the first complete medical anatomy and art library for your MAC or IBM.

- Available in high quality EPS and all major formats
- 3 volumes of 100 images for only \$99 each

1-800-998-8705

MediClip™

This offer not valid through retail outlets.

CIRCLE 431 ON READER SERVICE CARD

Cooking

Digital Gourmet

MacUser Rated Top 100 Gift Software. 1000+ recipes easy to use, incl. index, glossary of cooking terms, nutritional content such as calories, sodium, fat; add untd recipes, find, modify recipes. Other ethnic and specialty cookbooks: Lactose Free, Kosher, Greek, African, etc. avail. Also, Complete Works of Shakespeare & 5000 Quotations. Macintosh (incl. Hypercard) & IBM (DOS). TeleTypesetting Co. /Books-On-Disk 311 Harvard Street Brookline, MA 02146

800/800-3333 MacConnection
617/734-9700 Direct
617/734-3974 Fax

"I saw it in Macworld!"

Custom Development

THE **d.i.d.CIRCLE®** ORGANIZATION

Custom development with 4th Dimension®.

There is nothing better than the combination Macintosh, 4th Dimension and our specialist skills for larger corporate or institutional computer projects. Our realizations, both stand alone as well as client-server networks, show clearly that nothing can beat superior technology combined with our software analysis fine-tuned to a specific environment. Commercial, financial and administrative systems, but also process and production control, point of sale, bookings and reservation systems etc. etc. If you send us your project specifications we will be pleased to make a free costs estimate. On hourly fee basis we are also able to come and discuss with you your requirements. World wide intervention.

U.S.A.: (1-703-) 869.8709 *
FRANCE: (33-) 93.18.90.47
GREAT BRITAIN: (44-71-) 410.0930 *
JAPAN: (81-3-) 5562.9042 *

* Wait for connection (automatic machines 30 sec pauses), then enter subscriber ID 524 8724 ##. Do not forget the two ##.

CIRCLE 472 ON READER SERVICE CARD

Communications

IBM 3164 and VT 100 ...
File Transfer and Terminal Emulation for the MAC

MAC TO PC • MAC TO MAC • MAC TO MAINFRAME

800-262-RCOM
808-329-6646

CONNECT TO THE IBM WORLD

CVI
Computer Vectors, Inc.

NOW WITH IND\$FILE

FREE TRIAL
Small charge for \$41

CIRCLE 513 ON READER SERVICE CARD

Databases

Inside 4D™ v1.0 (New!)

The Ultimate On-line Reference Guide to the 4th DIMENSION® programming language. Example code, description, syntax for all 4D commands. Find commands in an instant. Copy example code to 4D procedures. ASCII tables, etc. For all 4D users, beginners/pros. Increase your Productivity NOW! ONLY £69.95 (Sterling) + shipping. Trade enquiries welcome.

Mackenzie Associates
P.O. Box 53, Stockton, Cleveland
TS19 8XU, England
+44-642-634-600
+44-642-769-977 FAX

Entertainment

Sailing Master™

A Regatta on your Macintosh



Race against your Mac. Learn sailing concepts. If you like flight simulators or golf games, you'll enjoy **Sailing Master**. \$59 + \$4 s/h. 313/662-4393, FAX: 313/662-0425. Starboard Software
Box 130014 • Ann Arbor, MI • 48113

CIRCLE 476 ON READER SERVICE CARD

Fonts

PostScript® Fonts

Mac/PC; Disk/CD-ROM

All the popular libraries & the hard-to-find.

Adobe: 40% off

excluding Balthus fonts

800.942.9110



FontHaus is an authorized reseller for more than 35 PostScript libraries including our own FoundryExclusives. Free delivery available. Catalog: \$5. American Express & C.O.D. is accepted. Fax: 203.849.8527

CIRCLE 418 ON READER SERVICE CARD

Genealogy

Family Heritage File™

New Version 3.0! Most powerful and easy genealogy program on Mac. Rated "BEST" by Macworld. Designed by genealogy professionals. •Enhanced •Fully Relational •Graphic Pedigree, Family Group, Individual, Marriage, Surname •Unlimited History •Sorted Lists •Export to WP/data base/modem. \$149 + 5 s/h. Call for Family Heritage Bundle. Also, new Jewish Version. Visa/MC. Demo \$7. Free Lit Pak. **StarCom Microsystems**
Windsor Park East
25 West 1480 North
Orem, UT 84057
801/225-1480

Educational

THE ABSOLUTE BEST IN TESTING!

LXR-TEST™ 4.1 is the most advanced and complete testing system available for your Mac!

- Item banking
- Character styling w/tabs
- Test generation
- Scoring & analysis
- Paper & interactive
- Mark reader support
- Commercial banks
- Full graphic placement
- Database selection
- Compatible gradebooks
- Student mastery
- Spelling checker

Highest rated software available in various editions to match your testing needs. Fully guaranteed! Pricing from \$149. For complete brochure & free preview disk: call, write, or fax:

Logic eXtension Resources
9651-C Business Center Drive
Rancho Cucamonga, CA 91730
(714) 980-0046 Fax: (714) 987-8706

CIRCLE 407 ON READER SERVICE CARD

BEST EDUCATION SOFTWARE: 800-669-6574

MAKETEST® organizes questions & prints tests quickly.
MATHMAKER FONTS™ type equations & number lines.
CLASSMASTER™ makes grading and attendance easy.
PLAN TO TEACH™ simplifies lesson planning.
also: HyperCard Projects for Teachers, clip art & more

298 FOURTH AVE. N° 401, SAN FRANCISCO, CA 94118 • FAX: 415-752-6506 • **FREE DEMOS**

CIRCLE 478 ON READER SERVICE CARD



MACGrade
CalEd Software
P.O. Box 22913, Carmel, CA 93922
or call (800) 795-0641

Take the work out of GRADING!

Save time and energy with MacGrade, the powerful grade manager that's fast, fun and exceptionally easy to use. And it's the only grading program available that makes full use of the power of your Macintosh. **30 Day Money Back Guarantee.**

\$85.00 (CA add \$6.17 tax)
MC/VISA

CIRCLE 406 ON READER SERVICE CARD

Say you saw it in the shopper

Font Reference Guide

The Precision Type Reference Guide 150+ pages of displays, information and pricing for thousands of fonts. **\$6.95**

Prices discounted up to 40% off list. The \$6.95 cost is refunded with your first order.



The Complete Font Software Resource
800.248.3668
47 Mall Drive
Commack NY 11725
\$16.864.0167

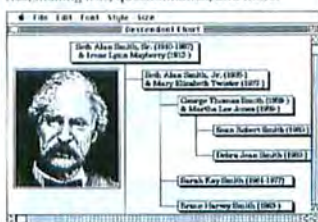
Use Visa, MasterCard, AMEX or Discover for your Reference Guide order.

CIRCLE 485 ON READER SERVICE CARD

Genealogy

REUNION
the family tree software

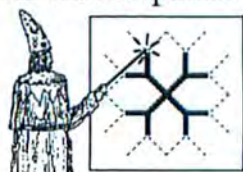
Reunion quickly organizes your family information and images, links and displays color and grayscale pictures, identifies relationships, creates large graphic charts, family group records, family histories, mailing lists, questionnaires, and more.



To order, call MacConnection @ 1-800-334-4444. For a brochure & sample printouts, contact...

Leister Productions
P.O. Box 280, Mechanicsburg, PA 17055
phone 717-697-1378 — fax 717-697-4373

Graphics

Enter the world of Expansions™

- Create, interact & use amazing growing patterns.
- Recreational & educational.
- Expansions reveals heretofore unknown natural order. 30 day money-back guarantee.
- Only \$55 Visa/MC.

"Absolutely wonderful" "The patterns are truly remarkable" "Great manual" "One of the best written programs" "Robust"

800-2-PIXEL-P
619-294-8666

Pixel Pathways

405 W. Washington St. #67 San Diego, CA 92103 USA

CIRCLE 432 ON READER SERVICE CARD

Graphic Translators

Some Translators Are A Waste of Your Time

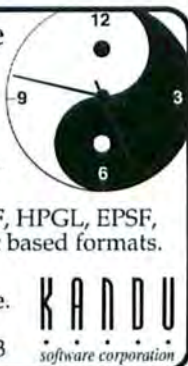
Don't Get Frustrated... Get CADMOVER®

CADMOVER won't lose your graphic's line weights, crush its layers, gloss over its text or complain that your file is too large.

Quality results are available via IGES, DXF, HPGL, EPSF, CGM, Gerber*, DDES2* & a variety of Mac based formats.

Easy to use...
accurate...effective.

Call 703. 532. 0213



CIRCLE 549 ON READER SERVICE CARD

Languages

MACTRAN PLUS Ver. 4.5

Sys. 7 Compatible INTEGRATED Made-For-Mac Development System. Incl: Editor, Optimizing Compiler, Source level Debugger, Linker, Library Manager, Profiler and Build facility. Supports 68020/030/040 & 68881/2 native code. Significant Vax Fortran & ANSI 8x ext. Hi & Low level tool box interface. Unltd. code segment size. "I believe you easily have the best FORTRAN compiler for Macintosh," Bill White, Texas A&M University. "You have made a number of major improvements that are significant, and it becomes the best FORTRAN Compiler for the Mac." Byron Palmer, Los Alamos Natl. Lab. DCM Data Products, 610 One Tandy Center Fort Worth, TX. 76102 817/870-2202 817/336-2416 Fax

Maps

Announcing a powerful new map drawing program

Geocart

- Over 100 different projections.
- It comes with detailed databases of the world coastlines, rivers, lakes, international borders, provinces, and U.S. states & counties.
- Export base maps for use with other programs.



Terra Data Inc. (212) 675-2971
Bramblebush, Croton-on-Hudson NY 10520

CIRCLE 408 ON READER SERVICE CARD

Hypercard

What speaks, conjugates, tutors and tests foreign languages on a Macintosh?

MacFlash Cards 2.0
The most advanced Language Software Program available

Call or write for a FREE brochure
The Language Quest Software Co.
101 First St. Suite 428
Los Altos, California 94022
Czech & Cyrillic fonts at low prices!
800-622-3574/415-941-6383
FAX 415-941-6119

CIRCLE 451 ON READER SERVICE CARD

Language

BASIC COMPILER

FutureBASIC™

- Editor, Compiler, Source-level debugger
- System 7.x compatible - 32-bit clean
- Writes double-clickable Mac applications
- Creates INTTS, CDEVs, XCMDs, DAs, ...
- Comparable in speed to C and Pascal
- Light-years ahead of QuickBASIC™
- Includes QuickBASIC conversion utility

For more information or a brochure call

800.482.4567

ZEDCOR, 4500 E. SPEEDWAY #22, TUCSON, AZ 85712
602.881.8101 - FAX 602.881.1841

FUTUREBASIC is a trademark of ZEDCOR, Inc. QuickBASIC is a trademark of Microsoft Corp.

CIRCLE 473 ON READER SERVICE CARD

FORTRAN 77 • System 7

Language Systems FORTRAN is an ANSI/ISO standard FORTRAN 77 compiler with System 7 features. Supports extensions from VAX and Cray FORTRAN, built-in debugging, background execution, MPW integration, and optimized code generation for all Macintoshes. The complete solution to your FORTRAN programming needs. Language Systems Corp. 441 Carlisle Dr. Herndon, VA 22070-4802 703/478-0181 703/689-9593 Fax 800/252-6479

Lottery

Great NEW Lotto Products!

MacLotto® - In its 4th WINNING YEAR! With \$8.4 Million already won...Covers every Lotto & Keno on Earth! We are Proud to Introduce. The Daily Number Machine - MacLottery® covers Every Pick 3 & Pick 4! MacLotto® is \$99. MacLottery® is \$99. Purchase them both for \$148 Save \$50. +3 FREE Issues Lottery Player Mag. All Lottos, Keno's and All Macintoshes! U.S. Math Labs - (Yes, System 7.0) 18 Main Street Concord, MA 01742 800/PLAY-SIX - Mastercard/Visa 508/653-9193 - Fax 617/431-5922 - Direct

Medical

Care4th™ for Clinicians

A complete and intuitive electronic medical record and clinical database environment in use nationwide from solo

practice to the NIH. Features alerts, reminders, To Do List, and much more. Starting around \$1000, single & multi-user.

If it's in your charts, you can do it better with Care4th™.

Med4th Systems, Ltd.
716 East Carlisle Avenue
Milwaukee, WI 53217
(414) 963-1985 Voice/Fax

TessSystem™: Ins/Billing

Wabash's state-of-the-art software for medical office mgmt. is competitively priced and outperforms any other on the market! Toll-free customer support. Enhanced features include electronic claims and multi-workstation networking. Aggressive enhancement schedule includes quarterly updates. Have TessSystem™ delivered to your office for as little as \$80/mo.! Call for lit. & DEMO! Wabash Medical Resources, Inc. 8335 Allison Pointe Trail, Suite 260 Indianapolis, IN 46250 317/579-5900 ph. or -5901 Fax 800/477-5902

Call

800.888.8622

to reserve your space in the MACWORLD Shopper® today!

For your ad to appear, call
800.888.8622

**MACWORLD
SHOPPER®**

Music/Midi

Music For The Mac
The full scale of Products

- From instructional music software, like our own Compose Yourself; to the intricacies of Hard Disk recording.
 - Authorized dealer for Apple, Coda, Digidesign, Dr. T's, Mark of the Unicorn, Opcode, Panasonic, Roland, and more.
- Expert advice before you buy, and full tech support after you purchase!

Mac BEAT

1314 Ruffina Circle A4
Santa Fe NM 87501Call the Experts at:
1-800-MAC-BEAT or
505-473-4929 fax: 505-473-4647

Free Catalog Available!

Religion

Bible Master v3.0

NASB, NIV, KJV Greek/Hebrew transliterated Dictionaries. The best computer Bible software available. Uses a standard MAC interface. Fast, flexible and sophisticated but easy to use. Easily transfer verses to your favorite word processor. Great discount prices! Free information! 30 Day money-back guarantee!

American Bible Sales
870 S. Anaheim Blvd.
Anaheim, CA 92805
800/535-5131

Scientific

RockWare

Scientific Software

For the largest selection of specialized and hard to find scientific software applications send for your

FREE CATALOG

Over 300 programs for the PC & Mac!
RockWare 4251 Kipling St., Suite 555
Wheat Ridge, CO 80033
(303) 423-5645 • FAX (303) 423-6171

Property Management

Mac Landlord \$399

Upgraded version 2.2 now available. Still the Easiest-to-use property management program for multiple properties & unlimited units. Includes tenant and unit records, recurring income and expense, check writing, checkbook balancing, printing tenant notices, income and expense ledgers, and much more. Free telephone support. Demo for \$25, credited to purchase.

Labana Management Company
P.O. Box 2037
Dearborn, MI 48123
313/562-6247

Religion

ROLL CALL

Church Management Software



ROLL CALL, featuring the power of 4th DIMENSION®, is a premier shepherding tool providing church leadership with a full range of management capabilities.

- Attendance • Visitation Mgt. • Directories
- Personal Records • Pledges • And More!

ORDERLINE: 1-800-554-9116

\$495 Comprehensive Package / Demo \$10

By The Numbers • RR1, Box 75
Sutton, NH 03221-9301 • 603-927-4508

NUMBERS

Church Data Master Plus now for Macintosh or Windows / CDM+ is the only comprehensive church data management program for either Mac or Windows. Available as single modules or integrated. Membership, Contributions and Accounting. Priced from \$265. Full featured demo with video \$10.

Computer Helper Publishing
5898 Cleveland Avenue
Columbus, OH 43231
800/533-5227
614/895-7071

Sales Marketing

Sell More, Work Less!!!
MARKET MASTER AUTOMATES the sales follow up you don't have time for and keeps the contacts happening! More than a mere contact manager, it's a SALESLEAD HANDLER! You get unmatched simplicity and maximum control. Versions available for one rep or a whole sales force! Six years on the market - everything works. 30-Day money-back guarantee. Demo Disk \$10

Breakthrough Productions
210 Park Avenue
Nevada City, CA 95959
916/265-0911
916/265-8036 Fax

Shareware

FREE SOFTWARE
FOR THE
MACINTOSH

**Fonts • Games
Clip Art • Kids
Home and Business**

On 3/3.5" Disks
PAY A SERVICE CHARGE OF
ONLY \$2.95 PER COLLECTION
CREDIT CARDS ONLY

Software of the Month Club
619-931-8111
Ext. 511

Satisfaction Guaranteed Since 1985

Real Estate

Management

Streamline Checks, Receipts, AP, AR, GL, Invoices, Tenant Statements, Cash Flow, Balance Sheet, Notices, Letters, Envelopes, Mailing Labels.

• Property Manager \$495/995

Transoft Corp

Analysis

Instantly Calculate Cash Flow, Financing, Depreciation, Amortization, Income Taxes, Profitability, Comparisons, IRR, Net Present Value & More.

• ProAnalysis \$295

800-949-6463

Farming

Efficiently Track Clients, Properties, FSBO's, Forclosures & Listings, Integrated Word Processor Personalizes Letters, Envelopes & Mailing Labels.

• Real Estate Edge \$395

Demos \$25

CIRCLE 429 ON READER SERVICE CARD

CIRCLE 487 ON READER SERVICE CARD

Say you saw it in the shopper

Services

Computer Insurance



SAFEWARE

INSURES YOUR COMPUTERS

Full replacement of hardware, media, purchased software. As low as \$49 yearly. Covers fire, theft, power surges, other accidents. Blanket coverage; no list of equipment needed. Call for information or immediate coverage.

1-800-848-3469
Local (614) 262-0559

SAFEWARE, The Insurance Agency Inc.
2929 N. High Street, P.O. Box 02211
Columbus, OH 43202

CIRCLE 522 ON READER SERVICE CARD

COMPUTER INSURANCE PLUS

- ✦ Replacement with no depreciation
- ✦ Covers computer hardware in home or office
- ✦ Easy to read policy
- ✦ Bonus 20% for software coverage
- ✦ Low \$50 deductible
- ✦ Covers theft, fire, power surges, accidents, natural disasters, even earthquakes and flood
- ✦ Policy backed by an A+ company

THE COMPUTER INSURANCE AGENCY, INC.
6150 Old Millersport Road, NE
Pleasantville, OH 43148

1-800-722-0385

CIRCLE 523 ON READER SERVICE CARD

Computer Repair

MAC REPAIR

Mac Shop Northwest

- Apple™ Certified Technicians
- One-Day Service Turnaround*
- Hard Disk Repair & Data Recovery
- Up to 75% below Dealer Rates
- Component-Level Repairs
- Expert Advice and Prices by Phone
- Power Supplies & Logic Boards
- Lifetime Repair Warranty*

Tel: 1-503-642-3456
*on many repairs. Visa/MC/AX. Fast overnight shipping available. We use genuine Apple™ parts.

1-800-MAC-SHOP

CIRCLE 515 ON READER SERVICE CARD

!!REPAIR BY MAIL

Real low cost, super fast turn-around. Mac Plus, Mac logic boards \$95+ parts; 1 yr. warranty. Plus and SE power sweep swap as low as \$59+ s/h; 1 yr. warranty. Drive repairs as low as \$35. Keyboard repairs as low as \$12.50+ s/h. New and used hardware for sale. School orders welcome. Open 12 noon-5, 6:30-10pm eastern M-Sat. We buy dead Apples, Macs, PCs. **Arminius Pubs. & Prods. Inc.** P.O. Box 1265/8519 Orchard Ave. Merchantville, NJ 08109 **609/662-3420**

Data Recovery



CPR has been recognized in national magazines for its data recovery techniques and the ability to repair SCSI drives. **Computer Peripheral Repair & Recovery Services, Inc.**

"Data Crash! ... We're Going In!!"

7570 S. U.S. Hwy. 1, Ste. 8 Hypoluxo, FL 33462 **800-765-9292** 407-586-0011 Ph 407-582-7921 Fax

CIRCLE 452 ON READER SERVICE CARD

"These guys get data out of Mac hard drives that software utilities haven't a prayer in recovering." —BMUG Fall 1992 Newsletter

DriveSavers.

Mac Data Recovery and Drive Repair. Optical, Removable, and PowerBook Specialists.

415-883-4232

30-D Pamaran Way, Novato, CA 94949



CIRCLE 510 ON READER SERVICE CARD

Desktop Publishing

WORLD WIDE SERVICE BUREAU

World Wide Press, Inc. • 801 River Dr. S. • Great Falls, MT 59405-4059
24-Hour BBS V.32bis Modem # **1-800-438-3869** 8-5 Mountain Voice # **1-800-548-9888**

Agfa SelectSet 5000 Imagesetter

Agfa Focus Scanner

AgfaProof System

AGFA

Agfa

Agfa

Agfa

Agfa

Located in Montana's FedEx hub city. Our shipping deadline is 8 PM. Rushes in by noon, out same day!

CIRCLE 405 ON READER SERVICE CARD

Computer Repair

HI-RES MONITOR REPAIR

Radius SuperMac E-Machines Sigma Designs
Mirror Mitsubishi Ikegami Monitorm

Most Full Page Displays • \$265
Most 19" Displays • \$345

5-day average turn-around on standard repairs
Visa • MasterCard • Discover

Ranked #1 in the
1992 Service News
Depot 100

Monitor Maintenance Corporation
27 Pacella Park Drive, Randolph, MA 02368 617-961-2600

CIRCLE 464 ON READER SERVICE CARD

Disk Duplication

DUPLICATION FROM \$.88 HIGHEST QUALITY MEDIA

Macintosh 3.5" DS/DD duplication starts at just **\$.88**. Prices go even lower as you continue to order!

- Duplication + 100% Verification
- Custom Labels/Sleeves/Mailers
- Custom Packaging & Assembly
- Colored Media Available
- Special Rates For Demo Software & Site Licensing
- Educational Discounts Available
- 24 Hour Turn-Around
- Guaranteed Products

800-255-3142

Diversified Systems Group, Inc.
PO Box 1114, Issaquah WA 98027

CIRCLE 496 ON READER SERVICE CARD

Education

B.S. & M.S. In Computer Sci.

The American Institute for Computer Science offers an in-depth home study program to earn your Bachelor of Science and Master of Science degrees in Computer Science at home. B.S. subjects covered are: MS/DOS, BASIC, PASCAL, C, File Processing, Data Structures & Operating systems. M.S. Program includes subjects in Software Engineering and Artificial Intelligence. **Amer. Institute for Computer Sciences** 2101 Magnolia Ave. Suite 200 Birmingham, AL 35205 **800-767-2427** 205-323-6191

**Mail Order can save
you time – and money**

Employment

Slides

Accessories

Cases

PROGRAMMER/ANALYST

The Miami Herald Publishing Co. is seeking a Macintosh support expert, knowledgeable in networking, communications and in C or Pascal programming. Must have Bachelors degree or 3-5 years of relevant work experience. Knowledge of QuarkXPress & graphics programs, postscript and prepress a plus. We offer an excellent benefits package and opportunity for advancement. Please send your resume and salary history to:

**The Miami Herald
Publishing Company**



Employment Office
Attn: Christine Kopesik
One Herald Plaza
Miami, Florida 33132-1693

An Equal Opportunity Employer

CIRCLE 438 ON READER SERVICE CARD

Slide Imagers

Overnight

\$4⁹⁵

Quality Guaranteed

Digital Output

- Color Slides & Overheads
- Canon Color Lasers
- Scanning Services

12-hour service standard. Send us your native files by 8 a.m. or Priority Federal Express, and we'll have the finished product back to you by the next morning. **CALL TODAY!**

The BEST Product,
Service, Technical
Support and Price!

(800)232-5411
(404)874-6740
22 7th St • Atlanta, GA 30305

CIRCLE 456 ON READER SERVICE CARD



A 55-YEAR
TRADITION

The Best Case Scenario Airline Check-in or Local Use
Zero Halliburton Aluminum Mac Cases: Lightweight, Durable, Distinctive Styling

Complete Selection
from \$299.95

1-800-542-4591 1-310-474-7152

TCC 13101 Washington Boulevard, #110, Los Angeles, CA 90066

CIRCLE 403 ON READER SERVICE CARD

Printer Supplies

TONER
LASER
QuipT[®]

Remanufactured cartridges for HP,
Apple, etc. Exchange Price

\$36.50

10300 Bren Road East
Minnetonka, MN 55343

VISA

800-777-8444 MC, COD

CIRCLE 421 ON READER SERVICE CARD

TONER!

New & Remanufactured
toner cartridges & other
supplies for laser printers!

RIBBONS!

New and Reloaded
ribbon cartridges for
impact printers!

ink jet refills!

- RECYCLE & SAVE up to 70% on printer supplies!
- Friendly service & great products for over 20 years.

CALL FOR FREE
SUPPLIES CATALOG

800-426-8196

We buy empty toner cartridges.



CIRCLE 445 ON READER SERVICE CARD

FOR ULTIMATE
PRODUCT PROTECTION!

Buy Reusable A.T.A.* Cases



"FREE"
Case
Catalog

When transporting anything
valuable or fragile, insist on the
Ultimate Product Protection.

★ STARCASE
(800)822-STAR
(800)782-CASE

CALL FOR PRICING

All major credit cards accepted

CIRCLE 558 ON READER SERVICE CARD

Covers

DUST COVERS

ALL FABRIC

- Heat Resistant, will not become stiff or crack with age! • Easy to Use • Machine Wash & Dry
- Highest Quality, Custom-Fit 1 • All makes & models • Custom orders • Tan, Navy, Royal, Red, Maroon, Grey, Brown or Black
- 100% Satisfaction Guaranteed!
- Outstanding service since 1983!

11-30 Mac Classic & Keyboard	24.95	10-85 Mac SE or II Ext Keyboard	9.95
10-74 Mac SE & Ext Keyboard	24.95	11-34 AppleColor 13" 16" 19" 24" 28" 32" 36" 40" 44" 48" 52" 56" 60" 64" 68" 72" 76" 80" 84" 88" 92" 96" 100" 104" 108" 112" 116" 120" 124" 128" 132" 136" 140" 144" 148" 152" 156" 160" 164" 168" 172" 176" 180" 184" 188" 192" 196" 200" 204" 208" 212" 216" 220" 224" 228" 232" 236" 240" 244" 248" 252" 256" 260" 264" 268" 272" 276" 280" 284" 288" 292" 296" 300" 304" 308" 312" 316" 320" 324" 328" 332" 336" 340" 344" 348" 352" 356" 360" 364" 368" 372" 376" 380" 384" 388" 392" 396" 400" 404" 408" 412" 416" 420" 424" 428" 432" 436" 440" 444" 448" 452" 456" 460" 464" 468" 472" 476" 480" 484" 488" 492" 496" 500" 504" 508" 512" 516" 520" 524" 528" 532" 536" 540" 544" 548" 552" 556" 560" 564" 568" 572" 576" 580" 584" 588" 592" 596" 600" 604" 608" 612" 616" 620" 624" 628" 632" 636" 640" 644" 648" 652" 656" 660" 664" 668" 672" 676" 680" 684" 688" 692" 696" 700" 704" 708" 712" 716" 720" 724" 728" 732" 736" 740" 744" 748" 752" 756" 760" 764" 768" 772" 776" 780" 784" 788" 792" 796" 800" 804" 808" 812" 816" 820" 824" 828" 832" 836" 840" 844" 848" 852" 856" 860" 864" 868" 872" 876" 880" 884" 888" 892" 896" 900" 904" 908" 912" 916" 920" 924" 928" 932" 936" 940" 944" 948" 952" 956" 960" 964" 968" 972" 976" 980" 984" 988" 992" 996" 1000	24.95
10-75 Mac SE & Ext Keyboard	24.95	11-23 Radius First Monitor	24.95
11-36 Mac IIx Computer Only	15.95	10-95 Radius T10" - 18"	24.95
11-37 Mac IIx 12" 14" 16" 18" 20" 22" 24" 26" 28" 30" 32" 34" 36" 38" 40" 42" 44" 46" 48" 50" 52" 54" 56" 58" 60" 62" 64" 66" 68" 70" 72" 74" 76" 78" 80" 82" 84" 86" 88" 90" 92" 94" 96" 98" 100" 102" 104" 106" 108" 110" 112" 114" 116" 118" 120" 122" 124" 126" 128" 130" 132" 134" 136" 138" 140" 142" 144" 146" 148" 150" 152" 154" 156" 158" 160" 162" 164" 166" 168" 170" 172" 174" 176" 178" 180" 182" 184" 186" 188" 190" 192" 194" 196" 198" 200" 202" 204" 206" 208" 210" 212" 214" 216" 218" 220" 222" 224" 226" 228" 230" 232" 234" 236" 238" 240" 242" 244" 246" 248" 250" 252" 254" 256" 258" 260" 262" 264" 266" 268" 270" 272" 274" 276" 278" 280" 282" 284" 286" 288" 290" 292" 294" 296" 298" 300" 302" 304" 306" 308" 310" 312" 314" 316" 318" 320" 322" 324" 326" 328" 330" 332" 334" 336" 338" 340" 342" 344" 346" 348" 350" 352" 354" 356" 358" 360" 362" 364" 366" 368" 370" 372" 374" 376" 378" 380" 382" 384" 386" 388" 390" 392" 394" 396" 398" 400" 402" 404" 406" 408" 410" 412" 414" 416" 418" 420" 422" 424" 426" 428" 430" 432" 434" 436" 438" 440" 442" 444" 446" 448" 450" 452" 454" 456" 458" 460" 462" 464" 466" 468" 470" 472" 474" 476" 478" 480" 482" 484" 486" 488" 490" 492" 494" 496" 498" 500" 502" 504" 506" 508" 510" 512" 514" 516" 518" 520" 522" 524" 526" 528" 530" 532" 534" 536" 538" 540" 542" 544" 546" 548" 550" 552" 554" 556" 558" 560" 562" 564" 566" 568" 570" 572" 574" 576" 578" 580" 582" 584" 586" 588" 590" 592" 594" 596" 598" 600" 602" 604" 606" 608" 610" 612" 614" 616" 618" 620" 622" 624" 626" 628" 630" 632" 634" 636" 638" 640" 642" 644" 646" 648" 650" 652" 654" 656" 658" 660" 662" 664" 666" 668" 670" 672" 674" 676" 678" 680" 682" 684" 686" 688" 690" 692" 694" 696" 698" 700" 702" 704" 706" 708" 710" 712" 714" 716" 718" 720" 722" 724" 726" 728" 730" 732" 734" 736" 738" 740" 742" 744" 746" 748" 750" 752" 754" 756" 758" 760" 762" 764" 766" 768" 770" 772" 774" 776" 778" 780" 782" 784" 786" 788" 790" 792" 794" 796" 798" 800" 802" 804" 806" 808" 810" 812" 814" 816" 818" 820" 822" 824" 826" 828" 830" 832" 834" 836" 838" 840" 842" 844" 846" 848" 850" 852" 854" 856" 858" 860" 862" 864" 866" 868" 870" 872" 874" 876" 878" 880" 882" 884" 886" 888" 890" 892" 894" 896" 898" 900" 902" 904" 906" 908" 910" 912" 914" 916" 918" 920" 922" 924" 926" 928" 930" 932" 934" 936" 938" 940" 942" 944" 946" 948" 950" 952" 954" 956" 958" 960" 962" 964" 966" 968" 970" 972" 974" 976" 978" 980" 982" 984" 986" 988" 990" 992" 994" 996" 998" 1000	24.95		
11-37 Mac IIx 12" 14" 16" 18" 20" 22" 24" 26" 28" 30" 32" 34" 36" 38" 40" 42" 44" 46" 48" 50" 52" 54" 56" 58" 60" 62" 64" 66" 68" 70" 72" 74" 76" 78" 80" 82" 84" 86" 88" 90" 92" 94" 96" 98" 100" 102" 104" 106" 108" 110" 112" 114" 116" 118" 120" 122" 124" 126" 128" 130" 132" 134" 136" 138" 140" 142" 144" 146" 148" 150" 152" 154" 156" 158" 160" 162" 164" 166" 168" 170" 172" 174" 176" 178" 180" 182" 184" 186" 188" 190" 192" 194" 196" 198" 200" 202" 204" 206" 208" 210" 212" 214" 216" 218" 220" 222" 224" 226" 228" 230" 232" 234" 236" 238" 240" 242" 244" 246" 248" 250" 252" 254" 256" 258" 260" 262" 264" 266" 268" 270" 272" 274" 276" 278" 280" 282" 284" 286" 288" 290" 292" 294" 296" 298" 300" 302" 304" 306" 308" 310" 312" 314" 316" 318" 320" 322" 324" 326" 328" 330" 332" 334" 336" 338" 340" 342" 344" 346" 348" 350" 352" 354" 356" 358" 360" 362" 364" 366" 368" 370" 372" 374" 376" 378" 380" 382" 384" 386" 388" 390" 392" 394" 396" 398" 400" 402" 404" 406" 408" 410" 412" 414" 416" 418" 420" 422" 424" 426" 428" 430" 432" 434" 436" 438" 440" 442" 444" 446" 448" 450" 452" 454" 456" 458" 460" 462" 464" 466" 468" 470" 472" 474" 476" 478" 480" 482" 484" 486" 488" 490" 492" 494" 496" 498" 500" 502" 504" 506" 508" 510" 512" 514" 516" 518" 520" 522" 524" 526" 528" 530" 532" 534" 536" 538" 540" 542" 544" 546" 548" 550" 552" 554" 556" 558" 560" 562" 564" 566" 568" 570" 572" 574" 576" 578" 580" 582" 584" 586" 588" 590" 592" 594" 596" 598" 600" 602" 604" 606" 608" 610" 612" 614" 616" 618" 620" 622" 624" 626" 628" 630" 632" 634" 636" 638" 640" 642" 644" 646" 648" 650" 652" 654" 656" 658" 660" 662" 664" 666" 668" 670" 672" 674" 676" 678" 680" 682" 684" 686" 688" 690" 692" 694" 696" 698" 700" 702" 704" 706" 708" 710" 712" 714" 716" 718" 720" 722" 724" 726" 728" 730" 732" 734" 736" 738" 740" 742" 744" 746" 748" 750" 752" 754" 756" 758" 760" 762" 764" 766" 768" 770" 772" 774" 776" 778" 780" 782" 784" 786" 788" 790" 792" 794" 796" 798" 800" 802" 804" 806" 808" 810" 812" 814" 816" 818" 820" 822" 824" 826" 828" 830" 832" 834" 836" 838" 840" 842" 844" 846" 848" 850" 852" 854" 856" 858" 860" 862" 864" 866" 868" 870" 872" 874" 876" 878" 880" 882" 884" 886" 888" 890" 892" 894" 896" 898" 900" 902" 904" 906" 908" 910" 912" 914" 916" 918" 920" 922" 924" 926" 928" 930" 932" 934" 936" 938" 940" 942" 944" 946" 948" 950" 952" 954" 956" 958" 960" 962" 964" 966" 968" 970" 972" 974" 976" 978" 980" 982" 984" 986" 988" 990" 992" 994" 996" 998" 1000	24.95		
11-37 Mac IIx 12" 14" 16" 18" 20" 22" 24" 26" 28" 30" 32" 34" 36" 38" 40" 42" 44" 46" 48" 50" 52" 54" 56" 58" 60" 62" 64" 66" 68" 70" 72" 74" 76" 78" 80" 82" 84" 86" 88" 90" 92" 94" 96" 98" 100" 102" 104" 106" 108" 110" 112" 114" 116" 118" 120" 122" 124" 126" 128" 130" 132" 134" 136" 138" 140" 142" 144" 146" 148" 150" 152" 154" 156" 158" 160" 162" 164" 166" 168" 170" 172" 174" 176" 178" 180" 182" 184" 186" 188" 190" 192" 194" 196" 198" 200" 202" 204" 206" 208" 210" 212" 214" 216" 218" 220" 222" 224" 226" 228" 230" 232" 234" 236" 238" 240" 242" 244" 246" 248" 250" 252" 254" 256" 258" 260" 262" 264" 266" 268" 270" 272" 274" 276" 278" 280" 282" 284" 286" 288" 290" 292" 294" 296" 298" 300" 302" 304" 306" 308" 310" 312" 314" 316" 318" 320" 322" 324" 326" 328" 330" 332" 334" 336" 338" 340" 342" 344" 346" 348" 350" 352" 354" 356" 358" 360" 362" 364" 366" 368" 370" 372" 374" 376" 378" 380" 382" 384" 386" 388" 390" 392" 394" 396" 398" 400" 402" 404" 406" 408" 410" 412" 414" 416" 418" 420" 422" 424" 426" 428" 430" 432" 434" 436" 438" 440" 442" 444" 446" 448" 450" 452" 454" 456" 458" 460" 462" 464" 466" 468" 470" 472" 474" 476" 478" 480" 482" 484" 486" 488" 490" 492" 494" 496" 498" 500" 502" 504" 506" 508" 510" 512" 514" 516" 518" 520" 522" 524" 526" 528" 530" 532" 534" 536" 538" 540" 542" 544" 546" 548" 550" 552" 554" 556" 558" 560" 562" 564" 566" 568" 570" 572" 574" 576" 578" 580" 582" 584" 586" 588" 590" 592" 594" 596" 598" 600" 602" 604" 606" 608" 610" 612" 614" 616" 618" 620" 622" 624" 626" 628" 630" 632" 634" 636" 638" 640" 642" 644" 646" 648" 650" 652" 654" 656" 658" 660" 662" 664" 666" 668" 670" 672" 674" 676" 678" 680" 682" 684" 686" 688" 690" 692" 694" 696" 698" 700" 702" 704" 706" 708" 710" 712" 714" 716" 718" 720" 722" 724" 726" 728" 730" 732" 734" 736" 738" 740" 742" 744" 746" 748" 750" 752" 754" 756" 758" 760" 762" 764" 766" 768" 770" 772" 774" 776" 778" 780" 782" 784" 786" 788" 790" 792" 794" 796" 798" 800" 802" 804" 806" 808" 810" 812" 814" 816" 818" 820" 822" 824" 826" 828" 830" 832" 834" 836" 838" 840" 842" 844" 846" 848" 850" 852" 854" 856" 858" 860" 862" 864" 866" 868" 870" 872" 874" 876" 878" 880" 882" 884" 886" 888" 890" 892" 894" 896" 898" 900" 902" 904" 906" 908" 910" 912" 914" 916" 918" 920" 922" 924" 926" 928" 930" 932" 934" 936" 938" 940" 942" 944" 946" 948" 950" 952" 954" 956" 958" 960" 962" 964" 966" 968" 970" 972" 974" 976" 978" 980" 982" 984" 986" 988" 990" 992" 994" 996" 998" 1000	24.95		
11-37 Mac IIx 12" 14" 16" 18" 20" 22" 24" 26" 28" 30" 32" 34" 36" 38" 40" 42" 44" 46" 48" 50" 52" 54" 56" 58" 60" 62" 64" 66" 68" 70" 72" 74" 76" 78" 80" 82" 84" 86" 88" 90" 92" 94" 96" 98" 100" 102" 104" 106" 108" 110" 112" 114" 116" 118" 120" 122" 124" 126" 128" 130" 132" 134" 136" 138" 140" 142" 144" 146" 148" 150" 152" 154" 156" 158" 160" 162" 164" 166" 168" 170" 172" 174" 176" 178" 180" 182" 184" 186" 188" 190" 192" 194" 196" 198" 200" 202" 204" 206" 208" 210" 212" 214" 216" 218" 220" 222" 224" 226" 228" 230" 232" 234" 236" 238" 240" 242" 244" 246" 248" 250" 252" 254" 256" 258" 260" 262" 264" 266" 268" 270" 272" 274" 276" 278" 280" 282" 284" 286" 288" 290" 292" 294" 296" 298" 300" 302" 304" 306" 308" 310" 312" 314" 316" 318" 320" 322" 324" 326" 328" 330" 332" 334" 336" 338" 340" 342" 344" 346" 348" 350" 352" 354" 356" 358" 360" 362" 364" 366" 368" 370" 372" 374" 376" 378" 380" 382" 384" 386" 388" 390" 392" 394" 396" 398" 400" 402" 404" 406" 408" 410" 412" 414" 416" 418" 420" 422" 424" 426" 428" 430" 432" 434" 436" 438" 440" 442" 444" 446" 448" 450" 452" 454" 456" 458" 460" 462" 464" 466" 468" 470" 472" 474" 476" 478" 480" 482" 484" 486" 488" 490" 492" 494" 496" 498" 500" 502" 504" 506" 508" 510" 512" 514" 516" 518" 520" 522" 524" 526" 528" 530" 532" 534" 536" 538" 540" 542" 544" 546" 548" 550" 552" 554" 556" 558" 560" 562" 564" 566" 568" 570" 572" 574" 576" 578" 580" 582" 584" 586" 588" 590" 592" 594" 596" 598" 600" 602" 604" 606" 608" 610" 612" 614" 616" 618" 620" 622" 624" 626" 628" 630" 632" 634" 636" 638" 640" 642" 644" 646" 648" 650" 652" 654" 656" 658" 660" 662" 664" 666" 668" 670" 672" 674" 676" 678" 680" 682" 684" 686" 688" 690" 692" 694" 696" 698" 700" 702" 704" 706" 708" 710" 712" 714" 716" 718" 720" 722" 724" 726" 728" 730" 732" 734" 736" 738" 740" 742" 744" 746" 748" 750" 752" 754" 756" 758" 760" 762" 764" 766" 768" 770" 772" 774" 776" 778" 780" 782" 784" 786" 788" 790" 792" 794" 796" 798" 800" 802" 804" 806" 808" 810" 812" 814" 816" 818" 820" 822" 824" 826" 828" 830" 832" 834" 836" 838" 840" 842" 844" 846" 848" 850" 852" 854" 856" 858" 860" 862" 864" 866" 868" 870" 872" 874" 876" 878" 880" 882" 884" 886" 888" 890" 892" 894" 896" 898" 900" 902" 904" 906" 908" 910" 912" 914" 916" 918" 920" 922" 924" 926" 928" 930" 932" 934" 936" 938" 940" 942" 944" 946" 948" 950" 952" 954" 956" 958" 960" 962" 964" 966" 968" 970" 972" 974" 976" 978" 980" 982" 984" 986" 988" 990" 992" 994" 996" 998" 1000	24.95		
11-37 Mac IIx 12" 14" 16" 18" 20" 22" 24" 26" 28" 30" 32" 34" 36" 38" 40" 42" 44" 46" 48" 50" 52" 54" 56" 58" 60" 62" 64" 66" 68" 70" 72" 74" 76" 78" 80" 82" 84" 86" 88" 90" 92" 94" 96" 98" 100" 102" 104" 106" 108" 110" 112" 114" 116" 118" 120" 122" 124" 126" 128" 130" 132" 134" 136" 138" 140" 142" 144" 146" 148" 150" 152" 154" 156" 158" 160" 162" 164" 166" 168" 170" 172" 174" 176" 178" 180" 182" 184" 186" 188" 190" 192" 194" 196" 198" 200" 202" 204" 206" 208" 210" 212" 214" 216" 218" 220" 222" 224" 226" 228" 230" 232" 234" 236" 238" 240" 242" 244" 246" 248" 250" 252" 254" 256" 258" 260" 262" 264" 266" 268" 270" 272" 274" 276" 278" 280" 282" 284" 286" 288" 290" 292" 294" 296" 298" 300" 302" 304" 306" 308" 310" 312" 314" 316" 318" 320" 322" 324" 326" 328" 330" 332" 334" 336" 338" 340" 342" 344" 346" 348" 350" 352" 354" 356" 358" 360" 362" 364" 366" 368" 370" 372" 374" 376" 378" 380" 382" 384" 386" 388" 390" 392" 394" 396" 398" 400" 402" 404" 406" 408" 410" 412" 414" 416" 418" 420" 422" 424" 426" 428" 430" 432" 434" 436" 438" 440" 442" 444" 446" 448" 450" 452" 454" 456" 458" 460" 462" 464" 466" 468			

Don't let your business take
a summer vacation. Advertise
in the Macworld Shopper.®

1993 Close Dates

June: 3/17
July: 4/21
August: 5/18
September: 6/22 Expo Issue!

It's easy to advertise!
All ads can now be submitted
on disk.

Ask your account
manager about the new color
options available.

800-888-8622
415-974-7414 (int'l only)

Carol Johnstone
Shannon Smith
Niki Stranz

Say you saw it in Macworld.

Late to Classify

BAR CODING FOR THE REST OF US

Bar Code Pro™

Bar Code Pro™ desk accessories create graphics (EPS or PICT) of the 15 most common bar codes to place directly into your documents. It's an ideal, easy-to-use solution for package design, labels, libraries, inventory, publishing, shipping, medical and scientific applications. Versions include: UPC (A)/UPC (E), EAN-8/EAN-13/ISSN/ISBN, Code 39 (includes font), ITF/ITF-14/Code 25, Code 128, POSTNET/FIM, Codabar, MSI/Plessey, All-in-one.

"Bar Code Pro™ installs in
under 60 seconds and takes
less than five minutes to
master." — MacWorld (9/92)



Bar Code Pro™ Quark® XTension

now available. From:

NEW

SYNEX

Tele (800)447-9639 692 Tenth Street B'klyn NY 11215 Fax (718)768-3997

CIRCLE 450 ON READER SERVICE CARD

COMPUTER POWER HOUSE

1880 Westwood Blvd., Los Angeles, California 90025

Mac II Si 5/80	\$1199	Centris 610-650 4/230	Call
Mac II VX w/CD ROM	Call	PSI Powerbook Fax/Modem S/R	\$159
Mac II VX 4-80/230	\$1850/2150	E-Machine T16 II MR	\$1319
Quadra 950 8/0	\$4588	Umax UC 630/840	\$1099/1250
Quadra 800 8/230	\$3999	Quantum SCSI LPS 240 Mb	\$480
Powerbook 160/180	Call	Syquest 44 Mb/88Mb	\$440/559
Powerbook 165c 4/80	\$3199	Fujitsu SCSI 2.4 Gb	\$2339

Phone (310) 474-6636 • Fax (310) 474-4665

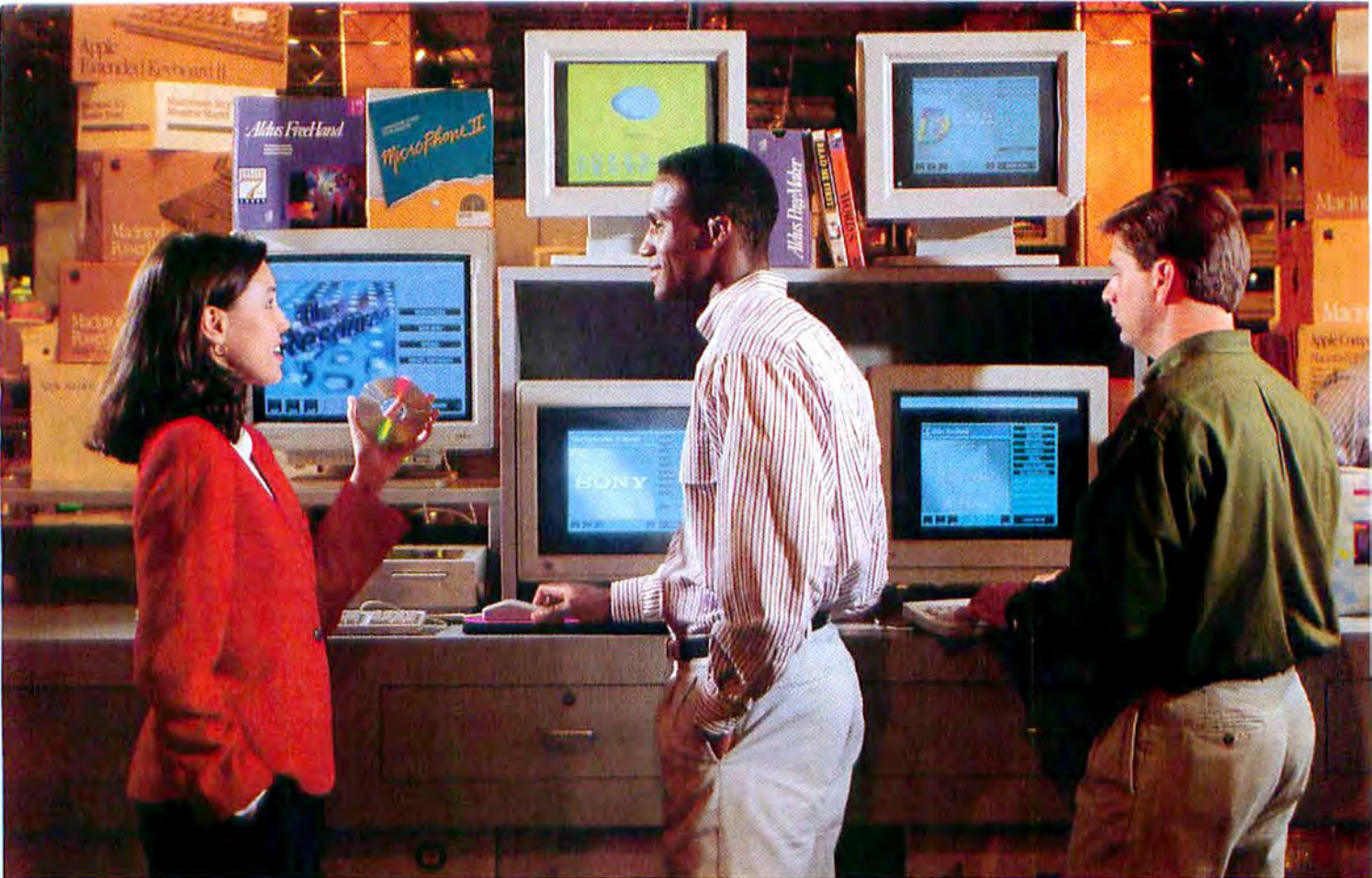
Mon. - Fri. 9:00 to 6:00 / Sat. 10:30 to 4:00

Prices Are Subject To Change Without Notice • Credit Cards Are Welcome

CIRCLE 423 ON READER SERVICE CARD

Reach your audience
when it counts.

Catalog readers are
ready to buy!



How to Try Before You Buy.

Simply go to your local Macintosh Reseller and ask them to run The Resource!



Would you buy shoes without trying them on? Probably not. Yet how often do you buy a Macintosh® product without some hands-on experience? Most of the time, right? Pretty risky proposition with hundreds, maybe thousands, of dollars at stake.

The Macworld Resource is an Interactive Showroom that provides information, demonstrations and free trial software—all of the tools you need to make an intelligent purchase decision.

Get In-Depth Information on Hot Products

You'll find the hottest products from top Macintosh software and hardware companies:

ADOBE

MEDIA VISION



CLARIS

FWB
incorporated

SIGMA
DESIGNS

INGRAM
MICRO

Bring Floppies—Take Free Software

The Resource employs the latest multimedia technology to deliver the kind of information you need when you need it most, in the retail showroom. You can print literature, view interactive demos, compare product features and take home free trial software. So don't leave home without a few blank floppies.

Plus a Directory of Thousands

The Resource features a database of thousands of the latest Macintosh products. You can easily locate listings and automatically generate a printed request for more information.

For your own subscription to The Macworld Resource CD call toll-free: 1-800-631-1700 ext.116.

Circle 217 on reader service card

MACWORLD

PRODUCT LAUNCH

SECTION

Turn to the Product Launch Section of Macworld for information on the new products in the Macintosh industry.

This is the premiere showcase for new product launches or relaunched. Look to the Macworld Product Launch section—your source for the newest Macintosh products.

Call your account executive for more details on advertising in the Macworld Product Launch section!
(415) 243-0505

Who would have thought your kids could get scores like this playing video games?

REPORT CARD

Math A+
Reading A+
Spelling A+

Most video games simply teach kids how to blow up spaceships and attack aliens with lasers. MacKids software gives them more than exciting games to play. It sharpens their skills in such areas as reading, spelling and math with programs like the Preschool Pack, Word Quest and Turbo Math Facts.

So if you want to make learning fun for your kids, give them MacKids. It's the weapon they need to zap low scores.



Nordic Software, Inc.
917 Carlos Drive • Lincoln, NE 68505-2059

FOR MORE INFORMATION CALL 1-402-488-5086

Circle 168 on reader service card

MACINTOSH SECURITY PRODUCTS

COMPLETE LINE OF PROVEN AND EASY TO INSTALL SECURITY PRODUCTS FOR MACINTOSH COMPUTERS.

PREVENT COMPUTER THEFT!

MacKablit™ Security System

This system allows you to secure all your computer components: CPU, monitor, keyboard, printer. **Internal component security:** Kablit fasteners secure the rear panel of CPU protecting internal boards and hard drives. Fasteners available for all applications. List price \$39.95.



ACCESS SECURITY

Disk Drive Lock™

Prevent anyone from copying your data. Protect your data from harmful viruses. Prevent unauthorized use of your drive. Installs easily and quickly. Models available for all Macintosh models (except Mac Plus). List price \$24.95.



Order your free catalog of these and many other security products. Purchase orders accepted. Quantity pricing available. Shipping not included. MC/VISA accepted. Dealer inquiries invited.

Secure-It, Inc.

18 Maple Court
East Longmeadow, MA 01028

1-800-451-7592

Circle 239 on reader service card.



Sure it's Insured?

Most computers are not insured. And ordinary policies may exclude or limit the coverage you need. Do you have the ready cash to replace stolen or damaged equipment? You will if you have SAFEWARE's® comprehensive COMPUTEROWNERS™ coverage. It provides full replacement of hardware, media and purchased software for just pennies a day! Your protection includes theft, fire, accidental damage, and more. Even costly power surges are covered. Just select your system value and premium from the table below. Use the coupon or call for immediate coverage or more information.

Amount of Insurance	Annual Premium
Up to \$2,000	\$ 49
\$ 2,001-\$ 5,000	\$ 69
\$ 5,001-\$ 8,000	\$ 89
\$ 8,001-\$11,000	\$109
\$11,001-\$14,000	\$129

Call for rates on higher amounts
Underwriting requirements may vary
by state. Void where prohibited.

SAFEWARE

1-800-848-3469

FAX 1-614-262-1714
On CompuServe, GO SAF
On GENie, SAFEWARE

SAFEWARE, The Insurance Agency Inc.
2929 N. High St.
P.O. Box 02211
Columbus, OH 43202

10 DAY TRIAL. Review your policy for 10 days after you receive it. Satisfaction guaranteed or your money back.

Name _____

Address _____

Phone (Daytime) _____

☐ Check Enclosed ☐ Visa ☐ MasterCard Exp. _____

Card # _____

Total value of hardware, media and purchased software \$ _____ (Insure to full value)

Your signature _____

Mail to: **SAFEWARE, The Insurance Agency Inc.**, P.O. Box 02211, Columbus, OH 43202

Circle 197 on reader service card

MACWORLD May 1993 301

Stop conflicts...



CONFLICT CATCHER™ and other Innovative Utilities™

Conflict Catcher puts you in charge of managing your start-up software. Also, it finds and solves conflict problems with Extensions, INITs and Control Panel devices. And, Conflict Catcher diagnoses without needing to be constantly updated like other problem-solving software.

Actually five products in one:

- **Conflict Catcher™**—streamlines your work by combining problem-solving with start-up software management.
- **Memory Maxer™**—allows you to dedicate all memory to one memory-hungry application, under System 7.
- **Color Coordinator™**—automatically adjusts color settings as you switch back and forth between programs.
- **Hot DA™**—opens desk accessories with a single keystroke. Pastes graphics or text into your favorite desk accessory.
- **Whiz-Bang Window Accelerator™**—opens and closes windows in a flash. Gives the Finder a speed boost.

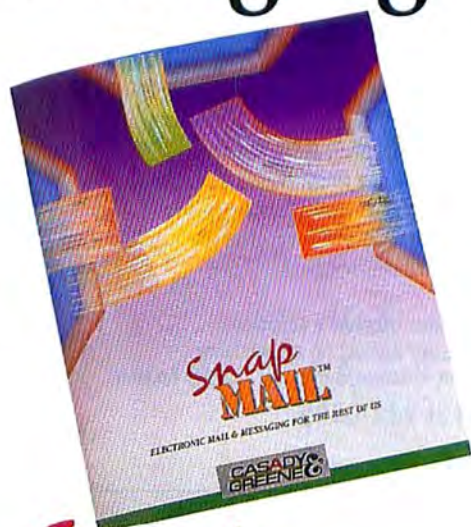
\$79.00

Conflict Catcher's ability to track down INIT-related problems makes it a worthwhile investment even if you already own an INIT manager. Macworld Magazine - March 1993



Requirements: A Macintosh with hard drive. 240K space for all five utilities. Compatible with System 6.05 or later, with exception of Memory Maxer, which requires System 7.

Start hassle-free messaging...



WITH... Snap MAIL™

Now, with Snap MAIL, you can *enjoy* electronic messaging on your Macintosh network, without hassles AND, without the expense of extra equipment! Snap MAIL is so easy to learn that everyone loves using it!

Snap MAIL is being used on Macintosh networks of two to 200, in offices of all sizes, in workgroups, schools, and homes.

Snap MAIL offers these hassle-free advantages...

- requires NO administrator or dedicated server
- supports Apple Talk Remote Access
- transfers documents effortlessly
- offers conferencing and instant alerts
- perfect for PowerBooks®
- easy to install and learn
- works fast!

Get your hassle-free Snap MAIL today, for just \$25 per workstation or less!

Requirements: Any Macintosh with 1 Mb RAM, B&W or color monitor; System 6.02 or greater; an Apple Talk™ Network

CASADY & GREENE

22734 PORTOLA DRIVE •
SALINAS, CA 93908-1119

Available through your favorite mail order service or call:

1-800-359-4920
FAX 408-484-9218
408-484-9228

Instantly organize your contacts and time. "Dead fit with PowerBooks." -MacUser

\$16.95 value
FREE
with purchase
of 1990-1991
calendar.



Port™: The best cradle for your Powerbook.



PORT 886
886 S : \$ 159.00 886L : \$ 189.00

Burgundy Black Gray

Suspension system

Developed and patented by PORT, the SafePort™ shock absorption system offers a level of protection that far exceeds our competition.



The Genius is in the details

- Swiss-made handle designed for better grip and comfort.
- Metal fittings for maximum strength.
- High-tech Microline nylon with genuine leather trim.



PORT 786
786S : \$ 149.00
786L : \$ 169.00



PORT 586
586 : \$ 59.00

To order today for immediate delivery, call

 **1.800.242.3133**   

MCW5

The PORT promises :

- We offer a lifetime limited warranty.
- If not satisfied, return within 30 days.
- Fits all sizes of PowerBook computers.

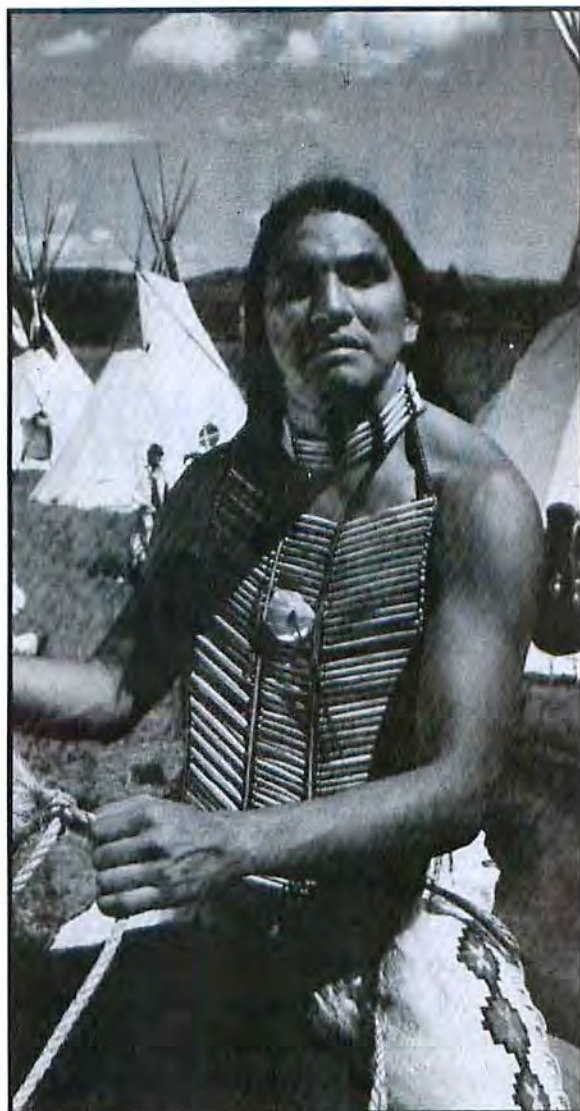


End user circle 123 on reader service card
Dealers circle 320 on reader service card



HARMONY

THE SEASONS • THE SUN • THE SOIL • THE WATER



Native Americans have always
understood the importance
of nature's harmony.

Be part of that heritage.

Help protect
our nation's soil and water.
Call for your free action packet.

1-800-THE SOIL

WE OWE IT TO OUR CHILDREN

U.S. Department of Agriculture
Soil Conservation Service

CHOOSE THE RIGHT TOOL FOR THE JOB.

Introducing MacDraft 3.0

MacDraft® has long been the tool of choice for architectural/engineering design & drafting and technical illustration. Its powerful tools and ease of use have made it one of the most popular CAD programs on the Macintosh® today. And now we've made it even more powerful!

MacDraft's new associative dimensioning tools support ANSI and international standards. They provide all of the features you need to create professional drawings, such as automatic witness and extension lines, leader lines, and text tolerances. Linear dimensions can be created in single, chained or baseline modes. In addition, we've added perpendicular, radial and angular dimensioning.

The new expanded tool palette provides many new drawing capabilities, including special tools for drawing perpendicular and tangent lines, regular polygons, and marker symbols. The new parallel line and polygon tools make it easy to create such things as exterior walls. And, with the parallel extrude tool, you can add interior walls with just a click of the mouse button.



MacDraft 3.0 offers many new line editing and construction tools, such as fillets and chamfers, extending lines to their intersections, and automatically trimming lines that overlap.

We've even added a great new slide show feature that allows you to present your drawings on screen, or print each slide as a transparency.

MacDraft 3.0 will read MacDraw® II files, and now Dreams® files and symbol libraries as well.

So, for your technical drawing needs, choose the tool that was designed specifically to do the job - MacDraft 3.0.

MacDraft and Dreams users, call now for upgrade information. And for those of you who haven't experienced MacDraft, and want to see how easy CAD can be, call today for more information or a demonstration disk - 510.680.6818.



MacDraft and Dreams are registered trademarks of Innovative Data Design, Inc.
Macintosh is a registered trademark of Apple Computer, Inc. and MacDraw II is a registered trademark of Claris Corporation.

Circle 129 on reader service card

CHECK OUT OUR LOW-PRICE MENU

SYSTEMS

Mac Centris	Call
Mac LC III - 4/80	1295
Mac LC III - 4/160	1439
Extended Keyboard	159
Mac Quadra 700 - 4 meg	2195
Mac Quadra 700 - 4/120	2559
Mac Quadra 700 - 4/210	2795
Mac Quadra 800	Call
Mac Quadra 950 - 8 meg	5195
Mac Quadra 950 - 8/210	5695
Mac Quadra 950 - 8/540	Call
Mac Powerbook 145 4/40	1995
Mac Powerbook 145 4/80	2395
Mac Powerbook 160 4/40	2289
Mac Powerbook 160 4/80	2495
Mac Powerbook 180	Call
Macintosh VX Systems	Call
Powerbook Duo Systems	Call

DRIVES

	Ext.	Int.
Quantum 127 MB ELS	395	295
Quantum Pro Drive 240	595	495
Quantum 425 MB		859
Maxtor 120	369	269
Maxtor 213	559	459
Maxtor 340	795	695
Toshiba 1.2 gigabyte	1759	1600
Syquest 44MB	479	
Syquest 88MB	589	
Internal Drive Kit		29
Syquest 44MB cartridge		69
Road Runner 80 meg for Powerbook		369
Fujitsu 425 meg 5-year warranty		1095

CD-ROMS

NEC CDR-74	639
NEC CDR-37	459
Smart & Friendly w/Cable and Classic CD Collection	399
Super CD Collection	499

MULTIMEDIA

NEC CDR-74 Gallery	895
SuperMac Digitalfilm	4895
SuperMac Videospigot	395

MEMORY

1 meg for LC/CI/II	34
4 meg for LC/CI/II	129
Powerbook 140 & 170 4 meg	175
Powerbook 140 & 170 6 meg	239
Envisio Powerbook Display	
Adapter and memory	Call

MICROTEK II XE (1200 DPI) WITH PHOTOSHOP



\$1079

MONITORS/CARDS

IDEK 15" SVGA Color Display	595
IDEK 17" Autocan SVGA Color	995
IDEK 21" Autocan SVGA Color	1795
IDEK 21" Autocan 80 KHz Color	2495
Radius 19" Precision Color Display	1989
Radius 21" Color Display	2695
Radius Precision Color Pivot	939
Color Pivot Interface	
II, LC, IIsi, SE, SE/30	399
Precision Color 20"	2339
Two Page Display 19"	959
Two Page Display 21"	1230
Two Page Display Interface	
SE, SE/30, II, IIsi	399
Precision 8 Interface	515
Precision 24x	1689
Precision 8x	779
Rocket Accelerator 25 I	1195
Rocket Accelerator 33 Mhz w/ mathco	1995
Apple 14" Color Monitor RGB	495
Seiko CM-1445	459
Sony 14" Trinitron	589
SuperMac Platinum 19" Display	964
SuperMac Platinum 21" Two Page Display	1175
Super Match 19" Color	1929
Super Match 21" Two Page Color Display	2839
Super Match 17" Trinitron	1069
Supermac Thunder Storm Pro	2795
Shamrock 14" Color Monitor	375
Dual Mode Trinitron 19"	2359
Thunder/8	Call
Thunder/24	Call
Spectrum 8.24 PDQ	839
Spectrum 24 PDQ+	1539

MODEMS

Zoom FX9624 Plus 2400 BPS	129
Modem MX 2400S w/ SendFax 9600 BPS	95
v32 Turbo w/v.42 bis w/MNP Software	329
Supra Fax Modem 14.4 V.32 bis (ext.)	349
Supra Fax Modem 96/96 (ext.)	279
PSI Comstation Four	310
PSI Comstation Five	479
Global Village Bronze 96/24 for Powerbook	195
Global Village Silver 96/96 for Powerbook	349
Global Village Gold 14.4/96 for Powerbook	429

SCANNERS

Logitech ScanMan 32	279
Microtek II	859
Microtek II XE (1200 dpi) with Photoshop	1079
Microtek 1850s Slide Scanner	1195
Umax UC-630	
with Photoshop	1095
Caere Typist	429

ACCELERATORS

Daystar 40 Mhz Powercache	769
Daystar 40 Mhz Powercache w/68882	935
Daystar 50 Mhz Powercache	1099
Daystar 50 Mhz Powercache w/68882	1279
Radius Rocketshare	419

NEWGEN TURBO PS 440B 400 DPI • 11x17



\$3495

PRINTERS

TI Turbo PS35	1495
Microtek TrueLaser	999
TI Microlaser PS35	1319
TI Microlaser PS17	1189
QMS PS 410	1475
NEC Model 97	1829
NEC Model 95	1389
Apple Stylewriter II	359
Apple Laserwriter II	2499
Apple Laserwriter IIg	3279
HP Deskwriter Color	549
HP IIp for Mac	1539
HP IV for Mac	1995
HP IIsi for Mac	4639
HP Deskwriter	389
HP Deskwriter Ink Cartridge	18
Appletalk Connectors	25
HP Deskwriter 550C	709
Newgen Turbo PS 400P (400x400 dpi)	1695
Newgen Turbo PS 880B (800x800 dpi)	3195
Newgen Turbo PS 440B (400 dpi 11x17)	3495
Newgen Turbo PS 660B (600x600 dpi 11x17)	3895
Color Printers	
NEC PS 40	4395

MAKE THE CONNECTION TODAY!

714-758-8832



Cards



**Overnight and
Federal Express
Shipping
Available**

Join the CD-ROM Revolution!

CD-ROM Drives

All drives are ready to run and are KODAK multisession compatible. 2 FREE CDs with every drive-EDUCORP CD Sampler & Electronic Arts Sampler. Plus you'll get driver software and your choice of cable. Specify #981 MAC to SCSI or #982 SCSI to SCSI. \$50 off the EDUCORP Shareware CD w/purchase of any drive from EDUCORP!

Access Time	Buffers	SCSI Settings	Volume Control	Audio Software	SCSI Ports	Terminator	Termination	RCA Jacks	Maximum Voltage	Data Transfer	Reliability MTBF	Warranty	MAC Price	MAC Part#
NEC CDR-38	400ms	64K	Dip Switch	Dial	Music Box DA	1	Not Included	Dip Switch Selectable	No	120 Volts	300K/Second	10,000	2 Year	\$549 1513
NEC CDR-74-1	280ms	256K	Dip Switch	Dial	Music Box DA	2	Included	Not Terminated	Yes	220 Volts	300K/Second	25,000	2 Year	\$639 1512
CD Tech CD-T3401*	200ms	256K	Push Button	Dial	CD Remote DA	2	Not Included	Not Terminated	Yes	250 Volts	327K/Second	50,000	2 Year	\$599 1824
Texel DM5024	265ms	64K	Dial	Dial	Music Box DA	2	Not Included	Dip Switch Selectable	Yes	240 Volts	300K/Second	30,000	1 Year	\$579 1815
PROCOM	200ms	256K	Dial	Dial	CD Audio DA	2	Included	Not Terminated	Yes	240 Volts	327K/Second	25,000	1 Year	\$599 1833

* 2 More FREE CDs- America Alive & Multimedia HANDisc

CD-ROM Drive Bundles

Get a CD-ROM drive, up to 11 titles, Labtec speakers stereo headphones, cable, power supply \$699!

Bundles below include a drive, Labtec speakers with A/C adapter, stereo headphones, cable, driver software, power supply and these 9 titles:

CD-ROM Title Retail Value

- | | | | |
|---------------------------------|----------|--|--------|
| 1. Color It!..... | \$299.95 | 5. Publish It!..... | 199.95 |
| 2. Desert Storm..... | 39.95 | 6. Sherlock Holmes Consult. Det I..... | 69.95 |
| 3. Multimedia Encyclopedia..... | 395.00 | 7. World Atlas..... | 79.95 |
| 4. The Orchestra..... | 79.98 | 8. EDUCORP CD Sampler..... | 9.95 |
| | | 9. Electronic Arts CD Sampler..... | 5.00 |

PROCOM TXM3401 Bundle \$749

Includes everything listed above. #P1833

Texel Bundle \$699

Includes everything listed above. #D1815

CD Tech T3401 Porta Drive Bundle \$759

Includes everything listed above PLUS coupons for 2 FREE multimedia titles #D1824

- | | |
|-----------------------------|-------|
| 10. Multimedia HANDisc..... | 99.00 |
| 11. America Alive..... | 99.00 |

Create Your Own Bundle

"You asked for it, you got it"

When you purchase ANY CD-ROM drive from EDUCORP, you now have the option of creating your own CD-ROM drive bundle! Start your CD-ROM library with the titles you want. Choose from these 33 titles on a variety of subjects.

Choose from 33 CD titles

- Pick any 3 titles listed below for only \$89.95 (code CB3)
- 5 for \$149.95 (code CB5)
- 8 for \$199.95 (code CB8)
- Only 1 of each title per bundle

CD-ROM Title Retail Value

- | | | | |
|--|---------------|--|--------|
| B1. World Atlas..... | \$79.95 | B19. DTPro..... | 149.00 |
| B2. Multimedia Encyclopedia..... | 395.00 | B20. Manhole..... | 34.95 |
| B3. Time Table of History..... | 129.00 | B21. Scenic & Nature III..... | 69.95 |
| B4. Desert Storm..... | 39.99 | B22. Scenic and Architecture..... | 69.95 |
| B5. Cosmic Osmo..... | 59.95 | B23. 600 Days to Cocos Island..... | 69.95 |
| B6. Beethoven's Quartet #14..... | 66.00 | B24. Boston Expo CD..... | 15.00 |
| B7. Multimedia World Fact Book..... | 49.95 | B25. Funny: A movie in QuickTime..... | 39.99 |
| B8. US History..... | 395.00 | B26. The Orchestra..... | 79.98 |
| B9. The Orient..... | 49.95 | B27. Sports Illustrated- Almanac..... | 59.95 |
| B10. Sherlock Holmes Consult. Det I..... | 69.95 | B28. Word Tales..... | 49.99 |
| B11. Think for Yourself..... | 249.00 | B29. The View from Earth..... | 79.95 |
| B13. US Atlas..... | 79.95 | B30. The Animals!..... | 119.95 |
| B14. Lucas Game Pack..... | (bundle only) | B31. Guinness Disc of Records..... | 99.95 |
| B15. Color It!..... | 299.95 | B32. Mayo Clinic Family Health Bk..... | 99.95 |
| B16. Publish It!..... | 199.95 | B33. Interactive Storytime..... | 49.95 |
| B17. SportsROM..... | 69.95 | B34. SpaceTime & Art..... | 199.00 |
| B18. FM Waves Artware..... | 149.00 | | |

More CD-ROM Drives & Optional Bundles available.

Over 300 CD-ROM titles in stock

Stock Photos

- | | |
|--|---------|
| 1863 African Wildlife..... | \$79.95 |
| 1735 People in Business..... | 99.95 |
| 1686 Kids..... | 99.95 |
| 1625 Aquatic Art..... | 79.95 |
| 1696 Nature's Way..... | 59.95 |
| 1585 Ocean Imagery..... | 59.95 |
| 1822 Ocean Magic..... | 59.95 |
| 1595 Swimsuit v.1..... | 99.95 |
| 1788 Swimsuit v.2..... | 99.95 |
| 1736 People at Leisure..... | 99.95 |
| 2066 People of the World..... | 79.95 |
| 1813 World Travel v.1 Europe..... | 79.95 |
| 1814 World Travel v.2 Far E. Asia..... | 79.95 |
| 1581 Int'l Graphics Library..... | 79.95 |
| 1587 Donatelli Lingerie v.1/2..... | 99.00 |
| 1698 Donatelli Lingerie v.3..... | 99.00 |

- | | |
|--|-------|
| 1334 Prof. Photo Collection-MR..... | 59.95 |
| 1444 Prof. Photo. Collection-HR..... | 99.95 |
| Same images as MR version in high resolution, 18 meg files. 2-CD set. Kodak Photo CD Format. | |

Published by Gazelle Technologies, Inc.

Media Tools

1701 Digital Video Library 180 clips.....\$79.95

1582 Sound/FX.....\$99.95

Over 225 quality sounds in 8-bit mono and full 16-bit stereo.

Published by Gazelle Technologies, Inc.

1677 ClipTime v.1.....\$79.95

Add a new dimension to your applications with 250 movie clips.

1919 ClipTime v.2.....\$199.00

American Media. 350 movie clips, photos, sounds, stingers.

Published by Alpha Technologies, Inc.

1659 WraptureReels One.....\$179.95

Broadcast quality digital video w/animated textures & looping video clips. 550 MB.

Published by Form & Function

Editable EPS

1857 BackIMPACT! Pro.....\$79.95

150 color & b/w EPS backgrounds.

1856 SlickART Plus.....\$99.95

Art lettering, images & backgrounds in marble, chrome and neon.

Published by Art Sector One

1819 Funny Business.....\$49.95

World class time-less cartoons by renowned artists, whose artwork regularly appears in such prestigious publications as The New Yorker.

1680 GraphTec Graphic Designs.....\$49.95

450+ color & b/w EPS images.

1408 Design Toolkit.....\$99.95

Over 1500 b/w EPS design elements.

Published by Gazelle Technologies, Inc.

1990 Wraptures

Two.....\$95

NEW! 130 more beautiful seamless tile-able PICT textures and backgrounds. You'll also find several animated textures in QuickTime format. Map to 3D objects or tile to create multimedia and presentation backgrounds.

1653 Wraptures One.....\$95

Over 120 textures

Published by Form & Function

2078 Animal Alphabet \$59.95

Colorfully animated, this engaging program is designed to help young children learn letters and words. Each letter is represented by an animal. Select an animation, QuickTime video, or narrated sentence based on the chosen letter.

Published by REMedia

1924 ABC Songbook \$29.95

Entertaining from A to Z as you hear a story related to each letter of the alphabet. Rockin' tunes, funny stories.

Published by Gazelle Technologies, Inc.

Background created w/Wraptures Two—#1990, \$95



CD-ROM Showcase

We'll meet or beat any advertised price on CD-ROM products!

1469 Putt Putt's Fun Pack\$39.95



Play and learn with Putt-Putt! Everyone's favorite little car is back, and now he's playing games. Your child will be entertained for hours with Checkers, the Cheese King, Remember!

Circus Block, Tic-Tac-Toe and Pinball. Four different skill levels allow your child to grow with the games. Practice matching and pattern recognition, sharpen letter and spelling skills, develop logic and spatial relationship abilities. Most important of all, have a lot of fun!

Published by Humongous Entertainment

1445 Aldus Fetch\$195.00



A powerful multiuser, mixed-media cataloging, browsing, and retrieval tool on diskette. Bundled with A Thousand Fonts CD-ROM-limited time offer.

Published by Aldus Corporation



2061 Curious George Learns the Alphabet \$39.95

Start youngsters on their first steps to successful reading with the adorable monkey Curious George. Every letter becomes animated and each screen is an adventure as words, letters and sounds add lively fun to early learning. Based on original story by H. A. Rey. Ages 4-6.

1734 The Velveteen Rabbit \$39.95

This classic story is beautifully narrated with colorful scenes, easy-to-read text, wonderful music and sound effects. Children explore each scene, uncovering delightful animated surprises. Ages 5 & up.

Published by Queue



1697 Sky v.1 version 2.0 PrePress\$99.95

The reviews are in and the skies have it! Enhance multimedia productions, create ads, special effect backgrounds and more with one of the best sellers of '92. Call up any one of 100, 2,000 DPI drum-scanned, high resolution photo images in minutes. The new interface allows you to view all the images quickly, zoom in, and save the file as 8/24-bit, or 15MB JPEG's. Unlimited reproduction rights to single users. Cloud control that fits any budget!

Published by CD Folios

LUNICUS

2089 Lunicus\$79.95
Interactively cruise through a 3D world to save the future. Virtual reality environments, original sound track, and talking Cyber Puppets!
Published by CYBERSOFT



1467 Better Dead\$59.95

Enter a strange, ominous, breathtaking photorealistic 3D world where you seek out and implement humankind's one last, desperate hope for survival.
Published by ARTSector One, Inc.



1786 Boris Vallejo\$99.95

200 incredible fantasy art pictures.

1787 La Femme Venus\$99.95

Featuring samples from The International Salon of Photographic Art 'Venus Studies And Portraits'.

1327 ExoticaROM 3.0\$99.95

Olivia is one of the foremost artists of our time. Here's 200 extraordinary exotic pieces, a color browser, and a QuickTime interview with Olivia.

Published by Gazelle Technologies, Inc.



1442 The Animals! \$79.95

The San Diego Zoo presents this true multimedia experience. See and hear over 200 exotic mammals, birds, and reptiles in over 60 minutes of award-winning video clips. Learn about each animal from experts, listen to narrated stories, or visit over 300 animal and habitat exhibits. You also get access to all of the media.



1047 U.S. Atlas\$39.95

High quality color and b/w detailed reference and relief maps, flags, anthems and more for all 50 states.

Published by Software Toolworks



FREE Catalog!

If you don't see the CD-ROM you want we probably have it! Call for your free catalog. (Foreign customers send \$4 postage & handling).



2068 The Journeyman Project \$69.95
The world's first photorealistic adventure game. It blew away the competition at the MacWorld Expo - "Forget about the director's cut of Blade Runner!...This time-travel adventure with stunning rendered graphics, sets the current standard for new...CD owners." MacUser Magazine - A rip has been detected in the fabric of time. Only moments remain until the continuum is changed forever. Your objective; jump back in time and prevent the corruption from ever happening!

Published by Presto Studios

1300 EDUCORP Shareware 7.0 2-CD Set.....\$199.00

From artists to zoologists, you'll find something for everyone! This 2-disc set is loaded with the best public domain & shareware software available. Over 1 gigabyte. You'll find education, business, graphics, desk accessories, utilities, sounds, games and much more! Plus an easy-to-use HyperCard Browser. \$50 off with CD-ROM drive purchase from EDUCORP.



1,000 Fonts 2067 A Thousand Fonts \$39.95

A huge collection of TrueType, Type 1, Type 3, and Screen fonts.

Published by EDUCORP

2033 Shelley Duvall's "It's a Bird's Life"\$44.95

Join a bunch of lovable, zany parrots on an odyssey from LA to the Amazon jungle. This enchanting original children's story is written and narrated by acclaimed actress/producer Shelley Duvall, and brought to life in interactive multimedia. Children can listen to or read the story, animate screen objects with a click of the mouse, join in on singalongs, explore the facts, and play games scattered throughout the story.

Published by Sanctuary Woods



2079 Loops: Music for Multimedia\$79.95

100 original music tracks. From up-tempo tracks for advertising and presentations to sophisticated 'soundscapes' for architectural fly-throughs. Each track is supplied in three formats. Give your presentation the creative edge.

2080 FaceLift Fonts v.1\$99.95

Why spoil your screen and video presentations with nasty, jaggy screen fonts when you can use FACELIFT anti-aliased screen fonts. They're smooth and they work just like regular fonts.

Published by REMedia



Your CD-ROM Specialist

Prices subject to change without notice. Dealer inquiries welcome.

Order toll-free in U.S. & Canada

EDUCORP 1-800-843-9497

EDUCORP • 7434 Trade Street • San Diego, CA 92121 • Info 619-536-9999 • Fax 619-536-2345

Circle 157 on reader service card

Best-Sellers

MAY 1993

Months on chart
▼ Last month
▼ This month

Business Software

87	1	1	Microsoft Excel <i>Microsoft Corporation</i>
96	3	2	Microsoft Word <i>Microsoft Corporation</i>
18	2	3	Microsoft Office <i>Microsoft Corporation</i>
73	8	4	Microsoft Works <i>Microsoft Corporation</i>
48	4	5	FileMaker Pro <i>Claris Corporation</i>
10	7	6	ClarisWorks <i>Claris Corporation</i>
17	5	7	MacDraw Pro <i>Claris Corporation</i>
34	6	8	Quicken <i>Intuit</i>
48	10	9	WordPerfect for the Macintosh <i>WordPerfect Corporation</i>
11	9	10	1-2-3 for the Macintosh <i>Lotus Development</i>
36	12	11	QuarkXPress <i>Quark</i>
83	14	12	Aldus PageMaker <i>Aldus Corporation</i>
26	13	13	MacProject <i>Claris Corporation</i>
30	—	14	Adobe Illustrator <i>Adobe Systems</i>
71	—	15	MacWrite II <i>Claris Corporation</i>

Education Software

62	3	1	Reader Rabbit <i>The Learning Company</i>
19	1	2	Math Rabbit <i>The Learning Company</i>
3	4	3	The Oregon Trail <i>MECC</i>
46	—	4	Where in the World Is Carmen Sandiego? <i>Broderbund Software</i>
27	—	5	Where in Time Is Carmen Sandiego? <i>Broderbund Software</i>

Months on chart
▼ Last month
▼ This month

Entertainment Software

61	1	1	Microsoft Flight Simulator <i>Microsoft Corporation</i>
21	5	2	Beyond Dark Castle <i>Aldus Consumer Division</i>
6	—	3	Space Quest III <i>Sierra On-Line</i>
35	3	4	Tetris <i>Spectrum HoloByte</i>
34	4	5	Falcon <i>Spectrum HoloByte</i>

Network/Data Communications

42	2	1	PhoneNet <i>Farallon Computing</i>
11	1	2	AppleTalk Remote Access <i>Apple Computer</i>
19	4	3	Netware for Macintosh <i>Novell</i>
65	3	4	AppleShare <i>Apple Computer</i>
2	—	5	Etherlink NuBus <i>3Com Corporation</i>

Add-In Boards

25	1	1	Macintosh IIsi NuBus Adapter Card <i>Apple Computer</i>
9	3	2	Macintosh II FDHD Upgrade <i>Apple Computer</i>
29	2	3	Macintosh Display Card 8*24 <i>Apple Computer</i>
21	4	4	Radius TPD Interface <i>Radius</i>
1	—	5	Precision Color Xp <i>Radius</i>

Months on chart
▼ Last month
▼ This month

Utility Software

35	2	1	SAM <i>Symantec Corporation</i>
24	1	2	After Dark <i>Berkeley Systems</i>
30	3	3	Norton Utilities for Macintosh <i>Symantec Corporation</i>
14	4	4	More After Dark <i>Berkeley Systems</i>
1	—	5	At Ease <i>Apple Computer</i>

The AmCoEx Index of Used Mac Prices

Machine/RAM/ Hard Drive	Average Sale Price	Monthly Change
Mac SE/2MB/20MB	\$675	\$0
Mac Portable/1MB/40MB	\$700	+\$50
PowerBook 100/4MB/40MB	\$950	+\$50
PowerBook 140/4MB/40MB	\$1450	+\$50
Mac Classic/2MB/40MB	\$700	+\$25
Mac SE/30/2MB/40MB	\$1250	-\$200
Mac LC/2MB/40MB	\$700	-\$150
Mac II/4MB/40MB	\$1100	-\$200
Mac IIsi/3MB/40MB	\$1000	-\$225
Mac IICx/4MB/80MB	\$1350	-\$50
Mac IIfx/4MB/80MB	\$1800	-\$150
Mac IIcx/4MB/80MB	\$2500	-\$100
Apple 12-inch B&W display/board	\$125	\$0
Apple 13-inch RGB display/board	\$375	-\$25
LaserWriter Plus	\$725	-\$100
LaserWriter IINT	\$1050	-\$125

Index provided by the American Computer Exchange of Atlanta, Georgia (800/786-0717). It reflects sales during week of February 19. Configurations include keyboard and exclude monitor and display board for noncompact models.

Source: Exclusive Audits & Surveys research from more than 250 Macintosh retailers and selected mail-order vendors. Covers sales during January 1993.

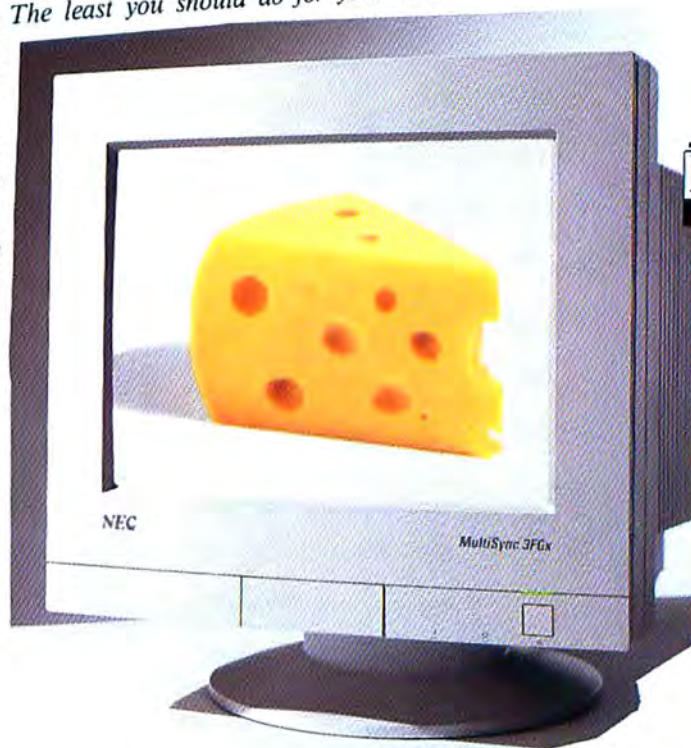


Announcing a better mousetrap.

NEC

The least you should do for your Mac[®]

The NEC MultiSync[®] 3FGx[™] monitor.



In 1992, the only monitor to snag the coveted five-mice rating was an NEC monitor: the remarkable MultiSync 4FG. After running it and 13 others through the most rigorous technical evaluation they'd ever used for testing monitors, *MacUser* magazine concluded, "If you're looking for the sharpest display, the NEC MultiSync 4FG should be your top choice."

What more can we say? Glad you asked. First, there's our AccuColor[™] Control System, which prompted *MacUser* to make special mention of the "easy color adjustments." AccuColor lets you adjust on-screen colors, so if you're looking for mouse-tail pink, that's what you'll get.

If, however, color control is not a priority for you, you'll be very happy with NEC's MultiSync 3FGx monitor, which shares almost all of the 4FG's award-winning features. Both monitors produce sharp, bright images, crisp graphics and vibrant colors. An Invar shadow mask provides increased brightness without loss of focus. And our high-contrast polished screen improves clarity.

Another big idea—the display area. The large 15" screen* coupled with FullScan[™] capability for edge-to-edge images gives you a considerably larger display area than typical 13" or 14" RGB monitors.

How do you make an NEC MultiSync monitor work with your Mac? Just plug it in, using

NEC's free FG/Mac cable adapter. It works with the Mac's on-board video, so you won't need an add-in video board.[†]

Both monitors are compatible with the Mac[®] II family, Quadra[™] series, LC's, PowerBooks[™] and PC systems. So you can use just one monitor for both types of platforms. *MacUser* noted the "powerful and versatile controls make switching from a Mac to a PC a snap."


And to make these monitors as user-friendly as possible, we've included ergonomic features such as a tilt/swivel base and up-front user controls. Plus, our Reduced Magnetic Field[™] technology meets the strict Swedish MPR II guidelines for magnetic field emissions.

There are lots of reasons for considering an NEC MultiSync monitor for your Mac—the sharp, bright images, the vibrant colors, the large display area, the flexibility, the compatibility—to name five. And the 🖱️🖱️🖱️🖱️ to name five more.

For more information on our award-winning monitors, call 1-800-NEC-INFO (in Canada: 1-800-343-4418). Or for information via fax, call NEC FastFacts[™] at 1-800-366-0476, request #62234.

[†]For Macintosh 640 x 480 resolution, just attach NEC's FG/Mac cable adapter and plug into Macintosh IIx, IIfx, LC, LCII, IIfx, IIfx, Quadra 700, Quadra 900, Quadra 950, Performa 100, Performa 500, PowerBook 150, PowerBook 180, and the PowerBook 210 and PowerBook 230 with either the DuoDock[™] or MiniDock[™]. Or with an add-in video card: Macintosh II, IIfx, IIfx, PowerBook 140, PowerBook 145, and PowerBook 170. Get the FG/Mac adapter free by calling NEC at (312) 622-7427 8:30AM-5PM CST.

*15" CRT with 13.4" visible display area. All guides reprinted from *MacUser* magazine, August 1992. © 1992 211 Communications Company. Macintosh and 5-mice logo are registered trademarks of Apple Computer, Inc. MultiSync is a registered trademark and AccuColor, FastFacts, FullScan, Reduced Magnetic Field and FullScan are trademarks of NEC Technologies, Inc. StereoView is a registered trademark of NEC Corporation. All other trademarks are the property of their respective owners. © 1992 NEC Technologies, Inc.

Because  is the way you want to go. **NEC**

Circle 16 on reader service card

The NEC MultiSync® 4FG™ The ultimate monitor for your Macintosh®

↑
*At NEC, we've developed
hundreds of computer
products expressly
for Mac systems:
from our highly-
acclaimed MultiSync
monitors, MultiSpin™
CD-ROM readers
and Silentwriter® laser
printers, to our
Professional Graphics
Series, which includes
our new 27" MultiSync
3PG data monitor and
MultiSync 6PG and
9PG Projection Moni-
tors for images as large
as 25 feet.*



*—MacUser Magazine
Aug. '92*

Cursor control. After all, that's what a pointing device really is all about. And now, with the introduction of Turbo Mouse® 4.0, cursor control takes on a whole new meaning.

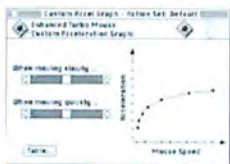
Macworld said, "Turbo Mouse 4.0 represents a real breakthrough in trackball software design. If you're shopping for a trackball, Turbo Mouse deserves first consideration."

Why a breakthrough?

Why is Turbo Mouse rated number 1?

The answer lies in a new and total integration of hardware and software. Take a look:

Custom Acceleration lets you change cursor speed according to the way you move the trackball. The faster the movement, the faster the acceleration. You can even have negative acceleration for detailed and precise work.



Want a really slow cursor? Activate the Slow Cursor command and you can temporarily move your cursor one pixel at a time.

Want a really fast cursor? Our new Brilliant Cursor™ technology will jump your cursor from one programmed HotSpot

KENSINGTON®

Don't
just
control
your
cursor.



to another. A real plus for large screen and multiple monitor setups.

And Turbo Mouse 4.0 features Enhanced Mouse Buttons that let you execute one of seven useful commands. You can even have the same button perform different commands in different applications.

Combine all this with onscreen help, System 7 compatibility, two ADB ports for chaining — not to mention a large comfortable ball with an ultra-responsive feel — and



you'll understand why Turbo Mouse has won more awards than any other Macintosh input device in history.

For more information, call 800-535-4242.

For information by fax, press 82 and request document 320. Outside the US and Canada, call 415-572-2700.



Dominate it.