

MACWORLD

THE MACINTOSH® MAGAZINE

February 1993 \$3.95 Canada \$4.95

Make Your PowerBook Take Off!



PICKING THE BEST ADD-ONS:

- Hard Drives **MW LAB**
- Printers and Fax Modems
- Monitors **MW LAB**

NEW COLUMN

PowerBook Notes

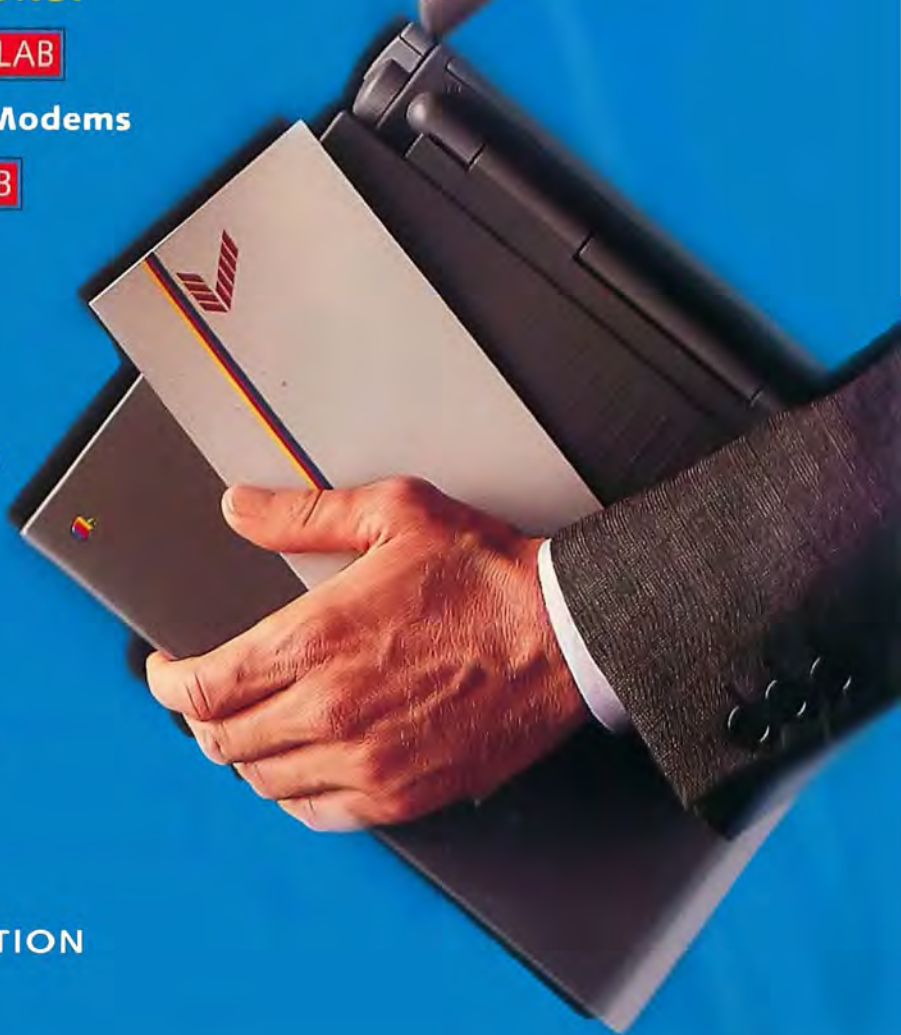
SEE PAGE 277

Full Color Fast!

18 HIGH-SPEED 24-BIT
BOARDS TESTED

Get Organized

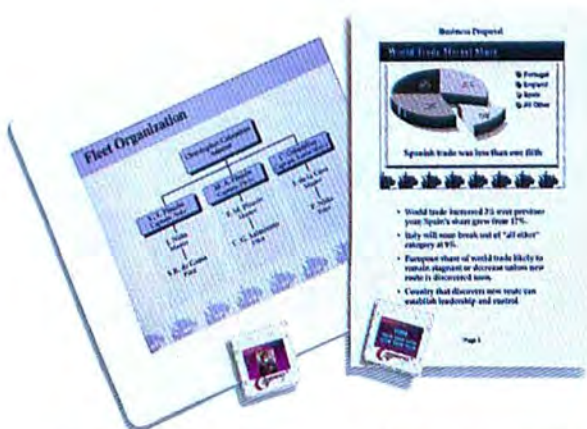
8 PERSONAL INFORMATION
MANAGERS



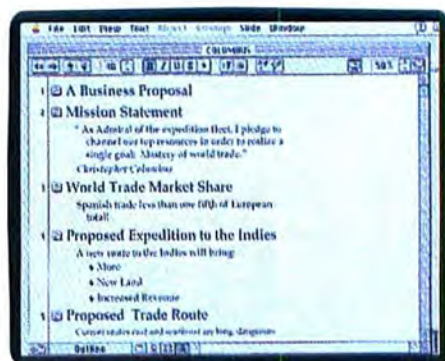
New PowerPoint 3.0. tools make power



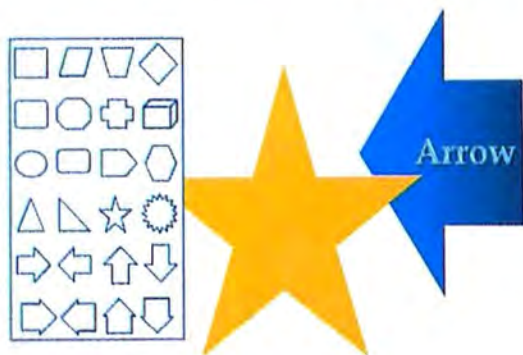
The toolbar. A powerful way to save time. Because now the most commonly used features are just a point and a click away.



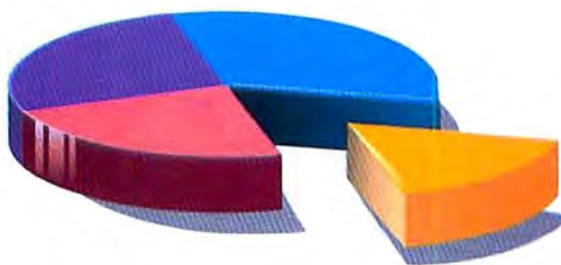
Output you have to see to believe. Creating sharp-looking overheads, 35mm slides or speaker's notes has never been easier.



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.

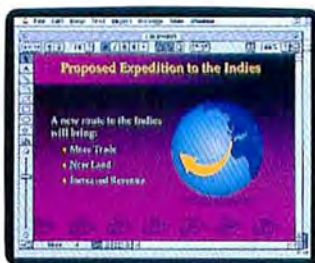
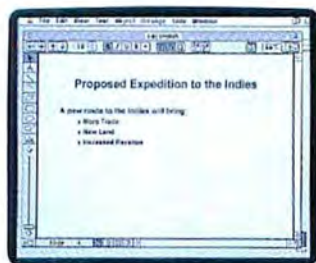
Now you have everything you need to make all your presentations as powerful as your ideas.

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

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.



You can upgrade to PowerPoint 3.0 and all these powerful features for only \$129.*



For your copy of the Microsoft® PowerPoint® version 3.0 upgrade, visit your nearest reseller or pick up the phone and push these buttons: (800) 426-9400.

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®.

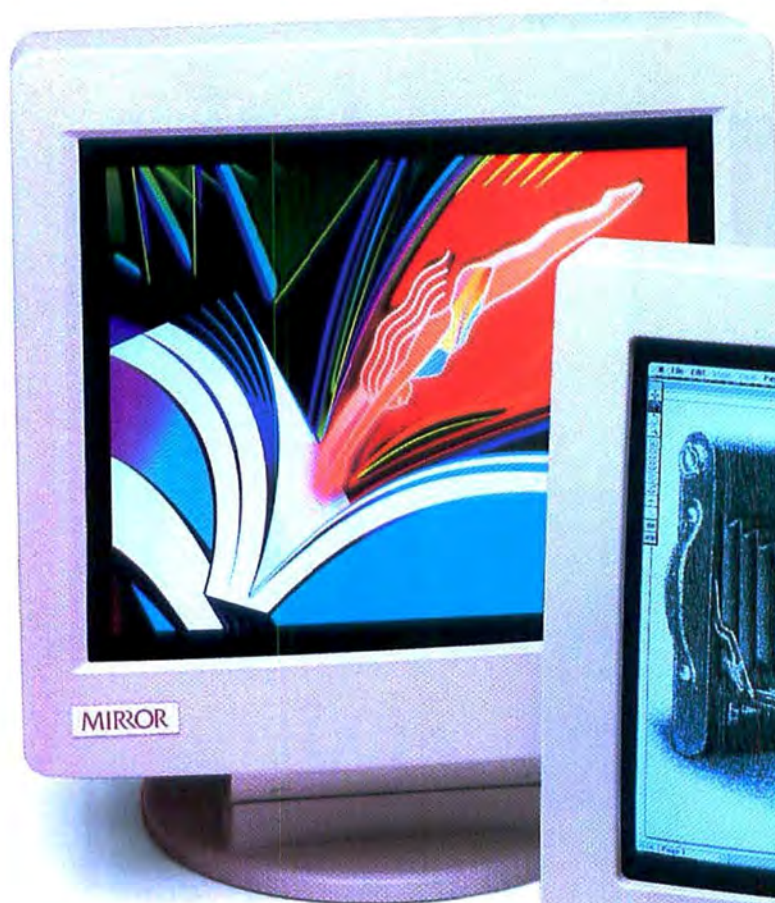
using PowerPoint 2.01 or older, Aldus® Persuasion®, or any other competitive presentation graphics program.*

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

MIRROR'S GOT YOU NEED TO



COLOR SYSTEMS

14-inch Color Display \$399[†]

PowerVision 8-bit video
adapter for PowerBook

w/0 MB of RAM \$499

w/2 MB of RAM \$699

w/4 MB of RAM \$999

16-inch Mirror Trinitron \$1099

w/8-bit board \$1349

w/16-bit board \$1449

w/24-bit board \$1549

20-inch ProView Trinitron

w/8-bit board \$2499

w/16-bit board \$2599

w/24-bit board \$2699

20-inch ProView V

w/8-bit board \$1799

w/16-bit board \$1899

w/24-bit board \$1999

MONOCHROME SYSTEMS

15-inch Grayscale Portrait Display \$399[†]
with monochrome card \$549

ViewPort™ Full-page SCSI Display
perfect for Mac Plus,
Classic II or PowerBook \$699

19-inch Two-page Display w/ card \$799

21-inch Grayscale Display \$999[†]
w/ monochrome card \$1199

SOMETHING 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 ViewPort Full-page Display that works on any Mac, Mirror displays 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 Mac Plus to the convenience of a full-page display, to add a color



The Mirror Grayscale Portrait Display.

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: 1038

14" COLOR DISPLAY

The Mirror 14-inch Color Display delivers affordable, brilliant color from the video port of your LC, LCII, Performa 400, IIfx and IIsx (or compatible video card). It's also a great choice for use with our PowerVision video adapter.



POWERVISION™

The Mirror Power Vision video adapter for the PowerBook 140, 145 and 170, displays 256 colors on a 13/14-inch color display or 16 shades of gray on a 15-inch full-page display. It features dual-screen and presentation modes, and includes a comprehensive installation videotape.



VIEWPORT™ FOR ANY MAC

With a ViewPort SCSI display system, you can enjoy the productivity and convenience of a full-page display, even on Macs without expansion slots. Perfect for the Mac Plus, Classic, Classic II, and PowerBook 100, the ViewPort works on any Mac with a SCSI port.



ORDER DIRECT ANYTIME 1-800-643-3374

† For built-in video. 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: 2641 Patton Road, Roseville, MN, USA 55113

Circle 122 on reader service card

Contents

MACWORLD THE MACINTOSH® MAGAZINE FEBRUARY 1993



FEATURES



On the Cover

MAKE THE MOST OF
YOUR POWERBOOK.
SEE PAGE 126
TO FIND OUT WHICH
ADD-ONS CAN
TURN A NOTEBOOK
SYSTEM INTO A
WORKHORSE.
(PHOTO BY STAN
MUSILEK.)



Expanding Your PowerBook 126

BY TOM NEGRINO Want to make your PowerBook your main Mac? Macworld Lab tests a slew of peripherals to turn a notebook into a powerful desktop system.

Digital Stock Photos 136

BY RONNIE SHUSHAN Need a news photo from the presidential election? A shot from a vintage movie? Or just an image that's classier than standard clip art? You can find all that and more in today's digital photo libraries, available now on CD ROM and online services.

Data Guardians 144

BY BRUCE SCHNEIER We tried our best to infiltrate 24 security programs—from simple password protectors to high-level encryptors—to discover which ones do the best job of safeguarding your data.



24-Bit Color Graphics 152

BY CHARLES SEITER If photo-realism is what you're after, you definitely need a 24-bit video-display board. Macworld Lab tests accelerated and unaccelerated boards—18 in all—to help you make the right choice.



Page 136

Software Secretaries 160

BY FRANKLIN N. TESSLER Keeping track of appointments, tasks, events, and people often seems like a losing battle. Now there's a whole range of personal information managers—PIMs—that can help you get organized.

Network Utilities 168

BY SHELLY BRISBIN A good network utility can be an administrator's greatest ally. Here's how to find the best tools for quickly diagnosing and solving your networking crises.

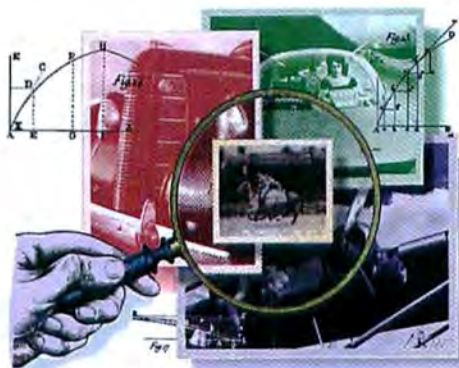
Halftones Demystified 175

BY STEVE ROTH With more than a dozen tips for producing high-quality halftones, this basic how-to helps you master the elusive art of getting good grays.

REVIEWS

- 188 **Microsoft PowerPoint 3.0**
Conventional presentation program
- 190 **MacroMind Director 3.1**
Multimedia/animation program
- 192 **DateBook 1.5.1**
Personal time manager
- 192 **TypeReader 1.0**
Optical character recognition
- 196 **PowerBook 145; PowerBook 160; PowerBook 180**
Notebook Macs
- 202 **Action 1.0**
Presentation software
- 204 **ElectricImage Animation System 1.5.1**
3-D rendering/animation package
- 206 **Power Portrait**
Portrait-style monitor
- 208 **PowerVision; BookView Imperial**
PowerBook video adapters
- 208 **Business Sense 1.6**
Small-business accounting
- 212 **WideWriter 360**
Large-format ink-jet printer
- 214 **ACT for Macintosh 1.0**
Contact manager
- 218 **Microsoft Works 3.0**
Integrated software
- 220 **Magnet 1.0**
Intelligent agent-based utility
- 222 **Poetry in Motion**
Poetry CD ROM
- 222 **HP LaserJet 4M**
600-dpi laser printer
- 224 **Sketcher 1.0**
Gray-scale paint
- 224 **PhonePro 1.0.3**
Telephony software
- 226 **Sportster 14,400 Mac & Fax**
Fax and data modem

- 226 **SimLife 1.0**
Educational game
- 230 **Inspiration 4.0**
Idea-development software
- 230 **MacGlobe 1.3**
Geography software
- 235 **So I've Heard, Volume 1: Bach and Before**
Music education on CD ROM
- 235 **Media Control Station**
ADB controller for multimedia applications
- 236 **Intouch 2.0.4**
Address book and reminder DA
- 236 **Insanity 1.0**
Stress-relief software
- 238 **Expert Landscape Design**
Home-landscape-design software
- 238 **ClearVue/SD21**
SCSI monitor



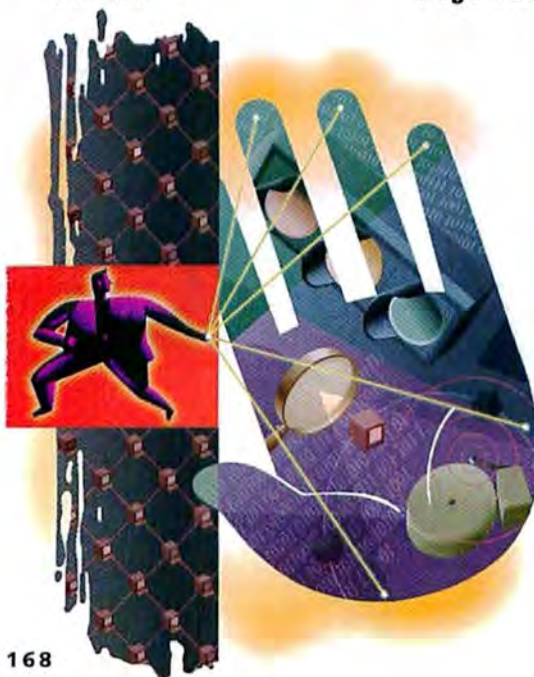
Page 175



Page 103



Page 103



Page 168

DEPARTMENTS

- 20 **How to Contact Macworld**
- 25 **MacBulletin**
- 37 **State of the Mac**
BY ADRIAN MELLO
Adding value to *Macworld*
- 41 **Letters**
- 63 **Art Beat**
BY CATHY ABES
- 77 **The Iconoclast**
BY STEVEN LEVY
The little hack called Newton
- 83 **Conspicuous Consumer**
BY DEBORAH BRANSCUM
An update on computers and health
- 89 **Lab Notes**
BY MARK HURLOW
- 103 **News**
BY DAN LITTMAN AND TOM MORAN
- 243 **The Desktop Critic**
BY DAVID POGUE
World's best address-book software
- 247 **New Products**
- 259 **How To/Quick Tips**
BY LON POOLE
- 269 **How To/Getting Started**
BY JIM HEID
Memory-maximizing tips
- 277 **PowerBook Notes**
BY CARY LU
Styling a sleek road machine
- 285 **Star Ratings**
- 297 **1992 Annual Index**
- 392 **Best-Sellers**



February 1993, Volume 10, Number 2 *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.

MIRROR'S NEW IS GREATLY FORTUNATELY,

SCANNERS

600 DPI

600 Plus Color Scanner,
with MirrorScan™ Software
\$999

600 Pro Color Scanner,
with JPEG Compression
and MirrorScan Software
\$1,399[†]

800 DPI

800 Plus Color Scanner,
with MirrorScan Software
\$1,299

800 Pro Color Scanner,
with JPEG Compression
and MirrorScan Software
\$1,699[†]

Transparency adapter
for 600 or 800 models
\$599

Adobe Photoshop™,
version 2.01
\$200 (requires Scanner purchase)



600 Plus Color Scanner,
with MirrorScan™ Software

\$999

MIRROR

CALL 1-800-
333-3333

© 1993 T. 33008

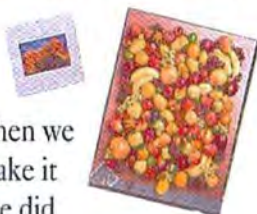
Low monthly payments
with your Mirror credit card.
Call for an application.

COLOR SCANNER ENHANCED THE PRICE ISN'T.

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 color scanner you could buy. Then we 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.

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



Transparency
adapter available

the ground up, MirrorScan™ combines sophisticated and powerful controls with a clear, easy-to-use interface, for great scans every time.

For serious design and publishing applications, we offer the 600 Pro and 800 Pro Color Scanners. With all the great features of the 600 and 800, plus hardware acceleration for JPEG compression, the Pro models let you scan even full-resolution images faster. And with JPEG, your images can be compressed to 1/50th of normal size, resulting in substantial savings in disk space, time and money.

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: 1039

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.

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 1-800-643-3378

*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: 1-612-633-2165 • Telephone: 1-612-633-4450 • FAX: 1-612-633-3136 • Address: 2644 Patton Road, Roseville, MN, USA 55113

Circle 125 on reader service card

AnthroCart®

NEW LOWER PRICES!



The Original AnthroCart...different widths, heights and depths. Over 40 accessories to add. Shelves adjustable in 1" increments.

Lifetime warranty. Made in U.S.A. 48 hours in house order turn-around. Order direct and experience Anthro's exceptional service.

Anthro. Look for our name.



Space saving.



Lots of choices.



Flexible.



Built tough.

ANTHRO
Technology Furniture®

3221 N.W. Yeon St. • Portland, OR 97210 • Fax: (503)241-1619

Free Catalog: **800-325-3841** 6:30 AM to 5:00 PM PST, M-F

GSA contract no. GS-00F-5040A. Available for OEM applications. Prices from \$159. Anthro, AnthroCart and Technology Furniture are registered trademarks of Anthro.

MACWORLD

PRESIDENT/CEO AND PUBLISHER	James E. Martin
MACWORLD COMMUNICATIONS, INC.	
ASSISTANT TO THE PRESIDENT	Terri Edelman
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
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 181 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; AUSTRIA'S Computerwelt Osterreich, PC Test; BRAZIL'S DataNews, Mundo IBM, Mundo Unix, PC World, Publish; BULGARIA'S Computerworld Bulgaria, Edworld, PC World Express; CANADA'S Direct Access, Graduate Computerworld, InfoCanada, Network World Canada; CHILE'S Computerworld, Informatica; COLOMBIA'S Computerworld Colombia; CZECHOSLOVAKIA'S Computerworld Czechoslovakia, PC World Czechoslovakia; DENMARK'S CAD/CAM WORLD, Communications World, Computerworld Danmark, Computerworld Focus, Computerworld Uddannelse, LAN World, 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, Tietovikko, Tietoverkko; FRANCE'S Distributive, 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, Netzwelt, 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 CompuEdicion, 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 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 Ekspress, PC World Norge, PC World's Product Guide, Publish World, Student Guelden, Unix World, Windowsworld, IDG Direct Response; PERU'S PC World; PEOPLE'S REPUBLIC OF CHINA'S China Computerworld, PC World China, Electronics International, IDG HIGH TECH New Product World, Consumer Electronics New Product World; PHILIPPINES' Computerworld, PC World; POLAND'S Computerworld Poland, PC World/Komputer; ROMANIA'S Infocub Magazine; RUSSIA'S Computerworld-Moscow, PC World, Networks; 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, CAD/CAM World, ComputerSweden, Corporate Computing, Lokala Natverk/LAN, LotusWorld, 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 Turkiye, PC World Turkiye; UNITED KINGDOM'S Lotus Magazine, Macworld, Sunworld; UNITED STATES' Amiga World, Cable in the Classroom, CIO, Computerworld, DOS Resource Guide, Electronic News, Federal Computer Week, GamePro, inCider/A+, IDG Books, InfoWorld, InfoWorld Direct, LOTUS, Macworld, Multimedia World, Network World, NeXTWORLD, PC Games, PC Letter, PC World, Publish, RUN, SunWorld, SWATPro; VENEZUELA'S Computerworld Venezuela, MicroComputerworld Venezuela; YUGOSLAVIA'S Moj Mikro.

CANVAS 3.

Fast cars. Bungee jumping. Triple chocolate cheesecake. Seems like all of life's

really satisfying stuff comes laced with

EVERYTHING ELSE THIS GOOD IS BAD FOR YOU.



danger. Or at least cholesterol. • Our drawing program on the other hand, is an exception to the rule. • A peak experience that's

actually good for you. • Good how? • Good by souping up your productivity. With Canvas, you won't need to hop around

as you work, passing your piece from program to program to get things done. And you won't find yourself face to face with significant

built in compromises, either. Because Canvas puts every tool and effect you'll need for just about any design job together in a single

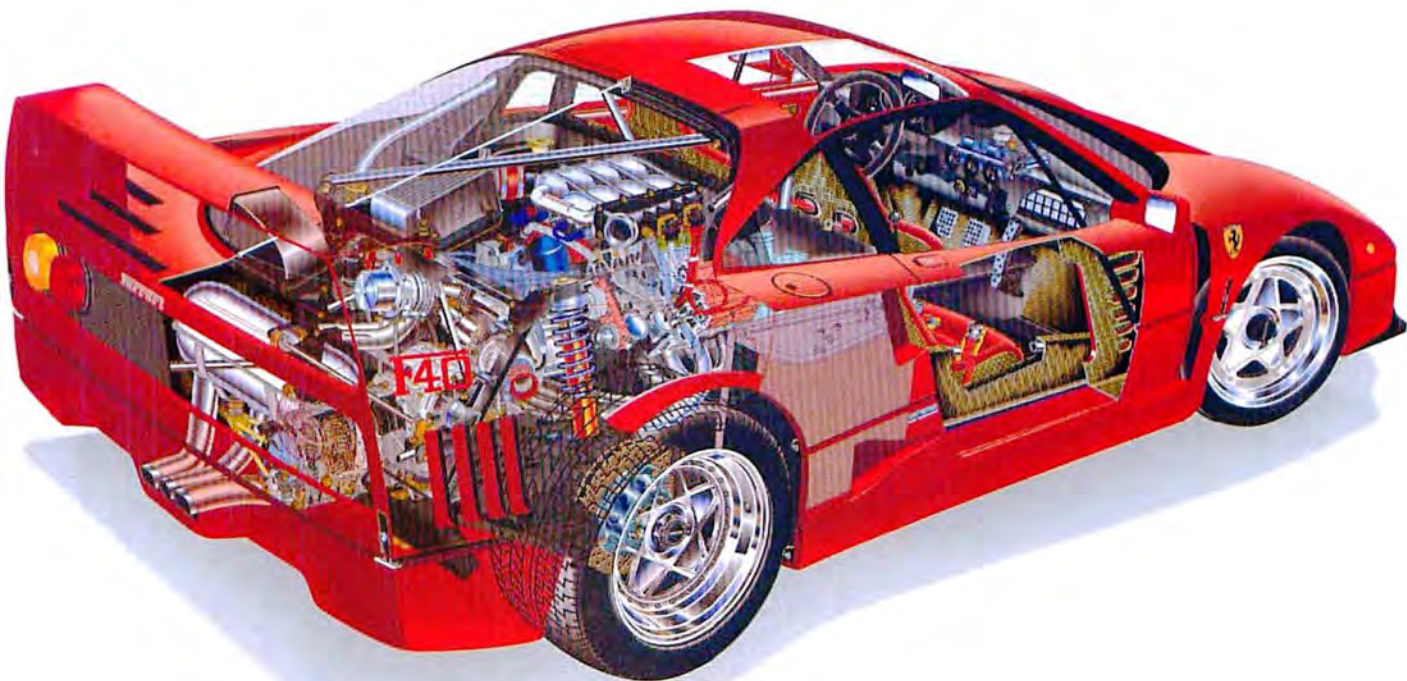
coherent package. It's all there. And it's all good. • How good? • Good enough to generate a slew of rave reviews and positive comparisons with

programs costing much more. • And good enough to capture virtually every significant industry award there is - from a MacUser Eddy for Best



Drawing Program to a MacWeek Target for Best Business Graphics Program to the Infoworld Buyers Assurance

Seal. • Canvas 3. No fat. No side effects. No shin splints. Just supreme drawing satisfaction.



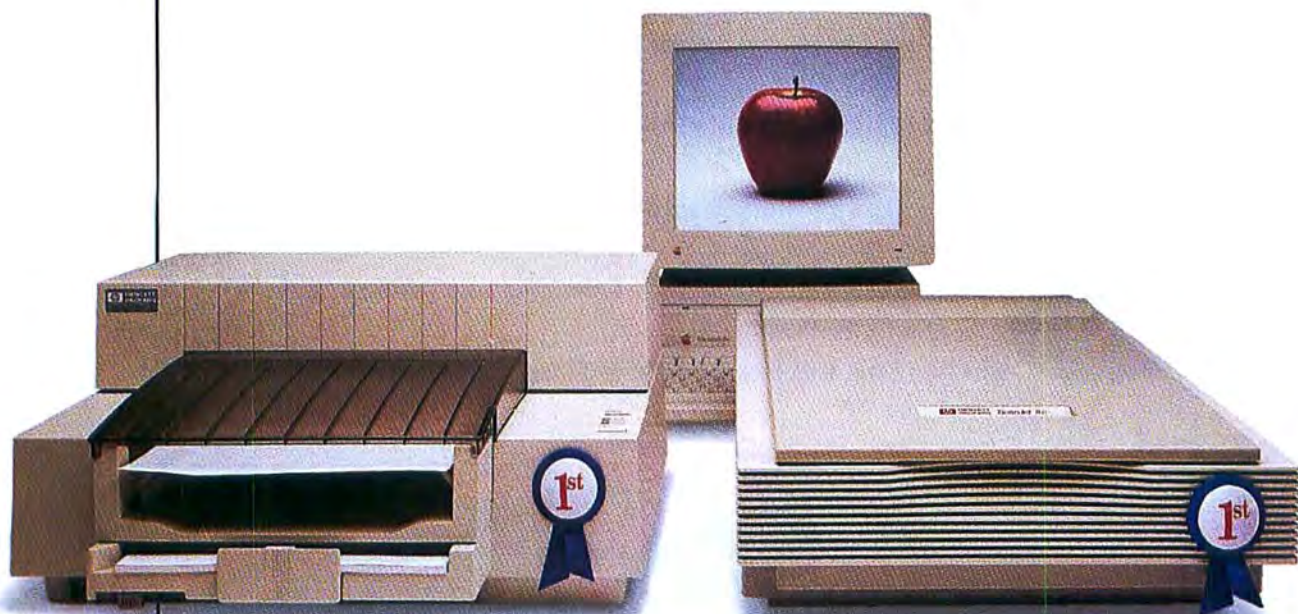
CANVAS 3. PRECISION DRAWING POWER FROM **Deneba** SOFTWARE

Illustrator®, Freehand™ and MacDraw® users, trade up to Canvas 3. (The Drawing Package That's Good For You). Send your original program disk along with \$149.00 to our address below. Include your MC, VISA, or Amex card number, account name and expiration date, or a check in US dollars drawn on a US bank. Add \$10.00 shipping. Offer valid in the United States and Canada. Expires on 3/31/93. Please allow four to six weeks for delivery. For more information or the name of your nearest dealer call (305) 594-6965 or FAX: (305) 477-5794. Deneba Software, 3305 Northwest 74th Avenue, Miami, Florida 33122. ©1992 Deneba Systems, Inc. Canvas™ is a trademark of Deneba Systems, Inc. Illustrator® is a registered trademark of Adobe Systems, Incorporated. Freehand™ is a trademark of Aldus Corporation. MacDraw® is a registered trademark of Claris Corporation. This entire ad was created and separated in Canvas.

Circle 57 on reader service card

Fame.

HP wins first-place awards for
Mac-compatible products.



Fortune.

HP gives \$100 or \$50 rebates on
award-winning ScanJets and DeskWriters.



**HP's Mac-compatible scanners
and printers seem to run forever.
But our rebate program won't.**

Now through January 31, 1993,
you can enjoy the famous perfor-
mance of HP's products for the
Macintosh. And save a modest
fortune in the bargain.

We're giving \$50 rebates on the
enormously popular HP DeskWriter
printer, providing laser-quality
output at a dot-matrix price. \$50

on the HP DeskWriter C, so you
can add a splash of color. And \$50
off the already low price of the
HP ScanJet IIp grayscale scanner.

We're also offering a \$100 rebate on
the HP ScanJet IIc color scanner.
With its superior scanning capabil-
ities, it meets all your imaging and
text needs.

HP DeskWriters and ScanJets won
landslide victories in Macworld

magazine's World-Class Awards.*
Voted on by Macintosh enthusiasts
who subscribe to Macworld.

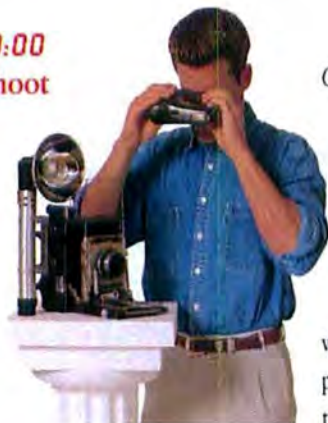
So call 1-800-35HPMAC, Ext. 7037
for more details and the name of
your local authorized HP dealer.
You'll find that the price of fame
is very reasonable.



**HEWLETT
PACKARD**

Painless Presentations

10:00
Shoot



Ouch!...Film. Processing. Projectors. Trays. Bulbs. All things that can make preparing a presentation a painful experience. The *Canon RC-570 Still Video Camera* can change all that. It records 25 electronic photos on a reusable 2-inch video floppy disk. No film or processing. No waiting. No waste. The 3X zoom lens and 450-line frame video resolution ensure superior image quality. Speed, portability and ease of use make the RC-570 an ideal tool for creating and delivering presentations.

10:12
Process

Canon's *RC-570 Electronic Still Presentation System* integrates the electronic photos as a computer graphic file into software, like *Persuasion®*, allowing you to produce image enhanced presentations quickly and easily. Once the "electronic slides" are complete, record the entire presentation to a video floppy disk. Imagine 25 slides on a single, reusable 2-inch disk, immediately, with no processing!



10:45
Present



Connect the RC-570 camera to any standard TV- monitor or video projector to deliver impressive presentations directly from your video floppy disk. Edit presentations right on the spot, add a shot, delete a shot, rearrange and customize. No computers. No slides. No projectors. No hassles.

Now...doesn't that feel better.



To learn more, call
1-800-221-3333 ext. 313.

Canon

© 1992 Canon USA, Inc. Still Video System Division. One Canon Plaza, Lake Success, NY 11042
Brand and Product names are trademarks of their respective holders.

Circle 110 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
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
ASSOCIATE EDITOR/FEATURES	Charles Piller
ASSISTANT EDITORS/REVIEWS	Marjorie Baer, Wendy Sharp
ASSISTANT EDITOR/NEW PRODUCTS	Carolyn Bickford
ASSISTANT EDITOR	Suzanne Courteau
ASSISTANT EDITORS/LAB	Matthew R. Clark, Tim Warner
EDITORIAL ASSISTANTS	Jim Feeley, Joanna Pearlstein, Gideon Yaffe
ADMINISTRATIVE ASSISTANTS	Lynn Taylor, Marisa Watkins
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 Landergrén, 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
SENIOR PRODUCTION EDITOR	Jo Ann Villalobos
COPY EDITORS	Doreen J. Kan, Paul M. King, Felicity O'Meara
ASSISTANT PRODUCTION EDITOR	Lisa Brazial

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 Yoon Kim
ASSOCIATE DESIGNER	Tim Johnson
DESIGN ASSOCIATES	Belinda Chlouber, Martha Katt

TO VIRUSES IT'S LIKE A IN FRONT OF AN ELECTRIFIED AND, TOTALLY SURROUNDED BY A MOAT FULL OF.

**New SAM 3.5. There's
 nothing tougher on viruses.
 And easier on you.**

In the war on viruses, it's all or nothing. So get new SAM 3.5, the toughest, most comprehensive virus stopper out there. And the easiest.

New To SAM 3.5

- Detects the most unknown virus activities of any program
- Only antivirus to scan compressed files
- Easy color interface
- Only one to schedule scans
- On-line help with virus info.
- Easy network install. & updates†

Because it stands silent watch in the background; scanning your files, floppies, and appli-

cations round-the-clock to stomp out attacks before they begin. And it helps you quickly repair infected files.

To update your protection, just drop the newest virus definitions, posted on most on-line services, into your System folder. Only SAM makes it this easy.

No wonder it's the number one selling Mac antivirus in the world.

The toughest SAM yet.

New SAM 3.5 is the toughest barrier against unknown viruses you can buy. It's the only antivirus that

scans and detects viruses in compressed files. And the only one that lets you schedule scans in advance. Plus, it's now easy to install and distribute over networks.†

With new SAM 3.5 you've got nothing to fear. And everything to gain, in productive worry-free computing. For just \$99* at your dealer. SAM owners can upgrade for just \$24** by calling **1-800-343-4714, ext. AF15** (offer expires March 12, 1993).



*Price in U.S. dollars. **Offer price in U.S. dollars, valid in U.S. and Canada only. SAM is a registered trademark of Symantec Corporation. In Canada, call 1-800-465-2266. Everywhere else, call 408-252-3570. † Available for volume purchasers, and with the SAM 3.5 10-pack version. Call 1-800-554-4403 for more information via FAX. Select option #2 and request document #4510. © 1992 Symantec Corporation.

SYMANTEC.

**HOW TO BE
NEAT, PRECISE
AND ORGANIZED.**

**WITHOUT BECOMING
ONE OF THOSE
OBNOXIOUS
PEOPLE WHO ARE
NEAT, PRECISE
AND ORGANIZED.**



OR



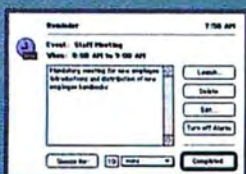


▲ Now Up-to-Date lets you schedule appointments and To Do's instantly — just click on the date you want and enter your information. Calendars can be viewed by day, multi-day, week, month or year, and can be customized in a myriad of fonts, styles and colors. You can even share schedules and events with your associates over a network or via modem.

▼ The To Do list lets you schedule tasks for certain due dates or simply for whenever you get around to them. It also allows you to prioritize tasks and automatically forwards them on to the next day's To Do list until each task is completed.



► As well as displaying the current time in the menu bar, AlarmsClock automatically alerts you and your associates of upcoming meetings, To Do's and other events (including recurring events). Even when you're not running Now Up-to-Date.



▼ Calendars can be printed in all the major appointment book sizes and formats, each in a wide variety of views and styles. You can even print out wall charts up to 34"x44".



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 AMAZINGLY ORGANIZED WITHOUT BECOMING OBNOXIOUS.

STEP 2. NOTICE HOW INCREDIBLY SIMPLE NOW UP-TO-DATE IS TO USE. TOTALLY CUSTOMIZABLE. 100% NON-FASCIST. LETS YOU DISPLAY CALENDARS AND EVENTS ANY WAY YOU WANT THEM. JUST CLICK ON A DATE, ENTER THE INFO, BANG, YOU'RE DONE. WANT TO CHANGE IT TO A DIFFERENT DATE? DRAG IT THERE. THAT'S IT. WANT IT TO SHOW UP ON THE FIRST THURSDAY OF EVERY MONTH UNTIL THE YEAR 2035? CLICK ONCE. YOU'VE GOT IT.

STEP 3. THINK TO YOURSELF, "WOW, CALENDAR SOFTWARE THAT'S ACTUALLY FASTER AND EASIER THAN THE OLD PEN AND APPOINTMENT BOOK APPROACH. AMAZING." HEY, WE LIKE THE WAY YOU THINK.

STEP 4. READ ALL THE DETAILS UP THERE IN THE

CAUTIONS THAT WE COULDN'T FIT DOWN HERE. THANKS.

STEP 5. IF YOU'RE ON A NETWORK, SHARE EVENTS ON YOUR CALENDAR WITH THE OTHER FOLKS ON YOUR NETWORK. THEY'LL NO DOUBT RETURN THE FAVOR, SHARING MEETING DATES AND WHATNOT WITH YOU. YOU SAY YOU'RE NOT ON A NETWORK?

THAT'S OKAY, NOW UP-TO-DATE WORKS FINE ALL BY ITSELF. PLUS, YOU WON'T HAVE TO GO TO ALL THOSE OTHER PEOPLE'S BORING MEETINGS.

STEP 6. FLY TO ZIMBABWE. OKAY, NOW BRING UP YOUR CALENDAR ON YOUR POWERBOOK. GOOD. NOW COMPLETELY DISCOMBOBULATE THE THING. CHANGE IT ALL AROUND. GREAT. NOW CONNECT TO YOUR OFFICE VIA MODEM. PRESTO! ALL YOUR CALENDARS AUTOMATICALLY UPDATE THEMSELVES.

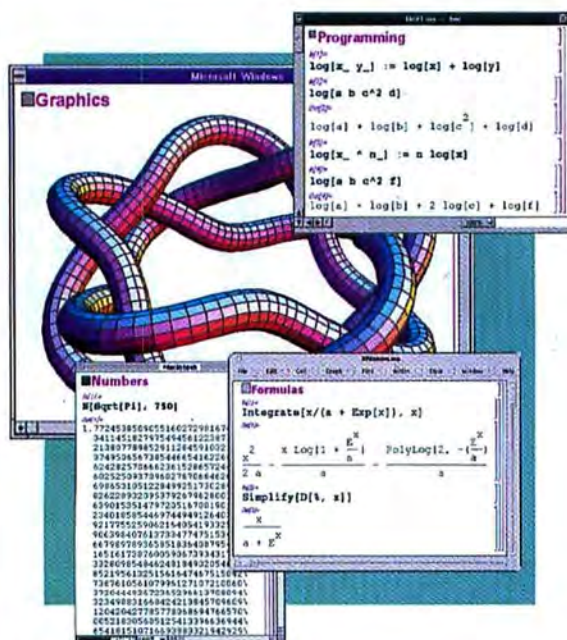
STEP 7. PICK UP NOW UP-TO-DATE 2.0. OR, FOR MORE INFO, GIVE US A CALL AT 1-800-237-3611.

STEP 8. QUIT GOOFING OFF READING SOFTWARE ADS AND GET BACK TO WORK. YOU'VE GOT A LOT OF STUFF TO DO.



Mathematica

THE COMPLETE SOLUTION FOR TECHNICAL COMPUTING



When it was released in 1988, the *New York Times* wrote that *Mathematica* "fundamentally alters the mechanics of mathematics." Four and a half years later, with several hundred thousand scientists, engineers, students, financial analysts, medical researchers, and others using the system, *Mathematica* is firmly established as the standard environment for technical computing.

The easy-to-use language that is built into *Mathematica* requires no learning for simple calculations, but has the power to let you create even the most sophisticated programs. And with the Notebook concept pioneered by *Mathematica*, you can create interactive documents that mix text, graphics, animations, and sounds with live formulas and programs.

And you can run your same *Mathematica* programs without change on everything from Macintosh and PCs (with or without Windows) to Unix workstations and supercomputers.

Call today to get the latest information about *Mathematica*:

1-800-441-MATH
Extension 401

Wolfram Research

Wolfram Research, Inc., 100 Trade Center Drive, Champaign, IL 61820-7237, USA
+1-217-398-0700; fax: +1-217-398-0747; email: info@wri.com

Wolfram Research Ltd., Evenlode Court, Main Road, Long Hanborough, Oxon OX8 2LA, UK
+44-(0)993-883400; fax: +44-(0)993-883800; email: info-euro@wri.com

Representatives in over 30 countries; contact main office.

©1992 Wolfram Research, Inc. Mathematica is a registered trademark of Wolfram Research, Inc. Mathematica is not associated with Mathematica Inc., Mathematica Policy Research, Inc., or Math Tech, Inc. All other product names mentioned are trademarks of their producers.

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. Salas (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 Bremer (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)
DIRECT RESPONSE SALES	Niki Stranz (415/978-3105), Carol Johnstone (415/978-3152), Shannon Smith (415/974-7414)
MACWORLD SHOPPER	
ASSISTANT TO THE DIRECTOR OF ADVERTISING SALES	Yuen Yeh (415/978-3258)

INTERNATIONAL SALES AND MARKETING

DIRECTOR OF MARKETING AND COMMUNICATIONS	Kimberlee A. Luedde
PROMOTION MANAGER	Lisa McKeon
ACCOUNT MANAGER	Christine Wong

MARKET RESEARCH

VICE PRESIDENT/RESEARCH	Gary L. Rocchio
RESEARCH COORDINATOR	Peter Summersgill

VICE PRESIDENT/MARKETING AND CIRCULATION	Lindsay Davidson
MARKETING AND CIRCULATION ASSISTANT	Deirdre Dugan

MARKETING

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 Garehar
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 Crossland
PRODUCTION ASSISTANT	Gary Silverstein

A print spooler is a print spooler is a print spooler. Right?

When it comes to printing in the background there are plenty of spoolers to choose from.

So why have over 150,000 Mac users chosen SuperLaserSpool?

Because it supports more printers than any other spooler?

Or because it's the only one that supports Apple® Image Writers® and HP LaserJets®, DeskJets® and DeskWriters®?

Is it because SuperLaserSpool is compatible with many more Macintosh® configurations?

Or because it's compatible with virtually every Mac application?

Because only SuperLaserSpool can spool color PostScript® files?

Or because it spools everything and anything faster than any other spooler?

Could it be our exclusive LaserQueue® desk accessory that lets you preview and prioritize documents, re-route them to another printer, or print to several printers simultaneously?

How about our vaunted 24-hour toll-free technical support?

How about our one-year, money-back guarantee?

How about picking up the phone? Dial 1-800-477-8212.

It's the right thing to do.



VISIT US AT BOOTH #2025
MOSCONE CENTER



FIFTH GENERATION SYSTEMS, INC

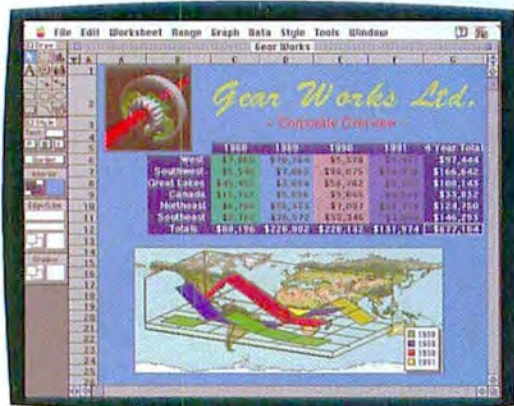
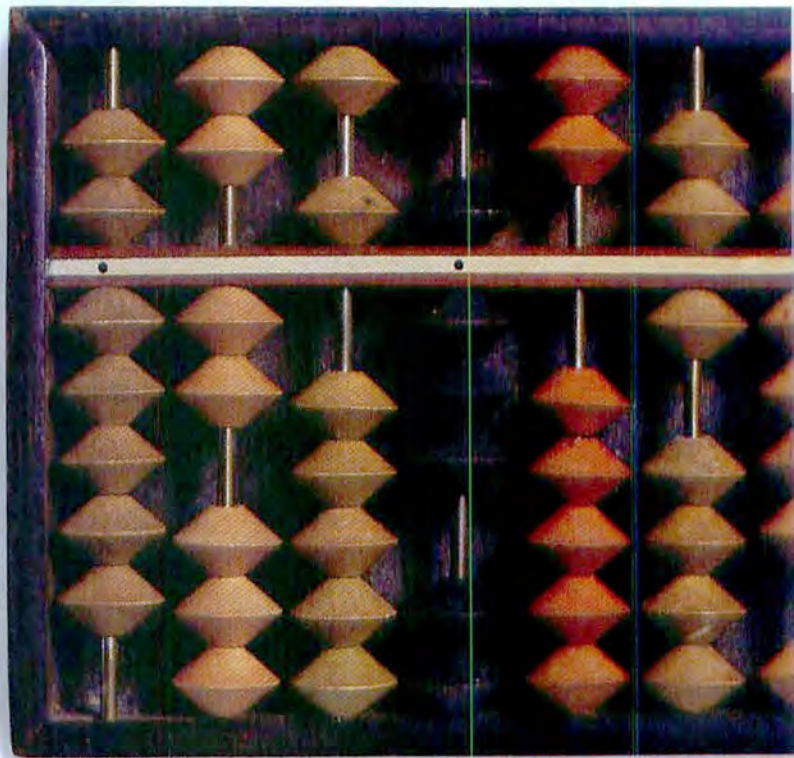
Circle 151 on reader service card

It's been centuries with number

The abacus first appeared around 500 or 600 B.C. Some say it was invented by the Egyptians. Others think it was the ancient Chinese. But whoever it was, they had the right idea: create a simple, easy-to-use device for working with numbers, and people will be a lot more productive.

Introducing 1-2-3 for Macintosh Release 1.1: the easiest-to-use Mac® spreadsheet.

Like the abacus, 1-2-3® for Macintosh® was inspired by simplicity, and Release 1.1 is even simpler to use. Now you can drag-and-drop data between worksheets. And with new SmartSum, you can simultaneously sum multiple ranges. Plus, Copy Down, Copy Right and Copy Back enable you to copy labels or formulas across columns, rows or 3D worksheets.



New graphing enhancements in Release 1.1 let you turn your numbers into graphic presentations faster and easier than ever.

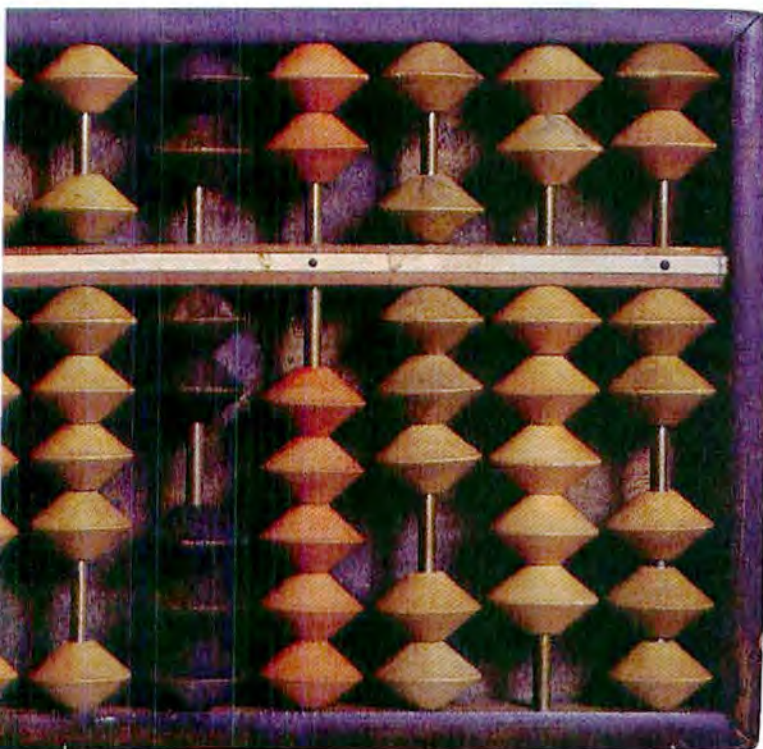
Of course, 1-2-3 is still the only spreadsheet that gives you In-Cell™ editing, so you can enter a formula directly into a cell for faster, easier editing.

The easiest graphing of any Mac spreadsheet.

1-2-3's remarkable graphing and charting capabilities make it the best Macintosh spreadsheet for presenting data. Because unlike Microsoft® Excel, 1-2-3 lets you store your graphs and charts in the same file as your worksheets. So you can manipulate data, text and graphics all in the same file with *one* set of menus and only *one* set of tools. And you can make one-click graph type changes, pull objects across window boundaries to the

The QuickTime animation "Magical Gear" was created using 1-2-3. **In Canada call 1-800-GO-LOTUS. ***Please have your credit card and product pack. Classic is a registered trademark licensed to Lotus Development Corporation. Microsoft is a registered trademark of Microsoft Corporation. Mac and Macintosh are registered trademarks of Apple Computer, Inc. The Apple logo is a registered trademark of Apple Computer, Inc.

es since working s was this easy.



True 3D makes organizing
and analyzing data fast and easy.

Only with the true 3D capabilities of 1-2-3 can you easily consolidate multiple spreadsheets into *one* file without having to link the files. 3D allows all spreadsheet functions to be performed *through* multiple worksheets just as they are performed down rows and across columns.

The easiest transition
from DOS to Mac.

For DOS spreadsheet users moving to Macintosh, 1-2-3 is the only way to go. 1-2-3's traditional Classic® Menu makes it easier for you to access familiar 1-2-3 commands and to run macros already written for 1-2-3. And only 1-2-3 offers cross-platform capabilities, so you can work more efficiently and productively with the 18 million other 1-2-3 users

across all major platforms.

1-2-3 for Macintosh. All in all, it's the easiest way to work with numbers to come along in centuries. To find out for yourself, buy a copy from your Lotus Authorized Reseller,* and try it for 60 days with a full money-back guarantee direct from Lotus.® Or call **1-800-TRADEUP, ext. 7312**** for a free working model. (Excel users be sure to ask about our special upgrade price:***)



Lotus

1-2-3 for Macintosh

NEW

LEARN 2 LEARN
PEANUTS

\$64.95

Snoopy and the Peanuts Gang
invite you to join them in five great activities. Learn and practice Math, Geography, Reading, Coloring and have Fun too! Increasing difficulty levels challenge kids time and time again.

1-800-U-SNOOPY
(1-800-8-766679)

II Series • Quadra • Preforma • System 6.07 or higher • System 7 compatible
Hardrive • 13" monitor or larger • 256 colors • 5 mb RAM min

ImageSmith
1313 Sepulveda Blvd
Torrance, CA 90501

ImageSmith
©1992 ImageSmith, Inc. All rights reserved.
Macintosh® Copyright Apple Computer.

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, MW Lab, Desktop Critic, Quick Tips, and Conspicuous Consumer are registered trademarks of International Data Group, Inc. APPLE, the APPLE LOGO, MAC, and MACINTOSH are registered trademarks, and MACLETTER 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.



CRUNCH **=** **3**

1 **7** **+** **POWER**

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

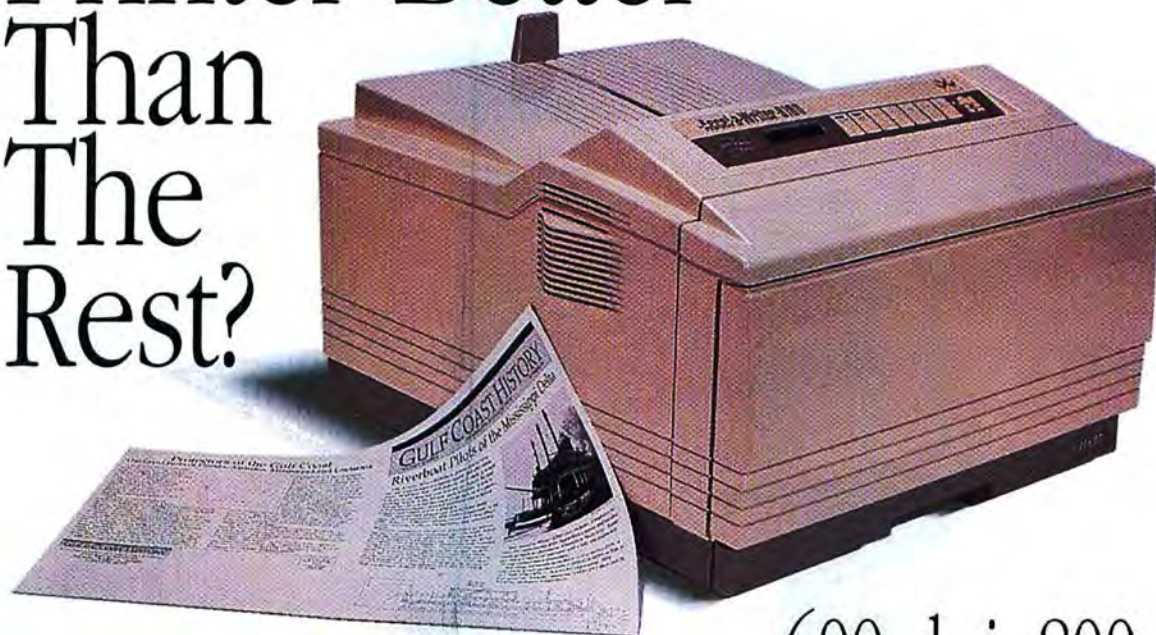
It's the number cruncher's dream.
For your nearest PowerPad dealer, call
Sophisticated Circuits at (800) 827-4669.

POWERPad

© 1992, Sophisticated Circuits, Inc.
Phone: (206) 465-7979, FAX: (206) 485-7172
PowerPad is a trademark of Sophisticated Circuits.
PowerBook is a registered trademark of Apple Computer, Inc.

Circle 184 on reader service card

What Makes Our 11x17 Printer Better Than The Rest?



600 dpi, 800 dpi,
960 dpi, Speed, Flexibility,
Upgradability and Support... oh yeah, Price.

When shopping for an 11x17 PostScript® compatible printer, we realize you have a lot of choices. And while many vendors lay claim to being the best, Xante prefers to leave the judging to you. We invite you to compare our printer with the rest. With the *Accel-a-Writer 8100*, you'll get...

11x17/A3 Printing - The large page size support will give you a new level of flexibility in page layout and printing.

True High Resolution - The *Accel-a-Writer 8100* supports true 600 x 600 dpi for incredibly sharp text and graphics. And you have the option to nearly double or triple the resolution with our 800 x 800 dpi and 960 x 960 dpi upgrades.

High Speed Printing - The *Accel-a-Writer 8100* is built for speed with the AMD 29000 RISC processor, 12 MB RAM, Xante's *Advanced Memory Management*, and Canon®'s 8 page per minute LBP®-BX laser print engine.

Flexibility - Sharing among Mac® and PC users is simple with simultaneously active AppleTalk®, Parallel and Serial interfaces. You'll get font flexibility with 35 Type 1 fonts plus the ability to download up to 30 more permanently on the controller with Xante's *Virtual Disk Technology*.

Best Price - The *Accel-a-Writer 8100* gives the highest quality in output, advanced printing technology and flexibility. But the best thing is you won't have to pay a premium. In fact, the *Accel-a-Writer 8100* is only \$3,995.

Quality Assurance Guarantee - Your purchase will be protected with toll-free customer support, a one year warranty and a 30-day unconditional money back guarantee. Compare, then call us directly.



	Accel-a-Writer® 8100	CalComp® CCL-600	NewGen® TurboPS 660™ B	QMS® 860 Print System
Standard Resolution	600x600 dpi	600x600 dpi	600x600 dpi	600x600 dpi
Optional Resolution	800 & 960 dpi	None	800 dpi	None
Standard RAM	12 MB	2 MB	12 MB	12 MB
Virtual Disk Technology	✖			
Enhanced Gray Scale	✖			
Price	\$3,995	\$3,995	\$5,495	\$4,595

Statistics as of 10/92

1-800-926-8839

Ext. 2102

Fax 205-476-9421

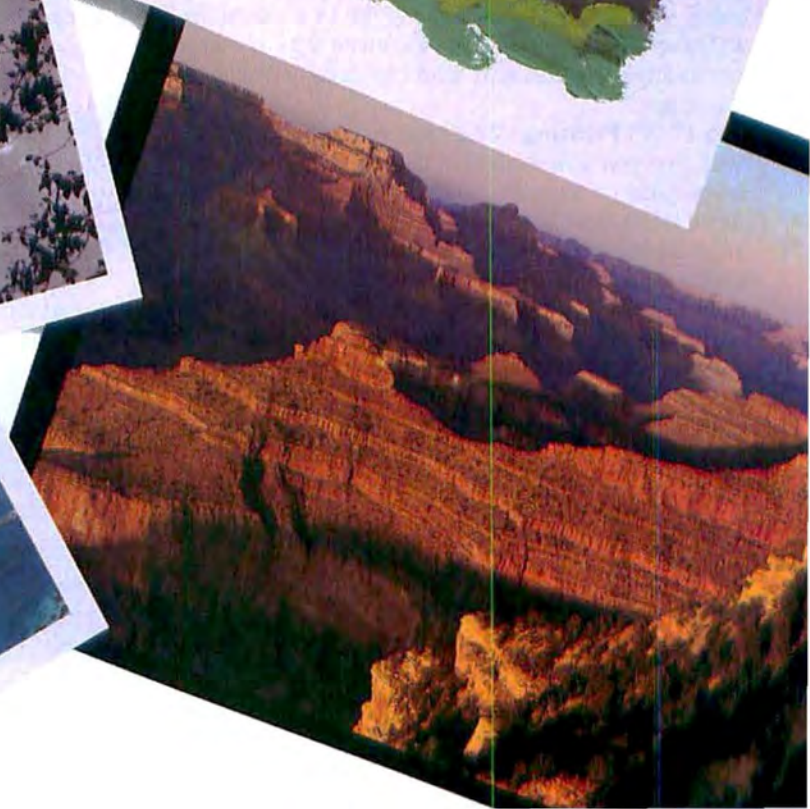


© 1992 XANTE Corporation. XANTE Accel-a-Writer is a trademark of Xante Corporation. Other brands and product names are trademarks or registered trademarks of their respective holders. XANTE Corporation: 2559 Emogene St., Mobile, AL 36606, Post Office Box 16526, Mobile, AL 36616-0526 USA, Tel. 205-476-8189.

Circle 1 on reader service card



SCAN THE
SEVEN WONDERS
OF THE WORLD.



WITH THE EIGHTH.



The Agfa family of scanners: Horizon, Arcus, and Focus.

It's no wonder so many companies today are choosing Agfa scanners.

From desktop publishing to high quality production prepress and graphic arts, Agfa offers a family of high-quality scanners that are not only affordable and easy to use, but designed for every production environment.

**A WONDER
TO WORK WITH.**

Whether you choose our affordable Arcus™ color or Focus desktop scanners or our exceptionally fast Horizon® color prepress scanner, you'll be getting a scanner that's the highest quality in its class.

Agfa scanners offer a range of features designed to meet your specific application needs. Like scanning resolution up to 1200 dpi. Multiple scanning modes from black and white to color. Transparency modules. Unique light sources. And image sampling up to 12 bits per color.

Built for speed, flexibility and increased productivity, Agfa scanners also offer the ability to work with reflective and transparent art. Automatic exposure and density control. Sharpness enhancement. White balance calibration. Exceptional dynamic range. And gamma and tone curve correction.

In addition, we offer a full complement of drivers for MAC®, PC®, and SUN® platforms and Agfa's professional imaging software.

**AT AGFA,
WONDERS NEVER CEASE.**

It's not surprising our scanners help you reach new levels of image control and accuracy. Consider the company behind them.

For over 100 years, Agfa's photographic and prepress products have provided the graphic arts industry with innovative, productive solutions. It's this long-term understanding of graphic arts needs that has enabled us to build a family of scanners and a service track record second to none.

We'd like to show you Agfa's family of high-quality scanners. Call us today at 1-800-685-4271.

Whatever your expertise, whatever your scanning needs, at Agfa, we can do wonders for your image.

AGFA 

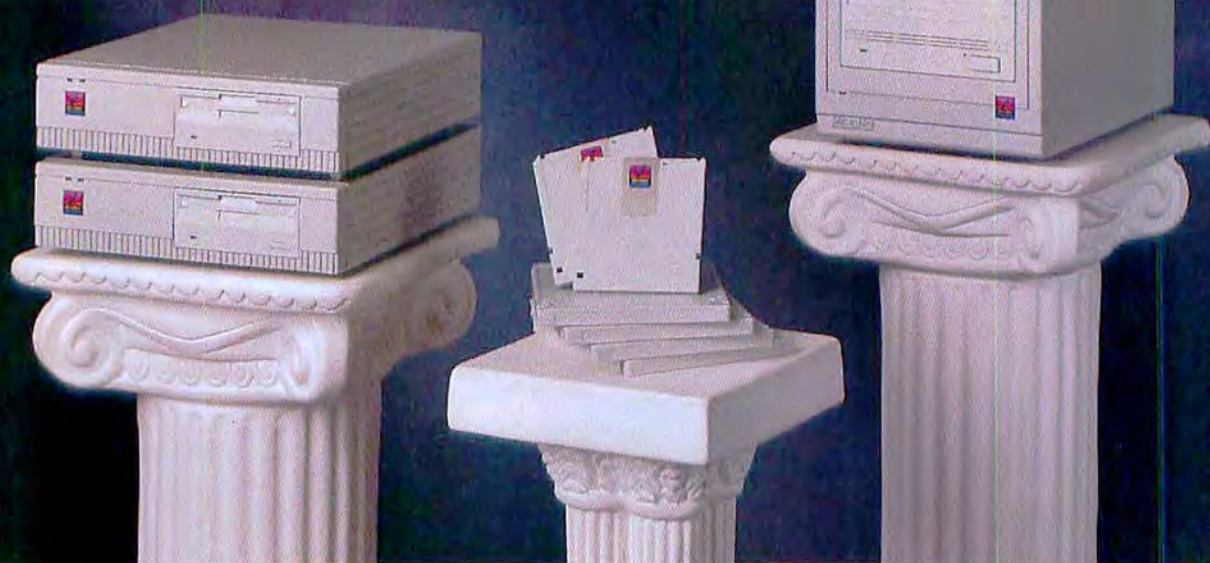
The complete picture.

AGFA and the Agfa rhombus are registered trademarks of Agfa-Gevaert AG. Arcus is a trademark of Agfa-Gevaert N.V., Mortsel-Belgium. Horizon is a registered trademark of Agfa-Gevaert N.V., Mortsel-Belgium. MAC is a registered trademark of Apple Computer Inc. PC is a registered trademark of International Business Machines Corporation. SUN is a registered trademark of SUN Microsystems Inc.

Circle 83 on reader service card

The Preferred Choice...

We Now Offer 1 GByte Tahiti-II
High Performance Optical Drives



MicroNet's Rewritable Optical Systems Offer More Speed, Size, and Performance Options For Removable Data Storage.

Today's complex projects require forward-thinking storage solutions. That's why MicroNet has added a new 3.5" rewritable optical system to our Macintosh, PC, and workstation product lines. It's fast, reliable, and cost-effective. Store 128 MB on a shirt-pocket-size disk at a lower media cost than any other system. Access data in just 38 ms. And secure valuable files now, and far into the future with optical cartridges impervious to contamination and head crashes.

MicroNet also offers 5.25" optical storage options. Our 586 MB system is perfect for transporting or archiving large CAD, pre-press, or graphic files from work site to work site. And like our 3.5" system, it's ISO compatible, so media can be recognized in any ISO standard drive.

MicroNet's rewritable optical systems for the PC operating under NetWare, ship with our specialized driver for optimum performance. And systems on a PC network, when combined with Cheyenne's ARCserve or ARCserve/Solo, make archiving and retrieving Macintosh, OS/2, and DOS files fast and easy.

MicroNet's 3.5" and 5.25" drives are available in internal and external configurations for most computer systems. They ship ready to install with software, connectors, cables, and brackets as needed.

Find out why MicroNet's systems are the preferred choice in rewritable optical storage. Call the MicroNet Sales Department today for the name of a Reseller near you. 1-714-837-6033.



Quality You Can Count On.



MicroNet Technology, Inc.

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

All trademarks are the property of their respective owners.

Circle 139 on reader service card.

MacBulletin

LATE-BREAKING NEWS

PowerBook 180 Slow Shipping:

Apple confirmed that the PowerBook 180 is shipping only in limited quantities because the LCD maker has failed to deliver enough displays. However, an Apple representative said shipments of the laptop are increasing every week. Another Apple employee said that the screen vendor was in violation of its contract with Apple. Both said the 180 was not in danger of being discontinued.

Prison for Software Pirates: The federal government recently passed legislation making copying software for commercial purposes a felony punishable by five years in prison or a \$250,000 fine. The legislation only affects organizations that use pirated software internally or resell it.

Adobe's New ATM: Adobe (415/961-4400) is developing SuperATM, a version of its font-rendering utility, Adobe Type Manager, that will intelligently substitute fonts and maintain page layout when a document is moved to a machine that lacks the right fonts. The \$149 SuperATM will include two Multiple Master fonts, several other typefaces, and a version of Adobe Type Reunion that indicates which fonts are substitutes.

Apple Bundles E-Machines Board:

As a special promotion, Apple is offering the Apple 16" Color Display bundled with E-Machines' DoubleColor SX graphics adapter for \$1799. The 256-color adapter will be available with the monitor through April 18. Contact your Apple reseller.

Apple Support for the Deaf: Apple has upgraded its Customer Assistance Center phone system with Telecommunications Device for

the Deaf (TDD) software so that deaf and hearing-impaired people can access sales information and general customer information. The 24-hour Customer Assistance Center number is 800/833-6223.

88MB SyQuest Drive: In January SyQuest Technology plans to announce at Macworld Expo, and start shipping, an 88MB removable-cartridge drive that can read from and write to the huge number of existing 45MB SyQuest cartridges. The current 88MB SyQuest drive can read 45MB cartridges but can't write to them. The drive, called the SQ5110C, will be available through third-party vendors at prices to be set by those vendors.

Connecting Ethernets: Compatible Systems (303/444-9532) is shipping a RISC-based gateway and router for connecting and moving packets between Ethernets running AppleTalk, TCP/IP, or DECnet. The RISC Router 3000E lists for \$2995. Future plans call for IPX support as well.

Compressed Color: Storm Technology (415/691-6600) is upgrading its JPEG-based color image-compression program PicturePress to version 2.5 with a faster engine and support for UserLand's Frontier scripting system. PicturePress comes with several scripts, including one for automating batch jobs. It lists for \$199, or \$999 with Storm's PhotoFlash accelerator board.

Type Solutions Goes Pro: Incubator Pro adds support for Type 1 PostScript to its TrueType support, converts between formats, and offers three new editing controls: x-height, descender size, and tracking. \$129 from Type Solutions, 603/382-6400. **m**

When the mercury

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.

Products preceded by Ⓢ are 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 Crabb, 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	
8799 PowerBook Auto Adapter	\$69.
8800 PowerBook Charger/Conditioner	139.
Asanté Technologies, Inc.	
EN/SC-BNC or 10/T for PBooks... ea.	339.
Battery Technology, Inc.	
7562 Battery for PowerBook 140-170	62.
Computer Care	
4153 BookView Imperial 140-170	999.
4162 BookRAM 4S 329. 4161 BookRAM 6S 439.	
★Dayna ... 60 day MBG	
5396 DaynaPORT SCSI Link PB (BNC)	299.
5360 DaynaPORT SCSI Link PB (10-BASE-T)	299.
5484 DaynaPORT SCSI Link-3 PB	349.
Envisio, Inc.	
2411 ColorBook 16 (2 MB) (Dec. '92)	799.
2380 (4 MB) 1019. 2268 (6 MB)	1049.
★FWB, Inc. ... 30 day MBG	
5567 hammerPB80 719. 5568 PB120. 799.	
★Global Village ... 30 day MBG	
7730 ⓈPowerPort/Bronze	197.



**Special
Price**

★After Hours Software ... 30 day MBG
7411 ⓈTouchBASE & DateBook Bundle—Keep track of your life & the people in it. Together they form a powerful Personal Information Management system that lets you schedule time & track contacts quickly & easily.. \$95.



★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. Plus, get AutoDoubler or Norton Utilities free. Also includes a 2 year warranty and Hard Disk Toolkit Personal Edition. A great value!

5533 MDS 44 with AutoDoubler	\$439.
5532 MDS 44 with Norton Utilities	439.
5534 MDS 88 with AutoDoubler	539.
5535 MDS 88 with Norton Utilities	539.

44 MB & 88 MB SyQuest Cartridges see listings

7720 ⓈPowerPort/Silver 369. 7710 Gold ...	429.
★I/O Design Cases ... 30 day MBG	
3362 PowerBook SL 64. 3371 PowerBook EX 69.	
★Kensington ... 30 day MBG	
9585 Executive PowerBook Case	125.
1118 Compact PB Case 45. 1092 Deluxe	79.
5976 NoteBook Keypad	95.
MASS Microsystems	
6313 1" Portable Drive Granite Case (120 MB) 599.	
2220 MASSfm 24/96 PB	189.
NEC	
6577 CDR37 Portable CD-ROM Drive	439.
Palomar Software	
9576 ⓈOn The Road	62.
PowerBook Cables	
8461 HD130 to Centronics 50 Pin Male (18") ..	39.
8460 HD130 to DB25 Male (18")	42.
PowerBook Memory Modules	
2 MB, 4 MB, & 6 MB modules available	
★PSI Integration, Inc. ... 30 day MBG	
5320 ⓈPowerModem 155. 6961 ⓈPow. Mod. II 235.	
7798 ⓈPower Modem III 329. 7786 ⓈIV	425.
Sigma Designs	
6939 Power Portrait (granite case)	849.
★Sophisticated Circuits ... 30 day MBG	
7425 PowerPad	79.
7419 w/QuickKeys	119.
★Symantec ... 30 day MBG	
1199 ⓈNorton Essentials for PowerBook ('92). 87.	
★Targus ... 60 day MBG	
1305 Universal Notebook	69.
6037 Premier Leather Case	169.
★Utilitron, Inc. ... 30 day MBG	
3012 ⓈPowerSwap	25.
7603 PowerBakPak Case	74.

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 ⓈHi! Finance	79.
★Abacus Concepts	
7106 ⓈStatView 4	369.
★Aclius ... 30 day MBG	
5618 Ⓢ4th Dimension 2.2.3	509.
★Advanced Software ... 30 day MBG	
8051 ⓈIntouch 2.0 55. 9049 ⓈDocuComp II 99.	
★After Hours Software ... 30 day MBG	
1352 ⓈTouchBASE 75. 3314 DateBook	75.
7411 ⓈTouchBASE & DateBook Bundle	95.
1977 ⓈTouchBASE/After Dark/Quicken Bundle	89.

Amaze, Inc.	
4989 ⓈCATHY Daily Planner	49.
3582 ⓈThe Far Side Daily Planner	49.
9105 ⓈTrivial Pursuit Sports Edition	49.
★Attain Corporation ... 60 day MBG	
8465 ⓈIN CONTROL 2.0	87.
★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	55.
Beagle Bros.	
3119 ⓈBeagleWorks	special 69.
Broderbund Software	
3608 ⓈMacUSA 29. 3356 ⓈMacGlobe ..	34.
★Chena Software ... 30 day MBG	
1594 ⓈFair Witness 1.2	185.
★Chipsoft ... 30 day MBG	
8059 ⓈMacinTax Personal Ed. 1992 Headstart..	49.
3916 ⓈMacinTax State Tax Packages	ea. 35.
3916 ⓈMacinTax & Quicken Bundle	59.
★Clarix ... 30 day MBG	
1129 ⓈMacWrite II 89. 1745 ⓈMacProj Pro 399.	
3903 ⓈClarixWorks 1.0V2 199. 3743 ⓈUpgrade 95.	
3531 ⓈClarix Resolve 125. 3745 ⓈUpgrade 95.	
3836 ⓈFileMaker Pro 2.0 268. 2191 ⓈUpgrd. 109.	
Contact Software	
7636 ⓈACTI 249. 10317 ⓈACTI Comp. Upgrd. 91.	



★Symantec ... 30 day MBG
1199 Norton Essentials for PowerBook 1.0—The most comprehensive PowerBook utility designed to increase the life of battery charge, enhance PowerBook usability and keep files synchronized (Dec. '92) \$87.


starts to fall,

New Version



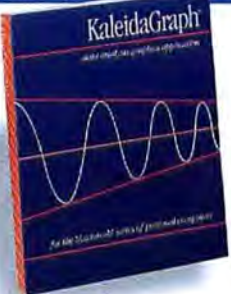
★Attain Corporation ... 60 day MBG
8465 **IN CONTROL 2.0**—The top-rated To-Do List Manager from the creators of FileMaker just got even better. Display and manage your activities as outlines, prioritized lists, and calendars! **\$87.**

- ★Expert Software ... 30 day MBG
- 5234 **Expert Writer 1.0**..... 29.
- ★ExpertVision ... 30 day MBG
- 7486 **TypeReader**..... 499.
- ★Helix Technologies ... 30 day MBG
- 1077 **Helix Express**..... 299.
- ★Intuit ... 30 day MBG
- 2507 **Quicken 3.0**..... 42.
- ★JAM Software ... 30 day MBG
- 6089 **Smart Alarms Plus 3.1**..... 45.
- 1153 **Smart Schedules**..... 199.
- ★Lotus Development ... 30 day MBG
- 3606 **1-2-3 Mac 1.1**.. 289. 3604 Upgrade. 99.
- ★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.



★Lotus Development ... 30 day MBG
3606 **Lotus 1-2-3 4.1 Mac**—Takes full advantage of the Mac. Directly manipulate and format all data, text, and graphics. Offers true 3D worksheets & Excel & 1-2-3 file compatibility **\$289.**
3604 **1-2-3 Competitive Upgrade**..... 99.

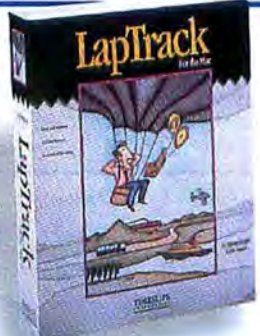
- 3669 **Excel 4.0**.. 295. 5237 **Upgrade**.. \$125.
- 4902 **Word 5.1**.. 295. 1503 **Upgrade**.... 125.
- 5454 **The Microsoft Office 3.0**..... 475.
- ★Niles & Associates ... 30 day MBG
- 4602 **EndNote 1.5**..... 85.
- 8010 **EndNote Plus 1.2**..... 142.
- Nisus Software
- 5683 **Nisus 3.06** 238. 1612 **Compact 3.3** 92.
- ★Nolo Press ... 30 day MBG
- 4228 **Personal RecordKeeper 3.0**..... 29.
- 2981 **WillMaker 4.0 (not valid in LA.)**..... 35.
- 1204 **Living Trust 1.0 (not valid in LA.)**..... 43.
- ★Palo Alto Software ... 60 day MBG
- 6932 **Employee Handbook Toolkit 5.2**..... 65.
- 6975 **Business Plan Toolkit 4.0**..... 75.
- ★Pastel Development ... 30 day MBG
- 1785 **DayMaker 2.0 (Dec.) 79. 1011 (network)** 92.
- ★Peachtree ... 60 day MBG
- 9584 **Accounting for Macintosh 2.0**..... 75.
- 9588 **Insight Accounting 4.0**..... 299.
- ★Portfolio Systems ... 30 day MBG
- 7992 **Dynopage 1.7** or 6916 **Dynodex**.. ea. 49.
- ★Power Up ... 30 day MBG
- 7696 **Calendar Creator**..... 48.
- 7694 **Address Book Plus**..... 62.
- 1760 **PowerRunner Bundle**..... 99.
- ★ProVUE ... 60 day MBG
- 4582 **Panorama II 2.0.6**..... 239.
- ★Reality Technologies ... 30 day MBG
- 6929 **WealthBuilder 2.0**..... 94.
- ★Reference Software ... 30 day MBG
- 6268 **Grammatik Mac 2.0**..... 39.
- 9587 **Webster's Dictionary & Thesaurus 1.0**.. 44.
- Round Lake Publishing
- ★LetterWorks, SALES or LEGAL ... ea. 45.
- ★Shana Corporation ... 30 day MBG
- 7692 **Informed Designer 159. 8810 In. Mgr.** 99.
- ★SoftSync, Inc. ... 30 day MBG
- 7129 **Accountant, Inc. 335. 3828 MultiUser** 679.
- Spyglass, Inc.
- 2027 **Transform 2.1** 399. 2033 **Format** 159.
- ★Symantec ... 30 day MBG
- 3422 **More 3.1**..... 265.
- ★Synergy ... 30 day MBG
- 6617 **KaleidaGraph 2.1.3**..... 149.
- SYSTAT
- 1230 **FASTAT 2.0**..... 399.
- 1231 **SYSTAT 5.2.1**..... 699.
- ★Technology Works ... 30 day MBG
- 7736 **Spiral 1.0**..... 79.
- ★Teleware ... 30 day MBG
- 7616 **M.Y.O.B. 3.0**..... 138.
- ★TIMESLIPS ... 30 day MBG
- 1701 **LapTrack for the Mac**..... 52.
- 2986 **Timeslips III 2.1**..... 194.
- ★T/Maker ... 30 day MBG
- 3636 **ClickArt Holidays**..... 28.
- 1858 **FaxMania (birthdays to bulletins)**..... 25.
- 7709 **WriteNow Workshop Compet. Upgrd.** 99.
- 7664 **WriteNow Workshop Bundle**..... 139.
- ★Vertical Solutions ... 60 day MBG
- 5886 **FastLabel 44. 3235 MacLabelPak**.. 85.
- ★WordPerfect ... 60 day MBG
- 9579 **LetterPerfect 2.1**..... 89.
- 3800 **WordPerfect 2.1.2** 279. 4711 Upgrd. 75.
- ★Wordstar ... 30 day MBG
- 6984 **Correct Grammar 3.01**..... 49.
- 3554 **American Heritage Dictionary 1.0**..... 55.
- 10277 **The Correct Bundle (4 programs!)**..... 99.
- ★Working Software ... 60 day MBG
- 5896 **Last Resort 38. 3792 Spellswell 2.2** 44.



★Synergy ... 30 day MBG
6617 **KaleidaGraph 2.1.3**—Data analysis and presentation tool. Lets you enter or import data, run sophisticated analysis, and then create scientific or business graphics using any of 16 plot types..... **\$149.**

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.
- 5750 **Classic ATM**..... 59.
- 10289 **SuperATM**..... 89.
- ★Adobe Type Sets for Business ... ea. 95.
- ★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 Upgrad.** 149.
- 8171 **Adobe Illustrator 3.2 (w/Dimensions)** 368.
- 5001 **Streamline**..... 119.
- 6644 **Photoshop**..... 548.
- AGFA
- 7971 **AgfaType CD-ROM**..... 69.



★TIMESLIPS ... 30 day MBG
1701 **LapTrack for the Mac**—Record time and expenses more easily than ever before—whether in the office or in the field using a PowerBook..... **\$52.**



MacConnection®

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

Just sit back and



Beagle Brothers

3119 **BeagleWorks**—Integrated word, spreadsheet, database, paint, communications & draw modules all in one package. Features include In-Context Editing, irregular text wrap, auto-sum tool, etc. Special limited offer only **\$69.**

- *Aldus ... 30 day MBG
- 6674 Aldus Personal Press 2.0 99.
- 2461 Aldus Gallery Effects 1.01 128.
- 10176 Fetch or 7541 IntelliDraw ea. 199.
- 3506 SuperPaint 99. 4751 Persuasion. 325.
- 1330 FreeHand 394. 7088 PageMaker 494.
- Altsys**
- 1983 EPS Exchange 2.0 89.
- 1195 Fontographer 3.5 258.
- *Apple Computer ... 30 day MBG
- 3008 Apple Font Pack 79.
- *Ares Software ... 30 day MBG
- 8878 FontMonger 1.5 (Dec. '92) 93.
- Broderbund Software**
- 7293 Kid Pix Companion 23.
- 3572 Kid Pix 1.2 34.
- 1427 Print Shop 35.
- 6281 TypeStyler 2.1 (with ATM) 126.
- *Claris ... 30 day MBG
- 2518 MacDraw Pro 275. 7505 Upgrade 95.
- 8007 Claris CAD 2.0 599. 6943 Upgrade 79.
- ColorAge (formerly Custom Applications)
- 8037 Freedom of Press Light 3.03 (17 fonts). 84.
- Computer Associates**
- 9581 Cricket Draw III 1.0 159.
- *DeltaPoint ... 60 day MBG
- 3558 DeltaGraph Pro 2.0 199.
- *Deneba Software ... 30 day MBG
- 3227 Canvas 3.0.4 259.



*Aladdin Systems ... 30 day MBG
6740 **StuffIt Deluxe 3.0**—Compression solution solves all your needs from archiving to transparent compression **\$65.**
7410 **StuffIt SpaceSaver 1.0**—Increases disk space without changing the way you work **34.**

- *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 94. 5425 Painter 1.2 235.
- Gryphon**
- 4202 Morph 1.0 95.
- *Letraset ... 30 day MBG
- 4709 LetraStudio 139. 6300 FontStudio 359.
- Light Source**
- 3733 Ofoto 1.1.1 275.
- *Linguist'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**
- 4990 Ready, Set, Go! (special 'til 1/31/93) .. 149.
- *MicroMaps ... 30 day MBG
- 7556 MapArt (PICT) or 7555 (EPS) ea. 89.
- *Microsoft ... 30 day MBG
- 2878 PowerPoint 3.0 295. Upgrade call
- 2565 Project 3.0 445. Upgrades call
- Postcraft International**
- 2210 Effects Specialist 2.0 89.
- Quark**
- 7612 QuarkXPress 3.2 (Dec. '92) 549.

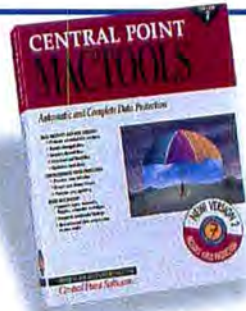


*Specular International ... 30 day MBG
4962 **Infini-D 2.0**—Blistering rendering speeds, QuickTime, & incredible texture mapping let you create broadcast-quality images & animations! **\$699.**
3543 **Replicas #1**—3D clip objects **135.**

- *Specular International ... 30 day MBG
- 4962 Infini-D 2.0 699. 3543 Replicas #1 135.
- Synergy Software**
- 6617 KaleidaGraph 2.1.3 149.
- *Timeworks ... 30 day MBG
- 7115 Publish It! Easy 3.0 109.
- 7409 ColorIt! 2.0 special 129.
- *T/Maker ... 30 day MBG
- ClickArt (bitmapped) 38. or (EPS) 82.
- *Virtus Corporation ... 30 day MBG
- 4488 WalkThrough 1.1 309.

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 Space Saver 34. 6740 Deluxe 3.0 65.
- Aldus ... 30 day MBG**
- 5100 SuperCard 1.6 195.
- *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! 49. 1608 More Disk Space 42.



Central Point Software

5041 **MacTools 2.0**—New Version offers automatic backup, data recovery and virus protection in an integrated package. *MacWEEK*, *Macworld* and *MacUser* claim it is a blockbuster product **\$105.**

- *Apple Computer ... 30 day MBG
- 1206 At Ease 1.0 49.
- 1074 System 7.1 79. 3413 MultiPack ... 349.
- 7072 QuickTime Starter Kit 1.5 149.
- *ASD Software ... 30 day MBG
- 7085 FileGuard 2.7.2 (1 user) 138.
- *Atticus Software ... 60 day MBG
- 9120 Super 7 Utilities 64.
- *Berkeley Systems ... 30 day MBG
- 2198 More After Dark (M.A.D.) 23.
- 5737 After Dark 2.0V 28. 2196 Bundle ... 39.
- 7987 Art of Darkness (Peachpit Press) 16.
- 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
- 5041 MacTools 2.0 105.
- *Claris ... 30 day MBG
- 8734 HyperCard Development Kit 2.1 139.
- *Connectix ... 30 day MBG
- 8441 CPU (Connectix PowerBook Utilities) ... 49.
- 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 1.3 264.
- 7946 Remote (10 Pak) 147. 3112 (50 Pak) 639.
- *Datawatch ... 30 day MBG
- 4803 Virex/Mac or 8561 911 Utilities 62.
- *Fifth Generation ... 30 day MBG
- 4287 PYROI 4.01 27. 3955 Suitcase 2.1 53.
- 8286 SuperLaserSpool 3.0 99.
- 5178 FastBack Plus or 5725 DiskLock ... 125.
- 7404 DiskDoubler 52. 4838 AutoDoubler .. 58.
- FWB, Inc.**
- 10198 CD Toolkit 49.
- 7929 Hard Disk Toolkit Personal Edition ... 49.
- 2999 Hard Disk Toolkit 1.1.1 125.
- ICOM Simulations**
- 6296 Intermission.. 29. 3731 OnCue II.. 55.
- *Inline Design ... 30 day MBG
- 1744 Icon 7..... 31. 9843 Inline Sync 1.0 79.
- 7068 INITPicker 3.0 49.
- 2913 Redux 1.63... 49. 1740 Deluxe 92.
- Insignia Solutions**
- 7552 Rapid Trak 56.
- *Kent Marsh Ltd. ... 30 day MBG
- 9513 FolderBolt 1.02 71.
- *KyZen Corporation ... 30 day MBG
- 10173 UP Diff 1.0 125.
- *Leader Technologies ... 30 day MBG
- 10272 PowerMerge 75.

give us a call.



★ **MicroMat Computer Sys. ... 30 day MBG**
 3732 **MacEKG**—Provides in-depth knowledge on what makes your Mac tick. Features: advanced component-level diagnostics, log & compare 178 different parameters, ability to isolate/diagnose intermittent failures **\$89.**

★ **Logical Solutions ... 30 day MBG**
 10169 **7th Heaven** 67.
 ★ **Magic Software ... 30 day MBG**
 7267 **AutoSave II 26.** 7270 **Backmatic**.. 50.
 ★ **MAXA Corporation ... 30 day MBG**
 8692 **Snooper 2.0 HW & SW Kit (Jan. '93)**.. 149.
 8694 **Snooper (software only)** 119.
 ★ **MicroMat Computer Sys. ... 30 day MBG**
 3732 **MacEKG II 2.0.5** 89.
 ★ **Microspot ... 30 day MBG**
 8706 **MacPalette II 45.** 8752 **MacPlot Pro** 249.
 ★ **Nine to Five Software ... 30 day MBG**
 2020 **9 to 5 Office** special 19.
 9767 **Reports 2.5** 125.
 ★ **Now Software ... 30 day MBG**
 1793 **Now Up-To-Date**.. 65. 2366 (10). 519.
 6925 **Now Utilities 4.0**.. 95. 8471 (10). 775.
 ★ **Palomar Software**
 8210 **PLOTTERgeist 2.1** 249.
 ★ **Pluma, Inc.**
 8704 **Cause or 8713 Net Effect** ea. 185.

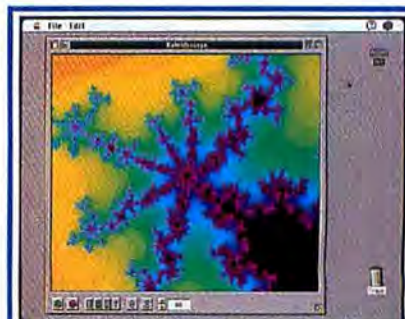


★ **Apple Computer ... 30 day MBG**
 7073 **Macintosh PC Exchange**—Lets Mac computer users work with files stored on 3 1/2" MS-DOS and Windows-formatted floppy disks. Move files between a Mac and a PC as easily as you can between two Macs **\$69.**

★ **Symantec ... 30 day MBG**
 5176 **AntiVirus for Mac (SAM) 2.1** \$64.
 6748 **Norton Utilities for Mac 2.0** 95.
 3421 **THINK Pascal 165.** 2688 **THINK C** 199.
 9957 **THINK Reference 1.0** 68.
 ★ **Teknosys**
 5203 **Help!** 88.
 ★ **TGS Systems ... 60 day MBG**
 6667 **Prograph 2.5** 299.
 ★ **Thought I Could ... 30 day MBG**
 4843 **Wallpaper 1.0.2** 37.
 ★ **UserLand Software**
 4753 **Frontier 2.0** 185.
 ★ **Utilitron, Inc. ... 30 day MBG**
 9616 **Guaranteed Undelete w/TrashMaster** 45.

LEARN & PLAY FOREIGN LANGUAGES, TRAINING, GAMES

★ **Abbott Systems ... 30 day MBG**
 9578 **Kaleidoscope** 25.
 ★ **Activision**
 1039 **Shanghai II** 29.
 1134 **Lost Treasures of Infocom Vol. I**..... 40.
 2470 **Lost Treasures of Infocom Vol. II**..... 29.
 ★ **AMTEC 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 Troubles** 41.
 6516 **The Playroom 2.0 (CP) (color)**..... 29.
 ★ **Carmen Sandiego Series (CP)**..... ea. 29.
 8285 **Where/World Carmen Sandiego Deluxe** 47.
 3559 **SimAnt or 5871 SimCity Supreme**.. ea. 35.
 8266 **SimEarth 1.1** 40.
 1910 **SimLife**..... 41. 3307 **A-Train**.... 39.
 ★ **Buena Vista Software**
 1711 **Heaven and Earth**..... 34.
 ★ **Bungle Software**
 8585 **Minotaur 1.01** 47.
 ★ **Carina ... 30 day MBG**
 7761 **Voyager II, the Dynamic Sky Simulator** 99.
 ★ **Centron Software ... 30 day MBG**
 5910 **Crossword Creator** 39.
 8525 **Casino Master**... 39. 8524 (Color).... 45.
 ★ **Colorado Spectrum**
 2554 **Mouse Yoke (aircraft yoke adapter)**..... 29.
 ★ **Cyan ... 30 day MBG**
 6320 **Manhole 1.6** 19.
 ★ **Davidson & Associates ... 30 day MBG**
 3922 **Talking Spell It Plus** 28.
 2574 **New MathBlaster Plus** 34.
 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** 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.



★ **Abbott Systems ... 30 day MBG**
 9578 **Kaleidoscope**—Create your own dazzling "screen saver" displays and have fun exploring the mysterious Mandelbrot Set—an infinite world of breathtaking color and endless detail! **\$25.**

4334 **NumberMaze**.. 25. 8527 **(Color)**.. 35.
 1513 **ReadingMaze (Color, ages 3-7)** 35.
 3471 **DaisyQuest (Color, preschool)** 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 (Dec. '92)**.. ea. 37.
 8809 **Tesseract** 31. 3414 **Mutant Beach**.. 37.
 ★ **Innerprise**
 1662 **CyberBlast** 25.
 ★ **Interplay Productions**
 1894 **BattleChess (3D animation)**..... 29.
 1893 **CheckMate (infinite play levels)**..... 31.
 ★ **Learning Company ... 30 day MBG**
 2670 **Reader Rabbit 3.0 (CP) (ages 4-7)**..... 34.
 3281 **The Writing Center 1.0** 51.



★ **Global Village ... 30 day MBG**
 2179 **TelePort/Gold**—New! High-performance 14.4 send/receive fax/modem ... **\$429.**
 2175 **TelePort/Silver**—New! 9600 send/receive external fax/modem. Comes complete with GlobalFax software **369.**



MacConnection®

© Copyright 1992 PC Connection, Inc. MacConnection is a division and registered trademark of PC Connection, Inc., Marlow, NH. MacTV is a trademark of PC Connection, Inc.

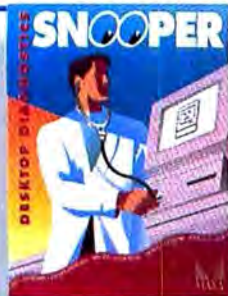
Let cold winds blow,



Contact Software

10317 **ACT! Competitive Trade-Up**—Owners of contact, address book, calendar, scheduling, or personal info. mgmt. software can trade-up to this professional contact-activity manager \$91.
7636 **ACT! 1.0**..... 249.

- *Leister Productions ... 30 day MBG
- 7126 **Reunion 3.0**..... 115.
- *MECC ... 30 day MBG
- 3963 **Oregon Trail 1.1**..... 28.
- 3960 **Number or 3959 Word Munchers**... ea. 18.
- Microlytics**
- 7871 **Berlitz Interpreter (Dec. '92)**..... 34.
- *Microsoft ... 30 day MBG
- 2868 **Flight Simulator 4.0 (CP)**..... 42.
- *Nordic Software ... 30 day MBG
- 8257 **Preschool Pack - Color 2.0**..... 34.
- 7470 **Jungle Quest 30. 7537 Kolor Klips 37.**
- *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, 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**..... 21.
- 3552 **Leisure Suit Larry V or 7396 Red Baron 39.**



*MAXA Corporation ... 30 day MBG
8692 **Snooper 2.0 Hardware & Software Kit**—(Dec. '92) Sad Mac? Diagnose from your Desktop with Snooper. Check out your hardware with over 60 tests. Rate your Mac's performance. A must for your Utilities folder \$149.

- *SoftStream ... 30 day MBG
- 4489 **Galactic Frontiers (1 to 4 players)**.... \$38.
- Software Toolworks**
- 4619 **Mavis Beacon Typing 1.3 (CP)**..... 29.
- *Spectrum Holobyte ... 30 day MBG
- 3464 **Tetris**.... 22. 3017 **Wordtris 1.0**.... 27.
- 4835 **Super Tetris (10 levels of difficulty)**.... 28.
- 3459 **Falcon**... 33. 9113 **Falcon Color**.... 39.
- *Strategic Studies ... 30 day MBG
- 3287 **Warlords (empires at war)**..... 34.
- StudyWare**
- 1395 **StudyWare for Calculus**..... 23.
- ACT, GMAT, GRE or SAT Prep**... ea. 29.
- *Toyogo ... 30 day MBG
- 7624 **NEMESIS Go Master 5.0**..... 35.
- 7623 **NEMESIS Go Master Deluxe 5.0**..... 99.
- Velocity**
- 2934 **Spectre**... 34. 5280 **LAN 3-Pak**..... 57.

VIDEO AND SOUND MONITORS, MUSIC, ANIMATION

- ARS NOVA**
- 9114 **Songworks 1.0**..... 64.
- Articulate Systems**
- 7013 **Voice Navigator SW w/Headset Mike**... 319.
- 7014 **Voice Navigator SW w/Desktop Mike**... 319.
- Coda Music Systems**
- 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.
- 9068 **ColorLink SX/2 629. 9069 SX/T**..... 629.
- 10321 **ColorPage T161l**..... 1299.
- 9071 **Double Color LC**..... 399.
- 9072 **Double Color LX 639. 9073 SX**..... 359.
- 9064 **E-Machines T191l**..... 2299.
- 9066 **Futura SX 479. 9065 Futura MX**..... 799.
- 9063 **Futura LX**..... 999.
- Envisio**
- 4016 **Quick 16/IC (Dec. '92)**..... 449.
- Macromedia**
- 5486 **Sound Edit PRO 2.05**..... 199.
- 7651 **Action! 2.0**..... 349.
- 4598 **MacRecorder Sound System PRO**... 239.
- 5087 **MacroMind Director 3.1**..... 799.
- 2246 **MacroMind Three-D 2.0.2**..... 999.
- NEC**
- 4252 **MultiSync 3FGx**..... 659.
- Passport Designs**
- 8250 **Encore (with free Trax)**..... 379.
- Radius**
- 1738 **Precision Color Pivot**..... 999.
- 7870 **Rocket 33**..... 2199.
- 1736 **Precision Color Display/20S**..... 2499.
- RasterOps**
- 8944 **RasterOps 24STV**..... 819.
- Sigma Designs**
- 6944 **Power Portrait (platinum)**..... 769.
- Software Toolworks**
- 5201 **The Miracle (piano teacher)**..... 349.
- 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. 4114 IIsi**..... 339.
- 4164 **VideoSpigot (for NuBus)**..... 379.
- 7676 **VideoSpigot Pro**..... 1099.
- 3691 **VideoSpigot Pro si**..... 1099.
- 9074 **Spectrum/24 PDQ+**..... 1649.
- 7679 **Spigot & Sound (NuBus)**..... 489.
- 7678 **Spigot & Sound Pro (NuBus)**..... 1189.
- 7677 **17" SuperMatch Multimode**..... 1249.
- 1805 **20" SuperMatch Color Display**..... 1599.
- 9075 **21" SuperMatch Color Display**..... 2699.
- 4720 **21" Platinum Two-Display**..... 1099.
- 2330 **Spectrum/8x24 PDQ or 2231 PDQsi** ea. 899.



*Berkeley Systems ... 30 day MBG
3392 **Star Trek: The Screen Saver**—Beam aboard the Enterprise with Captain Kirk and Mr. Spock on a mission to prevent screen burn-in. 15 animated displays, System IQ, and After Dark compatibility..... \$34.

CD-ROM

- Broderbund**
- 3730 **Just Grandma and Me (CD-ROM)**..... 34.
- CD Technology**
- 2321 **CD-ROM Caddy**... 11. 2533 **(5 Pack)** 49.
- 4084 **America Alive!**..... 75.
- 8057 **Porta Drive CD-ROM**..... 579.
- Creative Multimedia Corp.**
- 1874 **Mammals of North America**..... 29.
- 8739 **Beyond the Wall of Stars**..... 40.
- 8744 **Total Baseball 40. 2484 Family Doctor** 45.
- *Cyan ... 30 day MBG
- 1343 **Manhole 23. 2717 Cosmic Osmo 1.1** 37.
- *Highlighted Data ... 30 day MBG
- 7771 **Webster's Dictionary (CD-ROM)**..... 159.
- *HyperGlot Software ... 30 day MBG
- (French, German, Italian, or Spanish)**
- Berlitz Think & Talk (CD-ROM)**... ea. 125.
- ICOM Simulations**
- 3717 **Sherlock Holmes, Consulting Detective** 38.
- *Interplay Productions
- 7111 **Battlechess CD-ROM**..... 45.
- *METATEC/Discovery Sys. ... 60 day MBG
- 6823 **Best of MIDI Connection**..... 31.
- 3683 **Backpac 1, 3679 2, or 2176 3** ea. 44.
- 4007 **World Almanac & Book of Facts 1992** 50.
- *Multimedia Library ... 30 day MBG
- Image Series Vol. 1-4**..... ea. 105.



Hewlett-Packard
8368 **LaserJet 4 (with toner)**—All NEW! True 600 x 600 dpi resolution with microfine toner. Forty-five internal scalable typefaces. Fast RISC processor. 6 MB memory, incl. toner, LocalTalk capacity, & more. \$2249.

MacConnection[®]

YOUR SOURCE FOR MAC SOFTWARE AND PERIPHERALS SINCE 1984.

ON DAYS LIKE THIS, YOU MAY WANT TO STAY

INSIDE



CALL 800-800-3333

FOR HOT PRICES AND WARM, FRIENDLY SERVICE.

Call 800-800-3333.

*Pacific Data ... 60 day MBG

7956	LaserJet IV 1 MB	65. 7962 (4 Pack)	\$235.
7958	LaserJet IV 2 MB	109. 7965 (4 Pack)	419.
7959	LaserJet IV 4 MB	175. 7966 (4 Pack)	649.
7960	LaserJet IV 8 MB	345. 7969 (4 Pack)	1249.

*Sophisticated Circuits ... 30 day MBG

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

UPGRADES & DRIVES MEMORY, ACCELERATORS

SIMMs ... with free video & manual

Various SIMMs for all Macs..... call

*Applied Engineering ... 30 day MBG

2479	3.5" Floptical Drive.....	479.
1971	FastMath LC.....	109.
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)	599. 10264 (40 Mhz)..... 899.
10283	LC (33 Mhz)	599. 10286 (40 Mhz)..... 799.
7321	Ilci (50 Mhz)	1139. 7322 (w/FPU)..... 1399.

*Dayna ... 60 day MBG

8722	DaynaFile II 1.2 5 1/4" Drive.....	429.
------	------------------------------------	------

*DayStar Digital ... 30 day MBG

Does not include optional math chip.

8556	●FastCache for Mac Ilci.....	223.
8785	●FastCache 040 (for Quadra).....	409.
3401	●FastCache Ilci 299. 3389 w/FPU.....	369.
	●PowerCache for SE/30, II, IIx, Ilcx, Ilci, Ilci, LC	
	40 MHz.....	819.
	50 MHz.....	1179.
	FWB, Inc.	
7567	PocketHammer 80.....	599.
7566	PocketHammer 120 699. 2314 PH 240.	1169.
7570	Hammer 80is.....	479.
7579	Hammer Int. 120is 599. 2334 240is	979.

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.
MASS Microsystems		
2973	120 MB HD 599.	2972 210 MB HD .. 819.
2969	320 MB HD 1199.	2952 510 MB HD 1429.
3678	120 MB Port. HD...	499. 3663 210 MB .. 739.
3662	320 MB Port. HD 1129.	3659 510 MB 1349.
3657	HitchHiker Portable Drive (40 MB)	389.
3656	HH (80 MB) 629.	7008 HH (120 MB) 749.
1909	DiamondDrive 1000 2199.	1936 1500 2899.

*MDS Drives ... 60 day MBG

	MDS 44 SyQuest w/SW & cartridge	ea.	\$439.
	MDS 88 SyQuest w/SW & cartridge	ea.	539.
	Peripheral Land, Inc. (PLI)		
6432	3 1/2" Optical Media	59. 9737 (10 pak)...	599.
8327	PLI Infinity 40 Turbo	579. 9752 88	649.
2864	PLI Infinity Floptical Drive (21 MB)	.....	369.
4645	PLI Infinity MO 3.5" Optical Drive	.....	1549.
2865	Floptical Cart. (21 MB)	29. 2899 (10 pak)	259.
7124	120 MB	479. 7145 520 MB	1439.
7140	670 MB	1799. 7122 1.2 GB	2229.
7538	425 MB External HD	.....	1549.
	*SuperMac ... 30 day MBG		
2256	ThunderStorm	.....	849.

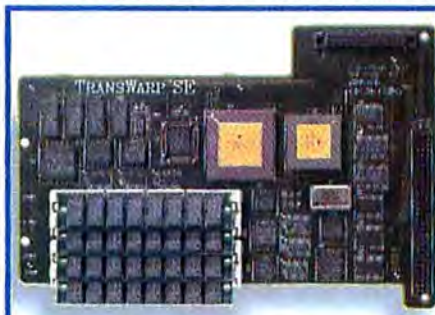
MEDIA

*Fujii ... 60 day MBG

2214	3 1/2" DS Disks (10).....	9. 2242 (50).....	32.
2215	3 1/2" HD Disks (10)...	15. 2241 (50).....	59.
4863	3 1/2" HD Disks (20) with storage case....	26.	
7758	3 1/2" HD 11-Pack Preformatted Disks	15.	

*Sony ... 60 day MBG

3297	3 1/2" DS Disks (10).....	9. 6148 (30).....	25.
3298	3 1/2" HD Disks (10)...	15. 6375 (30).....	42.
1603	DG60M.....	15. 2520 DG90M	19.
1895	QD2120.....	21. 3984 QD2120Q	27.



*Applied Engineering ... 30 day MBG

TransWarp SE—Accelerate your SE to warp speed! 25 MHz or 40 MHz 68030, optional 68882 FPU, 32K Static RAM Cache, and 4 standard SIMM sockets to add up to 16 MB. 10263 25 MHz. \$599. 10264 40 MHz \$899.

*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 Data Cassette.....	16.
7672	CT600N 150 MB Data Cassette.....	24.

*3M ... 60 day MBG

3943	DC2000.....	17. 1581 DC2120	22.
------	-------------	-----------------	-----

ACCESSORIES TONERS, CASES, DUST COVERS

American Power

3447	SurgeArrest Plus.....	39.
------	-----------------------	-----

Apple Computer

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

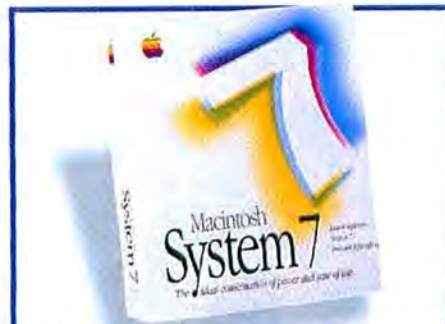
5392	Avery 5196 (3 1/2" Disk Labels-Laser).....	29.
7050	Avery 5660 (1" x 2 1/4" Clear Adrs.-Laser)	32.

*Curtis Manufacturing ... 30 day MBG

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

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

8812	Ultimate Classic	59. 1941 Ultimate LC	95.
------	------------------	----------------------	-----



*Apple Computer ... 30 day MBG

1074 System 7.1—Add powerful new capabilities like Publish and Subscribe, MultiTasking, Balloon Help, Virtual Memory, etc. Includes At Ease (limited time), QuickTime 1.5, free ATM disk, 4 fonts, & updated video..... \$79.

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

2559	Apple Security Kit.....	33.
3623	Apple 12" Anti-Glare Filter.....	63.
4973	Power Tree 20.....	29.
7060	MicroSaver Security System.....	34.

*Moustrak ... 30 day MBG

3301	ST-1 Pad or 2902 ST-2 Pad.....	ea. 14.
9076	Star Trek NG Crew Pad.....	14.

*Targus ... 60 day MBG

3617	Mac Classic/Plus/SE Case.....	59.
------	-------------------------------	-----

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 charge.
- 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 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:** Call 800-800-3333 for shipping info. **All other areas:** Please call 603-446-3333 or FAX 603-446-7791 for information.



Apple Computer

LaserWriter Toner & StyleWriter Cartridges

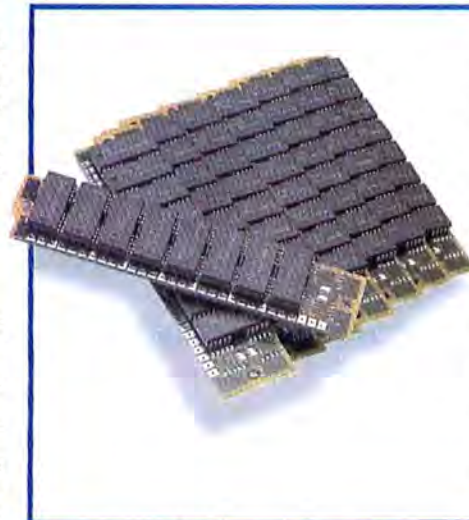
9773	StyleWriter Ink Cartridge.....	\$20.
8499 (3 pack).....	57. 1628 (5 pack).....	90.
7748	Personal LaserWriter Toner Cartridge	75.
1114 LW Plus or 1115 LW II Toner... ea.		95.

we've hot deals to go.

6577	NEC	CDR-37 CD-ROM Portable Drive...	\$439.
6582	CDR-74 CD-ROM Drive	.....	629.
4146	CD Express	.....	429.
4132	MultiMedia Gallery (with CDR-74)	.....	865.
Software Toolworks			
10308	US Atlas 34, 4397 Time Table/History	.....	49.
3915	Grolier Encyclopedia (CD-ROM)	.....	249.

COMMUNICATIONS MODEMS, MAIL, NETWORKS

*Apple Computer ... 30 day MBG			
7073	Mac PC Exchg. 69, 7102 AppleShare	.....	969.
7101	AppleTalk Remote Access	.....	159.
*Applied Engineering ... 30 day MBG			
8362	QuadraLink (with AE Shadow)	.....	269.
*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.
*DataViz ... 60 day MBG			
4842	MacLink Plus/Translator 7.0	.....	109.
1823	MacLink Plus/PC 7.0	.....	129.
*Dayna ... 60 day MBG			
DaynaPORT TRX: (BNC or 10 BASE-T) ea. 87.			
DaynaPORT E: (BNC or 10 BASE-T) ea. 149.			
8719	EtherPrint 339, 9888 (10BASE-T) ea.	.....	339.
7888	DaynaPORT E/II-3 Adapter	.....	199.
DaynaPORT SCSI/Link (BNC or 10 BASE-T) 269.			
1962	PathFinder	.....	599.
Dove Computer ... 30 day MBG			
6758	DoveFax 2.0	.....	199.
9634	DoveFax+V	.....	265.
*Dow Jones ... 30 day MBG			
5295	Dow Jones News Retrieval Membership	.....	24.
*Farallon Computing ... 30 day MBG			
Full line of EtherMac Cards available ... call			
1142	Ether10T-Starlet	.....	279.
8726	Farallon Concentrator PN710-1	.....	1999.
4869	PhoneNET Connector 10-Pk (DIN8)	.....	195.
9961	PhoneNET Card PC	.....	209.
2206	PhoneNET StarController 307	.....	879.
4802	Star 357	.....	899.
9805	Star 4814 Star 377	.....	1299.
6513	Timbuktu 4.0.2 or 4866 Remote 3.0	.....	129.
*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.
2300	Smartcom II Mac 84, 3226 Upgrade	.....	44.
5971	OPTIMA 24 145, 5970 OPTIMA 96	.....	389.
Insignia Solutions			
7557	Access PC...	.....	60.
9726	Entry Level SoftPC 2.5	.....	299.
4089	Universal SoftPC 195, 3441 SoftNode	.....	105.
Logiccode Technology			
5525	Quicktel Xeba M9624XV	.....	149.
5524	M9696XV	.....	289.
MASS Microsystems			
2280	MASSim 24/96N Network Fax	.....	349.
*Practical Peripherals ... 30 day MBG			
8994	2400 V.42bis Modem	.....	125.
7934	PM9600SA Modem 1.26	.....	289.
9849	SmartPack 9600 (with Smartcom II)	.....	349.
*Prometheus ... 30 day MBG			
4724	Home Office (24/96 w/Voice Mail)	.....	259.



SIMMs ... with free video and manual
All SIMMs come with a full 2-year warranty, plus a free installation manual and video. We also have 2 MB, 4 MB, and 6 MB PowerBook modules. So kick your Mac into overdrive and create huge spreadsheets and complex graphics with power to spare.

1107	1 MB SIMM (80ns)	.....	\$49.
8316	1 MB SIMMs (80ns, set of 2)	.....	98.
9437	2 MB SIMMs (for IIs or LC)	.....	89.
7437	4 MB SIMMs (80ns)	.....	175.
7600	4 MB SIMMs (80ns, set of 4)	.....	699.
9060	16 MB SIMMs (set of 4)	.....	2499.
3742	PowerBook Modules (2 MB)	.....	119.
5090	(4 MB)	.....	239.
5091	(6 MB)	.....	279.
5479	512K Video RAM for LC	.....	59.

8990	Ultima Home Office (144/96) (w/VM)	.....	489.
PSI Integration, Inc.			
3143	COMstation ONE...	.....	142.
3142	TWO	.....	247.
5340	COMstation FOUR	.....	319.
6965	FIVE	.....	439.
*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	.....	399.
NetModem/E (thick, thin, 10BASE-T) ea. 1479.			
Sitka/TOPS			
4188	Teleconnector (DIN8) 19, 2230 (10)	.....	179.
6264	TOPS Network 3.1 187, 2419 (3-Pak)	.....	249.
*Software Ventures ... 30 day MBG			
3455	MicroPhone Pro	.....	209.
Sonic Systems, Inc.			
7572	LaserBridge	.....	135.
7571	PowerBridge 99, 7573 SuperBridge	.....	169.
*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.
7380	VersaTilities 1.0	.....	59.
*Technology Concepts ... 30 day MBG			
7690	Net Utilities 75, 1763 Hubworks-8	.....	249.
1582	GracelAN 275, 1584 Corporate	.....	669.
Ethernet Cards call			
*White Pine Software ... 30 day MBG			
2404	Mac 320	.....	95.
3544	Exodus 4.0	.....	199.

Now With Fax STF

***Zoom Telephonics ... 30 day MBG**
3553 Fax/Modem VFX V.32bis—14,400 bps
Send/Receive Fax & data communication at a great price! Features auto. fall back/fall forward, V.42, V.42bis and MNP 2-5..... **\$269.**

*Zoom Telephonics ... 30 day MBG			
1168	AMX Modem (2400 baud)	.....	63.
2310	FX9624 Send/receive Fax/Modem	.....	99.
3576	FX9624V Send/receive V.42 Fax/Modem	.....	128.
1179	V.42bis Modem (with MacPack)	.....	125.
2311	V.32 Modem...	.....	199.
4698	V.32bis	.....	229.
3553	Fax/Modem VFX V.32bis	.....	269.

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

*Appoint ... 30 day MBG			
2760	Thumbelina Mac (mini 3 button mouse)	.....	65.
2769	MousePen Pro Mac	.....	65.
Caere			
4476	OmniPage... 459, 7705 Direct	.....	259.
4930	OmniPage Professional	.....	649.
*CoStar ... 30 day MBG			
Stingray ADB (platinum or black) .. ea. 79.			
1884	LabelWriter II, 185, 1880 Plus	.....	285.
*Curtis Manufacturing ... 30 day MBG			
8046	MVP Mouse (MVP-1)	.....	89.
*Datadesk ... 30 day MBG			
9830	MAC101E 129, 2384 owiQuickKeys	.....	159.
GDT Software			
2499	PowerPrint 94, 8290 S/W	.....	149.
Hewlett-Packard			
6514	HP B&W DeskWriter (w/cartridge)	.....	479.
2964	HP Color DeskWriter C (w/color cart.)	.....	599.
9993	HP LaserJet IIIiP (requires kit)	.....	1099.
8368	HP LaserJet 4 (requires kit)	.....	2249.
*Kensington ... 30 day MBG			
2547	Turbo Mouse 4.0 ADB	.....	107.
Key Tronics			
6974	Mac Pro + Kybrd. 139, 1070 TrakPro	.....	219.
*Logitech ... 30 day MBG			
1671	MouseMan...	.....	77.
1672	TrackMan	.....	89.
5082	ScanMan Model 32 G-Scale Scanner	.....	299.
7112	FotoMan with Digital Darkroom	.....	639.
*MicroSpeed ... 30 day MBG			
2807	MicroTRAC ADB (for SE & II family)	.....	57.
6621	MacTRAC ADB 2.0 (SE & II family)	.....	75.
*Microtek Labs, Inc.			
5438	ScanMaker II 969, 5441 IIxe	.....	1249.
Monster Design Group			
1486	MacSpeakers (two, stereo)	.....	169.
*Mouse Systems ... 30 day MBG			
7520	Little Mouse or 8001 Plus	.....	ea. 68.
9471	A ³ Mouse	.....	74.
NEC			
5377	SilentWriter Model 95	.....	1439.
*Orange Micro ... 30 day MBG			
8431	Grappler II 9-Pin 102, 3692 IIsp.	.....	115.

THE FUTURE OF CD-ROM IS NOW.

Warning: Interactive Addiction May Cause Compulsive Attachment To Your CD Player.

HAVE WE GOT YOUR ATTENTION NOW? INTRODUCING TOTALLY ADDICTIVE CD ROMS FROM MACWORLD CD VENTURES. EVERYONE CAN MAKE GREAT MUSIC WITH **Rock Rap 'N' Roll**.

NO EXPERIENCE REQUIRED. **Rock Rap 'N' Roll** TURNS YOUR MACINTOSH INTO A **Hip Music Machine**, AND YOU RUN THE SHOW. THE CD FEATURES HUNDREDS OF

ORIGINAL BEATS AND SONGLETS PRODUCED BY A TOP HOLLYWOOD COMPOSER. SIMPLY

DROPTHEBEATSAND

SONG-A-LIZER AND

ASSIGN INSTRU-

ANDSOUNDEFFECTS

YOUR MAC KEY-

ROLL-OVERS ON



SONGLETS INTO THE

YOU ARE ROCKIN'!

MENTS, VOCALS,

TO THE KEYS ON

BOARD AND TO THE

THE SCREEN IN

ONE OF THE **Ten Interactive Rooms Of Unique Sound**. THEN PLAY ALONG WITH THE

SONG-A-LIZER. RECORD YOUR SESSION, DIGITIZE YOUR OWN SOUNDS, AND SING ALONG!

Rock Rap 'N' Roll IS A TOTALLY UNIQUE APPLICATION OF INTERACTIVE CD

TECHNOLOGY - YOU'LL FIND IT IMPOSSIBLE TO WALK AWAY FROM. **AND BEST OF ALL,**

THE ULTIMATE MUSIC MACHINE COSTS ONLY \$49.95*. ORDER YOURS TODAY!



Call 800-821-1177 (x104) Today!

CD RUNS ON ANY COLOR-CAPABLE MACINTOSH WITH MINIMUM 4MB RAM.
*FOREIGN ORDERS PLEASE ADD \$12.50 PER CD. FAX ORDERS CALL 415-543-3984.
MACWORLD CD VENTURES, 501 SECOND STREET, SAN FRANCISCO CA 94107.
Circle 194 on reader service card.

Sixty ways to leave your lover.

Dear John,
Dear John,
Dear John,
Dear John,
DEAR JOHN.

Dear John,
Dear John,
Dear John,
Dear John,

Dear John,
Dear John,
Dear John,
Dear John,

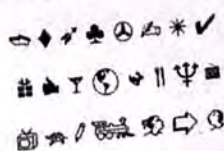
Δεαρ θονν,

Dear John,
Dear John,
Dear John,
Dear John,

Dear John,
Dear John,

Dear John,
Dear John,

Dear John,
Dear John,



Dear John,
Dear John,
Dear John,
Dear John,

Dear John,
Dear John,
Dear John,
Dear John,

Dear John,
Dear John,
Dear John,
Dear John,

Dear John,
Dear John,
Dear John,
Dear John,

Dear John,
Dear John,
Dear John,
Dear John,

DEAR JOHN,

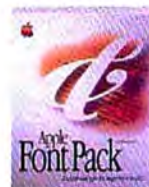
Dear John,
Dear John,
Dear John,
Dear John,
Dear John,

Dear John,
Dear John,

Dear John,
Dear John,
Dear John,
Dear John,

Finding the right words to express yourself is hard enough. Fortunately, finding a way to make those words look great with your Macintosh® personal computer has never been easier.

Introducing the Apple® Font Pack.



It's an indispensable collection of 43 distinctive TrueType® fonts that gives any document you're

working on more impact. From letters and memos to spreadsheets and presentations. All for about the price of a dozen roses.

Combine these fonts with the 21 TrueType fonts that come with System 7,™ and you're looking at over 60 ways to make a bigger impression. No matter how big the impression may be. Because TrueType ensures smooth, crisp-looking characters on screen and in print at any point size.

Installation is easy, too. Pop in the disk and let the automatic installer do the rest. Done. Go to work.

But before you can do that, you will have to visit an Apple software reseller in your area.

For the name of one near you, call 1-800-538-9696, ext. 150. Or, if you're reading this in Canada, call 1-800-665-2775, ext. 910.

And discover the kind of power that comes with changing your image. The power to be your best.®



THE ONLY 8MM TAPE DRIVE THAT CAN MAKE CHANGE.



IT MAKES CENTS. Take the magazine you're reading. To fill a single 8mm tape, you could backup every issue of MACWORLD for the next two years. A single issue costs just about 33 cents to store. Consider that you're spending less time backing up more data, and you're no longer dealing with small change.

Using our high speed, high capacity 8mm tape drives will save you time and money in manhours, media, storage, and shipping costs. In fact, our drives give you the lowest cost per megabyte on the market. On lightweight, reliable media. That is fast becoming an industry standard.



AND IT MAKES SENSE. The menu driven software features a calendar for automatic operation. Schedule a backup to run at any time, day or night. Choose an incremental or complete backup. The software's directory will keep track of every file that you've saved. To restore a file, simply pull up the directory and click on the file you want; if you want to create space on the hard drive, just copy selected files into the archive.

Compatible with all Macintosh models including systems running A/UX, our drives give you between 2.5GB and 25GB of storage per tape. Features like a liquid crystal display, data compression, data encryption, and high speed search capability give our drives the flexibility to adapt to your changing needs. We can meet any site requirements with rack mounting options, hard disk configurations, and a variety of cable lengths. And we back every product in our line with a 12-month warranty and technical support.

It doesn't make cents to wait. Call today for more information at 804/873-9000.

CONTEMPORARY
CYBERNETICS
Group

TRUE "PLUG-AND-PLAY" COMPATIBILITY WITH:

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

Rock Landing Corporate Center • 11846 Rock Landing, Newport News, VA 23606 • 804/873-9000 • FAX 804/873-8836

Circle 188 on reader service card

Navigating by the Stars

BY ADRIAN MELLO

SOMETIME IN JANUARY OR February, Apple expects to sell its 10 millionth Macintosh. This milestone marks a remarkable year in which the Macintosh had a 20 percent growth in unit sales and Apple surpassed IBM to claim the title of maker of the best-selling personal computer. As the Macintosh installed base has been growing, so have the number of products available to support it. The Mac is a very healthy personal computer platform, and we all know that one of the key signs of a healthy computer is the size of the software base that supports it. But with thousands of hardware and software products now available for millions of Macintoshes, users have a problem. It's no small task to choose among all these products to find those that best meet all your needs.

Since its founding, *Macworld* has dedicated itself to helping readers find the best products for their use. Ten months ago *Macworld* nearly doubled the number of stand-alone reviews appearing in each issue to provide more purchasing guidance through the product maze. We also added ratings to our *Reviews* section to provide an immediate assessment of each product. These ratings have made it much easier to quickly evaluate the relative worth of the many products we review.

Star Ratings

THIS MONTH WE MAKE IT STILL EASIER for our readers to find the quality products that meet their requirements, by adding a section called *Macworld Star Ratings*. The *Star Ratings* section appears in the back of the magazine and includes all the products evaluated in *Reviews* over the course of the past year. Products are organized into categories and then listed alphabetically. Each product review is summarized with a star rating and one or two concise sentences that capture the essence of the reviewer's opinion.

Your search for the ideal product begins with the star rating itself. Each product is rated with one to five stars. Five stars is the best rating we give; one star is the worst. Five-star ratings are reserved for truly exceptional products that may inspire a quasi-religious experience in the

reviewer. Four stars are awarded to well-designed products that excel in their respective categories. Three stars are given to good products that are reasonably effective for their intended use. Two stars means the product has one or more shortcomings that currently prevent the reviewer from recommending it. One star means the product is badly flawed or deficient and the reviewer recommends avoiding it until the manufacturer significantly improves it.

Keep in mind that ratings and reviews ultimately represent a reviewer's opinion. Different reviewers can have different takes on the same product. Products have a complex set of features applied to a varied set of jobs—no two reviewers will weigh this mix in precisely the same way. You can gain a little more insight into the rating by looking at the pros and cons listed in the header of each review. However, when you are seriously considering a product for purchase, it's always wise to read the body of the review to understand the reasoning behind the reviewer's opinion. That's why we provide a reference to the original review for each product listed in the *Star Ratings* section; we also indicate the current version number so that you know whether the product has been updated since the review was written.

Behind the Ratings

TO PROVIDE CONSISTENCY, THE EDITORS at *Macworld* ask that all reviewers apply key criteria to every product they evaluate. The main criteria that influence the ratings are interface, ease-of-use, design, documentation, support, value, performance, reliability, and innovation.

Interface has long been a key facet of the Macintosh's usability, and ratings take this into consideration. Ease-of-use covers how long it takes to learn to use the product and in what stages users are exposed to more-complicated features. When evaluating a product's design, the reviewer considers whether the product's features are well chosen and well implemented. Documentation

and support are important because it's not enough to create a good product without providing a solid framework for using it. Support is especially important; users need to be able to count on a company's assistance. Judging the value of a product requires the reviewer to ask whether the product is competitively priced and whether it's priced reasonably for the job it performs. Performance includes an appraisal of the product's speed and responsiveness. Reliability is crucial because even a fast and well-designed product can be useless if it's incompatible or buggy. Finally, the rating includes a consideration of how innovative a product is. Macintosh products have a proud history of pioneering new application areas as well as providing more-elegant solutions for existing categories. We think it's important to reward products that continue this tradition.

PowerBook Notes

IN ADDITION TO *STAR RATINGS*, WE'VE also started publishing a monthly column called *PowerBook Notes*. Using a PowerBook has become a new way of life for many Macintosh enthusiasts, judging by the 400,000 PowerBooks Apple sold last year. *PowerBook Notes* is written by *Macworld* contributing editor Cary Lu, who has been writing about the Macintosh since its introduction in January 1984. This issue's premier column begins by telling you how to get the most out of your PowerBook by paring down software overhead to produce an astonishingly lean system that maximizes available storage and memory.

We hope that, like the Mac, *Macworld* will continue to improve with time. *Star Ratings* and *PowerBook Notes* are both the result of readers like you telling the editors how the magazine can better meet your needs. As the new editor-in-chief of *Macworld*, I am especially interested in finding out what changes and additions you would like to see in coming months. Please write to me with your ideas so we can continue to keep our fingers on the strong pulse of the Macintosh. **m**



Guidance
through
the product
maze

A color publi so revolutiona news every

Take any big story in the San Francisco Examiner.[®] The Oakland Hills fire. The Gulf War. The fall of communism. The Giants leaving. And Radius had a hand in it.

The Examiner cranks out five editions every day. With deadlines ranging from a merely frantic three hours, to a maddening, ulcer-inducing 40 minutes.

Pretty impressive. But what's really remarkable is that they put them all out in color. Thanks to Radius.

How do they do it? Chris Gulker, Director of Development at the Examiner, explains. "We have to work fast." An understatement. "And Rockets



IT'S BEEN QUITE A DECADE. THE EXAMINER CAPTURED IT ALL IN RADIUS 24-BIT COLOR.

work feasible on a desktop system.

Giants leaving SF.

7:30 AM

City fights to keep ball team.

11:30 AM

Giants going, going gone.

1:30 PM

Giants stay home.

2:30 PM

They're out of here.

3:30 PM

ROCKET SPEED HELPS THE EXAMINER PUT OUT FIVE COLOR EDITIONS A DAY. BY THE LOOKS OF THINGS, THEY NEED IT.

"Radius' Color Matching System represents another major breakthrough for us in terms of hitting really tight deadlines. Rather than going through the whole

rigamarole of waiting for proofs then making all the necessary adjustments, we now have complete confidence that what we see on the monitor really is what we'll get in print.

"With this high level of comfort in the color on our screens, we've basically been able to turn our journalists into

color separators. Which means we save in terms of both time and personnel.

"We've also done a lot with video frame
"WE CAN GET A COLOR PICTURE FROM THE PHOTOGRAPHER'S CAMERA TO THE PRESSES IN THE SPACE OF 40 MINUTES."

grabbing. During the Gulf War, for example, the best images were coming from CNN. Using Radius products, we



A recreation of the San Francisco Examiner's "hellfire" coverage.

could put TV shots in the paper that were still of a very high quality."

On any given day, you can see six Rocket-equipped Mac IIc's and cx's with

shing system ry it's making two hours.



©1992 Focus Inc. Radius, the Radius logo and all Radius product names are trademarks of Radius Inc. San Francisco Examiner is a registered trademark of the Hearst Corporation.

large Radius displays working fast and furious. And, of course, each one comes loaded with Radius 24-bit color.

Satisfied though they may be, the

Examiner sees better days ahead. "We're hoping to get set up with RocketShare as soon as possible. That way, while we're waiting for color to separate in the

background, we can work on layout and photo editing on the screen. It's going to make life around here a lot easier."

Of course, you don't have to put out a "WE HAVE A PULITZER-WINNING PHOTOGRAPHER WHO NOW GETS NEAR DARKROOM-QUALITY COLOR ON A COMPUTER. IN HALF THE TIME."

multiple-edition city paper or work under crushing deadline pressure to appreciate the power of our color publishing system.

You just have to want to do a better color job faster.

Free Video Offer. Call us at 1-800-966-7360 to receive faxed information. Or 1-800-227-2795 Ext. 1C for a



WITH RADIUS COLOR MATCHING, WHAT YOU SEE REALLY IS WHAT YOU GET.

rebate certificate worth hundreds of dollars, along with a free videotape on how our color publishing system is being used in some newsworthy ways.

You'll see it's really quite a story.

DO EXTRAORDINARY THINGS

SEE US AT MACWORLD EXPO, BOOTH #507

radius

GIMME FIVE!

FIVE GREAT REASONS TO BUY GRACELAN UPDATE MANAGER



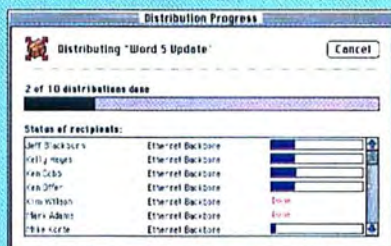
2 ELIMINATE PAPER FLOW

WITH AUTOMATIC DOCUMENT DISTRIBUTION, YOU CAN SEND REGULAR REPORTS AND INFORMATION TO MANY PEOPLE AT ONCE, RIGHT WHEN YOU NEED TO. NO NEED TO TIE UP LASER PRINTERS, WASTE PAPER, OR WORSE YET, WAIT IN LINE AT THE COPIER. YOU'LL ELIMINATE UNNECESSARY PAPER FLOW.



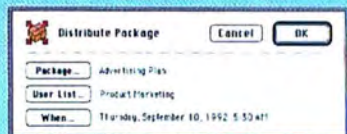
1 SAVE TIME

GRACELAN UPDATE MANAGER LETS YOU UPDATE SOFTWARE AND FILES REMOTELY IN "INTELLIGENT" PACKAGES YOU CREATE BY ADDING AS MANY FILES AND FOLDERS AS YOU WANT. PACKAGES CAN BE DISTRIBUTED TO ONE OR MANY NETWORK USERS ALL AT ONCE. YOU'LL SAVE TIME AND HASSLE.



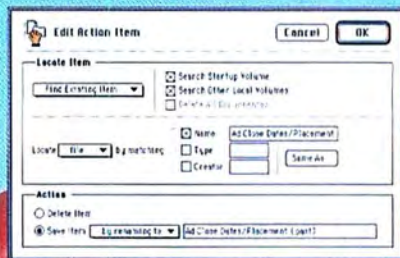
3 REDUCE SOFTWARE PIRACY

WITH GRACELAN UPDATE MANAGER, YOU CAN CONTROL THE DISTRIBUTION OF SOFTWARE AND SEND OUT UPDATES AS SOON AS YOU GET THEM. THIS HELPS KEEP USERS FROM UNAUTHORIZED SOFTWARE USE, ALLOWING YOU TO KEEP A HANDLE ON POTENTIAL SOFTWARE PIRACY.



4 REDUCE NETWORK TRAFFIC

ELIMINATE NETWORK TRAFFIC CAUSED BY SENDING UPDATES VIA E-MAIL SYSTEMS OR COPYING NEW VERSIONS FROM THE SERVERS. WITH GRACELAN UPDATE MANAGER, UPDATE PACKAGES ARE AUTOMATICALLY COMPRESSED AND CAN BE SENT FROM YOUR MAC AT ANY TIME—YOU CAN SEND THEM DURING "OFF" HOURS, WHEN NETWORK TRAFFIC IS AT A MINIMUM.



5 IMPROVE NETWORK MANAGEMENT

GRACELAN UPDATE MANAGER WILL IMPROVE YOUR NETWORK OVERALL. NOT ONLY CAN YOU KEEP ALL USERS CURRENT WITH THE SAME VERSIONS OF SOFTWARE, YOU CAN PERFORM REMOTE MAINTENANCE TASKS, SUCH AS DELETING, RENAMING, OR MOVING FILES. THIS MAKES IT EASY TO CLEAN UP POTENTIAL PROBLEMS ON USERS' MACHINES.

FOR EVEN MORE REASONS TO BUY GRACELAN UPDATE MANAGER, OR TO LEARN MORE ABOUT TECHWORKS' COMPLETE LINE OF NETWORKING HARDWARE AND SOFTWARE SOLUTIONS, CALL TECHWORKS TODAY!



FREE DEMO! 1-800-944-8598

TECHWORKS



GRACELAN UPDATE MANAGER
IS PART OF THE GRACELAN
PROFESSIONAL SERIES OF
NETWORK MANAGEMENT TOOLS.

RESellers: GRACELAN UPDATE MANAGER IS AVAILABLE THROUGH PROGRAM MANAGERS, WHOLESALE, AND TECHDATA TECHNOLOGY WORKS, INC., 4030 BRAKER LANE WEST, SUITE 250, AUSTIN, TX 78759, (512) 794-8532

© COPYRIGHT 1992 TECHNOLOGY WORKS, INC. ALL RIGHTS RESERVED. TECHWORKS, GRACELAN UPDATE MANAGER AND TECHNOLOGY WORKS ARE ALL TRADEMARKS BELONGING TO TECHNOLOGY WORKS, INC. ALL OTHER TRADEMARKS MENTIONED BELONG TO THEIR RESPECTIVE OWNERS.

Letters

FEBRUARY 1993

Dead Technology

I HAVE JUST FINISHED READING YOUR article on the Performa 600, and I must say, I have seen the beginning of the Mac's death ("Mass Market Macs," November 1992). Now, now, take it easy. No one loves the Macintosh OS and available software more than I do. But the rest of the world is progressing at a rate faster than Apple can manage in the hardware department.

Intel and Microsoft are set to unveil the '586 (P5) and Windows NT. IBM clones will offer computers with more than ten times the performance of the Performa 600 for a few hundred dollars more. How does Apple expect to hold them off with two-year-old, mediocre technology?

Philip Ebbert
Los Osos, California

I JUST RECEIVED MY FIRST ISSUE OF *Macworld* and I found the article "Mass Market Macs" very interesting. I just purchased my first computer. During the first week of trying to use it, I was ready to take a hammer to the whole mess.

The problem is the assumption that whoever buys a computer knows computers. If Apple thinks they will increase sales to first-time buyers by just offering Macs for sale in Sears, I think they're going to be disappointed. If I hadn't had the help of my son, I wouldn't have bought one.

What else should Apple do, then? Perhaps display some definitions and interpretations at the point of sale—define RAM and ROM, monitor, modem, mouse, and keyboard. Relate bits, bytes, kilobytes, etc., to how many pages of print they are equal to. Above all, the sales personnel should use everyday English rather than lapsing into computer language. Unfamiliar words will scare prospective buyers.

A. W. Ackley
Cincinnati, Ohio

ONE COULD MAKE A CASE FOR COM-paring the Performa 600 to the Mac IIx on a cost versus performance basis. Assuming a \$2500 cost for a Performa 600 with 5MB of RAM, a 160MB hard disk, and the Apple CD 300i, you would be easily beyond the capability of most any IIx package offered in the ads at the back of *Macworld*. Most IIx offerings run between \$2500 and \$3500; this for a 25MHz system with a single expansion slot requiring an adapter and no separate video RAM or extra internal drive bay. Give me an Apple Color RGB monitor, a 33MHz math coprocessor, and a full-blown, full-featured System 7 (rather than the watered-down one offered with the Performa series), and the Performa 600 would have me saying "Mac IIx? What's a Mac IIx?"

Joel Alvin Christine
Tyrone, Pennsylvania

To Each His Own Accounting

THANK YOU FOR PUBLISHING "Balancing the Books" (November 1992). It was helpful seeing 24 financial packages summarized and put in their place, that is, organized into groups with similar capabilities. And of course, Jim Heid's "Small-Business Accounting" (*Getting Started*) was an excellent companion article.

While the overview with its features chart covered many of the requirements in day-to-day use of an accounting package, there was little mention of the needs of a CPA performing a year-to-date general ledger; and general journal entries with additional description lines are all-important when handling the books over to a CPA. While most of the packages listed do include sufficient audit-trail capabilities, several of the low-end packages, especially those in the personal-finance group, do not. Even these packages will often have ways of faking it, but the targeted user (a business owner trying to keep his or her own books) is not likely to

continues



FILE SYNCHRONIZATION FOR THE POWERBOOK!

Are you:

- Having trouble keeping track of the latest version of your files when you move them back and forth between your PowerBook™ and your Desktop Mac?
- Modifying files on your home Mac and need to have them updated on the office Mac?
- Adding to a database when on the road, while back at the office, changes may have been made to the same database, and there is no simple way to determine if the file has changed on both computers?

If you are experiencing any of these problems, you need PowerMerge. PowerMerge provides you with a simple and automatic way to keep track of the latest version of your files if you use more than one Macintosh® computer!

- Precise Control of which files, folders or disks will be synchronized
- Drag & Drop ease of use
- Visually review all updates before they occur
- Inclusion or Exclusion of individual disks, folders, files, creators or kinds
- Bidirectional Updates
- Disk Locking allows single direction updating
- Conflict Notification if changes have been made to a file on both computers since updating.
- Unlimited setups can be created and saved for future synchronization
- A History Log provides you with a record of every file that was updated
- Works between any two Macs or disks via network or removable media

Order Now from resellers everywhere including:

The MacZone
1(800) 248-0800

LEADER TECHNOLOGIES
Call: (800) 922-1787

Fax (714) 757-1777
4590 MacArthur Blvd., Suite 550
Newport Beach, CA 92660

Circle 79 on reader service card



Take a short



Shortcut to tools. Now it takes the least amount of work to use the functions you need most.

Shortcut to bullets. Your most important points are clearly featured in one speedy step.

Shortcut to envelopes. Address the outside from the inside. Automatically.

Introducing Microsoft Word 5.1 for the Macintosh®.



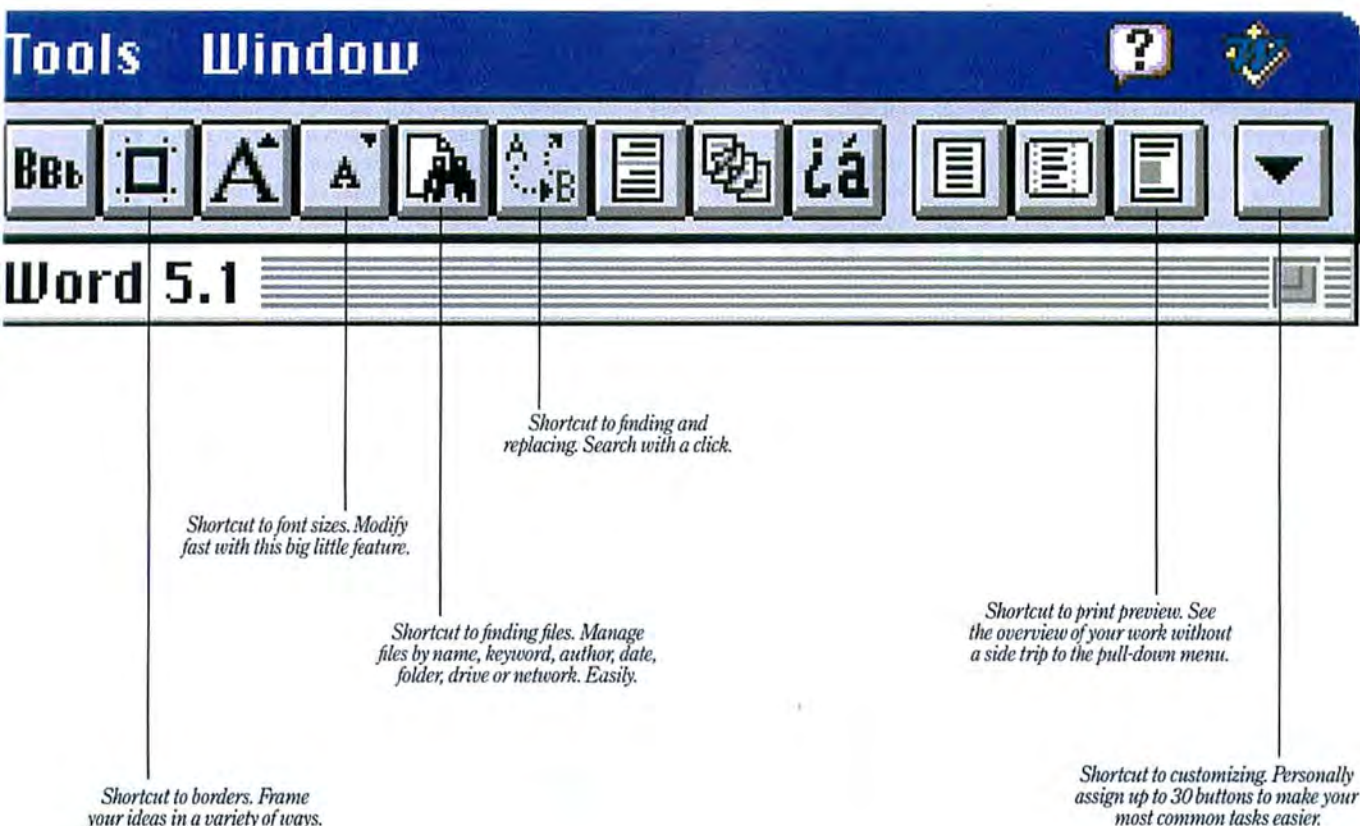
The path to easier computing just got shorter, with new Microsoft Word version 5.1.

Now you can speed through your work with our intuitive new Toolbar. It puts all of the functions you use most into short and easy reach. With a click.

This powerful Toolbar features one-step bulleting, automatic envelope addressing and up to 30 custom buttons to shorten the trip through repetitive tasks.

We've especially shaved time off your work on complex documents. Now you can easily create charts and tables or insert and edit your own text annotations. Your ideas look great in no time.

cut to work.



Microsoft Word 5.1 comes with special installation features and a new battery indicator for the Mac® PowerBook™. It also has QuickTime™ support, which allows you to add full-motion video as easily as inserting a simple graphic.

In short, we've made word processing easier than ever before. Thanks to you. Because we got there by listening to your comments and suggestions.

And for a limited time, as a special

reward to all registered users of version 5.0, you can upgrade to 5.1 for only \$14.95*. Users of any earlier version of Microsoft Word can upgrade for \$129*.

Call us at (800) 323-3577, Dept. HY3, for more information. And discover for yourself why new Microsoft Word 5.1 won't be easy to pass up.

Microsoft®
Making it easier

CORRECTIONS

"Insights on Lotus 1-2-3 for Macintosh" (December 1992) incorrectly described how to include computed records on a form. The actual data for a record selected on the entry form resides on line 515 of that same form.

recognize this, and is thus open to having a year of data-input efforts deemed useless by a CPA.

One inexpensive and easy-to-use package that provides a complete set of accounting was left out of the overview. As a cash-basis business accounting package, CheckMark Software's Cash Ledger bridges the gap between personal-finance and accrual-based software.

*Wayne Higdon
Albany, New York*

We covered Checkmark MultiLedger 2.0, which includes the capabilities of Cash Ledger.—Ed.

ALAN SLAY OMITTED THE OLDEST, best, and simplest accounting program to use, Dollars and Sense from Software Toolworks. As a certified public

accountant, I find it suitable for small service businesses, including corporations and sole proprietors that do not have a need for keeping a detailed inventory and are operated on a cash basis. Best of all, like Quicken, Dollars and Sense costs less than \$60.

*Howard Lisch
New York, New York*

We will review Dollars and Sense in an upcoming feature on personal finance. Even though this reader uses it for accounting, it is really geared more toward personal finance and competes in features and price with Quicken. The accounting article was intended to review products designed for traditional accounting. Please also note that Business Sense, Inc., has acquired Dollars and Sense from Software Toolworks.—Ed.

I HAVE FOUND THE DOCUMENTATION with Wetzel & Company's Profitability Professional to be more than adequate. Profitability is packaged as, and performs as, a stand-alone program. Unfortunately, many people still think of HyperCard as a toy. HyperTalk has allowed a small software publisher to put forth an accounting program that holds its own with the best of them.

*Carmine Picarello
Westport, Connecticut*

YOUR ARTICLE DID NOT ADDRESS what I consider to be an important feature of any accounting package: the ability to correct typographical or clerical errors made in recording data.

The argument, as I understand it, is that by making it impossible to correct typographical errors, it is more difficult for unauthorized users to embezzle funds. I do not have any concern for employee dishonesty and want to have the option to make such electronic corrections. In trying to help me solve this problem, a dealer has let me take a look at M.Y.O.B., which does permit the user to select a Changeability option. Your article fails to consider this capability.

*Samuel Field
Kalamazoo, Michigan*

I SEE THAT YOU INCLUDED BUSINESS Sense. I am a little surprised that they are still out there somewhere. I bought Business Sense and have found it to be a good package in many respects. It does, however, have two major problems. It is poorly documented and the publisher is totally unresponsive.

When I received the package from a well-known mail-order house, it did not have a registration card. I sent a letter to *continues*

A Winning Combination!

Whether used alone or together, CheckMark's MultiLedger® and Payroll give you efficient, straightforward, and easy-to-use accounting software. See for yourself why they were selected as MacWorld Editors' Choice.



Call (800) 444-9922 today
for a free demo disk!



MultiLedger Payroll

MultiLedger is a registered trademark of CheckMark Software, Inc., 1520 East Mulberry, Suite 200, Fort Collins, Colorado 80524 (303) 484-3541 (303) 484-0429 fax.



WITH 16 MILLION COLORS, IT'S CLEARLY THE GOLD STANDARD IN LCD PROJECTION PANELS.

INTRODUCING THE SHARP MULTIMEDIA QA-1650.

The world has never seen a computer/video projection panel with such incredible color and brilliance. From the leader in LCD technology comes the Sharp QA-1650. Able to create an unbelievable 16 million true-to-life colors. The QA-1650's TFT active matrix LCD lets you combine full-motion video with computer images for exciting multimedia presentations. There's a backlit remote with controls

that can even enlarge or freeze your images. Plus, an optional backlight to convert your panel into a direct view monitor. So why not put the power of 16 million colors into your next presentation. The QA-1650. From Sharp's complete line of LCD Projection Panels. See your local authorized Sharp Industrial LCD Products Dealer for a demonstration. Or call 1-800-BE-SHARP Ext. 333.



LCD PROJECTION SYSTEMS • LCD COMPUTER/VIDEO PROJECTION PANELS • LCD DIRECT VIEW MONITORS

SHARP®
FROM SHARP MINDS
COME SHARP PRODUCTS™

© 1992 Sharp Electronics Corporation. LCD Products Group, Sharp Plaza, Mahwah, NJ 07430-2135. (201) 529-8731. Fax (201) 529-9636. VGA and MAC II compatible. Simulated Screen Image.

Circle 109 on reader service card





Alone,
a Powerbook Duo™
is just a portable.



But with the
PowerLink™ Presenter
from E-Machines,
you can show your work
in full color
on virtually any
handy display.

You won't find
anything like it
anywhere else.

Not even the Big Apple.

For a demonstration,
come see us at Macworld
in San Francisco.
Or call, 1 800 344-7274.

Circle 303 on reader service card

Copyright © 1992, E-Machines, Inc.
All trademarks are the property of
their respective holders. 016-02029-00.

Wyoming Software, which is listed as the publisher in my documents, requesting a registration card, and received no response. I sent a registered letter with a return receipt. Someone there signed for the registered letter, but I am still waiting for any kind of response.

*Joe Aldrich
Kingwood, Texas*

Wyoming Software closed its doors earlier this year. (For more information, see *Conspicuous Consumer*, October 1992.) You may have better luck getting documentation, a registration card, and support for Business Sense from the current publisher, Business Sense, Inc., at 800/377-4954.—Ed.

Storage Obsolescence

I WAS ANGERED BY MATTHEW LEEDS' article "Removable Storage" (November 1992). He declared that because the new SyQuest Mesa series of 105MB removables will soon hit the market, the Bernoullis, Ricohs, and older SyQuests will become obsolete. A service bureau or major corporation that just spent tens of thousands on 44MB and 88MB SyQuests and 90MB Bernoullis is not going to just clear out the desks to let the SyQuest Mesa 105MBs in! I have good reason to

be upset: I just bought a Bernoulli 90MB MacTransportable for \$499 and think that it was the best \$500 I ever spent on a peripheral for my LC II.

*Thomas Isakovich
Hasbrouck Heights, New Jersey*

Leeds also stated that the 44MB SyQuest drives will be around for a while due to their large installed base. SyQuest has a much larger installed base than Ricoh or Bernoulli, so if you are buying a drive and will be sharing data with others who are not at your company, a SyQuest is a better choice. If, however, you are only going to swap data between drives in one company or if you are buying a drive for personal use, then any of the technologies is adequate—but be forewarned that as with all technology, current picks will eventually be made obsolete by bigger, better, faster ones.—Ed.

Poor Rating Undeserved

I AM WRITING WITH QUESTIONS about "Optical Update" (November 1992) in which FWB's technical support was rated as being poor for both our hammerDisk130 3.5-inch optical drive and our hammerDisk600S 5.25-inch optical drive. In another article in the same issue, "Removable Storage," FWB's support was rated as being good. We are con-

cerned, not only about the poor rating, but also about the mixed signals.

We'd like to know the criteria used to determine these ratings, and exactly what we did, or didn't do, to deserve the poor rating for our support of the hammerDisk130 and hammerDisk600S optical drives. Were three calls made for each product, or were the results extrapolated to apply to both products? If our staff somehow slipped up we'll take immediate action to bring our level of service and support in line, but we don't know what went wrong without your input.

*Steve Goodman
Vice President
Sales & Marketing
FWB
San Francisco, California*

When we test technical support, we make three phone calls to each company in each article, not three calls per product. We rate the technicians on ability to correctly diagnose and solve each technical problem; helpfulness; and promptness of response. We average the ratings for the calls to get the final score. In this case, we do owe FWB an apology. The company should have received a good rating in "Optical Update." The discrepancy occurred because we misinterpreted a technician's response to a question when we were scoring.—Ed.
continues

800-624-2926

USA/Canada

708-888-8300

Illinois

EDUCATIONAL

RESOURCES™

Your #1 Source for Educational Software & Technology

FREE!

**Call now for the ONLY
Educational Macintosh Catalog!**

SAVE UP TO 60% EVERY DAY!

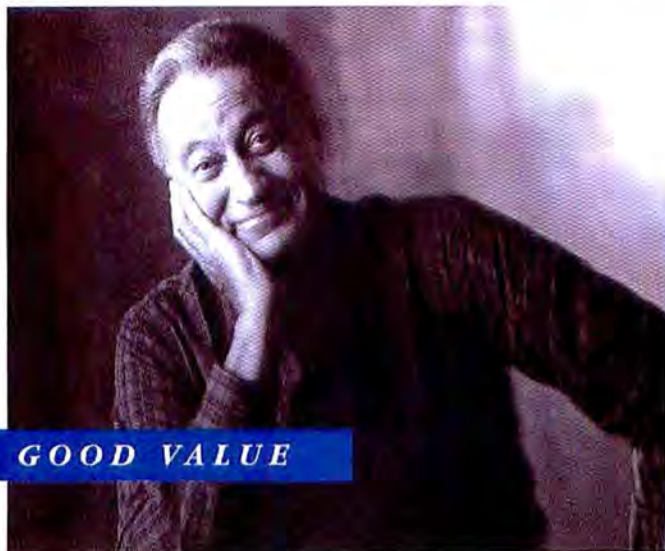
- ✓ Consumer Versions
- ✓ School Versions
- ✓ Accessories
- ✓ LaserDiscs
- ✓ Lab Packs
- ✓ Hardware
- ✓ CD-ROM

BUY WHERE THE SCHOOLS BUY!

**AMERICA'S LARGEST SUPPLIER
OF EDUCATIONAL TECHNOLOGY!**



"Sure, I remember my first modem..."



"My first modem? It was a cheap thrill. And that impulsiveness really cost me. Now I know better. The DataPort 14.4 Data/Fax Modem gives me real value; even puts money in my pocket!"

Now I Know Better."

The new AT&T DataPort™ 14.4/Fax Modem

Introducing the powerful, robust V.32bis DataPort 14.4/Fax Modem. It pays for itself—and features fax capability, too! Answers all your business and personal dial-up needs:

- Sends/receives text, data, and images
- Links Macs to PCs, fax machines, and mainframes
- Transfers data files; exchanges images with fax machines
- Accesses E-mail, bulletin boards, and information services

THRILLING, AND PAYS FOR ITSELF

The DataPort 14.4/Fax Modem features AT&T's exclusive, new *Optical phone Line Interface (OLI)*, pat. pending, that outperforms all other modems on extremely weak "real world" lines!

This faster transmission, with effective throughput of up to 57,600 bps, significantly reduces your long distance costs. And it improves your productivity—no more waiting for your screen

to refresh; no standing in line to send faxes. Serves double-duty with Macs and PCs near your desk and at home.

HIGHLY COMPATIBLE, RELIABLE

Designed by AT&T Bell Labs and AT&T Paradyne, ensuring the industry's widest compatibility with modems and fax machines, plus built-in reliability—tested and proven. And only AT&T gives you a lifetime warranty and toll-free technical support for as long as you own your DataPort modem!

READY TO GET SERIOUS?

From \$475, ready to plug and play, with FREE QuickLink II communications/fax software and cables for the Mac. Three slim, standalone models to meet your exact needs for price, speed, features, and functions: the DataPort 14.4/Fax Modem and DataPort 9.6/Fax Modem and the DataPort 14.4 Modem.



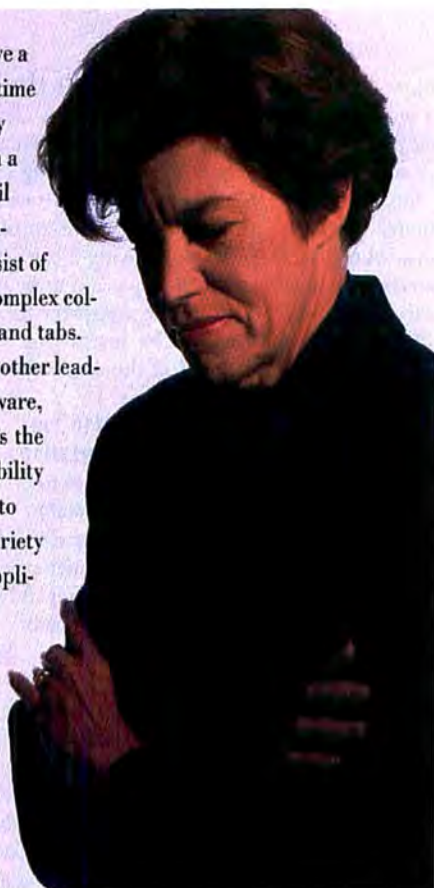
Proudly made by AT&T Paradyne in the U.S.A.

For more information on the DataPort family or the name of the dealer nearest you—call us at 1 800 554-4996 ext. 33.

SOLIDLY-BUILT, SOLIDLY-BACKED BY AT&T



"We don't have a great deal of time to waste at my firm. We scan a variety of mail lists and manuals that consist of some fairly complex columns, tables and tabs. Compared to other leading OCR software, TypeReader is the best. Its flexibility and capacity to export to a variety of software applications is invaluable."



ELIZABETH F. WAJER, FOUNDER—WORDS-WORTH, INC.

WE COMPARED OMNIPAGE® TO TYPEREADER®. WE'RE TYPEREADER USERS NOW.



"We tested the daylights out of OmniPage Pro, WordScan Plus and TypeReader. We were so impressed with the accuracy of TypeReader, we had to go with it. The superior formatting and extreme ease-of-use made it the most useful OCR product we've seen."

MICHAEL ARATA, PRESIDENT—ANDERSON & ARATA, INC.

InfoWorld calls it "...a quicker, better OCR with superb formatting." Users call it the best OCR product they've ever used! We know you'll agree. That's why TypeReader comes with a 30-day money back guarantee.

Call today at **1-800-562-8882** and become one of the growing number of zealous TypeReader users. For technical information and the name of your nearest reseller, call **1-800-732-3897**.

SEE US AT MACWORLD EXPO BOOTH 3371 HALL D



BEST TEXT TOOL

EXPERVISION

†Title page from OmniPage, OmniPage Professional, OmniPage Direct, WordScan, WordScan Plus, ReadRight, Read-it!, AccuText, Recognize, Recognita Plus or Perceive documentation required. Offer expires 2/28/93 and may be revised without notice. ExperVision, the ExperVision logo, and TypeReader are trademarks of ExperVision, Inc. All other names are trademarks of their respective holders. ©1993 ExperVision, Inc. All rights reserved. ExperVision, 3590 N. First Street, San Jose, CA 95134 (408) 428-9988.

Circle 170 on reader service card

Consider the Color-Blind

I GREATLY ENJOYED THE ARTICLE ON data representation by Charles Seiter in the October issue ("What's Wrong with This Picture?"). However, I would like to point out another potential problem in constructing color charts. A small proportion of the population (7 percent of North American men, 1 percent of women) is red-green color-blind, a hereditary condition that results in an inability to distin-

guish between these two colors. Unfortunately, there seems to be a propensity to use this color combination, perhaps because of the stop-go traffic-signal metaphor. Six of the ten color illustrations in the article use these two colors.

I would encourage those who make charts to avoid the red-green combination so that charts can be attractive, accurate, and readable for "the rest of us."

T. Rosenal
Calgary, Alberta, Canada

Ween Catches a Bug

I HATE TO BE A TECH WEENIE, BUT you have a small bug in your "Inside the Processor" article (October 1992). On page 142, you have an illustration of a processor tracing a calculation. The instruction you claim to be tracing is "Add 32 digits in a register to a memory address." The instruction you display in Stage II of the diagram is, however, the following:

```
1101 0001 0110 1101
0001 1110 0101 0110
which translates to
add.w d0,$1E56(a5)
```

This is, of course, valid, but if the application programmer expected a 32-digit add and got a 16-digit add instead, the results could be disastrous.

Sheridan Rawlins
Waltham, Massachusetts

We love tech weenies, and you're absolutely right. We started off using 16-bit instructions because we were going to illustrate the 68030, but then we switched to a 68040 to match the photograph and forgot to use the add.l instruction for long (32-bit) words instead of add.w for regular (16-bit) words. —Ed.

I HAVE NEVER FOUND THE NEED TO write to you regarding an article that you have published; however, I feel obliged to do so at this time to clarify some misconceptions that you may have inadvertently passed along to your readers in the article "Inside the Processor."

"Fabricating Transistors," a section of the sidebar "Making a Processor," describes the process that is used to fabricate the microprocessor.

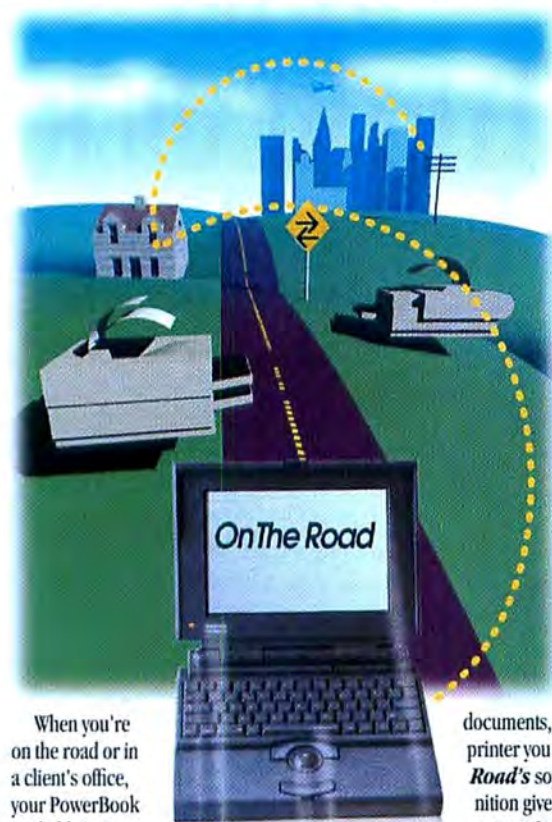
The statement "the exposed photoresist hardens" is descriptive of an older technology known as negative photoresist. In most modern fabrication facilities, negative photoresist has been replaced by positive photoresist because it can produce extremely fine, that is, 1-micrometer or less, patterns; this capability was absent in most negative photoresists.

You also mention that a machine "shoots ions at the wafer," and this is true. High-energy ions are implanted into the silicon to create the semiconductor properties of the device. This may be done several times. However, this process is not known as etching but as implantation. In addition, an integrated circuit or transistor must have electrically conducting features, usually metals, to connect the various circuit elements such as resistors, capacitors, and transistors. The patterns in the metal can be created by etching away unwanted metal after patterning the photo-

continues

Print or fax at 70mph

Introducing
On The Road™
for PowerBook™
users —
connectivity
software that
remembers to
print or fax your
documents when
you reconnect.



When you're on the road or in a client's office, your PowerBook probably isn't connected to a phone line or a printer. But that doesn't mean you can't finish the work you need to do.

Now you can print your documents or send faxes as you normally would — chose Print from the file menu, close the documents and forget about it. Wherever you are. Let **On The Road** remember to complete the tasks when you reconnect your PowerBook.

It happens automatically.

On The Road also handles repetitive chores like remounting AppleShare® volumes, opening desk accessories, control panels or

documents, and choosing the last printer you used. And **On The Road's** sophisticated location recognition gives all PowerBook users automatic site-specific configuration.

On The Road even makes it easy to re-assign deferred documents to similar printers at different locations. So when you're on the move, you can take advantage of whatever printer happens to be handy. Don't let your fast pace keep you from finishing your tasks on the spot. Like a traveling secretary, **On The Road** remembers all the deferred details. So you don't have to.

For more information, contact Palomar Software.



Palomar Software, Inc.
2964 Oceanside Blvd., Suite D
P.O. Box 120
Oceanside, CA 92049-0120
(619) 721-7000, Fax: (619) 721-4758

On The Road is a trademark of Palomar Software. AppleShare is a registered trademark, and PowerBook and PowerBook Duo are trademarks of Apple Computer, Inc. Other products may be trademarks or registered trademarks of other companies, and are used for explanation and to the owners' benefit, without intent to infringe.

Circle 228 on reader service card.

Our PostScriptTM Level 2 Printer is not only priced low, *now* it comes with a HUNDRED pieces of paper.



\$100

WITH THIS \$100 OFF COUPON THE DECLASER 1152 IS ONLY \$999.

If you think the deal's great wait until you see how great the printer is. This new 4-page-per-minute desktop laser printer comes ready to plug and play with Macintoshes[®] and PCs with simultaneously active ports. It also comes with AdobeTM PostScriptTM Level 2 and PCL protocols, image enhancement for extra sharp copy and a single supply cartridge, too.

This introductory offer won't last forever, so call us today for more information and the name of a participating distributor near you. And don't forget to clip this coupon, because from now until March 31st this piece of paper could be worth a hundred.

CALL 1-800-DEC-INFO EXT. 842

Customer must submit coupon with proof of purchase (dated invoice and serial number) from an authorized distributor to Lisa Johnston, Digital Equipment Corporation, 6 Technology Park Drive, DSG2-2/C4, Westford, MA 01886-4197. FAX: #508-635-8141. One coupon per customer site. One printer per coupon. Offer valid for purchases and deliveries in the U.S. only. Printer must be purchased by 3/31/93. Coupon must be redeemed by 4/30/93. This offer cannot be combined with any other offer or discount.

digitalTM

\$100

© Digital Equipment Corporation 1992. The DIGITAL logo and DECleraser are trademarks of Digital Equipment Corporation. PostScript and Adobe are trademarks of Adobe Systems, Incorporated which may be registered in certain jurisdictions. Macintosh is a registered trademark of Apple Computer, Inc.

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

PEAKS

THE LAST DRIVE YOU'LL NEED.

"This drive's speed is a significant advance for optical technology. . ."

Charles Piller
Macworld



"The PMO-650 is the first rewritable optical drive we've ever tested that can get out and run neck and neck with hard disks"

Rex Farrance
PC World



TYPE: 5.25" OPTICAL
CAPACITY: 650/600 MB
SIZE: 7.3" (H) X 3.6" (W) X 10.0" (D)
WEIGHT: 7.4 LBS
MOUNTING: VERTICAL OR HORIZONTAL

Optical technology has many advantages - removability, reliability, infinite storage capacity, and a lower cost per megabyte than magnetic media.

COST PER MEGABYTE COMPARISON

Drive Type	Retail/650 MB	1.3 GB	2.5 GB	5.0 GB
PMO-650 Optical Drive (1 Disk)	\$4,194	\$4,393	\$4,770	\$5,545
Magnetic Hard Drive (650 MB)	\$3,745	\$7,490	\$14,400	\$28,800
88 MB Removable Magnetic Disk	\$2,394	\$3,790	\$6,367	\$11,734

The PMO™ series are based on Pinnacle's own OHD™

(Optical Hard Drive) technology, making Pinnacle the leader in performance and innovation. There is no higher source in the industry. The PMO-130™ and PMO-650™ are the Twin Peaks. Plug-n-play for MAC, PC and compatibles, PS/2, SUN, HP, DEC, and Silicon Graphics. It's more than a hard drive - It's optical!

(800) 553-7070

PINNACLE MICRO

THE OPTICAL STORAGE COMPANY®

Circle 115 on reader service card.

toresist, or by depositing metal on top of the photoresist-patterned wafer and subsequently washing away the metal along with the photoresist on which it sits.

Brad Cantos
San Francisco, California

Favorite Tip

I SAVED \$150 DUE TO A SIMPLE TIP IN your *How To/Quick Tips* section (November 1992). When I receive the magazine, it is the first section I turn to. Using the tip, I was able to convert my HyperCard 2.1 that was bundled with my Mac to the scripting level. Because of this, I did not have to buy the HyperCard development kit. Thank you.

Michael Hazen
via CompuServe

For those of you who missed the tip: In HyperCard, go to the Preferences card, display HyperCard's message box, type the command **magic**, and press the return key.—Ed.

Review Response

Y OUR NOVEMBER 1992 REVIEW OF NightWatch II failed to understand

the modular positioning of the product. NightWatch II's locking techniques, user privileges, and true site-license capabilities are unique. The benefits from those features were not addressed. Instead, your reviewer focused on circumventing screen privacy, a user convenience we do not even consider security. This approach ignored the product's principal modular purpose—hard disk locking. If access protection is required while the machine is in use, use FolderBolt or MacSafe II.

We continue our high respect for *Macworld* and its writers. In the future, however, we hope that greater efforts will be made to identify and address product positioning in your reviews.

V. G. Nesbitt, CEO
R.C. Wesolek, COO
Kent Marsh
Houston, Texas

The manual says that "NightWatch II can lock your screen securely . . ." I spoke with Kent Marsh's lead technician, and he verified that the screen locker can be circumvented. This possibility is not mentioned in the documentation. I did not focus on the modular positioning of the product because this was not a collective review of Kent Marsh products. Also, throughout the software manual NightWatch II is touted as being "a complete security system for Macintosh hard disks." After spending up to \$159

for NightWatch II, I would be less than enthusiastic about spending the additional \$129.95 for FolderBolt for a really complete solution.—Matthew Clark

CD ROM, Not Record

L IZA WEIMAN STATES, "WITHOUT the drop in speed, music would sound like a 33-rpm record played back at 78 rpm" ("CD ROM Drives: Into the Mainstream," October 1992). This is ridiculous. The DAC (digital-to-analog converter) is crystal controlled and spits out audio at a 44.1kHz word-clock rate regardless of how fast data is being fed it. The worst that could happen is that you would overflow the buffer.

John Pond
via America Online

Flakes in FreeHand

I FEEL I MUST RESPOND TO DEKE McClelland's response to my letter about his June 1992 review of Aldus FreeHand 3.1 (*Letters*, October 1992). First, I remember reading that the EPS file format was developed as an export/import-only format. Second, I tried the experi-

continues

S P E E D D I A L I N G

from your Macintosh®

Get the convenience and speed of automatic telephone dialing, with DeskTop Dialer™.

- Dials any telephone number from within any Macintosh application
- Supports one- or two-line analog phone systems
- Simple "hot-keys" dial or redial any number you select
- Includes DialerDA™ personal telephone directory, FREE
- Easy to configure and installs through ADB port

With a suggested retail price of only \$75, DeskTop Dialer lets your Mac do the walking. And makes you more productive.

For the dealer nearest you, call Sophisticated Circuits at (800) 827-4669, (206) 485-7979, or FAX at (206) 485-7172.




☐ DialerDA

- Charles E.
- Vivian S.

1	2 ABC	3 DEF
4 GHI	5 JKL	6 MNO
7 PQRS	8 TUV	9 WXYZ
*	0 OPER	#

☐ Barry B.
☐ Rikki C.



DESKTOP Dialer™

© 1992, Sophisticated Circuits, Inc.
DeskTop Dialer and DialerDA are trademarks of Sophisticated Circuits. Macintosh is a registered trademark of Apple Computer, Inc.

Circle 237 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

INFINI-D™

The 3D Graphics Tool



If you're interested in 3D graphics, you owe it to yourself to take a look at Infini-D, the 3D package that's blowing the doors off the competition.

New Media Magazine declares Infini-D "awesome." (Highest Rating) Macworld writes that Infini-D "may well be the best all-around 3D visualization package available." And MacUser says, "No other competing product in its class comes close..."



Push the limits of your creativity and discover a new world with Infini-D, the finest 3D environment available for the Macintosh®

Call us at (413) 549-7600, and we'll send you a free Interactive

Demo showing how Infini-D can transform your ideas into reality.

Infini-D. The 3D Graphics Tool.



Infini-D has the tools you need to create the professional quality 3D graphics your clients want.



VISIT US AT
MACWORLD
BOOTH
637

Specular International

233 North Pleasant Street • P.O. Box 888
Amherst, MA 01004-0888
Phone (413) 549-7600 • FAX (413) 549-1531

"The Wheel" ©1992 Steve Mockensturm/Toledo, OH. Infini-D™ is a trademark of Specular International, Ltd. Macintosh® is a registered trademark of Apple Computer, Inc. Swivel 3D™ is a trademark of MacroMedia, Inc. ©1992 Specular International, Ltd. All rights reserved.

Circle 112 on reader service card

LETTERS

ment of exporting a simple textless file (one rectangle) in EPS format from FreeHand and trying to open it directly with FreeHand. After I removed EPS Exchange from the FreeHand folder, it opened the file but changed the location, fill, and line of the rectangle. That definitely is flaky.

Oh, well, despite its arcane faults, I prefer FreeHand because I find it more intuitive and predictable for producing line art to a laser printer, color separations to imagesetters, and color slides and overhead transparencies to film recorders than anything else I've tried.

Bill Ware
Cleburne, Texas

More on Our Schools

THANK YOU FOR YOUR COVERAGE of the deterioration of America's schools (September 1992). "America's Shame" exposed the mistakes and lack of forethought for which the administrators of our public schools have become known. This indeed is an issue computer users and makers should be aware of and involved in. Our future depends on it.

James Staten
Mill Valley, California

YOU SHOULD BE COMMENDED FOR your work as a medium for encouraging change in the American school system. I am in my second year studying computer science at Worcester Polytechnic Institute, and through my years of education I have seen firsthand the lack of emphasis placed on computer education, the lack of computer training American teachers have, and the misappropriation of resources in primary and secondary education.

It is necessary to draw bright, fresh new computer professionals into the field of education. In addition to training current teachers in the use of computers, we must provide our schools with computer professionals who can teach the skills students will need to carry them into the twenty-first century.

Paul Cousineau
Worcester, Massachusetts

Letters should be sent to *Letters*, Macworld, 501 Second St., San Francisco, CA 94107, 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 Time Has Come...

...to send for the latest copy of the free Consumer Information Catalog. It lists more than 200 free or low-cost government publications on topics like money, food, jobs, children, cars, health, and federal benefits. Send your name and address to:

Consumer Information Center
Department TH
Pueblo, Colorado 81009

A public service of the U.S. General Services Administration.

128 Megabytes To Go.



Chinon's New 3 1/2" Rewritable Optical Drive.

Now you can store 128 megabytes on a 3 1/2" disk. And take it anywhere. This technology is a massive breakthrough in mass storage.

In memory-hungry applications like desktop publishing, multimedia and CAD/CAM, the lack of portable, high-capacity storage has been a real limitation—until now.

Chinon's rewritable optical drives help you take full advantage of this exciting new technology. They offer the same rock-solid reliability and durable construction that has built Chinon's quality reputation. And their unique, proprietary dust protection system shields the drive mechanism, safeguarding your data for years to come.

Chinon optical drives are fast, too—with a 43ms access time, they're almost as fast as a hard drive. And the optical medium provides unsurpassed safety and data integrity.

External and internal versions are available for IBM and compatibles, external only for Macintosh. Best of all, Chinon optical drives are offered at a very competitive price.

Call Chinon today for the reseller nearest you. And get your data to go!

CHINON

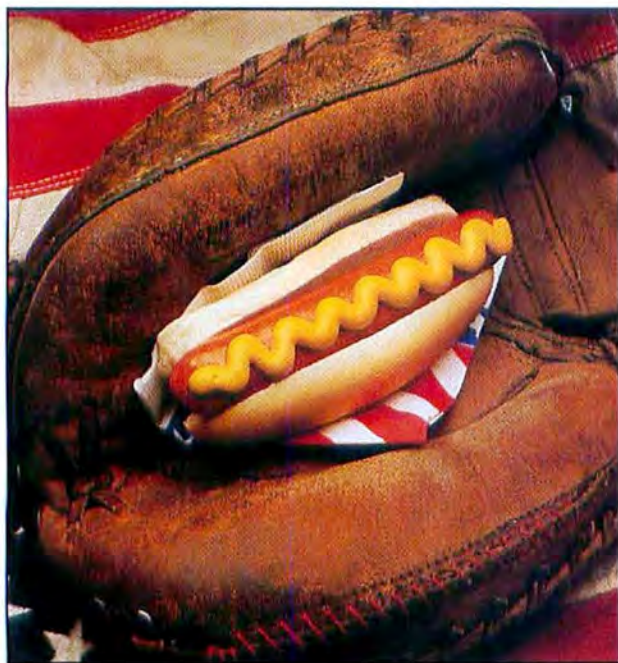
The Drive To Succeed

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

IBM is a trademark of International Business Machines Corporation. Macintosh is a trademark of Apple Computer, Inc.

Circle 223 on reader service card

Winning Co



**Baseball
and hotdogs**

Every business needs "recognition."

Caere® and Hewlett-Packard have joined forces again. It's hard to imagine HP's award-winning scanners without equally great page recognition software. Kind of like peanut butter without jelly. Mom without her apple pie. Or Peter and Paul without Mary.

HP and Caere let you put your best image forward, whatever your business or profession, allowing you to enter text, numbers or graphics directly into your Macintosh® without a single keystroke. It's like having a personal assistant to type reports or prepare graphics for key presentations around the clock.

A combination to match your need.

And now you can choose from two winning combinations to match your own *unique* set of needs.



**Mom
and apple pie**

Choose *OmniPage* Direct and the HP ScanJet IIp scanner for the Mac, the ideal solution if you happen to be an independent business person, or consultant, and require a powerful option at the most affordable price. Within minutes you'll be up and running, entering text and graphics of all sorts – directly into your favorite word processor, spreadsheet or page layout program. All without a hitch.

Or consider the world's most advanced page recognition solution, *OmniPage* Professional and the HP ScanJet IIc scanner for the Mac. This is the right choice if you require state-of-the-art capabilities, along with the world's most accurate and customizable OCR, 400 dpi text and images, as well as grayscale and 24-bit color.

mbinations



The HP ScanJet IIf scanner and OmniPage Direct



OmniPage Professional and the HP ScanJet IIC scanner

It pays to get recognized.

Now you can have the best for less with an HP "Fame and Fortune" rebate and a *bonus* money saving offer from Caere. If you own a small business and need to increase your productivity right away, save up to \$100 when you buy the HP ScanJet IIf scanner for the Mac and

OmniPage Direct. If you require the "industrial strength" page recognition solution – one that can tackle even coffee soaked memos, reams of paper, or documents – buy the HP ScanJet IIC scanner for the Mac and *OmniPage* Professional and save up to \$200!

Now is your chance at "Fame & Fortune."

Buy *OmniPage* Direct and the HP ScanJet IIf scanner for the Mac now and get \$50 from Caere and \$50 from HP!

Buy *OmniPage* Professional and the HP ScanJet IIC scanner for the Mac now and get \$100 from Caere and \$100 from HP!

Call Caere at 1-800-535-SCAN

Call HP at 1-800-35HPMAC, ext. 7141

Offer valid through January 31, 1993.

CAERE



**HEWLETT
PACKARD**

America's Most Popular Macintosh Workshops Now On Video

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 or purchase order info or mail or FAX your order to the address and number below. Add \$3 plus \$1/video shipping and handling.

Acius 4th Dimension Video #1	<input type="checkbox"/>
Acius 4th Dimension Video #2	<input type="checkbox"/>
Acius 4th Dimension Video #3	<input type="checkbox"/>
Acius 4th Dimension Video #4	<input type="checkbox"/>
Adobe Illustrator 3.2 Video #1	<input type="checkbox"/>
Adobe Illustrator 3.2 Video #2	<input type="checkbox"/>
Adobe Illustrator 3.2 Video #3	<input type="checkbox"/>
Adobe Photoshop Video #1	<input type="checkbox"/>
Adobe Photoshop Video #2	<input type="checkbox"/>
Adobe Photoshop Video #3	<input type="checkbox"/>
Aldus Freehand Video #1	<input type="checkbox"/>
Aldus Freehand Video #2	<input type="checkbox"/>
Aldus Freehand Video #3	<input type="checkbox"/>
Aldus PageMaker Video #1	<input type="checkbox"/>
Aldus PageMaker Video #2	<input type="checkbox"/>
Aldus PageMaker Video #3	<input type="checkbox"/>
Aldus PageMaker Video #4	<input type="checkbox"/>
Aldus Persuasion Video #1	<input type="checkbox"/>
Aldus Persuasion Video #2	<input type="checkbox"/>
Aldus SuperPaint Video #1	<input type="checkbox"/>
Aldus SuperPaint Video #2	<input type="checkbox"/>
Aldus SuperPaint Video #3	<input type="checkbox"/>

Claris FileMaker Pro Video #1	<input type="checkbox"/>
Claris FileMaker Pro Video #2	<input type="checkbox"/>
Claris FileMaker Pro Video #3	<input type="checkbox"/>
Claris MacDraw Pro Video #1	<input type="checkbox"/>
Claris MacDraw Pro Video #2	<input type="checkbox"/>
Claris MacProject II Video #1	<input type="checkbox"/>
Claris MacProject II Video #2	<input type="checkbox"/>
Claris MacProject II Video #3	<input type="checkbox"/>
Claris MacWrite II Video #1	<input type="checkbox"/>
Claris MacWrite II Video #2	<input type="checkbox"/>
ClarisWorks Video #1	<input type="checkbox"/>
ClarisWorks Video #2	<input type="checkbox"/>
ClarisWorks Video #3	<input type="checkbox"/>
ClarisWorks Video #4	<input type="checkbox"/>
Deneba Canvas Video #1	<input type="checkbox"/>
Deneba Canvas Video #2	<input type="checkbox"/>
Deneba Canvas Video #3	<input type="checkbox"/>
Claris HyperCard Video #1	<input type="checkbox"/>
Claris HyperCard Video #2	<input type="checkbox"/>
Claris HyperCard Video #3	<input type="checkbox"/>
Intuit Quicken Video #1	<input type="checkbox"/>
Intuit Quicken Video #2	<input type="checkbox"/>

Lotus 1-2-3 Video #1	<input type="checkbox"/>
Lotus 1-2-3 Video #2	<input type="checkbox"/>
Lotus 1-2-3 Video #3	<input type="checkbox"/>
Macintosh (6.0 or 7.0) Video #1	<input type="checkbox"/>
Macintosh (6.0 or 7.0) Video #2	<input type="checkbox"/>
Macintosh (6.0 or 7.0) Video #3	<input type="checkbox"/>
Microsoft Excel Video #1	<input type="checkbox"/>
Microsoft Excel Video #2	<input type="checkbox"/>
Microsoft Excel Video #3	<input type="checkbox"/>
Microsoft Excel Video #4	<input type="checkbox"/>
Microsoft Excel Video #5	<input type="checkbox"/>
Microsoft Word Video #1	<input type="checkbox"/>
Microsoft Word Video #2	<input type="checkbox"/>
Microsoft Word Video #3	<input type="checkbox"/>
Microsoft Word Video #4	<input type="checkbox"/>
Microsoft Works Video #1	<input type="checkbox"/>
Microsoft Works Video #2	<input type="checkbox"/>
Microsoft Works Video #3	<input type="checkbox"/>
Microsoft Works Video #4	<input type="checkbox"/>
QuarkXPress Video #1	<input type="checkbox"/>
QuarkXPress Video #2	<input type="checkbox"/>
QuarkXPress Video #3	<input type="checkbox"/>
WordPerfect Video #1	<input type="checkbox"/>
WordPerfect Video #2	<input type="checkbox"/>

\$49^{ea.}

Videos can be updated upon release of new software versions for only \$14.95.

MacAcademy®

Circle 106 on reader service card

477 S. Nova Rd. Dept. MW293
Ormond Beach, FL 32174
800-527-1914 FAX 904-677-6717

Art Beat

Behind Macworld's Graphics

BY CATHY ABES

Artist: Diane Fenster is an illustrator, fine artist, and designer based in Pacifica, California, who has been working on the Macintosh since 1985. Once she conquered her fear of computers, she found the Mac to be a perfect environment for transforming her traditional collaging into an electronic art form.

Hardware: Mac IIx with 32MB of RAM and a 425MB Quantum internal hard drive; 337MB Wren Runner external hard drive; SyQuest 44MB removable-cartridge drive; 128MB Sony rewritable optical drive; Nexus FX 55MHz accelerator board; AppleColor 13-inch monitor; SuperMac Spectrum/24 24-bit accelerated graphics board; 19-inch MegaGraphics monochrome monitor; AppleScanner with Abaton gray-scale upgrade.

Software: Adobe Photoshop 2.0.1.

How It Was Done:

For the illustration that opens our feature on security products, Fenster began by making a rough sketch in Photoshop (in gray-

scale mode) by scanning in various elements: the woman, the padlocks and keys, the man's head, the door and steps, and the hand. Then she arranged other images on top of the starry background and printed out a laser copy on which she hand-sketched some of the missing details for rough placement: the Mac and the encrypted code displayed on its screen.

Next Fenster switched from gray-scale to RGB mode and began colorizing each element in its own separate document (she filled in the patterned

backgrounds later). To gradate the sky from black at the top to dark blue at the bottom, she used the magic wand with tolerance set at 1 and clicked on the black of the background. After saving that selection as a new channel within the document, she went back to the original background and brought up the palette so she could choose a range of colors for the stars. Because the document was scanned in gray-scale mode, each star had a haze of gray pixels. Selecting the paint-

brush and choosing Color Only mode allowed Fenster to paint just the gray pixels around the outer edge of each star without affecting the stars' white centers or the sky's black background. On some of the stars she used the magic wand (again with a tolerance of 1) to select just the white centers, and used the blend tool to add radial fills of color.

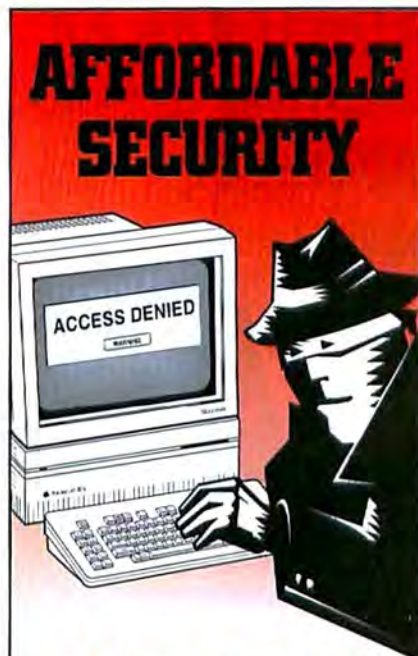
The figure of the woman began as an old black-and-white engraving from a book of clip art. Instead of scanning it in black-and-

white mode, Fenster scanned the image in gray scale. Because in gray-scale mode the scanner interpolates pixels, interpreting any areas that don't appear to be pure black or white as varying shades of gray, the image ended up with a much greater pixel depth than it would have had as scanned line art. After switching to RGB mode, Fenster applied Photoshop's Unsharp Mask filter to sharpen the image, then used the Adjust Levels command (in the Adjust submenu under the Image menu) to achieve the desired gray-

continues



The illustration that opens our feature on security software, page 144.



SAFELOCK^{MAC}

Simple and Reliable Data Security

SafeLock comprehensively protects your personal and professional data against unauthorized users and prevents computer viruses. Convenient? Yes, including an optional floppy disk lockout and the choice of an on-demand or preset lock. Now, you can add instant security to your Macintosh environment with SafeLock for only \$49!

- Installs in less than a minute
- Optional floppy disk lockout
- Hides files without altering or encrypting them
- Detects and removes all known MAC viruses
- System 7 compatible



Order now from your reseller or call:

800-228-5651



TREND

MICRO DEVICES INCORPORATED
2-21 W. 205th St., W.O. 100, Torrance, CA 90501
Phone: 310-782-6190 Fax: 310-325-5992

SEE US AT MACWORLD BOOTH 4458

Circle 203 on reader service card.

Here's the fast, proven tool for creating great business plans

Writing a business plan from scratch is enough to strike terror into the heart of any entrepreneur, no matter how good his ideas are.

Writing from scratch can take days, even weeks. Even then, your plan might not effectively communicate your ideas.

JIAN* provides an easier way. BizPlanBuilder is a complete business plan package based on the experience of successful business people and entrepreneurs. It provides you with 33 word processing and spreadsheet documents—over 90 pages—all ready for use on your computer. With BizPlanBuilder you can have a first-rate plan in a fraction of the time.

You simply follow the helpful hints in the text and edit the information in your favorite word processor. It's like having a top business consultant by your side.

BizPlanBuilder is built with the best elements from hundreds of successful business plans created by experts. Everything is laid out so your plan will be complete and ready to present.

Many businesses have received millions of dollars in funding using BizPlanBuilder. It's no wonder that *SUCCESS* Magazine has given it their "Editor's Choice Gold Medal."

BizPlanBuilder comes in versions for the Apple Macintosh, PCs, and compatibles. It's amazingly affordable at only \$129.

Discover the complete series of business building products available from JIAN. You can receive a free copy of our catalog by calling 1-800-346-5426.

Get BizPlanBuilder from your favorite software supplier today. It's the fast and easy way to write a winning business plan.

BizPlanBuilder™

SEE US AT
MACWORLD
BOOTH 3055



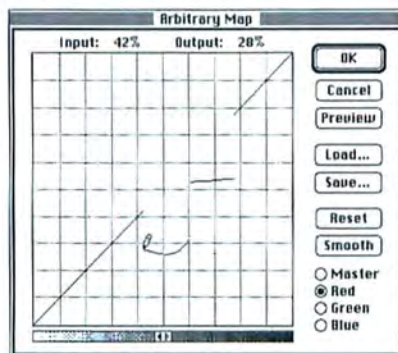
Proven Software for Growing Companies!™

1-800-346-5426 • 415-941-9191

ART BEAT



The rough layout in Photoshop, in which scanned elements were added for proper positioning.



The original black-and-white engraving of the woman scanned in gray-scale mode (top); the scan in the process of being colorized (middle) with the arbitrary map (bottom).

to-black ratio. Using the sliders in the Color Balance window (in the Adjust sub-menu under the Image menu), she added red and yellow to the image. Then she brought up an arbitrary map—a grid with a diagonal line through it—which allowed her to manipulate the color interactively (by choosing Arbitrary from the Map sub-menu, under the Image menu). Choosing first the red, then the green, and finally the blue map, she began redrawing the diagonal line in each. As she drew, she could see the colors of the image change accordingly. She used the arbitrary map's Smooth option to make a more subtle transition from gray scale to color. Because the woman's face and hands were white, they were unaffected by the map. Fenster selected them with the magic wand, chose a color with the Color Picker, and used the Fill command to fill them with that color.

The padlocks and keys were actual objects Fenster scanned (the lock and key were scanned together). Because the objects were not flat, after she placed them on the scanner and closed the cover, she draped a black cloth over the lid to block out any light that might leak through. This minimized shadows in the



The original scanned padlock and key (top). The padlock with the first pattern stretched over and pasted into it (bottom left); the padlock with the second pattern pasted over the first, making the first pattern into a mask that to varying degrees filters out parts of the second pattern (bottom right).

*JIAN (jee'on) is a real word meaning the master of every art.
© 1993 JIAN Tools For Sales, Inc. BizPlanBuilder is a trademark owned by JIAN Tools For Sales Inc.



New EtherPrint-3. Maximum Flexibility For Printing On Ethernet Networks.

At Dayna, we set the standard for low-cost, plug-and-play Ethernet printing when we introduced EtherPrint™ in 1990. And since then, companies of all sizes around the world have relied on EtherPrint for painless Ethernet printing.



1990
Eddy Award:
Best Connectivity
Hardware



Now, new EtherPrint-3™ is our most flexible solution ever. With on-board connectors for thick Ethernet, thin Ethernet and 10BASE-T, EtherPrint-3 connects any LocalTalk



As prices ranging from \$499 to \$699, EtherPrint won't stretch your budget to the breaking point.

printer directly to any Ethernet network. And for the ultimate in flexibility, EtherPrint-3 Plus connects up to four printers or other LocalTalk devices, with no setup or configuration required.



All three Ethernet connectors in one model make EtherPrint-3 your most flexible printing solution.

So when you're busy installing your Macintosh Ethernet network, don't tie yourself in knots trying to solve the printer problem. Call the Macintosh network specialists at Dayna today.



Dayna

Macintosh Networking Specialists

801-531-0600 Ext. 358



SEE US
AT MACWORLD
BOOTH 3263

BETTER PRINTING SOLUTIONS

POWERPRINT™

Now you can use your Mac® to print to over 1000 non-Apple® printers! Portable printers for PowerBooks™. Wide carriage printers. Inexpensive printers. Or just about any other laser, inkjet, or dot matrix printer you want access to at home, office, hotel business centre or airport lounge.

BETTERWRITERS™

Now you can use your ImageWriter® or StyleWriter® more efficiently! BetterWriters offers built-in spooling, faster and more intelligent printing, and LaserWriter®-like features.

PowerPrint and BetterWriters are compatible with just about anything and has the driver features you want.

- System 7™, TrueType™, Adobe Type Manager™, A/UX®, etc.
- supports color, bins and trays, duplex printing, etc.
- built-in spooling, reduction and enlargement, custom paper sizes, smart forms and label printing, enhanced greyscales, etc.

Both products are also available in network versions for easy sharing of any connected printer over AppleTalk® or EtherLink® without additional hardware.

GDT Softworks Inc.

4664 Lougheed Highway, Suite #188
Burnaby, BC Canada V5C 6B7

604-291-9121

800-663-6222 (orders)

604-291-9689 (fax)

AppleLink:GDT.MKT

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

Circle 42 on reader service card

ART BEAT

scanned image. After scanning the lock and key, she separated them into two files and duplicated the lock using the Duplicate command in the Calculate submenu (Image menu), keeping one as a template for later use. Using the magic wand with a tolerance of 1, she selected the white background around the lock and used the Inverse command (to make the lock the selected object). She copied a small rectangular section of a pattern she had previously created and pasted it into the lock using the Paste Into command. Then she stretched the pattern using the Scale command (in the Effects submenu under the Image menu) to cover the entire lock. Now the pattern covered the lock but not the background. Then she used the Paste Controls command set at 80 percent Opacity and Fuzziness set at 23 so the detail on the lock showed through and the fuzziness smoothed it out. Using a different pattern, she repeated

the process with the second lock. For the third lock, she selected the object and saved that selection as a new RGB channel, which made the background black and the lock white. She then used the Load Selection command to load the selection back onto itself in the new channel. After copying another pattern, using Paste Into, and stretching the pattern to cover the lock, she went back to the original composite channel and loaded the selection (the new channel) into it. Then she took a completely different pattern, copied it, pasted it into, and stretched it over the lock. In effect, the original pattern became a mask, allowing the newly pasted pattern to show through it in varying degrees: completely in the white areas, progressively less in the darker areas, and not at all in the black areas. On the keys, she used the same technique she had used to texturize the first two locks.

For the moon, she scanned a black-and-white photo in gray-scale mode, then used the paintbrush with the Color Only option at 40 percent opacity to colorize only the gray pixels, making them blue.

For the head of the man (another black-and-white photo scanned in gray-scale mode), Fenster cut away the background by outlining his head with the pen tool, making the head a selection, choosing Inverse to select the background, and



The original photo of the man scanned in gray-scale mode (top left); after the background was clipped out and the man was colorized with the arbitrary map (top right); the man inverted and solarized (bottom left); the man with neon edges along shadow lines created by slightly offsetting the colorized image from the gray-scale one underneath (bottom right).

deleting it. After switching to RGB mode, she used Color Balance to add overall color tone, then created another arbitrary map, through which she added yellow and lavender tones in the shadow and highlight areas. Going back to the original gray-scale image, she inverted it and changed it to RGB mode, then applied the Solarize filter (in the Stylize submenu under the Filter menu). In the colorized image, she selected the background, selected Inverse (Select menu), then copied and pasted the head using Paste Controls at 100 percent opacity with the Color Only option so the shadows and highlights of the gray-scale image underneath would show through. Then to create a neon edge effect, she offset the floating selection by dragging it slightly away from the underlying image.

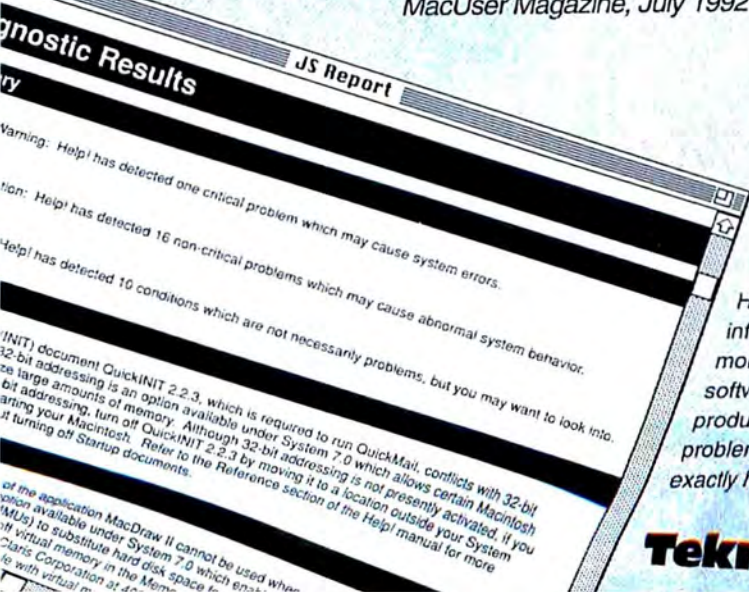
The hand was the last element to be added. Fenster used the same process she'd used to colorize the locks, except that she pasted in a pattern using the Color Only option (of the Paste Controls command) so that only the gray pixels would be changed, leaving the black lines and the white areas unaffected. This technique preserved the engraved effect of the original image while subtly colorizing it.

The illustration, whose file size was 17MB, took Fenster approximately 25 hours to complete. ■

Help!™ Puts 2,000 Macintosh Experts At Your Desktop



"... Help! is a solid solution."
MacUser Magazine, July 1992



Help! uses
information about
more than 2,800
software and hardware
products to detect
problems and tell you
exactly how to fix them.

Teknosys Inc.

Help!™ is a configuration problem solving utility. With Help! installed on your Mac, you'll benefit from the knowledge of more than 2,000 Macintosh experts. That's because Help! incorporates information provided continuously by Macintosh developers, consultants, service providers, systems engineers, etc. from all over the world. With Help!, you can improve the efficiency of your Macintosh and prevent system crashes.

Help! is different from all other diagnostic tools because it uses artificial intelligence to pinpoint conflicts, incompatibilities, and other configuration problems and recommend solutions. This technical support program not only analyzes your system, but it also tells you exactly how to fix all detected problems. Help! even has a simulation feature which allows you to perform a "what if" analysis and check in advance for problems prior to making changes.

Help! detects:

- Startup document conflicts
- Software or hardware incompatibilities
- Environmental problems
- Improperly installed files
- Memory problems
- Damaged files
- Duplicate files

New! Help! Network™

If you're supporting a network of Mac users, contact us about our network version of Help! Help! Network™

To purchase, contact any mail-order house or your local dealer. For more information, call Teknosys at: **1 (800) 873-3494**

Outside the U.S.A.,
call (813) 620-3494



MacUser
★★★★★
April '92

Help!™

Every Mac User Needs It.

© Copyright 1991, 1992 Teknosys, Inc. 3923 Coconut Palm Drive, Suite 111, Laguna Hills, CA 94039. All rights reserved. The Teknosys Help! and Help! Network logos are trademarks of Teknosys, Inc. All other product names are trademarks of their respective owners.



\$58

MacInTax

Now the easiest way to do your taxes is with your computer and MacInTax. MacInTax comes with everything you need to do your taxes quickly and accurately, including over 90 forms, schedules and worksheets, complete IRS instructions, tax help in plain English, itemizations and more. Enter your data into the headstart version 10.0 now and send in the registration to ChipSoft. You'll automatically receive the final version 10.1 with IRS-approved forms in January 1993. ChipSoft #06163



VERSION UPGRADE
\$94

Lotus 1-2-3 1.1 for the Mac

This, the latest version of the industry-standard spreadsheet, has been completely redesigned and optimized for Macintosh. Now Lotus 1-2-3 is even more powerful and easy to use than ever! You'll find new innovative spreadsheet capabilities, such as in-cell editing, true 3D worksheets, 1-2-3 Classic Menu and much more. Lotus #00518 #00507 Lotus 1-2-3 1.1\$328



\$2

ACT! for the Mac

ACT! for the Mac keeps up-to-the-minute files for all your contacts—with fields that can be customized, date-stamped and a comprehensive history log. The address scheduler, with graphical day, week, month views, lets you schedule unlimited calls, meetings and to-do's. The full-featured WYSIWYG word processor with spell checker is ideal for producing professional correspondence. Contact Software #

VERSION UPGRADE
\$124

Microsoft Word 5.1

Microsoft Word provides depth of function and ease-of-use like no other word processor on the market today. The all new version 5.1 makes it even easier than ever to apply the full power of Word to the chores you do every day. Microsoft #00596 ✓
#04898 Microsoft Word 5.1\$294



Microsoft POWERPOINT
Presentation Graphics Program



VERSION UPGRADE
\$88

Microsoft Excel 4.0

The leading spreadsheet for the Macintosh just got even better. Microsoft Excel version 4.0 for the Apple Macintosh was designed with you in mind. It gives you access to more powerful features and makes everyday spreadsheet tasks easier than you ever dreamed possible. Microsoft #04545
New customizable toolbars give you instant access to the right set of tools for your work.
Autosum™ lets you automatically sum rows of numbers with a click on the toolbar.
Wizards are interactive outline tutorials that walk you through tasks, including chart creation, to give you instant access to most common options.
#00227 Excel 4.0\$294



\$114

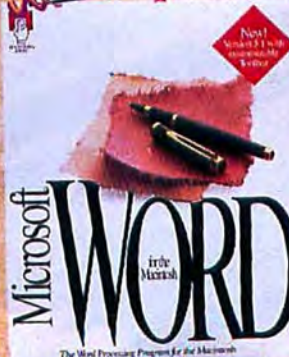
Special Features

- Scan in pictures and legal documents for a complete archive.
- Identifies confusing family relationships—like fourth cousin, twice removed.
- Create large, detailed descendant and pedigree tree charts.

Reunion

Bring your family together with Reunion genealogy software. Enter your family information and automatically create graphic tree charts, family histories, birthday calendars, mailing lists and more. Scan in pictures and legal documents for a complete archive. Reunion even identifies confusing family relationships—like fourth cousin, twice removed. Awarded 4-1/2 mice from MacUser. Macintosh Productions #05984

NEW VERSION



Special Features

- WYSIWYG outlining
- Flexible Slide Master
- Shaping Tool
- Cross-platform support
- TrueType

\$328

Microsoft PowerPoint 3.0

Now you don't have to rely on outside sources to produce slides and overheads for your presentations. Microsoft PowerPoint Macintosh allows you to make slides and overheads directly on the Mac! Microsoft #01220 ✓

NOW WE SHIP WEEKDAYS

Call for Competitive Pricing

Call Anytime 1-800-248-0800 / Fax Anytime 1-206-881-3421

The Mac Zone
Established 1986

Dependable, High Performantz Hard Drives... At Unbeatable Prices

\$488

Quality Mac Zone Performantz hard drives set the new standard for performance and value. Utilizing top-quality mechanisms from the leaders in hard drive technology—Quantum, Maxtor etc.—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. Available in a variety of popular capacities, the Performantz series offers a drive to fill every need. You will not find a better drive for the price!



#06215 Performantz 105MB Ext (shown)



New Performantz Series Hard Drives—Available Only At The Mac Zone

SyQuest \$69
44MB Removable Cartridge

With removable SyQuest cartridges your storage capacity is virtually limitless. Lifetime warranty. SyQuest #02183
#05442 SyQuest 44MB 5-Pk\$328
#05443 SyQuest 44MB 10-Pk\$649



#06221 Performantz 40MB Int .....\$258	#06220 Performantz 88MB Rem ...\$698
#06214 Performantz 42MB Ext .....\$338	#06224 Performantz 425MB Int ...\$1288
#06222 Performantz 105MB Int ....\$368	#06217 Performantz 425MB Ext ..\$1388
#06225 Performantz 80MB Ext .....\$438	#06218 Performantz 870MB Ext ..\$1788
#06215 Performantz 105MB Ext ....\$488	#06226 Mac LC/Si Int Mounting Kit .....\$15
#06219 Performantz 44MB Rem ...\$498	#06228 Mac II * it Mounting Kit ....\$20
#06223 Performantz 210MB Int ....\$598	#06229 Mac Q900/950 Int Mounting Kit .....\$29
#06216 Performantz 210MB Ext ....\$688	

Unlike many of our competitors, we carry only the ultra-fast 80ns SIMMs.

Prices may vary. Please call for latest quotes.

AS LOW AS
\$49
PER MB

FREE! SIMM Installation Guide

With our \$3 overnight delivery you can have your SIMMs and your installation kit in your hands tomorrow!

- Inexpensive, Safe & Easy
- Plug & Play Installation
- Top-Quality SIMMs
- Lifetime Guarantee



MAXIMA

FREE!

Maxima 2.0 with your 4x4MB SIMMs

\$698

4x4MB SIMMs

Purchase your 4MB SIMMs upgrade now and receive MAXIMA 2.0 FREE. MAXIMA is the unique RAM enhancement utility that creates a powerful RAM disk and gives you access to large amounts of RAM without using 32-bit addressing. Connectix #05654

#04144 Maxima 2.0\$44

	Your Mac	# of Slots	MB after Upgrade	# of Kits Needed	Kit #	Yon. Cost
Plus / SE	Plus/SE	4	2	1	05653	\$ 98
	Classic	4	4	2	05653	\$ 196
Classic with adapter	Classic	2	2	1	03824	\$ 118
	Classic II	2	4*	1	05653	\$ 98
	Classic II LC/LC II	2	6	1	05655	\$ 178
Classic II LC/LC II	Classic II	2	4	1	05653	\$ 98
	Classic II	2	6	1	05655	\$ 178
	LC/LC II	2	10	1	05656	\$ 349
SE/30	SE/30	8	8	4	05653	\$ 392
	SE/30	8	16	1	05654	\$ 698
	SE/30	8	32	2	05654	\$ 1396
Mac II, Ix	II	8	8	4	05653	\$ 392
	Ix	8	16	1	05819	\$ 698
Mac IICI/cx	IICI	8	8	4	05653	\$ 392
	IICI	8	16	1	05654	\$ 698
	IICI	8	32	2	05654	\$ 1396
	IICx	8	64	8	00848	\$ 3,648
	IICx	8	128	8	00849	\$ 5,000
Mac IISI	IISI	4	5	2	05653	\$ 196
	IISI	4	9	2	05655	\$ 356
	IISI	4	17	1	05654	\$ 698
	IISI	4	65	4	05338	\$ 3,112
Mac IIfx	IIfx	8	8	1	05659	\$ 175
	IIfx	8	20	1	05660	\$ 698
	IIfx	8	36	2	05660	\$ 1396
	IIfx	8	132	8	05129	\$ 6,224
PowerBook	PowerBook 100/140/170	1	4	1	05391	\$ 118
	PowerBook 140/170	1	6	1	05392	\$ 238
	PowerBook 140/170	1	8	1	05393	\$ 278
Quadra 700,900,950	Quadra 700	4	4	2	05653	\$ 196
	Quadra 700	4	20	1	05654	\$ 698
	Quadra 700	4	68	4	05338	\$ 3,112
	Quadra 900/950	16	8	2	05653	\$ 196
	Quadra 900/950	16	16	8	05653	\$ 784
	Quadra 900/950	16	64	8	05654	\$ 5,584
	Quadra 900/950	16	192	16	05338	\$ 12,448
	Quadra 900/950	16	192	16	05338	\$ 12,448

STORAGE MEDIA

Sony Corp. Of America	
05924 1.3GB 4mm DAI	\$14
00932 QD 2040 40 MB Tape	\$19
01158 Sony 10 Pack DS/DD	
800K Disks	\$12
02192 Sony 10 Pk DS/HD	
1.44MB Disks	\$14
00938 Sony 50 Pack DS/DD	
800K Disks	\$39
02193 Sony 50 Pk DS/HD	
1.44MB Disks	\$75

ACCESSORIES

Kensington ✓	
02979 Apple Security Kit System	\$32
04689 Basic Briefcase	\$44
00329 Compact Mac Keyboard	
Shelf	\$39
04690 Deluxe Briefcase	\$78
05896 Kensington MasterPiece	
Remote	\$114
05177 Kensington NoteBook	
KeyPad	\$98
03495 Kensington Side Clip	\$6
00330 Keyboard Slideaway	\$34
04427 LaserStand Mac	\$128
03346 Power Backer 450	\$337
03339 Power Tree 10	\$18
03342 Power Tree 20	\$27
03343 Power Tree 50	\$54
05178 PowerBacker 600	\$328
05177 PowerBook KeyPad	\$98
03350 Printer Muffler 80	\$43
04425 Printer Muffler 80 Stand	\$19
03357 Security System	
for Laserwriter II	\$32
04426 Space Saving	
Printer Stand	\$19
05175 Space Saving	
Printer Stand	\$30
02976 Tilt Swivel For SE or	
SE/30	\$21
05176 Turbo Mouse 4.0	\$106
03355 Universal Copy Stand	\$22
02977 Universal Printer Stand	\$25

BUSINESS

Ceres	
00588 Inspiration	\$158
Chena Software ✓	
00334 Fair Witness V 1.1	\$178
Contact Software	
06231 ACT! for Mac	\$254
Fisher Idea Systems, Inc.	
00897 Idea Fisher 2.0	\$378
Jian Tools ✓	
04257 Biz Plan Builder	\$84
04996 Livingtrustbuilder	\$99

Leister Productions

05984 Reunion - The Family Tree	
Software	\$114

Mainstay

01159 Mac Flow 3.7	\$214
--------------------	-------

GRAPHICS

3G Graphics

05601 Images with Impact!	
Accents & Borders 2	\$68

Adobe Systems Inc.

04983 Adobe Illustrator 3.2	
w/ ATM	\$364

04042 PhotoShop 2.0	\$548
---------------------	-------

Aldus ✓

06319 Aldus Fetch	\$189
00333 Freehand 3.1	\$393

05481 IntelliDraw	\$194
-------------------	-------

04573 Pagemaker V4.2	\$494
----------------------	-------

04190 Superpaint 3.0	\$98
----------------------	------

Caere Corporation

04173 Omnipage 3.0	\$458
05161 OmniPage Direct 1.0	\$274

01005 OmniPage Pro 2.1	\$648
------------------------	-------

Calliscope

00634 Satellite 3D	\$128
--------------------	-------

Deneba ✓

00803 Canvas 3.0	\$258
------------------	-------

Light Source

00657 Ofoto	\$279
-------------	-------

MacroMedia

03850 Filmmaker 2.0	\$478
---------------------	-------

04498 Model Shop II 1.0	\$618
-------------------------	-------

05835 Swivel 3D Pro 2.0 Upgr	
w/ Serial	\$98

03619 Swivel 3D Professional	\$434
------------------------------	-------

Strata ✓

04088 Stratavision 3D 2.5	\$628
---------------------------	-------

Type Solutions, Inc.

00490 The Incubator!	\$98
----------------------	------

Vividus ✓

05634 Cinemation	\$354
------------------	-------

EDUCATION

Broderbund

00892 Geometry	\$57
----------------	------

05479 Mac USA	\$34
---------------	------

01985 Physics	\$57
---------------	------

05638 Where in America's Past	\$36
-------------------------------	------

02749 Where in Europe is	
Carmen San Diego	\$28

02488 Where in the USA is	
Carmen San Diego	\$28

02186 Where in the World is	
Carmen San Diego	\$28

03513 Where in Time is	
Carmen San Diego	\$28

Davidson & Associates

00825 Math Blaster Plus	\$34
-------------------------	------

00225 Speed Reader	\$28
--------------------	------

04577 Spell It Plus	\$28
---------------------	------

Great Wave

00391 Numbermaze - Color	\$35
--------------------------	------

04249 Reading Maze - B/W	\$24
--------------------------	------

04248 Reading Maze - Color	\$34
----------------------------	------

Hyperplot Software Co.

03739 Hyperplot Spanish	
Tense Tutor	\$41

03744 Hyperplot French	
Tense Tutor	\$41

05440 Berlitz Think & Talk Italian	
CD-ROM	\$118

Learning Company

02593 Talking Math Rabbit	\$35
---------------------------	------

The Learning Company

01856 Reader Rabbit 1	\$35
-----------------------	------

Nordic Software

03101 MacKids Preschool Pack	\$34
------------------------------	------

01931 Turbo Math Facts	\$24
------------------------	------

03102 Word Quest	\$30
------------------	------

ENTERTAINMENT

Activision

05997 Rodney's FunScreen	\$28
--------------------------	------

01916 Sargon IV	\$27
-----------------	------

Amlex S/W Corp

00600 Tristan	\$38
---------------	------

Broderbund

06108 Arthur's Teacher Trouble	\$44
--------------------------------	------

02983 Playmaker Football Mac	\$28
------------------------------	------

05678 Playmaker Football Mac -	
Color	\$31

05649 Prince of Persia	\$31
------------------------	------

04197 The Playroom 2.0 Mac	\$28
----------------------------	------

Casady and Greene, Inc. ✓

04581 Aqua Blooper Piper	\$29
--------------------------	------

04580 Glider 4.0	\$29
------------------	------

04582 Fun Bundle	\$59
------------------	------

05047 Mission Thunderbolt	\$44
---------------------------	------

Microsoft Corporation ✓

04293 Flight Simulator 4.0 Mac	\$39
--------------------------------	------

Inline Design ✓

03599 3 In Three	\$31
------------------	------

06015 Cogito	\$38
--------------	------

03494 Darwin's Dilemma	\$31
------------------------	------

06170 S.C. OUT	\$38
----------------	------

03934 Tesserae	\$31
----------------	------

Interplay

04134 Battle Chess	\$29
--------------------	------

05537 Battle Chess - CD ROM	\$42
-----------------------------	------

06160 Omar Sharif on Bridge	\$34
-----------------------------	------

06161 Out Of This World	\$36
-------------------------	------

Spectrum Holobyte

04813 Wordtris or Tetris	\$22
--------------------------	------

UTILITIES

Alysis

00512 Super Disk I	\$49
--------------------	------

ASD Software Inc.

03286 Fileguard	\$138
-----------------	-------

Casady and Greene, Inc.

04810 Super Quick Dex	\$58
-----------------------	------

Dantz

04722 Disk Fit Pro 1.1	\$72
------------------------	------

02586 Retrospect 1.3	\$146
----------------------	-------

Fifth Generation

02194 Pyrol 4.1 for Mac	\$26
-------------------------	------

04965 Auto Doubler 2.0	\$58
------------------------	------

Inline Design

02191 INITPicker 3.0	\$46
----------------------	------

06016 Inline Sync	\$82
-------------------	------

Salient

04955 Auto Doubler	\$58
--------------------	------

03515 Disk Doubler 3.7	\$44
------------------------	------

Symantec

02071 Just Enough Pascal	\$51
--------------------------	------

04464 More 3.1	\$264
----------------	-------

04890 Norton Utilities 2.0	\$94
----------------------------	------

06166 Guy's Utilities for Mac	
PowerBook Ed	\$64

00458 Great Works V.2	\$196
-----------------------	-------

Teknosys, Inc.

00867 Help 1.04	\$88
-----------------	------

Terranetics

00863 Autoback	\$94
----------------	------

Thought I Could

04762 Wallpaper	\$36
-----------------	------

Visionary Software

04448 First Things First 3.0	\$49
------------------------------	------

03112 Synchronicity for Mac	\$34
-----------------------------	------

HARDWARE

Advanced Gravis

05999 Game Pad	\$32
----------------	------

02741 Mouse Stick ADB	\$78
-----------------------	------

05998 MouseStick II	\$58
---------------------	------

02740 Mousestick Joystick 512	
& Plus	\$58

Applied Engineering ✓

05362 TransWarp Classic 16MHz	
w/FPU	\$548

05360 TransWarp Classic 25MHz	
w/FPU	\$754

05358 TransWarp Classic 33MHz	
w/FPU	\$894

05356 TransWarp Classic 40MHz	
w/FPU	\$1098

04732 TransWarp LC 33MHz	
w/FPU	\$998

05381 TransWarp LC w/FPU	\$598
--------------------------	-------

04735 TransWarp SE 40 MHz	
w/FPU	\$1198

04325 TransWarp SE Accel 25MHz	
w/FPU	\$724

CalComp

05087 DrawingBoard II MacSerial	
w/Pressure Pen	\$438

05086 DrawingPad Mac Serial	
w/Pressure Pen	\$298

05846 MSer w/ Pressure Pen (18x24)	
Calcomp Tab	\$1505

FWB

00505 PocketHammer 50MB	\$524
-------------------------	-------

00506 PocketHammer 100MB	\$748
--------------------------	-------

04891 PocketHammer 249MB	\$1198
--------------------------	--------

04965 HammerDisk 44MB	
Syquest	\$938

04964 HammerDisk 88MB	
Syquest	\$948

Generation Systems

06286 52MB Quantum Ext	\$398
------------------------	-------

05008 105MB Quantum Ext	\$528
-------------------------	-------

05009 210MB Quantum Ext	\$868
-------------------------	-------

Mass Microsystems

00175 Datapack 45 Syquest	\$599
---------------------------	-------

04062 Datapack 88 Syquest	\$799
---------------------------	-------

05801 Floptipack Floptical	\$498
----------------------------	-------

00332 Datapack 3.5 Optical	\$1629
----------------------------	--------

Prometheus

06193 MacTurbo 14.4/9600 SR	
Fax Modem	\$349

06192 MacTurbo 96/96 SR	
Fax Modem	\$319

04416 Prometheus 2400 Mini	
Plus	\$123

03608 Prometheus9600M Plus</

The Mac Zone: Who To Call

The Mac Zone
Established 1986

Call Anytime 1-800-248-0800 / Fax Anytime 1-206-881-3421



\$348

Quicktel Xeba 14400 Send/Receive Fax Modem

Here it is: the latest in modem technology. On a speed-for-your-dollar basis, the Quicktel Xeba 14400 can't be beat. Comes with the manufacturer's lifetime warranty and connection cable. You get 14,400 send/receive fax with complete full back, V.42 bis and MNP 5 data compression with throughput to 57,000bps. Quick. Comes with connection cable and the manufacturer's lifetime warranty. Logiccode #05308



\$2284

Hammer 1000FMF

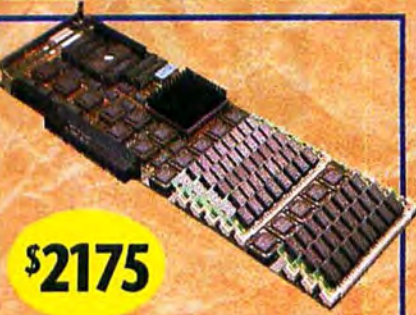
With an average seek time of just 9.5ms the handsome Hammer1000FMF (Fast Media Format) delivers incomparable capacity, performance and legendary Hammer reliability. Like all Hammer drives, the 1000FMF comes in a rugged aluminum enclosure, uses only the finest components and construction techniques available and includes an auto-switching universal power supply for plug-and-play operation anywhere in the world. FWB #05422



\$2698

SuperMatch 20-T Multimode Trinitron Display

The SuperMatch 20-T is an exceptionally versatile display for color professionals who want a desktop view that's right for every project. With easy customization controls, Trinitron technology, and exceptional color rendition, SuperMatch 20-T is right for every work environment. SuperMac #06234
#05123 SuperMatch 17" Multimode Color Monitor\$1244



\$2175

Radius Rocket 33

Blast your II, IIx, IIcx or IIfx computer into another dimension of performance with the Radius Rocket 33 accelerator. This awesome 33MHz Motorola 68040 powerhouse increases the processing speed of the original Mac II by up to eight times, making it even faster than the Quadra 700 in most cases—and it costs less than Apple's own upgrade! Radius #05250

Shift Your Productivity into High Gear with NEC



\$658

MultiSync 3FGx

Some products demand to be described in superlatives. The new FG series of MultiSync monitors from NEC fall into that category. They feature the best color accuracy in their class. Completely redesigned from the inside out, they give your Mac brighter, sharper, more accurate images. The 3FGx's flat (perfectly flat) 15" screen is packed with state-of-the-art extras like the new NEC FullScan capabilities which allow you to see up to 36% more active screen display. And it turns out the fastest refresh rate in the business which means crisper, deeper, truer colors than you've ever seen before. NEC #07144

- #07143 4FG MultiSync 15" Monitor\$778
- #00578 FG8x Interface Card\$718
- #04985 FG24x Interface Card\$1284

M95FX Printer w/ PostScript Plain Paper Fax

\$2075

Now everyone linked to the printer will also have access to fax. Sound too good to be true? Take a look.

NEC's new Silentwriter Model 95 incorporates the latest in intelligent laser printer technology—Adobe PostScript II—with the latest in high-performance fax.



On the printer side, the M95FX prints 6ppm, comes with 2MB of memory and ships with 35 scalable Adobe fonts, 14 bitmap and 8 scalable HP LaserJet fonts. It automatically reconfigures for PCs and Macs, simultaneously

handles paper and envelopes and automatically detects the source file type and sets the printer accordingly. Plus, you get all the convenience of personal fax capability. Fax an original-quality proposal to a sales rep for prompt delivery to a customer. Fax a high-quality proof to your client. Or, receive original quality reports from field offices—ready for immediate use in your executive presentation. The possibilities are endless. NEC #11660
#01032 M95 Printer\$1544
#05375 M95 Toner Cartridge\$144



Internationally Call:

Denmark

011-45-86-22-83-66
fax: 011-45-86-22-70-96



Sweden

011-46-866-50-990
fax: 011-46-866-15-070



France

011-33-1461-34-740
fax: 011-33-1479-06-903



Mexico

011-525-611-4646
fax: 011-525-611-0694



TO ORDER CALL 1-800-248-0800

NOW SHIPPING
WEEKDAYS TILL 2 PM E.T.

\$128

SNOOPER 2.0 w/ 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 virus protection FREE. Maxa Corporation #05025



\$34

Stuffit SpaceSaver

Stuffit SpaceSaver invisibly compresses your files and folders so quickly and quietly you may never notice it's there. At just about the speed of your hard disk, Stuffit SpaceSaver can compress and expand on-demand (as you specify) or automatically (while your Mac is sitting idle). Most importantly, you don't have to change the way you work on your Mac. Double-click a file in the finder. Open a document from an application. Everything works the way it usually does. But with one difference—your files take up less space! Aladdin Systems #05828



\$38

After Dark & More After Dark—Bundle

After Dark, one of the finest screen saver collections available for the Mac, comes with over 30 displays including Flying Toasters and Fish! The package also includes sound, password protection and message displays. More After Dark comes with over 25 incredible new displays for After Dark. It features context winners Mowin' Man, Tunnel, GraphStat and beautiful new Fish! Crazy Kittens and Lunatic Fringe game modules (requires After Dark). Berkeley Systems #04046 ✓
#04053 More After Dark Vol.1\$23



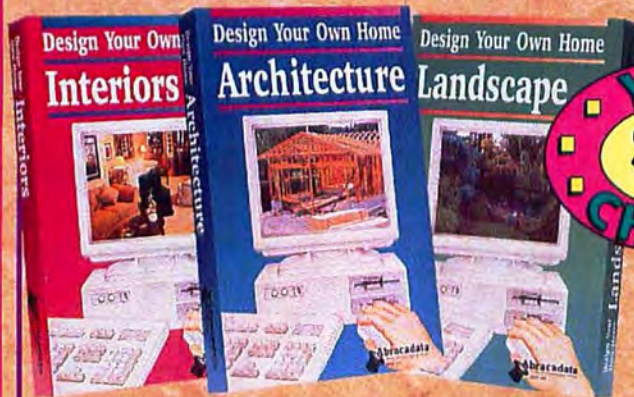
\$94

DateBook/ TouchBASE—Bundle

Keep track of your life and the people in it with DateBook, the Macintosh personal organizer that enables you to enter and keep track of appointments, schedules and things-to-do. TouchBASE is a database which keeps track of personal and business contacts. It remains handy all the time—no matter what application you're using. After Hours Software #06167
#05209 DateBook v 1.5 ✓✓ \$78 • #03908 TouchBASE ✓✓ \$78



Design It Yourself with Abracadata...And Save!



**YOUR
\$59
CHOICE**

Design Your Own Home:

Interiors

Interiors makes it easy to plan the decor of your home or office. Use the drawing tools and supplied patterns to bring your interiors to life! View the room from the top or from four different automatic side-view perspectives. Abracadata #03611 ✓✓

Landscape

Landscape gives you a variety of drawing tools and patterns to help you plan. Use the built-in object library or draw your own trees, shrubs, etc. then automatically see your design from four different side-view perspectives. Prints plans and plant shopping lists. Abracadata #03610 ✓✓

Architecture

With Architecture you'll draw your own floor plans, side view building plans and design structural details. The program has a unique stud repeater tool which speeds drawing and aids in lumber estimates. The overlay feature allows layering of details such as electrical or plumbing schematics and multiple floors. Abracadata #03609 ✓✓

\$42

Sprout!

Sprout! is a complete computer planning tool for vegetable gardeners. With it you can easily produce a graphic, scalable garden plan with correct plant and row spacing. In addition, Sprout! contains a fully editable database of vegetables for 7 climate regions. Print out garden layouts, calendars, shopping lists and reports. Abracadata #05085 ✓✓ ✓✓



\$26

Mighty Draw

Mighty Draw is the affordable, general-purpose, object-oriented drawing program that allows you to create pie charts, column charts, bar charts, flow charts, organizational charts, graphs, electronic schematics, network diagrams, fliers, news letters, greeting cards, advertisements, logos, clip art and much more. Mighty Draw comes with symbols for flow charts, electrical schematics and more. You can even add symbols from other programs. Abracadata #06162 ✓✓



Here! Call Us—We Can Help

☎ Call Anytime 1-800-248-0800 / Fax Anytime 1-206-881-3421

The Mac Zone™
Established 1986

ORDER THROUGH COMPUSEVE: TYPE GO MZ



\$95

Morph

The hottest movie image effect of the '90s is now available on the Mac! Morph smoothly transforms one image into another, creating dazzling images and effects. Whether it's last year's car model turning into this year's, or a docile kitten transforming into a ferocious tiger, this effect has astounded audiences all over the world. Morph is fast, easy-to-use, and fully compatible with QuickTime. Gryphon #05925



\$194

Aldus IntelliDraw

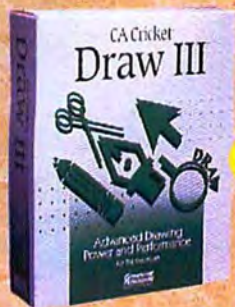
New from Aldus, IntelliDraw is an exciting new type of drawing program that gives you an easy new way to visually experiment, refine and draw your ideas. Full text and drawing options provide the flexibility you need. Aldus #05481 ✓



\$189

Aldus Fetch

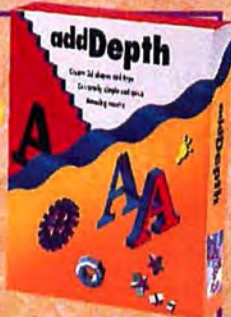
Keep all your production media (clip art, photo images, QuickTime movies and more) organized and instantly accessible! Aldus Fetch is a multiuser, mixed-media cataloging, browsing and retrieval tool designed for the professional production environment. Fetch makes browsing, finding and retrieving files fast, easy and efficient. Aldus #06319 ✓



\$188

CA-Cricket Draw III 1.1

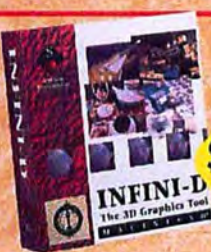
CA-Cricket Draw is a fully-featured drawing program for producing professional-quality graphics on the Mac. It features high-end drawing power with its Bezier-based tool palette, flexible color interface and more. Computer Associates #04414 ✓



\$128

addDepth

Create attention-grabbing effects including type and illustrations with addDepth. It's compatible with your drawing software and it's fast and easy. Enter text or objects directly or import PostScript-compatible clip art or drawings created in drawing software such as Adobe Illustrator or Aldus FreeHand. Next, add depth and perspective automatically with addDepth's virtual trackball and perspective tool. Print from addDepth or export fully editable line art back into your Macintosh document. Ray Dream, Inc. #05965



\$698

Infini-D 3D Modeler/Animator/Renderer

Communicate and sell your ideas with stunning 3D graphics and animations—at a cost that will keep you ahead of the competition. Infini-D is a fully-integrated 3D modeling, rendering and animation package for the Macintosh which allows you to generate photo-realistic images and animations with the easy-to-use interface you've come to expect from your Mac. Specular International #00815 ✓

Discover Affordable, Quality Scanning With Microtek

\$934

ScanMaker II

Looking for an affordable, easy way to bring high quality graphic images into your Macintosh? You need the ScanMaker II scanner from Microtek. It gives your publications the attention-grabbing power that a crisp color or black-and-white graphic can provide. It's the perfect desktop scanner for both the casual business user and the accomplished graphic arts professional. And it's available at a price that rivals today's leading gray-scale-only scanners. Microtek #06251



\$1214

ScanMaker IIXE

Try the ScanMaker IIXE and you'll see why Microtek scanners are some of the most popular color flatbed scanners in the world. And the latest, the ScanMaker IIXE, offers an incredible hardware and software value. It comes with everything you need to scan, edit, enhance and print great-looking color images—all at an unbeatable price. From start to finish, the choice of a growing number of graphics artists and desktop publishers is the ScanMaker IIXE. Microtek #06252

NOW SHIPPING
WEEKDAYS TILL 2 PM E.T.

The Mac Zone
Established 1986

The Road to the Top

☎ Call 1-800-248-0800 / Now Shipping Weekdays Until 2am E.T.

Write More Effectively Right Now with WriteNow!

WriteNow Workshop Upgrade

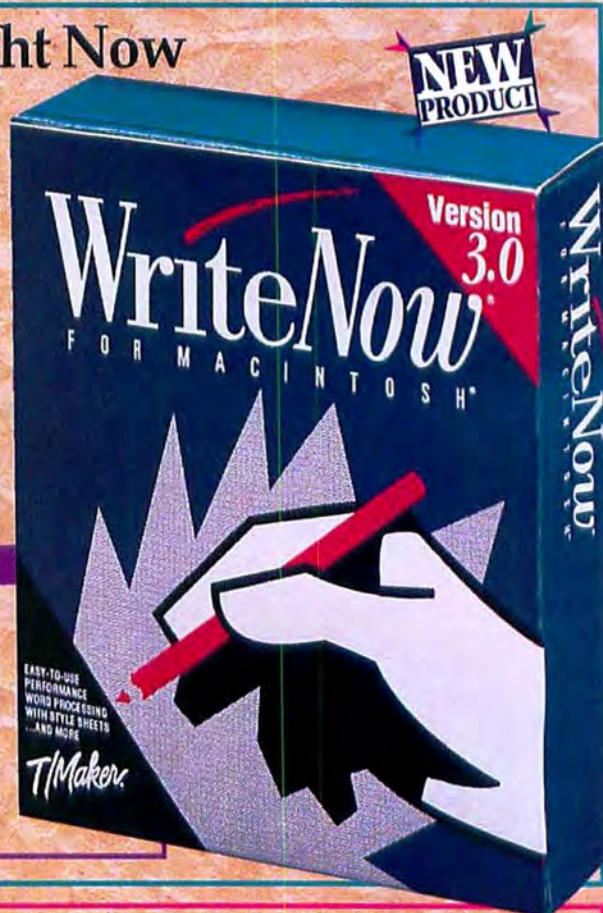
Upgrade from an earlier version of WriteNow and you'll get the all new WriteNow 3.0, plus a copy of Grammatik Mac 2.0, American Heritage Dictionary and Correct Quotes for FREE! A two-time winner of MacUser's Best New Word Processor Award, WriteNow includes a lightning-fast 135,000-word spelling checker, a complete thesaurus DA, the most powerful paragraph and character style sheets of any Mac word processor, a robust print preview, System 7 compatibility and a lot more! Completely compatible with Microsoft Word, Works, MacWrite II, PC WordPerfect and other popular formats. T/Maker #06273 ✓

**VERSION
UPGRADE**
\$96

#06274 Write Now Workshop \$148

Go with Award-Winning WriteNow Software

- Awarded four stars by Macworld, 1992 (version 3.0)
- Editors' Choice Award, Macworld, 1992 (version 3.0)
- "Very Good Overall Value" (second highest), MacWEEK, June, 1992 (version 3.0)
- Highest rating for Ease of Use, Speed, Value and Documentation, Government Computer News
- Highest overall rating, Software Digest, 1990
- Editors' Choice Award, Computer Reseller News, 1990
- Editors' Choice Award, Best New Word Processor, MacUser, 1989



#05703 MF2DD Fuji DS/DD Formatted 800K 10Pk \$9
#05707 MF2HD Fuji DS/DD Formatted 1.4Mb 100Pk \$58



Fuji Floppy Disks: Formatted

Why buy Fuji Disks? Reason #27: Double-Rib Liner Support. Improved contact between the magnetic surface and the liner is achieved by the addition of a second rib to the previous single rib-support system. This provides a more effective, long-term cleaning action. Buy preformatted disks, and save time!

Fuji Floppy Disks: Unformatted

#05704 MF2DD Fuji DS/DD Unformatted 800K 10Pk \$9
#05709 MF2HD Fuji DS/DD Unformatted 1.4MB 10Pk \$13
#05706 MF2DD Fuji DS/DD Unformatted 800K 10Pk Colored Plastic \$9
#05710 MF2HD Fuji DS/DD Unformatted 1.4MB 10Pk Colored Plastic \$15

Call The Mac Zone for All Your Cable Needs: 1-800-248-0800

What's in a cable?

The quality of your cables and connectors is important. Computer components emit strong electromagnetic emissions. Improperly shielded, inferior cables can and do pick up this interference. In short, poor-quality cables cause trouble. Who needs it! Our top-quality cables give you the performance you demand, at a price that's affordable!

SKU	Description	Length	Compatibility	Price \$
05761	DIN 8 M/M	10Ft	Mac+/SE/II to Hayes-compatible modem	11
05762	DB 9/DB 25	6Ft	Apple 128/512/512E to Hayes compatible modem	11
05763	DB 9 male/DIN 8female	1Ft	Apple 128/512/512E adaptor cable	15
05764	Mini DIN 8/DB 25	6Ft	Mac+/SE/II to Imagewriter I printer cable	15
05765	Mini DIN 8/mini DIN 8	6Ft	Mac+/SE/II to Imagewriter II/LQ (letter quality) AP modem	15
05766	Mini DIN 8/mini DIN 8	10Ft	Mac+/SE/II to Imagewriter II printer cable	11
05767	Mini DIN 8/DB 25	6Ft	Mac+/SE/II to Hayes-compatible modem	15
05768	Mini DIN 8/DB 25	10Ft	Mac+/SE/II to Hayes-compatible modem	15
05769	DB 25/Centronics 50	2Ft	Mac+/SE/II SCSI system cable	19
05770	2:1 mini DIN 8 switch box		Peripheral sharing device 2 to 1 switch box	29
05771	4:1 mini DIN 8 switch box		Peripheral sharing device 4 to 1 switch box	35
05772	Centronics 50 M/M	2Ft	SCSI daisychain cable	19
05773	Centronics 50 M/M	6Ft	SCSI daisychain cable	25
05774	Centronics 50 M/ F	6Ft	SCSI extension cable	25

CODE #30202

Circle 70 on reader service card

**NOW SHIPPING
WEEKDAYS TILL 2 PM E.T.**

Leads Through The Mac Zone

Call Anytime 1-800-248-0800 / Fax Anytime 1-206-881-3421

The Mac
Zone
Established 1986

Rhino Carrying Bags

Nothing protects your computer like a quality Rhino carrying case. Rhino's unique, cushioned, thermoplastic barrier with its double wall, honeycomb design, elastically disperses any shock. Covered by the manufacturer's 1-year limited warranty. Color: black. Innovative Manufacturing



- #05906 Universal PowerBook, Expandable: 17"x14"x14" Plus 17"x14"x14" ...\$78
- #05907 PowerBook/Fax Case: 13.25"x2.5"x13.25"\$44
- #05910 Best PowerBook Case: 15"x2.5"x10.25"\$38
- #05908 PowerBk/Fax Case, Expdble: 13.25"x2.5"x13.25 Plus 13.25"x2.5"x13.25"\$54
- #05909 PowerBook/Fax Case, Leather: 13.75"x2.5"x13.75"\$128
- #05911 Best PowerBook Case, Leather: 15"x2.5"x10.75"\$124

Crunch Numbers on the Road with Kensington

\$98

Kensington NoteBook KeyPad

The Kensington NoteBook KeyPad gives you the flexibility and features of a full keyboard when you use your Macintosh PowerBook. Its compact, sleek design is perfect for travel with your PowerBook or any other ADB device. This module gives you function and arrow key control, as well as the standard mathematical and number keys found on an extended keyboard. Kensington #05177



External Full-Cycle Battery Charger for PowerBooks 140/180

\$138



The Applied Engineering External Full-Cycle Charger not only charges the PowerBook 140/180 ni-cad battery but optimizes full performance and long life by giving you the option to discharge the battery completely before the charging cycle begins.

Applied Engineering #05354

#05352 Auto Adapter All Powerbook\$68

PowerModem 24/96 SR Internal

\$159

Make your Mac work harder for you with the unbelievably affordable PSI PowerModem. The PowerModem is not only an internal send/receive fax modem, it's also a 2400bps Hayes-compatible data modem. The Fax is Group III compatible, sends at a full 9600bps and receives transmissions at 4800bps. PowerModem will dramatically improve your PowerBook's performance—while PowerModem performs in the background, you can continue to work! PSI #04948

#05965 PSI PowerModem II 96/24 SR V.42bis MNP10\$249

#05694 PSI PowerMocem IV 14.4/14.4 SR V.32bis MNP10\$448



Synchronize Your PowerBook and Desktop Mac Automatically

\$86

With so many features and so much control, PowerMerge provides unbeatable file synchronization.

PowerMerge

Keep the files on your desktop Mac in sync with those on your PowerBook with PowerMerge. It identifies which computer has the most recent version of each file, updates the older versions with the newer ones and adds any new files and folders that have been created. Just select which files, folders or disks you want to update (or ignore), and PowerMerge does the updating for you automatically! It's fully System 6 and 7 compatible. Synchronizes any two Macs by direct link, network access or removable media. #05690



Precise

PowerMerge gives you precise control over which files and folders will be maintained. It alerts you if files have changed on both computers since the previous update so you can decide which is the correct version to save.

Secure

PowerMerge gives you the option to preview the updating process before it begins, so you remain in control. The program also warns you if a file of the same name has been created on both Macs and it gives you the option to change one of the file names.

Traceable

PowerMerge creates a history log of each update session to help you track which files or folders were updated, which direction each file was moved and which new files or folders have been created.



NOW SHIPPING
WEEKDAYS TILL 2 PM E.T.

WE SHIP WORLDWIDE: 1-206-883-3088

Newton Rising

BY STEVEN LEVY

THE NEWTON SLIDE SHOWS have been humming for almost a year now. The magazine covers—*Newsweek*, *Byte*, and yes, *Macworld*—have all been printed. The term PDA—short for personal digital assistant—has wedged its way into our vocabularies. Thanks to Apple's early disclosure, we all know that Newton is Apple's bold new venture into Jetson-tech, where portable smart devices will perform routine chores for us.

Newton definitely fires the imagination. But without a real product to ground our preconceptions, it's difficult to nail down what Newton really is. Apple only confuses things by attempting to explain what Newton is not. *Newton is not a product*, we are told. *Newton is not a product line*. Uh, come again? *Newton is a set of software and hardware technologies that enable multiple product lines*. Oh.

You know those comedians like Jerry Seinfeld who always say, "Ever have the problem where . . ." and then describe a mundane dilemma you perpetually suffer but never really think about? Well, Newton is sort of a Seinfeld machine. For every stupid problem you have in capturing, organizing, and communicating your routine information transactions, a Newton device will solve your problem. If Apple has its way, Newton will put a thousand stand-up comics on the breadline.

But, as far as I can make out, none of those devices alone will be Newton. Newton will reside in a collection of common behaviors. These include the ability to recognize and digitize scrawled input and sketches, the intelligence to decipher and execute complex requests based on simple (or even implied) commands, and the vivaciousness to communicate with other Newton devices and the world at large. The interface, a button-laden, HyperCard-like system, will be consistent and transparent, whether the device is a personal organizer that performs the duty of a private secretary; a smart telephone that automatically orders a pepperoni pizza and pays for it at the touch of a button; or a student's desk mate that reads a teacher's notes from a Newton chalkboard and inputs answers to a surprise quiz.

Will Apple manufacture these prod-

ucts? Not necessarily. The first product, for instance, presumably the ultimate electronic Filofax, will be manufactured by Sharp. (Originally Apple said the product would be shipping just about now. The date is now "late 1993.") Apple has recruited other strategic partners, drawing on their expertise in communications and consumer electronics. The idea is to increase Apple's ability to put its stamp on what it calls "revolutionary, mobile products." The ultimate prize is leadership in a new industry that promises to become bigger than the personal computer industry itself.

This much has been discussed ad infinitum by horizon-scanners and infopundits. But when I finally got around to attending a Newton briefing myself, a dog-and-pony show run by Newton's product marketing manager, Michael Tchao, I sensed a story not told. The videos showed us that Newton was real—we listened to executives from strategic allies like Pac Bell and Random House, and learned how common folk would use Newtons as smart assistants. But when it came to product, all we were shown was a sleek-looking hunk of plastic with no circuitry or software. (This was the cover model for all those magazines.) Then we were warned against making the assumption that the first Newton product would look like this—it might, or it might not.

How did this happen? Why is Apple going so far out on a limb? The reasons have as much to do with Apple as with the bold new technology itself.

Big Newton

THOUGH NEWTON IS NOT A product, exactly, it began as an attempt to design one. In 1988 Jean-Louis Gassée began a project he hoped would yield the ultimate in mobile computers—something in the spirit of Alan Kay's Dynabook, John Sculley's Knowledge Navigator, and Captain Kirk's personal navigator. (Running the project for Gassée was his lieutenant, Steve Sakoman.) "The charter was to go out and make the next great information device," says Michael

Tchao. "It would be the anything-you-wanted-to-carry-around computer," adds Steve Capps, a key engineer on the project.

Capps, known to Mac-trivia buffs as one of the architects of the original Finder, had been cajoled to join the team a few months after its formation. Already on board were the likes of original Mac team member Jerome Kunen and Macintosh II software wizard Ernie Beernink. The hardware guy was Mike Culvert, a prodigy—"stolen out of the cradle," says Capps. They set about to design a silicon movable feast—a fire-breathing slab about the size of an issue of *Vogue*, with a screen the size of the original Mac. There would be a stylus to input text, and the machine would be capable of recognizing handwriting. There would be the ability to communicate without wires. There would be two microprocessors, and it would run faster than a Quadra.

From the start, it was a pet project. "We've always been given a blank check to be separate," says Capps, who had been through something similar when working on the original Mac project. But he didn't want a repeat of the pressures of that experience. "With Macintosh, Apple was betting the company—it was, 'If you don't pull it off, we die,'" he explains. With Newton, "I always said 'Just make sure it's not a bet-your-company proposition.' Apple has its desktop business, so it's not like we won't be here [if Newton fails]. We have that freedom."

But freedom unchecked leads to messiness. As the proposed computer took on more features, it became so powerful, in fact, that some on the team began to think they were hatching a costly monster.

The engineers begged Apple to assign a marketing person to the team. Though on the face of it this seems strange—why would wireheads want a bottom-line type around?—it makes sense. A smart marketing person, with an awareness of what people fantasize about and what they're willing to pay for, could help focus the product. There was plenty of informa-

continues

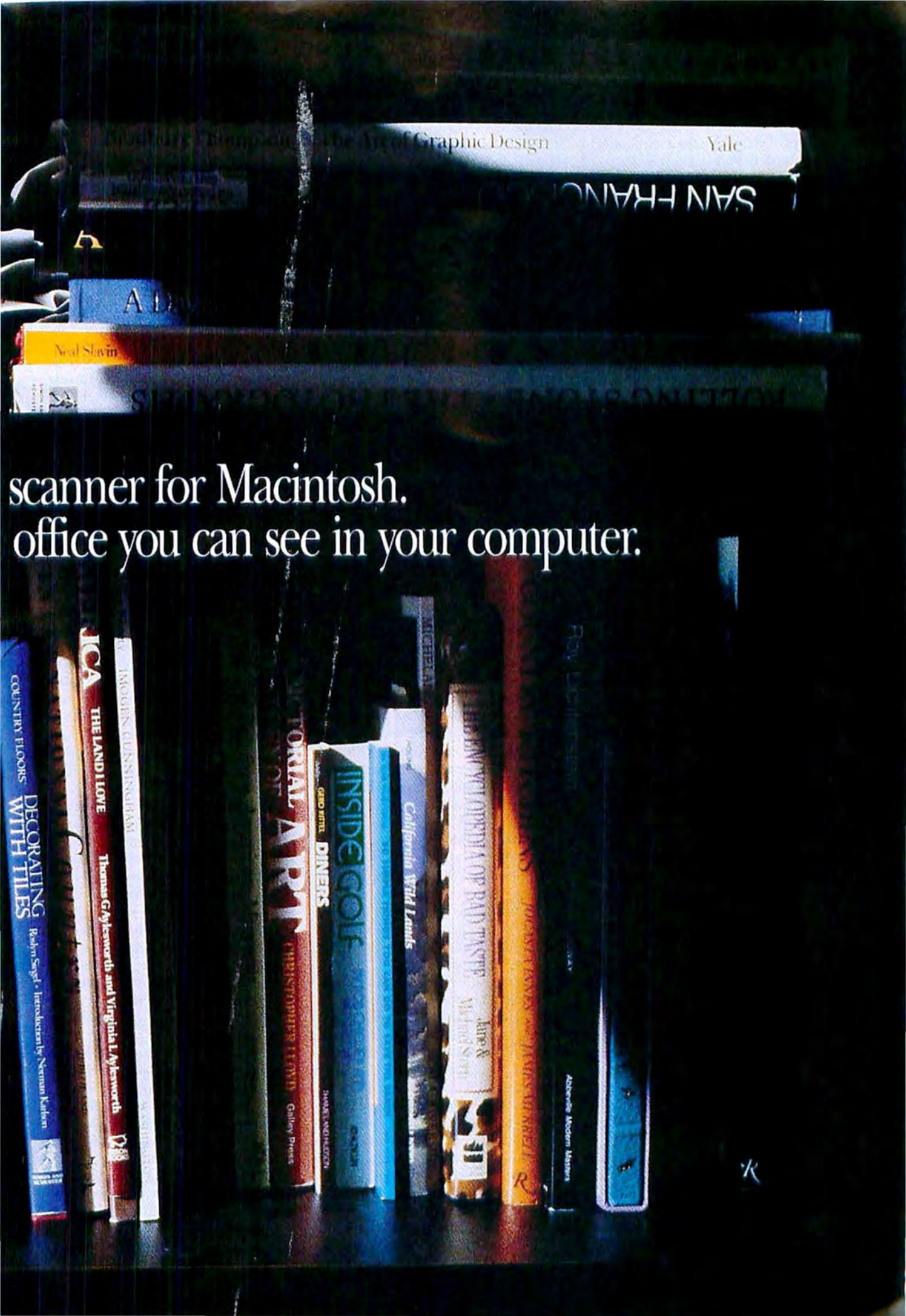


*How
a "little back"
became the
key to Apple's
future*



Epson now makes the
Suddenly everything you see in your





scanner for Macintosh.
office you can see in your computer.

tion to sift through—Apple had done zillions of user studies about the way people handle information. There were analyses of everything from telephones to chalkboards to Post-it notes. At one point Apple even had an anthropologist trailing knowledge workers, jotting down how they integrated stray bits of data into their daily lives. Still, engineers being engineers, the driving impulse on the project seemed to be Go Bonkers.

The Little Hack That Could

THE TURNING POINT CAME IN 1990, when multiple events conspired to irrevocably set the course of Newton. Gassée, whose technology-as-sex-object mentality had encouraged the engineers to keep raising the processing ante, had left Apple, and Sakoman went with him. Michael Tchao arrived to be the marketing person. John Sculley put the project under the control of Apple vice president Larry Tesler, a heavy hitter on the executive team. The new regime agreed that the project was too big, and the engineers began scaling down to something that might cost half as much.

But Capps and Tchao realized that the very concept of Newton was still off. The problem was that they were building a *computer*. "As a computer designer you know all about computers, and you look at all sorts of tasks, thinking, This has to be *better* than the best computers," explains Tchao. But if Newton's charter was to deliver smart information-processing on the run, it was wretched excess to compete with desktop machines in word processing and accounting. "You can't do it!" says Capps. "You can't run Excel 9.0!"

Tchao suggested that they focus on what they *could* do. Capps had the answer: "What is Apple good at? Making sexy user interfaces!" That sparked the idea to make a software core the essence of Newton. This required a major break in procedure. Newton could not be a Macintosh. It had to live in another realm. "Can you imagine if you came out and said, 'This is a Macintosh computer and it doesn't do windows?'" asks Capps. Instead, the new system, which Capps called "a little hack," would take a little bit of Mac and put it in a hand-held device. It would be an omnivore, scooping up the best artifacts of familiar information processing—faxes, phones, Post-it notes, paging systems, TV remotes—and integrating the whole mess into a single elegant system.

This downscaling was in a weird sense an expansion of the project. Though the device itself could be small, there could be any number of them, dedicated to different tasks. That thing called Newton would rest in the architecture, the recog-

nition, the intelligence, an ensemble that would be the constant in all the products. Like the Mac Operating System, this trinity would be the personality behind all Newton devices—the collective soul of an entire population of new machines. Hard to describe? Maybe. But easy to use. And useful. This new view of Newton, "the little hack," prevailed. Newton is now a juggernaut, an entire division of Apple. "It's still a hack," insists Capps, "but Apple can't do anything small."

When you think about it, the Newton venture is a stunning departure for Apple. "It's a new category, between the personal computer and the consumer electronics world," says Tchao. At the center of Newton devices will be Apple software, handling core tasks such as recognizing handwriting, translating vague natural-language commands into concrete instructions, and making educated guesses as to what users are asking for. But Apple won't be making all the hardware; this will generally be done by selected partners such as Sharp, phone companies, and toymakers.

"It's really a partnership; [Apple] can't do it alone," explains Susan Schuman, manager of Newton's communications products. "You can't say the intelligence rests in the device, the network, or the information—it's a different business for everybody." The killer apps that drive Newton will not be tools like spreadsheets or word processors, but customized data—content—fed into one's Newton device by credit card-size data disks or wireless communication channels. The applications could be things like phone books or travel guides.

The Bottom Line

WHICH BRINGS US TO THE *WHY* PART of the equation. Why would Apple devote so many resources to an alien business? The answer lies in the fact that the computing world, particularly Apple, has changed drastically since 1987, when the Newton group was originally formed. The writing is on the wall, and the medium is liquid crystal: the desktop Macintosh has peaked. Apple's recent impressive revenue gains are the result of monster sales of PowerBooks. Besides, the popularity of Microsoft Windows has helped assure that all desktop computers essentially work the same; the fact that Macintosh does it more elegantly is small consolation. And since Apple is betting that the desktop computer of the future will be the PowerPC—developed jointly with former blood rival IBM—it is assured that Apple computers in the future will look no different from anyone else's.

This puts Apple in a strange position.

The company mission is to produce distinctive products that, to quote Gassée, "smell like infinity." Five years from now, all desktop computers will be commodities, and they'll smell like manual typewriters rescued from a pawnshop shelf. In order to recapture Gassée's cosmological fragrance, Apple has to focus on a new area, big-time, and design excitement into it. Thus Newton is Apple's attempt to do with the operating system of mobile computers what it did with the operating system of desktop computers—develop the technology of tomorrow and convince people that it's the technology for today.

This is why, when Capps and Tchao proposed Newton's fateful downsizing, Apple seized the moment—even if it meant dramatically changing the way it did business. This is why the project, without a product to sell or even preview, was announced last year with such fanfare. The Macintosh, as much as we love it, is yesterday's news. Newton is tomorrow.

There are plenty of obstacles in Newton's path. Apple isn't the only one to realize that the company that lays the rails for a mobile computing architecture gets to claim the whole train set—this is the dream of a whole range of pen-based start-ups. And you can't say the word *standard* on planet Earth without raising the attention of Bill Gates and company—Microsoft has recently announced plans for its own Newton-like operating system.

It's far from assured that the development of new communications technologies will be rapid and organized, particularly in the wireless realm so essential to the fulfillment of the Newton vision.

And then there's the danger that the first Newton device, by freezing Apple's broad imaginative vision into a first-generation product, is bound to disappoint—especially since Newton doesn't get really interesting until many Newtons exist to talk to each other. "We're very concerned about that," admits Michael Tchao. "A single walkie-talkie is a lonely place, so we intend to make it valuable right out of the box." Even if Newton doesn't take off, Tchao says, "Apple can afford to be patient" and wait until other Newton devices come online.

Patience may be required, but the pressure for Newton to succeed is beginning to build already. I predict crescendo levels. Apple may not be betting the company here—but enough of its chips are on the table to identify Newton as its heftiest bet since Macintosh.

It's a heavy load for "a little hack" to bear. But Newton is one heavy hack. **m**

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



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, so you don't have to retype documents. 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 for more information. Just don't be surprised if you end up with a scanner.

EPSON®



Desktops



Scanners



Dot Matrix



Lavers



Notebooks

Every Mac Deserves Big Color

When it comes to big-screen color, your LC, SE/30 and Performa™ 400 now have the same potential as a Mac® II or Performa 600. The new Lapis™ ProColorServer™ display cards bring full color capability to every color-capable Mac. That means really big screens – up to two full pages. And as many colors as you want – 16,777,216 to be exact.

Now you can add 24-bit color to your LC. Expand your SE/30 with a 21-inch color display. Bring out the colorful best in your Mac II or Performa 600.

Lapis has a full range of display products that improve the look and productivity of all types of Macintosh® computers, from the Plus to the Quadra™. With the highest reliability and best prices in the industry.

Call **1-800-43-LAPIS** today to find out more about ProColorServer display cards. **Your Mac deserves it.**



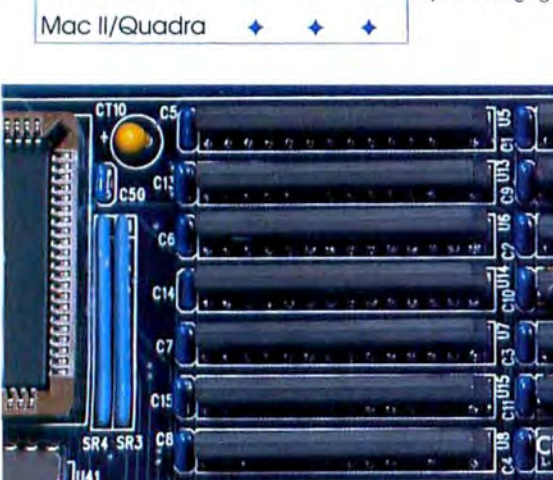
SEE US AT MACWORLD EXPO BOOTH # 548

Lapis Technologies, Inc.
1100 Marina Village Parkway
Blandmead, California 94501
(510) 740-1600 • FAX (510) 740-1645

8-bit
(256 colors)
16-bit
(65,536 colors)
24-bit
(16,777,216 colors)

LC & LC II	◆	◆	◆
SE/30	◆	◆	◆
Performa 400	◆	◆	◆
Performa 600	◆	◆	◆
Mac II/Quadra	◆	◆	◆

ProColorServer display cards are available in 8-bit, 16-bit, and 24-bit versions, and support monitors from 13" to 21", with resolutions ranging from 640 x 480 to 1152 x 872. Lapis also offers a full line of DisplayServer™ and PowerBase™ monochrome display adapters for all Mac systems ranging from the Plus to the Quadra.



Circle 258 on reader service card

Tips for Healthier Computing

BY DEBORAH BRANSCUM

FIRST, THE BAD NEWS. THE number of workplace injuries associated with working on computers continues to rise. Moreover, several recent studies suggest there's reason to be concerned about the possible health effects of exposure to extremely-low-frequency (ELF) electromagnetic fields (EMF). The good news is that the risk of keyboard-related injuries can be minimized by taking frequent breaks from typing and following other simple guidelines. And there's no need to panic over sitting in front of a monitor—any health risk from ELF emissions is quite small and can be lowered further by sitting at arm's length from your computer.

Workplace Injuries

CUMULATIVE TRAUMA DISORDERS (CTDs), also called repetitive strain injuries, are the most clear and present health threat to computer users. These injuries of the hands, wrists, arms, shoulders, and neck—associated with repetition, force, and awkward posture—afflict a growing number of office workers. (Some researchers believe CTDs are related to job dissatisfaction and work load as well.) And CTDs are not limited to white-collar workers—they've existed among factory workers, musicians, and athletes for years.

Last fall the National Institute of Occupational Safety and Health (NIOSH) announced the results of a two-year survey of nearly 1000 employees at the *Los Angeles Times*. NIOSH medical officer Dr. Bruce Bernard said that about 40 percent of the employees reported pain while typing; a subsequent one-day medical examination found evidence of injuries in more than half those cases. And like several earlier studies, this survey found that the more time employees used a keyboard, the greater the risk of injury.

"A lot of our recommendations try to deal with work-rest cycles," says Bernard. "There have been some studies that show people won't take breaks and will only get up when they start to feel bad. That's too late." The *Los Angeles Times* has instituted an electronic message system to remind people to take breaks. Most experts I've spoken to recommend breaking each hour or two of typing with a 15-minute period

of different activity, but even brief breaks are a good idea, says Bernard.

"Get up from the computer on a regular basis and do something else. If you need to, put a timer on your computer to do that," says Dr. David Rempel, an assistant professor of medicine at the University of California, San Francisco. Another expert, Dr. Barbara Silverstein, told the *New York Times* that a national commission in Japan limits the time workers can spend at keyboards and has set mandatory rest periods, resulting in fewer injuries. Taking rest breaks, in other words, is the single most important thing computer users can do to stay healthy.

How you work is just as important as what you work with. "I try to make the point that ergonomics is not just the keyboard you buy but also how you use it," says Dr. Thomas Armstrong, an ergonomics specialist at the University of Michigan at Ann Arbor. In addition to breaks, here are some other common-sense precautions.

- Keep your keyboard low and your wrists in a neutral position, parallel to the floor, as you type.
- The top of the display should be at eye level. (If the display is too low, just pop a book or two under it.)
- Adjust your chair, if possible, to fit your height, so that your feet are flat on the floor. (If your chair is too tall and can't be adjusted, try resting your feet on a phone book.)
- At least one study suggests full-back support is helpful for keyboarding, along with an erect sitting posture. So sit up straight, for more comfortable computing.

No Magic Solution

"THERE'S THIS GROPING FOR a magic answer," says Rempel, alluding to the slew of so-called ergonomic products on the market and in development. The problem is that there is no magic solution for preventing CTDs, although plenty of companies claim to market ergonomic products that prevent injuries. And more products are on the way. "I get two calls a day from

companies that would like me to look at a product and give it my blessing or give it an endorsement," says Rempel, who has nixed product endorsements to date. His advice? "Buyer beware."

Most of this stuff simply hasn't been tested sufficiently to know if it works. Because CTDs involve many factors, simply changing one aspect of a chair or mouse or keyboard or display may not solve a given problem, and could cause others. Of course, innovative products do exist to make computing more comfortable, and users deserve many more choices when it comes to keyboards and other computer devices (see *Conspicuous Consumer*, August 1991). Just remember that comfort is highly subjective; don't buy an expensive "ergonomic" device without a money-back guarantee.

Lawsuit City

AT LEAST 19 PRODUCT-LIABILITY LAWSUITS have been filed nationwide by users who claim they were injured by working on their computers. Apple is named in at least one suit, and IBM in at least two. (The rest of the suits are directed at computer workstation manufacturers such as Atex, Wang, and Computer Consoles.) Apple denies any liability and is vigorously defending itself against the \$1.2 million suit, according to company spokeswoman Marianne Lettieri. But clearly Apple is concerned about the issue and it shows in the company's recent products. Power-

Books, for example, have a built-in wrist rest to help users maintain a neutral wrist position as they type.

Apple has also lobbied for additional federal research on CTDs and is supporting independent research with its own cold cash. Dr. Rempel directs an ergonomics lab at UCSF and is testing keyboard concepts with funding from Apple and other companies. Apple, along with Compaq and IBM, also founded the VDT Health Foundation, which is funding the Center for VDT and Health Research at Johns Hopkins University, an independent center headed by Dr.

continues



*Sit
back from your
computer—
and take plenty
of breaks*

Ronald Gray and founded last fall to research both the ergonomics of computer use and the electromagnetic fields faced by computer users. One of the center's primary goals is expected to be supporting research on workplace measurements of EMF.

Magnetic Fields and Miscarriage

WHEN IT COMES TO ELECTROMAGNETIC fields, "we're dealing with a situation that is still unclear, in my view," says Gray. "I think that what we need is first to step back and review what we've learned; identify what might be the problems, particularly in measurement; and then decide if we can resolve some of the outside concerns. I think it is worth doing because VDT use is just becoming a part of all our lives."

Two and a half years after *Macworld's* July 1990 cover story on extremely-low-frequency EMFs and computer monitors, there's still no scientific consensus that these fields present a health risk. Some scientists dismiss the issue entirely. But the results of several recent Scandinavian studies imply that minimizing your exposure to these fields may be a good idea.

Early last year a team of Finnish scientists announced the results of a little-publicized study that measured the ELF

magnetic fields faced by a group of pregnant workers. Dr. Maila Hietanen of the Helsinki Institute of Occupational Health found no correlation between miscarriage and the number of hours a woman worked in front of a video display terminal (VDT). She and her colleague did find a relationship between ELF and very-low-frequency magnetic fields and miscarriages, however. According to a report in the March/April 1992 issue of *VDT News*, "VDT operators who were exposed to extremely low frequency magnetic fields of greater than 9mG [milligauss] had a miscarriage risk close to three-and-a-half times greater than those who used VDTs with ELF exposures of less than 4mG. . . . Women exposed to 4-9mG ELF magnetic fields had nearly twice as many miscarriages as those exposed to less than 4mG." Hietanen's study compared 191 clerical workers who suffered miscarriages with 394 clerical workers who gave live birth between 1975 and 1985. Both Hietanen and her partner, Dr. Marja-Liisa Lindbohm, stress the need for their results to be confirmed. In the meantime, should a pregnant woman who uses a computer take any special precautions? Many studies have failed to turn up an association between working on computers and miscarriages, although plenty of stud-

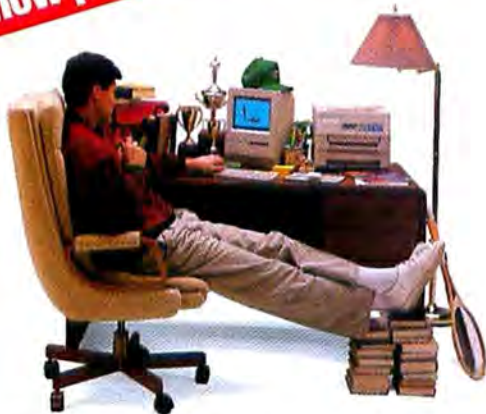
ies link stress with health problems. So the most important precaution is not to get stressed out over using computers—there's simply no confirmed evidence that a problem exists.

That said, *VDT News* quotes Dr. Hietanen suggesting that those women who are concerned about electromagnetic fields buy a monitor that meets the Swedish MPR-II guidelines (liquid crystal displays are another option). Her partner, Lindbohm, has said, "When you use a VDT, it would be better to have the lowest possible magnetic field," according to *VDT News*.

Reducing Your Exposure

BUT YOU DON'T HAVE TO BUY A NEW monitor to reduce your exposure to ELF fields. The simplest way to limit your exposure is simply to sit back from your computer. Electromagnetic fields drop off sharply with distance; at 28 inches from the front of many monitors, people are exposed to negligible levels of magnetic fields. That's particularly true for monitors that meet the Swedish MPR-II guidelines and that are offered by many companies, including Apple, Nanao, NEC, Radius, RasterOps, and Sigma Designs. (See *Macworld*, March and September 1992, for monitor overviews that

**PS17, PS35 and Turbo models
now priced lower!**



Five reasons to pick a T



No matter which Macintosh® computer you have, there are strong reasons why there's a perfect microLaser printer to go with it. Personal or shared.

1. It's affordable.

For the value-conscious, take a 9 pages-per-minute laser printer, load it up with 17 scalable outline fonts from the Adobe® PostScript® software library, give it an



operating cost of 1.9* cents per page and price it at \$1,449**. Now you've got the best value in the business, for yourself or your business. It's the microLaser PS17.

2. It's upgradeable.

Now take the microLaser we just talked about, double the fonts, have the options of Turbo upgrades for fast graphics, price it at \$1,549** and you've got the microLaser PS35.

3. It's powerful.

For high-speed PostScript printing with a built-in RISC processor, PostScript Level 2, 35 fonts, and automatic switching between PostScript and HP LaserJet® emulation, try a high-performance microLaser Turbo. Perfect for the power user at \$1,799**.

4. It's shareable.

And if you're into networking, the 16 ppm microLaser XL Turbo flies through documents

include ELF field measurements.)

If you do go shopping for a new monitor, keep in mind a few loopholes in the MPR-II testing requirements. Vendors are required to test their monitors at only one resolution. If you are buying a multiresolution monitor, ask the company at what resolution the monitor meets the MPR-II guidelines. Generally, the higher the resolution, the greater the electromagnetic fields. Ditto with brightness; the higher the brightness, the higher the fields. Vendors test at midpoint brightness, but that's not necessarily what users are exposed to. A quick look around the *Macworld* offices shows that like me, many people have their brightness setting cranked up all the way. The point is that the numbers manufacturers use to meet the MPR-II guidelines may be lower than what actual users are exposed to. So sit back from that display!

Keep in mind, too, that the strongest fields are emitted from the back and sides of a monitor. If you are concerned about EMF, avoid those areas. If you must work next to the side or back of someone else's computer, or if you have an old monitor that you can't replace, *Macworld* found two products on the market that actually reduce ELF magnetic fields. NoRad (310/395-0800) markets a set of special metal

bands called ELF Protech that fit around the top and sides of a monitor, deflecting magnetic fields from the monitor toward the bands. *Macworld* tests showed a reduction in ELF magnetic fields of between 17 and 69 percent, depending on the measuring points. ELF Protech is priced from \$65 to \$131, depending on monitor size. Fairfield Engineering (515/472-5551) manufactures E.L.F. Armor, a steel-alloy cylinder that fits over the yoke of a display's cathode-ray tube. *Macworld* measurements showed significant magnetic-field reductions in a monitor fitted with the device, which must be installed by a qualified technician and costs \$89.95.

The Power Line Debate

ON SEPTEMBER 30, 1992, SWEDISH RESEARCHERS announced the results of two major epidemiological studies involving magnetic fields. A residential study done by Dr. Anders Ahlbom and Maria Feychting of the Karolinska Institute in Stockholm found a dose-response relationship between childhood leukemia and exposure to weak magnetic fields from power lines. Ahlbom and Feychting found that "children exposed to more than 1mG had twice, those exposed to more than 2mG had close to three times, and those exposed to more than 3mG had nearly

Service Hero

Bart Cassel of Jacksonville, Florida, writes to nominate Jay Kein Productions as a service hero. "Jay Kein produces a grading program for the Mac called Making the Grade," writes Cassel. "Since I purchased the program he has gladly (and freely) upgraded my program disk four times."

four times the incidence of leukemia of those exposed to less than 1mG," according to a report in the September/October 1992 issue of *Microwave News*.

Several earlier U.S. studies found excess rates of cancer among children living close to power lines, but didn't find an association between the higher cancer rates and actual magnetic measurements (see *Conspicuous Consumer*, October 1991). As in those studies, the Swedish scientists didn't find a relationship between cancer and spot measurements of magnetic fields. They did find a relationship between cancer and estimated field exposures to magnetic fields based on a sophisticated computer model and a Swedish electric power

continues

microLaser™ for your Mac®.



with the high quality you want. Users on AppleTalk® networks find this to be the smart choice for big-time business, or for those who want to move into the big time without a huge budget. Priced at only \$3,749**.

5. It's reliable.

When you buy a printer, you want it to print. And print. And print. That's just what the microLaser does — the first time, every time, for years.

And, of course, with AppleTalk, PostScript and TI's Paper Tray Manager, microLaser is instantly compatible with whichever Mac you've got.

It's incredible. So pick up the phone and call for details and the name of a dealer near you.

1-800-527-3500.

Circle 313 on reader service card

 **TEXAS
INSTRUMENTS**

© 1992 TI 76544

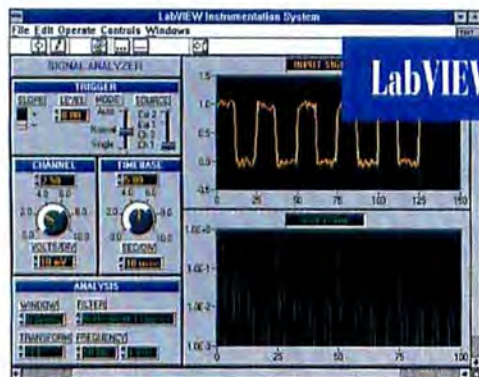
*Based on suggested retail price of consumables and approximate page coverage rating for each consumable at 6% black (toner, developer and OPC).

**Suggested retail price — includes AppleTalk interface. Dealer prices may vary. microLaser is a trademark of Texas Instruments Incorporated. Mac, Macintosh and AppleTalk are registered trademarks of Apple Computer, Inc. Adobe, PostScript and the PostScript logo are registered trademarks of Adobe Systems Incorporated which may be registered in certain jurisdictions. LaserJet is a registered trademark of Hewlett-Packard, Inc.

SEE US AT MACWORLD EXPO BOOTH #1930

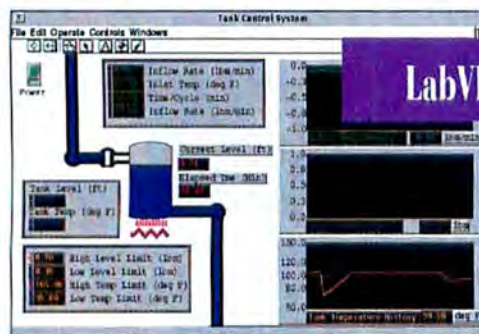
The First Revolution in Instrumentation Software...
Graphical Programming

The Second Revolution...
Platform Independence



LabVIEW for Windows

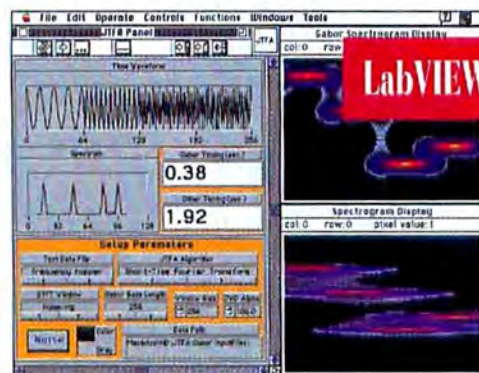
Over six years ago, LabVIEW® for Macintosh revolutionized the development of data acquisition, instrument control, and data analysis systems. No longer did you have to write text-based programs. With LabVIEW, you could graphically build virtual instruments (VIs) with front panel interfaces and block diagram programs. But, you had to have a Macintosh...



LabVIEW for Sun

Introducing LabVIEW for Windows and LabVIEW for Sun. Now you can choose from three industry-leading computing platforms – control your GPIB, VXI, and RS-232 instruments – acquire data from your plug-in data acquisition boards – and perform data analysis, from simple statistics to real-time digital signal processing. Best of all, you're not locked into one computer platform. All of your programs are portable between platforms.

If you're searching for an alternative to text-based programming, or considering another icon-based system – try the original, try LabVIEW – and draw your own solution!



LabVIEW for Macintosh

For a **FREE** LabVIEW Demo Disk, call:
(512) 794-0100 or
(800) 433-3488 (U.S. and Canada)



NATIONAL INSTRUMENTS®
The Software is the Instrument®

6504 Bridge Point Parkway
Austin, TX 78730-5039
Fax: (512) 794-8411

Branch Offices: Australia 03 879 9422 • Belgium 02 757 00 20 • Canada 519 622 9310 • Denmark 45 76 73 22 • Finland 00 524566 • France 1 48 65 33 70 • Germany 069 714 50 93 • Italy 02 48301892
Japan 03 3788 1921 • Netherlands 01720 45761 • Norway 03 846866 • Spain 91 896 0675 • Sweden 08 984970 • Switzerland 056 27 00 20 • U.K. 0635 523545

© Copyright 1992 National Instruments Corporation. All rights reserved. Product and company names listed are trademarks or trade names of their respective companies.

Circle 250 on reader service card

Lab Notes

Expanding the PowerBook Screen

BY MARK HURLOW

PERHAPS THE MOST IMPORTANT ADVANTAGE the new PowerBook 160 and 180 and the Duos (with docking station) have over the original PowerBooks and the 145 is the inclusion of a video port—which allows them to connect to a large-screen monitor, color monitor, or color projector. Connecting an older PowerBook, an Outbound notebook, or a compact Mac to an external display requires a special peripheral—a video-display adapter. As we tested the different types of PowerBook video peripherals—internal adapters, external SCSI adapters, and SCSI monitors—for the feature “Expanding Your PowerBook” in this issue, we discovered the problems inherent in trying to make a computer do something it wasn’t designed to do.

Internal Adapters

THE ONLY INTERNAL adapter available for our tests was Computer Care’s BookView Imperial, whose circuitry design is very similar to an LC II’s internal video. The BookView Imperial maps 1MB of video RAM (VRAM) into the PowerBook’s memory (the PowerBook has no VRAM). A connector lets the BookView run an external monitor. Like all video adapters, the BookView treats the Mac’s built-in monitor as a second display. Since the BookView Imperial has no graphics processor, the Mac’s CPU must do all the processing. Other Mac internal video adapters work similarly.

External Adapters

WE TESTED THREE EXTERNAL SCSI adapters: Radius’s PowerView, Aura Systems’ ScuzzyView, and Lapis’s PowerBase I. All use INITs to reroute video data over the SCSI bus to the adapter (which then sends the data to a monitor), but they differ in how they process the video.

The Radius PowerView tells the Mac’s CPU to process the video image, and reserves part of the Mac’s RAM to do this. The Macintosh then sends the processed data—initially an entire screen’s bit-mapped image—via the SCSI cable to the adapter’s video buffer, and the adapter sends the image on to the monitor. If subsequently only a portion of the image is updated, the PowerView software sends only the changes to the adapter. This is crucial because SCSI cannot send whole screens of data quickly enough to update the monitor at an acceptable pace.

Instead of having the Macintosh process the video, the ScuzzyView handles the processing itself. The ScuzzyView INIT intercepts QuickDraw calls and forwards them to the adapter box via the SCSI port. The adapter’s graphics processor builds the images for the selected monitor in the 1MB video buffer; afterward the ScuzzyView sends those images to the monitor.

The Lapis PowerBase I, a video adapter that supports only monochrome monitors, either processes the video itself or hands it off to the Mac, depending on the requirements of the Mac it’s connected to. When running in accelerated mode with a 68000-based machine like the PowerBook 100, the PowerBase I traps QuickDraw calls and forwards them through the SCSI bus to the adapter, which renders the image. With Macs that contain Color QuickDraw, or when running in nonaccelerated mode with a 68000-based machine, the PowerBase I lets the Mac process the image. To speed up screen redraw, the PowerBase I has an accelerated option for color Macs that reduces the number of screen updates—by

continues



MARK OSUNA

Buy Low. Send Fast. With TWINCOM **DATA+FAX** modems for Macintosh®



If you modem or fax large documents and demand the highest speeds—the TWINCOM 144 Pro is a solid investment for you. Achieve data speeds of up to 57,600 bps and yield big dividends in time savings and reduced phone bills.

For data + fax capability on the run we have the 24/96 COMMUTER—a 2,400 bps data modem, with send and receive fax capability. For home, office and away, it's the perfect companion for any Macintosh.

Got a PowerBook®? The 24/96 PowerTwin is a 2,400 bps data modem with send and receive fax. For maximum performance, the 14.4 PowerTwin provides 14,400 bps, the ultimate in super fast data + fax.

Call now: **800-723-2962**

TWINCOM™

is an American modem manufacturer that supplies innovative and award winning communications products to end users and corporations worldwide.

Macintosh Division
Wilmington, NC
© 1992 TWINCOM

All products and company names are registered trademarks of their respective companies.

Circle 178 on reader service card



Get everything from a mug to a PowerBook with the

Apple® will now deliver most items the next business day* at no charge.

Send for the new Apple Catalog, and you can order hundreds of exciting Apple products directly from us. We'll even deliver most items directly to you the next business day, with no delivery charge.

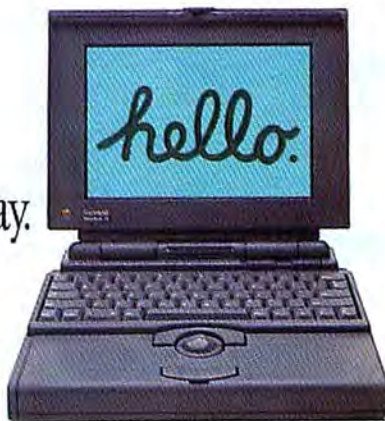
Included in the Apple Catalog are our best-selling PowerBooks™ and printers, hard-to-find networking cables and expansion

cards, software, CPU manuals, multimedia products, and Apple II products. You'll also find Apple mugs, mousepads, and memorabilia once available only at our own store in Cupertino, California.

The Apple Catalog also provides clear, thorough descriptions that can help you decide which product is right for your system. So without even asking, you'll get answers to all of your questions.

To get the new Apple Catalog now, call

new Apple Catalog. Send for your free copy today.



toll-free, or send us the coupon. You'll enjoy the convenience of ordering hundreds of Apple products. And because we'll deliver in-stock items free the next business day, nearly anything you see in the Apple Catalog today can be on your desk tomorrow.



Call toll-free 1-800-795-1000, ext. 120, 24 hours a day, 7 days a week.

*Items ordered Saturday and Sunday will be delivered Tuesday.

Send for the free Apple Catalog.

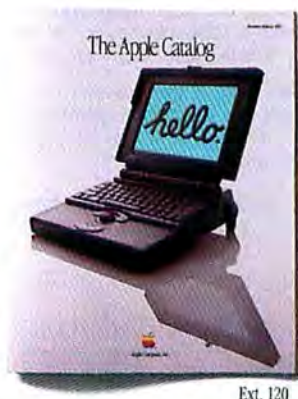
Complete and return this coupon to:
The Apple Catalog
One Apple Plaza
P.O. Box 9001
Clearwater, FL 34618-9001

Name

Address

City

State Zip



You don't know what you've got til it's gone

The time to buy security for your
Macintosh is **before** you need it.

FolderBolt



FolderBolt is sophisticated, yet easy-to-use desktop folder-level protection.

NightWatch II



NightWatch II is complete hard disk access security.

Kent•Marsh Ltd. offers a complete modular line of software security products. Whether you need a little privacy or a lot of protection, Kent•Marsh Ltd. has the solution.

Reviewers agree, Kent•Marsh provides top-notch security. For those with ten computers or more, site licensing may be a benefit. Ask, and we'll tell you why.

Before it's gone, secure the data on your Macintosh. Call today!

(800) 325-3587 (713) 522-LOCK

Kent•Marsh Ltd.

The Macintosh® Security Experts

Order now from resellers everywhere including...

MacWAREHOUSE
1-800-255-6227

Circle 225 on reader service card

LAB NOTES

going directly from the original screen to the changed screen without showing any of the transitional steps in between.

External SCSI Monitors

WITH A BUILT-IN VIDEO ADAPTER, A SCSI monitor works like an external SCSI adapter. The only differences among the SCSI monitors we tested were the graphics processors and the SCSI communication methods the adapters used.

The Outtrigger, ViewPort, and PowerPlay (all manufactured by Outbound) each have a built-in 20MHz 68000 microprocessor that handles all video processing. Sigma's PowerPortrait uses a specialized 40MHz Texas Instruments 34010 graphics processor and has more internal memory for displaying at higher resolutions. These two features enable the PowerPortrait to update screens more quickly than the others.

Your Speed May Vary

WE FOUND SPEED VARIATIONS BETWEEN external adapters that were due to their different designs. In most tests, the ScuzzyView ran faster than the PowerView. Because the ScuzzyView traps only QuickDraw routines (which take very few bytes each in most operations), it usually transfers less data across the SCSI bus than the PowerView, which transfers large bitmapped images—sometimes thousands of bytes per screen. For example, a standard 8-pixel-by-8-pixel color pattern for a 200-by-200-pixel square requires less than 50 bytes for processing with the ScuzzyView, whereas a similar operation on the PowerView sends 40K of processed data over the SCSI bus. But when sending huge amounts of data across the SCSI bus—specifically when redrawing the entire screen, when displaying a new picture, or when scrolling a page in which most of the screen needs to be redrawn—the PowerView came close to or even matched the ScuzzyView's speed. In some instances, the PowerView actually ran slightly faster, since it updated only changed areas of the screen.

Incompatibility Problems

ALTHOUGH TRAPPING QUICKDRAW calls (instead of letting the CPU process the image) speeds up the adapters, it can also cause incompatibilities. We found that many such adapters could not run applications that bypass QuickDraw and draw directly to the screen, such as Claris HyperCard, screen rendering in Aldus SuperPaint, the preview mode in Adobe Illustrator, QuickTime movies, a couple of operations in MacroMind Director, and some fast-action games like Spectre. The reason these applications write di-

rectly to the screen is usually speed—QuickDraw is too slow for their purposes. Some of the applications have options to use QuickDraw for screen-rendering instead, and most of the video-adaptor vendors either already have or are working on patches for the other applications. Technically, this problem is with the software, not the adapters. But because this method of boosting speed is so commonly used by software developers, vendors of video adapters need to plan accordingly.

Although the PowerView had problems with some operations in MacroMedia Director 3.0 and games like Spectre, we found it to be more software-compatible than the other adapters. Its monitor support, however, was not as versatile as that of its main competitor—the ScuzzyView. For example, due to a limited amount of video RAM (a non-expandable 0.5MB), the PowerView couldn't drive a 19-inch monitor in 256-color mode (which requires 1MB).

Another drawback of the PowerView is its incompatibility with 68000-based machines; it supports only the PowerBook 140, the 170, and the Classic II. The ScuzzyView works with all Macs from the Plus up, and provides color to the Plus, SE, PowerBook 100, and Outbound notebooks. Although these machines are considered monochrome Macs, their ROMs have QuickDraw routines for displaying eight colors—red, green, blue, cyan, magenta, yellow, black, and white. The ScuzzyView software allows you to assign these eight colors to the Finder and to applications that support them.

We also ran into some compatibility problems with Computer Care's internal adapter, the BookView Imperial. Since the BookView Imperial allocates some of the PowerBook's unused memory space for video RAM and a color lookup table, it conflicts with the PowerBook's memory-management scheme. The version we tested, 1.0.7, supports neither System 7's virtual memory nor the Apple RAM Disk. The latest version, 1.0.8, fully supports virtual memory but not the Apple RAM Disk. Computer Care plans to include a RAM disk utility called RAM Disk+ in a future version of the BookView Imperial.

Because internal video boards let the Mac's CPU do all the processing and avoid the SCSI bus bottleneck, they provide the speediest screen updates. Despite their compatibility problems, most of the video adapters we tested provide greater flexibility than do the built-in video ports of the new PowerBooks—because the adapters typically support more and larger monitors. Nearly all are acceptable choices for moving beyond your Mac's small monochrome screen. **m**



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!** They don't pack a Porsche engine in a Chevy body. Neither do we. 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.
- ☒ **Unlimited, toll-free, no-fee tech support!** No drive or scanner is worth its salt without it! That's why La Cie doesn't limit telephone technical support. Call as often as you need on our FREE 800 number. It's no-extra-charge.
- ☒ **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 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 on/off 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 1978. 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.

See us at Macworld Expo! Moscone Center Booth #607.

Call us now for our new free Winter 1993 catalog!

800-999-1332

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 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.

Avoid crashes.



La Cie's 3 1/2" Optical drives don't need air bags or anti-lock brakes.

Full lite speed ahead!

It's hard to beat the safety record of optical drive technology. And now you can achieve long range data safety with the next generation of removable-media optical drive technology. Smaller, faster and less expensive than conventional 5 1/4" optical drives, La Cie's Cirrus Optical drives use disks that are the same size as 3 1/2" floppies, but store about eighty-eight times more data than high-density floppy disks.

The Cirrus Optical also delivers a speedy 38ms seek time. Tailored to fit our sleekly-styled, award-winning Cirrus chassis, whisper quiet, fan-cooled Cirrus Optical drives offer massive storage capacity, lightweight portability, high-speed performance and removable media convenience.

Lite speed performance for Quadra.

Doesn't your Quadra deserve the speed and safety performance of our La Cie 3 1/2" Optical drives? We think so too. That's why we make brackets (and a really good instruction manual) available for mounting this money-wise, crash avoidance system inside your Quadra.

Silverlining, 2-year warranty, super support.

Every La Cie Cirrus Optical drive comes complete with System 6, and System 7 and Silverlining—the industry's number one rated disk management software. Plus you get a full year's parts and labor warranty with two day warranty replacement. What more can you ask? 30-day, 100% Satisfaction Guarantee, that's what.

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

- ☒ **All La Cie products are FCC, UL, TUV, VDE, CSA certified.** Uncertified equipment can be unsafe. Products sold without FCC certification are even illegal. Yet, non-certified equipment is sold every day. Check certification before you buy, to make sure no one sells it to you. We also burn in every drive for 24 hours for your protection.
- ☒ **La Cie is a real manufacturer—not just a reseller.** You learn a lot when you manufacture your own products. What works. What doesn't. And why. That's why we're never stumped for an answer when you need help. That's why—by anticipating problems—we can avoid them. And that's why our customers are bowled over with our service and support—not just blown off.

Backup safely.

See us at
Macworld Expo!
Moscone Center
Booth #607.

From
\$549



La Cie's DAT drives can backup without making you go in reverse.

Get it on tape.

Not backing up safely is like driving without car insurance. It can be very costly in the event of an accident. For safe, cost-effective backup La Cie's 155MB tape drives offer quality TEAC mechanisms and removable convenience. Or step up to our 600MB tape drives. They have the same TEAC quality, but with four times the storage. Now that's win-win.

DAT drives incredible.

For incredibly fast tape back-up and restore for your Mac try our La Cie 4mm DAT drive. With 1.3 to 2 gigabytes of storage on each cassette, standard DDS recording format, and reliable Archive electronic tape handling, you get high capacity, high reliability, and exceptional performance at an incredible value.

Compression engine performance.

For even higher revving capacity tape back-up for your Mac look at our La Cie Compression DAT Drive! With up to 8GB of storage on each 4mm cassette, our jumbo capacity Compression DAT drive offers true computer grade performance and reliability—not to mention ARDAT technology, and industry-standard DDS-DC data compression.

The La Cie advantage.

Like every La Cie product we sell, our tape drives are feature rich. Engineered within our award-winning Cirrus case, each comes complete with universal power supply, half-speed fan, SCSI cable and power cord, free tape cartridge, Retrospect™ software and our exclusive on/off termination switch.

Test us for real and call now for fast, friendly service!

800-999-1332

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*

LACIE
LIMITED
A QUANTUM COMPANY

*Call for details on terms, conditions, limited money back guarantee and free offers. System 7 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, Touram, 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. 8700 SW Creekside Place, Beaverton, OR 97005. Phone: (503) 520-5000. Fax: (503) 520-9100. All rights reserved. Printed in U.S.A.

BEST!
Macworld
Hard Drive
under \$1000

BEST!
Macworld
Hard Drive
\$2000-\$3000

BEST!
Macworld
Hard Drive
over \$3000

BEST!
Macworld
Color Scanner
SilverScanner

FCC
Certified!

TOLL-FREE
Technical
Support

TOLL-FREE
Customer
Service

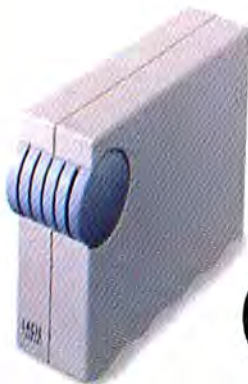
FREE!
Silverline™

Switchable
Termination!

Universal
Power
Supply!

30 Day
Money Back
Guarantee!

Our lot has great selection



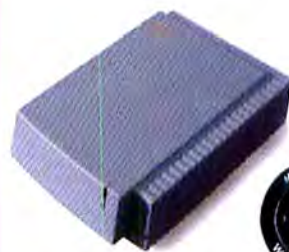
Internal, ZFP™, ZFP+™, Cirrus™ & Tsunami™ Drives

Our hard drives feature 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.*

Quantum	Internal	ZFP	Cirrus	Tsunami
40MB (3 1/2")	\$199	\$299	\$319	\$349
50MB LPS (3 1/2")	\$229	\$329	\$349	\$379
85MB (3 1/2")	\$299	\$399	\$419	\$449
100MB LPS (3 1/2")	\$349	\$449	\$469	\$499
120MB (3 1/2")	\$399	\$499	\$519	\$549
127MB ELS (3 1/2")	\$369	\$469	\$489	\$519
170MB ELS (3 1/2")	\$419	\$519	\$539	\$569
240MB LPS (3 1/2")	\$649	\$749	\$769	\$799
425MB Maui (3 1/2")	\$949	\$1049	\$1069	\$1099
525MB LPS (3 1/2")	\$1169	\$1269	\$1289	\$1319
700MB PD (3 1/2")	\$1559	\$1659	\$1679	
1.05GB PD (3 1/2")	\$1899	\$1999	\$2019	
1.2GB PD (3 1/2")	\$1919	\$2019	\$2039	
80MB (2 1/2") for Powerbook	\$399	See PocketDrive		
120MB (2 1/2") for Powerbook	\$499	See PocketDrive		

Seagate	Internal	ZFP+	HP	Internal	ZFP+
1.2GB (3 1/2")**	\$2119	\$2219	1.05GB (3 1/2")**	\$2099	\$2199
650MB (5 1/4")	\$1299	\$1449	700MB (5 1/4")	\$1699	\$1849
1.2GB (5 1/4")	\$1749	\$1899	1.2GB (5 1/4")	\$1989	\$2139
1.6GB (5 1/4")	\$2299	\$2449	1.6GB (5 1/4")	\$2399	\$2549
2.1GB (5 1/4")	\$2949	\$3099			
2.4GB (5 1/4")	\$3299	\$3449			

**Also available in our award winning Cirrus case.



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	\$549
120MB (2 1/2") incl. T-connector	\$649
160MB (2 1/2") incl. T-connector	Call!



Optional PocketDock Cable	\$59
Extra T-Connector	\$59
Universal AC Adaptor	\$59

Powerbook Internals

Pack more power in your Powerbook. Comes with brackets and instructions.

80MB Powerbook Internal	\$399
120MB Powerbook Internal	\$499
160MB Powerbook Internal	Call!

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
--------------	-------

and a friendly sales staff.



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	\$1399	\$1499
128MB Optical Disk		\$79

Cirrus Backup

Our Cirrus backup solutions have the power to handle large backup jobs. Includes Retrospect™ and one free tape.

	Internal	External
155MB Tape Drive		\$549
600MB Tape Drive	\$699	\$799
1.3-2.0GB DAT	\$1249	\$1349
4-8GB DAT	\$1549	\$1649



ZFP Removable

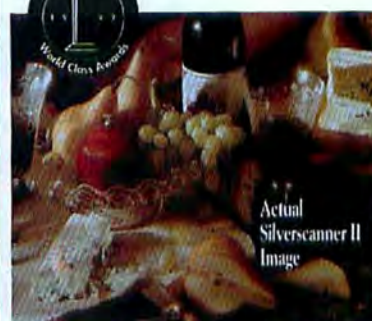
Our 44-88MB removable media drives deliver Syquest technology in a zero footprint case. Includes 1 free cartridge.

44MB Drive	\$499
88MB Drive	\$549
44MB Cartridge	\$63
88MB Cartridge	\$98

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	\$399
100MB Quantum LPS Drive	\$549
120MB Quantum LPS Drive	\$799
240MB Quantum LPS Drive	\$949



Silverscanner II™

One look at the image above should convince you that our next generation Silverscanner can really perform! Superior line art, detailed greyscale 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!

Call!

with Photoshop
and Read-It O.C.R. Pro!

Call!

with Photoshop, ColorStudio
and Read-It O.C.R. Pro!

Call!

La Cie Silverscanner

with Color It!
and Read-It O.C.R. Pro!

\$1399

with Photoshop
and Read-It O.C.R. Pro!

\$1799

with Photoshop, ColorStudio
and Read-It O.C.R. Pro!

\$1899

Test us for real and call now for fast, friendly service!

800-999-1332

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 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, Taurus, 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. 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.

From
\$299

La Cie's Powerbook 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. Mercedes 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.

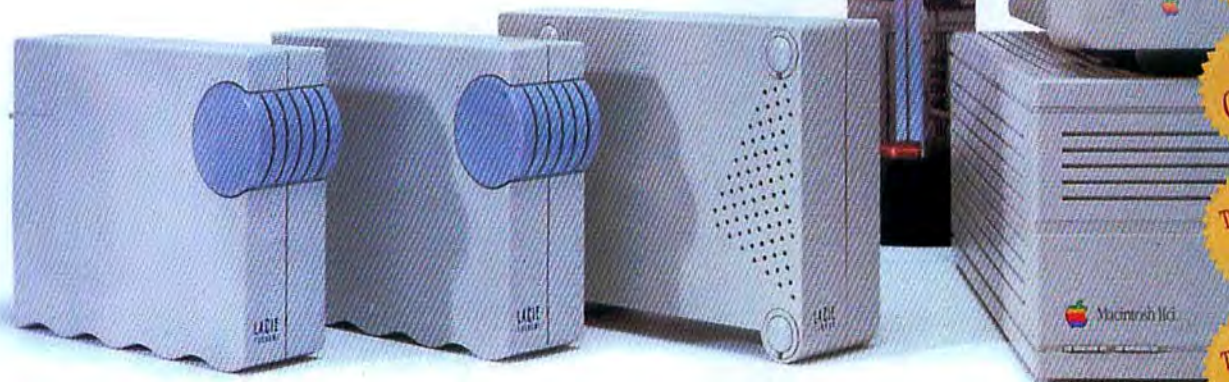
C H E C K O U R L I S T

- ☒ **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 on/off termination under the hood.** Only La Cie hard drives provide simple, straightforward 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.

See us at
Macworld Expo!
Moscone Center
Booth #607.

From
\$199



La Cie's Tsunami and Cirrus drives like to be driven hard and fast.

12 millisecond speed limit.

La Cie's Cirrus and Tsunami drives ace every test 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 external 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!

800-999-1332

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*

LACIE
LIMITED
A QUANTUM COMPANY

*Call for details on terms, conditions, limited money back guarantee and free offers. System 7 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
40-200 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

Great for your image.

Silverscanner II makes you look great with fabulous color, rich detailing.

Improve your image.

Our Silverscanner II is so good, we used it to produce this ad. Clean your glasses and take a look. Gorgeous color. Fine image detail. Excellent tonal range. Very high resolution. It's all there. The proof is right in front of you.

Great color from the start.

You can get pretty good color using any scanner if you fool with it long enough. With Silverscanner II, you get great color on the first pass. That's because Silverscanner II's built-in gamma correction 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. No difficult adjustments. No wasted time.

See us at Macworld Expo! Moscone Center Booth #607.

Test us for real and call now for fast, friendly service!

800-999-1332

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*

Hug the curves.

When comparing line art, the Silverscanner II really shines! At 1600 dpi, you get what amounts to an electronic stat. Even at 400 dpi, our competitors can't touch our curves.

Superior software at the controls.

La Cie's powerful plug-in modules for Photoshop, Color Studio, Color It!, Enhance, Image Studio and Read-It! have been hailed some of the best software ever written for flat-bed scanners. And with features like dynamic color preview, independent color/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.

LACIE
LIMITED
A QUANTUM COMPANY

*Call for details on terms, conditions, limited money back guarantee and free offers. System 7 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. 8700 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

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

The best place to get your photos printed.

You don't need a photo lab to get computer output like this. A Phaser™ IISD color printer by Tektronix will do just fine. It's the only dye sublimation printer that gives you detailed, photorealistic images with crisp, clean text—that's TekColor Photofine technology. But you also get Adobe PostScript Level 2 and TekColor PS to match and adjust colors. Plus Pantone certification, networkability, a 24MHz RISC processor for speedy output, a \$9995 price tag and a print cost of only \$2 per page. All in one little machine. That's what we call picture perfect. Call the leader in color printers at 1-800-835-6100 Dept. 25C for a free output sample. Or call (503) 682-7450, ask for Document 1222 and we'll send information by fax.



Tektronix

Computer Graphics



Phaser is a trademark of Tektronix, Inc.
Postscript is a trademark of Adobe Systems, Inc.

All other marks are trademarks or registered trademarks of their respective companies.

Circle 143 on reader service card



Port™: the best cradle for your powerbook



Swiss made Handle :

Designed for maximum grip and comfort, Port's Swiss made handles are ergonomically contoured on the inside and reinforced with metal on the outside.



Metal fittings :

Tough metal hardware anchor both the straps and the contoured handles, heavy duty nylon zippers provide durability and dependability.



High Tech microline :

Our cases are constructed with an outside layer of high tech microline nylon and padded underneath with impact resistant closed cell foam to further cushion and protect your computer.



Black



Burgundy



Gray

Colors Available :



Shock absorption system :

Developed and patented by PORT, the SafePort™ shock absorption system offers a level of protection that far exceeds our competition.

The difference is, where others simply pad your notebook, we quite literally defend it. SafePort™ actually cradles your notebook, suspending your computer on a cushion of air that works like a shock absorber to deflect and protect your computer from whatever the road can throw your way.



Ergostrap :

The straps are ergonomically designed to hold the contour of the human shoulder while twin strap adjustments keep the bag centered and stable.

Our cases are designed and engineered to hold all of the items you need to carry. Along with your computer there is room for a printer, A/C adaptor, phone and spare batteries. Plenty of pockets are conveniently located for pens, calculators, note pads, magazines and other miscellaneous items.

Port™. A completely unique line of cases distinguished by incomparable design, unmatched quality and an unbending attention to the smallest details.

To order today for immediate delivery, call

1.800.242.3133



The PORT promises :

- We offer a lifetime limited warranty to the original owner.
- If not satisfied, return within thirty days.
- Fits all sizes of NoteBook computers.



PORT 886
Colors : Black, Burgundy, Gray
Styles : 886L : L 16", H 13", W 4"
\$169.00
886S : L 14", H 11", W 4"
\$139.00



PORT 786
Colors : Black, Burgundy, Gray
Styles : 786L : L 16", H 15", W 4"
\$149.00
786S : L 14", H 15", W 4"
\$129.00



PORT 586
Colors : Black
Style : 586 : L 13", H 12", W 3"
\$49.00



The Difference

Circle 123 on reader service card

THIS MONTH:

Photoshop Upgraded •
Inexpensive PostScript
Printer • Future Mac
Processors • Timbuktu
Controls Windows • Big
PageMaker Upgrade

BY DAN LITTMAN AND TOM MORAN



HEALTH CARE'S KEYBOARD
CAN BE MODIFIED TO
REDUCE HAND STRESS FOR JUST
ABOUT ANY TYPIST.

An Ergonomic Keyboard

At last someone is developing an ergonomically designed keyboard that uses the standard QWERTY layout we all learned to type on. The only problem with Health Care Keyboard's Comfort Keyboard is the price: \$675. For that you get a keyboard split into three parts—one for the right hand, one for the left, and one for the numeric keypad—all of which separate, rotate, and tilt to any number of positions to avoid the rigid and stressful position of hands, arms, and shoulders enforced by the flat QWERTY keyboard. At \$675, the company must expect to find its market among the already-injured who have insurance or workers comp, but the keyboard could be equally attractive to those trying to prevent injury. Health Care Keyboard, 414/253-4131.—ANN GARRISON

PageMaker's Big Upgrade

With PageMaker 5.0, Aldus is responding to QuarkXPress's encroachment in several key areas of desktop publishing.

First is text. PageMaker 5.0's FreeHand-like text capabilities support rotating text by hundredths of a degree; flipping, mirroring, and skewing text; and editing and kerning text after it is modified.

Second is color. Process-color separations can be printed from inside PageMaker; objects can be set to overprint or knock out underlying color; at least 7 (maybe 12) color spaces will be supported; and colors from imported EPS graphics can be applied to elements in the PageMaker document.

Third is printing. Version 5.0 can print discontinuous page ranges and add printers' marks



COLORS FROM THE IMPORTED
GRAPHIC APPEAR IN PAGEMAKER
5.0'S COLOR PALETTE. NOTE
THE ANGLE OF ROTATED TEXT.

IBM Color Jetprinter

Lexmark International has introduced the IBM Color Jetprinter PS 4079, a 360-dpi color ink-jet printer that can work with Macs and DOS machines simultaneously. The printer includes a PostScript language emulation that was cowritten by Lexmark and Phoenix Technologies.

The Color Jetprinter PS 4079 can simultaneously accept files from Macs and PCs over its serial, parallel, and LocalTalk connectors using an optional \$39 Y-connector. The PS 4079 incorporates a RISC processor for higher performance and prints 7/10 color page per minute, according to Lexmark. Now shipping, the IBM Color Jetprinter PS 4079 lists for \$3495 including 4MB of RAM. It can be upgraded to 16MB. The printer comes with Mac and PC drivers and with ColorGrade software for producing fine textures and dithering patterns that reduce banding. The printer also includes one paper tray for paper up to legal size. Lexmark, 800/358-5835.—T.M.



THE IBM COLOR JETPRINTER
PS 4079 WORKS WITH MACS AND
PCS AND PRINTS 360 DPI.

and document information to output, and Aldus claims that the new version's printing speed is eight times greater than version 4.2's.

PageMaker 5.0 supports dragging elements between multiple open documents and searching their text with the story editor. Aldus is bundling numerous Additions to extend PageMaker's features, including a tracking tool and a simplified imposition tool. List price remains \$795. Aldus, 206/622-5500.—D.L.

DEC PostScript Printer for under \$1000

Computer giant Digital Equipment Corporation (DEC) has brought out the DEClaser 1152 Desktop Laser Printer, the least-expensive PostScript laser printer yet. The 4-ppm DEClaser 1152 will officially list for \$1299, but DEC will publish rebate coupons that will bring the list price to \$999. The one-to-a-customer coupons

A Macintosh to start a

Imagine you could design your own personal computer. What would it be? It would be fast, of course. Faster than your basic 486 machine. Fast

The Apple Macintosh Quadra.

enough to handle the rendering, animating, design and analysis jobs that often require a workstation.

It would have immense storage and memory capacity. And it would have features like high-

performance networking and accelerated video support built in.

You would make it flexible enough to run any kind of application. Affordable enough to put on every engineer's desk. And as long as you're fantasizing here, you'd make it as easy to set up, easy to learn and easy

to use as an Apple® Macintosh® personal computer.

But it's not a fantasy. It's a Macintosh Quadra™.

By any measure, the Macintosh Quadra 700 and 950 are two of the most powerful personal computers ever built. Both are based on the Motorola 68040 (rated at 20 and 25 MIPS, running at 25 and 33 MHz), which integrates the processor, math coprocessor and RAM cache all onto one chip.

They're up to twice as fast as any of their forebears. Fast enough to beat the chips off comparably priced 486 computers from IBM, Compaq and Dell.* And fast enough to make



Built-in 24-bit video lets you create photo-realistic images without the expense of an extra card.

programs like AutoCAD, MicroStation Mac®, MacBRAVO! and VersaCAD perform at a level once seen only in dauntingly complex workstations.

High-performance subsystems provide built-in support across the board: Ethernet networking, accelerated 24-bit video** support and faster SCSI and NuBus™ slots.

You can add a 400MB hard disk to both

*Comparisons are based on a 1991 independent research study conducted by Ingram Laboratories that tested a variety of personal computers running applications available for both the Macintosh and Microsoft Windows 3.0 environments. **24-bit video support for up to a 16" product specifications and descriptions were supplied by the respective vendor or supplier. Orbiter image created by Jerry Flynn. ©1992 Apple Computer, Inc. Apple, the Apple logo, AUX, Mac, Macintosh and "The power to be your best" are registered trademarks and Macintosh Quadra and is a trademark of William Research, Inc. MicroStation is a registered trademark of Bentley Systems, Inc. MS-DOS is a registered trademark and Windows is a trademark of Microsoft Corp. Motorola is a registered trademark of Motorola Corp. NuBus is a trademark of Texas Instruments.

with the power revolution.



communications architecture lets you easily take advantage of features like distributed processing, allowing programs like RenderPro and BackBurner to utilize excess CPU cycles on other Mac computers or workstations for faster renderings.



There are two Macintosh Quadra models. The 950 sits next to your desk; the 700 fits on top of it.

And Macintosh Quadra fits in with the PCs you already own. The built-in Apple SuperDrive™, used with Apple's new Macintosh PC Exchange software, allows you to share files easily with MS-DOS PCs via floppy disk or over a network. And with Apple's fully compliant version of UNIX® — A/UX® — you can even run UNIX, X Window, MS-DOS and Macintosh programs all at the same time.

It all adds up to the kind of power that moved *PC*

Week to give the Macintosh Quadra its highest satisfaction rating in the categories of overall performance, price relative to performance, expansion capability and ease of installation and configuration.*

Your authorized Apple reseller would be glad to show you all this and more. For the name and location of the one nearest you, call 800-538-9696, extension 200.

And soon you'll discover the latest power of Macintosh personal computers. The power to start a revolution. The power to be your best.®



Macintosh Quadra significantly outperforms 486 PCs from IBM, Compaq and Dell running Windows 3.0.

the 700 and the 950 to accommodate the largest CAD files. And the 950 even lets you add a CD-ROM drive or a removable cartridge drive, and a disk array or more than a gigabyte of internal hard disk storage.

You can increase the memory of the 950 to up to 64MB of RAM for handling compute-intensive applications like three-dimensional modeling and stress analysis.

Over your network, the unique Apple interapplication

PULLING ALL YOUR MEDIA TOGETHER REQUIRES SOME FANCY FOOTWORK.



PASSPORT PRODUCER

Integrating multimedia elements to create a spectacular presentation can be a bizarre, ritualistic dance. But with Passport Producer™—media integration software for the Macintosh®—it's simple and easy to keep complex multimedia presentations in step. Passport Producer serves as the master control for your entire production, synchronizing QuickTime™ movies, animation, graphics, text, digital audio and MIDI into one file. With Passport Producer, you integrate media elements on a visual "cue sheet" based on SMPTE time code that permits frame-accurate "cue" placement. By linking to programs that create multimedia elements, you can easily integrate and edit standard file types. When you need to edit your content, simply double-click on the cue and Passport Producer automatically opens the editor of your choice. Play back your presentation with the push of a button. It's that fast and simple. So if you feel that building a multimedia presentation requires a lot of tricky and cumbersome moves, get Passport Producer and you'll waltz your way through.



Integrate and edit Macintosh standard file types, including:

- QuickTime
- PICS
- PICT
- MIDI
- AIFF
- Text



QuickTime Files



Animation Files



MIDI and Digital Audio Files



Presentation Files



SEE US AT
MACWORLD
BOOTH #2543

PASSPORT

Call Passport at 415-726-0280 for a free evaluation copy of Passport Producer. Domestic and international customers can download a free evaluation copy from AppleLink (Updates & Demos) or CompuServe (Multimedia Forum).

Passport Designs, Inc. • 100 Stone Pine Road • Half Moon Bay, CA 94019 USA • Phone: (415) 726-0280 • Fax: (415) 726-2254
© 1993 Passport Designs, Inc. Passport Producer, Alchemy and QuickTunes are trademarks of Passport Designs, Inc. All other products and brands are trademarks or registered trademarks of their respective holders.



RICHARD RETHMEYER

THE DECLASER 1152,
A 4-PPM POSTSCRIPT PRINTER,
WILL SELL FOR \$999.

will be good through March 31.

The 300-dpi printer comes with 4MB of RAM, Adobe's PostScript Level 2, PCL Level 4 (for DOS machines), 17 scalable fonts, and a slot for an optional font cartridge to expand to 43 fonts. The DECleraser can accept data simultaneously from several Mac hosts and DOS hosts through serial, parallel, and LocalTalk connectors. DEC scheduled first shipments of the DECleraser 1152 printer for January. DEC, 508/493-5111.—T.M.

SilentWriter 95fx

NEC Technologies has introduced the SilentWriter Model 95fx, a version of the company's SilentWriter 95 laser printer with the addition of an integrated PostScript fax board. The Model 95fx can send a fax compressed in Adobe's new PostScript fax format, which means that another similarly equipped printer can receive the file and produce a plain-paper fax that looks just like the original PostScript document. The PostScript fax format compresses the data so that the transmission is faster than for a standard fax.

The Model 95fx comes with NEC drivers that the company says allow it to work with almost any DOS, Windows, or Macintosh application. Any user on the network can access the fax capability, which includes normal Group III faxing, an electronic fax directory, a time-delay feature, and multiple addressing.

The SilentWriter Model 95fx produces 6 ppm, includes PostScript Level 2 and an emulation of HP's PCL 5, and has 35 scalable typefaces. It lists for \$2348 and is shipping now. NEC, 508/264-8000.—T.M.

TREND

Structured Publishing

Publishing jobs that require repeatedly reorganizing a document's contents or changing its appearance without changing its contents can overwhelm standard desktop publishing tools, but tools for the Mac based on SGML (Structured Generalized Markup Language) are finally making it possible to automate such tedious work.

SGML documents have precisely defined parts and relationships between parts—for example, a chapter might be defined as always containing at least two sub-heads. A tag identifies each part, and filters for SGML-savvy page-layout software can read tags to import and automatically format a document, or tags can become the parts' attributes in a document database.

SoftQuad publishes Macintosh SGML tools, including Author/Editor 2.1 (\$995), where text is entered and tagged; and RulesBuilder 2.0 (\$995), where a document's rules and tags are developed. Author/Editor is a solid text-editor in its own right; for SGML work it includes outline-like control over the display of nested levels of document parts, and a view showing the contents of a document with all the formatting assigned to tags. RulesBuilder performs such tasks as finding conflicting rules. SoftQuad, 416/239-4801.—D.L.



TOM WOLFE

RICHARD LOVE HAS
MOVED THE AMERICAN
CHEMICAL SOCIETY'S 22
SCIENTIFIC JOURNALS ON-
TO SGML TOOLS.

ReadySetGo Rises Again

Manhattan Graphics' ReadySetGo (RSG) was the Macintosh's first real desktop publishing software. After enduring Letraset's unsuccessful attempt to market the DTP package as DesignStudio, Manhattan Graphics reacquired the program, restored its original name, and set to work on version 6.

Version 6 has abundant left- and right-hand master pages (26 each); provides precise typographical control over such details as small-cap sizes and first-line leading; and has new text features including more page-number formats and can count words and characters. Objects can be anchored together with precise control over their offset.

ReadySetGo supports add-ons called annexes; version 6 will ship with several annexes, including one for separating color that has some trapping capability. RSG lists for \$395. Near-future plans call for tools for creating tables and for generating indexes and tables of contents. Manhattan Graphics, 914/725-2048.—D.L.

News



READYSETGO VERSION 6'S
OBJECT-ANCHORING
PROVIDES PRECISE CONTROL
OVER OBJECTS'
POSITION ON THE PAGE.

CMS's High-Capacity Drives

Addressing the need for ever-more-capacious hard drives, CMS Enhancements has unveiled its Platinum II series of drives ranging from 660MB to 2.1GB. The storage devices have fast average access times, ranging from 8ms to 14.5ms.

CMS has begun shipping the Platinum II drives at list prices from \$3995 for the 660MB model to \$8990 for the 2.1GB model. CMS, 714/222-6000.—T.M.



TURKEY SHOOT

DESIGN FLAWS NOTED

Microsoft Works 3.0 Works will allow itself to be installed only on your start-up volume (though it can be moved to a different volume after installation). Doesn't this sound like a good reason to throw away some junk on your hard drive?

FileMaker Pro 2.0's Data-Export Is it Mac, or is it Windows? When exporting data for a mail merge, blank spaces between words in the field names are mysteriously replaced with underlines. Nifty: now your mail merge templates can't read in the data.

More FileMaker Pro mail merge mysteries: heaven forbid you should have blank fields in your database, because they'll come out the other side of the black box with double quote marks where once was void. Some word processors will read the quote marks as data and happily enter them in your mail merge; others will read them as extra fields and move your real fields over.

Macworld will send you a Turkey Shoot T-shirt if we shoot your turkey in this column. See *How to Contact Macworld*.

Looks like Mac users just got



The new generation HP LaserJet 4M printer.



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.

LaserJet

4M

4M 4M 4M 4M 4M

True 600 dpi creates rich, full-dimensional text and graphics.

Smoother 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 users, and 35 Intellifont and 10 TrueType typefaces for PC users produce a broad range of document styles.

At last, Hewlett-Packard introduces a laser printer built specifically for the Mac from the ground up—the new LaserJet 4M. A laser printer for Mac users with everything you expect. And, more importantly, everything you need. From built-in PostScript Level 2 software from Adobe and 6 MB of memory, to standard LocalTalk and optional EtherTalk. Features which make certain this new generation in laser printing is ready-made just for you.

The finest print quality in its class.

In addition to complete Macintosh compatibility, the LaserJet 4M printer also delivers the finest print quality of any 600 dpi machine available—thanks to



Faster printing of complex documents.

their very own HP LaserJet.



HP's microfine toner, Resolution Enhancement technology, and an advanced engine expressly engineered for 600 x 600 dpi.

New generation features mean you will lose no time getting your work onto the page. A new RISC processor and 6 MB of standard memory accelerate formatting and I/O speeds, so complex PostScript language and graphics files are rendered faster and more clearly than ever before.



6 MB of memory built in.

Greater flexibility.

But this wouldn't be an HP-caliber breakthrough if the innovations weren't across the board. That's why, even though the new generation LaserJet 4M printer is built for the Macintosh, it will perform for DOS and Windows users as well... automatically. Automatic

language switching (between PCL 5 and PostScript) and three hot I/O ports (serial, parallel, and LocalTalk) make sure users are able to share the printer simultaneously. Without waiting.

Also, because of the LaserJet 4M printer's two integrated paper trays (total capacity 350 sheets) and optional 500-sheet tray and power envelope feeder, you will save time, avoid paper-handling hassles, and gain flexibility.

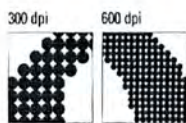
HP quality and reliability.

The new generation LaserJet 4M printer lets you enjoy the one particular no other Macintosh laser printer can offer—the renowned quality and reliability which comes with owning an HP peripheral. Not



Increased paper handling.

to mention our outstanding customer support,



Four times the dots for better resolution.

where information about how to get the most from your printer is never more than a phone call away.

Surprisingly affordable.

Perhaps the most remarkable attribute of the new LaserJet 4M printer is the price—\$2,999*.

A breakthrough in its own right. So call 1-800-LASERJET (1-800-527-3753), Ext. 7135 to receive a print sample** and comparison disk to see the quality for yourself.† Or visit your nearest authorized HP dealer and see the printer built to add some polish to your Apple.



HEWLETT
PACKARD

**To have a LaserJet 4M printer data sheet sent immediately via fax machine, call 1-800-861-1667 from your touch-tone phone. In Canada, call 1-800-387-5807, Ext. 7135. Adobe and PostScript are trademarks of Adobe Systems Incorporated which may be registered in certain jurisdictions.

DOUBLE THE SPEED OF YOUR LC/LCII FOR ONLY \$599

ONLY ONE OF THESE COMPUTERS IS USING AN ACCELERATOR DESIGNED SPECIFICALLY FOR THE LC



**Daystar™ Universal Power Cache
+ Required Additional Adapter**
8.0+ Watts Power Consumption
2 Boards/36 Components
Cumbersome Installation



Extreme Systems™ IMPACT 030

3.9 Watts Power Consumption
1 Board/18 Components
Simple Plug-in Design

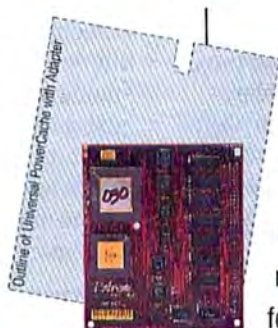
Make sure the LC accelerator you choose isn't meant for a IICI

Because the Extreme Systems' IMPACT™ 32MHz accelerator is designed specifically for your LC/LCII, no additional adapters are required and installation is literally a snap. The IMPACT's low 3.9 watt power usage meets Apple's 4.0 watt limit for the LC's expansion slot, so it won't shorten the life of your computer's power supply. By comparison, Daystar's™ "Universal PowerCache + Adapter-fits-all" notion consumes 8.0+ watts. *Ouch!*

With the IMPACT installed, your LC or LCII will perform 200-300% faster, exceeding the

speed of a Mac IIci! An optional math co-processor is available for just \$99, making performance on math intensive applications even faster!

Even though we've been designing and manufacturing quality accelerators for over four years, we may be new to you. For your peace of mind we offer a 30-Day Money Back Guarantee and a 3-Year Limited Warranty. These assurances are expressions of confidence in our product quality and our commitment to you. So when you feel the need for speed, don't just buy a name. Buy great design. Demand quality. Buy IMPACT.



EXTENDER
Upgrades your LC with an 030 processor. Allows use of Virtual Memory. Optional Math co-processor.

W/ FPU
\$149 \$219



VANDAL
IIfx speed for your SE. FPU, memory slots and video standard. Supports many Dual and Full page monitors.

33MHz 50MHz
\$699 \$999



SEE US AT
**MACWORLD
SAN FRANCISCO
BOOTH 140**

Extreme
S-Y-S-T-E-M-S

**ORDER
DIRECT**

"ENGINEERED AND MANUFACTURED IN THE USA"

1-800-995-2334

EXTREME SYSTEMS • 1050 INDUSTRY DR. • TUKWILA, WA 98188
PHONE: (206) 575-2334 • FAX: (206) 575-3928 • AL: EXTREME.SYS
MASTERCARD AND VISA ACCEPTED. PRICES ARE SUBJECT TO CHANGE. ALL TRADEMARKS ARE PROPERTY OF THE RESPECTIVE OWNERS.

Circle 142 on reader service card

Falcon Flies in Color

What if they gave a war and nobody came? Well, from the cockpit of your F-16 in Spectrum HoloByte's Falcon MC flight simulator, you could wage war against your own Mac. And you'd be ready if the enemy did challenge your air space by logging on across the office network or via modem.

In addition to multiuser capability, the new Falcon runs in color (in fact, it requires a color Mac), and its terrain is rendered in 3-D. It has new weapons and new missions; and for lovers of the martial life, the new



NO GROUND-FIRE TO PROTECT THIS BRIDGE. NOTE HOW FALCON MC'S TERRAIN APPEARS IN THREE DIMENSIONS.

version is packed with detail about the planes, your stable of pilots, mission briefings, and so on. Falcon MC will list for \$69.95. Spectrum HoloByte, 510/522-3584.—D.L.

The Ultimate PIM?

No one quite agrees on what personal-information-management software is supposed to be, but ProVue's Power Team covers just about every possibility.

To the standard phone book, calendar, and to-do list, Power Team adds a checkbook manager, an expense-report generator, a mailing list and correspondence manager, and a calculator. Though each module is a separate database, information from each module is available in all other modules. Perhaps Power Team's most interesting feature is its text-parsing ability—for example, type "lunch with Sue on Friday" and Power Team creates an appointment at noon on Friday and puts Sue's name in it.

Power Team is \$149.95. It uses the new version of ProVue's very fast database Panorama, which lists for \$395. Version 2.1's new features are mostly aimed at high-end users, with calendar functions, improved text parsing, advanced printing controls, many new macro commands, and new template- and form-design features. ProVue Development, 714/892-8199.—D.L.

Radius Board

Speeds Photoshop

The Radius DSP Booster is a piggyback board for the Radius Rocket accelerator that speeds the filter processing of Photoshop by as much as 800 percent on a Quadra 950, according to the company. Intended for users who regularly manipulate files of 20MB or more, the DSP Booster board contains two digital signal processor chips that compute up to 66 million floating-point math operations per second.

The DSP Booster, which works with Photoshop 2.5, comes with modules for Unsharp Mask, Sharpen, Sharpen More, Find Edges, Blur, Blur More, and Gaussian Blur. It was expected to ship by February and list for \$899. Radius, 408/434-1010.—T.M.

68060 to Overpower the PowerPC

While attention has been focused on the prowess of the upcoming PowerPC RISC processor, Motorola has been working quietly on a powerful successor to the 68040, the 68060, that will outperform the first PowerPC to be released, the PowerPC 601. Motorola's 68060 will perform in the range of 100 million instructions per second (MIPS), compared with the 29 MIPS of a 68040 with a 33MHz clock rate. Because the 68060 will be faster than the PowerPC 601, the 601 will be relegated to a mid-range Mac, while the 68060 will get a glamour job in a line of high-end Macs in early 1994, according to industry sources. The 68060 employs super-scalar execution, that is, the ability to perform two instructions per clock cycle. Motorola plans volume shipments of a 50MHz 68060 in early 1994, with a 66MHz chip to follow. Motorola skipped development of a 68050 in favor of the more radical 68060 design.

—JONATHAN CASSELL

News

First Silicon on PowerPC

IBM and Motorola recently produced the first working prototypes of the PowerPC 601, which will be the first model in the PowerPC line of RISC microprocessors that will be the

brains of a future generation of more powerful Macintoshes. The two companies began working together on the project a little

more than a year ago, when the Apple-IBM-Motorola alliance was announced.

The PowerPC 601 microprocessor is considerably more powerful than Motorola's existing 68040 microprocessor, which is used in Apple's Quadra models. The 50MHz PowerPC 601 performs at a very preliminary SPECfp89 (Systems Performance Evaluation Cooperative floating-point) rating of 60, and at a SPECint89 (integer) rating of 40. The 66MHz version of the same chip operates at a preliminary SPECfp89 of 80 and SPECint89 of 50, according to an IBM spokesperson.

IBM and Apple are both examining and testing the early chips now, according to spokespeople for both companies. IBM expected to come out with a non-Mac system using the new processor by the end of 1993, while Apple said its first PowerPC-based Mac should appear in early 1994. Other companies will also design systems around the new chips. IBM and Motorola are working on three more members of the PowerPC microprocessor family that will be even faster.—T.M.



DOROTHY CARICO SMITH

DESKTOP LIBRARIAN

Books for the Macintosh Reference Shelf

• *The Macintosh Bible*, 4th edition, by Arthur Naiman, Nancy E. Dunn, Susan McCallister, John Kadyk, and a cast of thousands (1992, \$32). The latest edition of the widely acclaimed ultimate collection of Macintosh tips. This 1233-page behemoth contains 800 pages of new material on just about every topic known to Macintosh. Includes a 68-page glossary, a list of products and companies, an index, and disks with 3MB of freeware and shareware applications. Price also includes three free updates. Peachpit Press, 510/548-4393.



THE MACINTOSH BIBLE, 4TH EDITION, AND THE MACWORLD MUSIC & SOUND BIBLE.

• *Macworld Music & Sound Bible*, by Christopher Yavelow (1992, \$37.95). This even more enormous volume (1398 pages) starts with the basics of Macintosh music and sound, then covers sound generation, organization, and editing; composition; notation; live performance; postproduction; film, video, and synchronization; multimedia; and education. Appendixes cover other reading materials, MIDI, and manufacturers of sound and music equipment, among other topics. Includes an index. IDG Books Worldwide, 415/312-0650.—T.M.

SEE STATVIEW AT MACWORLD EXPO, BOOTH #435

StatView 4.0 is Here!

Introducing the first integrated data analysis and presentation graphing system for the Macintosh.

StatView® 4.0 is the first software package that offers in a single application all the tools that scientists and researchers need to analyze data and present results.

StatView 4.0 integrates data management, statistical analysis, graphing, drawing, and color presentation into one powerful, elegant program. From data entry to presentation, StatView 4.0 dramatically saves you time and effort.

HOW DO YOU ANALYZE YOUR DATA?

Does this sound familiar?

- First, you collect data in a spreadsheet where you perform transformations and mathematical manipulations
- Then you export data from your spreadsheet and import it into a statistics package to perform statistical analyses
- Then you use a third program to graph your results
- And finally, you use a drawing program to prepare your tables and graphs for presentation

Each transfer adds time to your project and may introduce errors at any point. Plus you have to be an expert in at least four packages to get your work done. And if a mistake is made, you have to start all over again.

Now there's a better way.

THE SOLUTION IS INTEGRATION

Abacus Concepts has created the first truly integrated productivity tool for researchers and data analysts. You no longer need separate spreadsheet, statistics, graphing, and drawing packages to do your work.

StatView 4.0 frees you from the unnecessary, time consuming and repetitive tasks that you face with every project — tasks which are unavoidable when using conventional data analysis software.

BUILT ON THE BEST

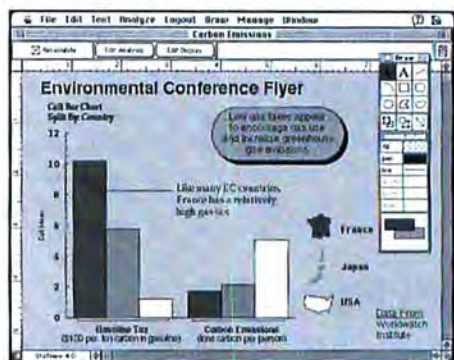
Five-time winner of the Macworld World Class Award, the StatView line is the most popular and highest rated statistics software on the Macintosh. StatView 4.0 continues this tradition of excellence.

With StatView 4.0, you can save your work as templates, then reapply them to any data. As powerful as macros, creating templates is as easy as saving your results.

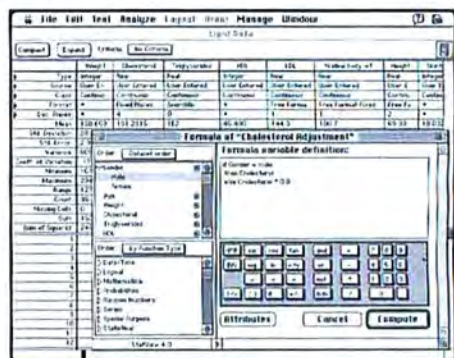
StatView 4.0 was developed using the latest object-oriented technology. This allows Abacus Concepts to deliver new statistical and graphing features as modular extensions. StatView 4.0 is just the beginning!

FIND OUT MORE

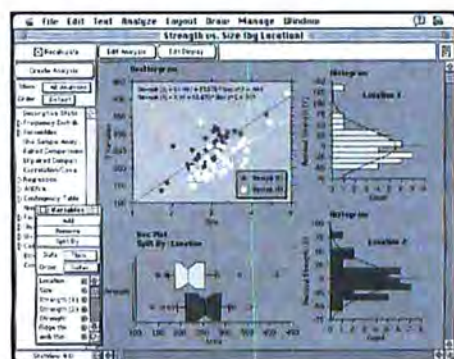
StatView 4.0 lists for \$595 (U.S.). Academic discounts are available. To learn more, please call Abacus Concepts at 1-800-666-STAT.



StatView 4.0's presentation capabilities rival those of the most powerful stand-alone graphing packages.



StatView 4.0's data management capabilities go beyond the features of conventional spreadsheet programs.



With StatView 4.0, you can save your analyses as templates and apply them to any dataset.

ABACUS
CONCEPTS

1984 Bonita Avenue, Berkeley, CA 94704-1038;
510-540-1949, 510-540-0260 fax.

Attention StatView Owners...

If you own StatView 512+, StatView SE+Graphics, or StatView II, you can move up to the next generation — StatView 4.0 — at an incredibly low price.

Call 1-800-666-STAT for details on this special limited-time offer!

© 1992 Abacus Concepts, Inc. StatView is a registered trademark of Abacus Concepts. All other trademarks are property of their respective holders. Overseas offices: France: (+33) 76-41-84-30; Switzerland: (+41) 32-23-54-65; Belgium: (+32) 25-34-45-35; UK & Ireland: (+44) 0 865-784800; Japan: (+81) 03-590-2311; Sweden: (+46) 08 - 753 22 23; Germany: (+43) 030 31 59 13-0; Australia & New Zealand: (+61) 03 326 5255.

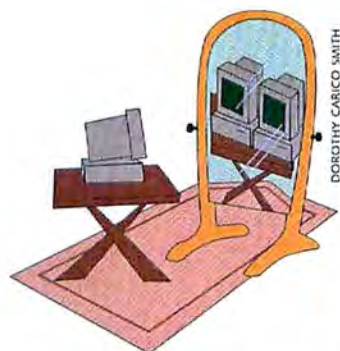
Long-Distance LANs

In the past, companies needing to connect remote offices have resorted to using poky 2400-bps or 9600-bps modems over dial-up lines. But Metropolitan Fiber Systems has been busily laying fiber-optic cable that connects 14 of the nation's largest urban areas, and the company's subsidiary MFS Datanet is leasing room on the fiber, making it possible for Macs and other computers in different buildings—or different cities—to connect as if they were all in the same office. Ethernet or token ring networks (or AppleTalk though an Ethernet network) can hook up through Datanet's High-Speed LAN Interconnect (HLI) and transmit at their regular speeds.

HLI pricing depends on configuration, but a typical situation might cost \$1000 per building for a one-time hookup charge, \$2000 per building for monthly access charges, and \$8500 per month for unlimited traffic at Ethernet speed. Slower speeds are available at less per month. MFS Datanet, 408/975-2200.—D.L.



CARVING A TRENCH DOWN THE MIDDLE OF A LOS ANGELES-AREA STREET TO MAKE ROOM FOR MFS'S FIBER LINES.



DOROTHY CARICO SMITH

Different Data Compression

Stacker is a utility that compresses data to squeeze approximately twice as much onto a hard drive. This requires a trick somewhat like keeping double books: the Macintosh innocently keeps track of where it thinks its files are, while Stacker manages the files' real locations and intercepts every request the Mac makes for files.

Because of the way Stacker allocates blocks, it is effective only on drives smaller than 1GB. Stac Electronics claims the Stacker way is more reliable because the Macintosh doesn't deal with the disk driver. Just in case, Stacker comes with a recovery utility.

Stacker is intended to be used with drives smaller than 1GB. Pricing is expected to be less than \$150. Stac Electronics, 619/431-7474.—D.L.

Portable Fax Modems

For the world travelers among us, two companies have recently introduced high-speed external fax modems for PowerBooks and other Macs. The products are the PM14400FX Pocket modem from Practical Peripherals and the aptly named WorldPort 14,400 Fax for the PowerBook from U.S. Robotics. Both small devices send and receive data at a basic rate of 14,400 bps, but can achieve a maximum rate of 57,600 bps by using the included V.42bis data-compression and V.42 error-correction protocols. The PM14400FX Pocket can also send and receive faxes at 14,400 bps; however, few existing fax modems support this fax transmission rate, so it may not be easy to take advantage of the greater speed. The WorldPort fax modem sends and receives faxes at the standard 9600-bps transmission rate. WorldPort comes with fax software and MicroPhone communications software. The WorldPort lists for \$699.

The PM14400FX Pocket comes with QuickLink II Fax software and has six pages of online help in ROM. The modem recognizes phone-credit-card prompting tones, making autodialing software more convenient. The Pocket modem lists for \$529.

Both fax modems were slated to ship in December. Both operate from batteries or through an included AC adapter. Practical Peripherals, 805/497-4774; U.S. Robotics, 800/342-5877.—T.M.



THE WORLDPORT 14,400 FAX FOR THE POWERBOOK (LEFT), AND THE PM14400FX POCKET.



BETA WAIT

Long-awaited products

ACIUS'S 4D Server

Shown publicly January 1991. Current ship date projected: after just-announced 4th Dimension 3.0 ships.

FoxPro/Mac

Fox Software discussed publicly winter 1990/91. Microsoft acquired Fox earlier in 1992, and says it will ship FoxPro/Mac "when it's ready."

Interleaf 5

Discussed publicly October 1990. No ship date projected.

Claris's MacWrite Pro

Announced spring 1991. Current ship date projected: end of 1992.

News

Plain-Paper Color Printers

Tektronix has introduced the Phaser 200e and Phaser 200i, two thermal-wax printers that use new technology to print on plain paper with excellent results. The new technology involves first laying down a primer coat that evens out the ridges and valleys in ordinary printer paper. The printers place the primer coat only on the parts of the paper that will

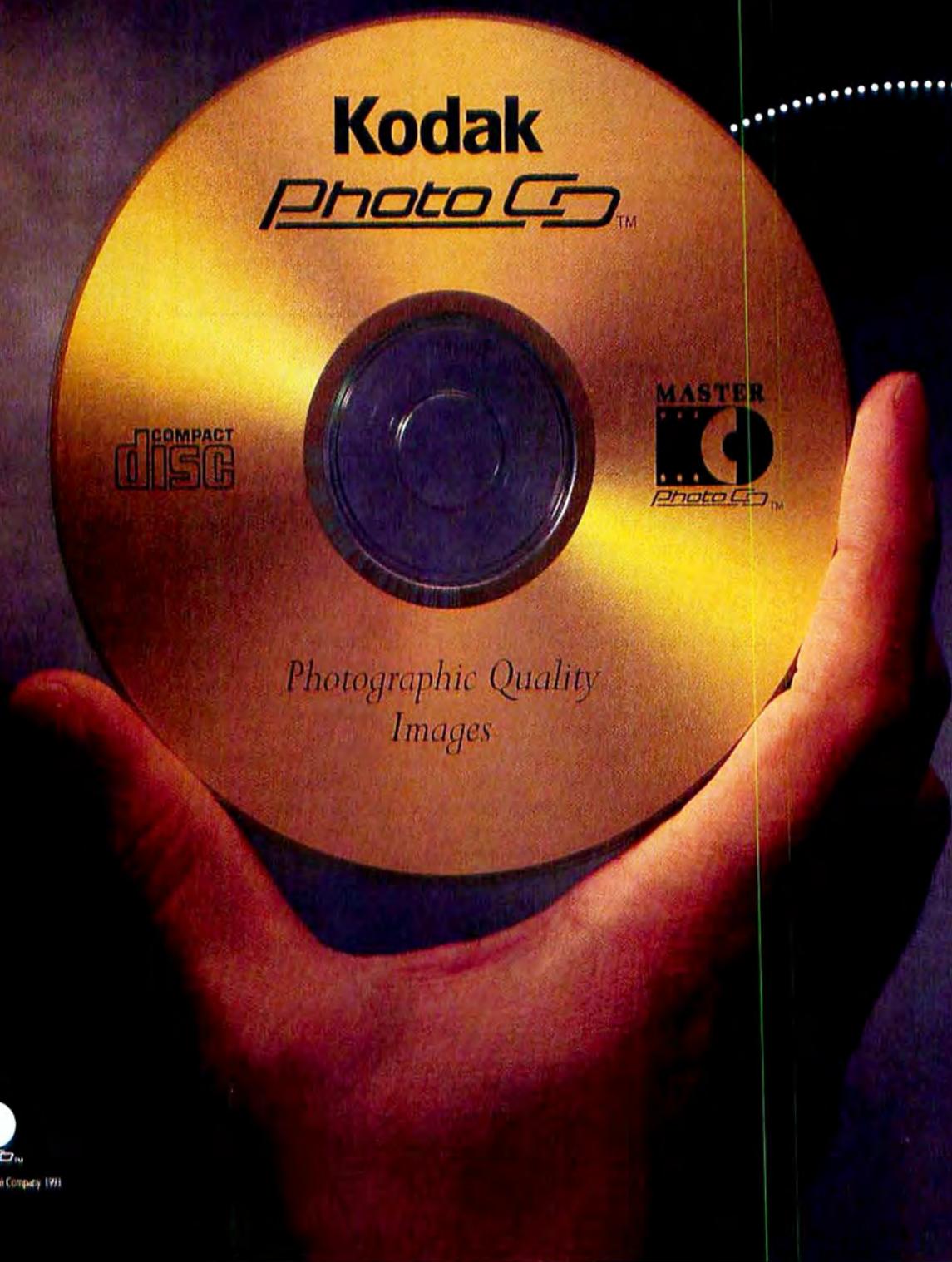


THE PHASER 200E IS A COLOR THERMAL-WAX PRINTER THAT PRODUCES 2 PAGES PER MINUTE.

be printed on later. Both printers output 2 pages per minute.

The Phaser 200e has a 16MHz 29000 RISC processor; comes with 4MB of RAM expandable to 8MB; and includes PostScript Level 2, 17 Adobe fonts, and HPGL. The 200e lists for \$3695. The Phaser 200i has the same features but with a 24MHz version of the processor, 6MB of RAM expandable to 14MB, 39 Adobe fonts, and a SCSI port. The 200i lists for \$5995. Both printers incorporate a serial port, a parallel port, and an AppleTalk connector; and both can be expanded to support TCP/IP and DECNET. The 200i can support an optional EtherTalk expansion. Tektronix scheduled first shipments of both printers for January 1993. Tektronix, 503/682-7377.—T.M.

NOW THAT THE POWER OF IMAGING IS YOURS,



©Eastman Kodak Company 1991

TAKE IT FOR A SPIN.



Introducing The Power Of High Resolution, Photo CD Images To Your Desktop.

KODAK Photo CD products will change the way you use images forever. For the first time, you have the power to easily and affordably transfer 35 mm photo images onto a Photo CD disc to use on your desktop. In bold, beautiful color.



Just Add High Powered Software.

To maximize your Photo CD images, Kodak has created a family of powerful, easy to use imaging software products. They are compatible with TIFF, PICT, EPSF and popular Windows formats. So you can access a world of images with ease.

Simply The Easiest Way To Manage Images.

KODAK SHOEBOX Software gives you the

power to catalog, index and search thousands of high quality images and multimedia objects as easily as point and click.

The Power Edge For Photo Enhancement.

KODAK PHOTOEDGE Software makes it easy to zoom, crop and adjust exposure. Sharpen and soften images. Adjust color tone, and create dramatic effects.

The Power To Design Intuitively.

With KODAK RENAISSANCE Design Software, you can design intuitively using a multitude of graphics in ways you never imagined. Insert a photographic image into your headline type. Zoom in. Crop. Change type on a whim.



Put A New Spin On Your Imaging Productivity.

For more information, call us today at 1-800-242-2424, ext. 53. Ask your local software dealer for a demonstration. To learn where you can have your 35 mm images transferred to a Photo CD disc, call 1-800-242-2424, ext. 36.

This advertisement was designed using KODAK Photo CD Access and KODAK RENAISSANCE Design Software. Kodak, Shoebox, PhotoEdge, Renaissance and the Photo CD symbol are registered trademarks. The Photo CD symbol is for use by Kodak and its licensees only and may not be reproduced without permission from Kodak.



The Power of Imaging Is Yours.



When it comes to powerful accounting systems for the Macintosh, we offer a world of difference.



Introducing VISUAL Accounting™ from RealWorld.

If you've been waiting for a comprehensive accounting system designed for the Macintosh®, welcome to the world of VISUAL Accounting.

This innovative system offers power and reliability to small and large companies with high-end accounting needs—and it takes full advantage of the Macintosh's graphical user interface and other features. There's simply nothing else like it on earth.

VISUAL Accounting from RealWorld is modular by design, so you can purchase the whole package or select one or two modules to solve your immediate accounting needs. And, as your business grows and future needs arise, you can complement your system with additional modules.

RealWorld has already made a world of difference in over 350,000 businesses, and we can make a difference for you. To learn more about VISUAL Accounting from RealWorld, call us at 1-800-678-6336.



RealWorld Corporation

Quality software that meets the needs of "real world" users.

RealWorld is a registered trademark of RealWorld Corporation. VISUAL Accounting is a trademark of RealWorld Corporation. Macintosh and the Apple logo are registered trademarks of Apple Computer, Inc.

Circle 229 on reader service card

Photoshop Gets Faster

Adobe is upgrading its photo-editing tool Photoshop to version 2.5, giving it much greater speed for many common tasks and a set of new features.

Two factors contribute to greater speed: a rewritten engine and what Adobe calls subsampling, which lets users experiment on a low-resolution version of an image, applying a complete transformation only once.

In the new-feature department: dodge and burn tools to lighten and darken selected parts of an image; support for using any tool to create a selection and generate a mask; collapsible tool palettes; support for an unlimited number of brush shapes; strokable and editable paths; a channel-editing dialog box; and Photo CD and JPEG support.

Photoshop's price is unchanged at \$895. Adobe, 415/961-4400.—D.L.

Animated Electricity

The high-end animation and rendering package ElectricImage Animation System (EIAS) is being upgraded to version 1.5. New rendering capabilities include shadow casting from multiple lights, transparency and environment mapping, along with tubular, foggy, and several kinds of glow lights for lighting scenes. The animation module adds many high-end features including a choice between a spreadsheet or a time-line interface; motion triggered by events; support for hierarchically linking lights and cameras to



PREPARING FOR A VIRTUAL CONCERT: STAGE MOCK-UP CREATED IN ELECTRIC IMAGE.

moving objects; and the ability to link objects temporarily—useful, for example, to animate a person picking up an object and then setting it down. A new project window is designed for editing animations by frame or by time.

EIAS lacks a modeler, so users must create objects in another program and import them (EIAS imports almost anything). EIAS is copy-protected and costs \$7495 from Electric Image, 818/577-1627.—D.L.

In Control's Calendar

When the first version of In Control shipped it was resolutely anticalendar and totally unlike anything calling itself a PIM (personal information manager). Instead, it merged an outliner's usefulness in planning with the control over information provided by the row-and-column structure of a flat-file database.

Between versions 1 and 2, Attain Software realized that people have not only things to do but times to do them: In Control 2 merges a calendar and to-do list into the outliner/database. The new version also adds FileMaker-like scripts, more control over the report-generator's printing capabilities, and improved searching.

In Control's price remains \$129.95. Attain Software, 617/776-1110.—D.L.



DRAWING A TO-DO ITEM IN IN CONTROL'S CALENDAR. COMPLETED ITEMS CAN BE MARKED OFF IN A CHECK BOX.

News

Stacking SCSI Drives

Envivio's SmartStack is a new approach to adding up to seven external SCSI drives without cluttering your desk with a lot of boxes, SCSI cables, and power cords. The subsystem is built on the SmartSource base unit, which contains a fan, a 120-watt power supply, and two 50-pin SCSI connectors. The power supply drives all the devices in the SmartStack. The SCSI connectors plug into the first drive module, which has its own pass-through SCSI connectors for the next drive to plug into. A cover unit contains a cable that links the two connectors on



THE SMARTSTACK FROM ENVIVIO CAN STACK AS MANY AS SEVEN SCSI MODULES.

the highest drive to each other, closing the SCSI loop. The cover unit also contains a second fan for more cooling.

The first SmartStack modules will include hard drives, erasable optical drives, and DAT drives (one device per module). Envivio is working on modules for devices such as modems, SCSI-to-Ethernet controllers, and CD ROM drives. The first hard drive modules will range in capacity from 105MB to 1GB. The SmartSource base unit and cover will retail for \$249. A 127MB module will list for \$699, while a 1GB module will be \$2649. SmartStack was slated to begin shipping in January. Envivio, 612/339-1008.—T.M.

TREND

Pinnacle's Paperless One

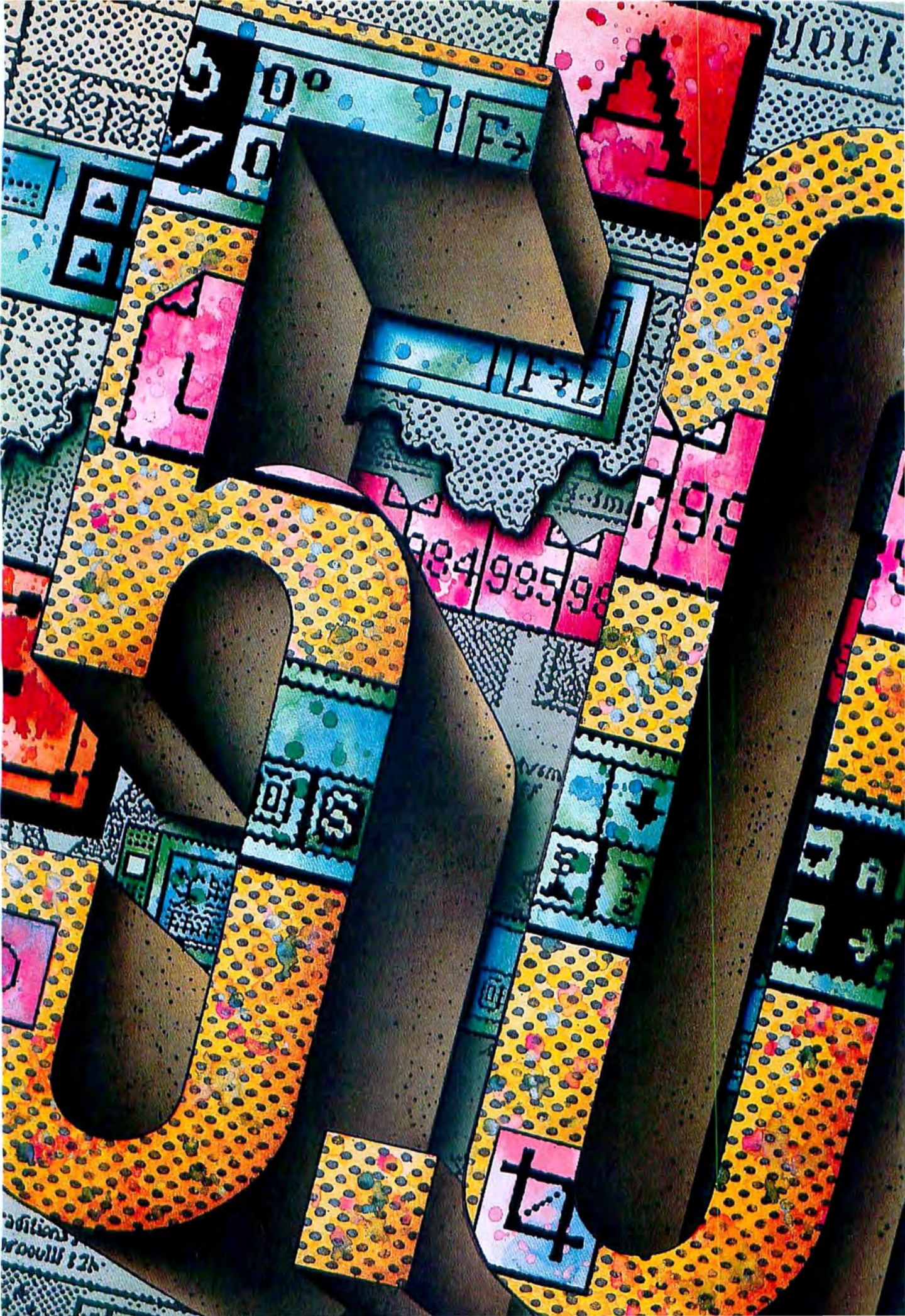
Distressed by the amount of paper your office consumes every day? Pinnacle Micro Imaging, a new division of Pinnacle Micro, claims to have a relatively fast, affordable solution with its new Paperless 1 Imaging System.

The system includes an automatic scanner, a rewritable optical drive, a 600MB disc, and an operating system. Users scan in documents or images at about 15 seconds per page, and can save multiple documents as a group or as individual files for later retrieval over a network. The software doesn't support optical character recognition, so scanned images of paper documents aren't searchable or editable as text files, but they can be retrieved using file names and keywords. To cut down on storage overhead, the system saves only a single copy of each document or image, transmitting pointers to the file rather than transmitting the file itself when multiple copies are needed.

The Paperless 1 Operating Software supports administrative functions, password security, template (forms) design, and electronic mail. The entire system lists for \$6995, including all hardware and software. Additional scanners, drives, and discs can be added as needed. The company says the Paperless 1 Imaging System should ship by the end of January. Pinnacle Micro Imaging, 714/727-3300.—T.M.



THE PAPERLESS 1 IMAGING SYSTEM INCLUDES AN OPTICAL DRIVE AND AN AUTOFEED SCANNER.



IF IT'S POWER YOU WANT, IT'S POWER YOU'LL GET.

COMING SOON—A BOLD NEW ALDUS PAGEMAKER.

Greater control. Unrivaled precision. Effortless integration. Unparalleled versatility. All with the intuitive feel of Aldus® PageMaker®. It's a bold new way of looking at the industry leader.

As a registered PageMaker user, you'll be among the first to get the news about the biggest PageMaker upgrade ever.

If you're *not* a registered user, give us a call right away.

Once registered, you'll not only receive the early scoop on 5.0, you'll also get 90 days of technical support, beginning with your first service call.

So get ready for a big jolt. In power, productivity, *and* creativity.

REGISTER TODAY BY CALLING ALDUS AT: (800) 685-3510.

If you're already registered, your 5.0 upgrade information will be reaching you soon.


If you're thinking of buying an existing version of PageMaker, don't wait. Buy now and you'll get a free 5.0 upgrade.

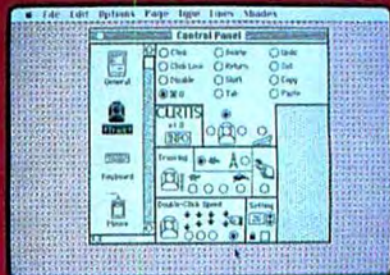


ALDUS PAGEMAKER 5.0 ABSOLUTE POWER FOR THE CREATIVE PROFESSIONAL.

Offer for 90 days of technical support is available to all newly registered PageMaker users. ©1993 Aldus Corporation. All rights reserved. Aldus, the Aldus logo, and PageMaker are registered trademarks of Aldus Corporation. Offer is good only in the U.S. and Canada and is subject to change or termination without notice.

*ADB Version for
Macintosh[®] SE/II*

One look tells you, MVP Mouse is not just another trackball. Its ergonomic 3-button design responds to your every impulse as if it were an extension of your hand. Its 200 DPI resolution and automatic acceleration give you pinpoint cursor control *plus* the ability to "jump" across the screen with just a short, quick movement of your fingers. And its powerful control panel lets you select preset tracking and double-click speeds . . . or create your own! And it gives you dozens of button functions to choose from, including a Custom Command that simulates any -(letter) keyboard command.



You can assign any command to any button, quickly and easily on-screen. Optional Foot Switch acts as 4th command button.

#MVP-1 Retail \$149.95

For the Curtis dealer nearest you
call (603) 532-4123, Ext. 42

Manufacturing Company, Inc.

CURTIS

30 Fitzgerald Drive, Jaffrey, NH 03452

© Curtis Manufacturing Company, Inc.

MVP Mouse is a trademark of Curtis Manufacturing Company, Inc. Macintosh is a registered trademark of Apple Computer, Inc.

Circle 20 on reader service card

Using Your TV as a Monitor

Lapis Technologies has unveiled its L-TV, an NTSC interface board that lets LCs, LC II's, and Performa 400s use a standard television set as a monitor. The company uses convolution software to prevent the flickering of 1-pixel-thick lines that normally occurs when transferring a noninterlaced digital image to the interlaced analog display of



THE L-TV BOARD FROM LAPIS LETS SOME MACS USE A STANDARD TV AS A MONITOR.

a television. Lapis also includes its TV-Show presentation software, which lets a presenter control the presentation with an Apple 12-inch RGB display while using a television for the presentation itself.

The L-TV board works in 1-, 2-, 4-, 8-, and 16-bit modes at resolutions up to 640 by 480. It offers a socket for a 68882 math chip. It connects to the television with a standard coaxial cable that can be up to 25 feet long, according to the company.

First shipments of the NTSC interface board began in November. The L-TV board has a suggested list price of \$349. Lapis, 510/748-1600.—T.M.



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

INIT 1984

TYPE: Virus
FIRST LISTED IN VIRUS WATCH: 8/92
INFO: Infects INITs; becomes active only on Friday the 13th
IMPACT: Destroys files and changes file and folder names and attributes to random garbage

Code 252

TYPE: Virus
FIRST LISTED IN VIRUS WATCH: 8/92
INFO: Displays a message telling user it is destroying contents of hard drive
IMPACT: After displaying message, it deletes itself without causing damage; infected Macs may behave erratically

Learning to Market

American Demographics magazine has published SMART-disk, or Strategic Market Analysis Resources and Techniques, a \$189 primer on market analysis.

Topics covered in the primer include how to use demographics to segment and target certain markets; how to choose advertising media based on consumers' life-styles; and where to open a new retail or service business.

SMART-disk also looks at long-term consumer trends that affect marketing, and provides a list of sources for demographic data, computer-based market-analysis systems, and books (with ready-to-print order forms) on marketing topics including how to market to the elderly or to the environmentally conscious and how to prepare for long-term real estate trends. *American Demographics* is at 607/273-6343.—D.L.

News

Great Plains' New Plans

Great Plains is making a big move for the stodgy accounting software business: it is bringing out a new product line with a graphical user interface.

The new Great Plains Dynamics products divide up accounting into small, specific modules. For example, the financial series starts with a general ledger and has add-ons for cash, multiple currencies, financial analysis, and consolidating subsidiaries. Other series provide inventory, payroll, sales, and

purchasing modules. A report writer is built in, and users can alter a form's appearance without breaking its

underlying logic. Programming tools for real developers can produce Mac- and Windows-compatible systems. Pricing for Dynamics modules varies widely.

Great Plains says it will maintain its traditional character-based products and plans to publish version 7, a major upgrade of Great Plains Accounting, sometime in mid-1993. Great Plains Software, 701/281-0550.—D.L.



DOROTHY CARICO SMITH

TREND

Envivio Dock for Duos

Designed to provide portable expansion capability for PowerBook Duo systems, the Dynamic Duo from Envivio is a very small and inexpensive docking station. The main feature of the Dynamic Duo is its 16-bit color graphics adapter, which supports 32,000 colors on 12-inch or 13-inch monitors and 256 colors on 16-inch monitors. It's compatible with Apple monitors measuring from 12 inches to 16 inches diagonally, and with the Radius Color Pivot monitor. The Dynamic Duo also works with VGA monitors and LCD projection panels.

The docking station, which is about the size of a deck of cards and weighs about 5 ounces, adds 16-bit stereo sound capability to a Duo notebook system. An optional NTSC television adapter can be added to the Dynamic Duo. Slated to ship in January, the Dynamic Duo will carry a list price of \$600. Envivio, 612/339-1008.—T.M.



WITH TIMBUKTU 5.0, YOU CAN WATCH THE SCREEN OF A WINDOWS MACHINE FROM YOUR MAC OR TAKE CONTROL OF IT.

Timbuktu Talks to Windows

Timbuktu allows you to look over a network to watch a remote Mac's screen, transfer files back and forth, use the remote Mac's printers, or even take control over it, using your mouse on its screen. Timbuktu version 5.0 lets Macs and machines running Windows perform all those functions.

Timbuktu manages file naming for transferred files. It runs on any AppleTalk-compatible network, including Ethernet and token ring. Version 5.0 comes as a desk accessory for System 6 and as an application for System 7. Under System 7, connection files can be saved and reused to automate log-ons.

Timbuktu 5.0 lists for \$199 per machine; pricing is less per unit for multiple copies. Farallon, 510/596-9100.—D.L.

If this reminds you of your PowerBook after an hour or so, make its battery charge last up to twice as long with The Norton Essentials™ for PowerBook. It increases battery charge, makes your PowerBook easier to use, and keeps files synchronized – all without sacrificing performance. To learn more, dial FAST FAX 1-800-554-4403.*

**THE NORTON
ESSENTIALS™
FOR POWERBOOK**
SYMANTEC.

*Option 1, document 462. Norton Essentials™ is a trademark of Symantec Corporation. ©1993 Symantec Corporation.

Inventing Medicine

Stumbling upon new medicines has long been a matter of a chemist's intuition and some lucky guesswork, but new software called Catalyst is intended to make inventing medicines a systematic process.

Catalyst can import a 2-D model of a molecule from standard chemical databases and show it in both 2-D and 3-D views. Chemists can click and drag to add atoms and reconfigure the molecule, while Catalyst validates the new molecule's bonds and structure and makes sure its folding fits biological constraints. Catalyst can search a 2-D database for molecules whose 3-D configurations fit into a certain receptor the chemist is trying to match, or the program can perform searches based on abstract criteria such as "greasiness" and charge.

A workbench metaphor emulates a chemist managing a laboratory's work flow, and a special command can clean up sloppily constructed molecules for publication. Catalyst runs on Mac-Silicon Graphics networks; the SGI machine does the serious number-crunching. Catalyst is \$30,000 per user from BioCAD, 415/903-3900.—D.L.



BUG REPORT

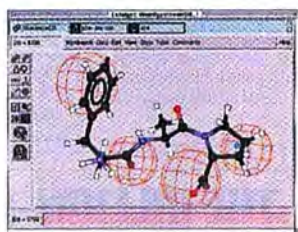
Aldus Persuasion 2.12 Text can move out of place when files are converted from version 2.0 to version 2.1. Aldus says this is caused by switching from line-based leading to more accurate point-based leading, and cannot be fixed.

Now Utilities 4.0 Now Menus disables menus in some applications. The problem is fixed in version 4.01, available free online or for \$6 by mail to registered users on request.

Microsoft Excel 4.0 The add-in function RANDBETWEEN is supposed to generate evenly distributed random integers, but it generates too few of the lowest integers in the range.

If you save an Excel file as a text file, numbers in any column with a width of zero disappear (but letters in zero-width columns survive). Microsoft says it has no immediate plans to release a bug-fix for Excel.

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.



CATALYST. MESH SPHERES SHOW WHERE A CHEMIST'S MODEL CORRESPONDS TO ATOMS OF A REAL MOLECULE.

Software Hooks

PowerBooks to Nets

Farallon Computing has come up with two related software products for linking AppleTalk devices to Ethernet networks or token ring networks without an expensive router. LocalPath works with AppleTalk devices in general, while PowerPath lets you connect a PowerBook to a network.

With LocalPath, you can connect a net of up to eight LocalTalk devices to a host Macintosh. LocalPath runs in the background while accessing an Ethernet or token ring network. The host Macintosh slows slightly, but can still be used for normal applications, according to Farallon.

The PowerPath application works the same way, but it's intended for adding a single PowerBook to the network. Both LocalPath and PowerPath use forwarding software technology, essentially a forwarding engine that eliminates routing tables and other network-management overhead.

LocalPath lists for \$199 and PowerPath lists for \$149 including connectors. Both products began shipping in November. Farallon, 510/596-9100.—T.M.

News

TREND

Stripping:

The Final Frontier

Stripping—positioning the film for individual pages so that signatures are printed, folded, bound, and trimmed correctly—is the most labor-intensive and most computer-resistant step in the prepress process. Ultimate Technologies' goal with Impostrip is to bring stripping into the modern era, out of the darkroom and onto the Mac, to eliminate tedious and time-consuming hand labor.

In Impostrip's job-setup window you describe how many pages a print job is, the trim size, the binding, and so on, and in the signature-setup window you describe the press size, margins, gripper area, and other details. Impostrip then im-



MACS MAY REPLACE OPAQUE AND RAZOR BLADES SOMEDAY, BUT STRIPPING WILL ALWAYS REQUIRE A TRAINED EYE.

ports the files—it supports PostScript files created by most publishing software from PageMaker or QuarkXPress to Xyvision and Tex—and runs out camera-ready imagesetter film. Price ranges from \$1995 to \$29,995 based on the number of import filters. Ultimate Technologies, 514/954-9050.—D.L.

Survey: Desktop Publishing

What types of graphics do you use in your DTP files?



How do you output your DTP files?



Based on 381 respondents to a 1992 Macworld reader survey who use publishing software on a Macintosh. Multiple responses were allowed.

Create Your Own Multimedia Productions And 3-D Renderings!

MacRecorder Sound System Pro. Turns your Mac into a complete audio workshop! Record, edit and play back live or recorded sound to add enormous impact to multimedia presentations, training materials and documents with voices, music and sound effects. Nothing smacks an audience like great sound — it keeps them right there!

The MacRecorder Sound System Pro digitizer features a built-in microphone, external microphone jack, line input jack and input level control. Just plug the digitizer into your Mac's printer or modem port, open the mic and start recording! The software included, called SoundEdit Pro, acts as your mixing board to create soundtracks, voice-over narrations and great sound effects. The sound appears on your screen as a waveform for easy editing. Cut and paste sound clips (just like cutting and pasting text) and modify sounds with a host of creative tools to create intriguing effects. Mix multiple tracks of music, sound effects, and voices to produce pro-quality, multi-track soundtracks for your presentations, interactive applications and more.

Magic — Multimedia Made Easy! Magic is appropriately named. Creating pro-quality multimedia productions is almost automatic! Create objects with MacDraw-like simplicity,

make them move along paths that you draw in seconds — lines, curves, circles and rectangles. Click and drag to change paths for custom movement. Great for animated bar, line and area charts and procedure flows. When you want to see what the animation looks like, just click "play." And Magic enables you to create run-time versions of your productions to distribute to others, along with a 2-disk ClipMedia sampler that includes music, backgrounds and animations.

NEW! DIRECTOR 3.1! Macromedia has packed a host of great new features into version 3.1, including enhancements to importing, interactive playback and exporting of QuickTime movies. Version 3.1 runs swifter than before, thanks to a new version of Macromind Accelerator included FREE — formerly sold separately for \$195. Macromind Accelerator also smooths out animations. There's also an expanded Object Sensitive Help System.

With QuickTime, Director 3.1 really explodes with opportunities. New features enable you to easily integrate QuickTime movies into interactive Macromind Director productions — edit, playback and export QuickTime movies from Director files without any additional hardware, and import QuickTime movies as cast members!

Swivel 3D Professional 2.0. Swivel 3D Professional 2.0 is superbly designed, with an interface that enables you to move with blistering speed. Build amazing 3-D scenes with uncanny realism and almost effortless object handling. In fact, NASA relies on Swivel 3D Professional for scientific visualization, concept modeling and idea development. For print applications, Swivel 3D Professional exports Adobe Illustrator format, so views of models can be edited directly in Illustrator. Joe Lertola of TIME Magazine uses this method to create many of his infographics.

Rendering and output capabilities include fast, incredibly smooth shading, 24-bit color output capability, 24-bit image mapping, 8 independent light sources, environmental mapping, spectacular highlighting, RenderMan RIB output and AutoCAD DFX output.

ModelShop II. Why not present your spatial design ideas in



amazing 3-D?! Architects and designers are pouring it on with this amazing sketch and rendering tool that produces realistic models with incredible speed, pinpoint-precision and remarkable flexibility. Even the most complex models can be constructed using ModelShop II's 2-D

and 3-D objects (including cuboids, cylinders, walls, arcs, polygons and more). Light and shadows are completely at your command: adjust intensity, color and add an unlimited number of point and spotlights. Drawing and re-drawing is faster with ModelShop II's Layering.

ModelShop II includes an extensive library of elements (including many city locations) that can be added to your models in a snap.

Life Forms. Create sophisticated human motion animations with this new, easy-to-use package. Access shape libraries of figures in sitting, standing, jumping, sports and dance poses, and more. Life Forms automatically creates smooth human motion between any two positions you define. Add natural human motion to Swivel 3D, Macromind Three-D and Director productions. Save motion sequences as QuickTime movies.

MACROMEDIA

BDH2539 MacRecorder Pro	\$249.95
BDH2560 Magic	\$279.95
BDH2561 Director 3.1	\$749.95
BDH2554 SwivelMan (With MacRenderMan)	\$625.95
BDH2555 ModelShop II	\$625.95
BDH2556 LifeForms	\$359.95



Incredible colors, unbelievable resolution and striking output. This example uses stylized and rendered type as part of the design. Images so lifelike, they are real — amazing capabilities.

If Picasso, M.C. Escher And Ansel Adams Wrote A Software Program Together...

The all-new Aldus SuperPaint — Version 3.5 — combines superior, easy-to-use painting, drawing and image processing into one complete package. You can use it to create stunning business graphics, fabulous designs and unforgettable color images — without working in separate programs. And believe it or not, you can access 16.8 million colors without 24-bit hardware!

This is another Aldus award winner, enabling designers and businesspeople to communicate ideas with a palette of advanced tools and powerful functions. Combine the spontaneous expression of painting with the precise accuracy of drawing to create spectacular office forms, reports, presentations, brochures, illustrations and even the most complex charts. SuperPaint enables you to



breathtaking works of electronic art.

Of particular note is SuperPaint's ability to include high-resolution text in the draw layer

(previously only a designer's dream), the ability to create beautiful gradients — blending up to 256 colors! Also allows you to import/export TIFF and EPS images — even scan images directly into the program (images can be of any size, even with limited RAM; SuperPaint works with large images in virtual mode). SuperPaint is the ideal tool for creating images for presentations and on-screen demos. Complex charts leap to life with stunning color, scaling and transformations.

SUPERPAINT VERSION 3.5

BDH2604 Aldus SuperPaint New Version 3.5	\$133.90
---	----------



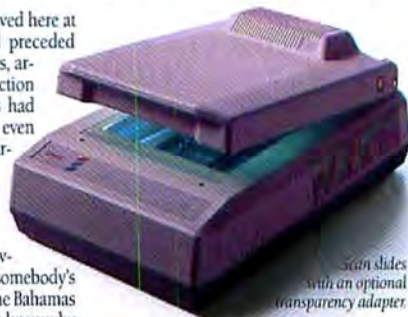
scan your sketches and then enhance them — or work from start to finish on-screen. Turn images into textures, mask and/or fill selected areas, and turn ordinary images into

THE BILLION-COLOR SCANNER!

When the UMAX scanners arrived here at Tiger, their reputation had preceded them. We knew that top designers, architects, artists, pre-press production houses and commercial printers had UMAX flatbeds. A few of us had even seen a UMAX in action. What surprised us was the prices. This low!

After plugging in the awesome UMAX UC1200S, and scanning a couple of magazine covers, glossy posters, a snapshot of somebody's baby, a 35mm slide of my trip to The Bahamas and our color matching chart — we knew why so many pros use the UMAX. They deliver one-pass, reproduction-quality scans at 1200 dpi! Drenched colors, razor-sharp detail. But the price... How can a product with such a reputation carry such a modest price tag?

UMAX scanners come in a variety of flavors, from a compact, 600 dpi speedster to the top of the line, 1200 dpi helical that delivers blistering colors scans — it recognizes a billion colors! Rivals the legendary drum scanning technology — at hundreds of thousands less! Color, black & white, grayscale, halftone



Scan slides with an optional transparency adapter.

— do it all with the amazing UMAX flatbed scanners. For office use, the UMAX black & white scanners pump out 600 dpi images. Feature for feature, nothing outclasses or outperforms UMAX's advanced technology. Great for OCR, handsome desktop design.

INCLUDED FREE

Adobe Photoshop

Extraordinary photo-retouching, image editing, and color painting software. Adobe Photoshop excels as an art production tool.

An *\$95 Value — FREE

UMAX SCANNERS

BDH2546 UC630 — 600 dpi Grey Scale Scanner	\$899.00
BDH2070 UC630 — 600 dpi Color Scanner	\$1195.00
BDH2547 UC1200S — 1200 dpi Color Scanner	\$3495.00
BDH2950 Transparency Adaptor Option Fits UC630 and UC1200S, User installable	749.00
Includes Photoshop, interface, and cables.	



A high-end instrument; the choice of professional production houses.

The Contact Management Choice Of Professionals.

Do you want to be successful? Do you want to handle your clients and prospective clients like a pro? Do you want to keep right in step and be ready when opportunity calls — and never miss a deadline?

ACT! is the best-selling contact management software (fully System 7 compatible) that puts you squarely in control of clients, vendors, friends and associates. That's what the pros demand. ACT! includes a Contact Manager, Activity Scheduler, Word Processor, Report Generator, To-Do List Manager and Auto Dialer — all rolled into one very sleek, very fast and very easy to use program.

Let's get specific. First, ACT!'s Contact Manager is dBASE compatible, so you can use existing information with no problem at all. Each record contains 70 customizable fields and you'll quickly schedule an unlimited number of calls, meetings and to-do's (without typing), and be reminded even if

you're in another program.

Need to re-schedule? It happens all the time, but with ACT!, you can just drag-and-drop the activity to a new time slot. Prioritize and filter activities with a click. Then, crank out handsome correspondence with the ACT! WYSIWYG word processor. You'll love the pre-designed templates for pro-style letters, memos, fax covers and more. In fact, ACT! can create a letter for you — and you don't even have to type! It includes a Houghton-Mifflin spell checker, easy-to-use mail-merge and a slew of other powerful features.

- Unlimited number of contacts and databases
- User-selectable screen layouts, etc.

"ACT! is the best software I've seen for managing contacts and activities. If you are dealing with people in your day-to-day activities, you need ACT! ACT! is easy to use and has the power and flexibility to help me take control of my business day!"

—Russell Cooper, Federal Express



ACT!

BDH2764A ACT! for the Mac Competitive Upgrade \$99.00
 BDH2761 ACT! for the Mac \$249.00

New! STAR TREK; The Screen Saver! From The Makers Of After Dark.

Here it is, Star Trek fans! A screen saver that pumps out stunning images right from the TV series: Captain Kirk, The Enterprise, crewmembers and those fabulous Tribbles, from that unforgettable episode. Prevent burn-in with new Star Trek: The Screen Saver.

Features • Over 15 incredible Star Trek displays, • Runs all After Dark displays, and • Screen-locking security system.

We've also got **After Dark**, the Ultimate Screen Saver Collection. Over 30 displays including Flying Toasters and Fish! With sound, password protection, logo and message displays, MultiModule and SystemQ performance maximizer Plus, **More After Dark** — Over 25 incredible new displays for After Dark. Features contest winners Mowin' Man, Tunnel, GraphStat, and beautiful new fish! Boris the Kitten and Lunatic Fringe game module help save your screen from phosphor burn-in. (Requires After Dark software.)



AFTER DARK AND MORE AFTER DARK....



BERKELEY SYSTEMS

BDH2608 Star Trek Mac \$37.95
 BDH2609 After Dark \$29.95
 BDH2610 After Dark & More After Dark \$33.00



Run MS-DOS Software On Your MAC!

At last! The great barrier between Mac and DOS compatibility has been removed — for good. As users of both Mac and DOS computers, we

know the pros and cons. Macs are friendly and advanced, but the DOS world has more people creating more specialized software. Plus, today's office environment uses a mix of DOS and Mac computers. This plays havoc with spreadsheet and data files which need to flow smoothly between Mac and DOS PCs. That's why Tiger is proud to offer the world's best-selling answer from Insignia Solutions. They're the best. They have a solution to fit every need and every Mac. And best of all — it's software only! No expensive hardware to buy or install.

Turn any Mac into a DOS PC. Run actual DOS applications: 1-2-3, ProComm Plus, dBase — virtually any DOS application — from inside a Mac window. Cut & Paste between Mac and DOS windows. Save, copy and print right from your DOS application. Run your favorite DOS application just like it was running on any DOS 286 PC. You can have the best of both worlds: the fast, easy Mac interface you've come to know, and a huge world of specialized DOS software that fits every known need.

Run a DOS program and print directly to any PC printer or Mac printer — just like it was an industry-standard Epson LQ2500 (which virtually all DOS programs support). Or if the DOS program supports Postscript printers, you can print directly to any LaserWriter or other Mac PostScript printer. True-Type fonts are even included for the Epson LQ2500 so you get crisp, clean printouts every time.

There are three members of the SoftPC family, each designed to take advantage of the wide range of different Macs:

Entry Level SoftPC. This member of the SoftPC family was designed for low-cost Macs including the Mac Plus, SE, Classic and Powerbook 100. Recommended for Textual based DOS programs. You get everything mentioned above including IBM

AT 286 emulation, DOS 3.3 and CGA graphics.

Universal SoftPC. Step up to Universal SoftPC and you add several new capabilities to the Entry Level SoftPC package. Universal SoftPC runs on any Mac. CD-ROM support lets your Mac CD reader play DOS CDs. Recommended for Textual based DOS programs.

SoftAT. Fasten your seatbelt and hang on as SoftAT takes DOS software to new levels of high-performance. You need a Mac LC, SE30, Mac II, si, ci, cx, fx, Quadra or Powerbook 140 or 170 to run it, but it's all speed. You get lightning-fast benefits like a Math Co-processor, EGA graphics for more demanding graphics applications, and Expanded memory for big, hungry applications. SoftAT is the ultimate answer to Mac and DOS compatibility.

SoftNode. Another Insignia Solutions breakthrough is SoftNode — the perfect solution for running Novell Netware PC client software on any Mac. With the addition of the SoftNode add-on, both Universal SoftPC and SoftAT can run off-the-shelf and customized MS-DOS programs on any Mac.

INCLUDED FREE

FormTool (For DOS) \$99.00
 Lotus Agenda (For DOS) \$395.00
 Personal Law Firm (For DOS) \$99.00

A \$593 Value FREE

FormTool, Lotus Agenda and Personal Law Firm FREE With the Purchase of Universal SoftPC And SoftAT Only.

SOFTPC

BDH2053 Entry Level SoftPC. For Mac Plus, SE, LC, Classic, Portable \$129.90
 BDH2917 Universal SoftPC. Adds CD ROM Support To Entry Level SoftPC \$219.90
 BDH2918 SoftAT. For SE30, LC, Mac II, SI, CI, CX, FX, Quadra, Powerbook \$335.90
 BDH2056 SoftNode. Lets SoftPC & SoftAT Run DOS LAN Software \$105.90
 Lotus Agenda, FormTool, and Personal Law Firm Free with Universal SoftPC and SoftAT only. 10 Pack Network Version In Stock. Call For Pricing.

Read DOS Disks, Floppies and External!

Here's a solution that solves forever the problem of Mac & DOS incompatibility. Need to use a co-worker's DOS floppy with their DOS 1-2-3 file on your Mac? No problem. Simply slip it in and watch as that DOS floppy appears just like any Mac floppy — complete with icons and folders. Amazing! But that's not all. Double-click on that DOS 1-2-3 file and stare in amazement as 1-2-3 Mac or Excel starts up automatically and loads that DOS file! You can make changes, save it, give it back to your DOS-using co-worker, and then chuckle as he loads the file with your changes.

Slip any DOS floppy into your Mac and it looks just like a Mac floppy! An icon appears, you double-click it and DOS files and sub-directories appear just like the Mac files and folders. Double-click on the DOS files and immediately run Mac applications like Word, 1-2-3 Mac and Excel. AccessPC is still the fastest — fully 4 to 10 times faster than the competition!

Now with Cartridge and Magneto-Optical Drive Support! AccessPC is instantly compatible with your external cartridge and magneto-optical drives. No other utility software is needed! (Unlike the others that make you call your drive manufacturer for software they haven't even finished yet.) Your DOS files are ready, willing and able with the finest DOS file access application made — AccessPC.

ADDED BONUS!

FREE — intelligent disk cache for your removable disk and magneto-optical drives can increase performance by 30% or more.



ACCESS PC

BDH2050 AccessPC \$65.95
 All programs require either SuperDrive or Drive capable of reading DOS Disks

The right add-ons can transform your notebook Mac
into a complete
desktop system

Thanks to notebook-size Macintoshes, you can take your computer—and your work—across the street, across the country, or around the world. But a notebook need no longer be a secondary Mac used only for travel; with the recent availability of a host of add-ons, now it can be your main computer. As you build your portable office, you'll be confronted by a wide array of products that promise to make your life easier both at the office and on the road. Some products live up to their billing; others should be left by the wayside. A battery of subjective evaluations by *Macworld* editors and objective tests by Macworld Lab separate the must-haves from the need-nots.

EXPANDING YOUR POWERBOOK

Before you choose from a selection of tools, you must first identify which tools you need. This can be difficult, given the newness of portable peripherals and the variety of notebook Macs. For example, three types of options are available to connect external video to the first-generation PowerBooks—the 100, 140, 145, and 170. While the second-generation PowerBooks—the 160 and 180—don't need video options because they have built-in video ports, they still benefit from some of the other portable options, like fax modems and portable printers. The Outbound Notebook Systems notebook Macs, from Outbound Systems, are similar to the first-generation PowerBooks, except that the Outbounds support fewer video options but have more-flexible upgrade capabilities (see *Reviews, Macworld*, September 1992). And the new Apple subnotebooks—the PowerBook Duo 210 and 230—have an entirely different set of options because of their unique docking-station design. One size definitely does not fit all. Use our “Notebook-Compatibility Guide” to see which tools work with which types of notebook Macs.

By Tom Negrino



The wide variety of PowerBook add-ons makes the portable office a reality. Owners of PowerBook 140s, 145s, and 170s can create a high-powered office-to-go by adding a 16-inch monitor (like Apple's, shown here), Computer Care BookView Imperial video adapter (inside the PowerBook), APS Companion 120 battery-powered hard drive (lower left), and GCC Technologies WriteMove II ink-jet printer (lower right).

Improve Your Memory

MORE MEMORY IS A MUST FOR MOST PEOPLE—4MB should be a minimum standard for spreadsheet and word processing users, 8MB for graphics and engineering users and for those who often switch between multiple open applications.

The PowerBooks, Duos, and Out-

Second, buy based on price. As long as you get the right kind of RAM for your notebook and it has a lifetime warranty, search for the lowest price. For example, a survey of prices advertised in recent issues of industry magazines showed a range of \$199 to \$299 for a 6MB memory board for the first-generation PowerBooks. Check

but unless you're technically inclined, rely on your dealer there, too.

Never Too Much Storage

THERE ARE AS MANY DRIVE OPTIONS for notebooks as there are working styles. You can replace your internal drive with a larger one (as large as 120MB for the PowerBooks and 220MB for the Outbounds) or add an external drive. If you choose an external drive, you can get one

FOR ANY NOTEBOOK MAC, CONSIDER 8MB TO

BE THE MINIMUM RAM CONFIGURATION

bounds each use a different type of memory chip. All the PowerBooks except the Duos use low-power pseudostatic RAM chips. They come in several sizes: 2MB, 4MB, and 6MB.

The first-generation PowerBooks that come with 4MB of RAM from Apple have 2MB soldered onto the logic board and a 2MB board in the RAM slot, so to expand to 6MB or 8MB, you have to remove the Apple 2MB RAM board and substitute a 4MB or 6MB board. Some older third-party RAM boards have pass-through connectors so you can plug more RAM into them—but because of space limitations and safety considerations, Apple is discouraging developers from using pass-through connectors.

The Duos use low-power dynamic-RAM chips in special SIMMs. And the Outbounds use standard dynamic-RAM SIMMs—just make sure that you do not mix SIMMs of different speeds.

If you follow three simple rules, you can't go wrong in purchasing memory.

First, if you own a first-generation PowerBook, you'll be best off if you upgrade to the maximum 8MB of RAM. Owners of other notebook Macs should also consider 8MB a minimum RAM configuration. The PowerBook 160 and 180 support as much as 14MB of RAM, while the PowerBook Duo 210 and 230 hold up to 24MB (4MB is the standard configuration). The Outbound 2030 and 2035 take up to 16MB of RAM, but applications can use only 4MB of RAM; the remaining 12MB becomes a RAM disk. Outbound's 2030E, 2030S, and 2030V also support 16MB, with up to 14MB for applications and the rest as a RAM disk. (A RAM disk is a large amount of RAM that is set aside for use as a temporary hard drive.)

One strong reason to get at least 8MB of RAM in any notebook is that you can create a RAM disk large enough to hold a System Folder and an application. (With a PowerBook, use the Memory control panel to create a RAM disk. On an Outbound, look for the Silicon control panel.) Making the RAM disk the start-up device and then restarting gives you a notebook that hardly ever needs to spin up the hard drive, thereby significantly extending your battery life.

publications like *Macworld*, *Computer Shopper*, and regional computer papers, as well as your local dealers, for the best prices. Factor in the charge for having your local Apple dealer install the RAM; typical fees range from \$30 to \$75.

Third, if you have a PowerBook or an Outbound, get your dealer to do the upgrade—neither Apple nor Outbound recommend user installation (although it is easy to do on an Outbound). If you have a Duo, you can upgrade the RAM yourself,

powered through a standard AC plug, via a battery, or through the notebook's ADB port. We looked at external drives that have either battery or ADB-power options.

There are two fine internal drive mechanisms to which you can upgrade, and more are coming soon. Quantum's 2½-inch Go drives come in 80MB and 120MB sizes, and either one is a good choice. Several vendors sell the Go drives under their own label, including APS Technologies, FWB (415/474-8055), La Cie, Mass Mi-

Designing a Portable Office

A notebook Mac with its standard array of features could suffice as your primary Mac—after all, it comes with a screen, keyboard, trackball, hard drive, floppy drive, and standard Mac connectors. But the truth is, it's probably not enough.

For starters, you're likely to want more RAM than your notebook came with. Bump your machine's RAM up to 8MB, because the advantages far outweigh the expense.

You're also likely to want more disk space than the 40MB that most first-generation PowerBooks came with. You can upgrade the internal drive or add an external one. Which option you pick depends on whether you travel and want to keep your archives safely at your desk instead or take them with you on the road.

Unless you have a 170 or 180, with an active matrix LCD screen, you'll quickly find that the passive matrix screen is tiring to use over the long term. So you should definitely get an external monitor. Even if you like your notebook's screen, you still may want a video-connection option so you can hook your Mac to a color monitor. (Note that the PowerBook 100 or an Outbound is limited to eight colors because these notebooks use older Mac ROMs, ones without color QuickDraw.)

A modem—either internal or external—completes the list of standard features for a portable office. Spend the extra money for a fax modem—even if you have a fax machine—since you can use the fax capabilities on the road, either for traditional faxing or last-resort printing.

Chances are that you can take advantage of more than just basic equipment. If you travel, you may want a portable printer. If you work half the time on the road and half the time at the company's offices, or if you rove from one branch office to another, you'll want to be able to connect to your company's network and peripherals directly through an AppleTalk or Ethernet network. And thanks to the SCSI, ADB, and serial ports available on all notebook Macs except the Duos, you can connect to any standard Mac peripheral, whether it be a CD ROM drive, mouse, or modem. For the Duos, the revolutionary docking stations add flexible, convenient connectivity.

There are also a host of odds and ends a notebook office might contain, such as carrying cases, batteries, battery chargers, numeric keypads, and locks. David Pogue covered many of these options in "The Case (etc.) for the PowerBook," *The Desktop Critic*, *Macworld*, September 1992. Other such products are reviewed in *Macworld's* new *PowerBook Notes* column, which debuts in this issue.—GALEN GRUMAN



For people on a budget, an Outbound Notebook System 2030S, Sigma Designs Power Portrait SCSI monitor, Apple StyleWriter printer, La Cie PocketDrive 120MB hard drive, and Outbound Pocket Port Fax Modem (counterclockwise from right) make up a capable portable office.

crossystems, and Microtech (203/468-6223). Macworld Lab tests show minimal differences in performance among the drives tested (since their mechanisms are the same), so base your Go drive buying decision on price and service. By the time you read this, Fujitsu and Conner Peripherals should also have drives available for vendors to package into portable drives.

Outbound owners have more capacity options—up to 220MB—as well as the option of using new removable drives that let you share a notebook among several people while keeping each person's applications and data separate and secure.

External drives give you the same separateness and security as removable drives, plus they work with any Mac. The La Cie PocketDrive is a good example of an external drive. Small enough to fit into a shirt pocket (hence the name), the PocketDrives come in 40MB (\$348), 80MB (\$598), and 120MB (\$698) sizes. They plug into one of two SCSI connectors: the included T-Connector, which attaches directly to the SCSI port on the back of a desktop Mac, or La Cie's \$99 PocketDock, which has a SCSI cable that lets you keep the dock where it's more accessible. Both connectors have a pass-through SCSI port so you can chain more SCSI peripherals.

Mass Microsystems and Mirror Technologies also sell portable external drives. Mirror also offers the \$199 PowerDock battery-charger stand for its drives.

Power to the La Cie and Mass Microsystems drives is supplied by a connector to the ADB port or by an AC adapter. Because of the PowerBooks' limited power supply,

La Cie recommends that its PocketDrives be used with an AC adapter (an additional \$59) when used with a PowerBook. Mass Microsystems offers no AC adapter.

Drives based on the Go 80 are particularly susceptible to inconsistent performance when powered through an ADB connector. The Go 120 does not have this problem, and Quantum has recently developed the new Go 80 GRS that works reliably with the ADB's power output.

We liked the La Cie PocketDrive 120MB a lot. Weighing only about a pound, the PocketDrive and PocketDock fit into a briefcase without a bulge.

For drives that carry their own power, consider the Companion 80 (\$499) and 120 (\$599), battery-powered drives from APS Technologies. Housed in a slim case the same color as the PowerBook, these drives use the type of rechargeable battery found in radio-controlled model cars to power a Quantum Go 80 or Go 120 drive for up to six hours. Liberty Systems configures its 20 Series of drives with built-in batteries (\$998 for the 80MB unit and \$1198 for the 120MB unit). The Liberty drives let you daisy-chain other SCSI devices from them; APS drives must be the last or only external device on the SCSI chain.

Video Options

THE BIGGEST DRAWBACK TO THE FIRST-generation PowerBooks is that they lack a video-out port. While Apple has provided video output on the PowerBook 160 and 180 (and, via docking stations, on the PowerBook Duos), there are still about 350,000 older-PowerBook owners who

need to turn to third-party options if they want to use a bigger or color screen, or an LCD projection panel.

Although the PowerBook 160 and 180 provide a video-out port, they are limited to 8-bit color on a 16-inch screen and cannot drive a 19-inch or 21-inch screen at all. Expect third parties to step in and beef up the video-output power of both of these machines by adding video RAM. At press time, Computer Care is planning a product that would let the PowerBook 160 and 180 produce 8-bit color on 19-inch monitors. The Aura Systems ScuzzyView video adapter also offers this functionality.

True to Apple's historical support for multiple-monitor display, all notebook video options let you have active the notebook's screen and an external display, to form a larger virtual screen. This is particularly helpful when you are making presentations: you control the presentation from your notebook, and your audience sees just the presentation itself on the external monitor. The PowerBook 160 and 180 and the Duos also support a video mode called *mirroring*, where the external video monitor shows the same image as the internal screen. This lets you and your audience see the same screen image, which is particularly helpful during demos.

Video options fall into three classes. First, there are monitors that hook directly to the SCSI port. Next come the SCSI video adapters, which work with a variety of regular monochrome and color monitors. These two types of video options can be used with the Outbound notebooks, as well as with the PowerBooks, and in fact,

with virtually any other Mac. And finally, there are video adapter boards that install in the PowerBook's memory socket.

SCSI monitors The SCSI monitors—monochrome portrait displays, with a video board built into the monitor housing, that connect to a Mac's SCSI port instead of a video port—are an all-in-one

We tested four SCSI monitors: the \$949 Outbound Systems Outtrigger, the \$999 Generation Systems PowerPlay, the \$749 Mirror Technologies ViewPort, and the \$749 Sigma Designs Power Portrait. All have two SCSI plugs, to allow for daisy-chaining additional peripherals. Hooking up all of these monitors is a snap: you plug

bottom edges of some screens we looked at had a noticeable bend called pincushioning—this was severe on some evaluation units but not on others.

We also had some odd problems with Outbound-based displays. Occasionally buttons in some application windows wouldn't appear until we passed the cursor over them, and sometimes the picture on the display would freeze, requiring a restart (see *Lab Notes*, this issue).

SOME OF OUR SCROLLING TESTS TOOK TWICE AS

solution. They need no dealer installation, have no tangle of cables or adapter box to get in the way, and work with any Mac. But they are slower than a traditional monitor. This is not the fault of the displays themselves but is because they get video information through the SCSI port, which is slower than a video port. The slowdown is very noticeable in graphics, but the performance is acceptable for text-oriented work. SCSI displays can also be jerky when you scroll, since they can't send information fast enough to scroll both quickly and smoothly. All vendors but Sigma Designs offer two settings—smooth and normal mode—to let you decide which is more important to you. Be warned: Some of our scrolling tests took twice as long in smooth mode as in normal mode.

LONG IN SMOOTH MODE AS IN NORMAL MODE

the SCSI cable into the Mac and into the back of the monitor, drag a system extension to the System Folder, and restart. From then on, you deal with the second monitor in the usual way, using the standard Monitors control panel.

The Outbound, Mirror, and Generation Systems monitors are all manufactured by Outbound Systems, so performance and operation are virtually identical for the three units. Unfortunately, that performance is mediocre. The units weren't especially fast in Macworld Lab's scrolling tests. And subjectively, the display was disappointing, as the picture tube has a marked, annoying curvature. The top and

The Sigma Designs Power Portrait fared better both in the lab and in everyday use. The monitor has a flatter screen that makes it much easier on the eye. The screen phosphor was also whiter and thus more comfortable to read. You can set the screen resolution to 72 dpi, 80 dpi, or 88 dpi; the two higher resolutions let you fit more on the screen. There is no smooth mode, but the unit's inherently smooth scrolling means none is needed. The Power Portrait also has a hardware panning feature that creates a virtual two-page display with up to 1024 by 1024 pixels of display area. The Power Portrait is the best choice of the SCSI monitors tested.



Portable Video Performance

REAL-WORLD SPEED TESTS

(in seconds)

Vertical Scroll

Average results for a series of up and down scrolls (one line at a time) in Excel and Word documents.

Horizontal Scroll

Average results for a series of left and right scrolls (one column at a time) in Excel documents.

Page Scroll

Average results for a series of up and down scrolls (one screen at a time) in Word documents.

LOW-LEVEL QUICKDRAW SPEED TESTS

(speed compared to PowerBook 170 screen)

All Commands

Relative performance in processing all 118 QuickDraw commands, using the industry-standard Hydra benchmark

Basic Commands

Relative performance in processing 25 common QuickDraw commands, using the industry-standard Hydra benchmark.

Notebook Computers (Monochrome)

Apple PowerBook 170*	20.2	16.8	9.2
Apple PowerBook 160 (13")	31.3	27.8	12.9
Apple PowerBook 160 (16")	43.2	40.5	12.2
Outbound Systems Outbound 2030S *	11.6	11.5	6.0
SCSI-Based Monochrome Monitors			
Generation Systems PowerPlay (15")	26.3	58.3	12.3
Lapis Technologies Full Page Portrait (15")	32.6	63.5	13.5
Mirror Technologies ViewPort (15")	26.4	58.4	12.2
Outbound Systems Outtrigger (15")	26.2	58.4	12.3
Sigma Designs Power Portrait (15")**	36.3	76.2	19.4
Color SCSI Video Adapters			
Aura Systems ScuzzyView (13")	65.4	47.9	24.7
Radius PowerView (13")	82.4	61.5	24.1
Aura Systems ScuzzyView (16")	89.1	68.9	22.6
Radius PowerView (16")	125.6	90.1	23.3
Aura Systems ScuzzyView (19")	115.3	99.4	21.9
Color Internal Video Adapters			
Computer Care BookView Imperial (13")	32.1	27.1	13.1
Computer Care BookView Imperial (16")	39.6	34.8	11.6
Computer Care BookView Imperial (19")	48.1	46.1	10.8

*Tested with built-in LCD display. **At 80 dpi. Shorter bars are better. Shorter bars are better. Shorter bars are better. Longer bars are better. Longer bars are better.

Performance for external monitors depends greatly on the connection solution used. The fastest performance is offered by the internal video adapters, which benefit from the high throughput of the RAM circuitry they plug into. In real-world tests, the performance of SCSI-based adapters is slower than that of internal video adapters, since the SCSI circuitry is slower. Size and color also

have an effect: it takes longer to display color than black-and-white (the SCSI-based monitors are all monochrome, while all the adapters support color, except for the Lapis PowerBase I, whose results were thus excluded here), and it takes longer to display an image on a large monitor than on a small one. In the QuickDraw tests, results bear little resemblance to real-world tests because



The PowerBook Duos introduced revolutionary docking stations, including E-Machines' PowerLink DeskNet (top), which adds Ethernet connections; E-Machines' PowerLink Presenter (right), which adds extensive video connections; and Apple's MiniDock (left), which offers standard Mac connections.

RasterOps began shipping the ClearVue/SD21 monochrome 21-inch display at press time. We looked at a unit and came away believing that \$1799 for a 21-inch black-and-white display is not a worthwhile investment (see *Reviews*, this issue).

SCSI video adapters If you want color display on your notebook and are put off by the \$3500 to \$5000 price tag of the active matrix color screen replacements offered by Newer Technology (316/685-4904) and Envisio (612/339-1008), you might consider an external SCSI video adapter. These adapters take a video signal from a Mac's SCSI port and translate it into a standard video signal, which is sent to any standard monitor through a standard video port (see "Breaking the PowerBooks' Video Barrier"). These adapters let you use existing monitors—whether at home, at your office, or at someone else's office. Some also support VGA video ports used by DOS PCs, so you don't need to worry if the office you're visiting uses Macs. But like SCSI monitors, these adapters are limited by the inherent sluggishness of SCSI.

We tested the \$599 Radius PowerView and the \$695 Aura Systems ScuzzyView, both of which support color display, and the \$599 Lapis Technologies PowerBase I, which supports only monochrome display. (The \$699 PowerBase II, which supports color, was scheduled to ship by the time you read this.) The color adapters were slower than the SCSI monitors—because color takes even longer to display than black and white—and much slower than the one internal video board we evaluated. The monochrome Lapis adapter was acceptably fast, partly because it supports only monochrome and partly because Lapis uses blind SCSI transfer, which is faster than the standard SCSI transfer mode. (The standard SCSI mode is purposely slow, to be backwardly compatible with the Mac Plus's slow SCSI bus. If you use the PowerBase I on a Plus, you can set

the adapter to run at the slower speed.)

Coming from a company with such a good reputation for video products, the Radius PowerView was a real disappointment. It was the slowest unit overall in our tests. It supports 8-bit color or gray scale on monitors up to 16 inches, but only monochrome on 19- and 21-inch displays. Radius's technical-support department told us that the company tested PowerView compatibility only with Radius and Apple monitors, and that it would not support the PowerView's use with other products.

The PowerView allocates some of the Mac's system memory—as much as 542K, depending on the screen size—for its internal use, so you won't want to use it on a bare-bones notebook. And the unit was very sensitive to the PowerBook's nonstandard SCSI termination, especially in a daisy-chain of additional SCSI devices. The PowerView caused errors in other SCSI devices when we did not terminate the first device in the SCSI chain (which you should do in a PowerBook). Other SCSI video adapters that weren't terminated did not create this problem. The PowerView could not support Outbound notebooks, although other adapters could.

The Lapis PowerBase I supports monochrome output on 12- to 21-inch displays, with fair performance. The PowerBase handles SCSI termination inelegantly: to remove termination, you have to take off the PowerBase I's cover and remove terminating resistors. The termination should be external or switchable.

The Aura Systems ScuzzyView turned out to be the best video adapter of the bunch. It was faster than the others, its images had the best color fidelity, and compatibility was not a problem, even with VGA displays. (It supports monitors as large as 19 inches at 8-bit color or gray scale.) But it lacks mirroring mode, which detracts from its usefulness in demos.

All the SCSI-based video solutions share a potential problem: they may not work correctly with applications that do not follow Apple's video standards. The Radius PowerView was the most compatible of the SCSI video products tested (see *Lab Notes*, this issue).

Due to the relatively poor performance of all of these units, you should pass them by in favor of an internal video board. If you decide that the advantages of a SCSI adapter—most notably, cost and the ability to be moved among Macs—warrant purchasing one, choose the ScuzzyView.

Internal video adapters The best option we found for video was the \$1399 Computer Care BookView Imperial. This board installs in the PowerBook's RAM-expansion slot and has 6MB of RAM, which brings your PowerBook up to its

SCREEN QUALITY TESTS

(in footlamberts)

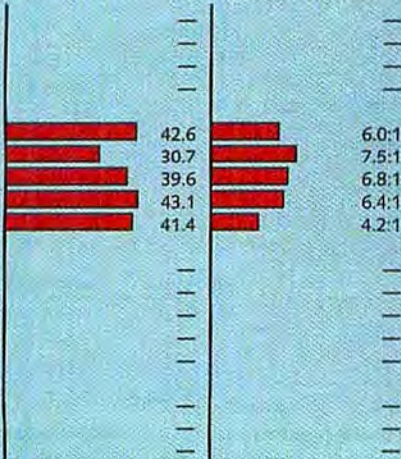
(ratio of white to black)

Max Brightness

Contrast Ratio

We tested each monitor with brightness turned up as high as it could go without showing scan lines. A reading of more than 20 footlamberts is good.

The luminance of the whitest squares compared with that of the blackest throughout the screen. A comparative luminance for white of 6 times or more is good.



Longer bars are better. Longer bars are better.

QuickDraw processing is a very minor component of overall performance for these adapters. The major components are the speed of the Mac's processor, the speed of the adapter's circuitry, and the complexity (size and color depth) of the image.

NOTEBOOK-COMPATIBILITY GUIDE

Company	Product	List Price	Tested by Macworld Lab	PowerBooks			Outbounds 2000, 2030 series	Technical-Support Rating	Consumer Contact: Toll	Consumer Contact: Toll-Free
				100, 140, 145, 170	160, 180	Duo 210 230				
EXTERNAL HARD DRIVES										
APS Technologies	Companion 80	\$499	○	●	●	● ¹	●	very good	816/478-8300	800/235-2752
	Companion 120	\$599	●	●	●	● ¹	●	very good		
La Cie	PocketDrive 40MB	\$348 ²	○	●	●	● ¹	●	excellent	503/520-9000	800/999-0143
	PocketDrive 80MB	\$598 ²	○	●	●	● ¹	●	excellent		
	PocketDrive 120MB	\$698 ²	●	●	●	● ¹	●	excellent		
Liberty Systems	20 Series 80MB	\$998 ³	○	●	●	● ¹	●	○	408/983-1127	○
	20 Series 120MB	\$1198 ³	○	●	●	● ¹	●	○		
Mass Microsystems	HitchHiker 40	\$599	○	●	●	○ ¹	●	○	408/522-1200	800/522-7979
	HitchHiker 80	\$899	○	●	●	○ ¹	●	○		
	HitchHiker 120	\$999	○	●	●	○ ¹	●	○		
SCSI MONOCHROME MONITORS										
Generation Systems	PowerPlay	\$999	●	●	●	●	●	⁴	612/633-5222	800/325-5811
Mirror Technologies	ViewPort	\$749	●	●	●	●	●	satisfactory	612/633-4450	800/654-5294
Outbound Systems	Outrigger	\$949	●	●	●	●	●	good	303/786-9200	800/444-4607
RasterOps Corporation	ClearVue/SD21	\$1799	○	●	●	●	●	○	408/562-4200	800/729-2656
Sigma Designs	Power Portrait	\$749	●	●	●	●	●	good	510/770-0100	800/845-8086
SCSI VIDEO ADAPTERS ⁵										
Aura Systems	ScuzzyView	\$695	●	●	●	●	●	excellent	619/438-7730	800/365-2872
Lapis Technologies	PowerBase I ⁶	\$599	●	●	●	●	●	poor	510/748-1600	800/435-2747
	PowerBase II	\$699	○	●	●	●	●	○		
Radius	PowerView	\$599	●	●	●	●	○	good	408/434-1010	800/227-2795
INTERNAL VIDEO ADAPTERS										
Computer Care	BookView Imperial	\$1399	●	● ⁷	○	○	○	very good	612/371-0061	800/950-2273
Lifetime Memory Products	Video+	\$695 ⁸	○	●	○	○	○	○	714/969-2421	800/233-6233
Mirror Technologies	PowerVision	\$499-\$999 ⁹	○	●	○	○	○	satisfactory	612/633-4450	800/654-5294
INTERNAL FAX MODEMS										
Apex Data	Freedom 14/96	\$529	○	●	●	○	○	○	510/803-2020	○
	Freedom 96/96	\$599	○	●	●	○	○	○		
Apple Computer	PowerBook Fax Modem	\$225	○	●	○	○	○	○	408/996-1010	○
Global Village	PowerPort Bronze	\$229	○	○	●	●	○	○	415/329-0700	800/736-4821
Communications	PowerPort Gold	\$499	○	●	●	○	○	○		
	PowerPort Silver	\$429	○	●	●	○	○	○		
MacProducts USA	Magic AFX 24/96	\$179	○	●	●	○	○	○	512/472-8881	800/622-8721
Mass Microsystems	24/96	\$249	○	●	●	○	○	○	408/522-1200	800/522-7979
PSI Integration	PowerModem	\$195	○	●	●	○	○	○	408/559-8544	800/622-1722
	PowerModem II	\$295	○	●	●	○	○	○		
	PowerModem III	\$395	○	●	●	○	○	○		
	PowerModem IV	\$495	○	●	●	○	○	○		
Twincom	14.4 PowerTwin	\$399	○	●	●	○	○	○	919/256-8025	800/723-2962
	24/96 PowerTwin	\$189	○	●	●	○	○	○		
WIRELESS MESSAGING										
Apex Data	Cell-Connect Kit	\$299 ¹⁰	○	●	●	○	○	○	510/803-2020	○
Applied Engineering	Axcell Cellular Interface	\$299 ¹⁰	○	●	○	○	○	○	214/241-6060	800/554-6227
Motorola Paging Div.	Embarc NewsStream	\$395	○	●	●	●	○	○	○	800/362-2724
DOCKING CONNECTORS										
Apple Computer	DuoDock	\$1079	○	○	○	●	○	○	408/996-1010	○
	Duo MiniDock	\$589	○	○	○	●	○	○		
	SCSI Disk Adapter	\$39	○	● ¹¹	●	●	○	○		
E-Machines	PowerLink DeskNet	\$699	○	○	○	●	○	○	503/646-6699	800/344-7274
	PowerLink Presentor	\$499	○	○	○	●	○	○		
Outbound Systems	SCSI Kit	\$139	○	○	○	○	●	○	303/786-9200	800/444-4607
Pilot Technologies	BookEndz	\$129	○	● ⁷	●	○	○	○	612/828-6002	800/682-4987
PRINTERS										
Eastman Kodak	Diconix 180si	\$459 ¹²	○	●	●	●	●	○	716/253-0740	800/344-0006
GCC Technologies	WriteMove II	\$599	○	●	●	●	●	○	617/275-5800	800/422-7777

● = yes; ○ = no. Technical-support ratings are based on a series of calls made by Macworld staffers posing as customers to each company to gauge the accessibility, helpfulness, and accuracy of their 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. ¹ With Duo's optional docking adapter. ² Price includes required 30-pin to 25-pin connector adapter. ³ Price includes \$199 battery charger.

⁴ Support offered through dealers only. ⁵ Limited to eight colors on PowerBook 100 and Outbounds. ⁶ For black-and-white display only. ⁷ Not compatible with PowerBook 100.

⁸ PowerBook 100 version \$795. ⁹ Price depends on amount of RAM included. ¹⁰ Connects to modem sold separately by the company. ¹¹ Compatible only with PowerBook 100. ¹² Includes required Macintosh interface kit.

8MB maximum. Although the PowerBooks' RAM sockets were not designed to handle video, crafty engineers figured out how to make it possible. The advantage is fast video transfer (unlike the SCSI-based solutions) and an inconspicuous video hookup (no external adapter boxes or cabling needed). Of all types of video options, the BookView Imperial was the fastest in our tests by a wide margin.

Because its video chips are software-programmable, Computer Care will be able to support new monitors with different resolutions simply by updating the control panel. (It now supports 16.)

We evaluated the board with a wide variety of monitors. In all cases, performance was excellent. Screen redraw speeds were virtually indistinguishable from those of a desktop computer, and the color was good, especially in graphics programs such as Adobe Photoshop. Another plus is software support for mirroring, so you can run a presentation on your notebook and have the audience see the same display on the external monitor.

As good as its performance is, there are a few problems with the BookView Imperial. At press time the board was incompatible with virtual memory and the PowerBook's RAM disk. Computer Care promises a software fix for virtual memory, and will provide an alternative RAM-disk program. The video connector you install with the BookView board is a small, flat

plug that comes out of one of the PowerBook's hinge covers and sticks to the rear of the PowerBook with double-sided tape—hardly a confidence-inspiring setup. Computer Care said it is working on a modified hinge cover that would enclose the video connector. The actual hookup to the monitor is a flat-ribbon cable that ends in a standard 15-pin Mac female video connector, but the cable mates to the PowerBook's video-out connector with a friction fit, which is easily dislodged. (You need an adapter to connect the BookView to a VGA monitor.) Furthermore, the BookView works better with VGA connectors than with Mac connectors on some monitors (such as those from NEC) and LCD panels (such as those from Proxima and nView). A more serious incompatibility is that the BookView Imperial can cause 120MB Quantum Go drives to behave erratically, because the BookView and Go 120 together draw too much power. The BookView is also not compatible with the popular shareware drive-formatter SCSI Director, nor, when used on an external drive, FWB's formatter.

Still, the BookView is a decent solution for video, providing fast redraw, good color output, and broad compatibility. The board costs \$1169 for the PowerBook 100 and \$1399 for the other first-generation PowerBooks (including 6MB of RAM).

Another popular internal video board has been the Envisio Notebook Display

Adapter (see Reviews, Macworld, September 1992). The Envisio boards range from \$795 to \$1595, depending on the amount of RAM included on the board. Envisio recently discontinued this product.

After our lab testing deadline, Mirror Technologies began shipping a relabeled Envisio unit under the PowerVision name (see Reviews, this issue). We strongly preferred the Mirror board because of its lower price and broader software compatibility, even though it supports fewer monitor sizes than the BookView Imperial.

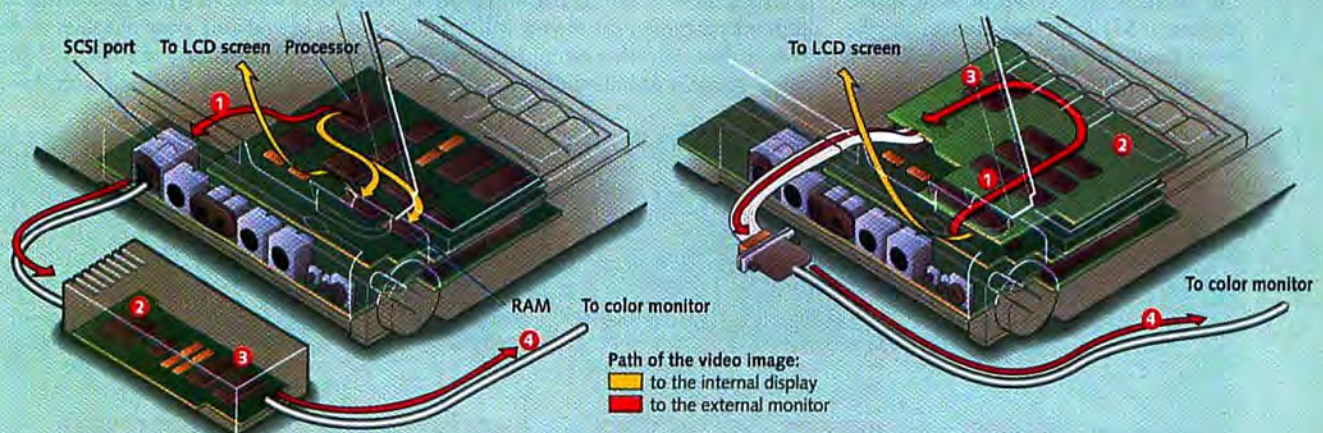
Also coming soon are 16-bit video adapters for the first-generation PowerBooks from both Computer Care (the BookView Imperial 16 for \$1549) and Envisio (the ColorBook 16 for \$1295 to \$1895, depending on how much RAM is included). These adapters are promised to support 16-bit color (32,738 colors) on monitors as large as 16 inches and 8-bit color (256 colors) on 19-inch monitors.

Staying in Touch

HANDY FOR DESKTOP MACS, MODEMS ARE practically essential for notebook use so you can stay in touch with clients or the main office. The market for internal data/fax modems is dominated by two companies: Global Village Communication, which sells the PowerPort series, and PSI Integration, with its PowerModem line. Both companies offer modems in a variety of speeds. They all work in all the

Breaking the PowerBooks' Video Barrier

The PowerBook 100, 140, 145, and 170 lack built-in support for external monitors. To add this support, some vendors add an external SCSI adapter; others add an internal RAM adapter. In both cases, the vendors route the video image intended for external display through a nonvideo part of the PowerBook's hardware. They also use an INIT to tell the PowerBook how to send the video image over these nontraditional video routes.



External SCSI Adapters

Most vendors supply an INIT that intercepts the QuickDraw commands that describe a video image; the INIT then sends a copy of the commands over the SCSI port to the external adapter (1). A processor on the adapter's own logic board translates the QuickDraw commands into the video image (2) and stores the resulting screen bitmap in VRAM (3) within the adapter. The adapter then sends the image for display on the external monitor (4). Because the Radius PowerView has no processor, it relies on the PowerBook's processor to translate the QuickDraw commands. Because SCSI is inherently slow, SCSI video adapters are slow.

Internal RAM Adapters

Some vendors supply an INIT that intercepts the QuickDraw commands that describe a video image; the INIT then sends a copy of the commands to the adapter board (1), which plugs into the PowerBook's RAM slot. A processor on the adapter's own logic board translates the QuickDraw commands into the video image (2) and stores the resulting screen bitmap in VRAM (3). The adapter then sends the image over a special dealer-installed connector for display on the external monitor (4). Vendors whose adapters have no processor follow the same process but rely on the PowerBook's processor to translate the QuickDraw commands.

first-generation PowerBooks, as well as in the 160 and 180. And all are both data modems and send/receive fax modems.

Global Village's PowerPort Bronze is a \$229 2400-bps data/9600-bps fax modem; the \$429 PowerPort Silver is a 9600-bps data/9600-bps fax modem; and the \$499 PowerPort Gold is a blazing 14,400-bps

unit. A unique feature of this modem will be its reliance on the CPU for some functions, such as data compression. Applied Engineering had also announced but not shipped a modem called the DataLink PB. This 14,400-bps data/fax/voice modem fits into the first-generation PowerBooks and has a \$299 optional interface for cellular

that support high-speed data transmission. If you don't intend to use the modem much for either AppleTalk Remote Access or large-volume data transfer, but are looking mainly for a fax modem, both the PSI PowerModem and the Global Village PowerPort Bronze are excellent choices.

For those who want to be up-to-date no matter where they are, Motorola has announced the Embarc NewsStream wireless messaging system that connects to a

THE SMALL DOCKING STATIONS OFFER

data/9600-bps fax modem. The PowerPorts come with Global Village's excellent fax software, GlobalFax. The PowerPort line is also completely internal to the PowerBook, unlike Global Village's discontinued PowerPort V.32, which required a separate telephone interface.

PSI's PowerModem line consists of the \$195 PowerModem, a 2400-bps data/9600-bps fax unit; the \$295 PowerModem II, which adds V.42bis data compression and MNP Class 10 error-correction for faster throughput; the \$395 PowerModem III, a 9600-bps data/9600-bps fax unit; and the \$495 PowerModem IV, which transmits data at 14,400 bps and is the only PowerBook modem available that can transmit and receive at the new 14,400-bps fax speed. At press time, PSI was previewing optical character recognition (OCR) for received faxes, which would let you scan faxes into a word processor. PSI also plans to offer fax broadcast, which is a service that, with a long-distance phone company such as AT&T or MCI, lets you upload one copy of a fax, along with a distribution list, to a central fax server. The phone company's fax server then sends the fax to everyone on the list.

At press time Apple had announced but not shipped the PowerBook Express Modem, a \$319 internal modem for the PowerBook 160 and 180. This will be a V.32bis, 14,400-bps data/9600-bps fax

BOTH PORTABILITY AND CONNECTIVITY

phones, so you don't need a phone line.

Many companies sell external modems, with and without fax capability. If you're a notebook owner you should consider them if you need to share one modem among Macs, and if you don't mind carrying a separate unit. Examples of modems that need no AC adapter include the \$745 QBlazer modem from Telebit Corporation (408/734-4333), which is tiny (a 2-inch cube), fast (runs at 9600 bps), and requires only a 9-volt battery to operate. Outbound has the \$379 PocketPort Fax, an ADB-powered, 2400-bps data/9600-bps fax modem the size of a pack of playing cards.

Which modem to buy depends mainly on whether you plan to use AppleTalk Remote Access to hook up to your computer or your company's network while on the road. AppleTalk Remote Access lets you access an AppleTalk network over the phone lines (see "Remote Possibilities," *Macworld*, January 1993). For remote access, a 9600-bps or 14,400-bps modem is a must, because, with a 2400-bps modem, the most basic remote operations—opening a Finder window, for example—are painfully slow. Another reason to get a high-speed modem is if you will often transfer data with other computers, or with online services or bulletin board systems

PowerBook. The \$395 device gives you access to your E-mail system, as well as to information services such as stock quotes and news for a monthly fee.

Integrating with Other Macs

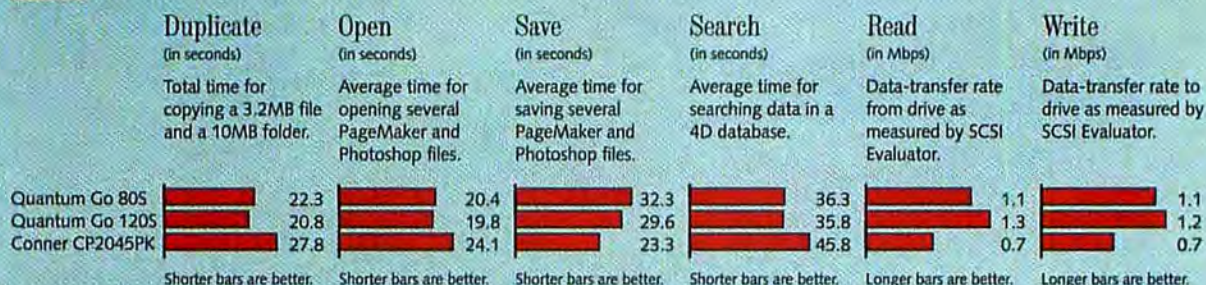
EVEN IF A NOTEBOOK MAC IS YOUR PRIMARY computer, you may want to plug into a network or directly into another Mac to quickly exchange large numbers of files. All notebook Macs let you connect to a network via the serial port or modem, but there are other direct-connect methods.

The simplest is to plug the notebook into another Mac's SCSI port, which makes that Mac think the notebook is simply another hard drive. Unfortunately, in the first crop of Mac notebooks only the PowerBook 100 and Outbound offered this capability (through optional adapters). But the new PowerBook 160 and 180 and the Duo 210 and 230 support this feature (again, through an optional adapter).

Another handy integration technique is a docking station—a box into which you plug desktop peripherals on one side and a notebook on the other. Voilà, instant desktop Mac, with everything preconfigured and no bewildering array of cables to deal with. Unfortunately, the original Mac notebooks weren't designed with this in



Portable Drive Performance



All vendors use the Quantum Go mechanisms for both internal and external notebook drives, since the Go drives are currently the only 2.5-inch 80MB and 120MB drives available in large quantities. The formatting software that comes with a drive can affect performance by about 10 percent. Results

here are averages both for several units of each mechanism and for several tests. For example, the duplicate test includes a 3.2MB file and a 10MB folder. For comparison, we also show the results for the 40MB Conner drive that Apple installs in its PowerBooks.



Ever-smaller computers require ever-smaller modems. Compare the modem board from the external Shiva Netmodem/E (top) to those used in the Outbound Pocket Port Fax Modem external fax modem (lower left), Apple PowerBook 170 internal modem (center), and PowerBook Duo internal modem (right).

mind, and the only solution (for the PowerBook 140, 145, and 170) is the \$129 BookEndz docking station made by Pilot Technologies (see *The Desktop Critic*, *Macworld*, September 1992). A version for the PowerBook 160 and 180 has also been announced. The BookEndz squarely addresses a need for first-generation PowerBook owners.

Apple has taken the docking station concept several steps further in its Duo line (see "Apple's Dynamic Duo," *Macworld*, December 1992). The Duo Dock offers expansion options (up to two NuBus boards) but takes a lot of space and costs a fair amount (\$1079). For small spaces and portability, better options are the \$589 Duo MiniDock from Apple (but made by SuperMac Technology) and the two PowerLinks from E-Machines. All provide the standard set of Mac ports; the MiniDock also has a pass-through connector for a Duo's internal modem.

E-Machines' \$499 PowerLink Presenter is designed for people who need to take presentations on the road. It supports 8-bit color on popular 14- and 16-inch displays and 4-bit color (16 colors) on popular 19-inch monitors. The unit works with LCD overhead projection panels and produces SuperVGA, NTSC (the U.S. television standard), and PAL output (the TV standard in many nations). A feature called *convolution* reduces the flicker normally seen when sending Macintosh video to a television set. QuickDraw acceleration is built in, as is hardware panning and zooming to 200 percent. In addition to its video functions, the PowerLink Presenter provides a stereo audio jack, an ADB connector, two serial ports, and an HDI-30 SCSI port for an external floppy drive.

The \$699 PowerLink DeskNet, designed as an alternative to Apple's Mini-

Dock, has the same RGB-video-output capability as the PowerLink Presenter and adds a thin (10Base2) or twisted-pair (10BaseT) Ethernet port to the package. You also have stereo audio in and out, ADB, external floppy drive, serial, and SCSI ports. The PowerLink DeskNet is a better choice than the Apple Duo MiniDock; for only about \$100 more, the DeskNet has what the MiniDock does (except for the modem pass-through connector), plus Ethernet.

Envisio (612/339-1008) has announced the Dynamic Duo, a small docking station due in January, with

16-bit-video and stereo-sound capabilities. No price had been set at press time.

Hard Copy on the Road

IF YOU NEED TO PRINT WHILE YOU'RE traveling, you have several options. The first works if you're visiting a site that has a Mac-compatible printer. You should carry a serial cable or an AppleTalk-compatible network connector along with your PowerBook, so you can hook into the office's network and print. If there aren't any printers in sight, but you have a fax modem in your notebook, plug into a phone line and fax your pages to the office's fax machine. While the result is just 200-dpi output, it's better than no output at all.

We also looked at two portable printers, the \$599 GCC Technologies WriteMove II and the \$459 Eastman Kodak Diconix 180si, both of which can be battery-operated. The new WriteMove II is tiny, lightweight, easy to use, and offers high resolution (360 dpi). The Diconix is heavier and has coarser resolution (192 dpi). Both print at about a half page per minute and require that each sheet be hand-fed. And both come with Adobe Type Manager and a selection of fonts.

The 2½ pound WriteMove II is a winner. The printer uses thermal-ribbon technology to produce crisp, dark blacks with its single-strike ribbon. The drawback of this ribbon is that it is only good for about 20 pages, then you must replace it. For longer ribbon life, but lesser quality, use the multistrike ribbon, which prints up to 100 pages before it is exhausted.

The Diconix 180si ink-jet printer is larger and heavier than the WriteMove II. Its print quality is inferior to that of the WriteMove II's single-strike ribbon and roughly equivalent to that of the multistrike ribbon.

MW

EDITORS' CHOICE

External Hard Drives

PocketDrive 120MB Lightweight, portable, well-designed, these external drives are a great option for anyone seeking to expand a notebook's storage. **Company:** La Cie. **List price:** \$699.

Companion 120 This battery-powered drive is especially well suited for travelers. **Company:** APS Technologies. **List price:** \$599.

SCSI Monochrome Monitors

Power Portrait Its light gray phosphors, multiple resolution settings, virtual desktop, and reasonable refresh rates make this SCSI monitor the best choice for people seeking a portable portrait display. **Company:** Sigma Designs. **List price:** \$749.

Internal Fax Modems

PowerPort series, PowerModem series Both series offer speeds from 2400-bps data/9600-bps fax to 14,400-bps data/9600-bps fax (the PowerModem IV supports 14,400-bps fax). And both series have excellent fax software. **Company:** Global Village Communications (PowerPort series); PSI (PowerModem series). **List price:** PowerPorts \$229 to \$499; PowerModems \$195 to \$495.

Docking Connectors

PowerLink DeskNet For a PowerBook Duo owner seeking desktop connectivity, this is the best option, offering all the standard Mac ports plus broad video-output capabilities and an Ethernet connection. **Company:** E-Machines. **List price:** \$699.

Should you get one of these printers? Not unless you must always have a printer on the road. If so, get the WriteMove II. Otherwise, get an inexpensive StyleWriter for your home office if you're short on cash, or an inexpensive laser printer if you have a bit more money (see "Personal Printers," *Macworld*, September 1992).

Customize Your Office

THE CORNUCOPIA OF PORTABLE PERIPHERALS gives you wide latitude in building a portable office. Whether you need large amounts of storage, fast communications, flexible display options—or all three—you can tune your system so that the tools you need most while on the road are at your fingertips. And you can easily reconfigure or grow your portable office by upgrading or replacing components as needed. The portable Mac office is now a reality—take advantage of it. **m**

TOM NEGRINO is a *Macworld* contributing editor.

Macworld Lab testing by MARK HURLLOW.



hello mr. modem...

CD ROMs and online services bring a wealth of stock images to your Mac

Need a soothing image of a sunset? A still from *Casablanca*? A news photo from the 1992 presidential election? If so, chances are you can find it using your Macintosh to search through a growing number of CD ROM and electronic-bulletin-board photography collections.

Stock photo agencies—which sell publication rights to the thousands of pictures in their catalogs—have been supplying prints and transparencies to graphic designers and picture editors for decades. In 1993, digital photo libraries based on those stock agency collections are poised to take off. Major stock photo agencies such as AllStock, FPG International, and The Stock Market have recently released CD ROM catalogs; and new dial-up services from Eastman Kodak and Picture Network International, a consortium of stock photo agencies, are expected to be available later in 1993.

But the emergence of digital photo collections poses many questions. How do the cost and procedure of using a photo from a CD ROM or bulletin board compare with

the traditional methods of dealing with a stock photo house? What kinds of images are available? What rights do you get—and not get—with a digital photo? What software do you need for maneuvering through image libraries? And perhaps most important, how do you determine if the image quality offered by a particular CD ROM or online service meets your needs?

How It Works

TYPICALLY, WHEN YOU BUY A STOCK photo, you phone in a research request to an agency that represents large numbers of photographers. The agency researcher then sends you, by messenger or overnight mail, a variety of prints and transparencies that fit your photo request. You pay a research fee—typically \$50 to \$75—and negotiate a usage rate for the images ultimately selected for publication.

The usage rate is determined by the size of the photo as it appears in your publication, as well as by the nature and distribution of the publication (nonprofit newsletter, national magazine, and so on).

by
*Ronnie
Shushan*

DIGITAL STOCK PHOTOS

TRAVEL/LANDMARKS

FPG International

FPG International's disc—part of Mirror's CD-Stock bundle—offers images of far-flung lands. Other CD ROM sources for travel shots include Gazelle Technologies and PhotoDisc.



PEOPLE

PhotoDisc

PhotoDisc Vol II: People & Lifestyles features a range of pictures, from children in the rain to seniors on the beach, that can strike an emotional chord among a publication's readers.



During the selection process, you're liable for a \$1500 fee if you lose or damage any piece of original art that the agency sends you for consideration.

Digital photo catalogs are helping to streamline the process of using stock photos. You can browse through image thumbnails in a CD ROM or bulletin board, much as you would flip through a printed catalog. But with these digital picture libraries, you can also zero in on the types of images you want through an electronic search—grouping all the thumbnails of horizontal landscapes or couples on a beach, for example. Having the images in digital form makes it easy to see how they'll look in your electronic layout, and the process greatly reduces the amount of original art that's sent through the mail.

Who's It For?

DIGITAL PHOTO COLLECTIONS ARE TARGETED at two types of buyers. For the growing communications market—the businesses and nonprofit organizations that desktop computers have turned into publishers—digital-image collections provide a source of previously unaffordable photos.

These digital photos can cost as little as 50 cents each, but like clip art, they don't generally measure up to the quality of stock photo originals, which cost from \$50 to thousands of dollars per image. That's because, in many cases, what you're getting from a CD ROM is a scanned image with only 72-dots-per-inch resolution, which

can't compare in quality to an original, continuous-tone photograph or transparency. But for many publishers on a budget, low-resolution photos selected from a digital image collection can add life and color to a publication, at the right price.

For the higher-level media market—the designers and publishers of books, magazines, newspapers, advertisements, and slick corporate promotions—access to digital image catalogs is likely to change the way in which photo buyers preview and select images from stock agencies.

With some CD ROMs and online bulletin boards, you choose the image you want from among the low-resolution scans, then contact the stock agency to obtain a high-resolution scan of that image or, most likely, an original print or transparency for reproduction purposes.

Images on CD ROM

CD ROMS, WITH THEIR CAPACITY TO store large amounts of data (just over 600MB), are becoming a popular way to distribute digital photo catalogs. It's important to remember, however, that a stock photo house's primary business is selling photo rights, not CD ROMs. As a result, many CD ROM photo products serve as a guide to the images available through a stock agency, rather than as an actual photo database.

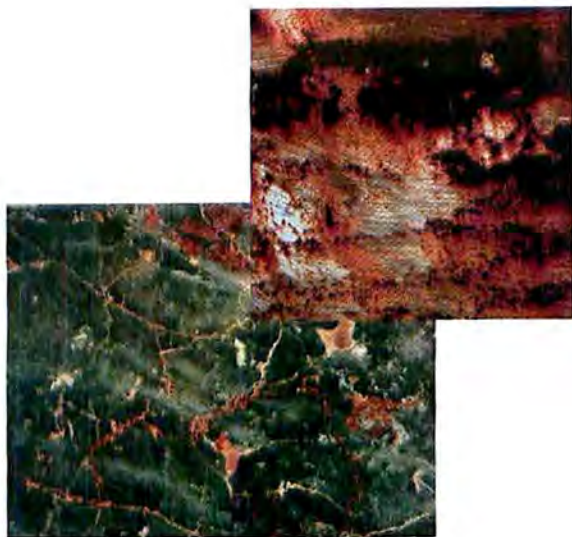
For example, the images offered on three new high-profile CD ROM prod-

ucts—the CD-Stock series, The Westlight Sampler 1, and The Image Bank Catalog 12 (due for release in January)—are all 24-bit color files with resolutions of 72 dpi. The low resolution means these images are best used for screen display or for the presentation layouts that designers call comps, but not for most reproduction purposes (see "Digital Photo Sources" for a sampling of the stock photo CD ROMs and online services available). You can easily select an image you need and test it in an electronic layout, but you must request original art from the photo agency for reproduction-quality photos and negotiate a usage fee.

CD ROM photo catalogs offer a variety of images, packages and prices, file formats, and usage rights.

The CD-Stock set of four discs is a cooperative venture between 3M, Mirror Technologies, and four of the top stock photo houses—AllStock, FPG International, The Stock Market, and Tony Stone Worldwide. Priced to appeal to the many designers who don't yet own CD ROM drives, the \$995 introductory package includes Mirror's CD ROM drive, 3M's CD-Stock image-management software, and four discs with a total of 20,000 photos.

The discs provide a wide variety of images, typical of the diverse collections of those agencies. Nonetheless, each of the four collections shows only a fraction of the agency's photos; some agencies have up to 600,000 images in their collections, while others offer several million photos.



BACKGROUNDS/ TEXTURES

D'Pix

D'Pix Folio 1 Print Pro's backgrounds and textures add an inexpensive but striking design element to a page.



NEWS

Reuters/KRT

By dialing up PressLink, you can download the latest news photos, from Madonna's décolletage (Reuters) to Bill Clinton's victory speech (KRT).

Comstock, one of the largest commercial stock photo agencies and the first to release a photo CD ROM, last fall released the first of five volumes in Comstock's Encyclopedia of Desktop Photography. Unlike the CD-Stock, Westlight, and Image Bank CD ROMs, the Comstock discs include the right to use the 72-dpi images for noncommercial, in-house use, such as a company newsletter or a teaching aid, as well as for comps.

WestStock provides the images for PhotoDisc's series of five CD ROMs. Although the images can't be used in a product for sale (whether editorial, such as a book or magazine, or commercial, such as a greeting card or T-shirt), they can be placed in advertisements, presentations, business, and broadcasts.

Discs with less-restricted use tend to have fewer images and a tightly focused selection. For example, Gazelle Technologies' Swimsuit CD offers nothing but pictures of women in bathing attire. But before you snicker, consider the nonprofit publisher who uses this \$199 CD ROM as an inexpensive source for head shots to illustrate women's health stories.

Bulletin Boards

BLAZING THE TRAIL FOR ONLINE SERVICES is PressLink (a Knight-Ridder subsidiary), a dial-up network of electronic bulletin boards that offers text, graphics, and photos from more than two dozen news organizations and a few photo agencies.

Image Quality

With the exception of CD ROM photo catalogs—whose images are intended for layout position only rather than for reproduction—almost every CD ROM collection of digital photos is promoted as having high-resolution scans. But if you compare file sizes, you'll realize that's not the case.

A truly high-resolution digital photo, one that you'd find in *Sports Illustrated*, for example, can be anywhere from 12MB (for a 4-by-5-inch image) to 70MB (for a two-page-spread photo). The CD ROM photo collections currently on the market have files ranging in size from 500K to 22MB.

To determine if the vendor's definition of high resolution is sufficient for your purposes, you need to know the resolution of the scans on the CD ROM and the line screen to be used in printing your publication.

Image resolution, the amount of information in a digital file, is measured in dots per inch. Screen frequency, the density of the lines of dots used to print a continuous-tone photograph, is measured in lines per inch. Newspapers typically use a coarse line screen of 85 lpi; in-house publications, 100 to 120 lpi; and glossy magazines, 133 to 155 lpi.

In general, optimal image resolution is twice the line screen: optimal dpi = $2 \times \text{lpi}$. But size is an important factor, too. When you reduce an image, you increase the effective resolution; when you enlarge the image, you decrease the resolution. So if you're resizing the original scan for use in your publication, the formula to use is $\text{dpi} = 2 \times \text{lpi} \times \text{percent of original size}$.

Consider a CD ROM image that's 300 dpi and 5 by 7 inches. You plan to print it at 65 percent of the original size, using a line screen of 133 lpi. In this case, the optimal resolution is 173 dpi ($2 \times 133 \times 0.65$), and the 300-dpi original provides more resolution than you need to successfully print the image.

If the CD ROM image is only 72 dpi, however, you don't have enough information in the file for good reproduction (remember that the optimal resolution is 173 dpi). The printed image is likely to lose detail, with some jagged edges where there should be smooth curves, or to appear posterized, with rough gradations in tone and unacceptable levels of contrast. (For more information on halftones see "Halftones Demystified," in this issue.)

A DIGITAL PHOTO GALLERY (continued)

HISTORY

The Bettman Archives

Bettman has a wealth of historical photos, including Churchill during World War II and San Francisco after the 1906 earthquake.



PEOPLE

Gazelle Technologies

The Swimsuit CD specializes in beautiful women. Gazelle offers other specialty people discs, including People at Leisure and People in Business.

PressLink's primary market is small-to-medium-circulation newspapers, which use the service to access photos from a Mac or PC rather than installing a satellite dish. You don't have to be a newspaper to subscribe, however. And while PressLink charges monthly, online, and data-transmittal costs, most news and stock photo agencies that offer images through PressLink offer the choice of a monthly fee with unlimited use or a fee-per-download pricing structure. This second option makes the service affordable to organizations with less-demanding photo needs than newspapers have.

As of this writing, PressLink offers roughly 30,000 photos online, which are accessed through an easy-to-use, menu-driven interface. Among its suppliers are such news agencies as Reuters, Knight-Ridder, and Agence France-Presse; All-Sport, a stock agency specializing in sports photography; The Bettmann Archives, the agency many turn to for historical and background pictures; and even the United States Army, which offers, at no cost for editorial use, pictures of generals, new weapons, and assorted military activities.

PressLink's scans are JPEG-compressed and optimized for a newspaper halftone screen of 85 lines per inch. But their large image size (12 by 18 inches is not uncommon) enables anyone who publishes pictures at smaller sizes to increase the resolution for finer line screens (see "Image Quality").

DIGITAL PHOTO SOURCES

Source	Product	Price
CD ROM		
Comstock	Desktop Photography Vol. 1	\$199.00
	Desktop Photography Vol. 2	\$89.00
	Desktop Photography Vol. 3	\$199.00
	Encyclopedia of Desktop Photography Vol. 1	\$399.00
D'Pix	Folio 1 Print Pro	\$499.95
Gazelle Technologies	Swimsuit CD Vol. 1	\$199.00
	African Wildlife	\$129.95
	U.S. Travel	\$129.95
	World Travel: Europe	\$129.95
	World Travel: Far East & Asia	\$129.95
Mirror Technologies	CD-Stock	\$995.00 ²
PhotoDisc	PhotoDisc Vol. I: Business & Industry	\$395.00
	PhotoDisc Vol. II: People & Lifestyles	\$395.00
	PhotoDisc Vol. III: Backgrounds & Textures	\$295.00
	PhotoDisc Vol. IV: Science, Technology, & Medicine	\$395.00
	PhotoDisc Vol. V: World Commerce & Travel	\$395.00
Cantrall's Photos on Disc	Nature & Scenic Backgrounds	\$249.00
	Flowers and Trees	\$249.00
	Wild & Domestic Animals	\$249.00
	Coastal Themes	\$249.00
Scott & Daughters	Stock Workbook: CD-ROM	\$39.95
Westlight	The Westlight Sampler I	\$15.95
ONLINE SERVICES		
Comstock	On-Line Access	Setup fee \$99; download fee \$4.50-\$9 per image ⁴
PressLink, Inc.	PressLink	Setup fee \$50; download fee 5.4 cents per kilobyte ⁴

¹ For position only. ² Price includes a CD ROM drive from Mirror, CD-Stock software from 3M, and four discs. The reproduction, request original art or high-res scan and negotiate the reproduction fee as usual.



SPORTS/ATHLETICS

AllSport

Images of athletes, such as these from the All-Sport PressLink bulletin board, are often used for business publications to convey competitiveness.



BUSINESS/INDUSTRY

FPG International/

PhotoDisc

Traffic jams are a popular way to illustrate stagnation—bottlenecks and logjams—in business situations (FPG), while an airplane in flight suggests upward motion (PhotoDisc).



Number of Images	Image Formats/dots per inch	Rights	Toll-Free Phone	Other Phone
499	8-bit gray-scale TIFF/72	comps; FPO ¹ layouts; noncommercial	800/225-2727	212/353-8600
100	24-bit color, 8-bit gray-scale TIFF/72	comps; FPO ¹ layouts; noncommercial		
441	24-bit color, 8-bit gray-scale TIFF/72	comps; FPO ¹ noncommercial		
3000	24-bit color, 8-bit gray-scale TIFF/72	comps; noncommercial		
100	24-bit color TIFF/266, 75	unlimited	800/238-3749	614/299-7192
200	24-bit color TIFF, 8-bit color PICT/72	unlimited	800/843-9497	619/536-9999
200	24-bit color TIFF/110; 8-bit color PICT/72	editorial; advertising for print runs of less than 10,000		
200	24-bit color TIFF, 8-bit color PICT/72	editorial; advertising for print runs of less than 10,000		
240	24-bit color TIFF, 8-bit color PICT/72	editorial; advertising for print runs of less than 10,000		
240	24-bit color TIFF, 8-bit color PICT/72	editorial; advertising for print runs of less than 10,000		
20,000 ³	24-bit color TIFF/72	comps	800/654-5294	612/633-4450
408	24-bit color TIFF/300, 72	advertising; business; presentations	800/528-3472	206/441-9355
409	24-bit color TIFF/300, 266, 72	advertising; business; presentations		
111	24-bit color TIFF/266, 72	advertising; business; presentations		
250	24-bit color TIFF/300, 266, 72	advertising; business; presentations		
300	24-bit color TIFF/300, 72	advertising; business; presentations		
100	24-bit color TIFF/300	one-time regional print runs of 100,000 and under	800/843-9497	916/933-5554
100	24-bit color TIFFs/300	one-time regional print runs of 100,000 and under		
100	24-bit color TIFF/300	one-time regional print runs of 100,000 and under		
100	24-bit color TIFF/300	one-time regional print runs of 100,000 and under		
2000	24-bit color TIFF/72	viewing only	800/547-2688	213/856-0008
3000	24-bit color PhotoCD format/72	search and retrieval only	800/872-7872	310/820-7077
12,000	24-bit color TIFF/72	noncommercial ⁵	800/225-2727	212/353-8600
30,000	varies by vendor	varies by vendor	NA	305/376-3818

four discs without the CD ROM drive cost \$650. ¹ Each of the four discs in this package contains 5000 images. ⁴ Other charges apply as well. ⁵ For commercial



NATURE/ANIMALS

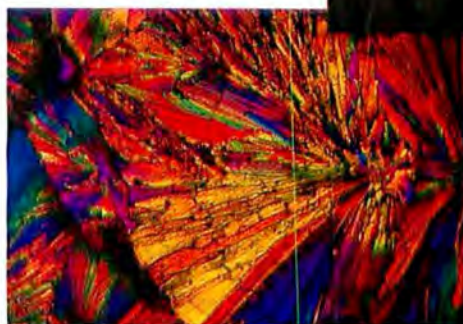
AllStock

The animal kingdom is a popular subject for stock photography. Among discs with digital nature images are AllStock and Cantrall's Photos on Disc series.

SCIENCE/MEDICINE

PhotoDisc

An image of surgeons at work can be used to convey precision and skill, while this microscopic enlargement of a sugar crystal could work as an abstract texture.



PressLink Access, the software used to view the images, assembles all the thumbnails in a given folder into the equivalent of an on-screen contact sheet. When you decide which images you want to use, you download the full-resolution files of those images using PressLink 2000, a communications and file-transfer utility; downloading takes 4 to 12 minutes at 9600 bps.

Meanwhile, Comstock is now offering some 12,000 images online, in addition to its CD ROM series. The images—24-bit TIFFs at 72 dpi—are intended for layouts, presentations, and noncommercial in-house use. For commercial reproduction, you must request the original transparency (or a high-res scan, which the agency sends on a SyQuest cartridge) and negotiate the reproduction fee as usual.

Most of Comstock's compressed images are 40K to 60K and take 4 to 7 minutes to download at 9600 bps. The images have been compressed using Kodak's Color-Squeeze utility; when you double-click on a file icon, the image decompresses to around 550K. You can save the file in TIFF or PICT format.

Image Management

WITH THE PROLIFERATION OF DIGITAL photo collections, image management becomes a critical issue. You need to be able to view thumbnails, create your own minicatalogs, conduct sophisticated keyword searches that quickly locate suitable images, and index images according to your own criteria.

LightBox, the software used by 21st Century Media for its PhotoDisc CD-ROM series, is a full-featured application, enabling you to view thumbnails (and to customize the thumbnail layout), search for images by keywords (and use Boolean descriptors such as AND, OR, and BUT NOT), edit the keyword list for any image,

and paste images from one PhotoDisc catalog into another.

You can mark thumbnails, view and print only the marked files, and save the marked files to your hard drive as a mini-catalog—a useful feature when you need to review preliminary photo selections with colleagues. You can also sort images by photographer, file name, catalog ID number, and so on.

At press time, several image-management products had been announced but were not available for review, among them were Aldus's Fetch, Nikon's ImageAccess, Kodak's Shoebox, and 3M's CD-Stock. All of these products were scheduled to ship before the end of 1992.

The ultimate success of CD ROM catalogs as a design tool may well depend on how easily designers can create their own custom catalogs of images from a variety of vendors. Aldus hopes its Fetch application, with the ability to catalog files in almost all standard Mac formats, will become the standard image-management program, creating a need for other image-management programs to be compatible with Fetch. But whether you'll be able to move images and the information attached to them (photo credits, keyword lists, and so on) from one management program to another remains to be seen.

In general, the less-expensive discs with fewer restrictions on usage (such as those produced by Gazelle Technologies) provide a HyperCard browser for viewing



You can print a 72-dpi CD ROM stock photo (top), but scanning a transparency at high resolution (254 dpi, below) provides a better image. CD ROM image and transparency are from FPG International.



ARTS

The Bettman Archives

The Bettman Archives is filled with classic movie stills (*Gone with the Wind*, top left, *The Lady from Shanghai*, left) and fine arts reproductions (Matisse's *La Danse*).



thumbnails. The search function is limited to one or two descriptive words, the indexing provided by the publishers is rarely adequate, and you can't edit the keyword list. You can mark the files, but you can't save the markings when you close the file, even if you save the file to a hard drive. You can get by with this sort of casual browsing if you use an occasional photo from one or two discs, but it's totally inadequate for managing large numbers of images in a production environment.

Legal Issues

USAGE RIGHTS FOR DIGITAL PHOTOS vary tremendously, so it's important to read all licensing agreements closely.

For example, PhotoDisc advertises "unlimited use for print, presentations, brochures, newsletters, and ads," but the actual license agreement adds "as long as the images are not used to create a product for sale." So if your newsletter goes free to an alumni group, that's OK, but if you sell a newsletter by subscription, it's not.

Some vendors allow "noncommercial" use, but the definition of noncommercial can be confusing. Comstock considers photos that illustrate an in-house training manual to be a noncommercial use, but photos used by a consultant hired to do an in-house training manual for a corporation are considered commercial use. The difference is that in the latter scenario, the consultant is using the photos to sell a service, thereby constituting commercial use.

Not understanding the copyright regulations that protect an image can get you into trouble, too. For instance, many consumers think it's okay to use an image if they alter it sufficiently. That's not the case, though—if any image, or part of an image, is recognizable as being derived from another image, you need permission from the copyright holder. In addition, some licensing agreements specifically prohibit image manipulation.

It's best to play it safe. If the usage you need falls outside the restrictions in the licensing agreement, you must negotiate a usage fee with the vendor, just as you would if you were buying a traditional stock photo. And if you're uncertain about what is or is not protected by copyright, don't assume—ask.

The Future of Digital Photos

WHILE THERE'S BEEN A GREAT DEAL OF progress in the digital photo market recently, the best is yet to come.

CD ROM photo collections should continue to gain in popularity, as CD ROM drives become more prevalent, thanks to the anticipated acceptance of Kodak's Photo CD format. But accessing images with a modem is, in many ways, going to be more promising than owning a collection of discs.

Kodak has announced Picture Exchange, a network on which a keyword search will enable you to preview low-resolution images from a variety of agencies.

Picture Exchange—currently set to debut by mid-1993—will forward the user's selection to the respective agency, which will then negotiate usage fees and provide prints, transparencies, or in some cases, high-resolution scans.

Another group, Picture Network International (PNI), plans to make available both preview and reproduction-quality images on its photo network, set to go online in late 1993. AllStock, Black Star, Contact Press Images, Stock Boston, and Woodfin Camp are expected to contribute photos to the 250,000-image database.

License arrangements for print use will be handled by the individual agencies, while rights for electronic media use will be negotiated directly by PNI on a uniform rate basis, thus simplifying the procurement of rights by multimedia publishers who need large numbers of images.

By the mid-1990s, fiber-optic phone lines—capable of transmitting huge amounts of data quickly—are expected to be much more widely available, giving users the ability to connect to enormous image databases.

With all this activity, the problem with digital photo libraries may soon be one of too many choices. As problems go, though, that's a nice one to have. **m**

RONNIE SHUSHAN is a partner in Broadview Media, an editorial and graphic design firm in Woodstock, New York, and coauthor of *Desktop Publishing By Design* (Microsoft Press, 1989).



DATA

How
strong
are
the
software
locks
on 24
security
products?

GUARDIANS

Security problems have become almost as commonplace as desktop computers. A disgruntled city employee, trying to get back at the boss, digs into the mayor's personal files and sends damaging information to the press. A woman asks her computer-expert husband to recover an accidentally deleted budget file; he recovers not only that file, but purposely deleted letters to an illicit lover. Or a major corporation

loses critical financial data to an industrial spy who dialed in to a company file server.

Most of us have some computer-security vulnerability. Fortunately, software solutions can address mild concern through outright paranoia. Some security products will keep your kid brother from reading your files. Others will prevent a Mac guru from reading your files. Still others will bar the best Macintosh programmers in the industry from reading your files. Finally, some software will probably keep the spy agencies of large nations or the industrial spies of multinational corporations from reading your files.

BY BRUCE SCHNEIER

Range of Protection

THE DIFFERENCES AMONG SECURITY programs are defined by both the type of security offered and the strength of implementation. The simplest security measure is password protection. If you're just worried about family members, coworkers, or nighttime office guards, password products are just fine. Password protection builds software locks around your system software, hard drive, folders, or files. If you have the password, you can get in easily; if you don't, you have to try to break the locks. And like physical locks, security programs vary in strength and reliability.

If you're worried about experienced hackers breaking into your system, use a program that encrypts files and folders on the hard drive. Encryption products alter files so that they become meaningless gibberish. If you have the password, the program decrypts the files; if you don't, you're out of luck unless the security product offers central administrator controls that allow emergency access (see "Access-Protection Programs" and "Encryption Plus Access-Protection Programs").

Some password-protection programs can be bypassed with standard hard drive utilities; others require more-advanced programming skills. Some programs use quick and easy encryption algorithms; they keep out all but skilled mathematicians and computer scientists. Others use the Department of Commerce-approved data encryption standard (DES) which, implemented properly, should keep out the cloak-and-dagger types at the National Security Agency (NSA).

I was able to break all but the strongest encryption programs

Security software is based on the concept of a *key*—usually a series of keyboard characters used by programs to decide whether to grant access to a computer, folder, or file. Without the correct key, you're locked out. Unfortunately, in most cases anyone sufficiently determined and skilled can find the key.

I tried to break 24 security programs by examining their code for weaknesses. I tried getting around their security measures by using disk utilities, file editors (such as ResEdit), and a debugging tool (such as MacsBug). In extreme cases I disassembled the code. I was able to break all but the strongest encryption programs—usually with ease (see "Breaking the Code").

Access Control

By the way, I have no intention of providing a cookbook for any of my cracking methods or making my programs public. They are not available on any bulletin board; I won't send you a copy. I hope software vendors whose programs I cracked will take it as a challenge to write better security software.

ALMOST ALL SECURITY PROGRAMS CONTROL access to a hard drive. Many, such as Magna's Empower series, usrEZ Soft-

ware's ultraSecure, Casady & Greene's A.M.E., ASD Software's FileGuard, and Kent Marsh's NightWatch II can partition a hard drive and grant individual passwords to several users. That feature is also part of some hard drive utility packages, including Symantec's Norton Utilities for Macintosh, Casa Blanca Works' Drive7, La Cie's Silverlining, FWB's Hard Disk ToolKit, and AlSoft's Power Utilities.

Kent Marsh's NightWatch II, ultraSecure, and A.M.E. offer the option of a key disk. This is a special floppy disk that a user must insert (in addition to typing a password) to access the hard drive. ASD Software's FileGuard has a similar option: it works with ASD's \$349 MacaccessCard magnetic card reader.

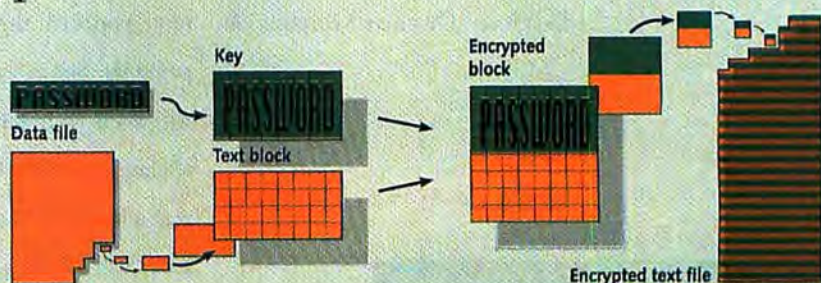
Many security programs have an optional screen-locking feature that protects the computer even after it has been turned on. The screen lock can be set to engage after you move the mouse to a particular location, when you hit a hot key, or after a specified period of inactivity. Someone walking up to a machine with a locked screen can't use it without the password. All such programs except CPU, from Connectix, and FileGuard support background tasks, such as printing and network access, while the screen is locked.

Another critical feature is the audit log, as kept by Kensington Microware's PassProof, FileGuard, Datawatch's Citadel with Shredder, NightWatch II, FolderBolt (also from Kent Marsh), Empower, Praxitel's Passport, ultraSecure, Fifth Generation Systems' DiskLock, and A.M.E. This log records all attempts to access the sys-

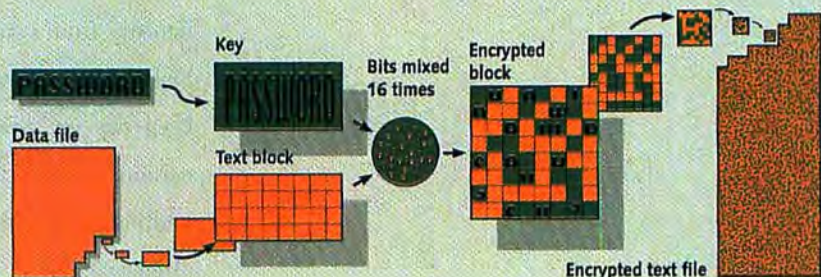
How Files Are Encrypted

PROPRIETARY ENCRYPTION

Proprietary encryption programs generate a key by using the binary bits of a password typed by the user. The key is then added to a text block—a small part of the data file—to create an encrypted block; when combined, those blocks become an encrypted text file. The relatively simple mathematical encryption formula offers less security than DES encryption does.

**DES ENCRYPTION**

DES encryption generates a key in the manner of proprietary programs. But with DES, the bits within the key and text blocks are then mixed and shuffled 16 times, using a complex algorithm. Encrypted blocks are then recombined to create an encrypted file that for nearly all practical purposes cannot be broken.



Network Security

If security on a stand-alone Macintosh has you tossing and turning at night, think of security on networked Macs as a nightmare. AppleTalk was designed for ease of use, not security.

People who use file sharing without thinking leave their files easily vulnerable. You have to be selective about what files you open and to whom.

The Mac system doesn't inform users when someone else is accessing their files, but users can find out by using Nok Nok, a \$49.95 program by Trik (800/766-0356). Nok Nok notifies users when someone initiates a remote connection, keeps a log of the activity, and can disconnect outside users after a specified period.

AppleShare 3.0 supports some password security, but there are many ways to get around it. Anonymous (guest) log-ons, automatic log-ons, and alias files can all be used to gain unauthorized access to a file server.

Guest log-ons allow people without passwords to access parts of a file server; the process works fine only if the system administrator carefully restricts such privileges to selected files or folders. Similarly, in a system that uses automatic log-ons and alias files without a secure access configuration, anyone can automatically log on to the server. Or if someone leaves a Mac unattended after

logging on (without a screen-locking security program), anyone can access the server.

Another problem involves network traffic interceptions. AppleTalk does not encrypt data passing across the network. Packet sniffers—hardware and software packages that read data as it travels across the network—can view all traffic, no matter whom messages are addressed to. No existing product encrypts data as it travels across the network (be it AppleTalk, Ethernet, FDDI, or any other).

Routers are a way to improve security by segmenting sections of the network. Unfortunately, many of them can be reconfigured over the network. They are password protected, but often not very well. A snoop can reconfigure a router to collect all kinds of interesting information for a packet sniffer on the other end. Even worse, someone can buy a new router and stick it on the network. A network administrator at the University of Illinois says that every so often new routers appear on the network. He watches for the problem, but people who don't are vulnerable.

A network may not be safe from off-site intruders. Most AppleTalk networks are wide open to remote users. Some routers offer zone- or resource-hiding features; selected printers, file servers, or even entire parts of the network can be hidden from remote users.

tem, successful or not. The feature can determine if someone is trying to break into your system, or help you discover who is using the system.

Tracking Users

ALL OF THE PROGRAMS THAT OFFER AN audit log, except Citadel with Shredder, and FileGuard, protect that log with a password to prevent an intruder from modifying it. NightWatch and PassProof go so far as to encrypt the audit log. DiskLock automatically alerts legitimate users of unauthorized attempts to access the system. All of the programs that support the log, except ultraSecure and Passport, let you print the audit log; all except Citadel with

Shredder, and Passport let you export the audit log to a word processing program.

Even after you type in your password, some programs keep on working. FileGuard, Empower II, ultraSecure, and A.M.E. allow customized access. Some users may be able to read and copy data files, but not delete or modify them. Others may read, modify, or copy files, but may not delete applications. This can be a boon in schools whose labs are used by different classes throughout the day.

Empower II also allows custom limits on the use of applications, Apple menu items, and control-panel items. Empower II and ultraSecure optionally allow guest users, who can log on to the machine and

use unprotected programs and data.

Empower Remote (which has all the features of Empower II) enables you to manage all of this remotely over a network. One security administrator can manage an entire network of Empower-protected Macs from one workstation. ultraSecure has everything from a simple screen locker to a complex, multilevel security program. The system administrator can configure the security at the desired level.

FileGuard and ultraSecure can modify applications so only password-holders can launch them. If you fear software pirating, FileGuard can also modify applications that are removed from the hard drive with a "suicide pill," which disables the removed application either immediately or after a specified period of use.

Empower, ultraSecure, and Citadel with Shredder can disable the floppy drive after start-up; this can prevent both unauthorized copying of software and the introduction of computer viruses. ultraSecure works with System 7 aliases; it can even allow access to an alias while denying access to the underlying program. This prevents unauthorized deletion or pirating. You can hide applications in a protected folder, and aliases still work transparently—even across the network.

Kent Marsh products take a modular approach to security. Each individual product provides a portion of the comprehensive security you get with a single package from some other vendors. NightWatch protects access to a hard drive, FolderBolt protects the desktop, and Kent Marsh's MacSafe II encrypts files. You only have to



Guards at the California Youth Authority in Norwalk, California, use ultraSecure to keep inmate data confidential.

EDUARDO UTENELIM

buy the security you need, but if you need all the features, everything works together and works well. Kent Marsh sells the three products together as its Executive Security Kit, for \$269.

It's also worth considering the relative convenience of password procedures. FileGuard, Empower, and ultraSecure work in the background—just enter your password once when you log on and that's it. DiskLock separates the access control and the encryption functions, requiring a password at log-on and again to encrypt or decrypt. A.M.E.'s convoluted interface requires the password at various points.

The Encryption Edge

IF YOU'RE WORRIED ABOUT SOPHISTICATED hackers or major intelligence agencies, try encryption. But it can be slow—up to an hour for a 1MB file, depending on the speed of your Mac and the product used. Because encryption changes a file's bits, an error in encryption or decryption could effectively destroy a file. And if you lose the key, you're out of luck. Symantec recently received a call from a police department, which lost its encryption key for the Norton Utilities DES module and couldn't recover the data. There was nothing Symantec could do to help. Always back up data—including encrypted data and keys.

The security of any encryption program depends on the strength of its encryption algorithm. Cryptographers spend years coming up with algorithms, only to have them broken by colleagues. Algorithms that seem foolproof can have hidden mathematical tricks that reveal fatal flaws. Governments have buildings full of people with more degrees than a thermometer

Too many encryption programs leave the key under the mat

working to develop encryption algorithms. Don't expect the same effort from a software vendor.

When a security program claims to have a proprietary encryption algorithm, you should immediately be suspicious. Proprietary algorithms are generally designed to be fast and easy to implement, not secure. Nearly all such algorithms—including those offered by DiskLock, Norton Utilities, A.M.E., Mac-

Safe II, and Empower (which also offer DES options); those in Hard Disk Toolkit and FileGuard (which do not offer DES options); as well as the built-in algorithms in WordPerfect, Microsoft Excel, and Informix's Wingz—are mathematically similar to one the Union Army broke dur-

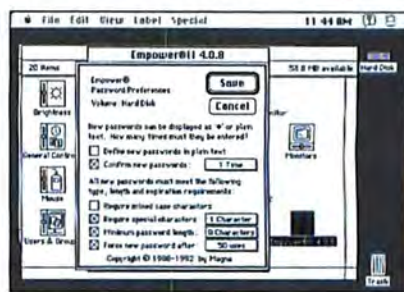
ing the American Civil War. It was secure then, but today a cryptographer with a computer can break it in five minutes. Mac-Safe II's alternate proprietary algorithm, LightningCrypt, varies significantly from that archaic approach—and it's only slightly more secure. The proprietary-algorithm options in usrEZ's ultraSecure and Camouflage are better, but not as strong as DES.

While programs with proprietary encryption algorithms may discourage unsophisticated but nosy coworkers, I don't recommend using such products. Password-protection programs will keep out all but experienced Macintosh programmers. Anyone skilled enough to break the best password-protection scheme will also be able to break a proprietary-encryption algorithm.

Two companies already sell products that break passwords for Excel, Wingz, and WordPerfect. AccessData (800/658-5199) offers Wrpas for WordPerfect, and Xlpas for Excel, \$185 each; NewVision (405/523-1639) has MasterKey (\$165) for Excel, WordPerfect, and Wingz.



Audit Log ultraSecure allows you to keep an audit log of specific user activities. This lets you keep track of which users log onto the computer, and what applications and documents they use.



Password Help Empower can be configured to prevent users from choosing simple passwords. Here, passwords must be at least eight characters long and must include at least one nonalphanumeric character.

ACCESS-PROTECTION PROGRAMS

General	BulletProof 1.0	CPU 1.0	DiskMaker 1.6.5	Drive 7 2.3	FolderBolt 1.02e
Company	Spectra Micro Development	Connectix Corporation	Golden Triangle Computers	Casa Blanca Works	Kent Marsh
Telephone	602/795-7288	415/571-5100; 800/950-5880	619/279-2100; 800/326-1858	415/461-2227	713/522-5635; 800-325-3587
Price	\$99	\$99	\$89	\$79.95	\$129.95
Online help	○	●	●	●	●
Features cracked	all	all	all	all	all
DRIVE ACCESS CONTROL	○	●	●	●	○
Prevents access (to hard drives/hard drive partitions)	NA/NA	●/○	●/●	●/●	NA/NA
Uses an optional key disk	NA	○	○	○	NA
Includes physical locks for floppy drive and serial port	NA	○	○	○	NA
Allows multiple passwords/master password	NA	●/○	●/○	●/○	NA
Provides screen locking	NA	●	○	○	NA
Allows background tasks with screen locked	NA	○	NA	NA	NA
FILE ACCESS CONTROL	●	○	○	○	●
Protects files and/or folders from copying/from deleting	●/●	NA/NA	NA/NA	NA/NA	●/●
Protects files and/or folders from modifying/from reading	○/○	NA/NA	NA/NA	NA/NA	●/●
Protects applications from copying/from deleting	●/●	NA/NA	NA/NA	NA/NA	●/●
Protects applications from modifying/from reading	○/○	NA/NA	NA/NA	NA/NA	●/○

● = yes; ○ = no; NA = not applicable. * Allows one password per partition.

Breaking the Code

Every password-protection program for the Macintosh can be broken. The easier ones, like Passport and CPU, can be bypassed simply by booting from a floppy disk. (If the program says it prevents this, hold down option-shift-control-delete when booting—that has always worked in the programs I've tried it on.) Some programs, like Trend Micro Devices' SafeLock, lock the hard drive and make files invisible. Almost any hard drive utility can undo this. FolderBolt and NightWatch II move files to a location that only the security program can detect—effectively tricking the Finder into thinking the file doesn't exist. But Norton Utilities can diagnose and circumvent that scheme. ultraSecure and Empower also use similar—though more elaborate—ways to trick the Finder, but an experienced programmer with a sector editor, such as those provided by Norton Utilities for Macintosh, MicroCom's 911, and MacTools by Central Point, can reset the correct file tree.

Most security products, such as FileGuard, DiskLock, Empower, A.M.E., ultraSecure, and NightWatch II, modify the SCSI driver so that it won't work without the correct password. Updating the SCSI driver bypasses that.

A.M.E. also alters the Macintosh directory and encrypts the entire drive. To break that I had to use MacsBug to trick the SCSI driver into producing readable data without the key, then I examined the log-on file to recover the passwords. The program uses some programming tricks to prevent the use of MacsBug, but a good hacker can neutralize them.

Probero's KeyLock Mac and PassProof include hardware locks that prevent access to the floppy drive and serial port. These made it impossible at the outset to use any debugging tools or cracking programs; there was no way to load them. After I analyzed each program, I used the locked Mac's ROM-level debugger to bypass the program's security and do manually whatever I would have done with a sector editor. While I could read and modify all of the protected files, I still couldn't make copies. To enable that, a locksmith friend came over and picked the locks—it took him a minute each.

Except for ultraSecure, all encryption products that automatically generate keys are pushovers; the key is usually poorly hidden in the encrypted file. That's why for top security you should try ultraSecure or any of the products with manual-key encryption.

More-reliable encryption programs use the DES algorithm—developed, in part, by NSA—which has withstood attacks by some of the world's best cryptographers for more than ten years.

While all DES programs are secure enough for everything but the most-demanding security needs, there is a catch. For the most dependable results, DES should be used in its most secure mode. Only Citadel with Shredder, and MacSafe II offer that mode; the other DES products—Empower, Norton Utilities for Macintosh, ultraSecure, and Camouflage—use another DES mode that is easier to implement.

Homemade DES variants offer less security than DES. DES is a very fragile algorithm; minute changes can significantly reduce its reliability. In addition to DES, Citadel offers 1/2-DES and 1/4-DES—faster, but less-secure adaptations of DES. ultraSecure and Camouflage, both from usrEZ Software, offer a double-DES option, where a file is encrypted twice with two different keys. This has been mathematically proven to be no more secure than any of the standard DES modes, but encryption takes twice as long.

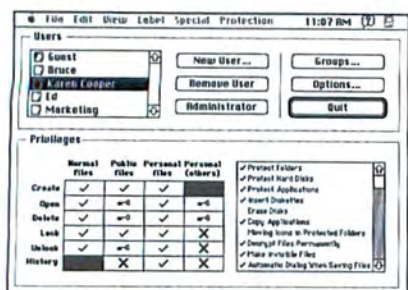
While the faster variants are secure from everyone except the most sophisticated adversaries, I don't recommend using

any of them. Any encryption takes time, so you might as well get the security for your investment.

Key Management

IF USING DES WERE ENOUGH, THERE would be a multitude of good security packages available. However, I can read files that have been DES-encrypted with Empower (Auto Key option only) and DiskLock. (I could do likewise with A.M.E. version 2.1, though version 3.00 shipped too late to test in this way.) I don't break DES; I look for the key. Consider the lock on your front door. It can be unpickable and unbreakable, but anyone can open it if

Folder Locker 1.2.8	Keylock Mac 3.92	NightWatch II 2.01b	Passport 2.2	PassProof 1.02	QuickLock 2.1	SafeLock 1.0	Silverlining 5.4.1
Software Brewing	Probero	Kent Marsh	Praxitel	Kensington Microwave	Kent Marsh	Trend Micro Devices	La Cie
415/940-1946	303/667-4444; 800/366-2515	713/522-5635; 800/325-3587	510/846-9380	415/572-2700; 800/535-4242	713/522-5635; 800/325-3587	310/782-8190; 800/228-5651	503/520-0845; 800/999-0143
\$30	\$109	\$159.95	\$24.95	\$64.95	\$59.95	\$49	\$99
●	○	●	○	○	●	○	●
all	all	all	all	all	all	all	all
○	●	●	●	●	●	●	●
NA/NA	●/●	●/●	●/○	●/○	○/○	●/●	●/●
NA	○	●	○	○	○	○	○
NA	●	○	○	●	○	○	○
NA	○/○	●/●	○/○	●/●	○/○	○/○	●/●
NA	●	●	○	●	●	●	○
NA	●	●	NA	●	●	●	NA
●	○	○	○	○	○	○	○
●/●	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA
●/●	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA
●/●	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA
●/●	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA	NA/NA



Access Levels FileGuard allows you to customize privilege levels, such as accessing personal files, and opening and deleting public files only with a password. In the above case, the user can also insert a floppy disk and copy applications onto that disk. But she cannot erase disks.

you leave the key under the mat.

Too many Macintosh encryption programs leave the key under the mat. They try to hide it, but often not well enough. DiskLock uses DES just fine, but then it includes the key with the file. To break into the program, all I have to do is examine the encrypted file for the key. Empower has an option that generates keys for you. I disassembled the program and figured out how it generates the key. Now I can generate the key myself and break into any file automatically encrypted with Empower.

ultraSecure, with the fastest DES in the business, is also the only program with automatic DES encryption whose key-

management scheme I couldn't break. usrEZ managed to hide its DES key extremely well. I'm paranoid enough to think that it can be broken by someone, though.

The manually operated key-management schemes are the most secure. Some programs force you to enter your key every time you want to encrypt and decrypt a file. This is more work than using a program that handles it all for you automatically, but manual encryption is more secure because the key is never stored in the computer. The manual encryption modes of Camouflage, Norton Utilities, Citadel with Shredder, MacSafe II, and Empower, are, as far as I can tell, secure. All those products

ENCRYPTION PLUS ACCESS-PROTECTION PROGRAMS

General	A.M.E. 2.1	Citadel with Shredder 1.10	DiskLock 2.12	Empower I 4.08 ¹	FileGuard 2.70	Hard Disk ToolKit 1.10	Norton Utilities for Macintosh 2.00
Company	Casady & Greene	DataWatch	Fifth Generation Systems	Magna	ASD Software	FWB	Symantec
Telephone	408/484-9228	919/490-1277	504/291-7221; 800/873-4384	408/282-0900	714/624-2594	415/474-8055	408/252-3570; 800/441-7234; in CA 800/626-8847
Price	\$279	\$99	\$189	\$169	\$249	\$199.95	\$149
Online help	●	●	●	○	○	●	●
Features cracked	all ²	all but encryption	all	all but encryption	all but encryption	all	all but encryption
DRIVE ACCESS CONTROL	●	●	●	●	●	●	●
Prevents access (to hard drives/hard drive partitions)	●/○	●/●	●/●	●/●	●/●	●/●	●/●
Uses an optional key disk	●	○	○	○	○ ⁴	○	○
Includes physical locks for floppy drive and serial port	○	○	○	○	○	○	○
Allows multiple passwords/master password	●/●	●/●	●/●	●/●	●/●	● ⁴ /○	● ⁴ /○
Provides screen locking	●	●	●	●	●	○	○
Allows background tasks with screen locked	●	●	●	●	○	NA	NA
FILE ACCESS CONTROL	●	○	●	○	●	●	○
Protects files and/or folders from copying/from deleting	●/●	NA/NA	○/●	NA/NA	○/●	NA/NA	NA/NA
Protects files and/or folders from modifying/from reading	●/●	NA/NA	●/●	NA/NA	●/●	NA/NA	NA/NA
Protects applications from copying/from deleting	●/●	NA/NA	○/●	NA/NA	●/●	NA/NA	NA/NA
Protects applications from modifying/from reading	●/●	NA/NA	●/●	NA/NA	○/●	NA/NA	NA/NA
ENCRYPTION	●	●	●	●	●	●	●
Encrypts all files/selected files in a folder	●/●	●/○	●/●	●/●	○/●	○/○	●/●
Autoencrypt on save and autodecrypt on open	●	○	●	○	●	○	○
Auto-reencrypt on closing or shutdown	●	○	●	○	●	○	○
Overwrites original after encryption	●	●	●	○	●	○	●
Self-decrypting files	○	○	○	○	○	○	○
Encrypts applications	●	●	●	●	○	○	●
Secure DES encryption	○	●	○	●	○	○	●
FILE ERASURE	●	●	○	○	○	●	●
Overwrites files/drives/free space	●/●/●	●/●/●	NA/NA/NA	NA/NA/NA	NA/NA/NA	○/●/○	●/●/●
Overwrites three times	●	●	NA	NA	NA	○	●

● = yes; ○ = no; NA = not applicable ¹ Empower II (\$296) adds complete file-access control and autoencryption. Empower Remote (\$396) adds those features plus remote-access abilities.

² Version 2.0 was cracked; version 2.1 arrived too late for testing. ³ Company offers magnetic card reader at extra cost. ⁴ Allows one password per partition.

implement DES according to one of the federally approved modes. Although all ancillary features—such as screen, folder, and disk locks—can readily be broken, any encrypted files are safe from prying eyes.

File Erasure

WHEN YOU DELETE A FILE, THE MAC deletes only the file name from the directory; many Mac utilities can recover the deleted file. To erase a file so this software cannot read it, you have to overwrite all the bits on the disk that contained that file. The Department of Defense (DOD) recommends overwriting a deleted file three times. File-reconstruction experiments

conducted by the National Institute of Standards and Technology with electron-tunneling microscopes suggest that even three times might not be enough.

Most of the programs that advertise file erasure follow the DOD's triple-overwrite guidelines. Look for a program—such as ultraSecure, Citadel with Shredder, and Norton Utilities for Macintosh—that overwrites files, entire disks, and that can overwrite all of the free space on a disk. Two specialized products, Viper (\$49.95) from Systematic Computer Services (513/275-9476) and Trash Guard (\$79), from ASD (714/624-2594), also offer triple-overwrite erasure.

The Best Data Guardians

IF YOU'RE INTERESTED ONLY IN PASSWORD protection, there are a number of good programs you should consider. Both PassProof and NightWatch II provide multiuser hard drive and screen locking, and keep an audit log of log-on attempts. PassProof also comes with hardware locks and is half the price, making it a much better value.

ultraSecure and Citadel with Shredder take top honors. ultraSecure does almost everything I can think of, offers an easy-to-use interface, never crashed on me, was the only automatic-encryption program I couldn't break—and it was also the fastest DES product. At a reasonable \$149.95, Citadel with Shredder is also a standout program, but for different reasons. It does not have file-access controls, but does have easy-to-use manual-key encryption—the most secure option available—and the best file-erasure features on the market. Disk-Lock, FileGuard, and Empower II are also strong programs, but lack ultraSecure's file-erasure mode and offer fewer options for file, folder, and drive protection. If you want to secure a number of machines on a network, though, Empower Remote is hard to beat.

To secure your files against the most sophisticated intruder, choose a key yourself and use a manual-encryption product, copy the file to a clean disk, and burn the old disk with the unencrypted file on it. Or lock the data in a safe; that's the way they do things in the government. m

BRUCE SCHNEIER, an independent computer-security consultant in Oak Park, Illinois, has worked in security for both public and private concerns. His book, *Cryptography in C*, will be published by John Wiley & Sons in the summer of 1993.

Power Utilities	ultraSecure 1.36	Camouflage 1.50	MacSafe II 2.00
AlSoft	usrEZ Software	UsrEZ Software	Kent Marsh
713/353-4090	714/573-2548	714/573-2548	713/522-5635; 800/325-3587
\$129	\$239	\$169.95	\$189.95
●	●	●	●
all	all but encryption	all but encryption	all but encryption
●	●	○	○
●/●	●/●	NA/NA	NA/NA
○	●	NA	NA
○	○	NA	NA
●*/○	●/●	NA	NA
○	●	NA	NA
NA	●	NA	NA
○	●	○	●
NA/NA	●/●	NA/NA	●/●
NA/NA	●/●	NA/NA	●/●
NA/NA	●/●	NA/NA	●/●
●	●	●	●
○/○	●/○	●/○	●/●
○	●	○	○
○	●	●	○
○	●	●	●
○	○	●	○
○	●	●	●
○	●	●	○
NA/NA/NA	●/●/●	●/○/○	NA/NA/NA
NA	●	●	NA

MW

EDITORS' CHOICE

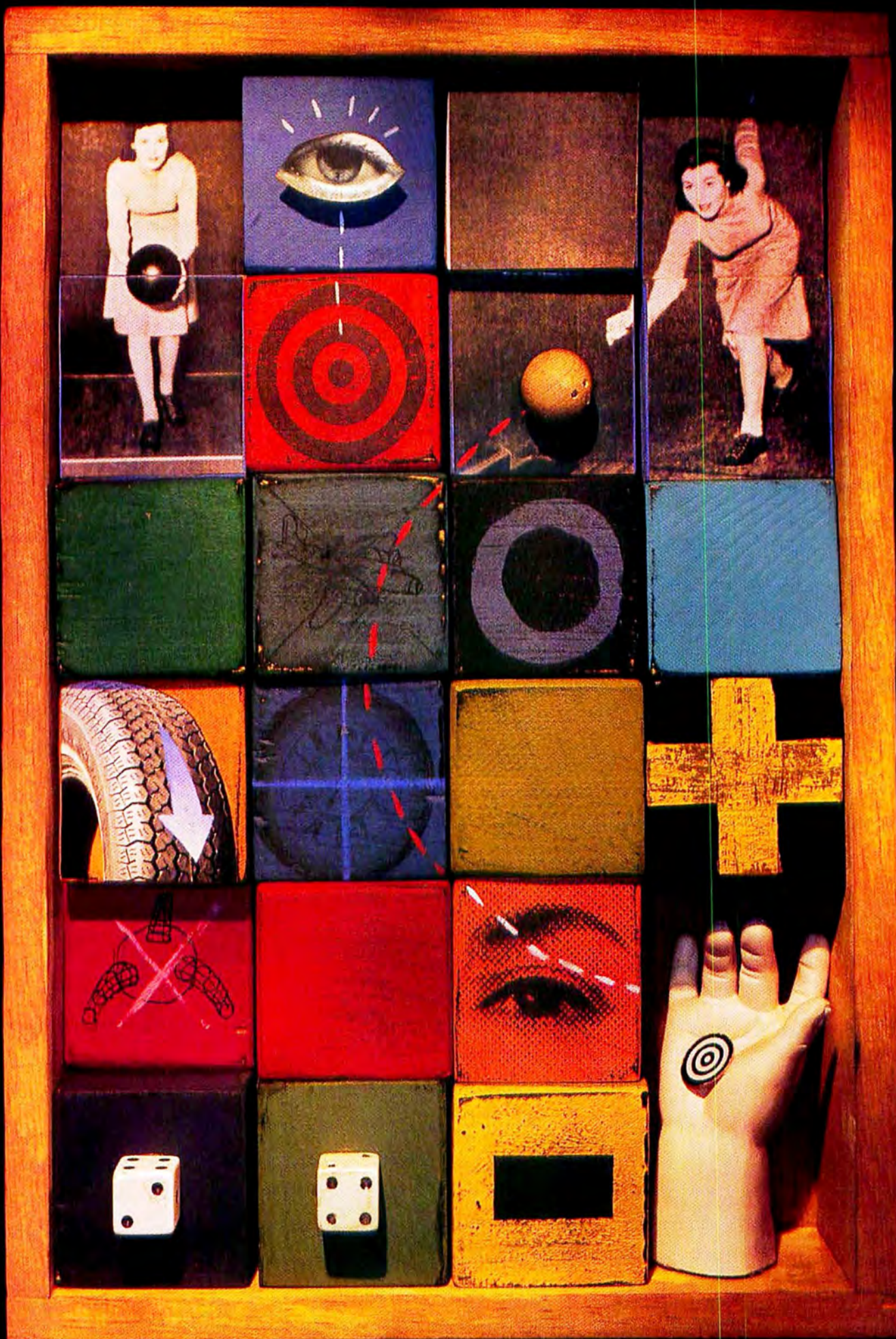
Economy Program

PassProof This program gives you a lot for your money—multiuser password protection, a screen locker, and an audit log of users. It also comes with locks for the floppy drive and serial port. **Company:** Kensington Microware. **List price:** \$64.95.

Full-Featured Programs

ultraSecure This fast program smoothly integrates access control, file encryption, audit trail, file erasure, and screen locking into a single package. **Company:** usrEZ Software. **List price:** \$239.

Citadel with Shredder This is the cheapest way to get secure encryption and file erasure. **Company:** Datawatch Corporation. **List price:** \$149.95.



by Charles Seiter

24-bit Color Graphics

Macworld Lab tests 18 graphics boards that deliver photo-realistic color—and sometimes more

You almost want to touch the image on your screen, thanks to the incredible realism provided by 24-bit-color video-display boards. A must for color publishers and artists, 24-bit video-display boards also appeal to the larger set of users who simply want the best display they can get.

Most 24-bit video-display boards are accelerated through special on-board chips that speed up common video-display tasks, but not all 24-bit video-display boards come with acceleration. So when do you want video acceleration? If you're using 24-bit color a lot, particularly with a large monitor, in programs like Adobe Photoshop and QuarkXPress, you definitely need all the hardware help you can get. If you're

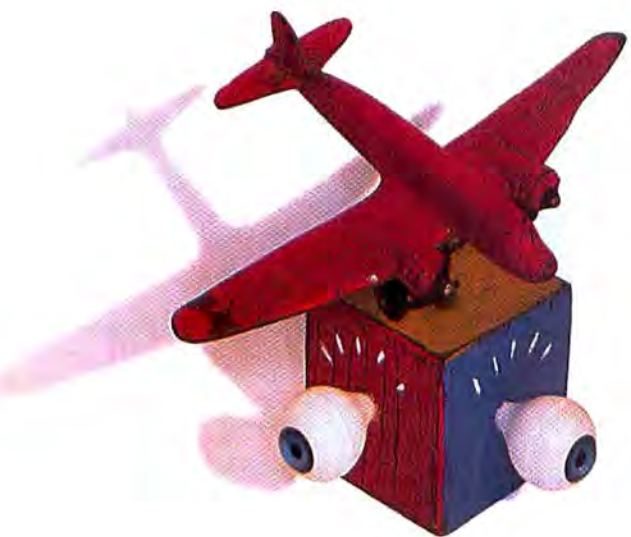
using a 14-inch monitor and don't do much high-end color publishing, you may not need the acceleration at all—or at least not the most expensive type of video acceleration. In this case, features like hardware pan and zoom and an extended desktop become important.

If your main consideration is scroll speed and drawing response when working with 24-bit color images in a paint program, you can find an accelerated video-display board for about \$1000 (or much less, at street prices). For most basic graphics uses, this gives you more speed for the money than a CPU accelerator; most CPU accelerators that will double your speed on scrolling cost more than an accelerated video-display board. All you

have to check is that the board supports the resolution you need for your monitor size (see "Comparing 24-Bit Video-Display Boards").

That's what Macworld Lab concluded when it evaluated 24-bit video-display boards designed to work with an array of standard Mac monitors—from vendors like Apple, E-Machines, NEC Technologies, Radius, Sony, and Super-Mac Technology, as well as from many companies better known for their DOS VGA monitors. (For an evaluation of large color monitors, see "The Bigger Picture," *Macworld*, September 1992.)

Why doesn't the Mac's built-in video processing work fast enough for 24-bit images in the first place? The Mac's hard-



ware was designed back when a small monochrome monitor was the only display option, and the hardware was fast enough for such displays. The data for a full-screen image on those early Plus and Classic monitors took just 640 by 400 bits, for a grand total of 32K of data per screen. In 24-bit color at the 1152 by 870 resolution that's appropriate for a 19-inch monitor, a full-screen image takes about 3000K. That's about 100 times more data for the Mac to process, and the latest Macs aren't 100 times faster than the early Macs, so you'll see a marked slowdown in screen display for large full-color images.

Quick on the Draw . . .

BECAUSE MOST PEOPLE USING 24-bit color work with large images on large monitors in high-end programs, most

24-bit video-display boards are accelerated. The most common method is QuickDraw acceleration, which generally makes common applications run three to ten times as fast.

The principle is simple: QuickDraw commands normally handled by the Mac's logic board are intercepted by the video-display board. A special-purpose hardware decoder executes the commands faster than the Mac's CPU can. QuickDraw commands, which take only a few bytes each, are the Mac's native language for describing display operations (like filling a rectangle with color); these commands must be translated to the pattern of bits that makes up the image on screen. (These patterns can take hundreds or thousands of bytes.) The video-display board uses accelerated hardware and removes the translation burden from the Mac's CPU to bring about the speedup.

Today's accelerated video-display boards have come a long way from the first QuickDraw accelerators, which only processed QuickDraw commands, and which required a separate video-display board. This hindered speedup because the image data had to move from the QuickDraw accelerator to the video-display board over the Mac's comparatively slow NuBus.

that kind of speedup in everyday use. Why not? Because several factors slow things down along the way.

First, the really big speed improvements are mostly on operations on large areas of an image, rather than on lines or small elements. Video processing involves two steps: image setup and image generation. Acceleration affects only image generation, so display of a graphic that requires a lot of setup cannot be sped up very much compared with a graphic that requires little setup. For example, to display a color fill in a rectangle, the CPU makes a modest investment in setting up the rectangle's coordinates; the QuickDraw-acceleration chip on the video-display board does 98 percent of the work of filling in the rectangle's color. Thus, you'll see significant speedup here. But in drawing a large set of small lines, the CPU takes much more time to set up than to generate the video data for the lines, so almost no acceleration results. A lot of what people do involves working with small elements like lines and text, not with large image areas.

Second, some applications, including Photoshop, Macromedia's Swivel 3D Professional, and Autodesk's AutoCAD, bypass many common QuickDraw commands, using either uncommon QuickDraw commands or the application's own special commands instead. This means that the amount of acceleration you get from a particular board depends on the application you use: if

. . . But Slow on the Uptake

SPECIAL HARDWARE CAN EXECUTE a QuickDraw command 100 times faster than can the Mac's CPU. But you won't see

MULTIFUNCTION BOARD OPTIONS

Company	Product	Price	Product Based On	Ethernet	Photoshop Acceleration	JPEG Compression	Video Frame Capture	Video Frame Output	Stereo Audio
E-Machines	ColorLink SX/T, SX/2	\$789	Futura SX	●	○	○	○	○	○
RasterOps Corporation	24MxTV	\$2199	24Mx	○	● ^{1,2}	● ^{1,2}	●	○	○
	24STV	\$1258	24Sx	○	● ^{1,2}	● ^{1,2}	●	○	○
	24XLTV	\$3499	24XLI	○	● ^{1,2}	● ^{1,2}	●	○	○
	MediaTime	\$1999	24Sx	○	● ^{1,2}	● ^{1,2}	●	○	●
SuperMac Technology	DigitalFilm	\$5999	Thunder/24	○	○	●	●	●	●
	Spigot & Sound Pro ¹	\$1699	Spectrum/8•24 PDQ	○	○	○	●	○	●
	VideoSpigot Pro	\$1499	Spectrum/8•24 PDQ	○	○	○	●	○	○

● = yes; ○ = no. ¹ Requires two slots. ² Optional; \$1999 for JPEG, \$999 for Photoshop.

the application uses common QuickDraw commands a lot, you'll see more acceleration than if it uses less-common QuickDraw commands or its own commands.

Finally, video accelerator designers implement only a few QuickDraw commands in their acceleration chips (called ASICs, or application-specific integrated circuits), so the acceleration process slows down every time the application makes a QuickDraw call that isn't executed in the video-display board's ASICs. There are hundreds of QuickDraw commands, but only a dozen or so are used routinely by popular applications. Rather than writing algorithms to speed each QuickDraw command (which is time-consuming and expensive), video accelerator designers have analyzed popular applications to see which QuickDraw commands they use routinely and then have focused on getting the most acceleration possible for these commands. This approach keeps costs down while providing good overall video acceleration. But it also means that the speedup you see will be different from what someone else sees. "Gauging Video Speed" shows these differences between real-world and theoretical acceleration.

In testing video-display boards' speeds, Macworld Lab used a variety of QuickDraw commands to see exactly what commands each board accelerates. The lab results show extreme speed enhancements for some QuickDraw com-

8, 16, or 24?

Although 24 bits, for 16.7 million colors, is considered a standard for "true color" or photo-realistic color, it's a standard that's overkill for visual and printing reality. Ask yourself these questions. Can you perceive 2 million different shades of yellow between orange and green in a continuous rainbow spectrum? Do you work with a printer that can give you 16.7 million colors? Do you think the folks at Pantone give you 16.7 million choices for spot color?

If you answered no to any of these questions, you might be able to live with 16-bit color, for about 65,000 colors on screen, as a lower-cost alternative to 24-bit color. What's the real difference between 16.7 million and 65,000? Look at the accompanying comparison of images and decide for yourself. While 24-bit color is strikingly superior to 8-bit for displaying photographs, its superiority is difficult to discern over 16-bit color in a direct comparison.

Sixteen-bit color appears to be the wave of future video. Already, Apple offers 16-bit color as a low-cost option in the new Macintosh IIvx and Performa 600 models, and the Quadras and new PowerBooks support it in most resolutions. Video-display-board makers are also realizing this. For example, Radius lets you upgrade its PrecisionColor 8X from 8-bit to 16-bit operation, while Lapis Technologies' ProColorServer series can run at 16 bits on monitors as large as 21 inches; NuBus, IIsi, and LC versions are available. For LC owners, the PSI Multicolor board from PSI Integration (408/559-8544) costs \$159, but it works only with the Apple 12-inch monitor in 16-bit color. For LCs, Envivio (612/339-1008) offers the \$595 Quick 16 board, which works with monitors as large as 16 inches. You may even want to run boards designed to run at 24 bits at 16 bits instead, to speed your screen scroll and redisplay time even more.

If you have a Classic right now, or an LC running in 8-bit color, and are planning to step up in the world of 24-bit graphics, you might want to consider getting halfway there instead. A Mac IIvx in 16-bit mode using the new Apple 15-inch color monitor for display produces color that's apparently good enough for Kodak (it's the standard for the Photo CD) and speed that rivals the fastest 24-bit video-display boards on a 19-inch display.

For many people, 24-bit color is overkill, both in terms of what they see and what they pay. Compare the same image in 8-bit, 16-bit, and 24-bit color (from top to bottom). The 8-bit image is decidedly inferior, but the 16-bit image is acceptable for most uses. Those doing color trapping or image editing will still want to work with 24-bit.



Consumer Contact: Toll	Consumer Contact: Toll-Free
503/646-6699	800/344-7274
408/562-4200	800/729-2656
408/245-2202	800/334-3005

mands and essentially no enhancement for other commands. To put these tests in context, Macworld Lab also measured the speedup in real applications; the acceleration for these real-world tests is

much more modest, ranging from two to ten times compared with the speed of unaccelerated video display. The real-world tests, by the way, were designed to highlight speed differences; in some

common drawing tasks, like updating a complex CAD drawing full of tiny features or filling in a smoothly modulated 24-bit continuous-tone photo, there would be practically no speedup.



Gauging Video Speed

REAL-WORLD TESTS

In our real-world tests, the size of the monitor dramatically affects performance for line scrolls: bigger monitors are slower. However, bigger monitors can have an advantage for page scrolls, where all the data on the new page is moved onto the screen in one step. Scrolls are good tests of actual performance because they are common tasks and because they cause the Mac to redraw a range of objects, from text to graphics.

LOW-LEVEL QUICKDRAW TESTS

Low-level tests of QuickDraw command processing show theoretical best performance. The Basic Commands group includes QuickDraw commands that all vendors accelerate. Radius and SuperMac accelerate some other commands, but our tests show that this does not change these boards' performance.

Products are ranked in overall performance order, from fastest to slowest, within each monitor size category. The best in each category is indicated in red.

Vertical Scroll (in seconds)

Average results for a series of up and down scrolls (one line at a time) in Excel and Word documents.

Horizontal Scroll (in seconds)

Average results for a series of left and right scrolls (one column at a time) in Excel documents.

Page Scroll (in seconds)

Average results for a series of up and down scrolls (one screen at a time) in Word documents.

All Commands (speed compared to Apple 8•24)

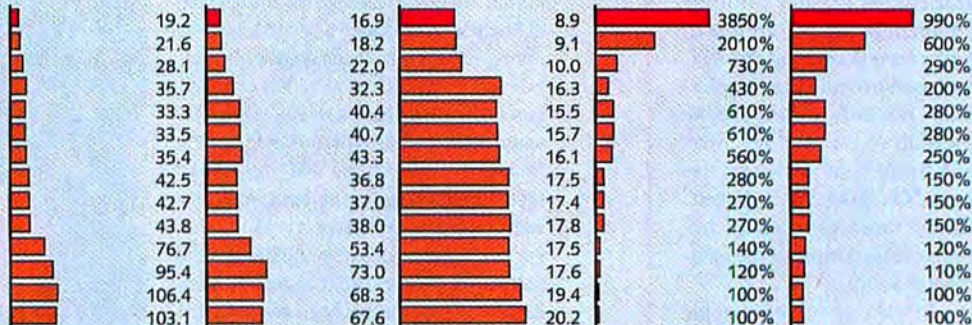
Relative performance in processing all 118 QuickDraw commands, using the industry-standard Hydra benchmark.

Basic Commands (speed compared to Apple 8•24)

Relative performance in processing 25 common QuickDraw commands, using the industry-standard Hydra benchmark.

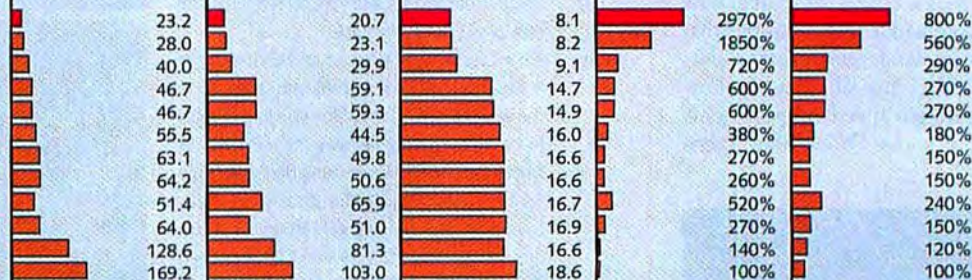
With 13-Inch Monitors

SuperMac Thunder/24
SuperMac Spectrum/24 PDQ Plus
SuperMac Spectrum/24 Series III*
RasterOps 24Sx
Radius PrecisionColor 24Xk
Radius PrecisionColor 24X
Radius PrecisionColor 24Xp
E-Machines Futura MX
E-Machines Futura SX
E-Machines Futura LX
Xceed MacroColor II
Apple 8•24GC
Apple 8•24
SuperMac Spectrum/24 Series III



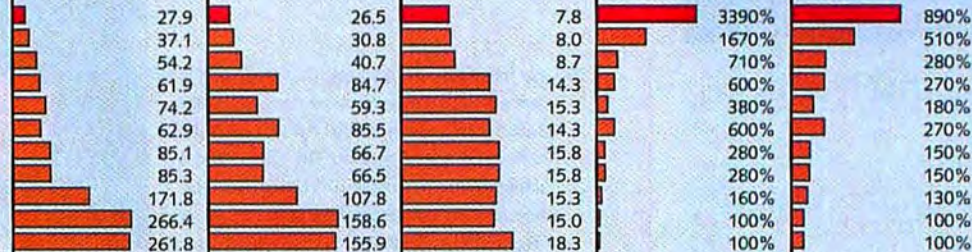
With 16-Inch Monitors

SuperMac Thunder/24
SuperMac Spectrum/24 PDQ Plus
SuperMac Spectrum/24 Series III*
Radius PrecisionColor 24Xk
Radius PrecisionColor 24X
RasterOps 24Mx
E-Machines Futura MX
E-Machines Futura SX
Radius PrecisionColor 24Xp
E-Machines Futura LX
Generation Systems Graphics Card
SuperMac Spectrum/24 Series III



With 19-Inch Monitors

SuperMac Thunder/24
SuperMac Spectrum/24 PDQ Plus
SuperMac Spectrum/24 Series III*
Radius PrecisionColor 24Xk
RasterOps 24XLI
Radius PrecisionColor 24X
E-Machines Futura LX
E-Machines Futura MX
Generation Systems High Resolution
RasterOps Paintboard LI
SuperMac Spectrum/24 Series III



*With \$499 piggyback board installed.

Shorter bars are better. Shorter bars are better. Shorter bars are better. Longer bars are better. Longer bars are better.

Other Acceleration Techniques

IN ADDITION TO QUICKDRAW acceleration, some vendors tout the use of other techniques, such as RACE (redundant access cycle eliminator), GWorld, and NuBus block transfer. Should you seek out these alternatives? Not really.

For example, GWorld is useful only if you use GWorld-compatible software, of which there is not much. GWorld helps speed display by accelerating the switching between images in some draw programs (like Time Arts' Oasis), but it doesn't count for much as a general video-acceleration technique.

NuBus block transfer—which speeds up the transfer of image data across NuBus by sending it in bursts—was a big deal before all 24-bit accelerated video boards had their own video RAM; but NuBus block transfer hasn't been a selling point since 1991, because on-board VRAM is now typical.

The same is true for RACE, which promises to speed up a standard video board by about 1.2 times by handling video computations more efficiently. But inexpensive QuickDraw acceleration chips are widely available, providing better acceleration at hard-to-beat prices.

All these video-acceleration methods might offer some benefit if used with QuickDraw acceleration, but typically none are advantageous enough to justify the extra expense compared with a QuickDraw-only accelerated video-display board.

Time Is Money

THE TEST DATA, FOR BOTH the real-world tests and raw QuickDraw tests, reveal several issues to consider when choosing 24-bit accelerated video-display boards. For one, the stately progress of the acceleration for larger monitors is so predictable that, given the data for 14-inch and 19-inch monitors, Macworld Lab nearly wasted its time running benchmarks on 16-inch monitors. A 19-inch monitor has

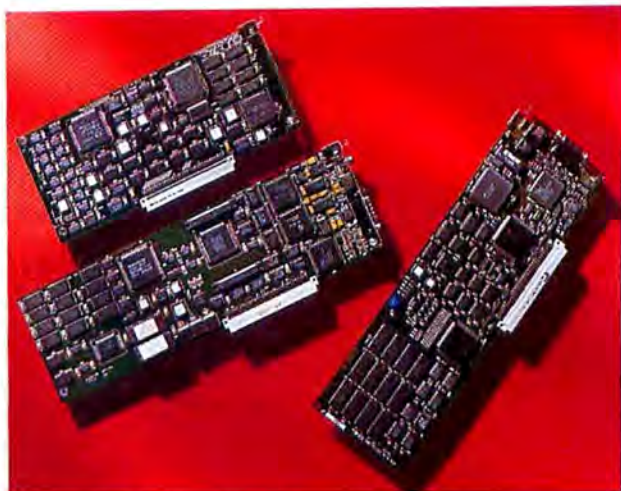
about twice the display area as a 14-inch monitor, and an accelerator takes about twice as long to redraw or scroll a 19-inch screen as a 14-inch screen. A 16-inch monitor has about one-third more area than a 14-inch monitor, so an accelerator will take about 1.3 times longer to redraw or scroll its screen compared with a 14-inch screen. Use these ratios to gauge the effects on your display: if you see an accelerated board used with a 14-inch monitor and you'll be using that board on a 16-inch monitor, expect the speedup to be three-quarters of what you see on the 14-inch monitor.

Another finding is that newer designs beat older designs by a large margin, an almost inevitable conclusion in the computer business. SuperMac's accelerated Spectrum/24 Series III handily beats a number of older boards, and is in turn left in the dust by SuperMac's own, newer Thunder series.

Finally, in line with the proverb that time is money, a look at "Comparing 24-Bit Video-Display Boards" will show you that faster boards just cost more, as you would expect. Comparing two of the best-known companies in the Mac graphics business—Radius and SuperMac—the very fastest board, SuperMac's Thunder/24, costs \$2000 more than the fastest Radius board (the PrecisionColor 24Xk). But the Thunder/24 is in fact impressively faster—to get the most performance for the least price your best approach might be to shop aggressively for the best deal on a Thunder/24.

Beyond Acceleration

THE FIRST ROUND OF 24-BIT accelerated video-display boards a few years ago offered improved screen-display speeds, but not much else. Now the extra features and different expansion options on today's boards may be their most important selling points. Special hardware for accelerating Adobe Photoshop, chips for JPEG compression/decompression, and interfaces to



MARK JOHANN

No One-Trick Ponies To reduce the number of NuBus slots taken, several vendors offer video-display boards that provide other features. The E-Machines ColorLink SX/T (bottom) includes Ethernet with its accelerated 24-bit video support. RasterOps offers special-purpose boards, like its PhotoPro (top) for Photoshop acceleration, that work with a general-purpose board, like its 24STV (middle); the special-purpose board is cheaper but still requires two NuBus slots.



MARK JOHANN

Fastest Displays SuperMac offers the best accelerated 24-bit video-display options. The Thunder/24 (top) is the fastest board available, while the Spectrum/24 PDQ Plus (bottom) offers high speed at an attractive price.

video equipment—just to name some common possibilities—may turn out to be more important to you than a 15 percent speed difference between comparably priced boards. Two manufacturers—SuperMac and RasterOps—let you use plug-in boards that go into the video-display boards' piggyback slots to add such features, as "Comparing 24-Bit Video-Display Boards" shows. This saves you from using a NuBus slot on the Mac for the features.

Photoshop Acceleration Simple QuickDraw acceleration isn't going to buy you

much speed for bitmap-oriented applications like Photoshop. You'll need either a more expensive board that includes both video acceleration and Photoshop-filter acceleration (like the \$3699 ThunderStorm Pro from SuperMac), or a cheaper board with no video acceleration but hardware support for Photoshop speedup (like the \$999 SuperMac ThunderStorm).

Common Photoshop operations (sharpen, unsharpen, blur, Gaussian and motion blur, and resize) pick out a block of pixels and perform arithmetic on the whole block. This means, for example, that a Gaussian blur can call for 20 million operations on a 1MB picture—and the operations aren't QuickDraw calls, so an accelerated video-display board won't help speed things up. But all these filtering tasks have been familiar for decades to companies that design digital signal processing (DSP) equipment, and several off-the-shelf chips are ideal for these compu-

tations. Several vendors claim their boards improve Photoshop filter speed from 5 to 20 times.

JPEG Compression If JPEG is important in your work, you will also need either a dedicated JPEG board or a multipurpose DSP board (see "Image Compression Matures," *Macworld*, March 1992). Once again, plain QuickDraw acceleration won't speed up JPEG compression/decompression.

It also happens that the same DSP chips are also just right for speeding up JPEG compression/decompression, so you'll find that boards that can accelerate Photoshop filters nearly always accelerate JPEG jobs. Some of the original chips and software developed by the JPEG pioneers at Storm Technology now appear in SuperMac's \$999 ThunderStorm boards. The \$895 Lightning Effects DSP board from Spectral Innovations (408/727-1314) not only accelerates Photoshop and JPEG jobs, but ColorStudio and QuarkXPress

as well. Newer Technology (316/685-4904) offers the Image Magic board (\$995 for NuBus, \$895 for Quadras) based on the same DSP chip used in the Lightning Effects board but with different filters. DayStar Digital (404/967-2077) recently announced a version of the Storm Technologies board that uses DayStar's own filters.

QuickTime Options Finally, if you do lots of QuickTime work, you are not only out of the world of big monitors but also out of the domain of the video-display boards reviewed here (for a definitive article on Mac video, see "The Full-Motion Macintosh," *Macworld*, January 1993). There are 24-bit video-display boards with QuickDraw acceleration that specialize in motion; "Multi-function Board Options" lists the capabilities of several. The video-display boards we tested are aimed at users of still images, such as graphic artists, engineering designers, and desktop publishers.



COMPARING 24-BIT VIDEO-DISPLAY BOARDS

Company	Product	Tested by Macworld Lab	List Price	Hardware Zoom	Extended Desktop	Number of Piggyback Board Slots	ACCELERATION	
							QuickDraw	Other
Apple Computer	8•24	●	\$699	○	○	0	○	○
	8•24GC	●	\$1499	○	○	0	●	○
E-Machines	Futura LX	●	\$1299	●	●	0	●	○
	Futura MX	●	\$999	●	●	0	●	○
	Futura SX	●	\$599	●	●	0	●	○
Generation Systems	Graphics Card	●	\$1079	○	○	0	○	○
	High-Resolution Graphics Card	●	\$1149	○	○	0	○	RACE
Lapis Technologies	ProColorServer II 24 ³	○	\$799	○	○	0	○	○
Radius	PrecisionColor 24X	●	\$1999	○	○	0	●	NBT ⁴
	PrecisionColor 24Xk	●	\$999	○	○	0	●	NBT ⁴
	PrecisionColor 24Xp	●	\$599	○	○	0	●	NBT ⁴
RasterOps Corporation	24Mx	●	\$1499	●	●	1	●	GWORLD
	24Sx	●	\$799	●	●	1	●	GWORLD
	24XLI	●	\$2499	●	●	1	●	GWORLD
	Paintboard 24	○	\$1999	●	●	0	●	○
	Paintboard LI	●	\$999	●	●	0	●	○
SuperMac Technology	Spectrum/8•24 PDQ	○	\$999	●	●	0	●	○
	Spectrum/24	○	\$899	●	●	0	●	○
	Spectrum/24 PDQ Plus	●	\$1999	●	●	0	●	○
	Spectrum/24 Series III	●	\$999	●	●	0	●	○
	Spectrum/24 Series IV	○	\$999	●	●	0	●	○
	Thunder/24	●	\$2999	●	●	1	●	GWORLD
Xceed Technology	ThunderLight	○	\$2399	●	●	0	●	○
	Xceed MacroColor II ²	●	\$569	○	●	0	○	○

● = yes; ○ = no. Technical-support ratings are based on a series of calls made by Macworld staffers posing as customers to each company to gauge the accessibility, helpfulness, products, and we call only those companies whose products Macworld Lab tests. ¹ Support offered only through dealers. ² Supports this resolution at 8-bit color. ³ Versions also

Speedup Strategies

SUPERMAC'S THUNDER OFFERS the fastest 24-bit video-display boards you can buy. The boards cost more, but the marketing people at SuperMac appear to have successfully targeted an audience of affluent and very impatient graphics professionals. The second-fastest board tested, for \$1000 less, is the SuperMac Spectrum/24 PDQ Plus. And the third-fastest is the SuperMac Spectrum/24 Series III.

If these prices are too rich for your blood, you might consider a less-lofty strategy in which you compensate for slightly slower display speeds by using a smaller monitor—a 15-inch or 16-inch monitor makes an intrinsically slower board seem considerably better. Furthermore, a perusal of mail-order ads in *Macworld* reveals a nearly 30 percent discounted price for all these accelerated video-display boards, so in comparing speed results in "Gauging Video Speed" and the prices in "Comparing 24-

Bit Video-Display Boards," you need to write in your own best-case street price before making a purchase. Because the Macworld Lab results show a fairly direct link between speed and price, you should insist on seeing a demonstration of a video-display board-Mac combination running your typical applications to find a speed you think is acceptable and match it to your budget.

And if you want 24-bit color for less-ambitious uses, should you consider an unaccelerated board like those from Apple, Generation Systems, Lapis Technologies, or Xceed Technology? Maybe so, if your main focus is reviewing rather than editing or retouching color images. Acceleration is expensive and not always meaningfully faster—for occasional 24-bit-image work, 3-times faster scroll speed probably won't change your life.

No matter which board you pick to meet your need for video speed, don't worry about the color quality. The monitor will

MW

EDITORS' CHOICE

Spectrum/24 PDQ Plus; Thunder/24 Serious acceleration costs about \$2000. This means that the Spectrum/24 PDQ Plus is a best buy for raw speed and the Thunder/24 represents a reasonable price for the most acceleration you can buy.
Company: SuperMac Technology.
List prices: Spectrum/24 PDQ Plus \$1999; Thunder/24 \$2999.

make the difference there; the video-display boards aren't a factor because they all use the same component (a Brooktree digital-to-analog converter) calibrated the same way to determine the color values sent to your monitor. **m**

CHARLES SEITER is a *Macworld* contributing editor who designs graphic displays for scientific imaging applications.

Macworld Lab testing supervised by TIM WARNER.

Video RAM Expandable	SUPPORTED RESOLUTIONS (AT 24-BIT COLOR)				On-the-Fly Resolution Switching	Tech- Support Rating	Consumer Contact: Toll	Consumer Contact: Toll-Free
	640 × 480	832 × 624	1024 × 768	1152 × 870				
○	●	○	○	○	○	1	408/996-1010	NA
●	●	○	○	○	○	1		
○	●	●	●	●	●	very good	503/646-6699	800/344-7274
○	●	●	●	○	●	very good		
○	●	●	○ ²	○	●	very good		
○	○	●	○	○	○	satisfactory	612/633-5222	800/654-5294
○	○	○	●	○	○	satisfactory		
○	●	●	○ ⁴	○ ⁴	● ⁵	excellent	510/748-1600	800/435-2747
○	●	●	●	●	●	very good	408/434-1010	800/227-2795
○	●	●	●	○	●	very good		
○	●	●	●	○	○	very good		
○	●	●	○	○	● ⁵	good	408/562-4200	800/729-2656
○	●	○	○	○	○	good		
○	●	●	●	●	● ⁵	good		
○	●	●	●	●	● ⁵	good		
○	●	●	●	○	● ¹	good		
○	●	○ ⁴	○ ²	○ ²	●	satisfactory	408/245-2202	800/334-3005
○	●	●	●	●	●	satisfactory		
○	●	●	●	●	●	satisfactory		
○	●	●	●	●	●	satisfactory		
○	●	●	●	●	●	satisfactory		
○	●	●	●	●	●	satisfactory		
○	●	○	○	○	○	excellent	313/727-4085	NA

and accuracy of their support technicians. Macworld uses a point system, including bonuses and demerits, to derive the final rating. Ratings are for companies, not individual available for SE/30 and LCs (\$799). ⁴ Supports this resolution at 16-bit color. ⁵ Restart of Mac required. ⁶ NuBus block transfer. ⁷ Version also available for SE/30 (\$599).

Software

Secretaries

PUT YOUR LIFE IN ORDER WITH ONE OF THESE
PERSONAL
INFORMATION
MANAGERS

BY FRANKLIN N. TESSLER

R

emembering all the details of day-to-day life used to be easy—addresses, appointments, and phone numbers came to me effortlessly, and I wouldn't think of taking a shopping list to the store. With middle age creeping up, though, I sometimes need help remembering the time of the next staff meeting or what my wife asked me to pick up on my way home. And judging by the thriving sales of paper-based personal organizers like Day Runner and Franklin Planner (no relation), I'm not the only one who finds it hard to keep a handle on a hectic schedule: Day Runner Corporation estimates that it has sold more than 6 million units since 1982, and sales continue to climb.

As always, software vendors want us to believe that what paper can do, computers can do better. In just a couple of years, their efforts have created a market for a new type of software called personal information managers, or PIMs. For this article, I took a comprehensive look at the current crop of PIMs for the Macintosh. As you'll see, I discovered that despite their many rough edges, PIMs can still be very handy to have around.

What's in a PIM?

UNFORTUNATELY, EXPERTS DO NOT AGREE on what a PIM is—vendors conveniently base their definitions on the capabilities of their products, not on any widely held opinion. In preparing for this article, I examined a diverse array of Macintosh applications and desk accessories (DAs). To keep things manageable, I narrowed the scope to include software that incorporates three major functions: keeping track of contacts (names, addresses, and other information about people), calendar and event planning (organizing and viewing schedules), and to-do management (maintaining lists of tasks). Eight programs meet these criteria: ACT for Macintosh, Connections, DateBook/TouchBase (a combination desk accessory and application), DayMaker, Info-Mation, OfficeMaster, The Nine to Five Office, and Shortlist.

In addition to examining major features, I compared flexibility in viewing data; printing; importing and exporting; speed; and overall reliability (see "PIM Roundup"). In the spirit of the



word *personal* in personal information manager, I didn't consider multiuser capabilities. Because my definition of PIM may differ from yours, several products that are often referred to as PIMs are described in "PIMs at a Glance." Also listed are a number of PIMs that arrived too late to be included in this article.



Contact Management

EVEN DIE-HARD COMPUTERPHOBES ARE USUALLY willing to concede that computers are ideal for maintaining address lists. If you are like most people,

EVEN DIE-HARD COMPUTERPHOBES WILL CONCEDE THAT COMPUTERS

though, typing information about business associates, friends, relatives, and other personal contacts is about as pleasant as filling out a tax return. Fortunately, good software design can help make the job easier, if not enjoyable.

All the PIMs but DayMaker include an entry screen for contacts, with defined spaces for names, addresses, phone numbers, and other information. DayMaker requires you to enter contact data as free text, so it doesn't distinguish between a person's last name and company, for example. Although that's not a problem if you're just browsing, it does make it difficult to export contact data to a database or print out a formatted address list.

In PIMs, contact management runs the gamut from simple to complex. Some address books, like the one in Info-Mation, are so brimming with fields

and pop-up menus that they are difficult to read. At the other extreme, Shortlist's simple setup doesn't let you customize data entry at all, so you can not modify any of the fields to suit your needs. TouchBase strikes a sensible balance between flexibility and ease-of-use—TouchBase's entry form provides 5 custom fields in addition to 14 standard ones (see "Great Contacts"). ACT, with more than 70 fields, is even more flexible. In addition to changing field names, you can lock any field to prevent users from entering information, or hide a field from view entirely.

Automatic formatting and data entry, features common to high-end database applications, can help cut down on keystrokes. For example, TouchBase can form at telephone numbers and capitalize names for

ARE IDEAL FOR MAINTAINING ADDRESS LISTS

you the instant you finish typing them in. ACT lets you create lists of predefined entries to choose from as you enter data, and you can specify default values for any field. Unfortunately, none of the PIMs do an ideal job of inspecting for missing or incorrect data, an area that's begging for improvement.

Most PIMs provide special fields that let you categorize contacts, useful for preparing mailing lists. For example, if you assign a unique identifier to all your business associates, you'll have an easier time printing a set of personalized announcements for the company picnic. Most PIMs also let you browse through your address book and mark selected records (usually by clicking on a check box), a handy way to temporarily segregate a subset of contacts.

Another helpful function lets you link events (like telephone calls and meetings) to specific contacts. Connections implements this feature especially well: when you dial a contact's phone number, a comprehensive log sheet pops up on your screen. If the line is busy, you can automatically schedule a reminder to make a follow-up call by clicking on a button. Shortlist also lets you link events to people: when you schedule an event, you can select associated contacts from a scrolling list, a workable solution as long as the size of your address book remains manageable. ACT actually requires you to associate activities with one or more contacts, a restriction I found bothersome.

Because TouchBase (a DA) and DateBook (an application) are separate programs, they're not as well integrated as the other PIMs. And since they communicate by sending Apple events, linking is available only if you're using System 7. For example, you can search for contacts in a TouchBase data file without leaving DateBook, but you can only scan by first name, last name, or company. When you schedule an event in DateBook, you can transfer selected information about the event (such as time and description) into TouchBase records that meet your search criteria.

Calendars and Events

OF ALL THE ARGUMENTS IN FAVOR OF USING A PIM, activity planning may be the most compelling, especially if you often shuffle meeting times and dates. A well-designed PIM should let you examine your event

Great Contacts Info-Mation's address book is flexible, but I found the layout made it confusing to read (top). TouchBase's contact entry form (bottom) includes five fields you can customize to store information that the standard fields cannot handle.

PIMs at a Glance

To make your PIM shopping easier, here are thumbnail sketches of the eight PIMs reviewed in this article, as well as several PIMs that weren't available in time to be included. This section also features brief descriptions of a few programs that don't meet my criteria for PIMs, but are often described as personal organizers. (Other organizers abound; for a look at address books, see *The Desktop Critic* in this issue; calendar programs will be the subject of a future *Macworld* article.)

PIM Reviewed in this article.

PIM Meets article's definition of a PIM (contact database, calendar, and to-do list), but wasn't available in time for review. Description is based on information provided by manufacturer.

PIM Doesn't meet article's definition of a PIM, but is commonly referred to as a PIM.

PIM **ACT for Macintosh 1.0** (Contact Software International; 214/919-9500, 800/365-0606; \$395)

ACT is a full-featured PIM that integrates contact-management, scheduling, and word processing. It has more contact fields than its competitors do, and gives you a wide variety of options for viewing the contact database. ACT also has several unusual features, including a macro recorder as well as links to a separate product called GeoQuery that works with ACT to let you display contact information on maps.

PIM **Active Memory 2.0** (ASD Software; 714/624-2594; \$199)

Active Memory is an activity planner with a spreadsheetlike format and multiple pop-up menus to speed data entry. Network support lets you coordinate projects among multiple users. (See *Reviews*, *Macworld*, August 1992.)

PIM **Ascend 3.0** (Franklin Quest; 801/975-9992, 800/877-1814; \$199)

Ascend incorporates calendar, contact, and to-do features in an application geared for users of the paper-based Franklin Planner organizer. You can attach notes to contacts in the program's address book, assign priorities to items in a to-do list, and print out pages for the Franklin Planner.

PIM **Connections 2.1** (Concentrix Technology; 415/358-8600; \$199)

This HyperCard-based PIM includes daily and monthly calendars, a telephone directory, and a reference library, which lets you archive text (such as correspondence). You can customize the tele-

phone directory by modifying, adding, deleting, or moving fields. The program also offers an optional link to the Sharp Wizard.

PIM **Data-Areas 1.0** (Numa Technology; 203/256-1973; \$59)

Numa's PIM combines a calendar, contact management, and to-do management in a low-cost package. The free-form contact section lets you set up custom formats. A separate Activities view shows current to-do items by category, and a notes module lets you store miscellaneous information.

PIM **DateBook 1.5.1 and TouchBase 2.0** (After Hours Software; 818/780-2220; \$125 each; \$169.95 for both)

Although DateBook (a calendar application) and TouchBase (a contact-management DA) are separate programs, they can share information under System 7. (After Hours Software bundles the programs.) DateBook lets you view your schedule in daily, weekly, or monthly format, and its support for recurring events is top-notch. TouchBase is an address book with five customizable text fields and automatic formatting of text and phone numbers during data entry.

PIM **DayMaker 1.01** (Pastel Development; 212/941-7500; \$99.95)

DayMaker focuses on schedule management by having you organize items (which can be activities, to-dos, or contacts) in a hierarchical fashion. It offers multiple options for display and output, including Gantt charts, as well as flexible event-scheduling and handling of uncompleted to-dos. Print-

ing options support popular paper-based planners.

PIM **DayMaker 2.0** (\$129.95) This version of DayMaker, which shipped too late to review, adds support for recurring events, a separate to-do view, and disk-based file storage to minimize RAM usage.

PIM **First Things First 3.0** (Visionary Software; 503/246-6200, 800/877-1832; \$79.95)

This system extension lets you categorize and schedule tasks and set reminders. First Things First displays a clock on your desktop; an alarm sounds for one-time or recurring reminders. (See *Reviews*, April 1992.)

PIM **In Control 1.1** (Attain Corporation; 617/776-1110; \$129.95)

In Control lets you manage to-do items using an outline that's organized in rows and columns. The program offers powerful search and sort capabilities. (See *Reviews*, May 1992.) Version 2.0 will include a calendar view, check boxes for completed to-do items, and scripts to automate common actions.

PIM **Info-Mation 1.1g** (Info-Mation; 510/559-4211, 800/444-4746; \$189)

This HyperCard-based PIM includes an address book, contact log, calendar, and a group scheduler. Info-Mation's project planner module enables you to organize all the activities associated with a project, while the group scheduler is useful for comparing the schedules of several users.

PIM **Intouch 2.0.4** (Advanced Software; 408/733-0745; \$99.95)

The newest version of Intouch is built around an address book that lets you enter contact information as free text, rather than using defined contact fields as do many competitors. Intouch also provides calendar and schedule management. (See *Reviews*, March 1992.)

PIM **The Nine to Five Office 2.0** (Nine to Five Software; 303/443-4104; \$99.95; \$19 through Sept. 1993)

This HyperCard-based PIM incorporates contact and calendar management. With Nine to Five's

\$19 special offer, The Nine to Five Office is ideal for users who want to explore a PIM at a bargain-basement price. The program includes a map view that lets you look up contacts by region.

PIM **OfficeMaster 2.0.4** (Cornice Software; 714/985-8323; \$195)

The personal version of OfficeMaster includes a contact manager, a reminder system, and a calendar with weekly and daily schedule views. Cornice's main product, however, is the multiuser version of OfficeMaster—in addition to all the features in the single-user program, it lets you manage event calendars for several people and send electronic memos over a network.

PIM **PowerTeam 1.0** (Provue Development Corporation; 714/892-8199; price unavailable)

Based on Provue's Panorama database application, the PowerTeam PIM includes the requisite calendar, contact, and to-do features, as well as some unusual features such as a checkbook, expense report form, and calculator.

PIM **Shortlist 1.01** (Brainchild; 513/831-8451; \$149)

Shortlist incorporates a simple contact manager along with a system for scheduling meetings, mail, phone calls, and to-dos, as well as a daily agenda and multiday calendar view. Shortlist is ideally suited to PowerBooks and other portable Macs, and according to Brainchild, the software is designed to maximize battery life.

PIM **ThoughtPattern 2.0** (Banana-fish Software; 415/929-8135, 800/552-5939; price unavailable)

This upgrade adds calendar functions and a field-oriented address book to ThoughtPattern's free-form note-taking and file-linking capabilities.

PIM **TimeVision 1.0** (Powercore; 815/468-3737; \$99)

Focusing on time management, TimeVision offers monthly, weekly, and daily schedule views, and also includes a Note Card file for storing addresses and other text. You can assign up to 64 custom categories to events, and attach alarms to them for reminders.

calendar from any perspective, ranging from a broad overview to a daily agenda. And it shouldn't take more than a few mouse-clicks or key-presses to book an event, whether it's one day or one decade in the future.

ACT, DateBook, and DayMaker provide the most-flexible calendar options, letting you survey your schedule a day, a week, or a month at a time; DateBook also includes a year view in the form of a scrolling monthly display. All three applications let you toggle between views by clicking on icons. I especially like DateBook's monthly calendar banners, colored over-



IF YOU USE A PIM FOR BUSINESS AND PERSONAL SCHEDULES,

lays that you use to mark special events that last more than one day (see "A Banner Year").

Calendar displays in the remaining PIMs are all limited. For example, OfficeMaster's weekly calendar shows events as color blocks, and its monthly view doesn't give any event information at all. The calendar in Connections would be more useful if it weren't so difficult to schedule and view events for future years: unlike with other PIMs, you have to build each year's calendar separately, a process that can take five to ten minutes.

If you use a PIM to handle business and personal schedules, flexibility in categorizing events is a must. For example, you might define lunches with clients as one event type and meals with friends as another event type. Shortlist and ACT for Macintosh take a fairly rigid approach to scheduling events by making you

choose from a limited number of categories (calls, meetings, mail, and to-dos in the case of Shortlist; calls, meetings, and to-dos in ACT).

All the PIMs let you schedule events that have specific dates, times, and durations, although their approaches differ. Usually you pick a day and starting time for the event and type in a brief description. Connections and Info-Mation also let you change event times and durations by dragging bars along a time line, an option that some users may prefer. Scheduling events in The Nine to Five Office is especially awkward—you enter the event's description next to its start time, select the text, drag until you reach the end time, and click on a button—it is more cumbersome than typing start and end times.

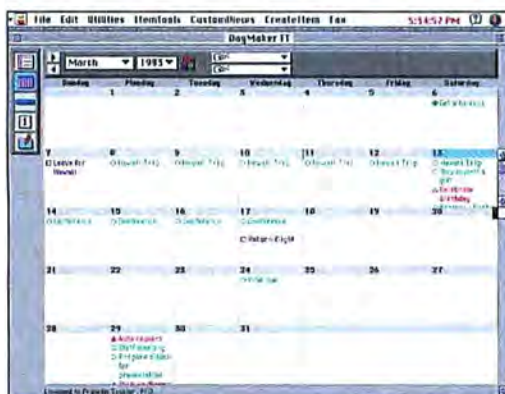
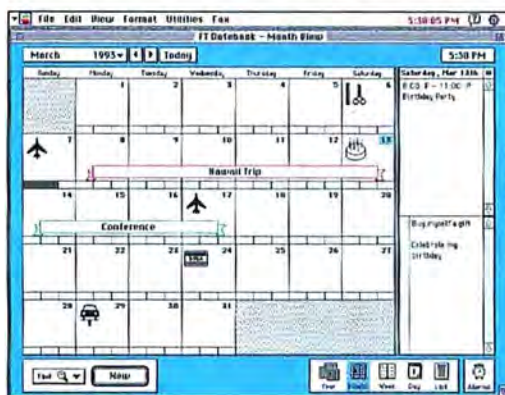
I found DateBook's event-scheduling function the easiest to use of all the PIMs. For each new event, you type a description, a summary, a start time, and an end time or duration. (You only have to enter the end time or the duration, and DateBook calculates the other one for you automatically.) The only drawbacks are DateBook's lack of support for events that have no predetermined duration (like visits to the dentist). DayMaker provides more flexibility in event scheduling than DateBook does, but I found its interface less intuitive and harder to master.

Some PIMs let you book recurring events like birthdays and mortgage payments. Overall, I found DateBook's recurring-event function the most practical: you can schedule events to occur at specific intervals (every four days), on specific dates (the tenth of the month), or on specific days of the month (the third Thursday of every month). When you alter any aspect of a recurring event (the description, for example), you're given the option of applying the changes to as few or as many of the posted events as you like.

Of course, scheduling an appointment with your boss to ask for a pay raise (another good example of a recurring event) is only half the battle: you have to remember to show up for the meeting, which is why an efficient alarm system is vital. For maximum effectiveness, reminder alarms should go off no matter what you're doing on the Macintosh, even if your PIM isn't up and running. All the PIMs with pop-up alarms use INITs—system extensions if you're running System 7—to make reminders appear on your screen. Only DateBook gives you the option of setting alarms to ring at a given date and time or at a specified interval before the event; reminder functions in the other PIMs aren't quite as flexible. When a DateBook alarm appears, you can cancel it forever or postpone it an arbitrary number of minutes, hours, or days, just the way you use the snooze button on an alarm clock.

What to Do

IF YOU'RE LIKE MOST BUSY PEOPLE, YOUR DESK and refrigerator are constantly cluttered with lists of things that need attention. Unlike events, which typically have a specific date and time, to-do items (like painting the garage) are often free-floating: you get to



A Banner Year Colored banners can be used to mark multiday events in DateBook's monthly view (top), while icons denote one-day events. Event and to-do lists are displayed in a separate area to the right. In DayMaker's monthly view (bottom), event data appears on the calendar itself.

them whenever you find the time. Fortunately, a PIM can help by nagging you until you take care of the chore or give up and delete it entirely.

Most personal information managers treat to-do items as special types of events. In DateBook, for example, to-dos have a date but no starting time or duration. Uncompleted to-do items are automatically carried over to succeeding days, and they remain on your calendar until you get rid of them. (All the PIMs let you retain completed to-dos for later review, however.) As with events, you can set an alarm to ring before an item becomes due. DayMaker is even more flexible, letting you push uncompleted to-dos forward one day, one week, or one month at a time, in addition to setting advance warnings.

Other Considerations

AS WE'VE ALREADY SEEN, MULTIPLE CALENDAR formats are essential for managing a busy schedule. Similarly, flexibility is also important when it comes to displaying lists of contacts or events. For example, TouchBase lets you browse through your address book entry by entry, or you can view any subset of your contacts in a multicolumn format. In similar fashion, DateBook enables you to display events and to-dos sorted by category, a good way of prioritizing your schedule. A handy view found only in The Nine to Five Office lets you find contacts by clicking on a map of the United States, as well as look up zip and area codes.

For the truly compulsive, DayMaker provides an impressive array of display options, ranging from simple text notes to Gantt charts. You can assign multiple hierarchical tags or categories to events and notes to help you organize them. It's a highly effective system if you're willing to make the effort to use it. ACT also includes multiple layouts for viewing contact information, calendars, and tasks.

If you've invested time compiling an address book using a database manager or other program, import and export capabilities are an important consideration. Fortunately, all the PIMs I reviewed let you import and export contact data as tab-delimited text files, a format that's compatible with most word processors, data-

Monday, February 15, 1993		
9:00 AM	11:00 AM	Planning Meeting
12:00 N	1:30 PM	Lunch with Debbie
2:15 PM	3:00 PM	Staff Meeting
4:00 PM	5:30 PM	Presentation
8:00 PM	9:30 PM	Dinner with Donners
		Pay mortgage
		Call Jim to confirm appointment
		Take car in for service
Tuesday, February 16, 1993		
9:00 AM	10:30 AM	Breakfast meeting
12:00 N	1:30 PM	Lunch with Sales Staff
3:00 PM	4:00 PM	Check Simpson Report
4:00 PM	5:00 PM	Meeting with accountant
7:00 PM	9:00 PM	City Council meeting
		Bring slides for meeting
		Pick up opera tickets
		Call George Baily about loan
		Return library book
Wednesday, February 17, 1993		
10:00 AM	11:00 AM	Return phone calls
12:00 N	1:00 PM	Lunch with Ed
2:00 PM	3:00 PM	Presentation/Snell & Assoc.
4:00 PM	5:30 PM	Meeting with Telemarketing
		Return library book
		Call printer
		Call Doug
		Buy fax paper
WEEKLY CALENDAR—FT		

Paper Output Most PIMs let you print pages that fit in popular paper-based planners such as Day Runner or Franklin Planner. This page was printed from After Hours Software's DateBook, on special paper designed to fit in the Day Runner planner.

bases, and spreadsheets. It's not as convenient as importing data directly, but it's a lot easier than retyping hundreds of names and addresses.

Flexible printing options are essential if you use a paper-based daily planner in addition to the PIM in your Mac. If the pages in your organizer are smaller than standard letter size (and they usually are), it's important to cram as many pages as possible onto each

PIMs on the Go

Paper-based planners are attractive for people who want to stay organized away from the desktop: they're cheap, widely available, and you can use them almost anywhere. Still, a paper organizer can never provide the functionality of a software PIM—try to find all your appointments with Bob Cratchit during the upcoming year and you'll see what I mean.

For several years, an intermediate solution has been available in the form of hand-held organizers from companies like Sharp, Casio, and Oregon Scientific. While

they're not as sophisticated as the Newton Personal Digital Assistant announced by Apple last spring, hardware PIMs can be very effective for managing contact lists, notes, and schedules.

For almost two years, I've been using Sharp's OZ-8000 Wizard organizer to keep track of my contacts and appointments. With a little effort, it fits into a shirt or coat pocket, and the durable case has held up well. The 40-character LCD display is quite legible, although it lacks backlighting. Unlike some other hand-held PIMs, the 8000

series organizers sport QWERTY-style keyboards.

Connections and TouchBase enable you to share data with the Wizard through a special interface cable that plugs into the Macintosh serial port (the cable is available separately from Sharp). Connections allows two-way data transfer between the Wizard and the Macintosh; TouchBase lets you export contact information only to the Wizard, and can not import data directly. Several PIM vendors I spoke to hinted that enhanced connectivity may be in-

corporated in future updates to their software.

Sharp also has introduced a new version of its Macintosh software that's designed to work with its series of electronic organizers. While it's not a full-fledged PIM, Organizer Link II does let you import data, edit it, and export it back to the organizer with a minimum of bother. Schedules and other data are displayed on the Macintosh exactly as they appear on the organizer's screen. For now, it's the best way to back up and archive data.

printed sheet to avoid wasting paper. If you buy specially perforated sheets (available from some PIM vendors and office supply stores), you can avoid the chore of cutting the pages apart once they're printed (see "Paper Output").

Output capabilities range from Shortlist's printed duplication of on-screen information to DayMaker's sophisticated printing options, which let you customize the size and layout of multiple tiny "virtual pages" on each sheet of paper. DayMaker comes with predefined settings for Filofax and Franklin Planner



IF YOUR PAPER ORGANIZER IS SO JAMMED THAT IT'S IMPOSSIBLE

organizers. DateBook and TouchBase also include settings for several paper organizers, including Filofax, Day Runner, and Day-Timer.

Although speed and reliability are critical to any type of software, they're especially important with personal information managers. You might tolerate short pauses when you're working with a word processor or spreadsheet, but a PIM should serve up phone numbers or appointments the instant you need them. With few exceptions, PIMs do their job without much fuss or delay.

To gauge their speed, I ran the PIMs under a variety of conditions, ranging from heavy CPU loads with multiple background processes, to less-demanding situations. Overall, the HyperCard-based PIMs (Connections, Info-Mation, and The Nine to Five Office) fared the worst. Even under relatively light conditions on a Macintosh IIfx, they often felt sluggish, especially when switching between modules or views. And while DayMaker was generally very fast, there was a noticeable delay as the data file was loaded into memory each time I opened it.

I tested reliability by running the PIMs on a stable system loaded with a moderate number of extensions, and found all of them to be acceptably dependable. I encountered a few glitches in Connections' directory module, but they weren't consistently reproducible. According to Concentrix Technology, scripting problems that plagued earlier versions of Connections have been eliminated from the current release. (For an alternative opinion, though, see *Reviews, Macworld*, November 1992.)

Remember that an extensive list of features may not be the primary consideration if you're choosing a PIM for a PowerBook. Despite the newer models' larger memory capacities and hard drives, you should still look for programs that use RAM efficiently and

take up little disk space. Conserving precious power also is essential to maximize battery life when you're far from an AC outlet, and that means minimizing disk access. While Shortlist wasn't my favorite choice for desktop use, its speedy performance made it seem right at home running on my PowerBook 170.

Strategies for Success

DESPITE THEIR IMPRESSIVE FEATURE SETS, PIMs aren't for everyone. While PIM software can help you work more efficiently, you may be perfectly happy with the paper-based organizer you're using now. And the word processor, outliner, or flat-file database that you already own may be sufficient for keeping track of contact information, agendas, and notes. But if your

PIM ROUNDUP

Product	Company	Contact Management	Calendar Functions
ACT for Macintosh 1.0	Contact Software International	Multiple layout options. More fields than other PIMs.	Weekly, daily, and monthly views.
Connections 2.1	Concentrix Technology	Automatic telephone logging.	Each year's calendar must be built separately.
DateBook 1.5.1	After Hours Software	Can retrieve limited contact information from TouchBase under System 7.	Weekly, daily, and monthly views. Can use banners to mark multiday events.
TouchBase 2.0	After Hours Software	Flexible contact entry with automatic formatting and five custom text fields.	NA
DayMaker 1.01**	Pastel Development	Contact information must be entered as free text.	Weekly, daily, and monthly views.
Info-Mation 1.1g	Info-Mation	Address book can be hard to read.	Can view schedule by month or user-specified range of days.
The Nine to Five Office 2.0	Nine to Five Software	Includes separate spaces for home, office, and billing information.	Weekly and daily views only.
OfficeMaster 2.0.4	Cornice Software	Simple contact entry form. Limited searching. Provides event history.	Weekly calendar doesn't display event information automatically.
Shortlist 1.0.1	Brainchild	Contact fields cannot be customized.	Daily schedule view includes Gantt charts.

NA = Not applicable. * Independent of application ** See "PIMs at a Glance" for information on version 2.0, which arrived too late to review.

paper organizer is so jammed with addresses, appointments, and to-dos that it's impossible to follow, or if you find yourself missing important meetings, then it's time to consider a computer-based personal information manager. (If you're budget-conscious, The Nine to Five Office is available through September 1993 at the unbeatable price of \$19.)

Once you've settled on a PIM, the next step is to devise a strategy for making the most of it. If you run the PIM on a single desktop computer at home or at the office, you'll need some way to carry information with you when you're away from the Mac. The cheapest approach is to print addresses, appointments, and notes on pocket-size pieces of paper or index cards. A slightly more expensive solution is to print on pages that fit into a compact daily planner like Day Runner. If you can afford them, hardware PIMs like the Sharp Wizard and the Casio BOSS also offer portability (see "PIMs on the Go").

If you have two or more desktop Macintoshes to contend with, or if you use a desktop machine and a notebook Macintosh, the biggest hurdle is making sure that the data at both ends is always up-to-date. PIM files are likely to change often during the course of a busy day as appointments and deadlines come and go. Although it's possible to reconcile data files manually (by using floppies, for example), you're courting disaster unless you're very careful. Several companies, including Inline Design, offer utilities that automatically synchronize files on several machines to keep data current.

The most efficient way to use a PIM is to have it load at start-up and keep it running in the background under MultiFinder or System 7—you shouldn't have to launch an application or open a DA every time you need to find an address or schedule a meeting. You

MW

EDITORS' CHOICE

TouchBase/DateBook Although not as well integrated as some of the other PIMs reviewed, TouchBase and DateBook combine good performance with a well-defined interface. **Company:** After Hours Software. **List price:** \$169.95 for TouchBase-DateBook bundle.

should also count on adding RAM to your system (aim for 8 megabytes or more, especially if you're using System 7). And even though most PIMs don't make heavy demands on hard drive space, expect at least a couple of megabytes for the software and data files, more if the PIM requires HyperCard.

Down the Line

TO SOME PEOPLE, THE IDEAL PIM WAS PORTRAYED in Apple's Knowledge Navigator video of a few years ago. In that scenario, a fresh-faced "agent" named Phil on the desktop of a notebook-size computer played secretary to a busy college professor, taking phone calls, arranging meetings, and being generally helpful. Although I found Phil a bit hard to take, the video provided an intriguing glimpse at one possible form PIMs might take in five or ten years.

For the time being, though, even the best PIMs can't take the place of a competent secretary. All of the PIMs I evaluated were lacking in some areas, but the TouchBase/DateBook duo came closest to filling my needs. My schedule hasn't become any less busy since I started using a PIM, but I now have a fighting chance at keeping one step ahead of the chaos. **m**

FRANKLIN N. TESSLER, a radiologist who is struggling to keep his life organized, is a *Macworld* contributing editor.

Events and To-Dos	Pop-Up Alarms*	Output	Comments
Phone calls, meetings, and to-dos only.	no	Flexible report options through mail-merge feature.	Events must be linked to contacts. Includes full-function word processor and link to GeoQuery. Poorly organized manual.
Events can be scheduled graphically.	yes	Multiple customized reports Optional link to Sharp Wizard.	HyperCard-based.
Easy to use. No support for open-ended events.	Can set to ring at given time or interval before event.	Multiple options, easy to customize. Can opt to print business days only.	Excellent interface. Limited data sharing with TouchBase requires System 7.
NA	NA	Multiple options, easy to customize Can print Day Runner or Filofax format. Outputs to Sharp Wizard.	Fast. Limited data sharing with DateBook requires System 7.
Very flexible, but interface can be difficult to learn.	yes	Can print Filofax, Franklin Planner, and other popular planner formats. Easy to customize.	Powerful, but takes time to master. Good choice for use with PowerBooks.
Events can be scheduled graphically.	yes	Includes up to 7 predefined print formats.	HyperCard-based.
Event scheduling awkward.	no	Easy to customize reports. Includes built-in word processor with mail merge capabilities. Can print Day Runner or Filofax format.	HyperCard-based.
No direct support for recurring events.	no	Supports Sharp Wizard.	Networked version supports multiple users and includes E-mail.
Six predefined event types. No direct support for recurring events.	no	Can print any view. Includes mail merge feature.	Fast and very easy to use, but less flexible than others. Good choice for use with PowerBooks.

A guide to the best tools for diagnosing



and solving network problems

NETWORK

UTILITIES

It's 1:15 on a Friday. As you return from lunch, a frantic, frustrated marketing manager meets you at your office door. "I have a brochure that has to go out to the West Coast today," he explains, "but I can't get it to print. What's wrong?"

"Are you trying to use the color printer upstairs?" you ask calmly. He says yes.

"OK, I think I know what the problem is," you say, reassuringly. You turn to your Mac while the marketing manager peers nervously over your shoulder. After a few minutes, you've solved the problem. "Go try it again," you say.

The marketing manager looks relieved but still confused. An hour later, he's back in your office, having printed and mailed the urgent document. "How did you do it?" he wonders.

"Simple," you respond. First, you knew the network router was down even before you returned to the office because your pocket pager sounded an alarm as you drove back from lunch. Then, you simply reset the router and confirmed that it was back online. Voilà!, another network emergency defused, thanks to that invaluable genre of software applications, the network-management utility.

Each step involved in handling this network crisis *du jour*—including the call to your pager—was accomplished using network-management and diagnostic utilities. Equipped with the proper software tools, you can learn which devices are running on a network; check whether the devices are communicating properly throughout the network; find out which software packages, graphics boards, SCSI devices, and monitors are installed on the computers linked by the network; and see which version of the operating system a particular Mac is using, among other things. In short, these utilities can help ensure your status as the company's official

Network God or Goddess, and in this economic climate, who couldn't use a little extra job security?

Making a List

YOUR FIRST TASK AS A NETWORK MANAGER is to get a precise picture of what's on the network. To help you accomplish this, most management utilities include a simple list function. Open the application, or initiate a network scan, and you get a list of all devices connected to the network.

A list typically includes a network device's name and type, address (network number, node number, and socket number), and zone (usually a department within a company). A node is any addressable network device—a Mac, a printer, a file server. A socket is any addressable entity in a node that corresponds to software applications and that interacts with the network, such as electronic mail, a shared database, or a remote backup application. Each socket has its own number, which is its network address.

The end result is that network-management (and diagnostic) software with a listing feature gives you a detailed inventory of the computer equipment on a network and many of the applications running on each device.

Generally, lists can be sorted by device, address, and zone. For example, you can compile a list of all the printers on a network. You can view a list on screen, print it, or export it to a spreadsheet or database; by saving the printed lists, you get a written history of the network devices.

A few network-management packages—some in the form of a desk accessory—specialize in listing. Typically, the specialized software automatically updates lists by performing dynamic network scans as devices come and go on the network; by contrast, many full-fledged network-man-

by Shelly Brisbin

How a Network Utility Talks to a Pocket Pager

1

This network's dedicated E-mail server, a Macintosh SE/30, has gone down because the E-mail application has unexpectedly quit.

2

The network administrator has a network-management utility on a Mac, and has programmed the utility to automatically check on the status of the E-mail server every five minutes. The program checks on the device by sending a Name Binding Protocol (NBP) lookup packet to the SE/30.

3

Once the network-management utility has determined that the SE/30 is down, the utility displays an alarm message on the administrator's Mac monitor and sends a message, via Apple events, to a paging-server program (such as E-Machines' Notify) that resides on the administrator's Mac. The message includes the text (such as "E-mail server in

production dept. down") that is to be transmitted to the pager.

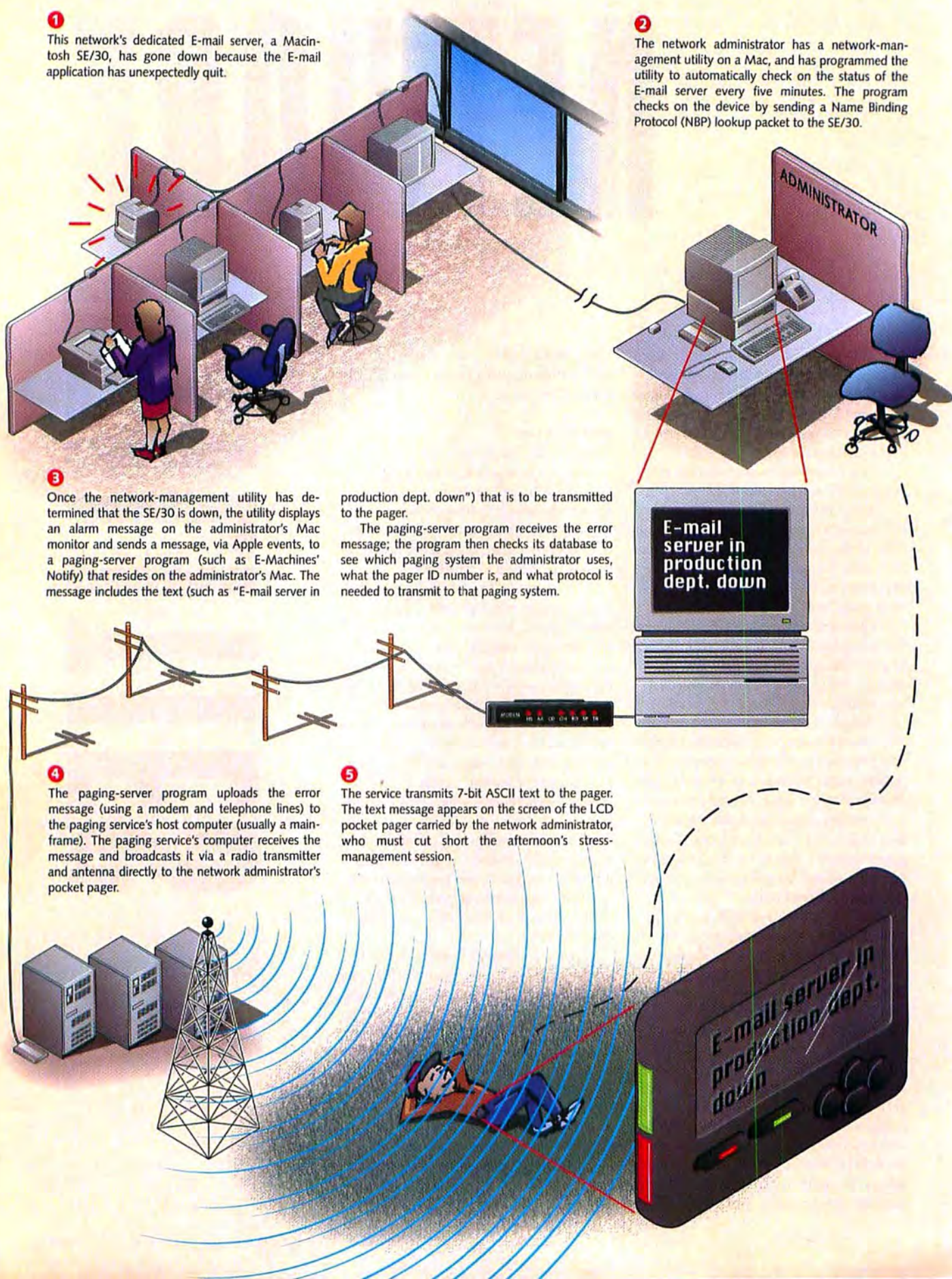
The paging-server program receives the error message; the program then checks its database to see which paging system the administrator uses, what the pager ID number is, and what protocol is needed to transmit to that paging system.

4

The paging-server program uploads the error message (using a modem and telephone lines) to the paging service's host computer (usually a mainframe). The paging service's computer receives the message and broadcasts it via a radio transmitter and antenna directly to the network administrator's pocket pager.

5

The service transmits 7-bit ASCII text to the pager. The text message appears on the screen of the LCD pocket pager carried by the network administrator, who must cut short the afternoon's stress-management session.



Don't **assume** everything is hunky-dory

with a node just because it shows up on a list

agement packages with a listing feature must rescan the network for each update. Dedicated listers, priced at around \$150, cost less than full-featured network-management packages with a listing feature (about \$300 and up).

For simplicity, convenience, and affordability, your best bet is the venerable PhoneNet CheckNet, a device-listing DA from Farallon Computing. CheckNet is easy to use, generates dynamic network lists, provides a wealth of display and sorting options, and costs only \$95.

If you simply need to keep tabs on how the Macs and other devices on a network are configured (system version, RAM and hard drive capacities, for example), and you don't need to track network addresses or do live scans, try TechWorks' GraceLAN Network Manager. The dynamic scan is missing, but an elegant display tells you almost everything you need to know about the configuration of networked Macs. For each Mac the display, which is useful and easily reconfigured, includes such information as the amount of RAM installed and System, Finder, MultiFinder, LaserWriter driver, AppleTalk, and EtherTalk versions, among other things.

Testing, Testing

DON'T ASSUME THAT EVERYTHING IS hunky-dory with a node just because it shows up on a list; a list doesn't tell you how a device is performing.

A node's performance can be impaired by heavy traffic, excessively long cable-wires, improper routing, and a host of other bedevils. To determine the existence of a problem and its source, you need software that offers device testing.

Several utilities allow you to perform *echo tests*. You send information to a network device from your computer in the form of a network packet. (A packet is a package of data that can be easily traced as it travels across a network.) The software then tells you how long it took the packet to travel to and from the problem computer, printer, or other device (hence the term *echo*). If a packet takes longer than normal to reach the device, contains invalid information, or doesn't make it back at all, you've found a problem.

Inter Poll Network Administrator's Utility, a diagnostic tool from Apple Computer, lets you send echo packets to specified computers, and it provides statistics on individual and average response times.

Inter Poll also provides some configuration information and includes a separate test for printers, which don't respond to echo packets (printers don't use the network protocol that's required to produce echo packets).

Inter Poll doesn't monitor your network or tell you when problems arise, but it points you toward the culprit. The product's greatest strengths are its variety of options and attractive price (\$129). Learning how to use it effectively may require a look at the manual, but the effort is well worth it.

Alarming News

ANOTHER WAY TO KEEP YOUR FINGER ON a network's pulse is by having your computer let you know—via an audible or visible alarm—when something's amiss. Alarm functions offer various notification options: all network-management tools send a screen message or a sound to the administrator's Mac; most, including AG Group's Net Watchman and Caravelle's NetWorks, notify a pocket pager (see "How a Network Utility Talks to a Pocket Pager"), and one—NetWorks—sends an E-mail message.

Alarm software tells you which devices are up or down and allows you to prioritize notifications by individual node or class of device—Mac Plus, LaserWriter, file server, and others. Given a large network, you might find it useful to limit your alarm requests to file servers, printers, or routers. And if you want additional job security, place a higher priority on your boss's laser printer, making sure you're notified whenever trouble brews.

NetWorks is the best alarm package available—it offers the largest array of alarm functions, sits comfortably in the background (it uses only 500K of RAM), is extremely flexible, and features a colorful graphical display.

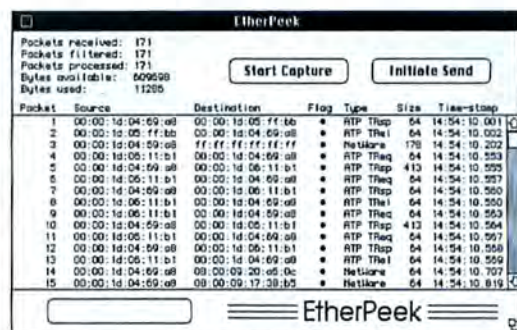
Drawing the Lines

EVERY BOOK ON NETWORKING—and almost every magazine article—advises adminis-

trators to make a map of the devices and wiring associated with their internet. (An internet is a collection of two or more networks, connected by routers and accessible by all users on each network.) Good advice, but such maps quickly become outdated unless maintained religiously.

Network-mapping utilities offer the ability to produce iconic representations of a network's nodes. Mac nodes look like Macs—most mapping packages can distinguish a compact Mac from a modular Mac—routers look like routers, and so on. Non-Mac network devices such as Novell file servers are represented by icons as well. Network diagrams also identify cable segments that lie between all devices.

In addition, a *logical* network map enables you to show network structures in a form more easily grasped by those who aren't network know-it-alls. A logical network map displays the network structure;



Packet Patrol In the main window of EtherPeek, AG Group's protocol analyzer utility is capturing the destination, type, size, and time-stamp information for every packet traveling across a network. EtherPeek can also be configured to capture and analyze only the network packets that are of immediate interest.

✓ Name	Zone	Laser Prep	Memory	Floppies	AppleTalk	Network C
KAROLJC	ETHERNET	7.1.1	8192K	1	56	EtherTalk
KAYJR	ETHERNET	7.0	8192K	1	56	EtherTalk
KETHJS	ETHERNET	7.0	8192K	1	56	EtherTalk
KIDAJC	ETHERNET	7.0	8192K	1	56	EtherTalk
LISAJMC	ETHERNET	7.0	5120K	1	56	EtherTalk
LISAJ1	ETHERNET	7.0	5120K	1	56	EtherTalk
MADELINE	ETHERNET	7.0	5120K	1	56	EtherTalk
MARCEJ3	ETHERNET	7.0	8192K	1	56	EtherTalk
MacosJ1	ETHERNET	7.0	5120K	1	56	EtherTalk
Miranda	ETHERNET	7.0	5120K	1	56	EtherTalk
PAHLJ	ETHERNET	7.0	5120K	1	56	EtherTalk
PeppyJ	ETHERNET	7.0	5120K	1	56	EtherTalk
RAYJD	ETHERNET	7.0	8192K	1	56	EtherTalk
RobertHill	ETHERNET	7.0	5120K	1	56	EtherTalk
RUTHLP	ETHERNET	7.0	8192K	1	56	EtherTalk
Server	ETHERNET	7.0	8192K	1	56	EtherTalk
WilburJ	ETHERNET	7.0	5120K	1	56	EtherTalk
JackieS	ETHERNET	7.0	8192K	1	57	EtherTalk
JerryJA	ETHERNET	7.0	8192K	1	57	EtherTalk

Who's Got What TechWorks' GraceLAN Network Manager provides configuration data for all devices on a network in a display that you can easily reconfigure. This window has been sorted to display information, such as operating-system version and computer RAM size, about all Macs on a network.

a network *topology editor*, on the other hand, indicates the actual location of a device or wiring segment.

CSG Technologies' Network SuperVisor is my pick among network mapping utilities. SuperVisor makes life as a network manager a great deal less painful because it lets you integrate mapping with network lists, alarms, and device filtering (selecting nodes to be mapped based on type or address) and because it gives you complete control over how a network diagram is drawn.

Traffic Control

JUST LIKE A CITY STREET, A NETWORK can bear only a certain amount of traffic; that amount depends on the *bandwidth*—the width, efficiency, and capacity of the network pipeline. Knowing how much bandwidth your network has, and how much of it is available given the size of your internet, can simplify the process of planning and allocating network resources.

You can keep an eye on available bandwidth with a graphically oriented network-traffic analyzer. This type of software acts as a voyeur, watching every packet as it goes

back and forth between nodes. A network analyzer reports the number and type of packets and displays this information on the network manager's screen, often in graphical form. You can export packet information to spreadsheets for further analysis. A network analyzer also tracks errors—for example, when a packet is prevented from reaching its destination.

If you experience repeated problems with printing or other communications, you can use a network analyzer to isolate data collisions and other errors that are likely to be the cause. Should insufficient bandwidth be the problem, you may learn enough from your analysis to make decisions about shortening network cables or moving problem devices to the quieter side of a router or bridge.

Farallon's TrafficWatch II is the most complete network analyzer that I tested. It tracks each packet's source and destination, as well as glitches that occur during transfer. The display is graphical, and information can be exported to a Microsoft Excel macro (which comes with the program). You can export TrafficWatch data to the macro, then create charts that display each

device's activity and error patterns.

TrafficWatch doesn't support all types of Ethernet network adapter boards, however. Farallon says TrafficWatch supports boards that—like its own products—are based on a National Semiconductor chip. The Cabletron E6119 network board I used in my tests wasn't supported by TrafficWatch. A call to Farallon's technical-support line yielded an offer to sell me a Farallon Ethernet board for \$100 (compared with the normal \$200-to-\$300 price of such an adapter), rather than a solution to the incompatibility problem.

Packets and Protocols

A SIMPLE COUNT OF PACKETS ISN'T always enough to tell you what's happening on the network. That's when a *protocol analyzer*, also called a packet analyzer, comes in handy (a protocol defines rules and procedures for transmitting information).

A software protocol-analyzer captures the complete contents and attributes of each packet. It tells you which network protocol is associated with each packet, as well as the source and destination information. It generally allows you to specify

NETWORK UTILITIES AT A GLANCE¹

Company	Product Name	Price ²	Lists Devices	Tests Devices	Provides Alarms	Contacts Pager	Generates Maps	Analyzes Traffic
AG Group	EtherPeek	\$795	○	●	●	●	○	●
	LocalPeek	\$495	○	●	●	●	○	●
	TokenPeek	\$995	○	●	●	●	○	●
	Net Watchman	\$295	●	○	●	●	●	○
Apple Computer	Inter Poll Network Administrator's Utility	\$129	●	●	○	○	○	○
Caravelle Networks Corporation	NetWorks	\$295	●	●	●	●	○	○
CSG Technologies	Network SuperVisor	\$495	●	○	●	○	●	○
	Network SuperVisor Jr.	\$145	●	○	○	○	○	○
	Network SuperVisor TE	\$295	●	○	●	●	●	○
Dartmouth College	MacPing	\$69	●	●	○	○	○	○
Dayna Communications	Network Vital Signs	\$449	●	○	●	●	●	●
Distributed Technologies	TalkManage	\$695	●	●	●	○	●	○
	TalkSpy/TalkStat	\$395	○	○	○	○	○	●
Farallon Computing	NetAtlas	\$695	●	●	○	○	●	○
	PhoneNet CheckNet	\$95	●	○	○	○	○	○
	TrafficWatch II	\$695	●	○	○	○	○	●
MacVonk USA	NetOctopus	\$645	●	○	○	○	○	○
Neon Software	NetMinder LocalTalk	\$395	○	○	●	○	○	●
	NetMinder EtherTalk	\$595	○	○	●	○	○	●
	RouterCheck	\$895	●	●	●	●	○	○
On Technology	Status Mac	\$749	●	○	○	○	○	○
SoftWriters	VersionTerritory	\$199	●	●	○	○	○	○
Sonic Systems	Radar	\$499	●	○	●	○	●	○
TechWorks	GraceLAN Asset Manager	\$895	○	○	○	○	○	○
	GraceLAN Network Manager	\$495	●	●	○	○	●	○
	GraceLAN Update Manager	\$295	○	○	○	○	○	○
	Network Utilities	\$129	●	●	●	○	○	○
Trik	NetDistributor Pro	\$695	○	○	○	○	○	○

● = yes; ○ = no; NA = not available. ¹The table includes network management and diagnostic utilities only. Utilities included in this table do not require specific hardware for base configurations; the size of base configurations can vary. In most cases, site licensing is available.

Just like a **city street**, a network can bear only a certain amount of traffic

which packets will be captured and which events or protocols will trigger the capture.

This sophisticated level of analysis isn't for everyone. For one thing, you have to be able to read packet headers and identify the relationship of protocols to network-traffic patterns. Novell file servers, TCP/IP-based Unix workstations, and Mac-to-mainframe communications, for example, all use different communications protocols. Such detail is probably more than you need if your network consists of only a few types of machines.

The two leading protocol-analyzer vendors offer separate versions of their software for Ethernet and LocalTalk networks. Neon Software's NetMinder LocalTalk (and NetMinder EtherTalk) and AG Group's LocalPeek (and EtherPeek) have similar capabilities. Each captures and decodes some or all packets traveling along

a network; each can be configured to begin captures when certain packets appear, or to filter out packets not currently of interest. Both programs can send packets of varying size to networked devices to ascertain the devices' status and ability to accept and transmit information without error.

Both programs stand up well against hardware protocol-analyzers, which are more expensive. The edge goes to LocalPeek and EtherPeek, which are simpler to use and full of little extras, such as the ability to graph packet activity, and a customizing function that allows you to modify any captured packet and retransmit it to the network.

Taking Stock

THE PROLIFERATION OF MAC MODELS, peripherals, and software has made it difficult to manage resources on a network. To

the rescue come software utilities called *profilers*, which are designed to gather highly detailed information about the computers on a network.

A profiler enables you to update your inventory of computers, software, and peripherals; determine whether or not a machine's configuration is adequate (you might discover an older Mac II that doesn't have, but should have, an accelerator board); and even perform some minor troubleshooting.

Typically, a profiler offers details about the kind of Mac (SE/30, IIsi, Quadra, and so on); the System and Finder versions, printer driver, and AppleTalk versions installed; the number and type of video boards, SCSI devices, and monitors attached; the names and versions of applications and system extensions present and/or running; the amount of RAM installed; and much more. By comparison, a utility with a listing feature, as mentioned earlier, provides details only on a network device's name and type, address, and zone.

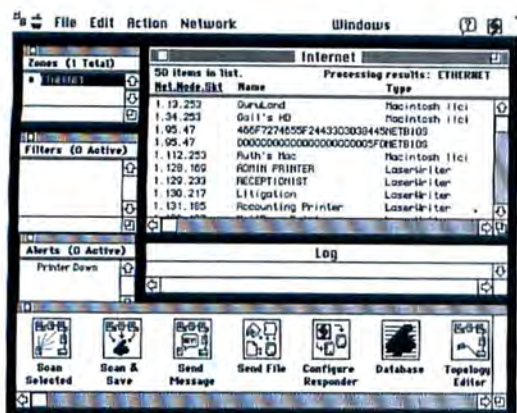
NetOctopus, an all-in-one network-management package from MacVolk USA, digs deeper than most profilers, offering such details as the size of a Mac's system heap (the amount of memory set aside for the operating system) and the amount of parameter RAM (a section of memory that keeps track of the Mac's clock settings and what devices are connected to the Mac's serial ports).

But GraceLAN Network Manager, from TechWorks, is the best among general-purpose analyzers. Because of its low overhead—it requires only 1MB of RAM, while others typically need at least 2.5MB to 3MB—the program can retrieve a vast amount of information at an acceptable speed. GraceLAN Network Manager has a useful on-screen viewing format, providing its configuration information in a scrollable display that can be sorted by any visible parameter; a menu choice brings forth an individual display for each Mac.

In addition, GraceLAN Network Manager works smoothly with GraceLAN Asset Manager, a stand-alone database built on ACIUS's 4th Dimension. The value of network inventory data depends, naturally, on your ability to use it in meaningful ways, and GraceLAN Asset Manager's inclusion of fields for supplies, accessories, software, and catalogs of common Mac hardware makes it a full-featured winner among network profiler databases.

Analyzes Protocols	Generates Reports	Provides Mac Profiles	Updates Software Remotely	Toll-Free Phone	Toll Phone
●	●	○	○	800/466-2447	510/937-7900
●	●	○	○		
●	●	○	○		
○	●	●	○		
○	●	○	○	800/776-2333	408/996-1010
○	●	○	○	800/363-5292	613/596-2802
○	●	●	○	800/366-4622	412/471-7170
○	○	●	○		
○	○	○	○		
○	●	●	○	NA	603/646-2643
○	●	○	○	NA	801/531-0600
○	●	○	○	800/285-4988	617/684-0060
●	●	○	○		
○	●	●	○	NA	510/596-9000
○	○	●	○		
●	●	●	○		
○	●	●	●	NA	215/660-0606
●	●	○	○	NA	510/283-9771
●	●	○	○		
○	●	○	○		
○	●	●	●	800/548-8871	617/876-0900
○	●	○	○	NA	512/263-4062
○	●	●	●	800/535-0725	408/736-1900
○	●	○	○	800/688-7466	512/794-8533
○	●	●	○		
○	●	○	●		
○	●	○	○		
○	●	●	●	800/466-8745	617/933-8810

products in order to work. Several individual network utilities are available as product bundles. ² Prices listed are



Mapping and More Network SuperVisor—CSG Technologies' network-mapping utility—enables you to keep an eye on the network map (shown in the Internet window, above right) or to click on any icon at the bottom of the window to launch a network scan, view a topology map, open the database, and more.

Staying Current

INCREASINGLY, SOFTWARE PROGRAMS are including a greater number of features with each revision, making the programs larger and therefore more difficult to install (Microsoft Word is a good example). That's bad news when your job is to keep everyone on a network supplied with up-to-date software revisions.

Remote software-updating utilities let you create a package of software for delivery to any or all workstations. Any updater can send software to a user's System Folder, a predetermined application folder, or a location of the user's choice. If the file already exists on the designated computer, the updater can be instructed to replace the file or to put it in another location.

The simplest update programs, including On Technology's Status Mac and Sonic Systems' Radar, deliver a file—an application program, for example—to networked Macs. If the file already exists on the designated computer, the updater can be instructed to replace it or to put the file in another location. Update packages are also usually smart enough to determine where a system extension or control panel belongs.

Most commercial applications come with a variety of auxiliary files. For this reason, many manufacturers use Apple's Installer program to automate the software loading process. Only one software updater, the versatile NetOctopus, can use the Installer scripts to duplicate the process on the network. That's helpful, because complex installations often require that files be placed in several locations on a user's hard drive—the Extensions folder, the Preferences folder, an applications folder—making the job of creating an update package time-consuming.

Another interesting entrant in this category is Trik's NetDistributor—the only

package capable of installing fonts and desk accessories directly into a designated Mac's System file. The easy-to-use package employs a combination of icon-rich scripts and useful plug-in modules to accomplish the task.

Should You Buy a Bundle?

SEVERAL VENDORS BUNDLE their most popular network-management packages—in some cases this is a good deal, but you should be careful not to buy more than you need.

For example, AG Group's LocalPeek, EtherPeek, and Net Watchman are sold separately at \$495, \$795, and \$295, respectively. AG's Net Patrol

Pack 1 bundle, which combines the three, costs \$1395. That's a fairly high price to pay, and the savings (\$190) isn't terribly significant; but if you're certain you can use all three utilities, then why not save \$200?

Farallon's bundle, PhoneNet Managers' Pack, is relatively expensive (\$995) too, but it's the most complete package available. The bundle includes Traffic-Watch II, NetAtlas, PhoneNet CheckNet, two copies of the Timbuktu screen-sharing software, the StarCommand hub-management utility, and ten copies of Dantz Development's Retrospect Remote, a backup package.

Selecting Features

BUNDLING ISSUES ASIDE, MOST NETWORK utilities perform more than one function, though not always equally well (see "Network Utilities at a Glance"). The challenge, then, is to find the package that offers just the features you need.

If your network is large and diverse—with hundreds of nodes and routers and several computer platforms—you're usually better off investing in a variety of soft-

ware utilities or desk accessories that focus primarily on a few functions. Hand-picking network software can become expensive, but more often than not, utilities that are dedicated to certain tasks give you a higher level of control and information than the all-in-one programs. If you go this route, try to buy as many utilities from the same vendor, as they're more likely to work together smoothly.

Managers with smaller, more Mac-centered networks of less than 100 nodes should consider full-featured packages, such as MacVonk USA's NetOctopus, the jack-of-all-trades network package. Although the functions might not be as complete as those offered by dedicated applications, in the long run these programs can offer the better value for the small network.

Coming Up

INCREASINGLY, NETWORK ADMINISTRATORS are finding themselves responsible for a variety of computer platforms, spread out over an ever-expanding internet. With that in mind, Apple is supporting a growing set of multidriver standards; chief among them is SNMP (Simple Network Management Protocol).

SNMP is a software protocol designed for open network management and is now widely used for TCP/IP networks. Networked devices that support SNMP employ an agent, a piece of software that provides network-configuration information to the network manager. This means you'll be able to manage routers, bridges, file servers, Macs, PCs, Unix workstations, and other networked nodes from one network-management workstation. While this is currently possible through sets of proprietary management tools, SNMP's emphasis is on open network management.

SNMP promises to deliver a whole new level of management to the Mac-based administrator. But at this writing, SNMP is in its infancy in the Macintosh arena. A few router vendors currently support SNMP, and many others are expected to follow suit in the coming months. Apple has promised to deliver SNMP-compatible products in 1993, but details haven't been made available. Once the hardware is in place, you should start to see SNMP-compatible software utilities on the shelves as well.

All of this means that your job as a network administrator should become easier this year. You'll still have to deal with the frustrated marketing managers who can't print their color brochures at the last minute—but that's what job security is all about. **m**

SHELLY BRISBIN is a writer based in the San Francisco Bay Area.

MW

EDITORS' CHOICE

Network Diagnostics

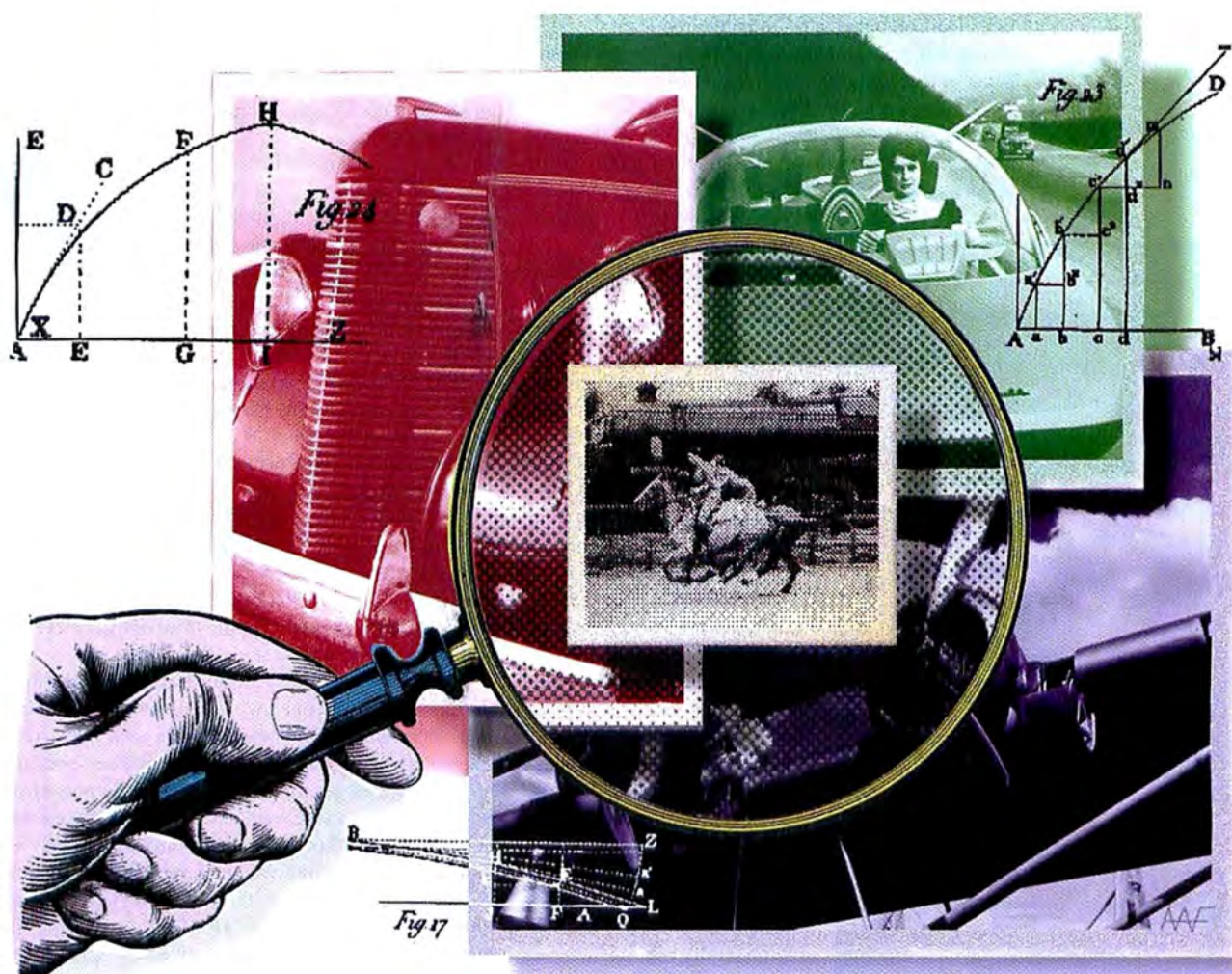
LocalPeek and EtherPeek These packet analyzers are robust, full-featured, and easy to use, despite the complexity of their functions.
Company: AG Group. **List prices:** \$495 and \$795, respectively.

Network Management

Network SuperVisor This smooth, integrated database and network-management package can be slow, but makes up for it with elegance and versatility. **Company:** CSG Technologies. **List price:** \$495.

HALFTONES DEMYSTIFIED

HOW TO
GET THE BEST
TINTS AND
HALFTONES
ON THE
MAC



ANDREW FAULKNER

PEOPLE OFTEN SAY THAT THE WORLD WOULD BE A PRETTY BORING PLACE WITHOUT COLOR. BUT IMAGINE IF THERE WEREN'T EVEN ANY GRAY—IF EVERYTHING WERE JUST BLACK OR WHITE. THAT'S WHERE WE'D BE IN THE WORLD OF PRINTING PRESSES, LASER PRINTERS, AND IMAGESETTERS IF WE DIDN'T HAVE *HALFTONING*, THE

BY STEVE ROTH

photographic or digital procedure for breaking up gray images into patterns of black spots that fool the eye into seeing gray. Halftoning is the heart and soul of the printing process.

Let's start by clearing up a common misconception (I'll address several in this article). Halftoning is not just for photographs. Any time you print gray on a page—a gray box or tinted type, for instance—you're using halftoning. It's essential, because printing presses, laser printers, and imagesetters can't print gray—just black. So how can black ink (or toner) give the impression of gray?

Photographic Halftoning

BY SCREENING AN IMAGE—PHOTOGRAPHING IT through a ruled sheet of glass or plastic—photographic halftoning breaks the image into a pattern of spots (see "Halftoning: Key to Gray-Scale Printing"). Take a close look at any photograph or tint printed in a newspaper or this magazine, and you can see those spots.

Now it's time to obliterate another common misconception. With halftoning, the spacing of the spots doesn't change; they are not bunched more tightly in dark areas, as you might think. Size is what counts.

The spots are smaller in light areas, and larger in dark areas (to the point of overlapping in black areas). The spacing of the spots is called the *screen frequency*.

In addition to screen frequency, halftones have two other controllable parameters—*screen angle* and *spot shape* (see "Special Effects Using Spot Shape"). You adjust these parameters based on your image, your output method (laser printer or imagesetter), and your printing method (laser printer, photocopier, or offset printer). Screen frequency indicates how many spots there are per inch. It's specified, somewhat confusingly, in lines per inch (lpi) or "lines," because halftone screens are made up of lines (rows) of spots.

Screen angle specifies the orientation of those rows of spots on the printed page. People generally use a 45-degree screen angle for halftones to make the halftone pattern least apparent. Other angles are useful for color printing and special-effects screening.

Spot shape is the shape of the halftone spots. They're often round, but they can be elliptical, square, or—for special effects—triangular or forming a line. See "Special Effects Using Spot Shape" for examples of special-effects screening.

Digital Halftoning

IT'S EASY TO MAKE HALFTONE SPOTS LARGER AND smaller with photographic halftoning, light being such a malleable medium. (The shape and spread of light beams vary according to the screen used.) But what do you do when you get to the digital world, with its rigid approach to things? You can't make laser printer and imagesetter dots larger and smaller; they're always the same size (though some of the new laser technologies—such as Apple's PhotoGrade—adjust laser dot sizes to give the appearance of high screen frequencies). The solution is to use a bunch of dots to make a halftone spot (see "Digital Halftoning"). By turning dots on, you make the halftone spot bigger; you're increasing the *tint percentage* for that area. Turn all the dots on, and you've got a 100 percent tint. Turn half of them on, a 50 percent tint. And so on.

The more dots within a halftone spot, the more possible gray levels it can represent. A spot that contains 4 dots has 5 possible gray levels (including white and black): no dots on, 1 dot on, 2 dots on, 3 dots on, and all 4 dots on.

Now let's get into a little arithmetic. (Math phobes take heart: you're reading the words of a man with a degree in theory of literature—no math background, no computer science. If you can multiply and divide—or have a calculator—you know all the math you need to master halftones. And if you find the terminology of scanning and halftoning confusing, take a look at "Dots versus Spots: A Glossary.") Imagine you're working with a 300-dpi laser printer. Its default screen frequency is 60 lpi—that means there are 60 halftone cells per inch. Since there are 300 dots per inch, and each halftone cell is $\frac{1}{60}$ inch on each side, each halftone cell contains 25 laser dots (in a 5 by 5 square).

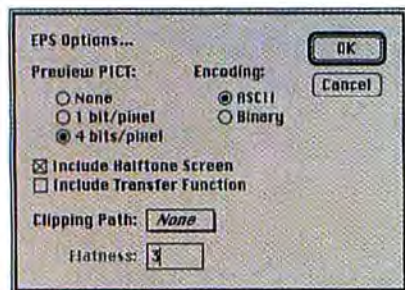
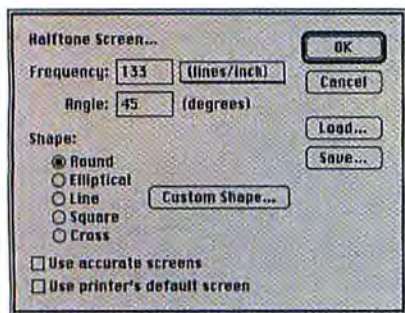
The obvious conclusion: On a 300-dpi laser printer, printing with a 60-line screen, there are 26 possible gray levels (there are 25 dots to turn on and off). Having only 26 gray levels to work with results in noticeable *posterization*—stairstepping from one gray level to another, as opposed to a smooth gradient.

Now imagine using a 50-line screen instead. Since there are 50 spots per inch, and 300 dots per inch, each spot contains 36 dots (6 dots on each side). It's a coarser-looking image because the halftone spots are bigger, but you get more gray levels—less posterization. This little exercise in arithmetic points out the essential trade-off of digital halftoning: at a given resolution, when you increase the screen frequency, you reduce the number of possible gray levels (see "Digital Quality Trade-Offs"). Here's the formula for figuring out the relationship between gray levels, screen frequency, and resolution:

$$\left(\frac{\text{output resolution}}{\text{screen frequency}} + 1 \right)^2 = \text{possible gray levels}$$

The following table gives several examples of this formula in action.

Resolution	Screen Frequency	Gray Levels
300 dpi	100 lpi	10
600 dpi	75 lpi	65
1200 dpi	100 lpi	145
1200 dpi	150 lpi	65
2400 dpi	120 lpi	401



Setting Screens The QuarkXPress Picture Screening Specifications dialog box (top) offers screening options for imported bitmaps. PageMaker provides similar options. Photoshop's Halftone Screen dialog box (middle) gives full control over the screen settings used to print an image. When you save an EPS file from Photoshop (bottom), you may include those screening instructions in the file.

Halftoning: Key to Gray-Scale Printing

To print a continuous-tone image (for example, from a photographic negative), you must break the image into tiny spots. These spots vary in size and shape and are arranged in a grid. When viewed from normal reading distance, the spots in the printed image simulate the various gray shades in the original image.

Photographic Halftoning

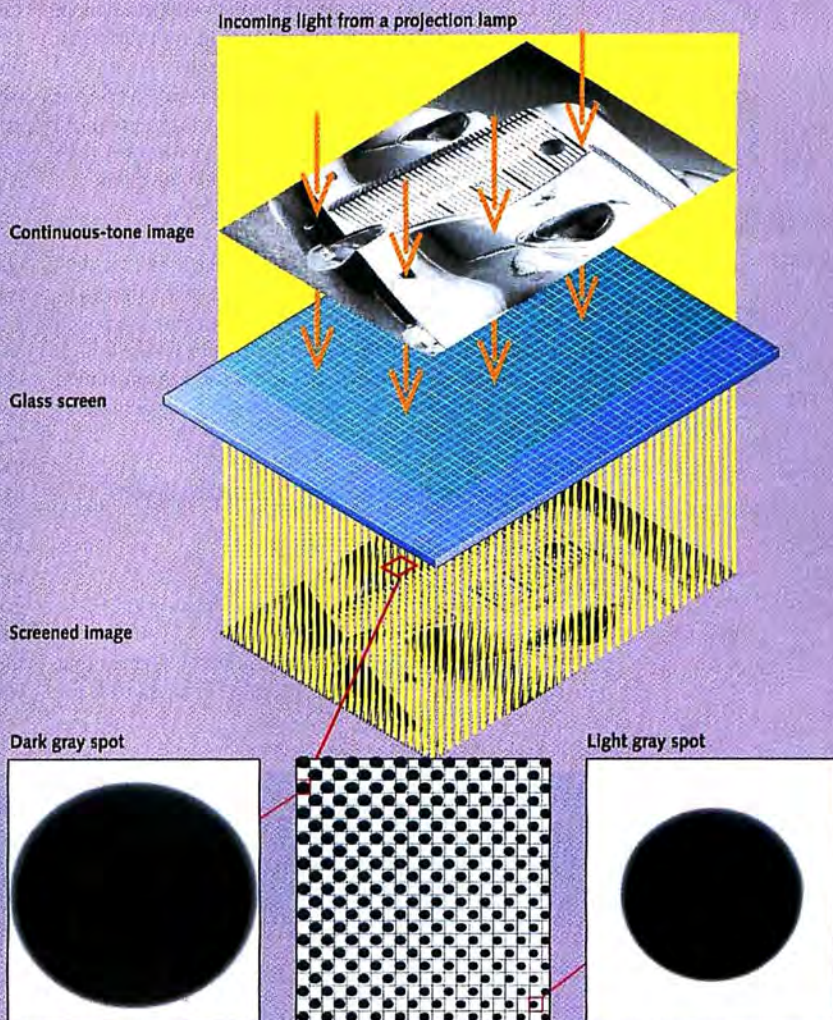
Screening an Image

In conventional halftoning, you project light through a continuous-tone film image. Depending on the opacity of the various areas of the image, different amounts of light pass through the film and hit a screen (usually a plate of glass with a grid etched into it). Each square in the grid focuses light onto an area on another piece of film below. The density of the grid is measured in lines per inch and determines the frequency of the halftone screen. Newspapers use very coarse screens, around 85 lpi; some magazines use screens up to 300 lpi for high-quality printing.

Screened Film Image

Spots on the screened film vary in size according to the amount of light that passes through the screen. Intense light passing through a relatively transparent part of an image creates a large spot. Subdued light, from nearly opaque sections of an image, creates a small spot. In this way a replica of the original image is formed.

Up close, conventional halftone spots are smooth and uniform in shape. Spot size can vary almost infinitely, limited only by the grain of the film receiving the light.



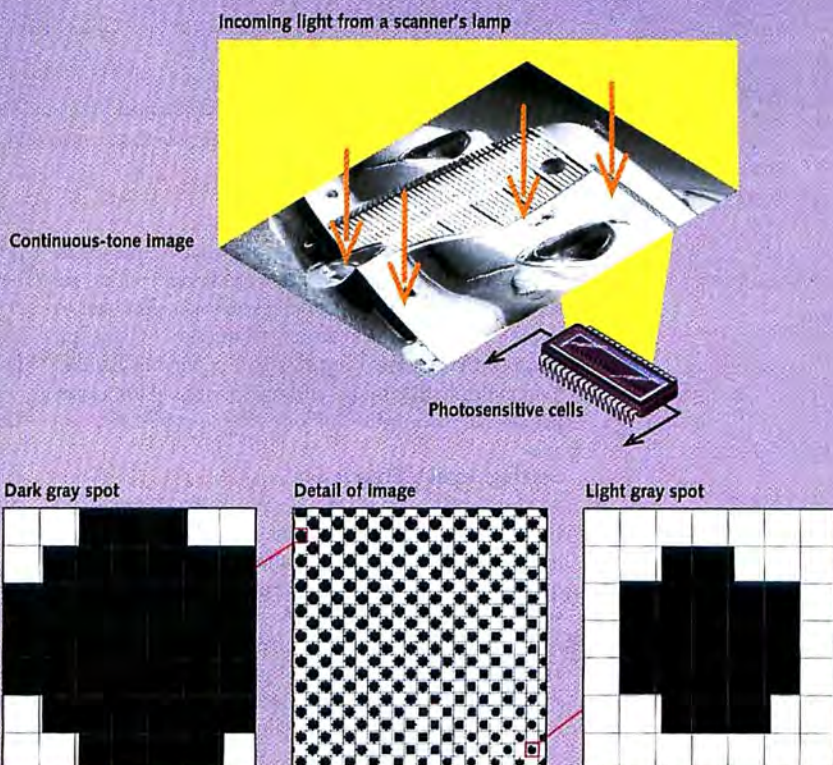
Digital Halftoning

Scanning an Image

As with photographic halftoning, digital halftones begin with a continuous-tone image. But in this case, light is passed through (or bounced off of) the image using a scanner instead of a screen. For digital halftoning, photosensitive cells measure the varying intensities of light passing through (or reflecting off of) the image. Each cell converts the light energy to an electric charge commensurate to the amount of light that hits the cell. Each signal is then converted to a gray value.

Activating the Dots

The output device groups black dots into halftone spots to create the halftone from a scanned image. The PostScript interpreter in the output device matches the scanned gray-scale image against the halftone grid and determines the number of dots to be turned on in each spot.



Up close, the limitations of digital halftones become apparent. Unlike the infinite variations seen in photographic spots, each digital halftone spot can vary only by how many dots there are per spot—in this case, 50 different grays are possible per spot. To get more flexibility out of the halftone spot, it must be larger—made up of more dots—thereby allowing more gray levels.

The formula and table are good guidelines, but you need one other piece of information to make them useful: the human eye can distinguish no more than 256 gray levels. So PostScript interpreters are limited to working with 256 gray levels (except PostScript Level 2, which for mysterious reasons supports more than 256). So there's no reason to strive for more than 256 gray levels. You can't print them or see them.

The Rule of 16

THAT SIMPLE FACT BRINGS US TO THE BEST TIP IN this article, which I call The Rule of 16 (it works because 16 is the square root of 256, but you don't need to know that to use the tip). This tip tells you how high the output resolution needs to be for a given screen frequency to avoid losing gray levels. You can express it in two different ways:

$$\text{maximum screen frequency} = \text{output resolution} \div 16$$

or (I find this one more useful):

$$\text{required output resolution} = \text{screen frequency} \times 16$$

The first one is helpful if you know your output resolution (you're using a 1200-dpi imagesetter, for

increase, of the halftone spots so they start to merge. It causes halftones to clog up and look dark and muddy. Dot gain is more of a problem at higher screen frequencies, since the spots are closer together. For a table of recommended screen frequencies for different situations, see "Choosing Screen Frequency."

- **Reproduction Method** How are you going to print copies? If you're using a laser printer or photocopier, don't plan on more than about 85 lpi; at higher frequencies the halftones clog up. With offset printing, you can normally use up to a 150-line screen. Talk to your printshop for offset work.

- **Reproduction Stock** If you're printing on newsprint, anything over about 85 lpi clogs up. Uncoated stock is limited to about 120 lpi (sometimes even 100 lpi, especially with less-than-white stock). Coated stock, depending on the quality, brightness, and printing method, can hold up to 300 lpi and still look good. Many printshops have trouble handling more than 150 lpi, however, even on high-quality coated stock.

- **Output Method and Resolution** Laser printers, no matter how high their resolution, have trouble printing good-looking grays. It's the nature of toner-based devices. Plan on using a 75-line screen or lower, though you may eke out good results at up to 110 lpi with higher-resolution and enhanced-resolution laser

printers. Imagesetters, since they use light to expose photographic paper or film, can produce very fine screens.

- **Output Medium** If you output to paper, even on a top-of-the-line, 3000-dpi imagesetter, you're limited to about 100 lpi. The printshop has to photograph the paper to make film in order to produce printing plates, and shooting from paper originals results in significant dot gain. If you want more than a 100-line screen, you need to output directly to film. This also brings up a tip for users of Apple's PhotoGrade and other high-res laser-printing methods: print page masters (from which plates are made) on acetate instead of on paper to reduce dot gain and therefore make the output more reproducible on press.

- **What You're Printing** If your publication contains no photographs or graduated tints, you may not need the whole gamut of 256 gray levels. In that case, consider

going to a higher screen frequency even if you don't have the resolution to support it under The Rule of 16. If you use only 2 or 3 or 4 different gray levels for tints in your publication, it doesn't matter if only 24 gray levels are available.

Controlling Screens in Software

SO HOW DO YOU CONTROL SCREEN FREQUENCY? IT depends what programs you're using, and in what combinations. Most desktop publishing, image-editing, and illustration programs provide means to control the halftone screens—frequency, angle, and spot shape—for the documents they produce (see "Setting Screens"). If you're using a single program and a single screen specification for the whole publication, setting the screens is pretty straightforward. But to create parts of your publication in one program and then place them on a page in another, there are some special fac-

CHOOSING SCREEN FREQUENCY

Output Resolution	Output Medium, Method	Reproduction Method	Paper Stock	Screen Frequency	Gray Levels
300	paper, laser	laser	laser paper	53	33
300	paper, laser	photocopier	bond	53	33
600	paper, laser	offset	coated	75	65
1000	paper, laser	laser	laser paper	100	101
1000	paper, laser	photocopier	bond	75	179
1200	photographic paper, imagesetter	photocopier	coated	85	200
1200	photographic paper, imagesetter	offset	coated	75	>256
2400	photographic paper, imagesetter	offset	newsprint	75-85	>256
2400	photographic paper, imagesetter	offset	uncoated	90-100	>256
2400	film, imagesetter	offset	coated	120-150	>256

Several factors affect the screen frequency you choose for a job. This table depicts several scenarios, with the factors that limit what screen frequency can be used highlighted in bold.

instance) and are trying to decide what frequency to use. The second one is useful if you know your target screen frequency. For example, your printshop says to produce a job with a screen frequency of 100 lpi, because that's what the press and paper can handle. You multiply that by 16, and start shopping for a laser parlor that has a 1600-dpi (or better) imagesetter.

Setting Screen Frequency

TELLING YOU TO TALK TO YOUR PRINTSHOP TO find out what screen frequency to use is sometimes good advice, but suppose you take your job to a local quick printer, and the counterperson (fresh out of high school) thinks screens are what you use to keep the flies out. How do you know what frequency to use? There are several interdependent factors to consider.

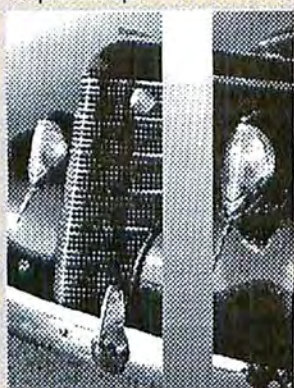
- **Dot Gain** Most of the problems of screen frequency revolve around *dot gain*—a slight spreading, or size

Digital Quality Trade-Offs

Digital halftone spots are made up of printer dots. The number of dots in each spot corresponds to the number of gray levels the spot can represent. The larger the spot, the more dots—and the more shades of gray that can be represented, at the cost of a coarser screen at a given output resolution. A finer

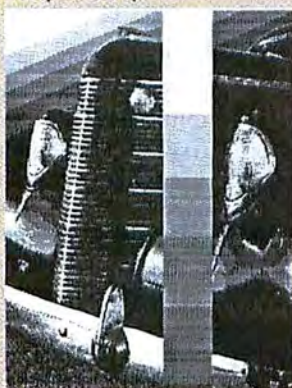
halftone screen creates smaller spots composed of fewer dots. This may sharpen details, but reduces the number of grays that can be represented. This results in posterization, creating a stair-step effect in moving from one shade to the next.

53 lpi at 300 dpi



At 300 dots per inch, a 53-lines-per-inch screen yields 33 shades of gray (including white). Each halftone spot is made up of 32 printer dots. This relatively small number of gray levels is not aesthetically jarring in such a coarse image.

133 lpi at 300 dpi



A finer halftone screen, when used on a laser printer, reduces the number of grays. Here, 300 dpi with a 133-lpi screen yields only 6 shades of gray. Although the image is more detailed, the finer screen creates abrupt shifts in shade.

150 lpi at 1200 dpi



Higher-resolution output devices, such as imagesetters, employ higher screen frequencies without sacrificing as many gray shades. Because printer dots are smaller, more dots can fit into a smaller halftone spot. At 1200 dpi with a 150-lpi screen, we get 64 shades of gray.

150 lpi at 2400 dpi



Increasing the output resolution increases the number of grays. Here, 2400 dpi at 150 lpi yields 256 shades of gray—eliminating posterization.

Special Effects Using Spot Shape

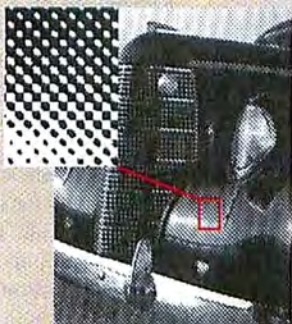
Common Halftone Screens

Below are a variety of halftone spot shapes and screen angles. At finer screen frequencies (133 lpi and up) screen differences are barely noticeable. At coarser frequencies (85 lpi and down, as shown below) the screen becomes visible, and using a different spot or angle has an obvious aesthetic effect. Screening options vary from program to program.

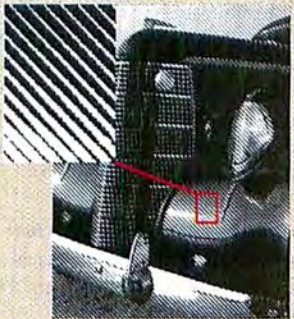
ROUND



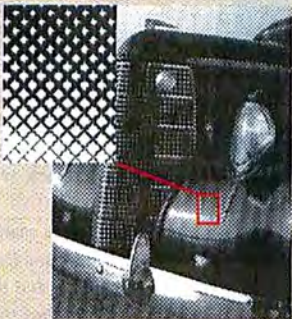
ELLIPTICAL



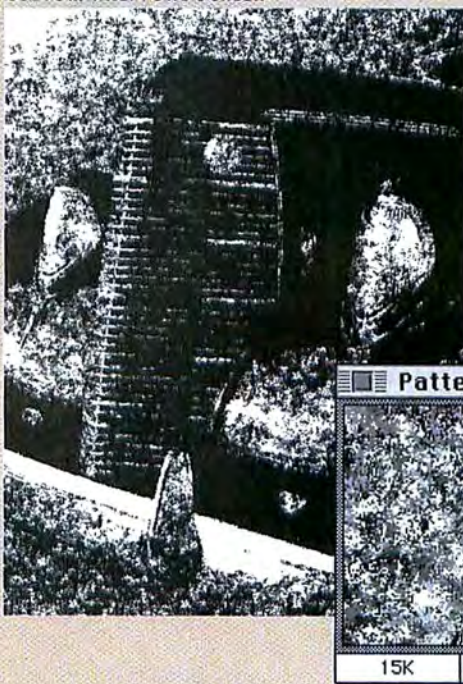
LINE



SQUARE



CUSTOM HALFTONE SCREEN



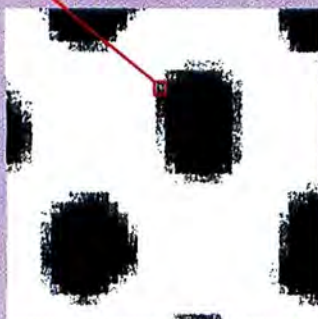
Custom patterns in Photoshop can be any size. The larger the pattern, the more random it will appear in the final halftone.

Dots versus Spots: A Glossary

One problem with understanding halftones is the fast-and-loose way that most people use the terminology—one word can mean several things. Here's a rundown of generally accepted definitions.

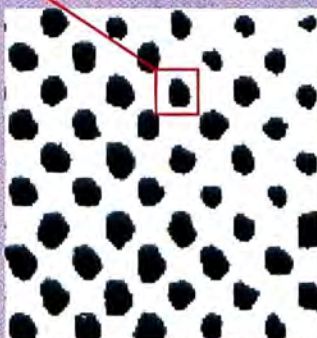
Dots: The marks that laser printers and imagesetters make on a page. Prepress experts always refer to the resolution of these devices in dots per inch (dpi), so this is a natural and inescapable term.

Each of these is a dot.



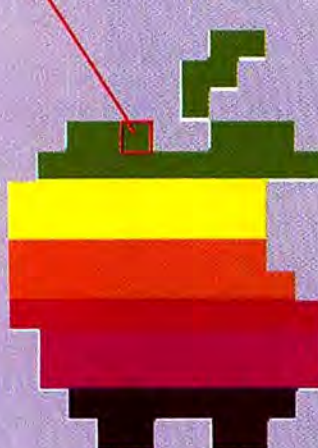
Spots, or Cells: In digital halftoning, these are made up of dots. A spot's size depends on whether it's in a dark area or a light one. They're called spots out of deference to the PostScript spot function, which controls their shape. They're called cells because they are often represented as a matrix, or grid, of dots. Printers traditionally call these things dots; this is the one term for which I have to break with tradition to achieve unambiguous terminology.

Each of these is a halftone spot, or cell.



Pixels: Picture elements. The lighted elements that make up a screen image. Screen resolution is typically cited in dpi, but ppi is more accurate.

Each of these is a screen pixel.



Sample Points: The elements making up a scanned image, or bitmap. A scanner samples an image every 1/300 inch, or every 1/72 inch, or whatever you choose. At each point, the scanner evaluates the sample, deriving a value. It's better to describe an image's resolution in sample points, or samples per inch (spi), rather than the commonly used dpi, which we reserve for output resolution.

Each of these is a sample point.



tors to understand. You should also consider these factors if different elements on a page use different screen settings (flat tints use one screen, for instance, while scanned images use another).

- **Using the Device Default** With most applications, if you simply create a document and print it on a PostScript device, you get the device's default screen settings. On 300-dpi laser printers, for instance, that's generally a 45-degree, 53-line, round-spot screen. You can experiment with your laser printer to determine its defaults, or ask your service bureau to determine the defaults for their devices.

- **Setting the Publication Default** Most publishing and illustration programs let you set up a publication default screen setting that overrides the device's default settings. The application applies its default setting to every element for which the screen isn't otherwise controlled. If you want everything in your document to print with a 75-line, 45-degree screen, you set that up as the publication default.

The method for setting the publication default ranges from very easy (type it in the QuarkXPress Page Setup dialog box) to somewhat complex (create a new PDX file for PageMaker using the PDX editor, then select that PDX in the Print dialog box). It varies enough that I (reluctantly) have to refer you to the documentation for the different programs.

- **Overriding Settings for Selected Items** Some programs give you the option of setting screens for individual items in a document. PageMaker and QuarkXPress, for instance, let you set the frequency, angle, and spot shape for imported bitmaps. FreeHand lets you set frequency, angle, and spot shape for any element. This object-level setting overrides the publication default, but only for that item. It's useful for special-effect screening (applying a 20-lpi, 45-degree line screen to a box, for instance), and for controlling screening for all your scans independent of other tints in the document.

- **Saving Settings in EPS Files** If you create a scan or illustration and save it as an EPS file, you can include screening instructions in that file. When you place that EPS image on a page in another application, the screening settings in the EPS file override the publication's defaults and even the item-level overrides you set in that application. EPS is the only file format that allows you to include screening instructions.

- **Overrides within Overrides** One final subtlety: Suppose you create an illustration in FreeHand, and set the screening for some of the elements in the illustration, but not all. Then you save the illustration as an EPS file and import it into QuarkXPress. The items within the illustration that have screening instructions set will use those settings. The other elements will print with the QuarkXPress default settings.

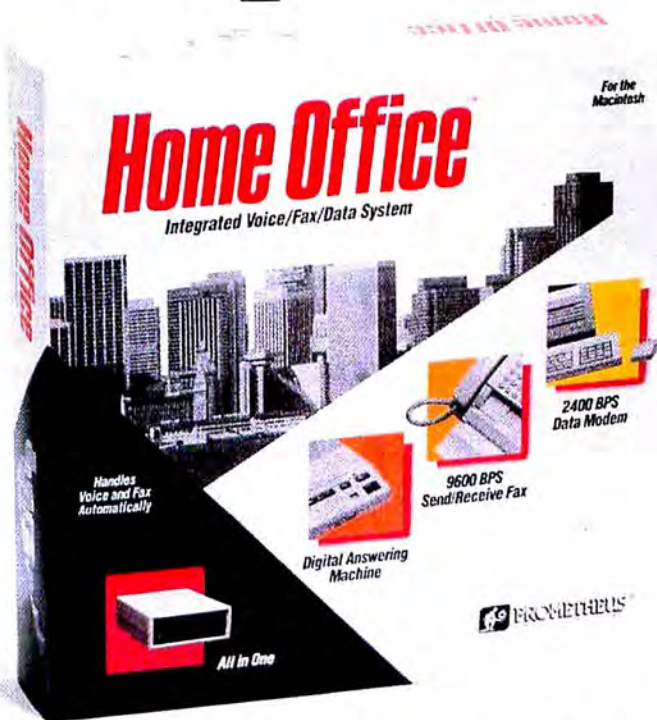
There's a whole lot more to know about halftoning and digital halftoning, some of which I'll be covering in an upcoming article on producing high-quality output from scanned images. For the time being, however, the basic rules and formulas laid out in this article will take you a long way toward that elusive goal—mastering the black art of getting good grays. ■

STEVE ROTH is coauthor of *Real World PostScript* (Addison-Wesley, 1988) and *Real World PageMaker 4* (Bantam Computer Books, 1990), and editor of *Real World FreeHand* and *The QuarkXPress Book* (both from Peachpit Press, 1991).

INTRODUCTORY OFFER
Ultima Home Office for PowerBook
ONLY \$399*

PLEASE SEE US AT MACWORLD EXPO BOOTH #933

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.



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

MacWAREHOUSE

1-800-255-6227

ORDER
UNTIL
MIDNIGHT(EST)
FOR
OVERNIGHT
DELIVERY

OVERNIGHT
DELIVERY
ONLY \$3.00



Best Seller Bundle -with Tesserae FREE!

●The Bare Essentials for every Macintosh! Save \$250 off list price on these three Best-Sellers. Here's what you get: **TouchBASE** lets you store information about personal and business contacts, alternative phone numbers, plus customize the fields. **Quicken** enables you to revolutionize the way you balance your checkbook and plan your finances. It even prints checks and pays bills electronically. **After Dark** will guarantee you'll never need to worry about screen burn-in again! Order today and you'll receive a FREE copy of **Tesserae** - a mind-rattling, addictive logic game.

Publisher: After Hours Software
BND0144

FREE
Tesserae
NEW!
\$99

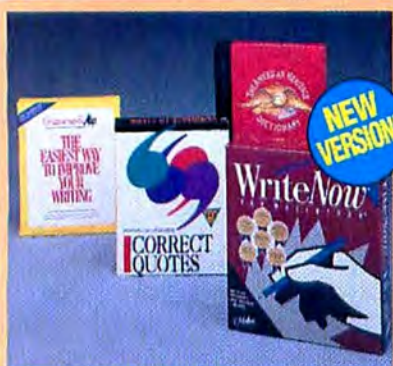


Atlas Pro

●Atlas Pro features a built-in spreadsheet that links database files to maps (down to street level) and includes query features that allow users to ask questions - and get answers - related to database or map information. Enter data directly into the spreadsheet, read in dBASE, FoxBase, and text files, or create live links to external databases and spreadsheets via System 7.

Publisher:
Strategic Mapping, Inc.
BUS0239

\$749



WriteNow Workshop

A complete set of writing tools for the Mac! A bundle of 4 award-winning packages designed to improve your writing. Includes **WriteNow 3.0**, the fastest & easiest Mac word processor. WriteNow is designed for anyone who wants award-winning word processing power in a package that's small, blazingly fast, and fully compatible. WriteNow's size and speed make it the best choice for the Classic, LC, and PowerBook families. Bundle includes **Grammatik Mac 2.0** (the grammar checker that allow you to write with clarity and confidence), **The American Heritage Dictionary** (116,000-word electronic dictionary), and **Correct Quotes** (electronic catalog of over 5,000 quotes) for FREE!

Publisher:
T/Maker
WRD0060

\$149

Accountant, Inc. 3.01

●"BEST ACCOUNTING PACKAGE"

1991 MacUser's Editors' Choice Award. More Features, more Power, more Flexibility. It's easy to use and gives you exceptional streamlining power. Every transaction is automatically posted to your General Ledger. Accountant, Inc.'s new revolutionary System 7 design gives you the advantage of customizing your forms, screens and reports by hot linking with your favorite forms design, spreadsheet and database programs. You get Invoicing, Accounts Receivable, Inventory, Accounts payable, Check Writing, integrated General Ledger and Payroll. Accountant, Inc. is now available in single and multiuser versions.

Publisher: Softsync, Inc.
FIN0048

\$335

Business Plan Toolkit or Business Management Toolkit*

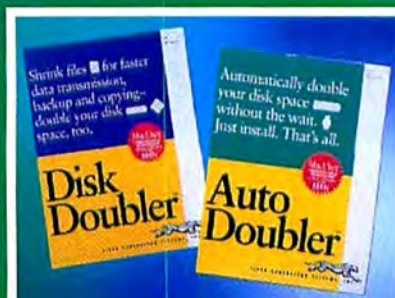
Solutions and shortcuts for businesspeople who plan.

●**Business Plan Toolkit 4.0**: Finally doing a business plan is easier than doing without one. MacUser gave it 4.5 mice and said "It guides you in a thoughtful, creative manner." Completely menu-driven financials and business charts, fully-linked forecasts, guided text writing. FIN0116 \$99

●**Business Management Toolkit**, a NEW product, includes business budgeting, milestones, strategy, tactics, and follow-through. Links to the business plan for planning and implementation. BUS0284*

Both require Spread Sheets.
Publisher: Palo Alto Software

\$99



AutoDoubler or DiskDoubler 3.7

●**AutoDoubler** is the easiest way to increase your hard disk capacity. It works in the background to automatically keep your hard disk compressed. It's lightning quick and completely transparent, so it won't interrupt your work. In fact, AutoDoubler's new patent-pending technique lets your Macintosh use files and applications while they are still compressed! It's fully compatible with almost all applications, desk accessories, and system extensions. UT10254

●**DiskDoubler 3.7** gives you total control of file compression-archiving for modem transfer, compressed backups, self-expanding files, and fast copying of files. AutoDoubler and DiskDoubler combined give you the ultimate in speed, convenience, and control.

System 7 Savvy!
Publisher:
Fifth Generation
UT10179

\$49 ea.



ScanMaker II and ScanMaker II XE*

●The new
Microtek

ScanMaker series provides a simple and affordable way to bring color and black-and-white images into your computer at resolutions up to 1200 dpi, and scans color photographs or artwork in full 24 bit color or 256 shades of gray. The ScanMaker II is bundled with Adobe Photoshop LE. The ScanMaker II XE is great for scanning color or black-and-white images and is bundled with a full version of Adobe's Photoshop, the premier image processing software for the Macintosh.

Manufacturer:
Microtek
II XE INP0247
II INP0246 \$929

\$1239*



Stuffit Deluxe 3.0 or Stuffit SpaceSaver*

●**Stuffit Deluxe 3.0** is the "complete compression solution". Only Stuffit Deluxe 3.0 can take all your compression needs from archiving to transparent compression and includes Stuffit SpaceSaver. Stuffit Deluxe 3.0 is the fastest most efficient compression product available. Our new Add Match intelligently stuffs only the files that use the extension that you specify. UT10302 \$49

●**Stuffit SpaceSaver** is unlike other compression products. It increases disk space (with lightning speed) without effort on your part. It works while your Mac is idle or when you say "Compress this for me." SpaceSaver provides complete on-the-fly compression in one package. SpaceSaver is also one of the least expensive, most productive and easiest to use compression products available.

Publisher:
Aladdin Systems, Inc.
UT10303

\$35*

Fonts Make All The Difference!

100

**POSTSCRIPT
TYPEFACES –
only \$49!**

***100 PostScript-compatible
typefaces for every application!**

KEYFONTS for Mac

Nothing adds more impact to printed work than the right fonts. But how do you gather a good typeface library? PostScript® fonts are so expensive – and TrueType™ fonts are still hard to find.

The solution is keyFONTS for Mac, from SoftKey. This professional library of 100 popular Mac typefaces brings you 100 PostScript-compatible and 100 TrueType-compatible typefaces, in one convenient package. For one unbelievably low price! Every font is fully scalable for exact point sizes, with a variety of styles, including Bold, Italic, Condensed, Normal and Outline, in portrait or landscape modes. Fully compatible with PostScript printers, and with ATM precision WYSIWYG display. Newest System 7 TrueType technology scales fonts on the fly for both screen and any Macintosh-compatible printer.

FON 0480

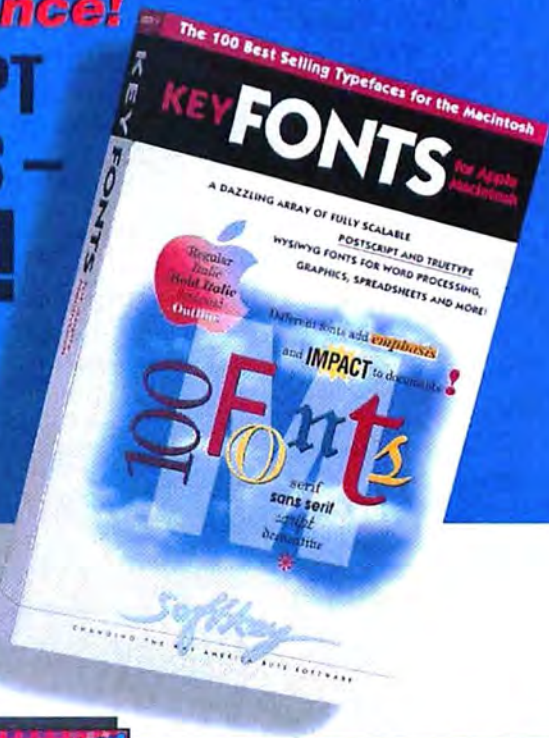
Publisher: SoftKey

Suggested Retail: \$59.95

System Requirements: Mac Plus or higher; 2MB RAM; hard disk drive; System 6 or later. TrueType requires System 7. ATM recommended for PostScript fonts.

**MacWAREHOUSE
Incredible Low Price**

\$49



BE A POWER USER... FREE*!

POWER USER'S TOOL KIT 12.0

The Power User's Tool Kit 12.0, compiled exclusively for MacWAREHOUSE by Steven Bobker, is packed with productivity enhancers and tools to customize your system to work the way you want. Your tool kit is Free* when you order from MacWAREHOUSE. You pay only \$1.50 for shipping and handling. If you would like the disk, please ask for Item #AAA0030.

Some of the programs are Shareware, so you can use them free of charge. Some authors do ask for a small fee. Six of the programs are absolutely FREE! See details on the disk.



MacEKG 2.0

Ⓢ This preventative maintenance utility is for everyone who owns a Mac Plus or above (System 6.0.7 or greater). Once installed, it runs by itself. MacEKG actually learns your machine and how it should behave. If a significant change has occurred, EKG will inform you by voice and indicate problems worth investigating. Is your disk drive slowly dying out on you? In only a few minutes EKG has determined the health of your machine for the day. EKG helps with inventory control by logging NuBus, ADB, and over 250 System configuration parameters. The program also includes ReActivator, component-level tests previously available only to Authorized Apple technicians, and a unique "capsule" to export for remote diagnostic analysis.

Publisher:
Micromat
UT10285

\$99

Kaboom!

Ⓢ Using a Macintosh was never this much fun! With Kaboom! you can add more than 150 wild and wacky sounds to your Macintosh! Each one can be played every time you start up your computer, insert a disk, empty the trash, and more! Amaze your friends with the sounds of traffic jams, screams, and ringing phones—even famous dialogue from "Twilight Zone," "I Love Lucy," Ronald Reagan, and more! With Kaboom! you'll never have to settle for a simple "Beep" again! A great gift idea!

Publisher:
Nova Development UT10281



\$29

Virex 4.0

Ⓢ Virex is the ultimate solution to Macintosh computer viruses. The Virex application detects and repairs files infected by all known Macintosh viruses. The Virex INIT continuously monitors the computer to prevent infection and performs repairs instantly. Virex 4.0 provides comprehensive network features. An administrator can request a network-wide virus scan and schedule periodic scans to ensure that the network remains virus free. The administrator can also outdate Virex versions and automatically update them. Virex is updated frequently and all registered users receive one free update.

Publisher: DataWatch
UT10093



\$69

I'm Kerry, call me at:

MacWAREHOUSE
1-800-255-6227

(1-800-ALL-MACS)
Inquiries: 908-367-0440
FAX: 908-905-9279
Call 24 hours a day,
seven days a week.
**NEW! Express
Customer
Service Number:**
1-800-445-9677
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 MW0293
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.

ACCESSORIES

CD Technology, Inc.	
ACD763 CD-ROM Caddy Replacement	49
Fuji USA	
BN0077 MF2DD 100PK Disks w/Labels	59
BN0076 MF2HD 50PK Disks w/Labels	59
Kensington	
ACC0623 Anti-Glare Filter 12"	69
ACC0460 MacAccessories Tilt/Swivel	23
ACC0677 Notebook Traveler-Deluxe	79
LB Innovators (full line available)	
WestSaver Mini-Mouse Pad (various colors)	ea. 12
MediaMate	
ACC0744 3.5in. Flex-Pack-10	10
ACC0738 DataFinder 3.5" Disk Filing System	10
Syquest Cartridges	
ME00035 44MB Removable Cartridge	75
ME00071 88MB Removable Cartridge	139
Targus	
ACC0482 Premier Leather Case	175
ACC0734 Premier PowerBook Leather Case	149
ACC0575 Universal PowerBook Carrying Case	69

BUSINESS & PRESENTATION

Aclair Software	
01W0162 CheckWriter 4.0	39
01W0168 HPI Finance	79
A Lasting Impression	
01R00000 Resumes, MS Word, Cover Letters, Manager, Sales & Marketing, Students, Computer Science & Engineering, Financing & Banking	ea. 49
Abacus Concepts	
01A0032 StatView 4.0	319
01A0010 StatView SE+Graphics 1.03	269
01A0028 StatView Student	75
01A0030 SuperANOVA	369
After Hours Software	
01B0000 DateBook or TouchBASE 2.0	ea. 79
Aldus	
01B0066 Persuasion 2.1	325
Atain Corporation	
01B0021 IN CONTROL 1.1	89
CE Software	
01G0070 Calendar/Memo 4.0	31
Chena Software, Inc.	
01B0050 Fair Witness 1.2	189
Chipsoft	
01W0160 MacTax'92	Call
Claris	
01B00201 ClarisWorks w/Free Quicken	199
Decision Engineering, Inc.	
01B00210 Crystal Ball 2.0	149
DeltaPoint	
01B00187 DeltaGraph Professional w/calculator	199
Diamante	
01B00180 Control Classic 1.5	299
Fisher Idea System, Inc.	
01B00168 Idealist 2.0	379
JAM Software	
01A0033 SmartAlarm 3.1 Plus Pack/Agpt. Diary	89
Kaeltron	
01B00218 FlowChart Express	93
01B00100 TopDown 3.0	199
Lotus Development Corporation	
01B00188 Lotus 1-2-3 for Macintosh 1.1	299
01S00004 Lotus 1-2-3 Competitive Upgrade	99
Meca	
01W0039 Managing Your Money 5.0	45
Microsoft	
01B00223 Microsoft Excel 4.0	295
01F00010 Microsoft Excel 4.0 Upgrade	35
01A00047 Microsoft FoxBASE+Mac 2.01	329
01B00181 Microsoft Project 3.0	125
01B00186 Microsoft Schedule+5 Pack	125
01B00243 Microsoft Works 3.0	159
01B00241 The Microsoft Office 2.5	475
01B00269 PowerPoint 3.0	375
Occam Research	
01B00233 Muse	469
Palo Alto Software	
01W01116 Business Plan Toolkit 4.0	99
Power Up	
01B00153 Address Book Plus 2.0	63
01B00073 Calendar Creator	44
Round Lake Publishing	
01Legal LetterWorks or Sales	ea. 45
Softsync Publishing	
01W0048 Accountant, Inc. 3.0 1	335
Teleware, Inc.	
01F00037 M.Y.O.B. 3.0	139

COMMUNICATIONS & NETWORKING

Apple Computer, Inc.	
01N0250 AppleShare 3.1	999
01C00131 AppleTalk Remote Access	165
01C00126 Macintosh PC Exchange	69
CE Software	
01C00101 QuickMail 2.5.1 (1-5 users)	249
Dayna Communications, Inc.	
01N0125 DaynaPort	269
01N0076 DaynaPort E/S	149
Ex Machina	
01C00111 Notify! 1.1 Personal Edition	109
Farallon™ Computing	
01N0007 PhoneNET™ Plus SE & II	31
01N0019 PhoneNET StarController	899
01N0122 Timbuktu® 4.0.3	129
01N0034 Timbuktu Remote 3.0	129
FreeSoft	
01C00060 White Knight V 11	85
Insigma (Full line available)	
01W0174 AccessPC 2.0	60
01C00108 SCA 1.2.5	299
01C00107 Soft PC Universal 2.5	195
Hayes	
01C00095 Hayes Connect 3.0	75
Shiva	
01N0246 LAN Rover II	599
Sonic	
01N0290 Radar 3.0	279
Synergy	
01C00003 VersaTerm Pro 3.6	177

TechWorks

01N01133 GraceLAN 2.0 50-user	279
White Pine Software	
01C00114 Mac 320-VT320 Emulator	95

DESKTOP PUBLISHING

Aldus	
01P00072 PageMaker 4.2	495
01F00003 PageMaker 4.2 Upgrade	99
01P00083 Personal Press 2.0	99
Quark, Inc.	
01P00071 XPress 3.1	549

DISK DRIVES & BOARDS

Mass MicroSystems	
01D00253 DataPak 45MB Removable	549
Peripheral Land, Inc.	
01D00375 Infinity 88 Removable single	699
01D00115 Infinity Turbo 40 Meg Removable	599
PowerUser®	
01D00499 100 Meg Drive	479
01D00533 20 Meg External Hard Drive	299
01D00450 60 Meg Drive	499
01D00494 Pro 105 MB Drive (Quantum LPS)	499
01D00546 Pro 210 MB Master Drive	749
01D00490 40 MB Drive	379
01D00094 44MB Syquest Removable	499
01D00095 88MB Syquest Removable	649
SuperMac Technologies	
01D00437 Spectrum/8 24 PDQ	899
01D00516 Spectrum/24 Video Mac II Card	799
01D00517 Spectrum Series III Accelerator Card	449
01D00440 Spectrum/8si	539

EDUCATIONAL & ENTERTAINMENT

Artworx	
01N0262 GraftQuest	19
01N0263 Bridge 7.0	35
Baseline Publishing	
01N0403 Talking Moose/Carroll Carnival 4.0	23
Broderbund	
01C00042 Just Grandma and Me-CD-ROM	35
01C00268 Kid Pix 1.2	35
Centron Software, Inc.	
01N0329 Blackjack Strategy Tester/BlackJack Ace	65
01N0289 CasinoMaster Deluxe Color Version	45
01N0440 Crossword Creator	39
HyperGlot Software Company	
01Word Tutor: Spanish, French, German, Russian	ea. 35
MECC	
01N0381 The Oregon Trail	29
01Lumber Munchers or Word Munchers	ea. 19
Hardie Software	
01C00276 Word Search Deluxe	35
01E00142 Preschool Pack 2.0	35
Opcode Systems, Inc.	
01M00107 Audioshop	65
Optimum Resource, Inc.	
01E00355 Stickybear's Reading Room	35
Passport Designs, Inc.	
01M00049 Encore 2.5	379
01M00105 MusicTime for Mac	169
Penton Overseas (Full line available)	
01Picture It! Level I: Spanish, German, French, Italian	ea. 42
01Yocube/Leanne/Level II, III: French, German, Hebrew, Italian, Japanese, Russian or Spanish	ea. 35
Personal Training Sys. (Full line available)	
01Excel 2.0 Word 5.0, Quark XPress 3.1	ea. 49
Pluma Software	
01N0447 Capitalist Pig 1.1	35
Software ToolsWorks	
01M00092 Miracle Piano	349
XOR Corporation	
01N0274 MacGolf Classic 1.1	52
Zondervan Publishing House	
01MacBible-Greek or NIV	ea. 79
01B00021 MacBible - King James Version	79

Fonts & Applications

Adobe Systems, Inc. (Full line available)	
01N0351 Adobe Type On Call 2.0	59
01N0295 Adobe Type Reunion	41
01N0439 Adobe TypeStyle 2.0 w/ATM	127
Softtek Software	
01N0480 KeyFonTS	49
Wayzala Technology	
01N0484 Font Fun House CD-ROM	35

GRAPHICS & MULTIMEDIA

Abracadabra	
01C00032 Design Your Own Home-Architecture	ea. 59
01G00339 Spiro!™	45
Adobe Systems, Inc.	
01G00371 Adobe Premiere 2.0	439
01G00383 Illustrator 3.2 (w/ATM 2.0)	369
01G00191 PhotoShop 2.0	549
Aldus	
01G00305 FreeHand 3.1	395
01G00279 Gallery Effects Vol. 1	129
01G00354 IntelliDraw	199
01HY0027 SuperCard 1.6	195
01G00112 SuperPaint 3.0	99
Apple Computer, Inc.	
01G00347 QuickTime Starter Kit	149
Broderbund	
01MacGlobe or MacUSA	Call
Claris	
01C00029 ClarisCAD 2.0	599
01G00350 MacDraw Pro 1.5	275
01S00014 MacDraw Pro 1.5 Trade-up	55
Deneba	
01G00280 Canvas 3	259
DIVA Corporation	
01G00326 DIVA VideoShop	395
Dream Maker	
01G00105 Clutures Vol. 1 Business Images	69
Fractal Design	
01G00323 Painter 1.2	249
01G00393 Fractal Design Sketcher	99
Gryphon Software	
01G00378 Morph	95
Kodak	
01G00381 AnimateCD	35

01G00380 Renaissance	499
Metro Image Base (Full line available)	
01G00277 Metro-ImageBasics	35
Postcraft	
01P00062 Effects Specialist	99
01P00063 Layouts for PageMaker	75
Ray Dream	
01G00383 addDepth	125
01G00291 JAG	79
Solstice Publishing	
01D00346 Expert Astronomer	29
01G00318 ExpertColor Paint	ea. 29
01G00367 Expert Landscape Design	29
Spectral International	
01G00383 Infini-D 2.0	699
T/Maker	
01G00317 FaxMania: Business Fax Cover Sheets	25
Thought I Could	
01G00302 Wallpaper	37
Virtus	
01G00278 Virtus WalkThrough 1.1	309

INPUT & OUTPUT

Appoint, Inc.	
01P0219 Mouse Pen Pro Mac ADB	65
01P0220 Thumbelina Mac	65
Caere	
01N0205 Typist Plus Graphics	339
CoStar	
01N0195 AddressWriter Envelope Printer	479
01N0194 Stringray Platinum	89
Datadesk International	
01P0174 Mac 101E Keyboard Platinum	129
01P0183 Mac 101E w/Keys 2	159
Kensington	
01P0231 Turbo Mouse (SE or II) 4.0	109
01P0221 Notebook KeyPad	105
Microtek	
01P0246 Microtek ScanMaker II	929
01P0247 ScanMaker II XE	1239
Microtouch	
01N0064 The UnMouse	159
Mouse Systems	
01P0132 Little Mouse ADB	74
01P0163 A3 Mouse	85
01P0199 A3 Trackball	85
Sophisticated Circuits	
01ACC035 PowerKey 2.0w/QuickKeys Lite	75
01N0232 PowerPad	79
SuperMac	
01N0224 20" SuperMatch Color Display	1699
ThunderWare	
01P0116 LightningScan 400	359
01P0189 LightningScan Pro 256	499

UPGRADES & ACCELERATORS

Computer Care, Inc.	
01D00336 Mac Rescue w/SCSI Port	139
01C00074 BookRAM 6S for PowerBook	479
DayStar Digital	
01Universal PowerCache 33 MHz	599
01Universal PowerCache 33 MHz w/852	749
01Universal PowerCache 40 MHz	839
01Universal PowerCache 40 MHz w/852	1029
01D00241 FastCache IIs (64K)	299
01D00500 FastCache Quadra 700/500	279
PowerUser®	
01C00011 4 Meg SIMMs 60ns	139
01C00013 1 Meg SIMMs 100ns	149
01C00066 2MB PowerBook 100/140/170 Upgrade	149
01C00067 4MB PowerBook 140/170 Upgrade Kit	259
01C00068 6MB PowerBook 140/170 Upgrade Kit	359

MODEMS & FAX

Global Village (full line available)	
01PowerPorts	Call
Hayes	
01C00055 Bundle 9600 ULTRA SmartModem	679
01C00057 OPTIMA 96 for the Mac	359
01C00056 OPTIMA 24 Bundle	149
PowerUser®	
01C00062 24/96 Mini Send/Receive Fax Modem	159
01C00043 2400 Mini Modem	89

Prometheus	
01M00034 Home Office 24/96	259
01M00035 Ultimate Home Office 24/96	489

UTILITIES & PROGRAMMING

Abbott Systems, Inc.	
01U00235 Calc+	39
01U00113 CanOpen 2	59
Advanced Software	
01U00291 InTouch 2.0	59
Aladdin Systems	
01U00302 StuffIt Deluxe 3.0	69
01U00303 StuffIt SpaceSaver	35
Alsoit	
01U00269 Alsoit Power Utilities Bundle	65
Apple Computer, Inc.	
01NG0058 AppleLink for Programmers	219
01NG0057 Mac Programming Fundamentals	449
01SY0004 System 7.1 Personal Upgrade Kit	79
01SY0003 All Ease	55
ASD Software, Inc.	
01U00135 FileGuard 2.7	139
01U00130 FileGuard 2.7 - Office Pack 5	479
Baseline Publishing	
01U00187 Mail Manager 1.1	34
01U00183 ScreenShot 1.2	34
Berkley System Design	
01U00119 After Dark 2.0	29
01U00231 More After Dark/After Dark 2.0 Bundle	45
01U00315 Star Trek: The Screen Saver	35
Caere	
01U00293 OmniPage Direct	269
01U00202 OmniPage Professional	649
Casa Blanca Works, Inc.	
01U00273 Drive 7.2.2	49
Connectix	
01U0297 CPU Connectix PowerBook Utilities	49
Danzil Development	
01U00246 DiskFit Pro	74
Fifth Generations	
01U00119 SuitCase 2.1.2	55
01U00246 SuitCase 3.7	ea. 49
FWB, Inc.	
01U00259 HardDisk Toolkit 1.1	125
Insight Development	
01U00098 MacPrint 1.3	55
Kent Marsh	
01U00262 Night Watch II	89
MAXA Corporation	
01U00277 Snooper Kit w/Free N.U.M.	159
Microcom	
01U00093 Virex 4.0	69
MicroMat Computer Systems	
01U00285 MacKRG 2.0	99
Nova Development Corporation	
01U00281 Labomat	29
Now Software	
01U00311 Now Utilities 4.0	99
Symantec Corporation	
01U00151 Norton Utilities for the Mac 2.0	95
01U00214 Symantec Antivirus for Mac 3.0 (SAM)	65
Teknosys	
01U00251 Help 1.02	89
TGS Systems	
01NG0053 Graph 2.5 Computer Ver	299
UserLand Software, Inc.	
01U00272 UserLand Frontier	189

WORD PROCESSING

Claris	
01W00026 MacWrite II 1.1	89
Microtypics	
01S00011 Word Finder Plus 4.0	45
Microsoft	
01W00059 Word 5.0	295
01W00001 Word 5.0 Upgrade	125
Softsync Publishing	
01W00057 ExpertWriter	29
T/Maker Co.	
01W00060 WriteNow Workshop	149
WordPerfect Corporation	
01W00041 WordPerfect 2.1	289
WorldStar	
01S00030 American Heritage Electronic Dictionary	55

- All major credit cards accepted. No surcharge.
- Your credit card will not be charged until your order is shipped.
- If we ship a partial order, we pay the freight on the remaining portion.
- All U.S. shipments are insured at no extra charge.
- C.O.D. orders accepted (add \$6.00 including shipping) - \$1,000 maximum.
- Cash, money order, or cashier's check.
- Corporate purchase order accepted subject to credit approval.
- All products are covered by a 120 day limited warranty.
- Sales Tax: CT residents add 6%, NJ residents add 7%, Ohio residents add appropriate tax.
- All orders add \$3.00 per order. We ship Airborne Express overnight unless UPS Ground delivers overnight. (Some rural areas require an extra day.)
- Orders placed by 12:00 MIDNIGHT (EST) (weekdays) for "in stock" items ship same day (barring system failure, etc.) for overnight delivery.
- C. O. D. orders ship via UPS (Blue Label) if you are more than 2 days from us via UPS Ground. Charge is \$6 including shipping.
- Alaska, Hawaii, outside continental U.S., APO/FPO call 908-367-0440 for information.

*Defective software replaced immediately. Hardware replaced or repaired at our discretion.
**We regret that we cannot be responsible for typographical errors.

I'm Kerry,

COMPUSERVE

You can now contact MacWAREHOUSE or place orders with us in the Electronic Mall on CompuServe. The MacWAREHOUSE GO code is GO MW. As always, you'll get fast, dependable overnight service and you can leave messages for Kerry or any of our support staff.

**OVERNIGHT
DELIVERY
ONLY \$3.00**



Snooper Kit 2.0 (contains NuBus card)

❶ Snooper 2.0 detects hardware problems and sources of intermittent failures. It performs over 200 major component tests, prints the results, and logs errors. It also does benchmark testing and reports on system configurations to allow technicians to find and fix problems quickly. Includes a NuBus card to check errors even when the screen displays a "Sad Mac." Now includes Virex FREE!

Requires: 2MB RAM.
Publisher: MAXA
UT10337

\$179



Effects Specialist or Layouts*

❶ Effects Specialist 2.0-With version 2.0, the industry's first and finest font styling program gets even better! 120 dynamic effects, each modifiable 1,000s of ways. A new high-performance interface and full color support. Transform any PostScript, bit-mapped or TrueType font into exciting logos, headlines, flyers, stationery, etc. Use with any DTP, drawing, WP or paint program. Powerful, easy-to-use.
DTP0062 \$99

Layouts - Punch up your Creativity! Postcraft's award-winning Layouts: professionally-designed page-layout templates for PageMaker. A fascinating variety of camera-ready B&W and color designs - 33 Brochures, 14 Newsletters, 82 Business cards, 35 Letterheads, 48 Envelopes and 2 business-reply cards. Customize with your own copy, fonts, and graphics. Output to any printer. All templates have crop, registration, and fold/score marks.

Publisher:
Postcraft International
DTP0063

\$75

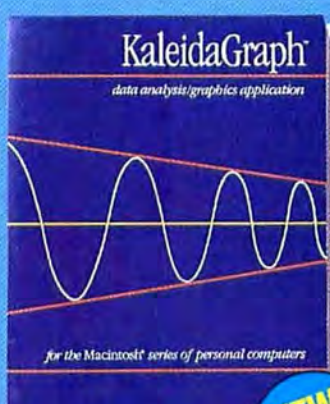
Bridge 7.0

❶ Bridge 7.0 pits you and your partner against two opponents on your Mac. Improved color graphics and screen layouts, plus enhanced bidding and play make it more fun. Your computer opponents have their own personalities, and digitized speech. Bridge 7.0 recognizes the stayman and blackwood conventions and allows you to adjust the style from conservative to aggressive. Publisher: Artworx

Also available:
Grail Quest- A graphic adventure. ENT0262 \$19
KaleidoKubes- A mind-bending game. ENT0417 \$12
Bridge 7.0
ENT0461



\$35



**NEW
VERSION!**

KaleidaGraph 2.1

❶ KaleidaGraph simplifies the process of analyzing and presenting statistical information. It provides 16 different graph structures, including scatter, histogram, probability plot, polar, as well as more common types, such as line, bar, and pie. You can crunch large amounts of data (up to 32,000 points per column), and plot up to 20 variables at once. Supports PostScript compatible printers including the DeskWriter C. Publisher: Synergy
STA0018

\$149



MicroPhone Pro

❶ With MicroPhone Pro you can connect to any on-line service at the touch of a button. Use its library of ready-made scripts to access CompuServe, GENie, or MCI Mail. You also can create your own scripts. MicroPhone Pro supports System 7 Publish and Subscribe, Apple Events, Balloon Help, and Aliases. It allows you to connect to any TCP/IP host network, such as Internet. It also includes fax sent and receive software for fax modems. Publisher:
Software Venture
COM0138

\$219

Super 7 Utilities

❶ Included are: Megas Menu to give you the ability to tear down from the menu bar of any application; Printer Picker lets you quickly select a network printer without visiting the Chooser; Desktop Extras to make filing files at the folder level; Super Commander which preserves the Finder's "last folder" command during desktop rebuild, and lets you edit or view files in any application; Trash Alias which prevents orphaned aliases; Helium Pro makes Balloon Help practical and Speed Deep Pro lets you customize your Mac's warning sounds. Publisher: Atticus UT10366



\$65



Sprout! or Design Your own Home:*

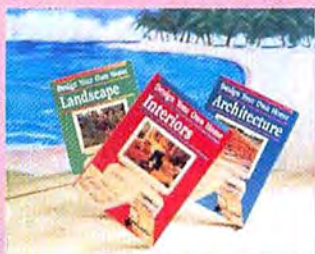
❶ Sprout! is a complete computer planning tool for vegetable gardeners. Produces a graphic, scalable garden plan with correct plant and row spacing. Contains fully editable database of vegetables for 7 climate regions. Prints garden layouts, calendars, shopping lists, and reports. GRA0339

\$45

❶ Use Design Your Own Home: Architecture, Interiors, or Landscape to create the right look

for your home or yard. Create floor plans and building plans with structural details. Do individual room plans and kitchen/bath design. Then complete your dream house with graphic landscape plans. Interiors and Landscape programs generate 4 side views from top-view perspective. Sample plans included. Publisher: Abracadata

\$59 ea.*



DiskFit Direct

Backup Solutions. For easy, basic backup to a SmartSet™ of floppies, use the NEW DiskFit Direct™. For SmartSets, scheduling capabilities, and automatic backup to AppleShare® servers, use DiskFit Pro™. Retrospect® is your complete automatic, unattended backup and archiving solution. Supports all tape, optical, and removable cartridge media. Publisher: Dantz
DiskFit Pro UT10246 \$74
Retrospect UT10118 \$148
DiskFit Direct UT10333



\$29

MacWAREHOUSE

1-800-255-6227

ORDER
UNTIL
MIDNIGHT(EST)
FOR
OVERNIGHT
DELIVERY

OVERNIGHT
DELIVERY
ONLY \$3.00



UserLand Frontier

With UserLand Frontier, you don't have to choose between pretty icons and the power to customize and automate your Macintosh. For the first time, you can have power and ease-of-use. Frontier has all the development tools you need to get your scripts running quickly, including a full script debugger and structured symbol tables you can watch and edit while your scripts are running. When you're done, you can link scripts into Frontier's editable menu bar, or save them to the Finder desktop.

Publisher: UserLand
UTI0272



\$189

Star Trek™: The Screen Saver* or AfterDark Bundle

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, SystemQ and full compatibility with After Dark. UTI0315

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. UTI0231 \$45

Publisher:
Berkeley Systems

\$35*



PowerRunner™

PowerRunner combines Power Up's popular Calendar Creator™ and Address Book Plus™ software with the best-selling Day Runner® personal organizer. Calendar Creator handles

everything from appointments to repeating meetings and holidays. Print your calendars in any format, from daily to yearly, then insert in your Day Runner binder. Address Book Plus produces top-quality address book pages, mailing labels, rotary file cards, envelopes, and unique InstaBooks™. Print double-sided address pages to fit Day Runner and other popular organizers.

Publisher: Power Up! Software
Also available:
Calendar Creator BUS0073 \$44
Address Book Plus BUS0096 \$52
BUS0268

\$99

Mighty Draw

Mighty Draw is an affordable, general-purpose, object-oriented drawing program, that allows the user to create pie, column, bar, and flow charts, graphs, electronic schematics, network diagrams, flyers, newsletters, greeting cards, logos, and more! Mighty Draw includes hundreds of pre-drawn symbols, and access to multiple object libraries simultaneously! Virtually any symbol from other programs can be added, making Mighty Draw an all-encompassing drawing program.

Publisher:
Abracadata, Ltd.
GRA0399

\$25



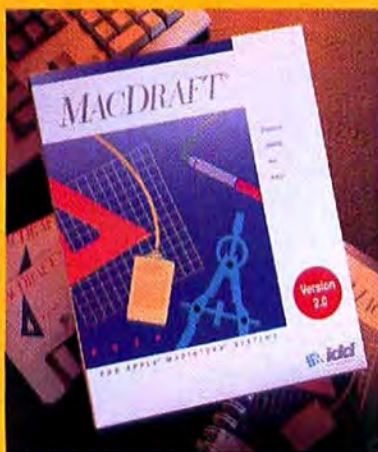
NEW!

Infini-D 2.0

Create dazzling images with the power of Infini-D's three-dimensional environment. The easy-to-use Infini-D 2.0 is an awesome second generation Infini-D 1.0 upgrade package that brings 3D graphics to the rest of us. Infini-D 2.0 combines the friendly interface with scaling 3D power. Infini-D's incredible new slider and raytracer now can render scenes up to 500x faster! Instant conversion of EPS files into 3D objects. Infini-D's awesome metamorphosis capabilities, precise PCB snapping control, and extensive QuickTime support make Infini-D 2.0 the 3D package of choice for graphics, art, and multimedia professionals.

Publisher:
Spectra International
GRA0303

\$699



MacDraft 2.1

MacDraft is designed specifically for architectural/engineering drawing and drafting, and technical illustration. It provides a fully scaled drafting environment that closely emulates the way you work and think when using the drafting table. MacDraft offers a full complement of drawing tools that are designed to provide extensive control over the creation and editing of objects. Tools include lines, circles, rectangles, arcs, polygons, ellipses, splines or Bezier curves, and freehand shapes. MacDraft provides a number of options that allow you to configure tools to meet your drawing needs. Use MacDraft to get the results you need.

Publisher: Innovative Data Design
CAD0039

\$279



White Knight V.11

Winner of 11 awards, White Knight will give you powerful, painless communications at an affordable price. Geared to all levels of experience, it

supports file transfer protocols like ZMODEM, 3 styles of YMODEM, Flash & 3 styles of Kermit. Terminal emulation supports VT1, VT52, VT100 & VT102 as well as 32 bit color QuickDraw & large monitors. Comes with a FREE copy of Disto (a revolutionary, new Mac-to-Mac file transfer program & \$39.95 value).

Publisher: FreeSoft COM0060

\$85

TRISTAN: Solid State PINBALL

If you like pinball, you'll love TRISTAN! With realistic ball action, colorful graphics and exciting sound effects, TRISTAN provides amazingly accurate pinball simulation. Flip and nudge your way to the highest score possible using great features incorporated from traditional pinball games, including multi-ball, extra ball, jackpot, and bonus. TRISTAN was a finalist for Best SimulationGame, 1991, by SPA Excellence in Software Awards.

Requires: 2 MB RAM; 256-color monitor; System 6.0.7 or later.

Publisher:
Amtek Software Corporation
ENT0443



\$39



TouchBASE/DateBook Bundle -with Redux FREE!

Keep track of your life and the people in it 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 and mailing labels, including postal barcodes, and fax sheets covers. DateBook is the ultimate personal time manager for Macintosh. Instant access and advanced scheduling keeps you on top of your appointments and things to do. Shows your schedule in multiple formats including list, Gantt chart and time bar.

DateBook's views enable you to see your schedule quickly in as much detail as you like. Order today and you'll receive a copy of Redux, a quick and easy backup utility. A \$80 value, FREE with your order.

Publisher: After Hours Software
BND0150

**FREE
REDUX**

\$99

POWER USER SIMMS ONLY

\$49*

Due to federal tariffs imposed on SIMMs, prices may vary significantly. Please call for the latest prices and availability.

FREE!
STEP-BY-STEP
VIDEO
INSTRUCTIONS**



A Power User Memory Expansion Kit will dramatically increase the power of your Mac. And our fast, reliable overnight service will have your Kit in your hands tomorrow!

MORE BRAIN POWER FOR YOUR MAC

Never again will you have to quit your word processor just to answer a question about a spreadsheet. Install extra memory and you can leave a letter open while you refer to last month's sales figures.

You can edit those monstrous scanner files with advanced graphics applications or develop your own custom HyperCard stacks. More memory means more power at your fingertips.

PLUG IN INSTALLATION

Adding memory doesn't require technicians in lab coats. You'll find installation at home easy when you follow our FREE** step-by-step installation video instructions. Just open your Mac, slide out the main circuit board and plug in your SIMMs.

WHAT DO I NEED?

Our helpful sales and technical staff is standing by to answer any questions and take the mystery out of memory upgrades. Memory cards come with one megabyte on each card and are usually sold in pairs — (2 @ \$49 ea.)

The chart explains exactly what you need to achieve the desired level of performance.

To open your Mac Plus, SE, and Classics you'll need a specially designed tool — it's available from us as part of a handy tool kit for just \$9.

WHAT YOU NEED TO KNOW

Memory chips come factory-installed on plug-in cards, called SIMMs (Single Inline Memory Modules). Each one megabyte SIMMs card holds eight top quality,

To upgrade a 4-socket Mac Plus or SE to this amount of memory	Do this: (Install in multiples of two only) SIMMs must be 150ns or faster
2 MB	Remove all four existing 256K SIMMs, install two 1 MB SIMMs, leave two sockets for future expansion.
2-1/2 MB	Remove only two 256K SIMMs, install two 1 MB SIMMs.
4 MB	Remove all four 256K SIMMs with four 1 MB SIMMs.
To upgrade a 2-socket Mac Classic II or LC to this amount of memory	Do this: (Install in multiples of two only) SIMMs must be 100ns or faster
4 MB	Install two 1 MB SIMMs.
To upgrade a 2-socket Mac LC II to this amount of memory	Do this: (Install in multiples of two only) SIMMs must be 100ns or faster
6 MB	Install two 1 MB SIMMs.
To upgrade a 8-socket Mac II, IIfx, IIfx or SE/30 to this amount of memory	Do this: (Install in multiples of four only) SIMMs must be 120ns or faster
4 MB	Remove all four existing 256K SIMMs, install four 1 MB SIMMs, leave remaining sockets for future expansion.
5 MB	Keep existing 256K SIMMs, install four 1 MB in remaining sockets.
8 MB	Remove all four 256K SIMMs, install eight 1 MB SIMMs.
To upgrade a 4-socket Mac IIfx to this amount of memory	Do this: (Install in multiples of four only) SIMMs must be 100ns or faster
5 MB	Install four 1 MB SIMMs.
To upgrade a 4-socket Quadra 700 to this amount of memory	Do this: (Install in multiples of four only) SIMMs must be 80ns or faster
8 MB	Install four 1 MB SIMMs.
To upgrade a 16-socket Quadra 900 to this amount of memory	Do this: (Install in multiples of four only) SIMMs must be 80ns or faster
4 MB	Install four 1 MB SIMMs.
8 MB	Install eight 1 MB SIMMs.
12 MB	Install twelve 1 MB SIMMs.

memory chips. We carry chips by all the major manufacturers like Texas Instruments, Intel and Samsung.

Prices can vary a lot, based on quality, speed and demand. At press time our price for 1MB, 120ns SIMMs is \$49.

Please call for the very latest prices and availability. Our sales staff will tell you what you need and help you make your choice an easy one.

SPEED

Do you need 80, 100 or 120 Nanosecond (ns) chips? Nanoseconds are billionths of a second, so an 80 ns chip responds faster than a 100ns chip. The original Mac used relatively slow 150ns memory chips. The 68020 processor needs 120ns (or faster) chip, and the 68030 Macs like the speedier model.

OVERNIGHT DELIVERY

Install a MacWarehouse Expansion Kit and working with your Mac will never be the same! Call us now. We'll help you select just the right Memory Upgrade, and we'll ship it overnight for just \$3.

CHP 0012 120ns SIMMs.....\$49

MacWAREHOUSE®

1-800-255-6227

Overnight Delivery Only \$3.00!

Call 24 hours a day, 7 days a week

© 1992 MicroWarehouse Inc.

MACWAREHOUSE

30-DAY MONEY BACK GUARANTEE

If, for any reason, you are dissatisfied with your Power User Memory Kit, you may return it for a full refund within thirty days of purchase. All you have to do is call us for a return authorization number and return this product, postage paid, in its original condition, with the original packaging and documentation.

TWO YEAR WARRANTY.

MacWarehouse also guarantees its Memory Kits against manufacturer defects for two years from the date of purchase. We will repair the item or replace it at our discretion.

* SIMMs prices vary. Call for latest information.

** Limited Offer! Free video with purchase of 2 or more SIMMs.

MW0293

Circle 150 on reader service card

Reviews

IN THIS ISSUE: ElectricImage Animation System, Action, Power Portrait, Microsoft Works, Magnet, WideWriter 360, SimLife, Inspiration 4.0, Sketcher 1.0, Insanity, and more

Conventional Presentation Program

Microsoft PowerPoint 3.0

PROS: Automated templates; extensive system of master layers; comes with OLE software architecture; reliable cross-platform compatibility; includes Equation Editor; screen-show capabilities include QuickTime support, flying bullets, smooth color transitions, and on-screen annotation. **CONS:** Small collection of predefined templates; can't blend between two custom colors when defining gradient background; limited zoom options; can't embed TrueType fonts. **COMPANY:** Microsoft Corporation (206/882-8080). **REQUIRES:** Mac Plus; 4MB of RAM; hard drive; 1.4MB floppy drive; System 7. Recommended: Color monitor; QuickTime. **LIST PRICE:** \$495.



SINCE DECEMBER 1988, WHEN Microsoft shipped PowerPoint one month after the release of Aldus Persuasion 1.0, PowerPoint has remained frozen in time. To put it in perspective, the cold war ended, Iraq invaded and then fled Kuwait, the Bush administration came and went, and Microsoft PowerPoint shifted from version 2.01 to 2.01f. Short of bribery, PowerPoint was bound to rank dead last in any survey of Macintosh presentation programs. That's why the newest update is so remarkable. Though occasionally stingy in the flexibility department, PowerPoint 3.0 offers more features per kilobyte than any other presentation program for the Macintosh.

Making Up for Lost Time

THANKS TO THE LONG HIATUS, VERSION 3.0 expends much of its energy playing catch-up with the former presentation kingpin, Aldus Persuasion. Like Persuasion, PowerPoint now offers automated



templates for managing the appearance of your slides. You can change color schemes, text formatting, and slide backgrounds by simply importing a new template. You can even use an existing presentation file as a template. But whereas each Persuasion 2.1 template contains several master layouts so you can vary the slides' appearance while maintaining a consistent design scheme, PowerPoint offers only one master layout per template. And stocked with only 40 designs, its ready-made template collection is pretty darn paltry.

As if to make up for its middling templates, PowerPoint provides outstanding organizational options, matching Persuasion item for item. Not only can you use a master slide to position repeating background elements and specify the formatting of titles, body text, and bulleted items, but you can also establish master

layers to aid in the printing of outlines, speaker notes, and handouts. You can open multiple files, rearrange your presentation in a slide-sorting window, check spelling, and search and replace key phrases. A text ruler enables you to specify up to five levels of indentation. You can assign each level a special bullet by selecting a symbol from a table that shows every character in the current font.

PowerPoint's color capabilities surpass Persuasion's for convenience and ease of use. In PowerPoint, you can give a new color scheme to a single slide or an entire presentation at will. If you're not comfortable with setting up your own color scheme, PowerPoint breaks with Persuasion and walks you through the process. For example, after you select one of 90 background colors, PowerPoint brings up a sampling of text colors that go well with the selected background.

Then, based on the color you selected for your text, the program displays several palettes of miscellaneous colors that go with both background and text. Even if your tastes run toward avocado appliances against cornflower blue wallpaper, you can't go wrong. In typical fashion, PowerPoint supports 24-bit color and enables you to import PICT, TIFF, and EPS scans and artwork. You can also create gradient backgrounds, though this feature could stand some rethinking (PowerPoint lets you blend between any color and a lighter or darker version of that same color only; you can't blend between two custom colors, nor can you create radial gradations).

The Microsoft Way

IN TERMS OF CONVENIENCE FEATURES, PowerPoint has Persuasion beat. PowerPoint takes the guesswork out of opening presentations and templates by providing a fast-displaying thumbnail preview of any file you select. The tools and icons that wreath the presentation window let you quickly access formatting options, drawing tools, and magnification settings. (I would be willing to trade some of this convenience for a more extensive collection of zoom options. Currently, PowerPoint's zoom levels jump from 66 to 100 to 200 percent with no variations in between.) From the desktop publishing arena, PowerPoint borrows the Smart Quotes option, which replaces generic straight quotes with meaningful curly quotes. Finally, as in any self-respecting Microsoft product, you can drag selected text in an outline rather than having to rely on the Clipboard to rearrange words and paragraphs.

Snubbing System 7's Apple events, PowerPoint is the first product on the Mac to include Microsoft's OLE (Object Linking and Embedding) software. Ported from Microsoft Windows in the form of 100K worth of system extensions, OLE acts like publish and subscribe—which PowerPoint also supports—without the hassle of having to save a file to disk. You can copy data, text, and/or graphics from an OLE-compatible server and then paste it as an embedded object into an open presentation.

To edit the embedded object from inside the presentation file, simply double-click on it. PowerPoint launches the embedded object's application and displays the object in a new window. After you make your changes, close the window—no saving required—to return to PowerPoint and see the up-dated object in the presentation. You can also use the Insert command to access the self-running Equation Editor and Microsoft



Doodling on the Slide You can write all over a slide to emphasize points or just to while away the time during an on-screen presentation. Though you're limited to a single color (any color you like, so long as it's yellow), you can highlight images and QuickTime movie frames, as shown by the additions made to my otherwise dashing profile.

Graph applications, both bundled with PowerPoint. Using OLE, I experimented with embedding objects using formatted text from Word 5.0a and a 3-D chart from Excel 4.0. The Excel chart was unable to create a worksheet, preventing me from editing the data, but otherwise OLE worked like a dream—better, frankly, than other techniques I've seen performed with Apple events, and better than publish and subscribe.

As if to strengthen its footing on the Mac, PowerPoint ships with a slew of TrueType fonts, most of which are no more than renamed versions of well-known classics. Arial is TrueType for Helvetica, Book Antiqua equals Palatino, Century Gothic takes the place of Avant Garde Gothic. Only Wingdings is unique, this being the symbol font responsible for the controversy surrounding the *New York Post's* "Program of Hate" article. (In case you don't know what I'm talking about, typing NYC in this font creates a poison symbol followed by a Star of David followed by a thumbs-up. Microsoft claims that any such relationship between letter keys and symbols is purely coincidental; very possibly it is, in light of the fact that the font has symbols for Christianity and Islam as well as a spectrum of other common icons—but it reportedly ruffled some feathers in the Big Apple and elsewhere.)

If your business requires a lot of file-swapping between Macintoshes and DOS machines, PowerPoint surpasses Persuasion, but only just barely. PowerPoint includes 16-color versions of its templates so you can prepare your presentation for display on a VGA monitor. The Macintosh and Windows versions of PowerPoint share the same menu commands, tools, and icons, and have similar key-

board equivalents and nearly identical native file formats. This allows PowerPoint to retain TrueType fonts and embed OLE objects when you switch platforms. However, QuickTime movies and 24-bit images are not retained when you switch to Windows. You should also note that while PowerPoint for Windows can embed TrueType fonts so that all text appears in the correct font even when played on a different machine, PowerPoint for the Macintosh lacks this capability.

Screen Display

POWERPOINT'S 35MM SLIDE-printing capabilities are nothing to write home about. Though software is included that enables you to prep files and download them to a Geni-graphics service bureau, PowerPoint provides no inherent printing advantages over Persuasion. Where PowerPoint does raise the stakes is in the on-screen presentation department. Like Persuasion 2.1, PowerPoint lets you embellish your screen shows with QuickTime movies. While Persuasion provides a more versatile build feature—enabling you to assign text blocks and images to separate layers and then display layers sequentially—PowerPoint provides better transition effects. For example, you can animate bulleted items by flying them in from off the screen. You can even preview transition effects and specify the speed at which transition effects occur independently of the CPU speed.

When you have to rely on an 8-bit monitor or lower, PowerPoint automatically dithers 24-bit images and gradient backgrounds and dynamically adjusts the palette to include the optimal collection of colors. To eliminate flickering when you're moving between different-color slides, PowerPoint animates color adjustments to coincide with the transition effect. If you run your presentation on a machine that lacks some of the fonts you've used, PowerPoint provides a dialog box that lists your presentation fonts and suggests alternatives that you can substitute for them. Finally, you can annotate a slide by drawing on screen, much as you might embellish an overhead projection with a felt-tip marker (see "Doodling on the Slide").

I encountered only one performance problem. If you rely on ALSoft's MasterJuggler type-management utility, you'll

need to disable it when using PowerPoint. If you don't, PowerPoint can take several seconds to perform simple actions like selecting text blocks and choosing commands. On the bright side, if you rely on an extensive font library, you'll be gratified to know that PowerPoint supports Adobe Type Reunion, even inside dialog boxes.

Like other Microsoft products, Word and Excel among them, PowerPoint is a program with obvious though not extensive deficiencies—problems that could be cleaned up with a minor upgrade. Based on the past performance of the product, this comes as no surprise. What does surprise me is that PowerPoint also joins the ranks of Word and Excel in dominating its class. For the first time since Persuasion's debut four years ago, Aldus no longer owns the presentation market.

—DEKE MCCLELLAND

Multimedia/Animation Program

MacroMind Director 3.1

PROS: Imports, edits, and exports QuickTime movies; new Lingo commands; includes MacroMind Accelerator. **CONS:** Complex interface; can't import TIFF images; Accelerator cannot accommodate bit-depth incongruities; overpriced. **COMPANY:** Macromedia (415/252-2000). **REQUIRES:** Mac Plus; 2MB of RAM; hard drive; System 6.0.7. Recommended: 8MB of RAM; color monitor. **LIST PRICE:** \$1195.



IF YOU'VE EVER USED MACROMIND Director, you know it to be a powerful and versatile multimedia authoring tool with an extremely daunting interface—hardly the thing for the casual user but just the ticket if you're a multimedia enthusiast who's grown frustrated with the limitations of traditional presentation and 2-D animation programs. Director also satisfies disenchanted HyperCard users with Lingo, a scripting language, and an integration of XObjects; the latter enable you to add drivers and other coded routines to the resource fork of a Director file. You can even integrate HyperCard-compatible XCMD and XFCN resources into Director scripts, as long as these resources do not call on commands and capabilities specific to HyperCard.

In addition to fixing a long list of problems throughout the program, Director 3.1 expands on its predecessor's capabilities in three key areas: the new version adds 23 scripting commands; it

lets you import and edit QuickTime movies; and it includes MacroMind Accelerator, a utility that compiles movies into a faster playback format. But while the expanded capabilities are fine, they come at a price. At a list price that is \$200 more than Director 3.0, this is one update that previous owners of the program—especially those who purchased Accelerator separately—can afford to miss.

QuickTime Gets Quicker

UNLIKE SOME OTHER PRODUCTS THAT have added QuickTime support, Director 3.1 allows you to do more than play a movie and adjust its volume. In fact, most of the program's new capabilities revolve around QuickTime. As with any other *castmember*—whether it's a graphic, text block, or sound—you can create scripts that modify a movie's behavior. Of Director's new Lingo commands, nearly half of the commands enable you to program adjustments to QuickTime castmembers, find out the duration of a movie, play the movie backward, specify the frames at which the movie starts and stops, and so on.

Even though MacroMind Director was not specifically designed for this purpose, it suffices as a QuickTime movie editor. It can play a movie over a specified duration of frames—just like a sound—while it animates other castmembers in front of and in back of the movie. You can cut away frames if a movie is too long. You can also combine two different movies by copying frames from the first movie and pasting them into the second. When you have finished integrating text, graphics, and sounds with your QuickTime castmembers, you can export the whole thing to the QuickTime format. If you like, Director can crop or scale your file down to the 120-by-160-pixel QuickTime 1.0 standard.

Accelerator 3.1 also supports QuickTime movies, though it strips the movie—as it does the rest of a Director file—of any sound. As always, Accelerator performs a remarkable job of compiling Director files for play at speeds of 30 frames per second and greater. You can also make simple tempo adjustments to a file. My only complaint with Accelerator is an old one: the utility requires that the bit depth of your monitor match the bit depth of your Director file. For example, if you want to compile an 8-bit movie, then you have to set your screen depth to 256 colors. I allocated 10MB of

application RAM to Accelerator under System 7.1 and then tried to accelerate a 1.3MB 8-bit movie while the monitor was set to millions of colors. Five minutes later, Accelerator gave up because the image was too complex, and then the program unexpectedly quit. With the monitor set to 256 colors, Accelerator compiled the file in about two minutes with only 4MB of RAM.

18 Percent Annual Inflation

DIRECTOR OFFERS A FEW OTHER MINOR enhancements, including support for the Microsoft Windows media-control interface and a Lingo command that interprets large, double-byte character sets, such as the ones used in international alphabets and Apple's System 7.1 WorldScript. But the most significant enhancement is Director's new price tag. What began as a \$695 product four years ago—not counting a previous \$295 incarnation as VideoWorks—increased to \$995 with version 3.0. No more than a minor update, version 3.1 adds a whopping \$200 to the price tag (\$149 for registered users of Director 3.0). Granted, that barely covers the \$195 Macromedia charges for the Accelerator utility on its own, but now you have to buy the utility whether you like it or not.

Go ahead, call me Ebenezer. Say I pinch pennies so hard they give up and become dimes. After all, there's no denying that Director 3.1 is twice the product it was back in its \$695 days. But so are leading applications in every other class of software: QuarkXPress, Microsoft Word, Aldus Persuasion. The difference is that not one of these programs has added so much as a dollar to its price tag over the years, much less nearly doubled it. Macromedia's persistent attention to its bottom line greatly diminishes the value of a strong piece of software.

—DEKE MCCLELLAND



The Many Windows of Director MacroMind Director can now accommodate QuickTime movies as castmembers. As with sounds, you can play a QuickTime movie simultaneously with animation created inside Director.

Do You Make These Six Common Mistakes On Your Taxes?



**Calculations
GUARANTEED
Accurate**

Six common mistakes can cause you big headaches on your taxes. An oversight here, an omission there. From unnecessary tax payments to full blown IRS audits -- you can end up paying too much ... or worse.

But now, using MacInTax and your personal computer, you can avoid these simple but costly mistakes:

1 The Arithmetic Error

Today, even the simplest forms contain complex calculations. And with all the late-night scrambling, an innocent mistake could cost you plenty.

2 The Transcription Error

With all those numbers being juggled from schedule to schedule, it's no wonder the figures are so often transcribed incorrectly or entered on the wrong line.

3 The Omitted Form

Even "ordinary" returns require anywhere from six to a dozen forms to complete. It's easy to miss one ... or end up rushing all over town to find the one you need.

4 The Misinterpreted Instruction

At best, IRS instructions can be tough to understand. At worst they can be mind-boggling. What you need are clear directions in plain English.

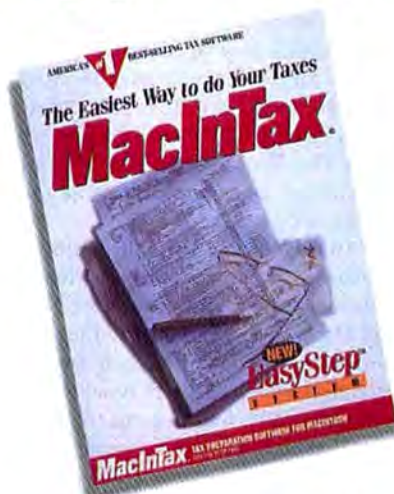
5 The Overlooked Deduction

You'd have to be a professional tax preparer to know all the deductions you're entitled to. If you miss just one, it could cost you hundreds of dollars.

6 The Exceeded Guideline

The fastest way to trigger an IRS audit is to exceed the "normal" range on one of your deductions. You need to know what the IRS looks for on a line-by-line basis.

When you do your taxes with MacInTax, mistakes like these are virtually impossible. And filing your taxes couldn't be easier.



America's #1 Tax Software

MacInTax is America's #1 best-selling tax software for the Macintosh. With MacInTax (or TurboTax on your PC) and the new EasyStep™ system, you can completely and accurately prepare your income taxes in just a few hours.

Here's how easy it is!

- Gather your records and receipts.
- Enter your data into MacInTax.
- Print out, sign and drop in the mail.

MacInTax does the rest. Even if your records and receipts aren't in any particular order,

MacInTax's new EasyStep system will guide you every step of the way. And like a good tax advisor, MacInTax helps you identify every deduction you can claim.

MacInTax makes all the calculations, checks for accuracy and consistency, and transfers every number to the proper lines on the proper forms. And MacInTax prints every form you need in IRS-approved format on your own printer -- ready to sign and mail (or file electronically, if you prefer, for a faster refund).

Macworld Magazine says that MacInTax is "... the most successful special-purpose program yet for the Macintosh." We know that if you try it, you'll never go back to doing your taxes the old-fashioned way. In fact, we back MacInTax with our Double Guarantee:

1. Guaranteed Satisfaction. Try MacInTax, even use it to prepare your taxes. If you're not completely satisfied, return it anytime before April 15, 1993 for a full refund. No questions asked.

2. Guaranteed Accuracy. Use MacInTax with complete confidence. If MacInTax makes an error in calculation on your return, we'll pay any IRS penalty.

Free Bonus-- SimCity!

With SimCity® by MAXIS, create your own dream city and find out if you have what it takes to run a thriving metropolis, or one of 7 cities. A \$49.95 value-- yours free with your MacInTax or TurboTax order!*

Yes, I'll try MacInTax for Only \$49.95* ChipSoft

Rush me MacInTax ASAP. If I don't like it for any reason, I'll just send it back by April 15, 1993 for a no questions asked refund.

- Please Choose:** ☐ MacInTax (for Macintosh®)
☐ 3-1/2" disks, or ☐ TurboTax (IBM®-compatible)
☐ 5-1/4" disks ☐ TurboTax for Windows™

Name _____

Address _____

City _____

State _____

Zip _____

Bill My: ☐ Visa ☐ MasterCard ☐ Discover ☐ Amex

I understand that there is an additional \$7.00 shipping per order.

Card # _____

Exp. Date _____

Signature _____

MACINTAX DOUBLE GUARANTEE

- Guarantee of Satisfaction-- If you're not satisfied for any reason, just return it by 4/15/93 for a full refund.
- Guarantee of Accuracy-- If MacInTax makes an error in calculation, we'll pay any IRS penalty!

Mail your order to: ChipSoft, Box 85709

Or Call NOW: San Diego, CA 92186-9668

1-800-964-1040

ext. 3132

MacInTax requires Macintosh Plus, System 4.2 or higher, hard drive. TurboTax requires IBM PC, XT, AT, PS/1, PS/2 or compatible, DOS 3.0 or higher, 640K RAM, hard drive. TurboTax for Windows requires Windows 3.0 or higher, 2MB RAM, hard drive. Offer expires 4/15/93 -- not valid with any other offer. © TurboTax and MacInTax are registered trademarks of ChipSoft, Inc. and ChipSoft CA, Corp. Other trademarks are the sole property of their respective owners. *CA residents add 7.25% sales tax. MN residents add 6.5% sales tax. Please add \$7.00 shipping and handling per order. *Tax retail purchases attach a copy of sales receipt and enclose \$7.00 U.S. for shipping and handling. (Check or money order payable to ChipSoft.) Send to: ChipSoft, SimCity, P.O. Box 85709, San Diego, CA 92186. All prices are U.S. dollars. SimCity, the award-winning city simulator from MAXIS.

Personal Time Manager

DateBook 1.5.1

PROS: Improved handling of recurring events; printing bugs fixed. **CONS:** PowerBook screen-redraw problem. **COMPANY:** After Hours Software (818/780-2220). **REQUIRES:** Mac Plus; 2MB of RAM; hard drive; System 6.0.5. System 7.0 for TouchBase 2.0 integration. **LIST PRICE:** \$125.



WHEN I REVIEWED DATEBOOK 1.0 (*Macworld*, *Reviews*, October 1992), the program had many strengths but suffered from the version 1.0 curse: some features were poorly implemented, and there were bugs. Version 1.5.1 fixes those bugs, improves some old features, and adds some welcome new features.

DateBook's printing has been improved. DateBook 1.5.1 now lets you include the Description field when you print views, and you can now correctly print weekly views in day-planner formats. The major printing bugs, which included problems with background printing and incorrect text scaling, have been fixed. After Hours has also added a page in the manual that shows, with diagrams, how to print double-sided day-planner pages.

The program's multiuser feature has been included in this version. I was able to share the calendar data file with three Macs using System 7 file sharing with no problem. I also had no problem accessing information across the AppleTalk network. In order to keep network traffic to a minimum, each client has control over how often his or her view of the

calendar is updated. Like DateBook 1.0, version 1.5.1 lets you associate an alarm with an event or a to-do item. At a specified time, the alarm pops up a reminder dialog and plays a sound. In multiuser mode, however, alarms apply only to the user who sets them; you can't set one alarm to go off for all users.

Most welcome in DateBook 1.5.1 is the improved handling of recurring events. In DateBook 1.0, when you set a recurring event, all occurrences are saved as separate events, with no link between them. If you want to change the time of a recurring event, you have to change each event separately. In the new version, if you change one event of a recurring chain, DateBook asks if you want to apply the change to some or all of the other events in the set.

After Hours has also added some new features. The program now handles events that overlap in time (see "Years and Dates"). You can display the text of events and to-do items in each day in the calendar views. Other new features include a Today button at the top of each view that takes you to the current date in one click; a faster way to reach any date (option-clicking on the Date Selector pop-up menu brings up a calendar window showing the entire year); improvement to the Holiday schedule (holidays now show up in the views); and the addition of keyboard commands.

DateBook 1.5.1 is a more stable product than the original version. I experienced no crashes and found only one screen-redraw problem, and that occurred only on PowerBooks. (The company plans to fix this problem in the next version.) Integration with TouchBase, After Hours' address manager, has also been improved. This integration feature looks up address and telephone information from the TouchBase data file and inserts it into a DateBook event or to-do record. You can also post information from DateBook to TouchBase.

DateBook still has some room for improvement. I'd like to see it implement the calendar-updating capabilities of Now Software's Now Up-to-Date; Now users can have their own personal calendar, which updates when the user connects to the network calendar server. One of DateBook's most appealing features is that you don't need to have the program open to work with your events or to-do's; the program has a small window that pops up in the Finder that lets you view or change your schedule. I wish you could also add alarms from this Finder palette the same way you can add and modify events and to-do's. But these features would be icing on the cake. With the im-

provements in DateBook 1.5.1, I can now recommend the program wholeheartedly to anyone who needs a personal time manager.—TOM NEGRINO

Optical Character Recognition

TypeReader 1.0

PROS: Straightforward interface; supports HP's AccuPage technology; excellent manual; good format-recognition features. **CONS:** Stiff hardware requirements; limited formatting features in editing window; no support for publish and subscribe or Apple events; no training features. **COMPANY:** ExperVision (408/428-9988). **REQUIRES:** Mac II; 4MB of free RAM; 9MB of hard drive space; SuperDrive (800K disks available by request); System 6.0.5. **LIST PRICE:** \$695.



ALARGE SELECTION OF OCR (OPTICAL character recognition) programs are available for the Mac, but most don't do a good job of translating page scans into editable text files. In *Macworld* Lab tests performed last year, only Caere Corporation's OmniPage Professional and Xerox Imaging Systems' AccuText delivered acceptable accuracy across a wide range of documents (see "From Page to Pixel," *Macworld*, July 1992).

OmniPage and AccuText have company now. ExperVision recently released a Macintosh version of TypeReader, an OCR package that debuted under the Microsoft Windows environment for DOS PCs. Although TypeReader doesn't do everything its competitors—particularly OmniPage Professional—can do, it does combine speed and excellent accuracy with a straightforward operating style. It's a major contender among high-end OCR programs.

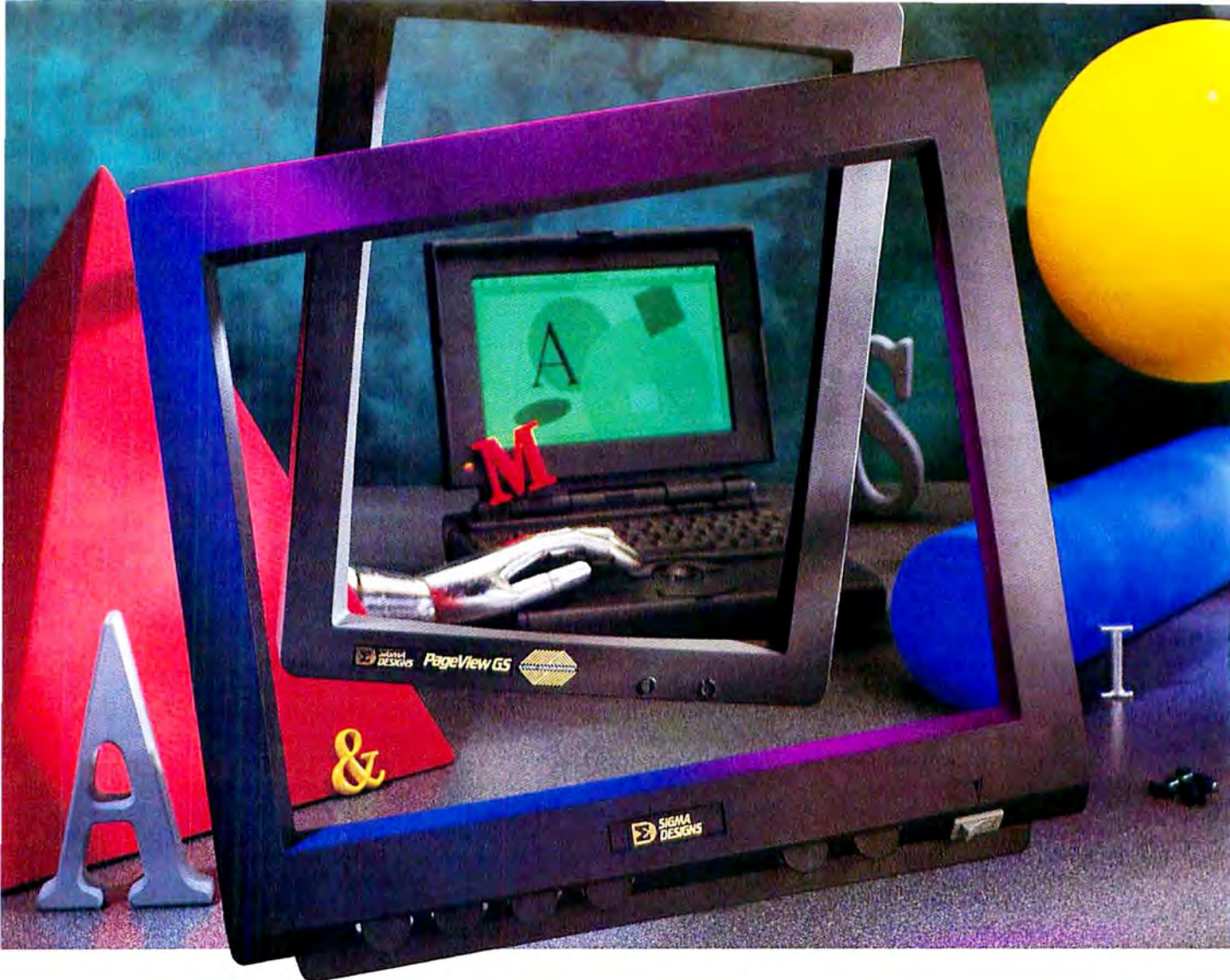
Like its competitors, TypeReader has hefty hardware requirements, starting with 9MB of hard drive space and 4MB of RAM. (That's 4MB of *free* RAM, not a 4MB Mac. If you're running System 7, you need an 8MB machine to run TypeReader.) If you have an original Mac II, you must trade TypeReader's high-density disks for 800K floppies. The TypeReader box doesn't list this requirement; it is mentioned in a text file on one of TypeReader's disks, but you can't read the file unless you have a SuperDrive.

TypeReader supports most of today's popular scanners, including models from Apple, Abaton, Dest, Hewlett-Packard, La Cie, and Microtek. Like OmniPage Professional and AccuText, TypeReader

continues



Years and Dates DateBook's Year view lets you see events for several weeks at a glance. Note the Event and To Do lists on the right side of the screen with two overlapping events, and the listing for Columbus Day on October 12. The banners show events that occur over multiple days. In this screen the skull and crossbones icons represent deadlines, the musical note is a concert, and the cakes are birthdays. The blue, yellow, and red bars are busyness indicators.



Brilliantly sharp landscape color for PowerBook 160, 180 & Duos with Duo Dock & Duo MiniDock, Mac LC, LC II, IIsi, Ilic, Ilii, IliX & Quadras.



COLORMAX 15™

Cost-effective grayscale portrait for PowerBook 160, 180 & Duos with Duo Dock & Duo MiniDock. Available in platinum for Mac IIsi, Ilic & 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

SEE US AT MACWORLD EXPO BOOTH #2331

© 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

47900 Bayside Parkway, Fremont, CA 94538 USA, Tel: (510) 770-0160 Fax: (510) 770-2610

Circle 176 on reader service card

also supports HP's AccuPage technology, which allows the OCR program to adjust the brightness and contrast of the scan in order to better capture text printed on shaded backgrounds.

TypeReader can also open TIFF and PICT image files created by other scanning software. Unlike OmniPage Professional, TypeReader provides no image-editing capabilities. You cannot, for instance, touch up a damaged character or erase a coffee stain.

One way an OCR program streamlines the OCR process is to automatically identify blocks of text on a page. TypeReader's page-decomposition features match the competition's. You can tell the program to automatically locate text blocks, or you can designate blocks manually by enclosing them in a frame (see "Recognizing Text"). You can change the order in which TypeReader recognizes blocks, and if you routinely scan similarly formatted documents, you can create templates that describe the location of text zones. You can also specify that TypeReader treat text as snaking columns (newspaper-style) or as tabular columns.

Recognizing and Editing

THE RECOGNITION PHASE IS THE MOST important step in any OCR job. It's when the OCR program applies a battery of complex shape-analysis techniques to identify the characters. In most of the tests run by Macworld Lab, TypeReader was more accurate than AccuText and ran neck and neck with OmniPage Professional (see "OCR Results"). It even did a respectable job on faxes. As for recognition speed, TypeReader was always faster than AccuText, and usually faster than OmniPage Professional.

TypeReader automatically retains character-formatting attributes such as boldface and italic. It even lets you assign a font to serif, sans serif, and monospaced (nonproportional) text. For example, you can tell the program to format all



Recognizing Text TypeReader's top-of-the-screen tool palette, called the Galley, is the gateway to the program's scanning, page-decomposition, and recognition features. The program's text-editing window, shown here, provides a pop-up verifier that lets you check recognized text against its scan. However, the text editor lacks common word processor features such as word wrap and the ability to access all installed fonts and sizes.

sans serif text in Helvetica, all serif text in Baskerville, and all monospaced text in Courier.

Like AccuText and OmniPage Professional, TypeReader recognizes text in the background under MultiFinder or System 7. TypeReader also provides a deferred-recognition option that enables you to scan a stack of pages but postpone recognition.

Unlike AccuText and OmniPage Professional, TypeReader does not provide a training feature—for teaching the program how to read a character that otherwise stumps it. As a result, TypeReader might not be the best choice for recognizing certain troublesome documents, such as those created on a typewriter with damaged keys.

TypeReader does provide an excellent spelling checker that also includes dictionaries for common geographical, legal, and medical terms. (Caere sells its medical and legal dictionaries separately.) Like AccuText and OmniPage Professional, TypeReader provides a pop-up verifier window that lets you compare a

suspect word against a magnified version of the word as it appears in the scan.

Like OmniPage Professional, TypeReader provides a text-editing window that lets you read and polish recognized text before saving it. TypeReader's editing window falls short of OmniPage Pro's, however. There's no ruler for changing line spacing and indents, nor can you mix and match fonts and type sizes. (TypeReader limits you to just one serif or sans serif font.) Worse, there isn't even a standard word-wrap feature—a line simply gets longer or shorter as you add or remove text. TypeReader users will definitely want to use a separate word processor for fine-tuning.

As for exporting, TypeReader can save text in all popular formats, including Word, MacWrite, WordPerfect, WriteNow, RTF (rich text format), and Excel.

Where to Turn

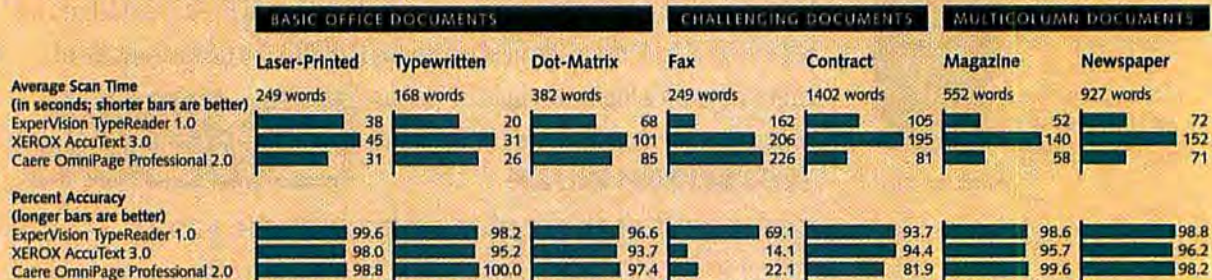
OMNIPAGE PROFESSIONAL HAS SOME talents that TypeReader lacks. One is support for System 7's publish and subscribe data-exchange mechanism; another is the ability to transmit recognized text directly to another program using System 7 Apple events. I don't consider either omission significant, since you can use text files or the Mac's Clipboard to move text from TypeReader into another program.

If you need training features, you should consider OmniPage Professional or AccuText. If you want glitzy System 7 data-exchange features or a text-editing window with more formatting features, go with OmniPage Professional. But if you want excellent speed and accuracy, thorough documentation and online help, and ease of use, check out TypeReader. But before you buy, try to visit a dealer that will let you audition a few programs using the types of documents you plan to scan. That's the best way to accurately determine how well a program will read what you throw at it.—JIM HEID



OCR Results

All tests were performed using a Mac IIci with a cache card, 8MB of RAM, 32K RAM cache enabled, in black-and-white (1-bit) and in 32-bit modes.



We made this ad the same way some people still do calculations.

Aside from the quarter million or so people who already use Mathcad®, most engineers and scientists continue to do calculations by hand. Using calculators and

And print presentation quality documents complete with text, graphics and equations in real math notation.

Mathcad comes with more

than 200 commonly used functions built-in, including exponentials, differentials, cubic splines, FFTs and more. Full symbolic capabilities are available with a menu pick, so you can evaluate any integral, Taylor series or infinite

to fully interactive formulas, diagrams and data tables directly from popular reference books. Work with them right in the handbook itself. Or click and paste them for use in your Mathcad documents.

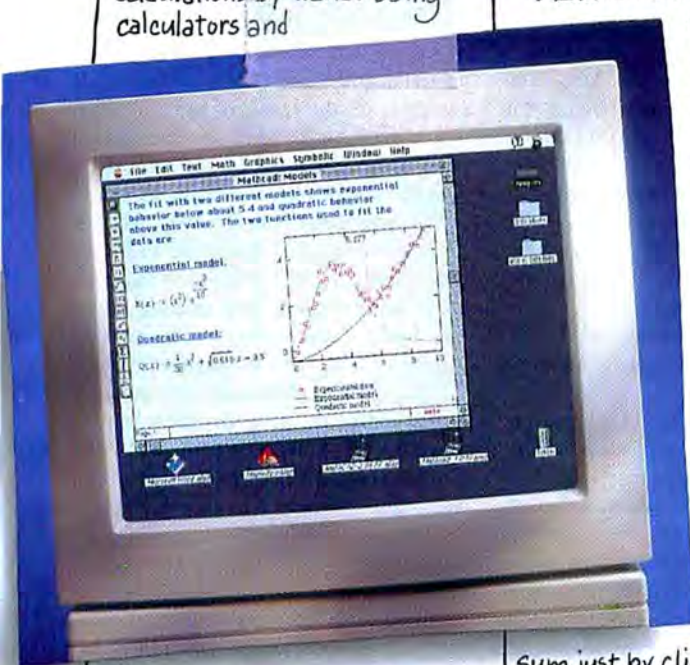
Plus optional Applications Packs with modifiable templates are available for all major engineering and science fields.

So put down your pencil, pick up the phone and call now to get a free Mathcad Working Model and complete information. Or mail or fax the coupon below.

Once you get your hands on Mathcad, you'll never do math the same way again.

Call: 617-577-1017
Fax: 617-577-8829

1-800-MATHCAD



scratch pads. Or jamming them into spreadsheets. Or pounding away at code on their keyboards.

Which is all quite unnecessary when you consider that Mathcad provides a faster, more natural, less error-prone alternative. Simply enter equations anywhere on the worksheet. Graph results in 2-D and 3-D. Change variables and instantly update answers. Add text to support your work.

Sum just by clicking.

Optional Electronic Handbooks* give you instant access

FREE Mathcad Working Model.



The Mathcad Working Model includes a concise demonstration and a fully functioning version of the product. It's the best way to introduce yourself to the power and ease of Mathcad.

Name			
Title			
Company			
Address			
City	State	Zip	
Country	Phone		

SPECIFY:
☐ PC Windows™
☐ PC DOS ☐ UNIX®
☐ Macintosh®
☐ 3½" ☐ 5¼" Diskette

MathSoft, Inc. 201 Broadway, Cambridge, MA 02139 USA • Phone: 1-800-628-4223 • 617-577-1017 • Fax: 617-577-8829
 For information on Mathcad distributors outside of the U.S., contact MathSoft USA © 1992 MathSoft, Inc. TM and ® signify manufacturer's trademark or registered trademark respectively.
 *Electronic Handbooks require Mathcad 3.1.

Notebook Macs

PowerBook 145

PROS: Most inexpensive PowerBook; moderately fast processor. **CONS:** No built-in video port; limited RAM and hard drive expansion capability; RAM upgrade requires dealer installation; cannot be attached to a desktop Mac as a SCSI device. **COMPANY:** Apple Computer (408/996-1010). **LIST PRICE:** \$2149 to \$2499.



PowerBook 160

PROS: Built-in video port; moderately fast processor; sophisticated battery-management software; fairly large RAM expansion capability; provides 16 levels of gray. **CONS:** Limited hard drive capacity; video port is not standard Mac video port; RAM upgrade requires dealer installation. **COMPANY:** Apple Computer (408/996-1010). **LIST PRICE:** \$2429 to \$3149.



PowerBook 180

PROS: Active matrix display; built-in video port; fast processor; sophisticated battery-management software; fairly large RAM expansion capability; provides 16 levels of gray. **CONS:** Limited hard drive capacity; video port is not standard Mac video port; RAM upgrade requires dealer installation. **COMPANY:** Apple Computer (408/996-1010). **LIST PRICE:** \$4109 to \$4469.



TWO OF APPLE'S THREE NEW NOTEBOOKS go a long way in making the PowerBook the all-in-one Mac. With the addition of video-out ports and the ability to have up to 14MB of RAM installed, the PowerBooks 160 and 180 have what it takes to do serious computing, both on the road and back at the office.

The new PowerBook 145 is an updated version of the discontinued 140. It's essentially the same machine, except that the CPU is a faster, 25MHz 68030, compared with the 140's 16MHz 030. Otherwise, it has the same limits as did the first-generation PowerBooks: memory expansion limited to 8MB, hard drive capacity limited to 80MB, no video-out port, and a black-and-white display. For occasional users—those who need a notebook only while traveling—the 145 has appeal as the lowest-cost PowerBook. But for most people, the few hundred dollars more for the 160 is a wiser investment.

The 160 and 180 are the notebooks of choice for most Macintosh users. (The

160 and 180 both replace the 170, offering the same or better processing speed but with more expansion options.) The essential differences between the 160 and 180 are in processing ability and in video-display quality. All their other features—software, interface, ports, and other hardware options—are identical.

Processing Power

FOR PROCESSING, THERE ARE TWO SIGNIFICANT differences between the 160 and 180. First, the 180 has a faster processor: a 33MHz 68030, compared with the 160's 25MHz 030. Second, the 180 has a built-in 68882 math coprocessor; the 160 has no such coprocessor nor any option to add one later. Few business applications take advantage of the coprocessor, however, whereas the 180's faster processor will appeal to users running complex applications or working with large files.

Although the 180 is the fastest Apple notebook, it is not the fastest Mac notebook. Two other notebooks—the 33MHz 2030S and the 40MHz 2030V from Outbound Systems (303/786-9200)—surpass the 180's overall speed. But the Outbound notebooks—while more upgradable and faster than the Apple PowerBooks—don't have built-in video or support color display on external monitors, which are critical considerations if you intend to use a notebook with a standard monitor.

Expect Outbound's notebooks to remain the speed champs for some time, since the 68040 processor that would give Apple the speed edge is not available in a low-power-consuming version, and the regular 68040 takes so much power that a notebook wouldn't last more than about 45 minutes before draining the battery in everyday use. Motorola is rumored to be working on a low-power 68040, but until it is released, Mac notebooks will continue to be based on the 68030 processor.

Though the 030 processors in the 160 and 180 are sufficient for today's more complex applications, the ability to expand the RAM to 14MB is welcome. Just having System 7, one major application, plus a few INITs running can easily surpass the 4MB of RAM that's standard on most PowerBooks. Indeed, the review units I looked at all came with 4MB, and I constantly got messages telling me I was out of memory, even though I had only Excel plus Adobe Type Manager, or Fractal Design Painter alone, loaded. Make sure you get 8MB of RAM, whichever notebook you buy.

Display Differences

LIKE THE 145, THE 160 HAS A PASSIVE matrix display, which is adequate for on-

and-off use but not for all-day use. The nature of passive matrix technology means you can expect to see ghosting, to have slow screen updating as you move elements, and to be limited in the angle at which you can view the display—if you get too far afield, the image starts to disappear. The 180's active matrix display, by contrast, can be viewed from nearly any angle and offers crisp images and fast refresh times. But that beautiful display adds about \$1000 to the price. This is due to the nature of the technology used, not price-gouging on Apple's part. If a notebook is to be your main Mac, spend the extra money for the active matrix display—your eyes will thank you.

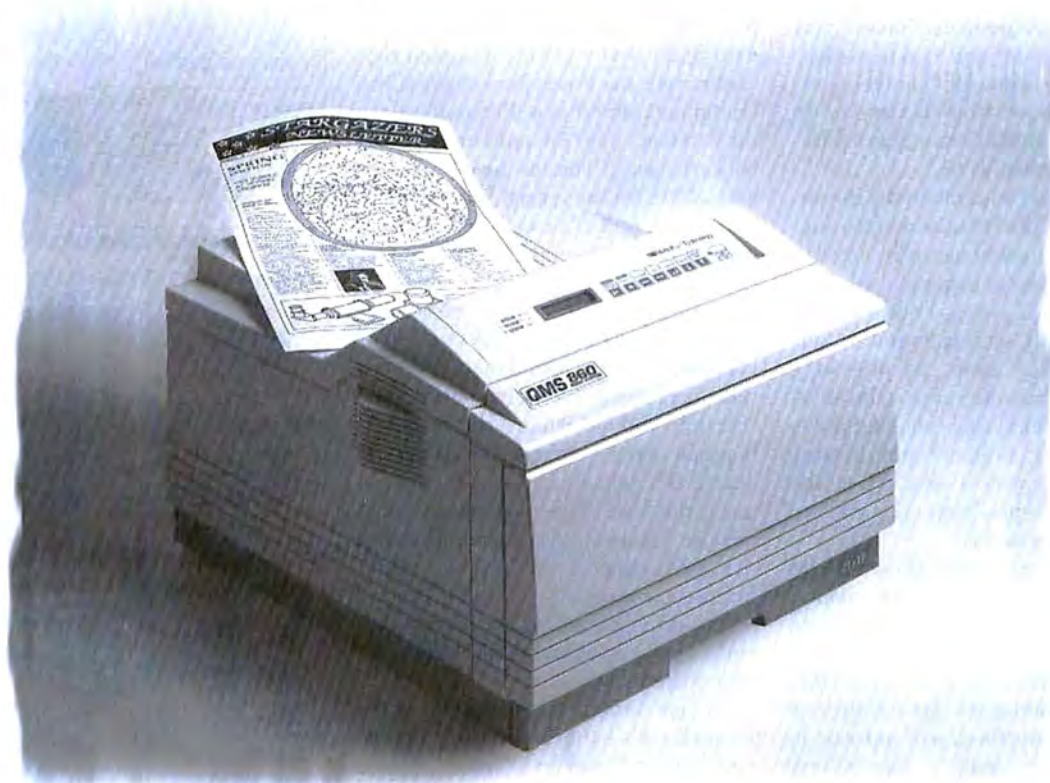
The 160 and 180 are the only Mac notebooks to offer gray-scale displays. The 16 levels of gray offered are inadequate if you expect to do detailed work with Photoshop or Fractal Design Painter or a page-layout program, but no liquid crystal display (LCD) currently available can provide the levels of gray an artist would need; but 16 levels are fine for previewing graphics. And for the many users who run nongraphics applications, the 16 levels provide a nicer display than a monochrome LCD (as in the 145) can. The shades of gray (actually, a steel blue) are pleasing to the eye and give the menus and folders and icons a soft, inviting touch, as "Display Comparison" shows.

The passive matrix and active matrix technologies do have an effect on the grays' display, however. On the 160's passive matrix LCD, the grays are muddier, the whitest white is not very white, and the blackest black is not very black. In photo-editing terms, the 160's grays cluster around the midtone values. By contrast, the 180's active matrix display shows very dark blacks and very light whites, but the midlevel grays are less subtle, and there is noticeable banding on images that have a full range of grays. Also, the contrast controls work differently on the passive matrix and active matrix screens—you get the best contrast on the 160 by placing the slider at its midpoint, while on the 180 you place the slider at the far left for best contrast.

You'll see many DOS notebook vendors advertising 64—or even more—levels of gray. By that yardstick, the Apple PowerBooks look to be downright dowdy. But there's less to those claims than meets the eye. LCD technology limits the numbers of grays (or colors) that the crystals can display. Many DOS notebooks advertise a higher number than their LCDs are really capable of—they either state the LCD's theoretical capabilities or the number of colors available from the notebook's

continues

SOME FEAR IT. ALL RESPECT IT.



WE BUILD IT.

HAMMERHEAD

THE PERFECT PRINTING MACHINE.

QMS has just released a serious predator into the sea of ordinary printers. The QMS® 860 Hammerhead printer is the first to feed on a Canon® LBP®- BX engine to give you true 600x600 dpi output in up to 11x17/A3 format. Its 25MHz RISC processor and optional EtherTalk®, NetWare®, or a host of other network support make it sleek, fast, and capable. It has everything you've asked for in a desktop printer—high resolution, PostScript™ Level 1 and 2 compatibility, HP PCL® and HP-GL® emulation, and up to 11x17/A3 output. It's fast, compact, compatible with all major platforms, and so affordable that it's causing a frenzy among the competition. The QMS 860 Hammerhead™ is the perfect printing machine. Get it. Call **1 800 392-7559** or **(205) 639-4400** for your nearest QMS dealer.

True 600x600 dpi • 11x17/A3 • \$4595*



* Suggested retail price, U.S.



QMS, the QMS logo, and Hammerhead are trademarks or registered trademarks of QMS, Inc. PostScript is a trademark of Adobe Systems Incorporated which may be registered in certain jurisdictions. All other product and company names are trademarks or registered trademarks of their respective companies.

Circle 191 on reader service card

book's palette, not the number that can be displayed simultaneously. By contrast, Apple is conservative in its claims of gray levels—a refreshing approach to marketing. (Of course, some DOS notebooks—particularly those from better-known vendors—can display more than 16 levels of gray, as many as 64.)

An important addition to the PowerBook 160 and 180 is built-in video support. You can now hook up an external monitor without an expensive adapter. The PowerBooks give you two modes in which to run the external monitor: normal dual-display mode; or mirroring mode, where the same image is shown on both screens. Mirroring is helpful if you are showing an audience step-by-step how to accomplish a task. (Use the PowerBook Display control panel to select mirroring mode.)

The external video is simple to enable: Plug the monitor into the adapter cable that comes with the PowerBook and restart the PowerBook. But be warned that the PowerBook must be plugged into an electrical outlet for the monitor to work. The PowerBook will not run an external monitor if it is using battery power, since the extra video processing needed to drive the external monitor consumes battery power quickly.

If you have a VGA monitor or LCD projection panel, you need a Mac-to-VGA adapter, which you can get from the monitor maker, an electronics supply store, or James Engineering (510/525-7350). However, not all adapters are alike. We tested three adapters, and two resulted in a purple cast over the entire screen. The third adapter gave us the true, unadulterated colors we expected.

When you have an external monitor connected, you'll notice that the screen seems to be shorter than a 14-inch monitor's standard 640-by-480-pixel screen when running in mirroring mode. Because of how LCDs are made, they are limited to 640-by-400-pixel screens, and since mirroring mode duplicates the LCD screen display, the result is 80 fewer pixels vertically on the external monitor. The effect on an external monitor is like watching a classic movie like *Lawrence of Arabia* in letterbox format on your TV.

In either mirroring mode or dual-monitor mode, the display quality meets Apple's usual high standards—the color (256 maximum on 16-inch and smaller monitors) is superb, and the screen refresh is quick.

Odds and Ends

APPLE HAS ADDED A FEW SUBTLE BUT nice touches to its 160 and 180. First, these PowerBooks support SCSI disk

mode, which means you can attach them via a SCSI cable to another Mac and see their drives' contents as if they were standard SCSI devices. Sony designed that feature into the PowerBook 100 (all the Outbounds offer it as well), but these are the first (and only) Apple-designed notebooks to have it. This feature is not free—it costs \$39 for the special SCSI connector needed. Still, it's a welcome addition, since it makes file transfer a snap. Too bad the 145 didn't add this feature.

Apple has enhanced the battery-management software on the 160 and 180 to give you more options. One option is a slider bar in the PowerBook control panel that lets you determine the trade-off between battery life and overall performance. To increase battery life, you can make the hard drive spin down when inactive. Other options include dimming the screen after user-defined intervals of inactivity, and slowing down the processor to 16MHz (which is fine for text-oriented applications and moderately complex operations).

These options extend the life of the PowerBook's battery—which is important, since a PowerBook 160 or 180 has only enough power for about 45 to 50 minutes of continuous, full use, according to Macworld Lab's tests. The Macworld Lab tests use the screen at full brightness, with the dim option off, the power-to-conservation trade-off at 75 percent, and the hard drive constantly in use. For everyday usage patterns, this translates to about 1½ hours of usage.

Finally, Apple added a Kensington MicroSaver security device (\$59.95, 415/572-2700) to the back panel. This device lets you lock your PowerBook to a chair or desk. The Kensington device is also found on several popular DOS notebooks, so it's likely this device will become a standard, making it easier to find extra security cables.

Usability Quibbles

DESPITE THE MANY WELCOME ADDITIONS in the PowerBook 160 and 180, I still quibble with some of the ergonomics choices Apple has made. I realize that the many chips on a Mac, compared with the fewer chips on a DOS computer, give Apple less flexibility in laying out the components in the notebook's cramped space, but I believe some better choices could have been made. After all, Outbound's notebooks offer more flexibility in the same confines. For example, the Outbound notebooks use standard SIMMs, and their RAM, hard drive, and even their processor are easily upgradable (even by a proficient user, not just by dealers).



Display Comparison The 16 levels of gray on a PowerBook 160's or 180's screen (top) make for a more appealing display than the other PowerBooks' black-and-white display (middle). When attached to an external monitor, the PowerBook 160 and 180 both can display an image in as many as 256 colors (bottom).

Other things on my wish list are implemented in better DOS notebooks but in no Mac notebooks. One request is that Apple use a standard Mac video port on its notebooks. The current port on the 160 and 180 requires an intermediate cable—basically an adapter—which is one more thing to lose. (The cable does have a locking mechanism, so at least it won't pull out of the PowerBook.) Also, the restart button is not easily accessible—it's behind the ports panel at the back of the notebook. A restart button near the keyboard would be much more convenient, and it could be designed to avoid risking accidental restarts.

The Apple keyboard could be improved. First, the keys are slightly too close together, making touch typists reorient their finger motions when moving to or from another Mac. DOS notebooks have the same keyboard spacing as DOS (and Mac) desktops, as do the Outbound notebooks. The PowerBooks' arrow keys are arranged in the unintuitive

continues

Experts agree,
RasterOps beats
the competition in
24-bit color.

We beat them with
our VLSI technology.

We beat them with
our technical support.

So what's left?

RasterOps. The True Value In True Color.

The best in color display technology just got better. Announcing incredible prices on unbeatable displays and display adapters from RasterOps.

With our new price reductions, you can now get the large-screen RasterOps 21" Color Display for an incredible \$2999, our 20" Multiscan Trinitron Display for just \$2499, and our 20" Multimode Color

DISPLAYS*	20" Multi-frequency	20" Multi-freq. Trinitron	21" Fixed-frequency
RasterOps	RasterOps/20 Color Display \$1499	RasterOps/20T Color Display \$2499	RasterOps 21" Color Display \$2999
Radius	PrecisionColor Display 19 \$2499	PrecisionColor Display 20 \$3299	PrecisionColor Display 21 \$3699
SuperMac	SuperMatch 20 \$1799	SuperMatch 20T \$2999	SuperMatch 21 \$3649

*Prices verified by manufacturers on October 15, 1992.

Display for an amazing \$1499. No one else in the industry gives you so much color for so little.

RasterOps gives you that same unbeatable price/performance with our display adapters. Choose the award-winning, accelerated, large-screen, 24-bit color of our 24XLi for just \$2499. Or select the \$999 RasterOps PaintBoard Li, offering 24-bit, photorealistic color for 20" displays. Either way, you will find that

RasterOps is the true value in true color imaging for the Macintosh®.

We also give you the best in 8-bit accelerated color graphics display adapters, the RasterOps 8XL, for an unbelievable \$599.

No One Lets You Create A Better Color Display System Than RasterOps.

Select any RasterOps display, combine it with any one of our display adapters, and you

RasterOps Introduces The Lowest Prices

Our New Low Price!
\$2999
RasterOps 21" Color Display

Our New Low Price!
\$2499
RasterOps 20" Multiscan Trinitron Display

Our New Low Price!
\$1499
RasterOps 20" Multimode Color Display

Simple. We Be

can create a customized color display system that's perfect for your needs. That's because no one gives you a broader line of color display products to choose from than RasterOps. The best color. The best prices. And the best selection. So what's left?

The Industry's Best Technical Support.

At RasterOps, we back all our products with the best technical support in the business. In fact, we were recognized by Apple Computer, Inc.

as an Apple Online Services Outstanding Information Publisher for 1992. And our family of color display adapters also won Macworld World Class Awards for the fifth consecutive year.



RasterOps has won Macworld World Class Awards five years running.

RasterOps has earned a reputation as the leader in color technology by producing displays and display adapters that are always a step ahead. Now you can count on the technical support we put behind our products to be as superior as the products themselves.

Unbeatable Color Technology.

With all these new price reductions from RasterOps, the industry's most advanced technology is more affordable than ever. RasterOps. You can't beat our color. You can't beat our VLSI technology. And now you can't beat our prices.

So just visit your nearest RasterOps dealer, or call us today at 1-800-SAY-COLOR.

RASTEROPS®

THE ART & SCIENCE OF COLOR™

On The Industry's Best Display Systems.

Office Publishing

OCCUPANCY BY QUARTER

1991 1992

60% 40% 20% 0%

JANUARY-MARCH APRIL-JUNE JULY-SEPTEMBER OCTOBER-DECEMBER

Our Low Price! \$2499 RasterOps 24XLi

Our Low Price! \$999 RasterOps PaintBoard Li

Our Low Price! \$599 RasterOps 8XL

at Their Prices.

and products are trademarks or registered trademarks of their respective holders.

See Us At Macworld Expo Booth #735

horizontal arrangement of the original Mac keyboard. Please, follow the intuitive inverted-T design (where the up arrow is above the down arrow, and the left arrow is at the left and the right arrow is at the right). And add page up and page down keys—nothing is faster for scrolling through text files and spreadsheets.

The position of the floppy drive is inconvenient on airplane and train seat trays. Eject your floppy, and it hits the food tray of the person sitting next to you. On a cramped desk, it will likely push against an external drive, a stack of files, or other obstacle. The best DOS notebooks have the floppy eject from the front, where the worst that can happen is that it will fall in your lap.

How about adding status lights (again, like most DOS notebooks) so you know when caps lock is on, whether the battery is charging, if the power cord is plugged in, and what speed the processor is running at.

Last, Apple should follow other notebook leaders and add PCMCIA (Personal Computer Memory Card Industry Association) slots. Such slots let third-party vendors add memory, hard drives, modems, and other expansion options via small cards—about the size of a credit card folded in half. These slots are destined to become a standard, and the cards do not require dealer installation.

Despite these complaints, I like the new 160 and 180. They now have the connectivity and RAM capabilities a business user expects in a notebook, plus all the interface niceties that users expect in a Mac. A few improvements, and they'd be perfect.—GALEN GRUMAN

Presentation Software

Action 1.0

PROS: Broad variety of transitional effects; creates gradient and patterned backgrounds; includes basic drawing tools; templates included.

CONS: Imports only PICT-format graphics; can't import text; playback degrades rapidly as presentations grow more complex; choppy performance on slower Macs. **COMPANY:** Macromedia (415/442-0200). **REQUIRES:** Mac LC; 4MB of RAM; System 6.0.7; 32-bit QuickDraw. Recommended: Mac IIcx; 8MB of RAM; color monitor. **LIST PRICE:** \$495.



CREATING A MULTIMEDIA PRODUCTION can be a daunting task, especially if you're using higher-end presentation software packages such as MacroMind Director and trying to combine numer-

ous color graphics, digitized sounds, animations, and QuickTime movies.

Action, an entry-level multimedia-integration program from Macromedia, offers a less intimidating introduction to multimedia production. Action's straightforward interface makes turning out high-quality presentations with sound and motion a surprisingly easy process.

You start by importing graphics, movies, and sound objects you've created with other applications and positioning them against a backdrop in Action's main Presentation window. The backdrop—called the Stage—can be a solid color, an imported PICT graphic, or a two-color pattern or gradient created within Action. Imported sounds and images must be in one of five standard formats: AIFF, SoundEdit, PICT, PICS, or QuickTime movie.

Next you configure each graphic object's attributes through the Edit Object dialog box, including its entrance and exit time and the transitional effect that will be used to make it appear and vanish. Action offers an excellent variety of 30 transitions, such as Fine Dissolve, Checkerboard, and Horizontal Blinds. You can also instruct objects to enter from off screen or to travel along a path you define.

Action's button and linking features enable you to give viewers control over the flow of the presentation. You can designate any object to be a button and set it to perform a task such as Pause or Go to First Scene.

Though primarily designed to use objects created in other applications, Action provides a number of basic drawing tools to create circles, rectangles, polygons, lines, and arcs. There's also a text tool for adding formatted titles and other text to presentations. The text tool is not just a convenience, it's a necessity; you can't import text files into Action.

One of Action's best features is that it lets you view and edit your work-in-progress from several different standpoints. The Content List displays an inventory of all the objects and events making up each scene. Double-clicking on any object's name in the list gives you instant access to the object for editing. You can edit text objects from within the Content List simply by selecting the text and retyping. The Scene Sorter window displays a tiny image of each scene in the presentation and lets you rearrange the



Action's Timeline Window Bars on the time line give you second-by-second control over each object and event in a scene. Here, two text objects (one hidden behind the Timeline window), a PICT graphic, and a sound file, have been combined to create a 12-second scene.

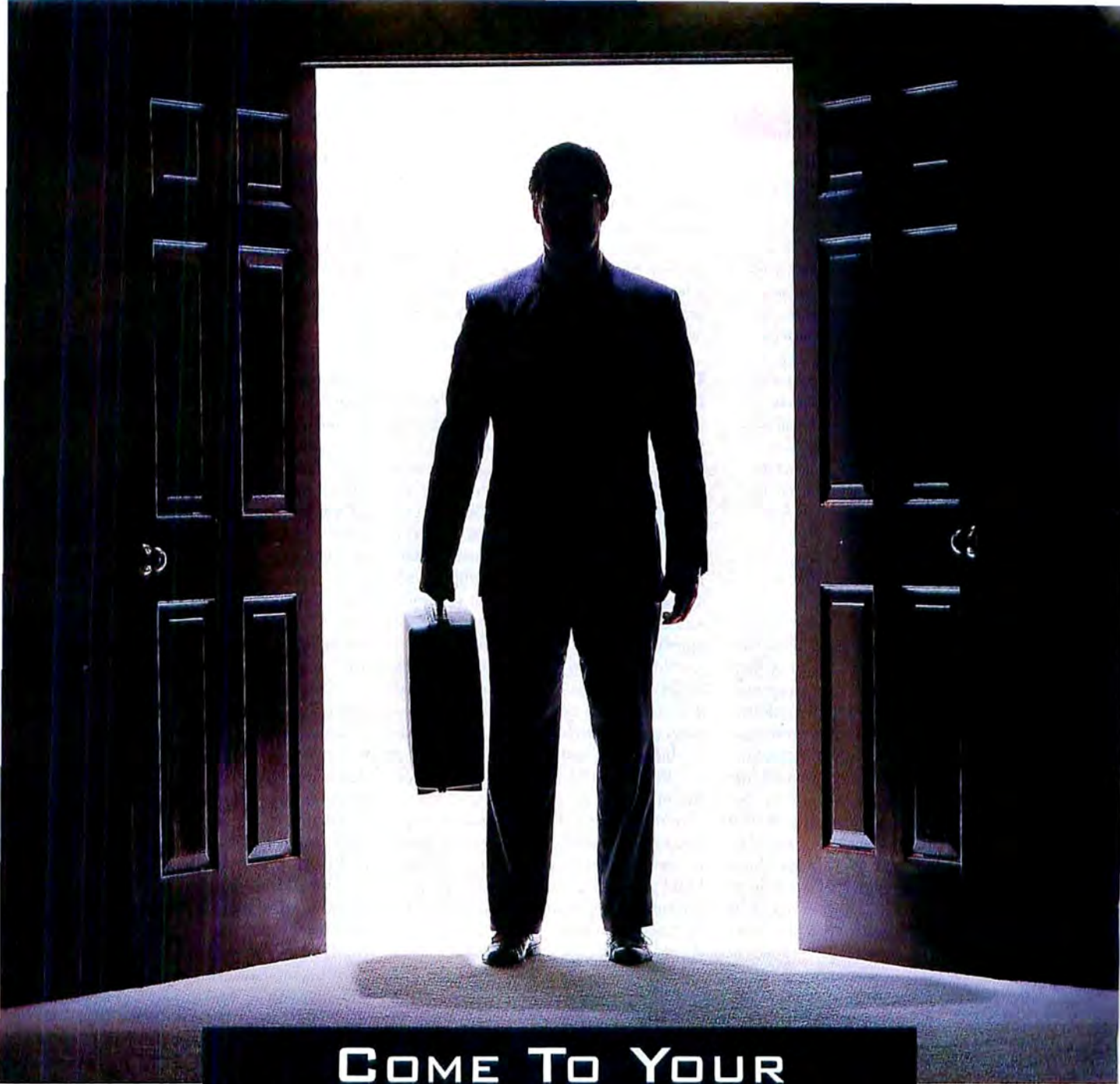
sequence by dragging scenes into a different order. In the Timeline window, each object in a scene is represented by a bar on a time line. You can lengthen, shorten, or drag the bars to change any object's entrance, exit, or duration within the scene.

All of this makes for extremely easy editing. But before attempting anything too fancy, you should know that Action—like any multimedia program—requires a fast Macintosh with plenty of memory. You need at least an LC with 2MB of RAM to run the program, and Macromedia recommends doubling the application's standard partition to 4MB and using at least a IIcx with 8MB of RAM for best results. Even with that configuration, movies and transitional effects become choppy and uneven if you combine more than just a few transitions, sounds, and movies within a scene.

Once your production is complete, you have a variety of playback options. You can use the Run Presentation command for immediate full-screen playback. If you have a VCR and an RGB-to-NTSC video converter, you can use the program's Print to Video command to transfer presentations to videotape. Or distribute presentations to other Mac users along with the runtime player application, included with the program.

Macromedia promises that by using the program's well-designed templates you'll have your first presentation completed in 10 minutes. That's a bit too optimistic; it takes somewhat more practice to create polished presentations. But of the half-dozen multimedia-integration programs now available in the \$300-to-\$600 price range, Macromedia's Action gives you the richest selection of features and is one of the easiest to master.

—JOSEPH SCHORR.



COME TO YOUR NEXT PRESENTATION ARMED WITH A LETHAL WEAPON.

Walking into a presentation today loaded down with overheads and slide

trays is suicide. ■ If you really want to blow an audience away, it takes animated graphics. Live action video. And the kind of high resolution images you see every day on your computer screen. ■ Only bigger. ■ An LCD projection device from nVIEW can give you all that. A seamless, computer-based presentation. In over 250,000 true, saturated colors. From up to four video sources (computer or television video) using a standard



nVIEW products are manufactured under U.S. patents #4,763,993 and #4,976,536. Other and foreign patents pending.

new multiple source LCD projector with its own built-in light source. ■ For killer presentations, we have the weapon. And we'll put it up against any overpriced, oversized 3-gun CRT projector any day. ■ Arrange for a demonstration before your competitor does. Call **1-800-736-8439** or **804-873-1354**. Or write nVIEW Corporation, 860 Omni Blvd., Newport News, Virginia 23606.

overhead projector. ■ Or, better yet, through the Luminator, our



LCD PRESENTATION PRODUCTS

Circle 117 on reader service card.

3-D Rendering/Animation Package

ElectricImage Animation System 1.5.1

PROS: Vastly improved documentation; rendering capabilities include shadow casting, transparency and environmental mapping, and special lighting effects; intuitive project window lets you control all aspects of animation from single location. **CONS:** Expensive; hardware copy protection; no modeler; must convert models before importing. **COMPANY:** Electric Image (818/577-1627). **REQUIRES:** Mac II with math coprocessor; 8MB of RAM; 80MB hard drive; 1.4MB floppy drive; color monitor; System 6.0.8; 3-D modeling program. Recommended: Mac IIx or Quadra; 32MB of RAM; 32-bit video board; System 7. **LIST PRICE:** \$7495.



ELECTRICIMAGE IS THE KIND OF program you'd expect to see on a shelf in Steven Spielberg's home on an episode of "Lifestyles of the Rich and Famous." It retails for the price of a European vacation for two, it lacks modeling capabilities, and it's copy-protected with a hardware device to discourage the riffraff. But ElectricImage is also the most powerful animation program available for the Mac. You've no doubt seen a few by-products of this fantastic application. Teenyboppers will recall the titles to "Beverly Hills 90210" and the fantastic creatures from MTV's Liquid Television hit "The Adventures of Thomas and Nardo." For the why-read-the-book-when-you-can-wait-for-the-movie crowd, there's the titles to Scott Turow's made-for-TV *Burden of Proof* and a whole slew of special effects for the upcoming big-budget Spielberg rendition of Michael Crichton's *Jurassic Park*. Other credits include the family of TV-heads for the "Nick at Nite" identification (see "1991 Macintosh Masters Showcase," *Macworld*, April 1992), the theatrical trailer for *Encino Man*, and the nuclear annihilation of downtown L.A. from *Terminator 2*.

Some of these fantastic sequences were created using the newest version of the program, ElectricImage 1.5.1. Free to registered users of previous versions—"This will be the only free upgrade we

offer," warns a press release—the update ships with a substantially improved manual that offers a more comprehensive description of the product, better explanations of texture mapping and other complex topics, tips for rendering realistic surfaces, and a well-rounded introduction to the video-animation process. The index is awful, but otherwise the documentation is a phenomenal improvement over the previous effort.

The Beauty of the World

ELECTRICIMAGE 1.5.1 ENABLES YOU TO create extremely realistic environments for animated objects. For one, you can cast antialiased shadows using spot, radial, and parallel light sources. You can even shine many lights onto a single object to create overlapping shadows of different shades and colors. The manual recommends that your system be equipped with at least 32MB of RAM to cast shadows; and even then scenes with shadows take approximately 25 percent longer to render than scenes without shadows, but the difference is easily worth the wait. If you're short on time and memory, however, you can reduce the size of the shadow buffer, but you lose quality.

Version 1.5.1 has also improved on the program's transparency and reflection capabilities. The original ElectricImage was limited to 16 levels of opacity. As a surface became more transparent, highlights and reflections also faded, flattening the appearance of objects. The upgraded program offers 256 levels of

opacity and maintains the intensity of reflections and highlights to enhance the perception of reality. Furthermore, you can increase the opacity of the edges of an object to make it appear hollow. (Hold an empty drinking glass up to the light and you'll see that it becomes less transparent around its edges.)

To imitate reflections, ElectricImage provides what it calls environmental mapping. Instead of performing ray tracing, which the documentation dismisses as unnecessarily time-consuming, ElectricImage wraps a 360-degree view of a scene around an object by projecting the reflection in six different directions—up, down, right, left, forward, and backward. Incidentally, this is an improvement over traditional reflection mapping, in which a scene is projected onto a model in only one direction. While the effect falls short of ray tracing, in which a program calculates the behavior of every single beam of light in a scene, environmental mapping is hundreds of times faster, requiring minutes instead of days to render.

ElectricImage adds two moody lighting effects—glow and fog—either of which would be perfectly at home in a bit of film noir. The glow effect surrounds a transparent light beam with a luster that fades outward from the beam to a specified depth. If you apply a glow to a spotlight, you get a searchlight effect. Apply a glow to the new tube light source—which produces a linear, laserlike beam of light—to achieve a neon effect. The fog effect is similar to the glow effect, but the light beam is opaque and sheds no light on the background, as if the light were inching its way through a pea-soup fog. Combined with a radial light, the fog effect lends itself to the bare-bulb-in-a-smoky-room effect, ideal when you want to render some dogs playing poker.

The Paragon of Animation

POSSIBLY THE BEST—AND CERTAINLY THE most intuitive—new feature is the project window, which enables you to control virtually every aspect of an animation from a central location. The project window lets you specify the movement of any light, camera, or object in the current scene with respect to key frames in the animated sequence, individual frames, or increments of time. You can even switch back and forth between different animation modes with no loss of accuracy; this encourages experimentation and enables you to fine-tune an animation from several different perspectives. You can also independently adjust specific attributes of an object, including position, rotation, scale, and color. If that's not enough, you

continues



Soupy Sails The white haze drifting across the bow of the boat was created by combining a radial light source with the fog effect. The image also makes use of ElectricImage's shadowing (on the deck) and reflection (in the water) capabilities. The entire 1200-by-1400-pixel image took 7½ hours to render.

DAN SPANGLER AND TOM MIDGLEY



WriteMove II. The Portable Executive Printer for the PowerBook.

The Macintosh® PowerBook™ is unquestionably a great book. And now it has the great printer it deserves: the new WriteMove® II from GCC – simply the best portable printer you can buy for your PowerBook. At just 2.5 pounds, the battery powered WriteMove II fits easily in a briefcase. So you can print crisp, 360 x 360 dpi laser-quality output anywhere – in the air, on the road, or in a hotel room. You can negotiate a contract over dinner, print it out, and sign it over dessert. Print on plain paper, envelopes, or even transparencies.



The WriteMove II comes with ATM™, 21 fonts, background printing and On-Screen Print Preview. Plus, there's a one-year trouble-free warranty, and toll-free support. All for just \$599. Because every great book deserves a great printer.

Call 800-942-3321, for the name of your nearest GCC dealer, or 800-422-7777, ext. 905 to order the WriteMove II direct. In Canada, call 800-263-1405.



can attach objects to each other so that if you move one object, the attached objects move in kind. For example, you might attach two spotlights to the front of a car to create headlights. Or, you can have two objects move independently while forever facing each other, like a spotlight following an actor on stage. These options and more are within easy reach from the project window.

But while this program is exceptional in many ways, I do occasionally wish for more. For example, ElectricImage provides no means for storing texture maps to a library. Though you can save textures and their settings to the Scrapbook, a library feature with texture palettes would be much more convenient. Furthermore, ElectricImage doesn't provide you with a link between a texture map and objects, meaning that you cannot edit a texture and automatically update objects mapped with that texture, as in Alias Sketch, StrataVision 3D, and half a dozen other programs. Finally, ElectricImage can only import models stored in its native Fact format. To bring in other models, you have to first convert them one at a time by using the laborious Transporter utility.

These minor complaints aside, ElectricImage Animation System 1.5.1 is a rare piece of software that blurs the borders between souped-up Macs and dedicated graphics workstations. You can argue that at \$7500, this program is cheaper than the next-best alternative, which is to invest tens of thousands of dollars in Unix-based software like Alias or Wavefront. But if you're a typical student or graphic artist trying to convert your skills from traditional techniques to computer art, ElectricImage is quite simply out of your reach. ElectricImage does supply the occasional money-saving trick. For example, folks who want to render to videotape can write an animation file to

an Exabyte tape-backup system in the Abekas A-60 format and then restore the file to an A-60 at a service bureau, thereby saving the \$60,000 an Abekas machine would cost. And this is wonderful news for corporate users.—DEKE MCCLELLAND

Portrait-Style Monitor

Power Portrait

PROS: User-configurable resolution; built-in QuickDraw acceleration. **CONS:** Incompatible with some software; SCSI ID and termination hard to change. **COMPANY:** Sigma Designs (510/770-0100). **REQUIRES:** Any Mac with built-in monitor and SCSI port. **LIST PRICE:** Platinum \$899; granite \$949.



THE POWER PORTRAIT IS A 15-INCH portrait-style monochrome display for Macs with built-in screens, like the Classic and PowerBook. Because these models lack provision for external monitors, the Power Portrait gets its signal from the Mac's SCSI port. The monitor has a tilt-and-swivel base and comes in both platinum and dark gray.

SCSI devices can be frustrating to set up, especially if you have more than one. Sigma provides external SCSI ID and termination controls, but they're not as convenient as they could be. To change the SCSI ID number, for example, you have to rotate a miniature dial that is recessed into the back of the monitor. I found it hard to see what I was doing. And to turn SCSI termination on or off, you have to press 24 tiny rocker switches. Still, it's better than cracking open the case.

The Power Portrait sports two 25-pin connectors instead of the more-common 50-pin connectors. If you have additional hardware, it's easiest to hook the Power Portrait directly to the Mac and daisy-chain other devices to the monitor. Although you can place the Power Portrait anywhere the SCSI cable reaches, Sigma recommends locating it to the right of the Mac to avoid the computer's power supply.

On Macs with the 68000 processor, you can use the Power Portrait by itself or alongside the Mac's internal screen; you set display options in Sigma's control panel (or cdev). On Macs with 68020 or 68030 processors, like the PowerBook, the internal display remains active, and you control the Power Portrait via the Monitors cdev. Either way, you can



Power Portrait from Sigma Designs

set the monitor's screen resolution to 72, 80, or 88 dots per inch, as well as turn hardware panning on and off. With panning enabled, the Power Portrait displays a small portion of a larger virtual screen of up to 1024 by 1024 pixels (about two 8½-by-11-inch pages side by side); hidden portions scroll into view when the cursor reaches the edge of the screen.

Brightness and contrast are easy to adjust using knobs on the front of the monitor. Three dials at the rear let you tweak the position of the display on the CRT screen. Once I set the controls, text and graphics were crisp, and the background was adequately bright. Although I couldn't verify the claimed refresh rate of 97Hz, there was no noticeable flicker, and I worked with the Power Portrait for extended periods without eyestrain.

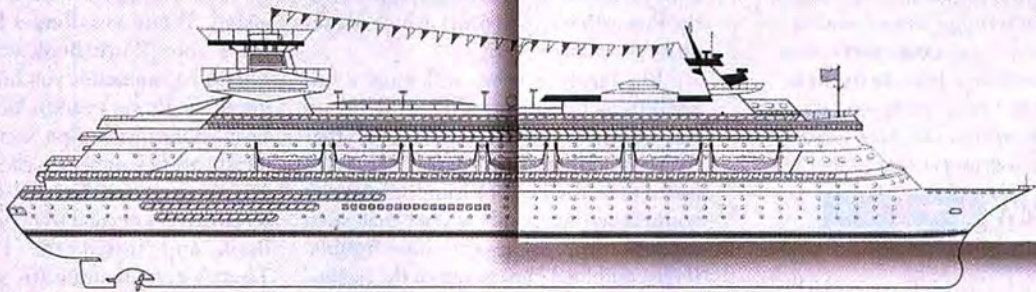
In the past, SCSI-based monitors have been criticized as being too poky to be practical. To overcome the SCSI bottleneck, Sigma incorporates QuickDraw acceleration into the Power Portrait's hardware. On average, display speed was similar to that of my PowerBook 170's built-in screen. However, the Power Portrait doesn't work with software that bypasses QuickDraw, including certain After Dark modules, many games, and HyperCard (Sigma's installer adds an XCMD to HyperCard to make it compatible). A Read Me file disk lists known incompatibilities and workarounds, but doesn't mention Aldus Persuasion, which had minor problems displaying graphics.

At first, I was skeptical about the value of an external display for my PowerBook. After a while, though, I began to appreciate the larger display area. The Power Portrait is also an acceptable option for users of compact Macs, like the Classic. Before you buy, though, check with Sigma to make sure that your software is compatible.—FRANKLIN N. TESSLER



Rendered Aghast Rich Fernald achieved this traditional depth-of-field effect for his animated TV series "The Adventures of Thomas and Nardo" by rendering his "computer cutout" characters in several different passes and compositing the images in ElectricImage's Projector utility.

DON'T MISS THE BOAT.



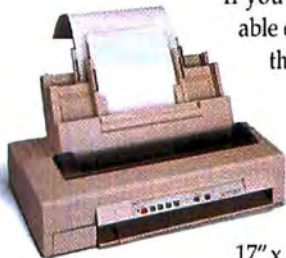
S.S. OCEAN DUCHESS

1590 passengers. 70,000 gross tons. 811 feet in length. 14 Decks. Pizzeria. Health and beauty center. Two pools, one with in-pool bar. Four whirlpool spas. Ultra-spacious staterooms, many with verandas and balconies. Observation lounge with entertainment complex and casino. Italian registry.



PROMENADE DECK

GET THE NEW WIDEWRITER 360.



If you've been waiting for an affordable desktop printer that can handle the really big jobs, your ship has finally come in. Introducing the new WideWriter 360™ from GCC Technologies® — the wide-carriage inkjet printer capable of printing on 17" x 22" (C-size) paper. With the

WideWriter 360, printing large CAD drawings, super spreadsheets and gigantic graphics is no big deal. And because it can also print on a variety of paper sizes including letter, ledger and fanfold, there's little the WideWriter 360 can't handle.

The WideWriter 360 is fast and quiet. Plus its 360 x 360 dpi resolution produces crisp, laser-quality lines, text and graphics. Of course, this large format printer is also big on features, including:

- **AppleTalk® networking or serial.** Automatically configures for shared or personal use.
- **Background printing.** Returns control of your Macintosh® to you faster.

- **ATM™ and Adobe® Type 1 fonts are included, with support for TrueType.™** Gives you unlimited font access in any size.
- **Flexible paper handling with multiple sheet feeders.** Lets you take letterhead from one feeder and subsequent pages from the optional second feeder.

The WideWriter 360 also features the unmatched reliability and innovation that are standard in every GCC Technologies product. It's the only name to count on when you want a high quality, large format printer that fits even the smallest budget.

Easy Ordering. 800-422-7777, extension 960.

The WideWriter 360 is available now for just \$1699! Call 800-942-3321, for the name of your nearest GCC dealer, or 800-422-7777, ext. 960 to order the WideWriter 360 direct. In Canada, call 800-263-1405. When you order direct from us, you get a 30-day money-back guarantee and \$9 Federal Express overnight delivery.



**GCC
TECHNOLOGIES**
Peripherals With Vision™

PowerBook Video Adapters

PowerVision 1.31

PROS: Displays images quickly; supports multiple color levels; has excellent installation video and tools. **CONS:** Limited to smaller monitors; requires restart to change between mirroring and dual-display modes. **COMPANY:** Mirror Technologies (612/633-4450). **REQUIRES:** PowerBook 140, 145, or 170; System 7.0.1. **LIST PRICE:** With no RAM \$499; with 2MB of RAM \$699; with 4MB of RAM \$999.



BookView Imperial

PROS: Displays images quickly; supports wide range of monitor sizes, as well as VGA monitors. **CONS:** Video-out port design is not sturdy. **COMPANY:** Computer Care (612/371-0061). **REQUIRES:** PowerBook 140, 145, or 170; System 7.0.1. **LIST PRICE:** \$1399 (includes 6MB of RAM).



IF THE TWO APPROACHES USED BY vendors to add external video ports to the first-generation PowerBooks—the 100, 140, 145, and 170—the better approach is the internal video adapter, which connects to the PowerBook's memory slot, since this type of adapter provides the fastest display possible on the second monitor. (The other approach is a slower SCSI video adapter, covered in "Expanding Your PowerBook," in this issue.) While the new PowerBook 160 and 180 have this video-out circuitry built in, there are more than 300,000 first-generation PowerBook owners who could benefit from a video adapter.

Two top choices for internal video adapters are Mirror Technologies' PowerVision and Computer Care's BookView Imperial. The trade-off between the two is monitor support: the PowerVision supports 12-inch and 14-inch color monitors, as well as 15-inch portrait gray-scale and black-and-white monitors, which covers most of the monitors people use every day. The BookView Imperial supports these plus 16-inch and 19-inch color monitors (at 8-bit color).

The PowerVision and BookView Imperial differ in other ways, too. The most striking is in their RAM configuration. The BookView Imperial comes with 6MB of RAM, which brings the PowerBook to its maximum of 8MB (the PowerBook 140, 145, and 170 come with 4MB of RAM, 2MB of which are soldered onto its logic board). By contrast, the Pow-

erVision comes in three configurations: with 0MB, 2MB, or 4MB of RAM. Those who pick the 2MB version are generally limited to running one large application (such as Excel) and a few INITs, since System 7 and these applications take up a lot of RAM. The 4MB version brings the PowerBook up to 6MB, which is adequate for many users.

But business users will want a full 8MB (which requires 6MB of RAM on the PowerVision). They can get that RAM by adding a third-party 2MB RAM board onto the PowerVision's expansion connector, but Apple warns that such expansion approaches can cause trouble. If the combined dimensions of the stacked boards exceed the PowerBook's specifications, the boards could cause a short circuit. The BookView Imperial is a better choice for users who are concerned about this.

In either case, keep in mind that the video adapters reserve RAM for their own use. The BookView Imperial takes 2MB of system RAM, leaving just 6MB for the System and application. Computer Care promises that future versions of the BookView Imperial will let applications use some of this RAM when it's not needed for video processing. In contrast, the PowerVision has separate VRAM, so the memory that comes with the board is completely available for the System and applications. This makes the PowerVision a much less expensive product in terms of processing bang for the buck.

The PowerVision's video-out port is also sturdier than the BookView Imperial's. Instead of requiring an intermediate adapter to be attached between the video-out connector and the monitor's cable, as the BookView does, the PowerVision's video-out connector is a standard Mac adapter. This means there's one less thing to fall off or get lost.

For software, the BookView and PowerVision are more evenly matched. Both support the two types of display modes: mirroring, where the external and internal displays show the same image, and dual-display, where the two monitors make up one virtual screen (the standard Mac treatment of multiple monitors). And both require a restart to switch modes. The PowerView does not support virtual memory or Apple's RAM disk, while the BookView Imperial supports virtual memory but not the RAM disk. Computer Care has announced plans to include a shareware program called RAMDisk+ to address that need. And Mirror says it is now shipping a software upgrade to make the PowerVision compatible with both virtual memory and the RAM disk.

The two products are evenly matched in terms of video display speed. Macworld Lab tests showed that the two products performed within a few hundredths of a second of each other on all scroll and redisplay tests—a statistical tie.

But the PowerVision is easier to install. While installing a PowerVision voids your PowerBook warranty (and Mirror recommends you hire a dealer to install the PowerVision), Mirror provides a well-done installation video that a technically proficient person can follow. Plus, Mirror provides the hard-to-find Torx screwdrivers needed to open the PowerBook and install the PowerVision. There's even an antistatic wrist strap. A lot of care and thought went into the installation package, and it shows.

The BookView Imperial is the better bet if you intend to use a 16-inch or 19-inch monitor. But for the vast majority of users, who use 14-inch monitors, it's basically a tie. You'll have to decide whether the RAM options and slight differences in software give one product the nod over the other for your needs.

—GALEN GRUMAN AND MARK HURLOW

Small-Business Accounting

Business Sense 1.6

PROS: All-in-one program; uses double-entry bookkeeping method; includes training videos. **CONS:** Payroll tax tables should be simplified; documentation needs to be reorganized. **COMPANY:** Business Sense (801/963-1385). **REQUIRES:** Mac Plus; hard drive; System 6.0.7. **LIST PRICE:** \$199.



IF LONGEVITY IS ANY INDICATOR OF success, Business Sense is successful. I first encountered the program in 1987 when it was called Turbo Mac Accounting, published by Digital, Etc. At the time it impressed me as a fairly competent accounting package. Business Sense, the program's new publisher, has updated the code to make the application run faster under System 7. Business Sense is still a competent program, with a reasonable \$199 price and a one-year money-back guarantee. The company also includes two video training tapes on how to use the program, free with Business Sense.

Business Sense 1.6 uses conventional electronic versions of double-entry paper forms. It is a comprehensive all-in-one package offering general ledger (G/L), accounts payable (A/P), accounts receivable (A/R), and payroll.

continues

THE NEXT WAVE IN COLOR PRINTING.



Introducing a photorealistic color printer that's surprisingly affordable – ColorTone™ from GCC Technologies®. At just \$10,999, ColorTone brings continuous tone PostScript® compatible printing right to your desktop. So you can create stunning presentations, comps, and design proofs.

ColorTone's breakthrough technology includes full 300 dpi dye-sublimation output for superior quality imaging. And GCC's font enhancement technology ensures smooth, clean text – even at small sizes.

ColorTone comes ready-to-use, fully configured with memory, an internal hard disk, multiple networking interfaces, including Ethernet, and GCC's own RISC-based controller technology.

It's easy to experience ColorTone's vivid color imaging first hand. Simply call 800-942-3321, for the name of your nearest GCC dealer, or 800-422-7777, ext. 432 to order direct. In Canada, call 800-263-1405.



**GCC
TECHNOLOGIES**
Peripherals With Vision™

Although it has no inventory module, the application accepts data from a separate product called ShopKeeper (from ShopKeeper Software). If you run a service business, you can also import data from the Timeslips application (from TimeSlips Corporation), for billing purposes. Business Sense imports and exports data in text or tab-delimited format; and the Claris XTND translator, for moving text into MacWrite and MacWrite II, is included.

Business Sense's Chart Of Accounts is numeric (you must identify departments by numbers, not names), and like that of most accounting packages, includes budgeting capabilities. It enables you to create separate departments as profit centers or job-tracking units, and lets you budget for these groups separately. Business Sense allows for 2000 customer accounts and 1500 vendors; the payroll function handles 100 employees with up to 10 withholding categories, plus tips and fringe benefits.

The program also provides all the standard reports needed in small businesses (trial balance, income statement, balance sheet, and so on), with many reports available in graphic format. The A/R module warns you when you approach your credit limit, calculates and applies finance charges and discounts, handles partial payments, and tracks sales commissions by customer. The A/P module tracks bills by invoice date, due date, and discount date, and automatically applies vendor discounts based on the information you enter when you set up your vendor list.

Business Sense keeps the books open for a whole business year, which some bookkeepers see as an advantage; others don't like this feature because you can change a previous month's data reports after the fact.

Business Sense works from a simple main screen, with menus for functions, accounting activities, and reports (see "Business Sense Main Screen"). Assuming you haven't rearranged the icons, you set up books using the icons in the first two rows on the main screen: Company Info, where you enter information about your company (name, address, and federal ID number, for example); Chart Of Accounts; Customers; Vendors; Departments, if any; Employees; Tax Tables; and Recurring Entries (those that occur every month). The setup process is covered in detail, occupying approximately half of the user manual. The main screen also has a Help icon and an icon for making entries in the General Journal.

Most of the actual bookkeeping entries are made in the bottom row of

icons: Sales/AR, where you enter your sales; Purchases/AP, for purchases; and two Checking icons (one for making deposits and one for writing checks). For these processes Business Sense uses standard double-entry forms familiar to people who have worked with manual business books and ledger cards.

All A/P, A/R, disbursement, and deposit entries are basically made the same way, directly into the ledgers' (the General Journal) double-entry format. For example, to handle a payables purchase, you make one entry crediting A/P and a second, balancing, entry debiting the category of the purchase, such as rent.

To assist you in these entries, the Chart Of Accounts, Vendors, and Customers modules all contain a Transfer button that lets you automatically move a selected item onto your ledger form. For the payables purchase, for example, you open Vendors, scroll through the list, select the vendor you want, and click on the Transfer button—that vendor name and number is automatically copied onto the ledger sheet. You then open the Chart Of Accounts, click on the expense category (rent), then click on Transfer, and the balancing entry appears on the next line in the ledger as a rent expense.

Of course, the program doesn't let you close the ledger if information is missing or the entries don't balance. You must either complete the entry or select Line Delete from the Edit menu to remove unbalanced entries.

As a general rule, data entry is much easier in other all-in-one packages, such as Teleware's M.Y.O.B., Peachtree Accounting for Macintosh (formerly at-Once), CheckMark's MultiLedger and Payroll, and Softsync's Accountant, Inc. The file-cabinet metaphor and work-flow diagrams in M.Y.O.B., and CheckMark's logically ordered menus, are much easier to work with than Business Sense. Also, the competitive all-in-one packages use windows with scroll boxes to automate data entry, rather than making you manually open vendor lists or charts of accounts. The other packages also hide the double-entry ledger sheets, so you don't have to be concerned with balancing debits and credits, except when you make General Journal entries.

The Business Sense payroll function, like that of virtually all other products, requires that you enter a Social Security number, address, telephone number, and the hours worked directly into each employee record. CheckMark's payroll function is the only exception, giving you a separate screen for entering all employee hours. If employees have variable hours each period, such as in a small retail store



Business Sense Main Screen When the application opens, the user chooses the appropriate entry journal by clicking on a main window icon. The menu bar provides the standard File and Edit, plus menus for functions, accounting procedures, and reports.

or service business, the CheckMark approach makes entry of these hours much easier.

M.Y.O.B. differs from Business Sense by not offering a payroll segment; and CheckMark and Accountant cost more because they have integrated Inventory modules not included in Business Sense.

In terms of competition, Business Sense goes head-to-head with the Peachtree package, and Peachtree's Mac interface and data entry are better.

Business Sense's main fault, however, lies in its payroll tax tables. The program would be much improved by using annualized tables rather than separate detailed listings for Single/Married, Weekly, Biweekly, Semimonthly, and Monthly. Although you can update these tables yourself, it takes a massive amount of time (not to mention disk space) if you have different pay periods. You will probably want to buy the federal tables that Business Sense makes available each year. The company does not, however, sell state tax tables (except for California), so you could have quite a job revising your state tables each year. Peachtree does not allow you to update its tables in any way, thus forcing you to purchase them each year. But at least it sells both federal and state tables.

Business Sense uses the previous version's documentation with an addendum. While it does a good job of guiding you through setup, the manual could have more details and continuity, especially in describing the processes of entering payables and receivables. The documentation needs to be reorganized to match the actual work processes performed by the user.

Business Sense is a competent, single-user all-in-one bookkeeping program—adequate for keeping the books for a small company. It is not as easy to use as its most direct competitor, Peachtree Accounting for Macintosh, but if Business Sense would simplify the tax tables and reorganize the manual, it would be a much more formidable competitor.—ALAN SLAY



It works for beginners as well as experts.

And no matter how hard you try, you can't exhaust its potential.

In many ways, it's a lot like CompuServe.

For the beginner at interactive computer services, we've got news, travel information, stock quotes, entertainment and games, a complete encyclopedia, free time to sharpen your online skills, and more.

For the experienced user, we feature hardware and software support, special-interest forums, free software, a wealth of online computer expertise, and sophisticated research tools. In fact, no computer service offers the choices that CompuServe does.

Now, for just \$7.95 a month, and a one-time membership fee, you get all the basics as often as you like: news, sports, weather, shopping, a complete encyclopedia, and much more, plus up to 60 E-mail messages a month. And, there are lots of other valuable services available on a nominal pay-as-you-use basis.

Whether you're a beginner or an expert, to choose the right interactive service, just use your brain. Pick CompuServe.

For more information or to order, see your computer dealer or call 1 800 848-8199. Outside the United States, call 614 457-0802.

CompuServe®

The information service you won't outgrow.

Circle 319 on reader service card

Large-Format Ink-Jet Printer

WideWriter 360

PROS: Good output quality on cut sheets as large as 17 by 22 inches; excellent printer-driver software and manual; supports serial or Local-Talk connection. **CONS:** On the slow side; does not support PostScript; ink is water soluble.

COMPANY: GCC Technologies (617/890-0880). **LIST PRICE:** \$1699.



LASER PRINTERS ARE FAST AND QUIET, and they produce sharp copy; but they don't think big. Most lasers are limited to a maximum page size of 8.5 by 14 inches (legal size), with a few supporting 11-by-17-inch (ledger-size) stock.

These page sizes are fine for most correspondence and publishing tasks, but they're too small for many applications. Larger page sizes work best for architectural drawings, circuit diagrams, and technical illustrations. The preferred device for these jobs has traditionally been the pen plotter, which zips special felt-tip pens across a sheet of paper. Plotters are ideal for line art, but they don't handle gray shades or text well.

Publishers who produce tabloid-size publications often prefer to proof two-page spreads, which require a 17-by-22-inch sheet. To print large page sizes, most publishers resort to their page-layout programs' *tiling* feature, which divides large pages into smaller sheets that are then taped together—not exactly cutting-edge.

The GCC WideWriter 360 printer provides large-format output in a reasonably priced package. The WideWriter 360 uses a Canon-built ink-jet print mechanism that's conceptually similar to that of Apple's StyleWriter ink-jet printer. Like a StyleWriter, the WideWriter provides print resolution of 360 dpi and uses a disposable ink cartridge.

But a StyleWriter is limited to legal-size sheets; a WideWriter 360 can automatically feed sheets as large as 14 by 91 inches. Using the manual-feed slot, you can print sheets up to 17 inches wide, with

no length limitation. You can also load the WideWriter with continuous-feed fanfold paper to print ultrawide spreadsheets or Texas-size banners. The WideWriter may be the ultimate banner-printing machine.

Big Output, Small Package

THE WIDEWRITER 360 MAY THINK BIG, but it isn't big. The printer measures 5.4 inches high, 23.3 inches wide, and 14.9 inches deep. With the included sheet feeder attached, the WideWriter weighs less than 25 pounds. The printer is easy to set up: remove the packing tape that secures its plastic lids, unlock the print head, and slide the sheet feeder home.

The WideWriter 360's single rear-panel connector has a dual personality. Attach the included cable to the Mac's modem or printer port, and you have a fast, serial connection like that used by an Apple ImageWriter II, StyleWriter, or Personal LaserWriter LS. Attach a Local-Talk or PhoneNet network connector instead, and you can share the WideWriter among numerous Macs. When switched on, the printer senses which connection scheme you've used and configures itself appropriately.

Every printer needs driver software, which translates the generic printing commands all Mac programs use into the commands required by a specific printer. The WideWriter's driver is based on the one used by GCC's Personal LaserPrinter series, WriteMove II portable ink-jet printer, and ColorFast film recorder. The advantage of this family resemblance is reliability and compatibility; the PLP driver technology has been around since 1987. The disadvantage is that it doesn't support PostScript, so you can't print illustrations from PostScript draw programs such as Aldus FreeHand or Adobe Illustrator. If you're willing to go through a two-step printing routine, however, you can get PostScript output by using TeleTypesetting Company's (617/734-9700) T-Script Deluxe PostScript-emulation software. Another popular PostScript emulator, Freedom of Press from ColorAge (formerly Custom Applications), does not support the Wide-

Writer. The WideWriter includes the Adobe Type Manager utility and 21 Type 1 fonts. TrueType fonts work fine, too.

The WideWriter 360 driver provides High, Medium, and Draft print-quality settings; the latter two produce faster output and use less ink than the first. You also get some convenience options that even Apple's drivers don't provide, including detailed online help, a Preview button that lets you see how a document will appear before printing, the ability to specify up to 15 custom page-sizes, and an edge-to-edge printing option that lets you print to the edges of the page (print quality degrades a bit at the edges). The driver also supports background printing under MultiFinder or System 7.

GCC sells a second sheet feeder for \$149 that lets you mix and match paper sizes. The WideWriter Print dialog box lets you print the first page of a document from one feeder and subsequent pages from the other.

It's No Laser Printer

THE WIDEWRITER'S OUTPUT QUALITY is excellent, but it still isn't in the laser printer league (see "WideWriter 360 Close-Up"). Character edges have a slightly fuzzy appearance, especially if you use cheap bond paper. (GCC recommends a minimum cotton content of 25 percent.) Moreover, the WideWriter's ink is water soluble—take a WideWriter blueprint out in the rain, and it's likely to smear. (You can work around this by photocopying the output.) The WideWriter is no speed demon, either, but it is faster than most pen plotters.

If the WideWriter 360 sounds appealing but a bit pricey, you might consider combining Canon's DOS PC-oriented BJ-330 ink-jet printer with GDT Softwork's driver-and-cable package, PowerPrint. The Canon BJ-330 uses the same print mechanism as the WideWriter and often discounts for about \$700, including a sheet feeder. The combination isn't as elegant as the WideWriter—PowerPrint can't compare to GCC's driver—but does cost considerably less.

The WideWriter 360 isn't for everybody. Publishers who want to produce camera-ready tabloid output will be better served by a laser printer such as the QMS-PS 1700 or 860 (see "Workgroup Printers," *Macworld*, January 1993). And anyone who needs large-format color output for drafting will want to stick with pen plotters. But for proofing large-format publications or printing black-and-white architectural or technical drawings—and for banner buffs—the WideWriter is an excellent choice.

—JIM HEID

The quick brown fox jumped
The quick brown fox jumped

WideWriter 360 Close-Up The 360-dpi WideWriter's output (top) is very good, but it still falls short of 300-dpi laser printer output (bottom). Note the somewhat jagged character edges caused by ink seeping into the paper's fibers as it dries.

MORE FOR LEA\$E

LEASING ADVANTAGES

- Leasing is FAST and EASY!
- Possible tax advantage
- Conserve your working capital
- Have the system you need NOW, when you need it!

A
QuickKorLease
from MacFriends
makes good
sense!

HERE'S HOW:

Just call. We'll quote your package and ship your order upon quick credit approval! *All leases are 4 year leases w/10% residual. Call for details.

"Desktop Dynamo"
Mac IIvx
\$130*
per month

Total Pkg...\$1188

- Quadra 950
- 24MB RAM
- 400 MB HD
- 16" Sony Color Monitor w/Video RAM
- Extended Keyboard w/Quickkeys Light
- QuickKor Kare

with your

TRADE UP!
or cash of... \$2200

\$8988

- 8MB RAM
- 120 MB Hard Drive
- 300i CD - includes 9 CDs!
- 14" Color Monitor
- QuickKor Kare
- Extended Keyboard w/Quickkeys Light

"Business Plus"
Mac IIci
\$107*
per month

"Power Master"
Quadra 950
\$255*
per month

Get more
power for
lease dollars
with a
Mac ci!

Each of these systems include:

**QuickKor
Kare**

- 2 years extended service
- Next day air equipment replacement
- Unlimited toll free technical support

Why QuickKorLease your Mac from MacFriends?

- Competitive Pricing
- Customer Package Design Assistance
- Better Performance and Warranties
- Unlimited Toll-Free Technical Support for 2 years
- Products Pre-assembled and Tested

We're the Nation's MAC Specialists!

With
MacFriends'
exclusive TradeUp you
can make the most of your
old Mac and never
become obsolete!

"Fast Track"
PowerBook 160
\$119*
per month

- 8 MB RAM
- 120 MB HD
- QuickKor Kare
- Carrying case
- Apple send/fax modem
- 1.44 super floppy
- Up to 3 hrs. battery life
- 10" backlit display
- Reads DOS disks

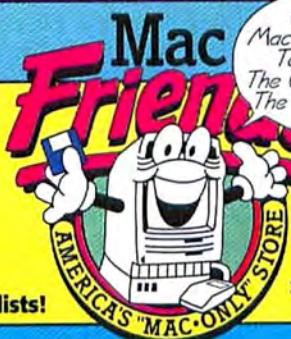
Every Mac is
**CUSTOM
CONFIGURED!**
especially
for you

Best
Price!

"Office Manager"
Mac LC II
\$89*
per month

- 8MB RAM
- 120 MB Hard Drive
- 14" Color Monitor/256 Colors
- HP Deskwriter  PACKARD
- Ext. Kybd w/Quickkeys Light
- QuickKor Kare

Put the
power of the
LCII to work
for your
office!



Call
MacFriends
Today...
The QuickKor
The Better!!

Call Toll Free Today!

800 331-1322

24 HOUR QUICKFAX: (503) 286-8710 LOCAL: (503) 286-9350

Contact Manager

ACT for Macintosh 1.0

PROS: Customizable contact fields; macros; multiple contact views; integrated word processor.
CONS: Reference manual difficult to use; fixed-size windows; application must be running for alarms to appear. **REQUIRES:** Mac Classic; 2MB of RAM (4MB with System 7); hard drive; System 6.0.4. **COMPANY:** Contact Software International (214/919-9500). **LIST PRICE:** \$395.



ACT FOR MACINTOSH—ONE OF THE newest business applications to make the transition from the PC world to the Macintosh—is a contact manager that combines an extensive personnel database with scheduling and word processing modules. But while ACT provides some features not found in competing products, the poorly conceived reference manual makes learning ACT a frustrating experience.

With more than 70 customizable fields, ACT's contact manager is more comprehensive than most Macintosh address books (see "Keeping in Contact"). In addition to changing a field's on-screen labels, you can lock a field to prevent users from entering data into it or you can conceal a field from view. You can set up a field to accept any text, or you can restrict the field to accept only dates, times, numbers, dollar amounts, or phone numbers. ACT formats telephone numbers automatically as you enter them, and an autodial feature lets you dial calls through a modem.

ACT incorporates several other features that are designed to cut down on keystrokes when you're entering contact information. You can specify default values for any field, and you can define sets of alternative entries (which Contact Software calls Pick Lists) to use for entering data into fields whose contents are limited to certain values. For fields that store coded information like state abbreviations, the Pick List can display both expanded and shorthand versions for each entry. If you're using System 7, you can program balloon help to prompt users during data entry. Finally, ACT's macro facility lets you record sequences of frequently repeated actions (including typing and mouse clicks) for later replay.

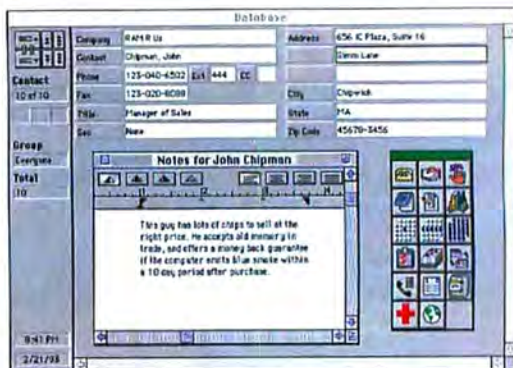
ACT provides 18 different views for displaying contact information, accessible from the View menu. Although ACT's default layouts should be adequate for most users, it would be nice if you

could customize the position, order, and font of contact fields. Controls at the top left corner of the contact-view window enable you to browse the database one record at a time (either forward or backward) or jump directly to the first or last entry. ACT also includes a tabular list view, which displays all the records in the contact database. The list view lets you tag selected contacts, but it doesn't let you delete items.

Search capabilities in ACT are more than adequate. Menu commands let you find records based on a single attribute (name or company, for example). To perform more-detailed searches, ACT's Query module lets you enter lookup criteria on a screen that resembles the standard contact view. You can also program complex searches by typing the field names and values you're looking for into a special window, an option that users with a flair for programming might prefer. The ability to add frequently used queries to the Lookup menu by saving them in a special folder is useful, but it's not as simple as customizing menu commands in Microsoft Word.

Because ACT's scheduling functions are centered around its contact manager, you have to associate activities with a particular contact or group of contacts, which is an annoyance if you want to book an event that doesn't involve anyone but you. (You can get around this restriction by associating an event with your own contact record.) To schedule a new activity, you enter the date, time, duration, and a brief description, and then choose the type of event (meeting, phone call, or to-do item) and priority (high, medium, or low) from pop-up menus. Strangely, ACT's scheduling dialog box accepts invalid times and dates without complaint (99999 is interpreted as 8 a.m., for example).

Unlike After Hours Software's DateBook, ACT cannot calculate an event's duration from the beginning and ending times. However, ACT does flag schedule conflicts, giving you the choice of accepting or rescheduling them. You can also schedule "timeless" activities, such as items on a to-do list that have no starting time or length. You can schedule recurring events, although this doesn't work as flexibly as in DateBook. You also can set an alarm to remind yourself of an upcoming event, but the alarm appears on your monitor only if ACT is running in the foreground.



Keeping in Contact ACT for Macintosh lets you attach notes of unlimited length to records in the contact database. A customizable tool palette provides access to ACT's major functions.

ACT lets you view your schedule in daily, weekly, or monthly format. You can turn off display of timeless activities in the day and week views to make extra room for scheduled events. The monthly calendar shows the names of contacts associated with each day's events; clicking on a date brings up a complete list of that day's calls, meetings, and to-dos. Alas, all three schedule windows are fixed-size, so you can't adjust them to fit your monitor. And their modal design prevents you from toggling between the contact and schedule views.

ACT's word processing module sports all the usual functions, including a spelling checker, and you can import and export documents using the supplied Claris XTND file-translation filters. Unfortunately, the word processor is relatively poky at scrolling through long documents. When you create a new document, you can base it on a template that specifies which contact fields to incorporate. ACT ships with templates for letters, fax cover sheets, and envelopes, and you can supplement these with your own new templates. Templates can be programmed to ask whether to import data from a single contact or a group of contacts, a handy way of sending a memo to several people at once.

Although most Macintosh users dislike reading manuals, old hands have learned to appreciate a manual's role in revealing the fine points of a program. Unfortunately, ACT's *User's Guide*, although well organized, doesn't go far enough. Many important features are covered only in the abysmal *Reference Guide* that is organized alphabetically rather than by function—even patient readers are sure to be frustrated by numerous cross-references. ACT for Macintosh has several laudable features, but I'm afraid that its poor documentation and a few rough edges prevent me from awarding it a higher rating.

—FRANKLIN N. TESSLER

KEEP THE COLOR IN HOUSE

Matchprint-quality

Continuous-tone,
dye-sublimation color

11"x17" full bleed
8 1/2"x11" full bleed

300 dpi



100% Adobe PostScript Level II

EfiColor proof-to-press
color-matching technology

Industry's fastest
Adobe Photoshop printing

PROOFPOSITIVE PROOF. 11"x17" \$9.

Tired of waiting for proofs and paying sky-high prices?

SuperMac offers down-to-earth affordable Matchprint-quality dye-sublimation prints, right on your desktop. Starting at just \$6,999.

Introducing the ProofPositive printers. Everything you need for proof-to-press color matching: Adobe PostScript Level II.

EfiColor color-matching technology. The industry's fastest Adobe Photoshop printing. One- and two-page formats. And a lot more.

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

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

And stop throwing money out the window.



SUPERMAC.
The SuperSource for Color

© 1992 SuperMac Technology, Inc. All rights reserved. SuperMac, SuperMac Technology, and ProofPositive are trademarks and SuperFacts is a service mark of SuperMac Technology, Inc. PostScript is a registered trademark and Adobe Photoshop is a trademark, which may be registered in various jurisdictions, of Adobe Systems Incorporated. EfiColor is a trademark of Electronics for Imaging, Inc. All other brands or product names are the trademarks of their respective holders.

Circle 88 on reader service card

Maya 2.0
Computer

800-998-0093

Power Tools!

\$3 Overnight Delivery

FWB - 120 MB ext.  Pockethammer
\$699 #7566

FWB Internals
7579...Hammer 120is LPS599
2334...Hammer 240is LPS979
1795...Hammer 300i 5.25"1599
1794...Hammer 425i 3.5"1499
5567...Hammer PowerBook 80 2.5"719
5568...Hammer PowerBook 120 2.5"799

FWB Externals
7566...Pockethammer 120 MB699
2314...Pockethammer 240 MB1159
1803...Pockethammer 425 MB1599
1801...Hammer 300 MB1789
7991...Hammer 1000 FMF - 1 Gig2249
7319...Optical Hammer 130M 3.5"1589

SIMMS

Due to the great volatility of the current DRAM market, and to our commitment to aggressively pass on savings to our customers, Maya 2.0 retail SIMM prices are adjusted daily. Please call us for today's lowest SIMM prices.

Hayes

8186...Optima 144389
5970...Optima 96145
5971...Optima 24669
5024...Ultra 144599
7391...Ultra 9600399
7440...Ultra 24399

Ultra 96 Bundle

The Ultra 96 is a networkable modem with V.32, V.42, V.42bis, MNP5 and comes with Smartcom II and Hayes Connect software.

\$649

Part # 1610


Accelerators

DayStar 
1667...Universal PowerCache 40 w/Math985
1734...Universal PowerCache 60 w/Math1445
1692...Mac II Cache Adapter46
1813...FastCache 040 Quadra277
3594...Dualport IIe w/FPU165
5501...Equalizer LC185

Radius
10314...Radius Rocket 25i1299
2849...Radius Rocket 25 mHz1679
7870...Radius Rocket 33 mHz2199
2888...RocketShare439

TransWarp LC

40MHz 68030 with Math Coprocessor
#4903 **\$995**

Applied Engineering 
4850...FastMath Classic II 16 MHz w/FPU109
2464...QuickSilver199
3317...TransWarp SE 40 MHz1119
7322...TransWarp CI 50 w/FPU1395

Applied Engineering

Input Devices

Kensington 
2547...Turbo Mouse 4.0105


Microtek Scanners 
5438...ScanMaker II Mac899
5441...ScanMaker IIX1249

Wacom
9110...Wacom 6 x 9 Digitizing Tablet499

Networking

Sonic Systems
7571...PowerBridge99
7572...LaserBridge135
7573...SuperBridge169
7575...Radar269

Asante
2583...FriendlyNet to 10 Base-T adapter79
1739...MC3MB NuBus Ethernet Card199
2575...EN-SCSI 10Base-T Ethernet SCSI249

Dayna Communications 
8719...EtherPrint339
2540...DaynaPort EII/10Base-T149
3687...DaynaPort SCSI Link 10Base-T269
5363...TRX 10-T FriendlyNet Adapter87

Farallon 
2203...PhoneNet Plus Din 8 Connector31
4869...PhoneNet Din 8 10 Pack195
1142...Ethernet Starlet279
4938...EtherMac NuBus Card159

Shiva 
6555...LaniRover/L599

Software Upgrades

Proof of Purchase Required: Mail or fax us the first page of your user manual.

4728...Aldus FreeHand 3.1149
4725...Aldus PageMaker 4.295
8173...Microsoft Works 3.079
1503...Microsoft Word 5.1125
5237...Microsoft Excel 4.095
4711...WordPerfect 2.189
4752...Claris FileMaker Pro 2.089
4729...Claris MacWrite II69
4733...Claris MacDraw Pro99
4732...Claris MacProject II99
5259...T/Maker WriteNow49

Video


E-Machines
9070...ColorLink DGT 8-bit Card w/10T510
10321...ColorPage T16 II 16" Trinitron1299
9064...ColorPage T19 II 19"2299

Radius
1736...PrecisionColor Display/202499
2960...VideoVision2089
4180...Full Page Display639

NEC
4249...MultiSync 4FG 15"779
4252...MultiSync 3FGX 14"669

Nutmeg 
10275...Monochrome Portrait w/ Card519

Drives

Applied Engineering 
5290...Plus Drive (FDHD for Plus & SE)299
8361...FDHD Drive229

PLI
4645...PLI Infinity 3.5" Optical 128 MB1549
3682...PLI 240 MB889
7933...PLI 212 MB Mini719
7145...PLI 520 MB Mini1439

NEC
4132...Multimedia Gallery/CDRW865
4146...CD Express/CDRW429

CD Technology
8057...Porta-Drive CD ROM579

Modems

Shiva 
3443...Netmodem 2400339
6917...Netmodem v.32 96001039
2004...Netmodem/Ethernet (10Base-T)1475

Logicdata Technology
5523...Quicktel Xeba M1414XV289
5525...Quicktel Xeba M9624XV149

Zoom Telephonics 
1168...AMX 2400 Baud Modem63
7757...FaxModem AFX84
3576...FX9624V 24/9600 v.42 Fax Modem127
4688...VX V.32bis 14,400 Modem227
3553...VFX V.32bis 14,400 Fax/Modem267

Maya 2.0 Hours:
8:30 am to 8:00 pm
Eastern Time

MDS SyQuest

44 MB Removable Cartridges 10 for \$615 #9728 **\$65 ea.**


5912...44 MB SyQuest Cartridge65
3603...88 MB SyQuest Cartridge99

MDS Removable Drives
5533...44 MB w/AutoDoubler439
5532...44 MB w/Norton Utilities439
5534...88 MB w/AutoDoubler539
5535...88 MB w/Norton Utilities539


ZOOM #3553


\$267
VFX V.32bis
14,400 baud Data & S/R fax with Software and Cable


PowerBook Gear

Applied Engineering 
8800...PowerBook Charger195
8799...Auto Adapter67

Asante
2555...10Base-T PowerBook SCSI279


BTI 
7632...PowerBook Battery62


Connectix 
8441...CPU PowerBook Utilities49


Dayna Communications 
5306...DaynaPort SCSI Link (thin)299
5414...SCSI Link-3 (thick, thin, 10Base-T)325


E-Machines
10323...PowerLink Desktop 10T (PB Dock)609

Envisio
1848...PowerBook Display Adapter629
2411...ColorBook 16 (2 MB)949

Kensington 
1118...Compact PowerBook Case49
5976...PowerBook Key Pad99

PSI Integration 
5320...PowerModem155
6961...PowerModem II235
7798...PowerModem III329
7786...PowerModem IV425

Sophisticated Circuits 
7425...PowerPad79

Ullitron 
3012...PowerSwap25
7603...PowerBak Pak Case74

Global Village

7730...PowerPort Bronze Fax197
7720...PowerPort Silver V.42bis Fax369
7710...PowerPort Gold V.32bis Fax429

PowerPort Gold

Internal fax modem for the PowerBook featuring: 14,400 bps data and 9600 send/receive fax, V.32bis, V.42bis, and MNP 2-5.
#7710 **\$429**

* Money Back Guarantees

If you are dissatisfied for any reason with your purchase of an item covered by a Money Back Guarantee simply call us for a return authorization. Then return the product with all packaging, registration cards, etc. in original condition within the guarantee period and receive a refund or credit on your credit card. We reserve the right to limit quantities on returns.

 30 day guarantee, or  60 day guarantee.

Why buy your next Macintosh from Maya 2.0?

• \$3 Overnight Shipping • One Year Warranty
• NEW Hard Drives in all used Macs
• Toll FREE Technical Support
• Stay on top of changing technology
• with Maya 2.0 Macintosh Computers
800-998-0093



CALL 800 998-0093

Auto Doubler
Automatically double your disk space without the wait. Just install. That's all.

MDS SyQuest
44 MB Removable Cartridges 10 for \$615 #9728 **\$65 ea.**



ClarisWorks #3903
\$199

Claris

1129... MacWrite II	89
1117... MacDraw II	139
1123... MacPaint II	86
3836... FileMaker Pro 2.0	268
3531... Resolve	125
8734... HyperCard Dev. Kit	139
2518... MacDraw Pro	275
1745... MacProject Pro	409
8007... Claris CAD 2.0	599

Dataproducts 1560
\$3195 #10326
High-Performance 11 x 17,
400 dpi Laser Printing!



800-998-0093

PRINTERS

10318... DataProducts 960	1695
10319... DataProducts 965	2595
1880... CoStar - LabelWriter II Plus	285
1884... CoStar - LabelWriter II Mac	185
6514... HP - DeskWriter B&W	479
2964... HP - DeskWriter 500	599
7665... HP - DeskWriter 550C	849
8368... HP - LaserJet 4M	2249
4505... Microtek - TrueLaser	1349
5377... NEC SilentWriter Model 95	1439

Maya 2.0
Computer

FAX 802
496-6596

\$3 Overnight Delivery

Value Added Mail Order

Graphics Software

Aldus	
7088... PageMaker	494
1330... FreeHand	394
4731... Persuasion	325
6574... Personal Photo	99
Deneba	
3227... Canvas	259
Light Source	
3733... Cloto	275
Quark	
7612... Quark XPress	549
OIVA Corporation	
3011... VideoShop	369
MacroMedia	
5067... MacroMind Director	799
3450... SwivelMan	596

Utility Software

Aladdin Systems	
6740... StuffIt Deluxe	65
Berkeley Systems	
2196... After Dark & More After Dark	39
3392... Star Trek Screen Saver	34
Casa Blanca	
9225... Driveshare 5 Pack	85
1593... Drive 7	49
Dantz	
5255... Retrospect	147
7945... Retrospect Remote	264
3393... DiskIt Pro	72
DataViz	
1823... MacLink Plus	129
4842... MacLink Plus Translators	109
Datawatch	
8561... 911 Utilities	62
2482... Citadel w/ Shredder	62
6978... MVP Bundle	144
4803... Virex	62
Fifth Generation	
3955... Suitcase	53
7404... DiskDoublor	45
4838... AutoDoublor	58
Insignia	
9726... Entry Level SoftPC	125
3229... SoftAT	299
Now Software	
1793... Now Up-To-Date	65
6925... Now Utilities	95
Symantec	
6748... Norton Utilities For Mac	95
5175... SAM	64
5724... SUM II	95

Communications

CF Software	
8067... QuickMail 10 User	375
Fazallon	
8605... Timbuktu	129
6513... Timbuktu Remote Twin	169
FreeSoft	
6115... White Knight II	85
Hayes	
5101... Hayes Connect	75
2300... Smartcom II	84
Software Ventures	
1964... Microphone II	139
3455... Microphone Pro	209
1842... Personal Microphone	36
2019... Microphone Pro Go Bundle	199
STF	
7644... FaxManager Plus	74
7645... Fax STF Net	155

Business Software

Aclus	
5618... 4th Dimension	509
CheckMark	
5863... Multitagger	225
5862... Payroll	169
Lotus	
3606... 1-2-3 For Mac	289
WordPerfect	
3800... WordPerfect For Mac	279

Education & Fun

Broderbund	
3572... Kid Pix	34
7293... Kid Pix Companion	23
3307... A-Trait	39
8298... Where in America's Past is Carmen	35
9049... Arthur's Teacher Trouble	41
5317... Spelunk and the Cave of Mr. Seudo	29
5969... Prince Of Persia	29
8286... SimEarth	40
1910... SimLife	40
Davidson	
2574... MathBlaster Plus	34
3822... Talking Spell-It Plus	28
Inline Design	
7650... S.C. Out	35
7646... The Tines	35
7652... Cogito	35
EarthQuest	
8050... EarthQuest	34
3118... Ecology	34
5294... Time Treks	34
Interplay	
1894... Battle Chess	29
7111... Battle Chess Enhanced CD-ROM	45
Spectrum Holobyte	
4835... Super Tetris	28
8181... Vette	33
The Learning Company	
2870... Talking Reader Rabbit	34
3272... Outnumbered	34



Microsoft #3669
\$295
Excel 4.0

Microsoft	
4902... Word 5.1	295
9445... Mail 3.0 Server	269
2565... Microsoft Project	445
2884... Microsoft Works	155
5454... Microsoft Office	475
2866... Microsoft File	123
2878... PowerPoint	295

Floppy Disks

3297... Sony 3.5" 800k Disks	(10) ... 9
6148... Sony 3.5" 800k Disks	(30) ... 25
3298... Sony 3.5" 800k Disks	(10) ... 15
6375... Sony 3.5" FDHD Disks	(30) ... 42
2214... Fuji 800k Disks	(10) ... 9
2242... Fuji 800k Disks	(50) ... 32
7379... Fuji FDHD Disks	(11) ... 14
2241... Fuji FDHD Disks	(50) ... 59
2243... Fuji 800k Color Disks	(10) ... 10
2239... Fuji FDHD Color Disks	(10) ... 16



SuperMac #9075
SuperMatch 21
\$2699

GENUINE
Apple LaserWriter
TONER \$89
GENUINE
HP Deskwriter Ink Carts
3 PAC \$52



Chipsoft & Intuit #8059
MacInTax & Quicken
\$49



Adobe #8171
\$368
Illustrator/
Dimensions
Bundle!

Adobe	
10167... Dimensions	93
6644... Photoshop	548
5001... Streamline	119
5750... Adobe Type Manager	59
10289... SuperATM	89
6957... TypeReunion	41
6098... TypeAlign for ATM	61
8794... Type On Call CD-ROM	56
4145... Premiere	429

BeagleWorks
Word Processor,
Spelling/Thesaurus,
Spreadsheet, Chart,
Database, Draw, Paint,
Communications
Part # 3119
\$69

Maya 2.0
Computer

Call us for a Quote

We Buy Macs

800-998-0093

Maya Computer 2.0, Waitsfield, VT 05673
802-496-7650 • FAX: 802-496-6596
"The Bridge" BBS: 802-496-9330

- VAMO** Value Added Mail Order
- Streamlined Order Entry
 - \$3.00 Overnight Delivery
 - Money Back Guarantee*
 - Toll FREE Technical Support
 - Ecologically Sound Packaging
 - Electronic Bulletin Board Service
 - Latest Product Versions Only

Integrated Software

Microsoft Works 3.0

PROS: Easy to learn and use; good manual and help system. **CONS:** Sluggish performance, especially on 68000 Macs; mediocre integration between modules; some bugs. **COMPANY:** Microsoft Corporation (206/882-8088). **REQUIRES:** Mac Plus; modem; System 6.0.5. **LIST PRICE:** \$249.



FOR YEARS, MICROSOFT WORKS WAS the dominant integrated-software package for the Mac, chiefly because Works was the only major integrated package available. After version 2.0 was released in 1988, the program's development languished, with only minor maintenance releases in the next four years. Serious competition for Microsoft Works arrived in 1991 from Symantec's GreatWorks and Claris's ClarisWorks, prompting many users to switch. Finally, a completely rewritten Microsoft Works has arrived, and while longtime loyalists aren't likely to desert the ship, the new Microsoft Works probably won't make many new converts. Works 3.0 has significant performance problems and some bugs, and it falls short of ClarisWorks and GreatWorks in integration between modules (see "All-in-One Programs," *Macworld*, June 1992).

Microsoft Works 3.0 consists of five modules: word processor, database, spreadsheet with chart, draw, and telecommunications. The draw module is new; previously, drawing tools were a part of the word processing module. The program's interface has undergone a welcome face-lift; under System 7 it sports an attractive 3-D look. Each module now has a floating tool palette that lets you use

the mouse to accomplish many tasks. There is a good help system, and balloon help is also available. Other System 7 features supported include TrueType fonts and the Apple Communications Toolbox, and Microsoft says the program is 32-bit clean. Works doesn't support publish and subscribe or Apple events.

Installing Microsoft Works is easy; an included installer program copies Works and installs system resources as needed. A small annoyance for people with more than one hard drive is that the installer requires that you put the program on your start-up drive. A complete installation, with dictionaries, help files, and sample documents, requires almost 5MB of hard drive space. I tested Works using the program's 1MB default memory partition.

Microsoft Works 3.0 is immediately familiar to users of previous versions. Although the program has several new features, there are fewer than might be expected for an update that was four years in the making. The new version has improved headers and footers for all documents; better support for color, with a new 256-color palette; and better internal memory management, which allows you to have more windows open simultaneously. And if you use Microsoft Mail, you can use Works to send and receive E-mail messages. The word processor now supports footnotes and endnotes; improved mail merge; and a better spelling checker and thesaurus. Unfortunately, you can't convert custom user dictionaries from the 2.0 version, which I think is a major oversight.

The database allows you to name and save record-selection criteria, save up to 16 forms, and print labels and envelopes from within the database. In the spreadsheet module, charts are now a layer over the spreadsheet, rather than a separate document. The new draw module includes linked text columns for desktop

publishing, object rotation, and automatic 3-D and shadow effects. The completely new telecommunications module is based on Apple's Communications Toolbox and has the usual dialog boxes for modem speed, setup, and file-transfers. File-transfer protocols include Xmodem and Kermit; there are no Ymodem or Zmodem tools available from Microsoft, although such tools are available at extra cost from Seaquest Software (503/531-0252). The phone numbers and settings for each BBS or online service you call are

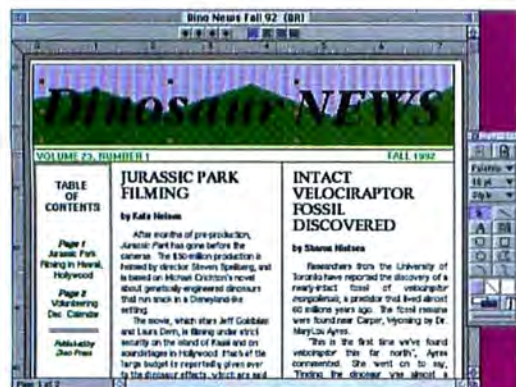
saved in a separate communications document. You can record a series of keystrokes and responses, and store them as an automatic log-on sequence. You can also use Works' macro feature to automate other online actions. An on-screen status bar can tell you how long you've been online or how much the session is costing you in online charges. The telecommunications module is adequate, although I'd like to see a Zmodem tool included with the program.

Microsoft Works uses file-translation technology from DataViz, maker of the MacLinkPlus translation package. In addition to the file translators included with Works, you can buy translators from DataViz that will translate files from a wide range of Mac, Windows, and DOS programs to and from Works. While Microsoft includes a selection of translators, it doesn't include translators for Microsoft Word 3.0, or for Excel 4.0 for the Mac. There are, however, workarounds for both of these.

Works 3.0 is easy to learn and use. The tutorial supplied with the program steps you through basic document creation, and the manual is adequate. The word processor, which is the heart of any integrated program, can easily handle most business correspondence. You probably shouldn't try to write a book with Works, but it should be fine for most writing projects. The same goes for the spreadsheet and database modules; they're capable, but not spectacular.

Microsoft Works 3.0 has a number of bugs and problems, ranging from incompatibilities with common third-party extensions, to odd design choices, to outright crashes. The program is incompatible with and crashes with Super Boomerang, part of the popular Now Utilities package from Now Software. I experienced other occasional, unexplained bombs, even when I had all extensions turned off. In the database module, \mathbb{H} -L previously toggled between the List view and the Data view; now it goes to the List view and stays there. The database also deals oddly with reports—for example, if you make a character change (font, style, or size) in a report, that same change is reflected in the List view (and vice versa). This doesn't make much sense, as part of the idea of being able to save different report formats is being able to customize reports for different purposes. These changes, among others, have brought complaints from several users on the online networks.

Performance in Works also needs some improvement. Scrolling was very slow in the draw mode, running on an



Drawing a Newsletter Works 3.0's expanded drawing capabilities allow improved control over color and linked text columns, as shown here. Note the floating tool palette, which lets you easily set font attributes, and contains the drawing tools.

Creating A Masterpiece Starts with 1200 dpi...



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 11-by-17-inch paper for all your oversized jobs.

Give us a call for some sample output from the new Unity 1200XL. You'll see. Creating in-house masterpieces has never been so easy.

Unity 1200XL Features

- 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
- SmartSense™ automatically switches between PostScript™ language and PCL
- Flexible paper handling up to 11"x17" (A3) with up to 3 paper sources (optional)
- Expandable RAM
- Software-upgradable controller

All the features above plus...

LocalTalk®, parallel, and serial (optional Ethernet) ports. Multi-Platform Compatibility for just...

\$9,995

1200 dpi on a budget!

LaserMaster 1200XL Personal Typesetter

\$6,995

The highest resolution on plain paper—at a bargain price! This bus-based typesetter prints 11x17-inch, 1200x1200 TurboRes output. Mac or PC versions available.



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.



LM LASERMASTER®
TURBORES TYPESETTING DIVISION

1-800-950-6868 ASK
1-612-944-9330 FOR
(FAX) **1-612-944-0522** DEPT.
28K

© 1992 LaserMaster Corporation, 6900 Shady Oak Road, Eden Prairie, MN 55344. LaserMaster Europe Ltd., Hoofddorp, 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

SE/30 in 8-bit color and a color monitor. The database module is slower in some find and sort operations than in Works 2.0, although to be fair, saving a database is much faster in version 3. People with 68000-based Macs, such as a Mac Plus or Classic, may be better off to stick with Works 2.0e until Microsoft improves the new version.

With Works 3.0, Microsoft delivers marginally improved functionality to a large installed base of users. The problem is that the world has changed in the past four years; Works is no longer the only kid on the block. ClarisWorks and GreatWorks take fresh approaches to the integrated-software problem and deliver more capability for the same price. I recommend Works 3.0 for longtime Works 2.0 users who have many documents in the old version; it would be difficult for these users to make the switch to a new product. But if you're shopping for an integrated package for the first time, you should take a look at the other packages before you write a check.—TOM NEGRINO

Intelligent Agent-Based Utility

Magnet 1.0

PROS: Searches by file attribute or content; requires no scripting; file-synchronization feature; can automatically log on to remote volumes using AppleTalk Remote Access. **CONS:** No Boolean search operations. **COMPANY:** No Hands Software (415/321-7340). **REQUIRES:** Mac Plus; 2MB of RAM; System 7. **LIST PRICE:** \$129.95.



ALTHOUGH COMPUTERS MAKE ROUTINE work of jobs that would be impossible to perform manually, most computerized tasks still demand a good deal of human interaction. For years, computer visionaries like Alan Kay have predicted that someday smart software "agents" would go about their business independently. Magnet, billed as the first intelligent agent for the Macintosh, automates the laborious task of file management on a local disk or over a network. User-specified events trigger Magnet's agents (also called magnets); in response, and operating unattended, the magnets scavenge designated volumes looking for files and folders to copy, move, or alias.

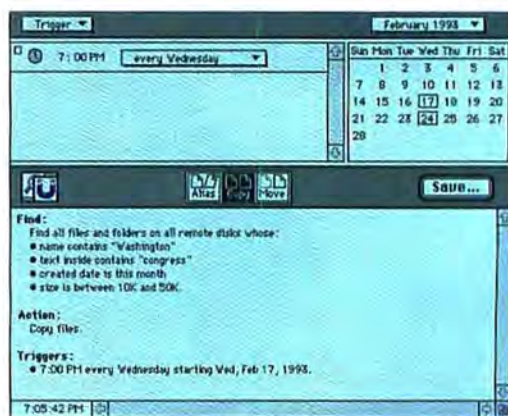
Creating a magnet is a straightforward process. Unlike UserLand Frontier, which provides many more capabilities but forces you to learn a scripting language, Magnet lets you control the Mac Operating System via a system of pop-

up menus. The first step uses an interface similar to System 7's Find command to tell Magnet what files and folders you want to look for. Magnet's filters let you scan by name, kind, location, date, label, or size. You also can search for files containing specified text strings, something you can't do with the Finder. Magnet doesn't support Boolean search operations, though, so you can't look for files that contain Clinton AND Bush, for example.

When you finish specifying your criteria, you can manually scan to test your search parameters. As Magnet works, files and folders that meet your specifications appear in a scrolling list. You can select items from the list one at a time, and open, locate, copy, move, create aliases for them, or put them in the Trash, but you can't shift-click to select multiple items.

The next step is to indicate when the magnet should run. Magnets can be set to activate on a given date and time, or to repeat regularly (say, every Friday at 5 p.m.). You also can direct magnets to launch whenever the Mac is idle, or just before shutdown. The program's most powerful feature lets you instruct a magnet to trigger whenever a particular volume is mounted, either locally or on a network. For example, you can create a magnet that automatically backs up certain files whenever you insert a particular floppy disk or cartridge. If you use AppleTalk Remote Access, you can even have a magnet log on for you, mount and search a remote volume, and log off—all without supervision. (For security, you can lock and password-protect magnets.)

The last step before saving the magnet is to tell it what action to perform on the items it finds. (The magnet's location determines where found files and folders will be copied, moved, or aliased. The term *magnet* refers to the agent's ability to "attract" files and folders to its location.) If a found item already exists in the destination folder but has been changed since the last time the magnet ran, Magnet moves the older version into a special Conflicts folder instead of overwriting it, a wise safety precaution. Magnet's Sync function creates a pair of magnets that automatically makes the contents of any two folders identical by copying the most recent versions of all the files into both folders. Although this feature is intended primarily for users who want to reconcile a desktop and a portable Macintosh, it works equally well with any set



Quick Trigger When you create an agent, Magnet displays an updated summary of your search criteria, triggers, and actions.

of folders, even across a network.

Magnets can activate automatically only if the Magnet application is running and the Magnet extension is loaded. Magnet's Control window, accessible from the application, shows the triggers, status, and location of all your magnets, and lets you disable or run them manually; a separate Activity Log keeps track of what happens each time a magnet runs.

No Hands Software trumpets Magnet as a replacement for manual file-management utilities like On Technology's On Location. Scanning by file name, Magnet compares favorably with On Location, easily outperforming the Finder. Because Magnet doesn't use indexes, though, it can't match On Location at searching by content. (Note: If you use Salient Software's AutoDoubler, be sure to get Magnet 1.01. Because of conflicts in the way the two programs process background tasks, Magnet 1.0 cannot scan for text within AutoDoubler-compressed files.)

Magnet's agents are relatively primitive, and the range of triggers and actions should be expanded in future releases. But while Magnet is easy to learn, its concept is so novel that its potential uses may not be immediately obvious to many users—I tinkered for over a week before I discovered just how helpful Magnet could be, automatically cleaning up unwanted files and other housekeeping chores. Magnet's requirement that the application be running for agents to trigger is a potential pitfall, but fortunately, Magnet issues a warning before it quits.

Fault-tolerance also is critical for success. In my tests, magnets always triggered reliably, and problems encountered during execution never caused the application to crash. While single-volume users might prefer other utilities for manual file-management, anyone who routinely works with multiple disks will find Magnet invaluable.—FRANKLIN N. TESSLER



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

Poetry CD ROM

Poetry in Motion

PROS: Effectively combines text and video; clear interface; flawless operation. **CONS:** None.

COMPANY: The Voyager Company (310/451-1383). **REQUIRES:** Mac II; 4MB of RAM; color monitor, QuickTime-compatible CD ROM drive; hard drive; System 6.0.7. **LIST PRICE:** \$29.95.



POETRY IN MOTION, BASED ON A FILM of the same name, juxtaposes performance videos of contemporary poets with the texts of their poems and with taped interviews. The result is a unique presentation that combines the excitement and emotion of the stage with the more reflective appeal of the page.

The 22 authors featured in Poetry in Motion are a culturally and stylistically diverse group, but they share the quality of being performance-oriented and accessible rather than academic. Whether it's beat poets like Allen Ginsberg; pop personalities like Jim Carroll; or writers not primarily known for their poetry, such as Ntozake Shange or William Burroughs, the writers in this selection are as likely to be found in a nightclub or coffee house as in the pages of the *Atlantic*.

Poetry in Motion is easy to install and use. You can read the poems with or without video accompaniment, either as they were performed or as published. I tried the disc on two computers. On a Quadra, the video looked fairly smooth and sound synchronization was convincing. On a IIfx, the visuals were jerky, but they still provided a feeling for the performer's style and personality.

It's not just the videos that make this disc come alive, it's the voices. Voices that bring out the hidden structure and rhythms of a poem, that sing or wail, that color one line ironic, another wistful. Anyone who enjoys poetry will value this

disc. But the drama and interpretive power the performances bring to the verses make Poetry in Motion especially valuable for teachers and librarians trying to inspire new audiences (though some pieces do contain profanity).

It's hard to imagine anyone who has seen this work wondering "but what's the point?" That makes Poetry in Motion a rarity among multimedia projects available today. Better still, it's one of a handful of discs that go beyond providing online instruction or entertainment, offering instead moments of moving beauty, pathos, art.—JOE MATAZZONI

600-dpi Laser Printer

HP LaserJet 4M

PROS: New print engine produces sharper characters; fast print speed; automatically switches between Mac and DOS printing. **CONS:** Price of new toner \$150. **COMPANY:** Hewlett-Packard (800/752-0900). **LIST PRICE:** \$2999.



PRINTING COMPLEX IMAGES USING an older HP LaserJet with a PostScript cartridge was just too slow. Thanks to technology, everything about the new HP LaserJet 4M from Hewlett-Packard improves upon the LaserJet III.

The 4M comes standard with 6MB of RAM (expandable to 34MB); is PostScript Level 2-capable; and has LocalTalk, parallel, and serial interfaces. It comes with the standard 35 Adobe Type 1 typefaces that Macintosh users have come to expect in a laser printer, as well as 35 Intellifont and 10 TrueType fonts for the DOS world.

The printer can interpret HP's PCL (Printer Control Language) and PostScript, and it can accept input from a DOS machine and a Mac at the same time without the user having to set any switches or unplug any wires! This autoswitching is a must in a mixed-platform office. One user can print a Mac document via LocalTalk while another user can print a document from a DOS workstation without either user resetting the printer.

The 4M has an Intel i8960 RISC processor—a big improvement over the 68000 processors used in many of today's printers. Printing times are less for complex graphics from Aldus FreeHand and Adobe Illustrator, for example, and for documents containing many fonts in a variety of sizes. At 300 dpi, print speed is equal to that of Apple's LaserWriter IIg. You will notice a vast difference in performance speed when you compare the

4M at 600 dpi with others at the same resolution, such as the QMS-PS 1700, Xante's Accel-a-Writer, or the Lexmark LaserPrinter 10A (see "Workgroup Printers," *Macworld*, January 1993).

The 4M is also one of the first printers to use the new Canon LBP-EX engine, capable of printing at a true 600 dpi. That means you get four times as many dots per inch as you would at 300 dpi without interpolation. The engine is rated at the standard 8 pages per minute for 300-dpi printing and also for printing simple, single-font documents at 600 dpi. Macworld Lab test results show little discrepancy between the 300-dpi and 600-dpi print time for a 20-page single-font Word document—a mere two seconds!

The people at Canon have done away with the corona wires and replaced them with a roller that actually makes contact with the paper. With all other existing engines, the corona wire is charged and attracts toner from the drum to the paper. This process can result in characters with fuzzy edges, since the wire sometimes produces a stray charge. By making physical contact with the paper, the 4M can print sharper, more-controlled characters. With the new engine comes micro-fine toner—toner whose particles are roughly 20 to 30 percent smaller than previous toner particles. When you combine the new printing method with the microfine toner, 600-dpi resolution, and HP's Resolution Enhancement Technology, the result is clean, sharp output.

The LaserJet 4M is a definite winner when compared with its predecessors. The switch to a RISC processor has accelerated printing complex images and even documents with a lot of fonts. The new print engine and toner guarantee smooth curves and crisp characters. And its all-ports-active feature makes the 4M one of the most flexible printers on the market today.—DANNY LEE

HP LASERJET 4M PERFORMANCE

	600 dpi	300 dpi
Multifont document Word 5.0	216.07	174.59
Single-font document Word 5.0	174.11	172.01
Complex document MacDraw Pro 1.5	168.64	169.89
Complex document FreeHand 3.1	495.81	400.78
4-page document PageMaker 4.2a	148.16	133.59



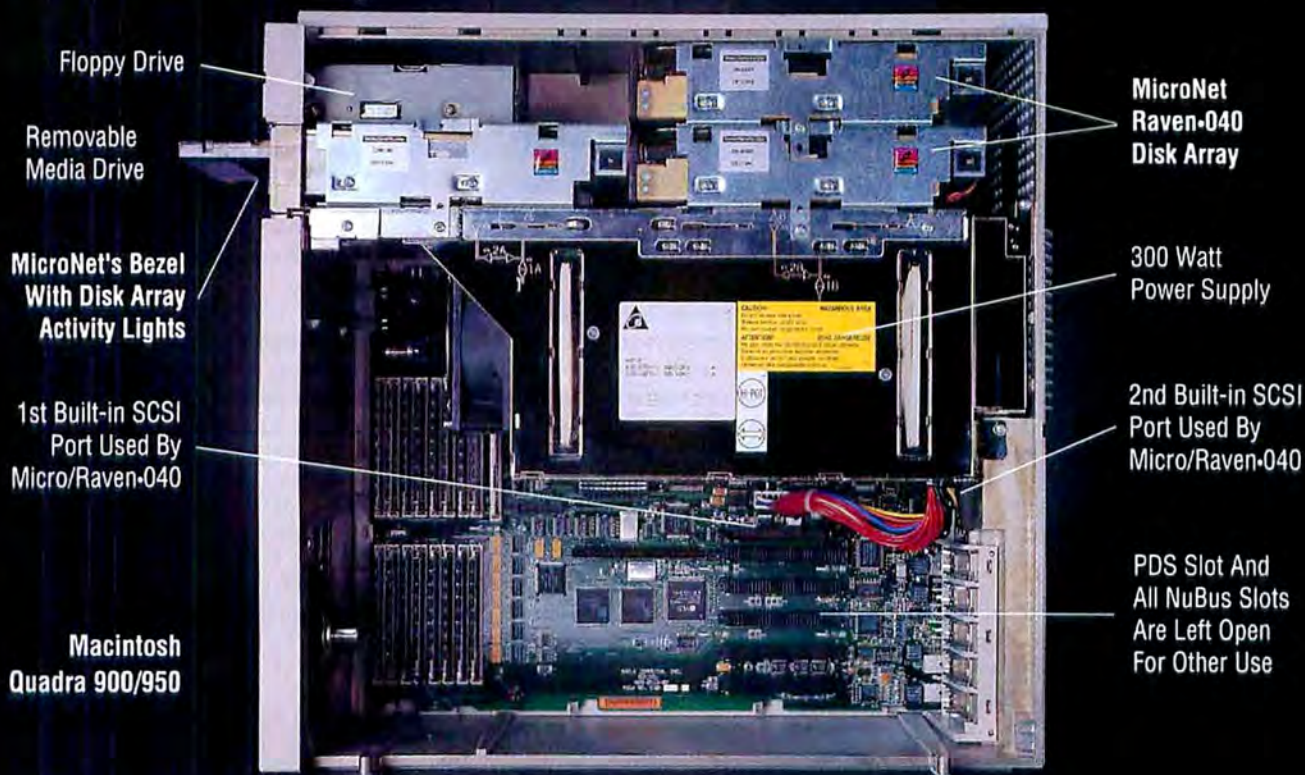
All times are in seconds. For detailed information on the documents used for the tests, see the chart "Rating Printer Performance" on page 136 of *Macworld's* January 1993 issue.



Oye! As the QuickTime performance video at top left plays, the poem at right pages forward. Touch on the window at bottom left to watch an interview.

Disk Array•040!

SAY 'NO' to SLOW – See Latest Raven-040
Disk Arrays – MacWorld/Expo – Booth 2307



High Performance Storage For The Macintosh Quadra 900/950 MicroNet's Raven•040 Internal Disk Arrays

MicroNet's RAVEN brought unbeatable disk array performance to the Macintosh II. Now there's a more powerful Macintosh. The Quadra 950! It's based on 68040 technology and it's fast. The performance of the Quadra can be greatly increased by use of a MicroNet RAVEN-040 disk array.

The RAVEN-040 is a two-drive array employing FAST-SCSI-2 technology. With sustained data transfers of 9.2 MBytes/sec, average access times as low as 4 ms, these new storage systems are six times faster than standard hard disk drives. Available as internal or external systems with capacities from 642 to 5,560 MBytes.



The RAVEN-040 was designed to use the built-in SCSI ports of the Quadra 900/950. The PDS and all five NuBus slots remain open for other use.

The RAVEN-040's built-in performance makes it ideal for graphics, animation, pre-press, digital sound, multimedia, and CAD/CAM, where speed and capacity are paramount.

The RAVEN-040 is the ultimate data storage system for Quadra 900/950. No one can match the power of the RAVEN-040.

Call a MicroNet sales engineer today for additional information and the name of your nearest reseller.
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 the property of their respective owners.

Circle 113 on reader service card

Gray-Scale Paint

Sketcher 1.0

PROS: Excellent reproduction of traditional drawing tools. **CONS:** Can't export record sessions; icons should be smaller. **COMPANY:** Fractal Design Corporation (408/688-8800). **REQUIRES:** Mac II; 2.5MB of RAM; hard drive; System 6.0.5; 32-bit QuickDraw. **LIST PRICE:** \$149.



PACKAGING IS NOT USUALLY GRIST for reviewers, but Sketcher's is so novel, you can't miss it. And you shouldn't. The program comes in a facsimile of a cigar box, complete with a drawing-pad-like manual. Sketcher, a gray-scale paint and image processing program, is wonderful.

Similar in style to Painter, its 24-bit color version, Sketcher offers a multiplicity of effects reproducing the styles and techniques of traditional drawing tools. However, Sketcher is more straightforward, faster, and simpler to operate than Painter.

Sketcher uses floating palettes. The smallest one holds generic tools, such as a magnifying glass and marquee, as well as tools for applying friskets (masks) and importing TrueType and PostScript fonts

for textured text. Other palettes let you customize brush sizes, define fills, edit friskets, and access different paper surfaces.

Drawing implements, such as pencils, charcoals, pens, crayons, and water, are organized by icon in the Art Supplies palette. You select individual tools (Variants) from the Art Supply pop-up menu. All variants can be fine-tuned for penetration (how tools interact with paper surfaces) and concentration (how tools interact with previous strokes), making them infinitely modifiable. In addition, many variants respond to pressure-sensitive input, such as is offered by Wacom digitizing tablets.

You can tear variants off the floating palette for recurrent use (Painter could use this feature), and you can save customized variants, but you can't name them or add them to the pop-up menu; nor can you have two customized versions of a variant active simultaneously. Smaller art-supply icons would also be an improvement. This palette dominates small screens, and torn-off tools can quickly clutter the work area. Still, Sketcher's interface is well designed, logical, and adaptable.

Sketcher's brightness, contrast, sharpening, softening, and posterization effects can be applied to an entire image, selections, or friskets. Sketcher also lets you apply artistic effects to photos as their clones.

If you enjoy dazzling your friends,



Artistic Impression Sketcher offers a wonderful combination of natural drawing effects and computer editability.

you'll love Sketcher's Record Session feature. Turn it on, and Sketcher keeps track of every brush stroke and command. Play it back to see an animation of your creative process. Currently, Sketcher cannot export these animations as PICS files or QuickTime movies. Maybe next version.

The manual is concise, thorough, and peppered with examples, but there are no sample files. However, Sketcher is easy to learn. Doodling and trying out all the interactions is the best way. For all its technological prowess, Sketcher is at heart an artist's tool that encourages creativity. If you draw for a living, or simply like to dabble, you'll find Sketcher irresistible.

—CARLOS DOMINGO MARTINEZ

Telephony Software

PhonePro 1.0.3

PROS: Flexible protocols; icon-based programming; includes database and connection to Micro-soft Mail and CE QuickMail. **CONS:** More suited to developers than end users. **COMPANY:** Cypress Research Corporation (408/752-2700). **REQUIRES:** Mac Plus; 4MB of RAM; hard drive; System 7. **LIST PRICE:** \$950.



WHAT, YOU MAY ASK, IS TELEPHONY? Telephony rears its modern but not entirely attractive head when you dial a number expecting to talk to someone and get "if you wish to speak to customer service, press 1" and you press 1 and then hear "if you're calling about WonderWidget version 3, press 4," and so forth. PhonePro is an application that makes it relatively easy to set up this sort of system on a Mac. Fortunately, it's not simply a tool for driving people crazy. In fact, it's advanced enough to make better and friendlier versions of this apparently necessary evil.

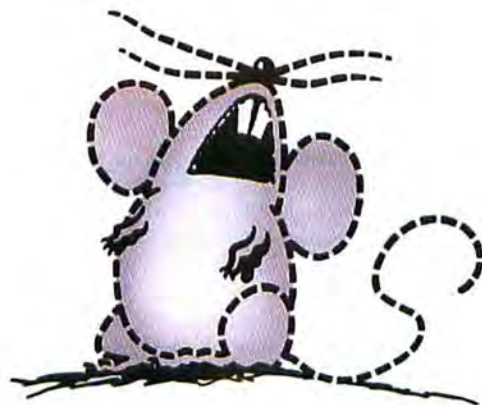
PhonePro includes a 9600-bps, single-line modem with a headset connection and a headset/microphone. You use this setup to record outgoing messages as digitized

sound on the Mac; incoming voice messages are likewise stored and compressed on the Mac's hard drive (a 20-second message takes about 85K of drive space). For managing these messages and storing them in order, PhonePro software presents you with palettes of icons that represent different possible program operations: pick up phone, play message, receive tone signal, pick another message in response to signal, and so forth. You drag these icons to the work space and connect them to set up a protocol; a simple answering machine protocol takes seven icons simply connected in a straight line (Go, Pick Up, Play Msg 1, New Record, Take Incoming Msg, Play "thank you," Hang Up).

The point of PhonePro, though, is really to construct fancier stuff. If you don't have much programming experience (PhonePro strongly resembles the icon-programming schemes in Odesta's Helix, Serius's Serius, and National Instruments' LabView, for example), there are sample scripts that cover PhonePro's two main uses: branched multiple-question scripts and voice-mail operations. PhonePro provides some nice touches for branching scripts. You can generate different outgoing messages from a Word Table, you can make a system that finds a human for desperate callers to talk to instead of dead-ending at a voice mailbox, and you can store

caller information in a database (each database record has eight fields) that date/time stamps each message. PhonePro supports the sort of detail that lets callers punch in a contact's name if they don't know the extension; it's as complete as the best commercial systems. You can use PhonePro not only as your main voice-mail system (it can send messages over a local network as well), but also to forward voice-mail messages to CE Software's QuickMail and Microsoft Mail (there are icons for automated log-on and log-off from these services). And of course you can mobilize all this firepower for outgoing calls too, using it to direct automated telemarketing at people who are simply trying to eat dinner in peace.

PhonePro makes programmed telephony as easy as it's going to get; I set up a multiple-level voice-mail system for a small retailer in a few hours, but I was calling on years of experience in icon-based programming in LabView. If you have no programming background, you might be stuck making only small modifications to the scripts supplied by Cypress—extending PhonePro's capabilities using Apple events, for example, is not an ideal sport for beginners. But PhonePro is a good product, lives up to its claims, and promises the beginning of voice-mail systems with more humane and engaging "personalities" than we've seen in the past.—CHARLES SEITER



DON'T CALL ORKIN.*

When the Mac first came around, everybody loved its *little rodent*. No cursor up.

No cursor down. Man, what a handy device. Then people got into graphic arts.

Whoops. *Mousetrap!* INTRODUCING ARTZ.[™] The flashy, jammin', way cool ADB graphics tablet from Wacom.

ArtZ simply *plugs into your ADB port* and lets you



create graphics using a cordless, batteryless, pressure-sensitive stylus, about the size and weight of a fine pen. Now, creating art on a computer is as *natural* as

creating art on a note pad, a canvas, or even a subway. To see just how flashy and

way cool the ArtZ is, TAKE THIS SIMPLE TEST: (1) Cut out the mouse at the top of the page. Blow it up if you like. Now (2) *trace it* with the mouse

on your computer. Then (3) print it,

and (4) scurry on down with both to your local Wacom dealer. Don't know where one is? Just call 1-800-922-6613. When you get there, (5) trace the mouse on an

ArtZ. *Feels good*, doesn't it? Now (6) print it and (7) compare the two. OK? Now

(8) pull out your pocketbook. You've been doing *mickey mouse art* long enough.

*For the mice that run on a Mac, you can't call for pest control. But for the mice that run on top of a Mac, and under a Mac, and in the cupboards and stuff, call these guys: Orkin Exterminating.



WACOM

Putting technology in its place.[™]

Fax and Data Modem

Sportster 14,400
Mac & Fax

PROS: On-screen help; high-speed throughput; front-mounted volume control; modem cable included. **CONS:** Complicated documentation; data communications occasionally garbled despite error controls. **COMPANY:** U.S. Robotics (708/982-5001). **LIST PRICE:** \$599.



THE SPORTSTER IS U.S. ROBOTICS' first real attempt to target the Macintosh market. True, other U.S. Robotics modems can operate with a Mac, but they're usually bundled with PC software, a non-Mac cable, and perplexing PC-only documentation. The new Sportster comes 100 percent Mac-ready, complete with a high-speed Mac modem cable and Macintosh fax software right in the box.

In data mode, the Sportster is a speed demon; it connects at rates of up to 14,400 bps (bits per second). With the modem's V.42bis/MNP Class 5 data-compression enabled, you can achieve throughput of up to 57,600 bps—depending heavily on the quality of your phone line. The Sportster

slows to whatever speed is necessary to ensure accurate transmission.

In its default configuration, the Sportster always negotiates for the fastest connection and highest levels of MNP protocol. If the connecting modem is operating at a lower speed or does not support the more-advanced features, the Sportster drops its speed and establishes the best connection it can. To take full advantage of the modem's high-speed error-control features, you must use it with telecom software that supports hardware flow control rather than XOFF/XON signaling.

The Sportster provided highly reliable communications when I connected to BBSs and online services at 2400 bps and 9600 bps. I also had good success with Xmodem-protocol transfers, though a staticky phone line still managed to produce a stream of garbled characters on one occasion.

The Sportster's documentation, though still a bit too technical and slanted toward PC users, is adequate. There's also a quick-reference card you can remove from the manual for easy use. Better still, the Sportster can produce its own help screens. To view the help screens, you simply issue the proper AT modem command from within your telecom program. The screens provide a summary of the codes and commands needed to adjust the modem's settings.

As for design, the Sportster has several

features often missing on other modems, such as an easily accessible power button on the side of the unit and a front-mounted volume-control dial that lets you adjust the output level of the modem's internal speaker without issuing a command with your telecom software. There are also nine status lights along the top to indicate when the modem is connecting, sending, or receiving data; set to autoanswer; retransmitting data under error control; or in fax mode.

Like most fax modems, the Sportster is compatible with all 9600-bps Group III fax machines, and in my tests, it sent and received faxes cleanly and reliably. The modem comes with the latest version of Fax/stf, a widely distributed fax application.

With Fax/stf, you can send a fax from within any application with a print command by selecting the FaxPrint extension from the Chooser. The program provides group-faxing capabilities, and you can schedule faxes for future transmission. In the Fax Manager you can store a directory of frequently called fax numbers.

If there's anything disappointing about the Sportster, it's that you probably won't be able to use a lot of its features—unless you have a friend with another full-featured 14,400-bps modem. There just aren't many 14,400-bps modems at this time—but, of course, that's what people said about 9600 bps not too long ago.—JOSEPH SCHORR

Educational Game

SimLife 1.0

PROS: Educational; variety of scenarios. **CONS:** Difficult to learn. **COMPANY:** Maxis Software (510/254-9700). **REQUIRES:** Mac SE; 2MB of RAM; hard drive; System 6.0.2. **LIST PRICE:** \$69.95.



MY HUMPBAC WHALES ARE FLYING! This is not a bug, it turns out, but a feature of SimLife. I also witnessed aquatic llamas and carnivorous squirrels, thanks to rampant mutations. With SimLife, Maxis (which gave us SimCity, SimEarth, and SimAnt) has tackled the formidable task of simulating life itself.

SimLife is a megalomaniac's dream come true. The simulation gives you tools to create mountains, oceans, and deserts; populate your world with fish, fowl, and plants; change climate or terrain at will; invent new species; or unleash natural disasters such as floods, plagues, and comets. What other program gives you a Smite command? (Well, Microsoft Word might—I'm not yet familiar with all its features.)

Anybody can summon a comet; in SimLife, the hard part is creating a well-bal-

anced, functioning ecosystem. Certain plants need cold weather to germinate; carnivores must have other animals to eat; animals must survive long enough to mate and pass on their genes. Fortunately, SimLife's life-forms can evolve, by means of mutations, into plants or animals more suited to a particular environment. As a session goes on, you can see how various species adapt to ever-changing conditions. The manual suggests several scenarios to try out, such as an isolated island community reminiscent of the Galápagos, or the introduction of a destructive alien species into an established ecosystem. You don't have to be a passive observer—you can alter various factors as a

simulation progresses. (My major gripe is that you can reintroduce a species once it's become extinct.)

You view your world through a series of windows, graphs, and status reports. The Map window shows you a bird's-eye view of an ecosystem in action; zoom in to the Edit window to watch individual plants and animals, represented by animated icons. (You're subjected to constant audio feedback, with a spicy "ooh-la-la!" indicating mating, and a sad little "ooh!" signaling a creature's demise.) In the Biology Lab window you specify traits such as intelligence, habitat, diet, and number of offspring. You can check on each species in several Census windows, which include population statistics, a history of mutations and extinctions, and a report on who's eating who.

SimLife's complexity is both a blessing and a curse. Let's face it, life itself is complex. However, one look at, say, the Animal Genome window, with its 23 sliders, 20 buttons, and 4 pop-up menus, is enough to make a budding biologist flee in terror. It'll take you several days to learn SimLife. But it isn't just some arcade game; each simulation produces different results, based on a sophisticated set of rules. Building a successful simulated world isn't easy, but the reward is an increased understanding of the complex interrelationships that sustain life in the real world.—ERFERT FENTON



It's Alive! Despite their often fanciful appearance, the animals you create in SimLife exhibit many of the characteristics of their real-world cousins, including the ability to produce offspring.

Only one printer can give you this fax.



Our goal at NEC is the complete integration of computers and communications. The Silentwriter Model 95fx is just one of many innovative products that help us to realize this goal. For example, we not only developed the first notebook computer with a built-in phone and fax, we make satellite dishes capable of sending data worldwide.



Once upon a time, all faxes looked the same. *Bad.* But with the Silentwriter® Model 95fx multifunction printer/fax, nothing gets lost in the transmission. Imagine PostScript™ language-quality faxes from your printer. It's no fairy tale. Now you can send and receive documents in all their original glory. You'll see beautiful fonts and graphics with none of the dirt and glitches, the jaggies and imperfections, that can turn a wonderful story into a tragedy. Why send a facsimile when you can send an original? Get the NEC Silentwriter Model 95fx multifunction printer/fax and live happily ever after.

The End




Facsimile generated from a Silentwriter Model 95fx.

And these facts.

- 1 A state-of-the-art 6 PPM laser printer equipped with Adobe's PostScript™ Level 2 and HP's PCL5.
- 2 Send and receive faxes in either conventional or PostScript-language formats.
- 3 Patented Sharp Edge Technology delivers 600 DPI-equivalent clarity.
- 4 Automatic interface switching supports both Macs and PCs.
- 5 Under \$2,349 (MSRP). Far less than you'd pay for any printer/fax multifunction combination.



The Silentwriter Model 95fx Printer/Fax

Because  is the way you want to go. **NEC**

PC
MAGAZINE
EDITORS
CHOICE

November 24, 1992
NEC Silentwriter Model 95

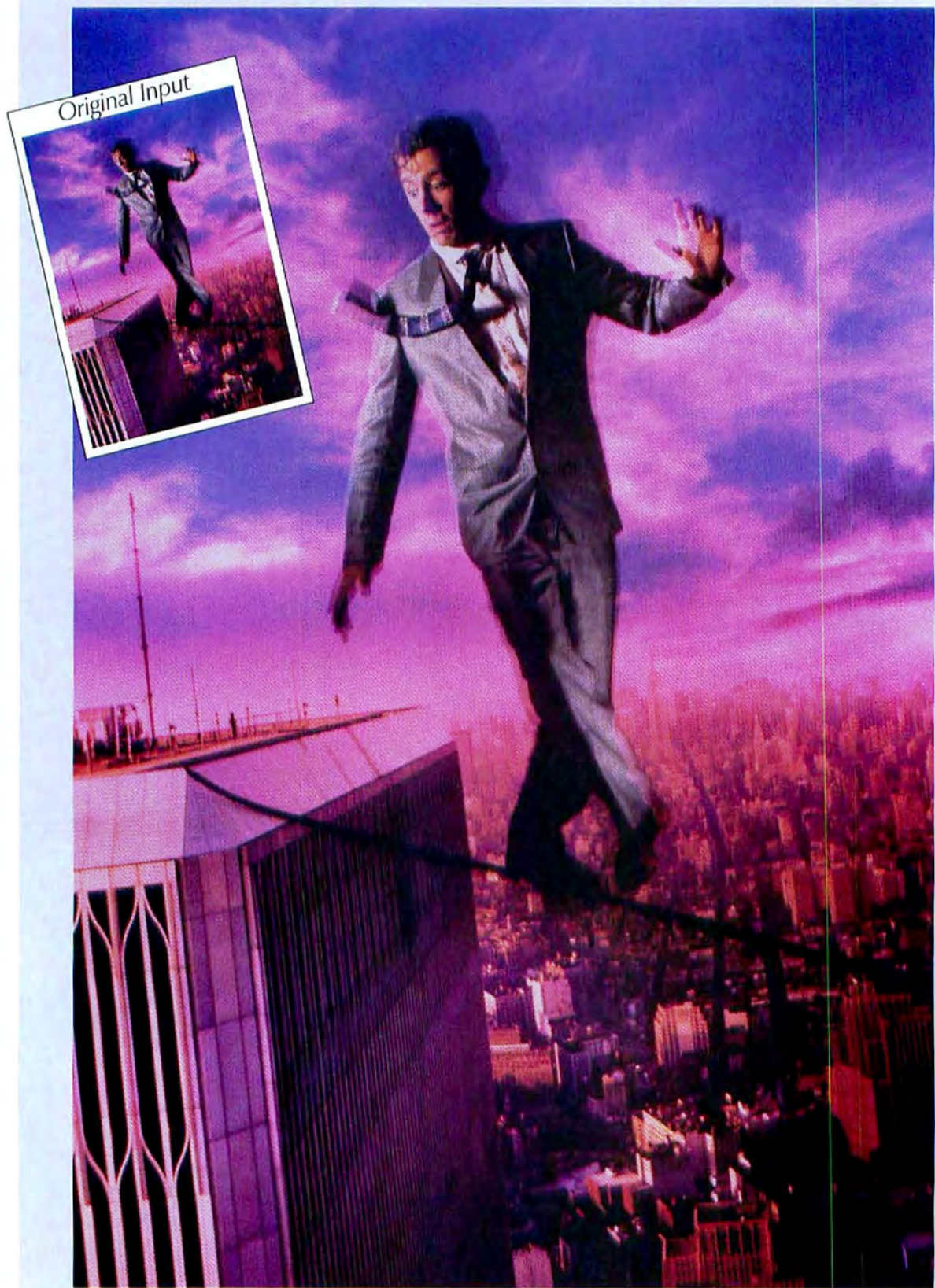
POSTSCRIPT
Software from Adobe

BIS
1992
Printer Of The Year
Silentwriter Model 95

THE PC/COMPUTING
200
BEST PC PRODUCTS
BY CATEGORY
WINNER

*...all the PostScript printers
you'll ever need.*
PC-Computing
The Ideal Windows PC
June 1992

To upgrade your existing Silentwriter Model 95 printer with fax capability (U.S. only), or for more information about the Silentwriter Model 95fx, call NEC at 1-800-325-5500.



The Kodak ColorSense Color Manager helps you match printer output to the original image.

WHEN COLOR CONSISTENCY 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, today for an information kit on the Kodak ColorSense Color Manager. And experience accurate color like never before.



Kodak
COLORSENSE
COLOR MANAGER

Even visionaries need to see reality



Idea-Development Software

Inspiration 4.0

PROS: Elegant interface and easy-to-customize formats; diagram and outline modes are well integrated. **CONS:** Brainstorming capabilities are only as good as the user. **COMPANY:** Inspiration Software (503/245-9011). **REQUIRES:** Mac Plus; second disk drive; System 6.0.4. **LIST PRICE:** \$295.

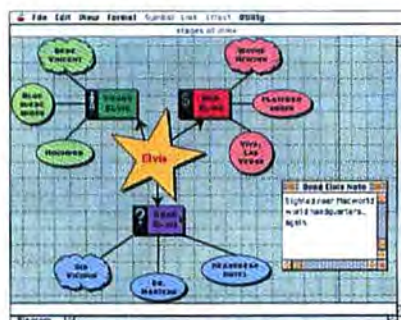


ADMIT IT. FOR YEARS, IF AN OUTLINE was required, I constructed one after the fact. I persisted in the cut-paste-and-rewrite school of composing. Finally I pirated from a train mate a great technique for visualizing ideas. Rather than starting with a rigid, linear outline, the gentleman across the aisle summarized each thought in a word or two, circled it, and linked it to another topic; sometimes he set related ideas in orbit around a circled thought. A topography of the overall concept began to emerge.

The beauty of Inspiration is that you watch your ideas evolve in both a text-based Outline mode and in a dynamic Diagram mode. In the latter, you begin by typing your central concept into the Main Idea symbol. You add topics by typing a word or

two into one of 63 predefined symbols; you can also import or draw custom symbols. To annotate a topic idea, you call up a symbol's Notes Text window; each window holds up to 15K. (I do wish the cursor appeared at the end rather than at the beginning of previous text when you re-open a Notes Text window.) Customizing a diagram with color-coded symbols and a medley of links is just as easy as choosing from a palette.

Whether you are developing a free-form diagram or a well-defined flowchart, space constraints may convince you that it's time to Adopt a Child—Inspiration argot for opening a file linked to a topic; the child file makes the selected topic the Main Idea



Take a Note To annotate any symbol, call up its Notes Text file and record up to 15K of data. (That's nearly five times the length of this review.)

in a whole new flowchart. You can also Print or Disown a Child, and the excellent manual reassures, "Children do not use memory until they are opened."

When you switch to the outline, ideas are arranged in an indented format that mirrors the levels of topics and subtopics in the diagram. All the familiar outliner features are there: collapse and expand; promote and demote; sort; and check spelling. There's even a special treat, the ability to calculate numbers embedded in subtopics and show the sum in the topic, useful when figuring budgets, for example. Topics, subtopics, and Notes Text added to the outline appear automatically in the diagram.

Printing is straightforward; the Fractional Fonts feature improves the quality of files printed in reduced format. You can import files in text-only and Inspiration 3.0 formats, you can import files from Symantec's More, and you can export formatted outlines to most word processors.

Overall, Inspiration is fairly fast, easy to learn and to customize, and the two modes complement each other well. Although it's also touted as a presentation tool, Inspiration works best as a vehicle for organizing and developing ideas. Unfortunately, it can't be expected to solve all our conceptual problems. After all, the old saw still holds: You can write only as well as you can think.—SUZANNE STEFANAC

Geography Software

MacGlobe 1.3

PROS: Great assortment of maps and statistics; just about ideal for high-school-level projects; can export graphics. **CONS:** Performance problems on low-end hardware and small monitors. **COMPANY:** Brøderbund Software (415/382-4400). **REQUIRES:** Mac Plus; hard drive; System 6.0.4. **LIST PRICE:** \$59.95.



TEN YEARS AGO, COMPUTER MANUFACTURERS and educators assumed that computers would revolutionize and accelerate education in the United States. It's safe to say that the bright hopes in this area have not been realized, and the problem has been a lack of high-quality, imaginative software. One significant bright spot in education is the best-selling lineup of products from Brøderbund, the people who made Carmen Sandiego a household name. Recently the company acquired MacGlobe, outfitted it with some modifications and a new manual, and dropped the price.

MacGlobe's atlas of the world was correct in early 1992: there's just one Germany, the parts of the former Soviet Union are correctly represented, and what was for-

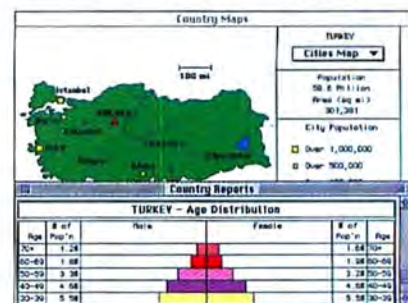
merly Burma with its capital at Rangoon is now called Myanmar administered from Yangon; but Bosnia is still part of the Yugoslav Federation. Because it's on disk, it's easily updated (updates cost \$25), and updates include not just map changes but also changes in tabulated data.

The quantity of information in MacGlobe is impressive. Besides maps and little bits of fun (the program displays flags and plays national anthems), MacGlobe offers complete demographic and economic data (birth and death statistics and projections, age distributions, health and educational data, exports, imports, tourism, GNP). The data is presented not just in standard bar charts but also as thematic maps—in thematic maps color codes or patterns indicate numerical values for parameters such as literacy or infant mortality. MacGlobe also computes distances between map points, converts currencies, and computes time differences around the globe. The documentation of data sources is exceptionally thorough, so students using MacGlobe for school projects can find the original documents.

This program faces some problems common to all Mac-based atlases. First, the 72-dpi standard display means that the Apple 12-inch monitor, ubiquitous atop LCs in classrooms, gives pretty grainy maps. Another problem is that graphs are saved as

PICT files for easy Clipboard export to word processors or page-layout programs. Most of the data presented in charts would be more useful in compact form as tabbed text for import into other graphics, statistics, or spreadsheet programs. Finally, this program tests the usefulness of scrolling lists as a selection device: scrolling through 208 countries with only 5 entries visible is fairly annoying.

But the high-quality data selections and flexible mapping make this program a necessity for schools and a fascinating intellectual adventure for home use. It could stand some improvement in data export, but it's the best geography product currently available for the Mac.—CHARLES SEITER



All about Turkey You can switch through different map views of any country or region in MacGlobe and call up an impressive array of demographic and economic statistics.

Make it clear.

Make it colorful.

Make it happen.



The HP DeskWriter 550C
for the Mac.
\$1,099.

Great things happen when you have a DeskWriter 550C printer from Hewlett-Packard. Because it's never been so easy to print high-quality black and white. And brilliant color.

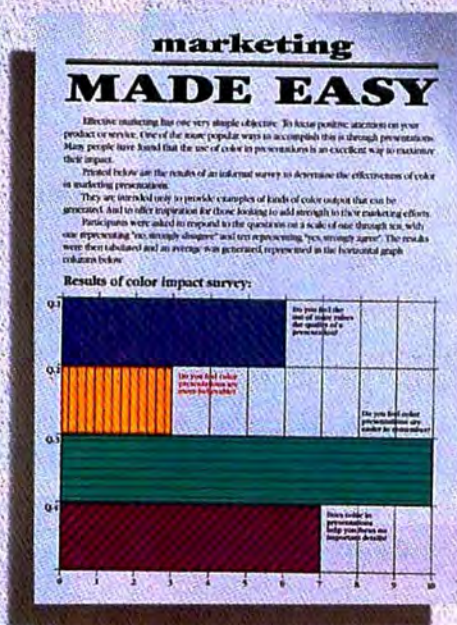
The DeskWriter 550C prints true black at 300 dots per inch. Clean, crisp and sharp, for the kind of professional print quality you expect from HP.

For added impact, the DeskWriter 550C makes it easy to add color to your work. The black and color cartridges are built in and work together. Giving you access to millions of colors.

You can get an HP DeskWriter 550C, or the DeskJet 550C for PCs, for a suggested list price of only \$1,099.* So if you're looking for an affordable way to make a powerful impression, get a DeskWriter 550C printer. Then see what happens.

For another cost-effective way to get great-looking black and white and color, the HP DeskWriter C and the DeskJet 500C are now available for a low price of just \$779.*

Call 1-800-552-8500, Ext. 7119 for the name of the authorized HP dealer nearest you.* To receive information by fax call 1-800-333-1917, choose HP FIRST, document #9607.



DeskJet Printers
Make it happen.

MAC DIRECT

Specialists in Mac Storage

Monitor Special

Sampo 20" Color\$1398

- Perfect for DTP & CAD/CAM
- Include Interface cards

Trinitron 19" Color ...\$1998

Full Page Display\$398



14" Sampo Color.....\$398

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



14" SONY Trinitron.....\$698

- SONY 1304 for the Mac LC, Si, CI and Quadra



16" SONY Trinitron ..\$1098

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

Sampo 20" Color System 1398.00



Sampo 20" 8 Bit Color System\$1398.00

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, 8 or 24 bit Video board and cable
- 2 page display supports all Mac IIs, the Si, SE-30, SE and the LC

Trinitron 19" Color System

8 Bit System\$1998.00

24 Bit System\$2598.00

- This Trinitron, 19" Is a Sony OEM product 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

NuDesign Full Page Grey Scale\$398.00

- Plug compatible with Si, CI and Quadra (16 levels of Grey).
- Available with 1 Bit interface card for all Mac IIs, SE-30, SE and LC \$488.00.
- 20" Grey Scale Monitor manufactured by Sampo for Apollo/HP



19" Trinitron System

- With 8 Bit interface\$1998
- With 24 Bit interface\$2598



NuDesign Full Page Display

- Grey Scale for CI, Si, Quadra.....\$398
- II, IIfx, FX, SE30, 1Bit\$488



20" Sampo Color System

- With 8 Bit interface\$1398
- With 24 Bit interface\$1998

600 & 1200 DPI Color Scanners

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

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

Automatic Document Feeder\$498.00

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

UG-630 With PhotoShop Grey Scale Scanner\$898.00

Umax UC-1200S With PhotoShop\$3298.00

Transparency/Slide Scanner Option.....\$898.00

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

Sharp JX-320 With PhotoShop\$1298.00

- One pass scanner • 8 1/2 x 11 Scanning area • Includes Photoshop

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-1200S ...\$3298

With Photoshop



800-621-8467

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

Music Education on CD ROM

So I've Heard, Volume 1:
Bach and Before

PROS: Good summary of, and collector's guide to, early Western music; numerous musical excerpts; affordable. **CONS:** Omits some essential works; music stops when new card appears.

COMPANY: The Voyager Company (310/451-1383). **REQUIRES:** Mac Plus; 2MB of RAM; hard drive; CD ROM drive; speakers or headphones; System 6.0.5. **LIST PRICE:** \$24.95.



ONE THING THE CURRENT CROP OF music-appreciation CD ROMs lacks is a bird's-eye view of the grand sweep of Western music. Warner Audio includes a history of the requiem as a musical form in Johannes Brahms, A German Requiem, and a brief rundown of opera's first few hundred years in Mozart, The Magic Flute. To fill the gap, The Voyager Company plans a five-disc survey called So I've Heard.

The first volume in the series, Bach and Before, describes nearly two millennia of Western music, up to the mid-eighteenth century. The text, engagingly written by classical-music critic and lecturer Alan Rich,

is divided into nine short HyperCard-based chapters. Most cards are enlivened by period illustrations; buttons scattered throughout let you play the musical examples highlighted in the text. (Unfortunately, moving to a new card immediately silences any music that may be playing.)

Rich's carefully selected musical examples double as his recommendations for a basic collection. They provide a unique and affordable opportunity to sample 50 or so specific performances, compositions, and musical styles before you decide to buy. I have just two small quibbles: I wish Rich had at least noted second- and third-choice recordings for people who don't live near a classical-music superstore. Also, Rich tends to bypass compositions of well-known composers if he feels they're overexposed—Vivaldi's *Four Seasons*, for instance. Anyone starting a music collection based on So I've Heard would thus miss one of the greatest (and yes, most overexposed) of baroque compositions.

The musical examples are also listed in a HyperCard catalog, each card containing the composer, title, performance, label, and a brief commentary for a single work. You can search the catalog by composer, performer, label, or type of music or era, and you can add your own cards. In both the catalog and the main essay, you can enter notes (linked to specific cards) in a pop-up



Early Music Sampler Buttons at the bottom of the window help you navigate the program, open the notepad, turn on the balloon help system, and highlight words in the glossary.

notepad, and you can mark cards for retrieval. You can also print part or all of the catalog and/or main essay.

Because the volume of material here is so broad, discussion is necessarily not very deep. You won't find serious discourse on music theory—no measure-by-measure analysis, no disquisition on the sonata form, no lengthy explanation of rhythm, meter, or musical notation.

Some people love the music featured in this CD ROM, but many find it spare and not immediately accessible. For anyone interested in classical music and daring enough to go beyond the concert-hall hit parade, Bach and Before is a musical history tour without peer.—ROBERT C. ECKHARDT

ADB Controller for Multimedia Applications

Media Control Station

PROS: Optical wheel moves smoothly and accurately; buttons are easy to customize.

CONS: Documentation is unclear in places.

COMPANY: JLCopier Electronics (310/306-4131). **REQUIRES:** Mac Plus; System 6.0.

LIST PRICE: \$269.95.



FIRST, TO QUELL ALL INNUENDOS OF bias, I am not related (even distantly) to anyone presently or previously employed by JLCopier. My people are honest barrel-makers from Virginia. Now let's talk about the Media Control Station. If you work with Adobe Premiere, Macromedia's MacroMind Director, Digidesign's Sound Designer II, or any application that manipulates temporal data, I recommend that you check out the Media Control Station (MCS).

The MCS is a small black box, the size of a skinny brick, that connects to the Mac through the ADB port (it has a second ADB port for chaining a keyboard and pointing device). On the top of the box are seven buttons (rewind, fast forward, stop, play, record, shift, and option), and a silver dollar-size wheel that has an indentation for

turning it with your finger. The MCS comes with settings for four applications and includes an application for defining key sets for other Mac programs.

I first tried using the MCS with Adobe Premiere 2.0 (a tryout version of Premiere 1.0 comes with the MCS). Rather than using the mouse or keyboard to control the playback functions, I put the MCS to the test. Rotating the wheel clockwise or counterclockwise advances or rewinds a QuickTime movie by one frame per stop. This is similar to the way the jog/shuttle wheel on a professional video deck works. In jog mode, when you rotate the wheel, it moves the tape forward or backward in one-frame increments. I found using a wheel invaluable, especially when setting in-points and out-points in Premiere. Trying to move through movies precisely by pushing buttons with the mouse is a real pain.

The MCS wheel also allows shuttling, which involves moving through tape (or data) at a variety of speeds (such as half-

speed, five times normal speed, or ten times normal speed) by turning the wheel left (for reverse) or right (for forward) of center and holding it there. The farther you turn the wheel, the greater the speed. JLCopier offers shuttling for Sound Designer II; it is not available for Premiere.

Pressing combinations of buttons on the MCS invokes functions in Premiere that let you set an in or out point, move forward or backward five frames, and play or stop a movie. There are 20 different key combinations that have preset functions, or you can give them new functions by using the MCS application.

Four factory-preset combinations invoke the function keys found on extended keyboards. This is especially useful if you have defined these keys using a macro program such as CE Software's QuickKeys.

Also included on the MCS disk are preset functions for MacroMind Director, Claris HyperCard, and Opcode's Vision. The device defaults to the settings for Premiere, but you can change the default using the MCS application. I found it easy to program my own commands for other applications, and once I deciphered the poorly written manual, modifying existing sets was a snap. The MCS is a versatile tool, and it's invaluable for zipping through MIDI files, Director scores, and QuickTime footage like a pro.—EVAN COOPER



Programming the MCS The MCS application enables you to edit preset configurations for the device or create your own group of commands.

Address Book and Reminder DA

Intouch 2.0.4

PROS: Flexible output options; database is accessible while working in other applications.

CONS: Free-form data entry limits sort options; calendar's list view shows reminders, not events. **COMPANY:** Advanced Software (408/733-0745). **REQUIRES:** Mac Plus; System 6.0.3. **LIST PRICE:** \$99.95.



INTOUCH 2.0.4 ADDS A REMINDER SYSTEM to a fast, easy-to-use database for storing addresses, phone numbers, and other contact-related information, while retaining the free-form approach to data entry. Unlike address books that provide separate fields for names, cities, phone numbers, and other facts, Intouch lets you enter contact information any way you like.

Without fields, however, Intouch can't automatically capitalize names or format telephone numbers as you type. The lack of fields can also lead to unpredictable results when you try to sort the database. The manual suggests that you use a standard address format, so the company name would always go on line two of the address field, for example. For sorting purposes, Intouch distin-

guishes between the first, second, and last words in address lines, and it recognizes U.S. zip codes.

Intouch lets you assign records to groups—for example, all your friends in one group and relatives in another. (If you are friendly with a relative, you can assign that contact to more than one group.) You can also find records that contain or don't contain specified strings of text.

The Dial button lets you place a telephone call over your modem or through the Mac's speaker. To reach outside lines or long-distance services, you enter special sequences before and after the main number. Because there are no phone-number fields, Intouch's scheme to distinguish telephone numbers from other numeric data works well for standard North American number formats. Intouch also allows you to identify foreign telephone numbers.

Intouch offers four print options: envelopes, labels, address books, and fax cover sheets. All the formats are easy to customize: on envelopes, for example, you can specify the location and appearance of the address and return address, and you can add bar codes. However, if you move the return address by mistake, you must save the changed version under a new name.

The reminder function lets you schedule events for a specific date, for a point in time, or for a block of time. You can set

alarms to notify you ahead of time; if the reminders control panel device is installed and turned on, alarms will pop up on your monitor even if Intouch isn't running.

Unfortunately, Intouch falls short as a calendar planner: when you display reminders for any day, week, or month, the list shows only the advance alarms you've set, not the events themselves. There is a daily view that includes both alarms and events, but that's not sufficient to plan activities a week or a month at a time.

A control panel device called Snap lets you access Intouch while you're working in other applications. If you're using a word processor to write a letter, for example, you can select the recipient's name and search the Intouch database. Snap scans the address book and lists the matching entries; selecting one pastes the associated address into the document. You can also use Snap to add entries to the Intouch database, dial phone numbers, and print envelopes or labels, all without leaving your application.

Despite the free-form data entry, Intouch is a good choice if you need to look up names and addresses and print envelopes. The ability to search the database and print without leaving your word processor is a definite plus. But until Intouch provides more ways to view events, I can't recommend it as a calendar planner.

—FRANKLIN N. TESSLER

Stress-Relief Software

Insanity 1.0

PROS: Realistic sound effects; detailed animation; variety of modules. **CONS:** Novelty wears off; installing modules is complicated; promotes violence in society. **NOTI COMPANY:** UV Wave (318/868-9944). **REQUIRES:** Mac Plus; 2MB of hard drive space; System 6.0.5; 32-bit QuickDraw. **LIST PRICE:** \$28.95.



MUCH AS I LOVE AND APPRECIATE my Mac, there are times when the computer so frustrates me that I'd just like to slap it upside the head. Then I realize that smacking an expensive, fragile box of bits and bytes would be less than prudent. That's when I reach for Insanity.

Originally introduced as Madness-Rage from Me & John Software, Insanity has been improved and completely rewritten by the two-man publishing house of UV Wave. This cool little control panel (cdev for System 6) lets you harmlessly "shoot" the Mac whenever your blood pressure climbs or your trigger finger itches. Just click the mouse while pressing the user-definable ⌘-key combination, and Insanity's floating menu appears on the menu bar, displaying

a list of the "weapons" at your disposal: sea pigeon, 12-gauge assault rifle, 20-gauge shotgun, .44 caliber magnum, BB gun, Bill the human cannonball, 9mm Glock pistol, Moof .45, and an Uzi machine gun.

Once you choose a module from the floating menu (or allow Insanity to pick one at random), the cursor turns into an appropriate gunsight. For instance, the cursor becomes a normal sight for all the pistols and rifles, a bird for the sea pigeon, a bull's-eye for Bill the human cannonball, and bovine buttocks for Moof the Dogcow.

To shoot, move the cursor anywhere on screen and click the mouse button or press the user-definable ⌘-key combination for the gun trigger. What happens when you pull the trigger depends on the module. As you might expect, each of the real weapons goes off with a distinctive bang (or in the case of the shotguns, resounding booms) and tears convincing bullet holes in the Mac's display. The Glock blows perfectly round holes with deadly accuracy, the shotguns perforate the screen with buckshot.

If you prefer something a little more disgusting, check out Insanity's three non-weapons. The sea pigeon lets loose a sticky glob of white goop (sure to have the kids laughing hysterically), Moof deposits a cow pie that lands with a resounding thud, and Bill the human cannonball flies gracefully through the air until he splatters onto the

desktop with the same disgusting result as a bug hitting a windshield at 70 mph. The animation is first-rate and looks great in monochrome as well as color (requires 32-bit Color QuickDraw).

When you're finished shooting up the place, or you've expended all of your ammo, press the return key to hang up your holster and resume work. Everything on screen returns to normal, with bullet holes and bird droppings cleaned up in a flash.

The default settings for each module accurately reproduce the characteristics of the actual weapon. For example, the standard Glock clip holds 15 rounds, each of which can be squeezed off individually in rapid succession. But sometimes it's more fun to tweak the performance. Using the Insanity control panel, you can set the total number of shots, shots per burst, and firing speed for each module.

Insanity is a fun program that lets you harmlessly blow off steam. After a while, however, the novelty of blasting the Mac to smithereens wears off. Still, Insanity is worth keeping around to entertain your friends and strike fear into the hearts of your enemies. My only real complaint is that enabling individual modules in the control panel is awkward and unnecessary. For simplicity's sake, all modules should be available simply by their presence in the System Folder.—OWEN W. LINZMAYER

Deep Inside Your Old LaserWriter Lurks A 600 x 600 dpi Superprinter

(You Just Have To Know How To Coax It Out.)

If you have an Apple® LaserWriter® or HP® LaserJet®, you already have the makings of a lightning fast, 600 x 600 dpi Superprinter. Don't let your current investment go to waste!

Just install an *Accel-a-Writer* controller and bring new industry leading technology to your old Apple LaserWriter or HP LaserJet. Print speedy, high resolution graphics without the expense of buying a brand new printer!

True 600 x 600 dpi Text and Line Art. Produce near-typeset quality output that is clearly suitable for camera-ready reproduction.

850 x 850 dpi equivalent gray scales. Now you can print smooth and detailed gray scale images. For example, you will now receive 197 levels of gray at an equivalent 60 line screen instead of the 25 available at 300 dpi.

Permanent Font Storage.

In addition to the 35 resident fonts, Xante's own *Virtual Disk Technology* allows you to permanently store up to 30 more download fonts directly on the controller. You will also be able to change the fonts stored depending upon specific job requirements. For those of you who want to store more than 30 fonts,

the *Accel-a-Writer* also includes a SCSI port for an external hard drive.

Lightning Fast Speed. Print your documents up to 12 times faster with the *Accel-a-Writer's* AMD 29000 RISC processor. *Advanced Memory Management* and *Dual Page Processing* will also speed up your printing by allowing one page to be built while another is being printed.

Simultaneous Mac®/PC Printing. *ISI* (Intelligent Simultaneous Interfacing) allows you to print from Macintosh® and PC/compatibles at the same time, without having to use manual switches or software commands.

Quality Assurance Guarantee. Xante offers a full, unconditional 30 day money back guarantee along with a 2 year warranty! Coax the lightning fast, 600 x 600 dpi SuperPrinter from your old LaserWriter today.



	Accel-a-Writer	Apple LaserWriters	HP LaserJets
PostScript® Compatible	✖	✓	
True 600x600 dpi	✖		
850x850 dpi Equivalent Gray Scale	✖		
Virtual Disk Technology	✖		
RISC Processor	✖	✓ NTR	✓ IIIsi
Standard 6MB RAM	✖		
Simultaneous Interfacing (AppleTalk®, serial, parallel)	✖		
Ask About The <i>Accel-a-Writer</i> Line Of Laser Printers.			

Statistics as of 9/92

© 1992 XANTE Corporation. XANTE Accel-a-Writer is a trademark of Xante Corporation. Other brands and product names are trademarks or registered trademarks of their respective holders. XANTE Corporation: 2559 Emogene St., Mobile, AL 36606, Post Office Box 16526, Mobile AL 36616-0526 USA, Tel. 205-476-8189.

1-800-926-8839

Ext. 2103
Fax 205-476-9421



Circle 2 on reader service card

Home-Landscape-Design Software

Expert Landscape Design

PROS: Extensive toolbox; good scaling features; easy to learn. **CONS:** Awkward color and pattern tools; limited object libraries; few library objects are labeled; nonstandard Mac interface. **COMPANY:** Expert Software (305/567-9990). **REQUIRES:** Mac Plus; System 6.0.5; 32-bit QuickDraw. **LIST PRICE:** \$49.95.



EXPERT LANDSCAPE DESIGN OFFERS amateur landscape artists an inexpensive, easy-to-use object-oriented graphics environment for designing gardens literally from the ground up—from ground cover, trees, and shrubs, to garden furniture. However, by neglecting to identify plant types or to facilitate precise drawing, the program fails to give budding home gardeners a good tool for landscape design.

Expert Landscape Design creates a view of your garden from above, like a floor plan. You then design the garden using a combination of library objects and objects you draw yourself in the familiar Macintosh drawing environment of snap-to grids, layers, scalable rulers, and so on. The toolbox also contains several specialized features,

such as fence- and wall-drawing tools, a vertex grabber (for editing polygons), replace and copy tools (used with library objects), and a measuring tool.

Expert Landscape Design uses several distracting cursors, including a crosshair and a pointing finger to indicate the direction objects are being moved in. The program also presents annoying phantom outlines of marquees that follow the pointer cursor when you select and move multiple objects. And you must click on an empty area of the screen, rather than on another object, to deselect an object. The program also redraws very slowly. All these behaviors hinder the ability to draw. You can, however, import PICT files from other draw programs and use them in your on-screen garden plot. The program supports color, but in a somewhat roundabout way.

After you scale and draw the area of your garden using the ruler and the wall and fence tools, you select and arrange the plants and furnishings. The program has several libraries of plants and yard furniture with which to populate your landscape (don't expect to identify the plants stored in the library, though—none are labeled), and you can add your own hand-drawn plants, pools, and furniture to libraries. Placing objects is an un-Mac-like experience. You draw circles to receive objects, drag one object from the library into a cir-

cle, and then use the replace tool to duplicate that object in the other circles (the copy tool makes only one copy of an object). Then you drag the circles to where you want them in your garden, resize the objects to fit their designated spaces, and finally color them.

In sum, Expert Landscape Design provides a bare-bones drawing environment in which you can experiment with landscape design—moving images of plants and objects around a scalable area. The only instruction this program offers is a chapter at the back of the manual on elementary landscape design.—RITA LEWIS



My Garden Although drawn to scale, my garden is badly approximated in Expert Landscape Design, with only generic plant forms and no rocks for my rock garden. Note the open Tree Library and the kludgy color tools.

SCSI Monitor

ClearVue/SD21

PROS: Fast scrolling; uses little RAM. **CONS:** No mirroring mode; terminators difficult to access; does not display gray scale. **COMPANY:** RasterOps Corporation (408/562-4200). **REQUIRES:** Mac Plus; System 6.0.3 (7.0 for color Macs). **LIST PRICE:** \$1799.



IMAGINE YOUR AUDIENCE IN RAPT attention to your presentation on a 21-inch display as you maneuver through your disk-based slide show or QuickTime movie from your PowerBook. That's the potential I envisioned for the RasterOps ClearVue/SD21 monitor, a monochrome display with a 21-inch screen that plugs into any Mac via the SCSI port (it's intended primarily for PowerBook users). Sadly, the reality is less than the potential.

The ClearVue/SD21 lets you display images in black and white, not gray scale, so chances are you won't be using it for any graphics-intensive work, whether for yourself or for a presentation to others. It also offers only the standard 1152-by-870-pixel resolution for 21-inch monitors—there's no option to switch to, say, 640 by 480 or 832

by 624—so you cannot use the monitor as a magnifying monitor for presenting text to an audience.

And even if it did let you do any of this, the ClearVue/SD21 does not support mirroring mode (also called presentation mode), in which the monitor displays the same image on the PowerBook screen as on the external monitor, so managing a live presentation is tricky unless you manage to position yourself so you can watch your PowerBook screen, the external monitor, and your audience.

Although the RasterOps monitor is nice, and the INIT that lets it run as a second, external monitor is easy to install and use, this product is limited in how it can be used. What can you do with it? Basically, you can work on large text files at a home or office setup where a PowerBook is your primary Mac. I don't think many word processing users need such a large monitor, and the number of Excel or Lotus 1-2-3 spreadsheets that need to be displayed at this size must surely be a small part of that universe.

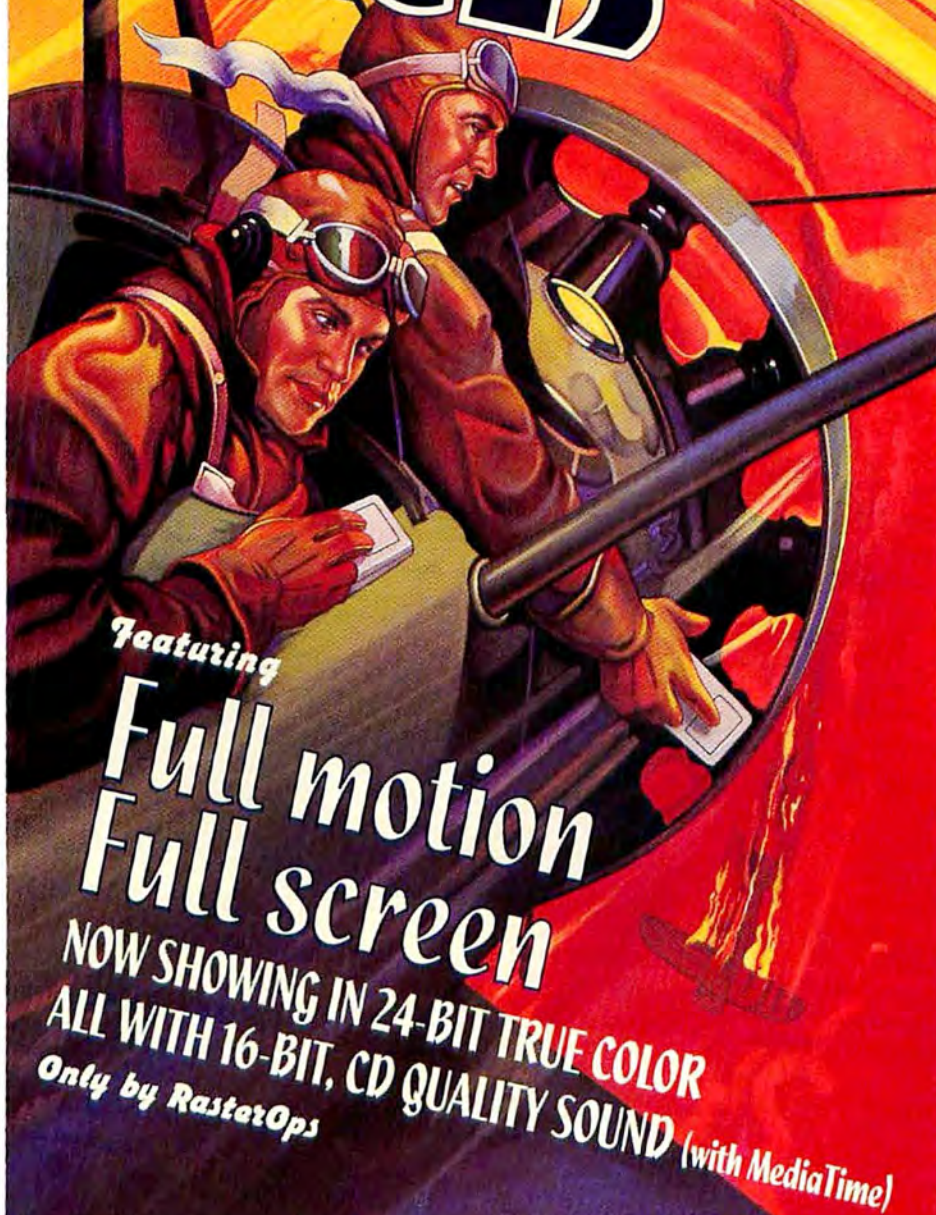
The screen display is relatively speedy, thanks to the monitor's built-in graphics acceleration. I found the scrolling to be about as fast as that of a PowerBook 140's internal screen. Considering the amount of data that a large monitor must handle over a relatively inefficient path like SCSI, that's an accomplishment.

The INIT that controls the monitor takes only about 120K of RAM. In addition to intercepting the QuickDraw calls that are sent to the PowerBook's internal display, and sending calls on to the video board built into the ClearVue/SD21 monitor, the INIT can also be set to create an *extended desktop*, so you can pan across an even larger screen than can fit on a 21-inch monitor (see *Lab Notes*, this issue).

If only the ClearVue/SD21 supported gray scale, mirroring, and high resolution, many more users would benefit greatly from this monitor. With these additions, the \$1799 ClearVue would be a good investment for graphic artists who want a portable Macintosh so they can take files to their clients, yet not be limited to a PowerBook's small screen while working on detailed artwork; or for businesspeople making presentations on the road or in a conference room. For use as a large, text-oriented screen, it would be hard to justify the investment, since you would pay about the same price for both a regular 19-inch gray-scale monitor and an Aura Systems (619/438-7730) ScuzzyView SCSI video adapter (see the feature "Expanding Your PowerBook," this issue), which together give you 8-bit gray-scale support, as well as color if you plug the adapter into a color display or LCD panel. (But, alas, no mirroring.)—GALEN GRUMAN

MoviePak
presents

THE EDITING ACES



Featuring

Full motion
Full screen

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



With MoviePak, the sky's the limit. It works with all RasterOps multi-media display adapters to give you full-motion digital video recording, and full-screen playback and print-to-tape capabilities, all in a single-slot solution for any size Macintosh®.

See Us At
Macworld
Expo-
Booth
#735



MoviePak flies with all QuickTime editing software including Adobe Premiere™, yours free with MoviePak—only until 11/30/92. A \$695 value.



Apple® got QuickTime off

the ground using RasterOps® products. So it's no surprise that we have the most complete interface for it. MoviePak supports all QuickTime capture software and saves videos formatted for use in any of its applications.

CALL FOR YOUR FREE
1-800-SAY-COLOR
MOVIEPAK POSTER

et in
e action or
der your free 13"x24"
g Aces poster, call RasterOps
00.SAY.COLOR.

See Us At MacWorld
Expo-Booth #735

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

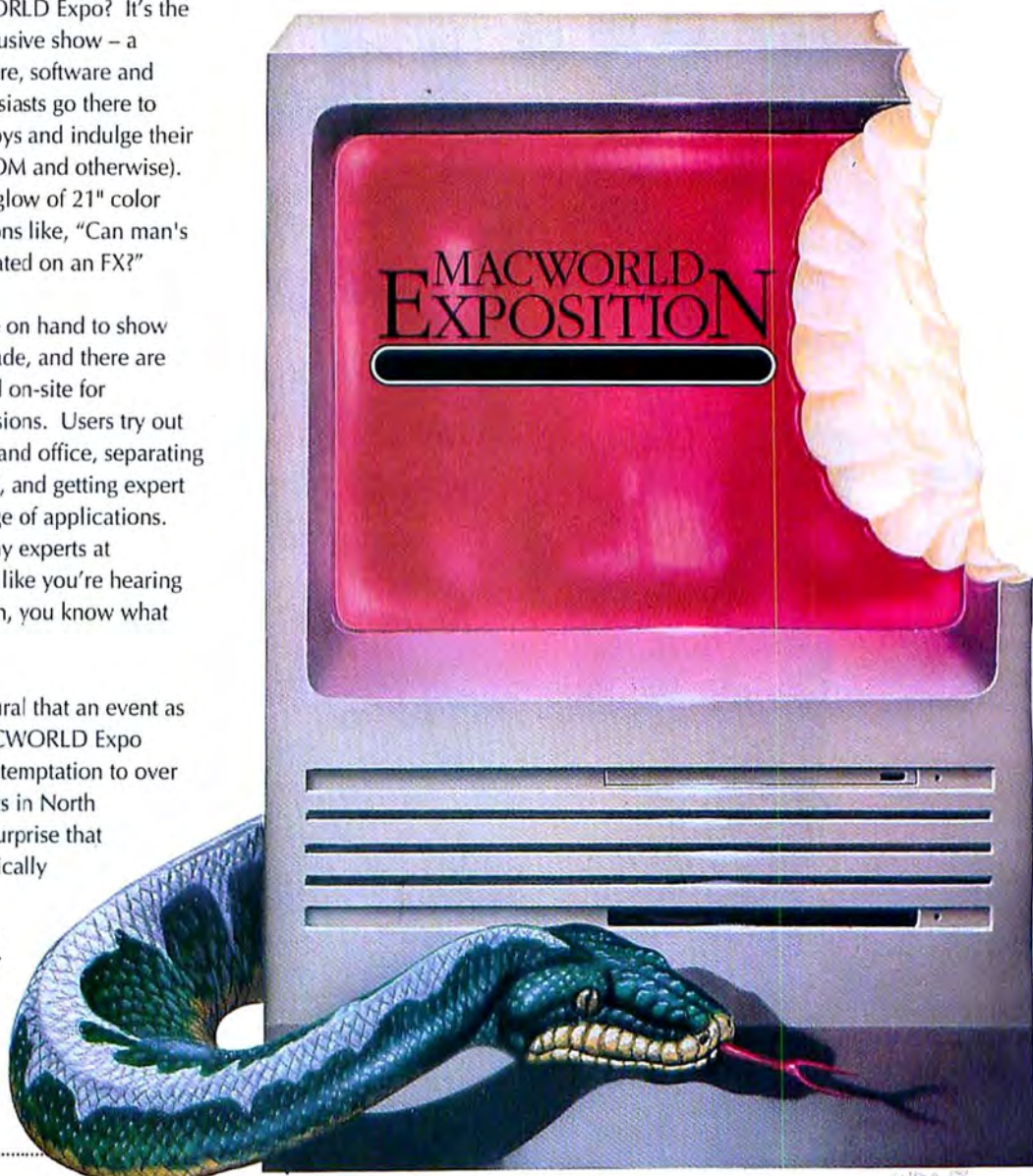
© 1992 RasterOps Corporation. Adobe Premiere is a trademark of Adobe Systems Incorporated which may be registered in certain jurisdictions. Adobe Premiere front panel is the copyrighted trade dress of Adobe Systems Incorporated. © 1992 Adobe Systems Incorporated. All other brand and product names are trademarks or registered trademarks of their respective holders.

NO ONE CAN RESIST THE TEMPTATION.

Who can resist MACWORLD Expo? It's the original Macintosh-exclusive show – a paradise of new hardware, software and peripherals. Mac enthusiasts go there to feast on the latest Mactoy's and indulge their lust for power (RAM, ROM and otherwise). They bask in the warm glow of 21" color displays and ask questions like, "Can man's fall from grace be animated on an FX?"

Qualified Macheads are on hand to show users the tricks of the trade, and there are plenty of Macs provided on-site for impromptu practice sessions. Users try out new software for home and office, separating the quick from the dead, and getting expert critiques on a wide range of applications. In fact, there are so many experts at MACWORLD Expo, it's like you're hearing the word of G...(well, uh, you know what we mean).

In the end, it's only natural that an event as big and exciting as MACWORLD Expo would be an irresistible temptation to over 100,000 Mac enthusiasts in North America. (And it's no surprise that companies would practically part with their ribs to exhibit). True believers know that glory is never more than an upgrade (or two) away. And sticking with the same old program is almost a sin.



TEMPT ME...

PLEASE SEND ME MORE INFORMATION ON MACWORLD EXPO.

I AM INTERESTED IN: ☐ ATTENDING ☐ EXHIBITING
☐ SAN FRANCISCO ☐ BOSTON ☐ CANADA

NAME _____

TITLE _____

COMPANY _____

ADDRESS _____

CITY/STATE/ZIP _____

PHONE _____

FAX _____

MAIL TO: MITCH HALL ASSOCIATES
260 MILTON ST., DEDHAM, MA. 02026
OR FAX TO: 617-361-3389

BOSTON '93 • August 3 - 6
World Trade Center & Bayside Exposition Center

CANADA '93 • September 20 - 22
Metro Toronto Convention Centre

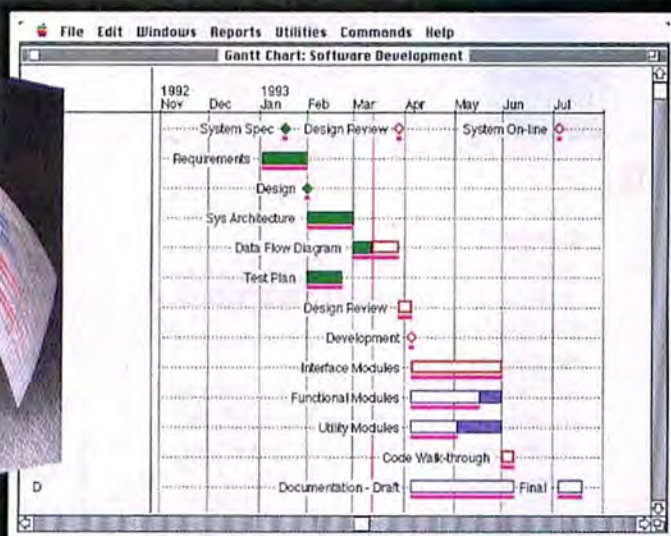
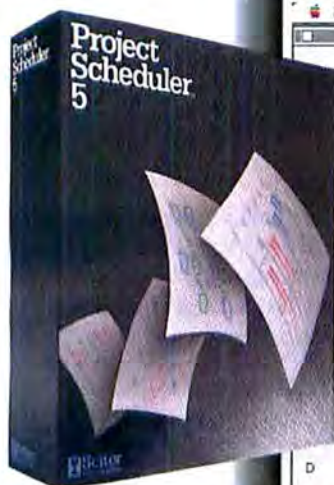
SAN FRANCISCO '94 • January 5 - 8
Moscone Center



You'll receive complete information on each show as soon as it's available. No obligation, of course. MACWORLD Expo is sponsored by MACWORLD, the Macintosh™ magazine, an IDG Communications publication. MACWORLD Expo is an independent trade show produced by IDG World Expo Corp. and managed by Mitch Hall Associates, and is not affiliated with Apple Computer, Inc. MAC, MACINTOSH and MACWORLD are trademarks of Apple Computer, Inc. IDG World Expo Corp. is a company of International Data Group, the world's leader in information services on information technology.

Project Scheduler 5

Award-winning
Project Scheduler 4 just got better.



Introducing the next generation in the award-winning Project Scheduler series—Project Scheduler 5 for the Macintosh.

Awarded "Editor's Choice" by MACWORLD in April 1992, Project Scheduler 4 has gained greater functionality and enhanced performance in Project Scheduler 5. With Project Scheduler 5, you can meet the challenges of coordinating multiple projects. Now, managing tight schedules, limited resources, and different computing platforms is easier than you ever thought possible.

Effective communication.

As a project manager, you know that communication is your most important—and most difficult—task. With Project Scheduler 5, you can convey your scheduling information effectively through customized reports and schedules. And, since Project Scheduler 5 is available in Macintosh, DOS, and OS/2 versions, you can track projects and update schedules easily, even in a multi-platform environment.

Multi-project management with ease.

With Project Scheduler 5 you can track resources and status across multiple projects. Integrate multiple projects into groups and establish dependencies that cross project

boundaries. Automatically calculate validated group schedules using error-free, cross-project critical path analysis. And automatically update individual projects to accommodate schedule commitments and changes made at the group level.

A professional product. Backed by professional support.

When you have a question, we'll get you the answer fast—without making you waste your time waiting in an electronic queue. Our support program even provides direct access to Project Scheduler 5's designers. And we offer the most comprehensive training and consulting program in the industry.

The ideal corporate solution.

Whether you're managing multiple projects in a Fortune 500 corporation, or a single project in a small business, Project Scheduler 5 is the fast, easy, and elegant way to make everything come together—on time, every time.

For more information, call or write:

415/570-7700

393 Vintage Park Drive
Suite 140
Foster City, CA 94404



"The only way I'd file my own return is if I knew it'd be easier and faster than taking the stuff to someone else."

Of course, I'd have to know I was paying the least tax and it'd be perfectly accurate."

With TaxCut® Software, filing your own tax return is a simple two-step process:

1. Key in answers to the questions your computer asks.
2. Print and file!

It's guaranteed accurate, and you'll pay as little tax as the law allows.

Plus you'll get two Free Gifts.

This year, team up with Andrew Tobias' TaxCut and your Macintosh to complete your tax return. You'll secure the skill of America's best tax professionals. Plus, use your computer's power to save time and money. And, you'll understand your taxes as never before.

How TaxCut Works

You start by selecting the Interview, Shoebox, or the Direct-to-Forms method.

The Interview. Answer a few simple Yes-or-No questions right on your computer screen. Next, from the thousands of questions in its database, TaxCut selects just those questions it needs to correctly fill out your return, including which forms you should file. You key in your answers, TaxCut shows your completed return on your screen, then prints IRS-approved forms ready to file, on plain paper. Or, file electronically and get your refund in as little as two weeks!

The Shoebox. Pick up any receipt from your pile of records. Use the scroll-down list that TaxCut shows you to identify the type of record. Key in the figure. TaxCut decides where it should go on your return, then does all the calculations.

Direct to Forms. Simply enter the numbers, and let TaxCut automatically carry the amounts to each relevant form. TaxCut then does all the math.

Become Your Own Tax Expert Instantly

TaxCut knows the entire Tax Code, so you don't have to. You access only what you need through the on-line Help key. Or, go straight to IRS instructions, if you prefer.

TaxCut Audits Your Return Before You File

TaxCut checks every figure as you complete your return. Then it compares your deductions with national averages. The program alerts you to anything that looks out of line, to reduce the risk of an IRS audit.



NEW!

Guaranteed Accurate

TaxCut's Accuracy Guarantee: if the IRS makes you pay a penalty because of a miscalculation in TaxCut, MECA will pay that penalty for you.

Your Complete Tax Tool

TaxCut provides over 85 different IRS-approved forms and worksheets, from the most common to the obscure. You can also file the new IRS-preferred 1040PC form, which can speed your refund.

CA & NY State Editions Available Too

Data from your Federal return automatically transfers to the State Edition to save you time and ensure accuracy.

Order By 3/31/93 To Get Two FREE Gifts

Order TaxCut before this special offer expires 3/31/93. Send us a check or money order, or we'll bill your credit card today only \$49.95 for the Federal Edition, and \$29.95 for each

State Edition (plus shipping). We'll immediately send your Free Software Gift: MacUSA™. It's a complete atlas, almanac and fact book right on your computer (\$69.95 value). You'll also get a 1992 Tax Planning Checklist, to get you started right for the easiest tax preparation ever.

To Order, Call Toll Free

1-800-727-3694 ext. 425

24 hours, 7 days a week

Or Fax Your Order To 1-800-944-6322

System Requirements

Mac Plus, System 6.0.2 or higher,
System 7 compatible, Hard Drive,
2MB RAM.



☐ **YES!** Please reserve my copy of TaxCut for the 1992 tax year now (plus state editions indicated). You'll bill my credit card/cash my check today, send my Free MacUSA™ Software and my Tax Planning Checklist.

TaxCut Edition	State	Quantity	Price	Total
Federal Only			\$49.95	
Federal/State			\$79.90	
Additional State			\$29.95	
Sales Tax (CA, CT, FL, and TX residents please add sales tax.)				
Shipping: \$8.50 US, \$16 Canada (U.S. Funds Please)				
Order Total				

Method of Payment:

- ☐ Check or Money Order Enclosed
Payable to MECA
☐ Visa ☐ MasterCard ☐ AMEX

Canadian residents are responsible for all duties and taxes upon delivery. We can only ship and fulfill to U.S. street addresses, no P.O. Boxes (including PR, US Territories, FPOs, APOs, and Canada.)

NAME _____
STREET ADDRESS _____
CITY/STATE/ZIP _____
DAYTIME PHONE (In case of questions) _____
CARD NUMBER _____ EXP. DATE _____
SIGNATURE _____

Also available at your favorite retailer.

Mail To:
MECA Software, Inc.
P.O. Box 912, Dept. 425
Fairfield, CT, 06430-0912.

Giants of Little Black Books

BY DAVID POGUE

AS I SEE IT, YOU HAVEN'T BEGUN to use your Mac until you own two programs: a word processor and an address book. Oh, the bliss of little-black-book software! Oh, to dial a 93-digit credit-card sequence with one keystroke! To look up your client's kid's name before you've even finished saying "And how is little...?" To print mailing labels for only those deadbeats in zip code 10025 who owe you money!

There are two drastically different approaches to phone-book programs. Some show you a big blank card for each address. You can type information in any order, taking as much space as you want. One card might contain 11 phone numbers and no address at all; another might hold a recipe. This is the index-card model, the QuickDex protocol, the free-form database metaphor. These address books do everything fast: opening files, finding names, and saving changes.

The other kind of program has a separate fixed-length blank, or *field*, for each particle of info. First name. Last. City. State. Zip. Because the software knows precisely where each datum is socked away, it can perform stunts like sorting your entire phone book by car-phone number. Or printing labels for one specific state. Or alphabetizing your contact names. Field-based programs are slower, and you generally can't record information for which there's no preassigned blank (a car-phone fax number, say). On the other hand, the index-card programs generally can't sort or select individual pieces of information, nor print labels or envelopes that include only the address.

I say *generally* can't, because both kinds of programs have recently exhibited some ingenious schemes for solving their characteristic drawbacks. Index-card programs now print labels that exclude phone numbers and notes; field-based programs now offer spare blanks where you can store miscellaneous data scraps. As you read the following reviews, consider your character. Decide whether you'd prefer a program that lets you color outside the lines, so to speak, or you would feel more secure with every data fragment filed in a field.

AddressBook 3.4.1

WHAT DO YOU CALL A PROGRAM THAT lets you customize its color scheme, that automatically logs the amount of time you spend on each phone call, and that costs a third of what its rivals cost? You call it shareware—specifically, AddressBook. You get it from a user group or a dial-up network like America Online, try it out, and mail Canadian author Jim Leitch 30 bucks if you like his work.

AddressBook is both a program and a desk accessory (DA); both versions are fast and feature-rich. Its phone-directory main screen lists all your friends at once; double-click on a name to see a full screen showing address, phone number, and so on. If your phone is hooked to a modem (or to Sophisticated Circuits' Desktop Dialer), AddressBook's dialing smarts can handle preposterous touch-tone sequences (like credit-card access codes) with aplomb. (But like all programs except Advanced Software's Intouch and Casady & Greene's QuickDex, AddressBook maxes out when the dialing sequence exceeds 30 numbers, as my MCI card does.) AddressBook (the application, not the DA) prints great-looking labels, envelopes, and phone books. One feature in particular should embarrass the expensive commercial address books: automatic font resizing for addresses too large to fit on a label. You never *ever* get chopped-off mailing labels.

The burning question: Is AddressBook index-cardish or field-based? Happily, it's a clever hybrid. There are three blanks for each person (plus three phone-number blanks): one for the name, one for the complete address, and a third for miscellaneous notes. This scheme grants the incredible speed of index-card programs, while still isolating the stuff you wouldn't want printed on your envelopes (such as "chronic garlic breath").

Address Book Plus 2.0

DON'T CONFUSE ADDRESS Book Plus with AddressBook, its non-Plussed shareware namesake. This \$99.95 program from Power Up Software takes full advantage of its field-

based orientation: it sorts, selects, formats, and prints names and addresses in every conceivable way. You can assign contacts to a category ("Send Xmas Card") and print them all in a batch. Data entry is fast with typing shortcuts, such as autoexpansion of anything you start to type ("Ober") into its full form ("Oberüberammergau") and automatic capitalization.

By far the best aspect of AB+ is that you see on the screen precisely what you print—even the little binder holes in the paper (if you're printing Day Runner pages, for example). You get to spot problems before you print. AB+'s phone-dialing setup deftly handles multiple long-distance carriers and credit-card accounts, and automatically tacks on country codes when you're dialing overseas.

However, this what-you-see-is-what-you-get wonderworld is slow, especially when a file has more than 200 addresses. On a Mac IIci, it took 25 seconds to save a change to a 500-name file, and 30 seconds to switch from one layout display to another. On lesser-horsepower Macs, you might crave something quicker.

Dynodex 2.0.7

GREAT RIVALS OF HISTORY: CAPULET and Montague; Hatfield and McCoy; Dynodex and Address Book Plus. The last two have tried to out-feature each other for years; each manufacturer distributes a fact sheet pointing out its rival's shortcomings. Both programs are field-based. Both include a dialer/lookup DA. And both come with instructions for printing on both sides of pages so you can produce a pocket-size address book.

But Dynodex (\$89.95; Portfolio Software) trades an attractive WYSIWYG screen display for speed. Where Address Book Plus gets sluggish for the sake of making WYS match WYG, Dynodex offers only an uneditable page preview just before you print. More annoying: you can't change the screen display typeface (the yucko Monaco font). And there's no balloon help to demystify the unlabeled tool icons. Still, speed is

continues



*The top
11 phone-book
programs
battle it out*

ADDRESS BOOK FEATURES

	AddressBook 3.4.1	Address Book Plus 2.0	Dynodex 2.0.7	Intouch 2.0.4	MacPhonebook 3.06
Company	Shareware Jim Leitch	PowerUp Software	Portfolio Software	Advanced Software	Synex
Telephone	NA	415/345-5900	408/252-0420	408/733-0745	718/499-6293
List price	\$30	\$99.95	\$89.95	\$99.95	\$49.95
Phone dialing	●	●	●	●	●
Credit-card dialing	●*	●*	●*,*	●	●*,*
Imports/exports text files	●/● [†]	●/● [†]	●/● [†]	●/●	●/● [†]
Prints envelopes/lists/labels	●/●/● [†]	●/●/● [†]	●/●/● [†]	●/●/●	○/●/● [†]
Selectable fonts for screen for printout	●/● [†]	●/●	○/●	●/● [†]	○/● [†]
Number of fields	6	21	22	2	6
Number of assignable categories	32	unlimited	unlimited	unlimited	8
Sorting options	by last name	by any field	by any field	by first name, last, zip, category	company name
Time to open a 500-name file in seconds	3**	21**	3	2	20

● = yes; ○ = no; NA = not applicable. * Up to 31 digits. † You can't override the credit-card dialing on a call-by-call basis. ‡ Only in application, not in the desk accessory.

** Desk accessory version tested.

good; we like speed. Dynodex is fast in opening, searching, and saving.

I looked at a prerelease version of Dynodex 3.0, which should be available by the time you read this. The interface is in color, but you stare at the same old Monaco font; and mailing-label addresses, if Dynodex thinks they're too long, still get chopped off without warning.

Intouch 2.0.4

NEVER LET IT BE SAID THAT AMERICA IS losing its technological edge. This brilliant DA/control panel (\$99.95; Advanced Software), neatly solves the index-card-versus-field-database problem by giving you *two* free-form fields (for more about Intouch, see *Reviews*, in this issue). In one, you type what you want to have appear on the envelope. In the other, you put phone numbers and notes. You get the speed of the free-form programs without sacrificing envelope-printing ability. For example, on a IIci, a 500-card file takes four seconds to open, and the program finds a name about half a second after you click on Search. Alas, if the file is much bigger than that, Intouch runs out of memory headroom and has to read chunks of the file from your drive. Translation: It's slow.

Intouch dials even complicated sequences effortlessly, spewing touch-tones at a machine-gun clip. The program prints gorgeous envelopes, complete with bar codes. It also prints labels, phone books, and fax cover sheets. You can assign each name to a category (maybe "Call back" or "Potential dates"), then view or print only those addresses—a feature traditionally only in field-based databases.

There's still more (this is some DA!). For example, a reminder system pops a message onto your screen at an appointed time—and even displays the appropriate Intouch card, so that one click dials the

person you were supposed to call.

Cooler of all, there's some kind of wild background-lookup magic that works in *any* program, even when Intouch isn't running. You highlight a person's name in, say, your Microsoft Word memo, and press a key. Intouch looks up the address behind the scenes, and, after about five seconds, plops the mailing address into your document. You can also *dial* somebody whose name you've highlighted in any program, or print an addressed envelope for that person. It's pretty spectacular, and no other program does it.

MacPhonebook 3.06

"BE MERCIFUL," SAID A SYNEX SPOKESMAN when I told him I'd be reviewing MacPhonebook. That's because this dialer/printer/address book program (and DA) is ancient and feature-poor. For mercy's sake, I'll simply mention that the new version in development, 4.0, is supposed to be polished and state-of-the-art.

Mail Dex 1.0.2

EVER HEAR PEOPLE SAY THAT WHEN they go to Andrew Lloyd Webber musicals, they walk *into* the theater humming the songs? You get that same sense of familiarity when you open Mail Dex, an index-card program (\$59.95; Mission Accomplished Software Services). It's like QuickDex.

Anyway, despite Mail Dex's sole innovation—a nice envelope-layout view—I prefer the genuine article (QuickDex). I couldn't get Mail Dex to dial at all, and this DA from 1988 doesn't have nearly as many features or as much polish as its better-known, more modern look-alike.

MyMailList 4.0.0

IMAGINE A WORLD WHERE YOU CAN'T drag through text to select it; where ꞑ-pe-

riod (.) doesn't cancel; where you can make font changes to highlighted text, but you don't see the change until you print; where the company's own copy of the software bombs on the phone technician's Mac. This is the world of MyMailList (\$59.95; MySoftware Company).

It gets weirder: there's neither a command, nor a button, nor instruction in the manual for adding a new entry to your address file. And are you ready for this? After two free calls, the company charges \$7 per call for tech support.

PhoneBook DA 2.6.4

WHEN I WAS GROWING UP IN OHIO, MY family kept its phone numbers in a spring-loaded gadget Mom called a Metal Directory. You slid a clicky pointer along the side until it pointed at, say, letter *M*; then you pressed a tab and the Metal Directory's lid popped open to the *M* card.

The closest you can come to this classic analog database is Tim Herzog's polished, extremely fast PhoneBook program. It's shareware; the desk accessory version costs \$35, and the application, PhoneBook Plus, and DA together cost \$35. It works exactly like a Metal Directory—you click on a letter tab to pop to a screen of names beginning with that initial. It's more fun, though, to type the first few letters of somebody's name and watch the program zoom closer and closer to your target with each typed letter. It also does dialing and envelopes, creates beautiful phone-call logs, and can import 500 names-and-addresses in eight seconds.

Rolodesk 3.3

WHAT IS TIM ENDRES, SOME KIND OF saint? The guy writes a sweet, swift, 'wonderful QuickDex precursor with a witty title—and it's free. Download this index-card-style DA from a dial-up ser-

Mail Dex 1.0.2	MyMailList 4.0.0	PhoneBook DA 2.6.4	Rolodesk 3.3	Super QuickDex 2.58	TouchBase 2.0.1
Mission Accomplished Software Services	MySoftware Company	Shareware Tim Herzog	Freeware Tim Endres	Casady & Greene	After Hours Software
213/870-2441	415/325-9372	NA	NA	408/484-9228	818/780-2220
\$59.95	\$59.95	\$35	free	\$89.95	\$125
○	○	●	○	●	●
○	○	● [†]	○	●	● ^{†, *}
●/● [†]	●/●	●/● [†]	○/○	●/● [†]	●/●
●/○/●	●/●/●	●/●/○ [‡]	○/○/○	●/●/● [§]	●/●/●
●/● [‡]	○/● [‡]	●/● [‡]	●/○	●/● [‡]	○/●
1	72	6	1	1	20
#	#	#	#	#	2
none	any field	by last name, company	none	by first name, last, zip	by any field
2	2	3 **	2	1	4

[†] Prints envelopes from the DA; needs application for other printouts. [‡] Only one font for the entire address. ^{*} There's no category feature, but you can search for keywords.

vice, and you don't owe Endres a penny.

You can change the type style. You can even change the size of the window (something even QuickDex doesn't permit). And—what's important—a 1000-name file opens in two seconds, and Rolodesk pulls up the name you're looking for before your pinkie is off the return key, even on slow Macs. Rolodesk does not, however, dial the phone or print; it's strictly an on-screen looker-upper. Thank you, good Tim, wherever you may be, for your 1986 creation that's still a contender.

Super QuickDex 2.58

QUICKDEX IS THE QUINTESSENTIAL index-card phone-book program (\$89.95; Casady & Greene). Having read about its ancestors and heirs (Mail Dex, Rolodesk, and even Intouch), you know that QuickDex is terrifically fast. As with the others, you type only a few letters of a name—*stoc* for Admiral Stockdale, for example—and you instantly see that person's card. A second keystroke dials the phone.

Trouble was, you couldn't print labels or lists—not even an envelope. But the *Super* in Super QuickDex stands for two add-on programs that liberate your electronic list. (You can buy QuickDex II without the add-ons for \$60). With a single keystroke, QuickElope, a DA, fires off an envelope addressed with the information you highlight in QuickDex (or copy from anywhere); with Background Printing turned on, QuickDex returns control of the Mac to you in four seconds. There's also a printing/sorting application called PrintDex. It's not as polished as Address Book Plus, but it works similarly—it shows an editable WYSIWYG display of your printout-to-be. If you add appropriate searchable keywords to the cards of your file ("Client," and so on), PrintDex can search, sort, and create sub-

groups of your QuickDex database almost as flexibly as field-based programs do. Like the shareware AddressBook, PrintDex shrewdly shrinks the type on labels that would otherwise be too long to fit.

This'll take a whole paragraph, but I must describe one life-changing aspect of QuickDex's auto-dialer. Revel in its brilliance: if you type an X in a phone number, QuickDex stops dialing at that spot, waits for you to tap any key, then continues dialing. For example, my QuickDex card for Fed Ex's computerized pickup service reads 800-654-0920×9999-9999-9×10025×1×1. QuickDex dials the 800 number and stops; when I hear the greeting, I tap a key to make QuickDex blast away at my Fed Ex number (represented here by 9's). QuickDex pauses until I'm asked for my zip code (key tap), the number of packages (key tap), and if I'll be home (key tap). And consider the number of other times you're asked to dial touch-tones on cue: for phone extensions, bank-by-phone services, credit-card calls. QuickDex is the consumer's sole defense against Creeping Voice Mail in America.

TouchBase 2.0.1

TOUCHBASE (\$125; AFTER HOURS SOFTWARE), a field-based directory, has a structure in common with Dynodex: you fill in 20 individual blanks (city, state, zip, and so on) for each person. The program can display either an individual data-entry screen or all of your contacts in a scrolling list.

TouchBase differs from Dynodex, however, in two major ways: first, it's far simpler. Every dialog box, menu, and window element is neat and elegant, and there are no mystery icons. But second, TouchBase is much slower than Dynodex. In a 500-name test file, TouchBase accessed the hard drive—slowly—and repainted the screen after almost every operation,

from resizing the window to closing a dialog box. In particular, finding a certain record is slow and—compared with other programs—involves too many steps. On the other hand, TouchBase is twice as easy to learn as the other field-based programs. Furthermore, it is one of the few network-sharable address book you can buy.

The Upshot

IF YOU NEED THE POWERS OF A BONA fide database, choose DynoDex for its speed. Or consider a true database that dials, like ProVue's Panorama or Claris's FileMaker Pro.

I must admit, however, that I can't live with the rigidity of field-based programs. Today I wanted to write down, next to a phone number, "Fax/modem line—notify before faxing!" No field-based program allows such a notation. True enough, field-based programs can find subsets of your contacts by (for example) street address or state. Intouch and QuickDex can only search or sort by first name, last name, zip code, or category (or keyword). If that's enough for you, then the speed and flexibility of these desk accessories blow away all other filing systems.

Both QuickDex and Intouch also dial superbly, let you choose a font and layout for your contact information, and are fast. Intouch is more integrated (QuickDex's printing and sorting features are split off into a separate program). But give me QuickDex. Its auto-label-sizing, voice mail-blasting, and speed advantage over all comers make it addictive and fun—which is something I rarely said about our Metal Directory. **m**

Contributing editor DAVID POGUE is the author of the best-selling *Macs for Dummies* (IDG Books Worldwide, 1992). He wishes somebody would type the Manhattan phone book into QuickDex.

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 itself.

Each egg, so tiny that it can only be seen by the human eye with the help of a microscope, is laid on or 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 wormlike creature almost immediately begins to feed as it will consume the majority if not 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 bursts 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 its body upright by silken threads to a twig creating a chrysalis or exposed 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 kept close to its moist tiny 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 itself.

Each egg, so tiny that it can only be seen by the human eye with the help of a microscope, is laid on or 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 wormlike creature almost immediately begins to feed as it will consume the majority if not all of its nutrients during this phase of its life.

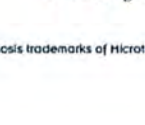
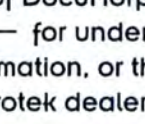
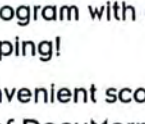
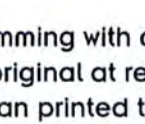
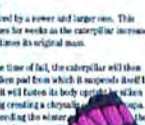


The caterpillar will continue to eat until it has eaten so much that its skin can no longer contain the newly acquired mass. The skin then bursts and the caterpillar will shed it in order to have it replaced by a newer and larger one. This process continues for weeks as the caterpillar increases in size, 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 its body upright by silken threads to a twig creating a chrysalis or exposed 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 kept close to its moist tiny 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.

New Products

The Latest Macintosh Releases

EDITED BY CAROLYN BICKFORD

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

AE Floptical Drive

External high-density 3.5-inch floppy drive that formats, reads, and writes to 21MB floptical disks, 1.44MB high-density Macintosh disks, as well as two-sided and high-density MS-DOS formatted disks. Bundled with Insignia Solutions' AccessPC, which allows users to format, read, and write MS-DOS disks. Includes SCSI cable and one floptical disk. 2MB min. memory. \$513. Applied Engineering, 214/241-6060, 800/554-6227; fax 214/484-1365.



AE Floptical Drive

CDC-435

CD ROM drive features CD-audio play capability as well, with software, headphone jack with volume control, built-in RCA audio jack, and DIP-switch termination. The drive also has 12-function audio remote control with buttons for play, pause, stop, fast forward, reverse, random play, play introduction only, repeat single track, and repeat all tracks. Average digital-data-access speed is 350ms, according to company. \$895. Chinon America, 310/533-0274, 800/441-0222; fax 310/533-1727.



CDC-435

Companion 80 and 120

External drives for the PowerBook that run up to four hours on their own batteries. Each drive comes with Companion INIT, which allows the drive to respond to the PowerBook's Sleep command. Drives also come with AC charger/adaptor and SCSI cable. They store up to 80MB and 120MB of data, respectively. Companion 80 \$499; Companion 120 \$599. APS Technologies, 816/478-8300, 800/235-2752; fax 816/478-4596.

DiamondColor Print 300PS

Color dye-sublimation printer produces photographic-quality output at 100 seconds per page, according to the company. Printer has color-correction controls on front panel, 32MB full-page buffer, 14MB of RAM, and a 40MB internal hard drive. Comes with 35 fonts and AppleTalk and provides EtherTalk ports as well as parallel and serial ports. \$10,995. Mitsubishi Electronics America, 714/220-2500, 800/843-2515; fax 714/236-6272.

Expanse NB4 and Expanse NB8

These two external expansion chassis house four or eight additional NuBus slots, respectively, for the Quadra 950. Both chassis connect to the Quadra via a NuBus interface board and cable and contain their own power supplies. Expanse NB4 \$1295; Expanse NB8 \$2295. Second Wave, 512/343-9661; fax 512/343-9663.



Flexscan F750i

Flexscan F750i

A 21-inch color monitor that displays noninterlaced, flicker-free images at resolutions up to 1280 by 1024 pixels at 74Hz, and 1024 by 768 pixels at 90Hz, according to the company. Controls are located at the front of the monitor. Microprocessor can recall up to 32 different signals. Meets Swedish MPR-II ELF-emission guidelines, according to company. \$3299. Nanao USA Corp., 310/325-5202, 800/800-5202; fax 310/530-1679.

INT-128

Rewritable, removable internal optical drive stores up to 128MB of rewritable data on magneto-optical disks; one disk is included. Seek time is less than 45ms, and data-transfer rate is 640 Kbps, according to the company. \$947. Image Network Technology, 818/454-1617, 800/334-6684; fax 818/454-1655.

JX-610

Flatbed 36-bit color scanner offers 600 by 1200 dpi, with single-pass scanning and software control for lightness, sharpness, negative scanning, and gamma-correction control. Can scan reflective and transparent original as large as 12 by 17 inches and as small as 35mm slides. \$13,500 with software; \$12,500 without software. Sharp Electronics Corp., 201/529-8731, 800/237-4277; fax 201/529-9636.



Mirror Quick

Mirror Quick

JPEG (Joint Photographic Experts Group) accelerator board compresses and decompresses images transparently for QuickTime applications. Mac IIcx with board opens compressed 1.2MB PhotoShop PICT in 1½ seconds that would take 21 seconds to decompress without board, according to the company. \$599. Mirror Technologies, 612/633-4450, 800/654-5294; fax 612/633-3136.

MultiVision 875 Plus

A 17-inch color monitor that has an on-screen programmable processor, 110V/220V power supply, side-panel



MultiVision 875 Plus

user controls, and a two-year warranty. Monitor features 120MHz bandwidth, dynamic beam focus, and horizontal and vertical scan circuitry. \$1899. Taxan, 408/748-0900, 800/648-2926; fax 408/748-9599.

PB-10

External video adapter that connects PowerBook 140, 145, or 170 to LCD panel or other projection device. Converts PowerBook's 1-bit video to VGA. No software needed. \$399. Power R, 206/547-8000, 800/729-6970; fax 206/285-0260.

Personal Color-Point PSE

Thermal-transfer color printer has 300-by-300-dpi resolution; 5MB of RAM, expandable to 21MB; and 17 fonts. Uses 16MHz Intel 80960 RISC processor. Prints standard 8½-by-11-inch letter and 8½-by-14-inch legal page sizes; postcard size, and 210mm-by-297mm (A4) size. Can print full-color page in 2 minutes, 38 seconds, according to company. \$3999. Seiko Instruments USA, 408/922-5900, 800/888-0817; fax 408/922-5835.



PowerPlay

PowerPlay

A 15-inch monochrome portrait display that connects to a PowerBook via the SCSI port; no special video adapter required. Designed with built-in 20MHz 68000 microprocessor and on-board QuickDraw acceleration. Also features a screen-refresh rate of 72Hz, resolution of 640 by 870 pixels at 80 dpi, two SCSI ports, and external SCSI-address and SCSI-termination switches. Also connects to Mac Plus or Classic. \$999. Generation Systems, 612/633-5222, 800/325-5811; fax 612/633-1083.

PowerSwap

PowerBook accessory enables users of the 140, 145, 160, 170, and 180 to swap batteries without having to shut down the computer; device allows a standard 9V alkaline battery to power the Power-continues

Removable, Rewritable, Remarkable.

Introducing DataPak™ MO/128, the latest thing in magneto-optical storage from Mass Microsystems.

Slip 128MB of storage into your shirt pocket. Send it in a courier envelope, or secure it in your desk drawer. DataPak MO/128 stores an incredible 128MB onto a DataCart™ cartridge that's nearly as small as a floppy disk. And like all DataCart cartridges, this one includes a Mass Micro exclusive: *Our Lifetime Warranty.*



The best of both worlds. DataPak MO/128 gives you both removable drive performance and optical drive reliability.

DataPak performance is nearly twice that of earlier optical drives. And because DataPak MO/128 incorporates high-technology non-contact laser design, loss of data is virtually eliminated, keeping your precious data where you want it when you want it.

Give us a call and discover why DataPak MO/128 is the best removable storage solution for you.

MASS
microsystems
1-800-522-7979

©1992 Mass Microsystems, Inc., 810 West Maude Avenue, Sunnyvale, CA 94086. Phone (408) 722-1233. Fax (408) 733-5499. Mass Microsystems and the Mass Microsystems logo are registered and Mass Micro and DataCart are trademarks of Mass Microsystems, Inc. Mac and Macintosh are registered trademarks of Apple Computer, Inc.

NEW PRODUCTS

Book while the computer sleeps to preserve RAM contents. \$39.95. Utilitron, 214/727-2329, 800/428-8766; fax 214/727-2329.

PowerVision

This internal video adapter enables user to connect a PowerBook 140, 145, or 170 to a standard 12-inch, 13-inch, or 14-inch color monitor or to a 15-inch gray-scale monitor. Display-detection circuitry deactivates the video board when monitor is disconnected. Includes installation video and tools. Without RAM \$499; with 2MB of RAM \$699; with 4MB of RAM \$999. Mirror Technologies, 612/633-4450, 800/654-5294; fax 612/633-3136.



PowerVision

ViperDrive

Floptical drive that reads and writes to 3.5-inch flopticals, high-density (1.44MB) Mac or DOS disks, and two-sided DOS disks. Internal configurations support the Mac II family, the LC and LC II, and the SE and SE/30. Also available as an external floppy drive. Ships with SCSI cable and floptical disk. Internal \$349; external \$399. Second Wave, 512/343-9661; fax 512/343-9663.

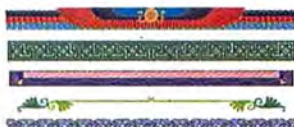
Wacom UD-0608

Pressure-sensitive ADB graphics tablet that has the ability to distinguish 120 levels of pressure, twice that of the original Wacom tablets, according to the company. The tablet also recognizes more than 100 data-input points per second, as compared with top input speeds of 50 to 60 points per second for conventional ADB tablets, according to company. \$449. Wacom Technology Corp., 206/750-8882, 800/922-6613; fax 206/750-8924.

SOFTWARE

Accents & Borders 2

Modular clip-art collection that includes more than 300 decorative and representational images, some of which were inspired by historical motifs, such as Native American and Celtic art. There are five categories: borders, which are designed to be scaled, cropped, duplicated, and linked together; frames, designed for proportional scaling when imported into a page-layout program; ornaments, which can be used alone or duplicated



Accents & Borders 2

to create borders and frames; symbols, made up of several images that can be separated and used independently; and tiles, designed to be repeated horizontally and vertically to create continuous background patterns. 2MB rec-ommended. \$149.95. 3G Graphics, 206/774-3518, 800/456-0234; fax 206/771-8975.

Bestbooks by Teleware

Entry-level bookkeeping product for small businesses. Provides sample data files covering almost every type of business: check, deposit, invoice, and purchase-entry screens; automatic entry balancing; both item and service invoicing; and integrated draw program to customize checks, invoices, statements, and mailing labels. Product is data-compatible with M.Y.O.B. accounting software. 1MB min. memory. \$99. Teleware, 201/586-2200, 800/322-6962; fax 201/586-8885.

Bridge 7.0

Bridge-playing program deals the opening hand, bids and plays out a hand, recognizes Blackwood and Stayman conventions, lets the player choose weak or strong two bids, saves and replays hands; the Hand Editor lets the player set up, swap, or modify hands. The hint button suggests bids along with a reason for making bids. Player can set bidding style to be more aggressive or conservative. Players can also choose to play contract or duplicate bridge or whist. 1MB min. memory. \$49.95. Artworx Software, 716/385-6120, 800/828-6573; fax 716/385-1603.

Christmas Pack

Collection of 15 games with a holiday theme; includes picture puzzles, word searches, matching games, and strategy and memory games for one or two players. Rather than pulling down menus, users access each game by clicking on presents or stockings in a holiday picture on screen. Sound is a part of each game as well. 1MB min. memory. \$59.95. Nordic Software, 402/488-5086; fax 402/488-2914.

ClickArt Artistry & Borders

Clip art collection of more than 325 EPS images. Consists of more than 60 borders; people, business, flower and animal pictures; labels; and initial capital letters. 2MB min. memory. \$129.95. T/Maker Company, 415/962-0195; fax 415/962-0201.

Cliptures Volume 5 Borders

Collection of more than 300 EPS clip art border styles including art deco, art nouveau, calligraphic, certificate, contemporary, and Victorian. 1MB min. memory. \$129.95. Dream Maker Software, 303/762-1001, 800/876-5665; fax 303/762-0762.

Cogito

Player must restore a geometric figure of marbles, which are randomly mixed by the computer, to its original shape by moving rows and columns on the board. Game has 120 levels of difficulty. In color with optional background music. 2MB continues

PowerBook Users

Word
ProcessingTwo word processors
are PowerBook contenders.The winner is **NISUS COMPACT**.

"...best new PowerBook™ product I've seen."

Steven Bobker, MacUser 6/92

**NISUS[®]
COMPACT**WriteNow[®] 3.0**Suggested Retail Price**

\$150

\$245

Toll-Free Tech Support

Yes

—

Uses Claris[®] XTND to Read/Write MS[®] Word

Yes

Yes

POWERBOOK FEATURES:

Battery Status & Clock Display

Yes

—

Sleep Command Within Program

Yes

—

Battery Conservation

Yes

—

Thick Cursor & Insertion Point Preference

Yes

—

EDITING FEATURES:

Headers/Footers

Yes

Yes

Paragraph Style

Yes

Yes

Footnotes

Yes

Yes

Custom Keyboard Equivalents

Yes

—

Unlimited Undos

Yes

—

Noncontiguous Selection

Yes

—

Rectangular (Vertical) Selection

Yes

—

File Management & Retrieval System

Yes

—

Graphics Layer

Yes

—

SPELL CHECKER:

Words

135,000

135,000

User Dictionary

Yes

Yes

Skip/Replace All

Yes

—

Auto Hyphenation

Yes

—

Thesaurus Words

1.4 Million

1.4 Million

FIND/REPLACE FEATURES:

Find All

Yes

—

Wild Cards

5

1

Font, Size, Style, Color Sensitive

Yes

—

Phonetic Find

Yes

—

**FREE DEMO DISK**

Phone (619) 481-1477 ext. 92

FAX (619) 481-6154

NISUS

107 S. Cedros Ave • Solana Beach, CA 92075

© Nisus Software Inc. All referenced trademarks are property of their respective holders.

min. memory. \$59.95. Inline Design, 203/435-4995, 800/453-7671; fax 203/435-1091.

CompassPoint

Image-management system that catalogs and manages photos, slides, overhead transparencies, illustrations, and QuickTime movies. The program includes a feature that automatically tracks where and when images have been used and where they are currently filed or who has borrowed them. Also has remote-access capability that allows authorized off-site users to browse and download images. 6MB min. memory. \$749. Northpoint, 313/543-1770; fax 313/541-1858.



CompassPoint

The Complete Stories, Volume 1

Expanded book for PowerBook brings 46 of Isaac Asimov's stories to the laptop. Users can annotate passages, mark text, search references, and set bookmarks. Requires HyperCard 2.1. 2MB min. memory. \$19.95. The Voyager Company, 310/451-1383, 800/446-2001; fax 310/394-2156.

Contractor's Dream

Construction-estimate program has database for labor-and-materials costs, sorts by task or material description, gives the contractor four types of bids, accumulates bids, saves jobs, and calculates percent waste. Works in feet, inches, fractions of an inch, and pitch; and can update bids or database by percentages. Includes 30-minute tutorial tape cassette. 2MB min. memory. \$475. Workhorses, 303/279-8551, 800/777-2477; fax 303/279-0411.

Country Club Art

Over 175 images of golf- and tennis-related clip art in HyperCard and MacPaint formats. Requires HyperCard or MacPaint. 1MB min. memory. \$44.95. FYI Publishing, 817/732-1521; no fax.

Datica

Tool for converting physical measurements; allows users to convert between English and metric systems and independent units. The program can solve 50 fundamental equations with variables in any units. Includes periodic table with the 10 most-used properties for each of 103 elements; a library feature allows user to add data about other measurement types. 512K min. memory. \$65. By Design, 414/648-3712, 800/527-7472; fax 414/648-3712.

Dear Diary

Journal program that enables user to take extensive notes and organize them in a database-like way; includes a built-in

personal information manager, appointment calendar, to-do list, and date-stamping capability; designed particularly for the purpose of tracking telephone and in-person conversations. 1MB min. memory. \$69.95. Purrfect Software, 602/967-0097; no fax.

The Educator's Time Source

Computerized grade book, database, search-and-report generator, assignment-key generator, and test-scoring and grade-posting program. Helps educators keep track of grades and associated clerical work. Tracks up to 50 students per class, and up to 15 classes. 1MB min. memory. \$125. Missing Link Technologies, 503/259-2882, 800/833-5790; no fax.

EduClip Images 1, 2, & 3

EPS clip art for use in materials relating to education. EduClip Images 1 includes clip art images for school sports, classrooms, holidays, and various curriculum areas. EduClip Images 2 includes alphabet with different images for each letter and the numbers 0 through 10. EduClip Images 3 includes logos for different curriculum areas and symbols for subjects such as biology, chemistry, health, music, literature, foreign languages, and geography. 2MB min. memory. \$39.95 per title. Teach Yourself by Computer Software, 716/381-5450, 800/724-4691; fax 716/427-7628.

Exam in a Can

Generates objective-based math exams, tests, and worksheets for grade levels 4 through 12. Algorithm bank attaches an algorithm to each predefined curriculum objective and then generates as many problems for that objective as teacher requires. Teacher can also enter questions. Questions can be multiple choice or free response. Titles include Basic Math, Applications in Basic Math, Pre-Algebra, Algebra I Skills, Algebra II Skills, Geometry, Pre-Calculus and Calculus. 1MB min. memory. \$499 per title. Chancery Software, 604/294-1233, 800/999-9931 ext. 180; fax 604/294-2225.

Handcrafted Type Designs

Original and revived set of typefaces includes Metroliner Caps (originally known as Metropolis Shaded typeface), Jm Eden Light, Antique Row, Spring Garden, and Exposition. 1MB min. memory. \$89. Jonathan Macagba, 215/829-1558; fax 215/829-1512.

ABCDEFGHIJKLMNOPQRSTUVWXYZ
OPQRSTUVWXYZ
ABCDEFGHIJKL
IJKLMNOP

Handcrafted Type Designs

Human Envelopes

Envelope-and-label utility that features preset support for 28 types of envelopes and labels, provides 9 database fields for each address, dials telephone numbers, continues

Circle 289 on reader service card

FIND THE PROBLEM

OVER 250 HARDWARE TESTS • GRAPHICAL USER INTERFACE • COMPLETE SYSTEM INFORMATION

LOCATES BAD SIMMS • TERMINATION PROBLEMS • 24 VIDEO/AUDIO TESTS

DESKTOP DIAGNOSTICS

SNOOPER

VERSION 2.0

FREE VIREX
INCLUDES COMPLETE PACKAGE

VIREX

PERFORMS OVER 250 HARDWARE TESTS INCLUDING RAM • SYSTEM • HARD DISK • VIDEO • BENCHMARKS

MAXA

MATH - MEMORY - VIDEO - CPU - HARD DISK BENCHMARKS • COMPLETE "SAD MAC" & ERROR CODES

SUPPORTS



DIAGNOSTIC SOFTWARE FOR MACINTOSH

The next time you see a "sad Mac" on your screen or your Mac's performance isn't up to par, diagnose from your desk with SNOOPER, the revolutionary new standard for Mac diagnostic and testing tools. SNOOPER performs over 250 tests, checks all your hardware and identifies any problems. And the

same SNOOPER software runs on all Macs.

SNOOPER is easy to use and saves you time and money. Complete your Mac utilities with SNOOPER, the hardware diagnostic and get the complete VIREX virus protection package FREE.

MAXA CORPORATION 116 MARYLAND AVENUE • GLENDALE, CA 91206 IN THE US AND CANADA CALL: 800-788-6292

MAXA and SNOOPER are trademarks of MAXA Corporation. Other product and company names are trademarks of their respective owners. © 1992 MAXA Corporation. All rights reserved.

Circle 270 on reader service card

MACWORLD
EXPOSITION
SEE US AT BOOTH #3556

MAXA

First in desktop diagnostics

sorts on 11 criteria, and finds across all fields; lets the user view a database by any field, add graphics, and do quick cut and paste from word processors; and offers online help, postal information, and wide-area bar codes. The Open House feature searches a hard drive for previously typed addresses and enters them in the Human Envelopes database. Program can import 19 different file formats, including Word 3 and 4, Works, MacWrite 5.0 and II, and WordPerfect. 1MB min. memory. \$124.95. We, 415/368-0828, 800/452-2635; fax 415/858-2598.

Imploder 2.0

External development system for 4th Dimension database applications; compresses data up to 85 percent, according to the company, without any modification or removal of data from image or document. 2MB min. memory. \$249. Component Software Industries Corp., 609/497-4501, 800/633-4252; fax 609/497-4008.

Jam Session

Program includes 20 popular songs, such as Peter Gabriel's "Sledgehammer," Ritchie Valens' "La Bamba," Elton John's "Crocodile Rock," and Garth Brooks' "Rodeo"—all without vocals. Users can change a sound's instrumentation and jam along, even record alongside, with their own MIDI instrument or with an on-screen keyboard. 1MB min. memory. \$59.95. Bogas Productions, 415/592-5129; fax 415/592-5129.

Japanese Word Torture

Program drills user on 2014 Japanese words, based on the list of essential words formulated by the Japanese Language Institute. Learner builds vocabulary by typing in hiragana or katakana without running the KanjiTalk operating system. The program does not display Japanese words in romaji. 2MB min. memory. \$49.95. HyperGlot Software, 615/558-8270, 800/726-5087; fax 615/588-6569.

The Modern Concrete Estimator

Templates and databases that use Microsoft Excel 4.0 for concrete estimating for residential through light industrial construction. Areas for concrete estimation include foundations, cast-in-place structures, and flat work. Templates can handle information to calculate materials, labor, and indirect labor costs. Has ability to report on material cost per yard, labor cost per yard, material cost per square foot, and time remaining to completion. 2MB min. memory. \$150. Rock St. Software, 805/653-5462; fax 805/652-0742.

Orchids

Program designed to manage the flow of medical clinic data. Features include formats for entering medical history or notes of physical examinations and follow-up visits; picture files for patients' photo, X rays, surgical photos, and medical sketches; customized scrolling checklists for histories and physicals; customized automated letters generated from



Orchids

the checklists; a contact log for identifying and reviewing interactions with patients; a chart-review format for cross-referencing information; a report generator for extracting and relating data and performing statistical analyses; and password protection. 5MB min. memory. \$4995. CapMed, 205/881-8620; fax 205/883-9717.

The Pelican Brief

A mystery story by John Grisham in Expanded Book form, designed for the PowerBook. A law student uncovers clues leading to the assassin of two Supreme Court justices. Users can mark passages, write notes, set bookmarks, and search text for specific references. Requires HyperCard 2.1 or later. 2MB min. memory. \$19.95. The Voyager Company, 310/451-1383, 800/446-2001; fax 310/394-2156.

Real Answer

Shareware math application includes algebraic calculator that supports trigonometric and transcendental functions, and named variables. Flex-Calc feature

allows the user to modify an expression previously submitted for evaluation and to receive an answer without disturbing the historical record of mathematical query and response. Also solves sets of simultaneous linear or nonlinear algebraic equations. 512K min. memory. \$20. ARSoftware, 301/459-3773, 800/257-0073; fax 301/459-3776.

ReOpt

Electronic encyclopedia of remedial-action options for hazardous-waste containment; features summary descriptions of 88 remedial-action technologies and 214 synonymous terms. Lists about 500 previous applications of cleanup technologies, including the company performing the cleanup and the status of the operation. Automatic technology selection allows user to choose appropriate technologies based on site characteristics. 5MB min. memory. \$2500. Sierra Geophysics, 206/822-5200, 800/826-7644, ext. 120; fax 206/827-3893.

Sailor Song

Fiction by Ken Kesey; this Expanded Book designed for the PowerBook focuses on the inhabitants of an Alaskan town who have to deal with the environmental changes that are brought on by a Hollywood production company filming a children's story. Users can search text to find and annotate passages, mark passages, and set bookmarks for future references.

Turn your Mac Into a Professional Trading Station!

Professional Analyst, from Trendsetter Software, let's you analyze real-time market data from Signal instantly.

Designed for the Mac, **Professional Analyst** lets you:

- **Monitor your choice of 500 symbols**
- **Create a wide variety of charts, including Japanese Candlesticks.**
- **Instantly access the best technical studies including Gann, Fibonacci and computer generated trend lines (a Trendsetter exclusive).**
- **Display studies in the same window as your chart with up to 14 studies per chart and 9 charts per screen.**
- **Update charts each time a trade occurs**
- **Get audio/visual alarms when your Buy/Sell points are reached.**



Custom layouts "remember" every aspect of your personal design.

Take advantage of our unconditional 30-day moneyback guarantee now!

1-800-825-1852 Ext. 27

Trendsetter Software • 2020 N. Broadway, Ste. 102 • Santa Ana, CA 92706 • 714/547-5063 Fax

Signal

Trendsetter

Shattering optical illusions.



The breakthrough you've been waiting for in optical technology.

If you thought optical storage meant sacrificing speed, compatibility, desk space or your hard earned dollars, then the new Microtech Genesis 650 rewritable optical drive will shatter your illusions.

While other drives may deliver fast access times or claim to conform to ISO/ANSI standards, *no* other high capacity optical on the market today can provide outstanding price/performance, true compatibility *and* offer an internal model for the Quadra 900s. With 650MBs of reliable optical storage ensuring 15 years of data integrity, a 40ms access time and an unbelievable list price of \$2199, it's now time to reevaluate your technology of choice for removable storage. When you add Microtech's commitment to quality, FCC Class B compli-

Manufacturer	Microtech	MicroNet	Ricoh	PLI
External Model	Genesis 650	SB SMO-1	RS9200EX	MaxOptical
Internal Model	Genesis 650i	none	none	none
Capacity	650MB	650MB	650MB	650MB/1GB
Access Time	40ms	95ms	37ms	35ms
Mechanism	Sharp	Sony	Ricoh	Maxoptix
Warranty	2 year	1 year	1 year	1 year
List Price	\$2199	\$3995	\$3900	\$4599

Specifications and pricing based on respective manufacturer's quotation 11/24/92.

ance and leading service and support, the Genesis 650 is the breakthrough you've been waiting for in optical technology.

Proudly distributed by **INGRAM MICRO**

For your nearest dealer call: **800-325-1895**

Western regional office: 800-777-4276

International inquiries: 203-468-6223/Fax 203-467-8124



©1992 Microtech International, Inc. 158 Commerce St., East Haven, CT 06512. All trademarks or registered trademarks are the property of their respective owners. Microtech reserves the right to change prices and specifications without notice.

Circle 254 on reader service card

erence. Requires HyperCard 2.1. 2MB min. memory. \$19.95. The Voyager Company, 310/451-1383, 800/446-2001; fax 310/394-2156.

The Secret Island of Dr. Quandary

In order to escape Dr. Quandary's island, players need to solve puzzles using math and logic skills. Game has three difficulty levels. 1MB min. memory. \$49.95. MECC, 612/569-1529, 800/685-6322 ext. 549; fax 612/569-1551.



The Secret Island of Dr. Quandary

Server Manager

Network-management software that allows network administrators to monitor, control, and administrate multiple AppleShare file servers from a single location. Program tracks and pinpoints problems such as back-up failures, network clock-synchronization problems, excessive server and node activity levels, impending disk-space shortages, and viruses. Records server and node usage levels over periods of time. 2MB min. memory. 1-pack \$395; 5-pack \$695; 10-pack \$995; 20-pack \$1495. Santorini Consulting & Design, 415/563-6398; fax 415/563-0332.



Server Manager

Spiral

Application designed for taking and organizing notes on a PowerBook; uses notebook metaphor. User creates notebooks consisting of text pages the size of the PowerBook screen. Users can divide each notebook into sections and attach bookmarks to specific pages in each section. Users can also enter shortened versions of words or phrases, which the program then writes out in full. Program loads itself directly into memory in order to avoid spinning up the hard drive, thus saving battery power. Program also includes optional fat I-beam cursor for easy viewing and a Sleep command that's accessible from within the program. 1MB min. memory. \$129. TechWorks, 512/794-8533, 800/688-7466; fax 512/794-8520.

Swamp Gas Visits Europe

An extraterrestrial creature, guided by the player, visits countries, capitals, and points of interest in Europe. When a mission of visiting a certain number of countries, capitals, cities, and landmarks

is complete, the player can choose to play one of three arcade games. For ages 6 and up. Game has three difficulty levels. 2MB min. memory. \$59.95. Inline Design, 203/435-4995, 800/453-7671; fax 203/435-1091.

SymArt Pro

Software designed to administer prepress production of bar-codes. Enables user to design custom bar-code formats with up to five lines of text in any position and in any font, to store and name formats in a database, and to save bar codes in a print queue and print them simultaneously without opening them in other applications. 2MB min. memory. \$2999. Bar Code Systems, 404/399-5921, 800/883-8300; fax 404/399-7837.

Target Tones System

Adobe Photoshop plug-in that helps user select and specify duotones, tritones, and quadtones. Guidebook offers more than 120 multitone variations; user selects reference number by sample in guidebook that corresponds to appropriate



Target Tones System

curve in Photoshop. 2MB min. memory. \$99.95. Graphic Systems Technology, 606/283-9750, 800/528-1851; fax 606/283-9769.

The Tinies

Tinies, which are mischievous, hairy beings from the planet Sklumph, are coming to Earth to play some practical tricks. Player has to find the Tinies and maneuver them back into their sleep pods. Game has more than 100 difficulty levels. 2MB min. memory. \$59.95. Inline Design, 203/435-4995, 800/453-7671; fax 203/435-1091.



The Tinies

Trivial Pursuit Daily Planner

Sports edition tests users' knowledge of sports trivia daily in such categories as nicknames, football, all-stars, hockey, baseball, and numbers. Program keeps score of successful answers throughout the year. Comes with a Genius edition of the trivia game, for which user answers questions in the categories of science and nature, art and literature, history, geography, entertainment, and sports and le-

continues

Feel the Power...

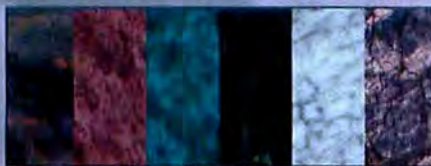
- **FinderExpress:** Increases Finder file copy speeds by up to 340%
- **FileMapper:** Allows double-click launching of orphaned files
- **Informant:** Complete system information tool

IIcx	15.0MB/min	Finder copy test average of one 32MB file and 32 item 32MB folder
Quadra 700	29.9MB/min	
IIcx using FinderExpress	51.7MB/min	
IIcx and Quadra configured with System 7.1, 20MB RAM and DEC 1GB hard drive Longer bars are faster.		

An appropriately configured Quadra 950 has reached 120MB/min with FinderExpress

See the Beauty...

- **Chameleon:** The ultimate desktop pattern enhancement utility
- **Calendar:** Versatile desktop calendar with notes and graphics
- **VectorPlasma:** Screen saver that uses minimal processor power
- **RedAlert:** Installs color icon sets for the system alert icons



Chameleon includes Artbeats® seamless marble & tile patterns



7th Heaven MACINTOSH UTILITIES FOR SYSTEM 7

Eternal Bliss

The 7th Heaven Utilities are a collection of seven separate applications and installers that allow you to customize System 7 the way you like it. Use 7th Heaven instead of memory and disk hungry alternatives to make your Macintosh as fast and colorful as it can be.

To order the 7th Heaven Utilities call
1-800-645-2495

LOGICAL SOLUTIONS, INC.
2124 University Avenue • St. Paul, Minnesota 55114
(612) 659-2495 • (612) 659-2498 fax

System 7 Enhancements That Make Sense

Circle 169 on reader service card

MACWORLD Expo/Tokyo 1993

MACWORLD Expo/Tokyo attracts the biggest Macintosh crowd on earth!

90,000 Macintosh enthusiasts will get a look at new or pre-release products from more than 200 exhibitors from all over the world. And in addition to exhibitor booths, MACWORLD Expo/Tokyo 1993 will feature the first-ever CD-ROM Software Library, where visitors can sample the new world of disks, as well as the Hands-On Corner, where software products will be available to try. At the conference sessions, a full program of world-famous Mac experts from the US and Japan will speak on the new frontiers for Macintosh.

MACWORLD
EXPOSITION
Tokyo



Don't miss the big show in Tokyo.

- **Date** February 10th (Wed.) - 13th (Sat.), 1993
- **Place** Nippon Convention Center at Makuhari Messe, Tokyo
- **Sponsors** Macworld Communications Japan, IDG World Expo/Japan
The Japan Industrial Journal, Nippon Broadcasting System
The Sankei Shimbun, Fuji Television Network
- **Special Support** Yokogawa-Hewlett-Packard
- **Special Cooperation** SONY Corporation
- **Management Office (For general information)**
IDG World Expo/Japan
Ichibancho First Bldg., 3F, 15-1 Ichibancho,
Chiyoda-ku, Tokyo 102 Japan
phone: 81-3-5276-3751 fax: 81-3-5276-3752

See us at
MACWORLD Expo/San Francisco
January 6 -9, 1993!
Hospitality Suite
Room 230, Moscone Center

● **Number of Exhibitors** 215 ● **Booth Spaces** 956 ● **Expected Attendees** 90,000

General Sessions - U.S. Speakers

2 / 1 0 (Wed.)	13:00	Keynote : Macintosh, Multimedia, PDA & Beyond	John Sculley, Chairman & CEO, Apple Computer Inc.
	15:00	Keynote : Future Technologies	David Nagel, Senior Vice President, Apple ATG
	16:30	Special Session QuickTime International Film Festival Tokyo	Jerry Borrell, President, SUMERIA Y. Hamano, National Institute of Multimedia Education
2 / 1 1 (Thu.)	10:30	Consumer PDAs	PDA's and Consumer Market Gaston Bastiaens, Vice President & General Mgr., Apple P.I.E.
	13:00	DTP, Graphics and Design	Future of Digital Photography Rick Smolan, Photographer/President, Against All Odds
	14:30	System Software and Future OS	System Advances - Future Directions Roger Heinen, Vice President, Software, Apple Computer Inc.
	16:00	Apple in Japan	Senior Vice President & General Mgr., Macintosh Architecture Div.
2 / 1 2 (Fri.)	10:30	Multimedia & QuickTime	The New Multimedia Standard Nat Goldhaber, President, Kaleida Labs, Inc.
	13:00	Multimedia & QuickTime	QuickTime Movie Makers to be announced
	14:30	Future Operating System	Future OS, RISC and Power PC Fred Forsyth, Senior V.P., Macintosh Systems Div., Apple Computer Inc.
	16:00	Networking & Business	New Style Communications to be announced
2 / 1 3 (Sat.)	10:30	Multimedia & QuickTime	Multimedia Entertainment Christopher Yavelow
	13:00	Multimedia & QuickTime	New CD-ROM Titles to be announced
	14:30	DTP, Graphics and Design	Super Users Tips Guy Kawasaki, Bob Lavitus, Steven Levy

General Sessions - Japanese Speakers

2 / 1 1 (Thu.)	10:30	Collaboration and Networks	Collaboration and Group Networking Tsuyoshi Sasada, Professor, Osaka University
	13:00	Business Work Integration	Macintosh for Office Efficiency Mitsuhiro Miyazaki, AXIS
	14:30	Design	Design Advances (tentative) to be announced
	16:00	TV & Press	Macintosh in Mass Media Fuji TV, The Sankei Shimbun, Nippon Hoso (tentative)
2 / 1 2 (Fri.)	10:30	PowerBook	What is Mobile Computing? Kazutoshi Otani, Macintosh Evangelist
	13:00	Multimedia & Business	Staff Training Program/Sales and Multimedia Sumino Ueda, ANA Business Create / Tetsuya Kitayama, Uchida Yoko
	14:30	Graphics	3D Illustration/Macintosh and Animation Naoyuki Kato, Illustrator / Hikaru Yuzuki, Cartoonist
	16:00	DTP	DTP Advances during 1992 to be announced
2 / 1 3 (Sat.)	10:30	Networked Databases	Organizing Business Information to be announced
	13:00	Business & Customization	Customizing Applications for Your Office Kiichi Ikenoue, Chiyoda Corporation Ryosuke Mizouchi, Kirin Brewery
	14:30	Education	Macintosh for Education to be announced

☆ Sessions may be changed without advance notice.

ADVANCE TICKETS (Including Tax)

4-day Conference & Show Ticket ¥33,000
(Ticket at the door ¥38,000)
4-day Show Ticket ¥2,000
(Ticket at the door ¥1,500 for 1 day)

Where to Buy

Tickets may be purchased from the Conference Management Office. Please fax your name, company name and department, address and tel/fax number to the fax number on the right.

MACWORLD Expo Conference Management Office
c/o Nippon Broadcasting System
1-9-3 Yurakucho, Chiyoda-ku, Tokyo

FAX: 81-3-3216-2549

For more information, please contact: MACWORLD COMMUNICATIONS JAPAN, (Ms.) Izumi Okamoto phone:81-3-5276-0451 fax:81-3-5276-3753

World Expo Corporation currently produces 65 events in 21 countries including

MACWORLD Expo, ComNet, CD-ROM Expo, Object World, SunWorld, and WINDOWS™ WORLD

sure. 2MB min. memory. \$69.95. Amaze, 206/820-7007, 800/395-1546; fax 206/823-0568.



Trivial Pursuit Daily Planner

Update

File-synchronization utility keeps duplicate documents on two or more Macs up-to-date by copying the newest version of a document to the Mac with the outdated version. Optionally mirrors a hard drive or folder to another disk and allows quick backup by copying only files that have changed. Also copies latest versions of files to and from disks on the desktop. Works with AppleTalk Remote and file sharing. 1MB min. memory. \$49. Qdea, 612/779-0955; no fax.

Zen and the Art of Motorcycle Maintenance & Lila

These two novels by Robert Pirsig in expanded book for the PowerBook for-

mat combine quirky characters with contemporary philosophy. Format allows readers to take notes and mark pages on the computer screen. 2MB min. memory. \$19.95. The Voyager Company, 310/451-1383, 800/446-2001; fax 310/394-2156.

CD ROMS

Battle Chess

Animated chess pieces engage in a short struggle with each capture, accompanied by audio music, character voices, and battle sound effects. Current version features 30-minute animated tutorial on chess tactics and the history of each piece. Product includes opening library of 30,000 moves; provides ten levels of play against the computer; and allows you to play another human—either on the same Mac, over a network, or with a modem connection. 2MB min. memory. \$79.95. Interplay Productions, 714/553-6655, 800/969-4263; fax 714/252-2820.



Battle Chess

Hi Rez Audio Vol. 1

A set of 42 royalty-free music clips for use in multimedia productions. Length of each track ranges from 10 seconds to 1 minute 30 seconds. Disc includes 20 sound effects. User can choose between 22kHz and 11kHz sound quality. Musical styles include new age, orchestral, rhythm and blues, funk, rock, and pop. 3MB min. memory. \$149.95. Presto Studios, 619/689-4895; fax 619/689-4895.



Hi Rez Audio Vol. 1

Images with Impact CD-ROM

Library of modular clip art has over 1100 images in EPS and PICT formats. Contains all images from five 3G Graphics clip art collections: Accents & Borders 1 and 2, People 1, Business 1, and Graphics & Symbols, along with an additional 450 color images. 2MB min. memory. \$499.95. 3G Graphics, 206/774-3518, 800/456-0234; fax 206/771-8975.

The Journeyman Project

Interactive computer game in which player jumps back in time to prevent someone—or something—from sabo-



The Journeyman Project

taging history. Player clicks on arrows to navigate through scenes, and clicks on objects to interact with them. Also has message screens and an inventory window. Has three-dimensional graphics and full sound track. 5MB min. memory. \$99.95. Presto Studios, 619/689-4895; fax 619/689-4895.

A Poke in the Ear with a Sharp Stick (Volume II)

Alternative sound library has over 1800 samples in either 16-bit linear mono or stereo AIFF (audio interchange file format) files sampled at 44.1kHz. Consists of hard-edged industrial samples and ambient textures. Contains 150 rhythmic loops, 170 ambient textures, more than 500 percussion sounds, and more than 800 melodic sounds. 2MB min. memory. \$199. OSC, 415/252-0460; fax 415/252-0560.

URW TypeWorks Collection

Contains 3000 PostScript Type 1 fonts and Kernus, a kerning utility. The fonts are style variations—regular, outline,

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.



inline, relief, drop shadow, and rounded—of 500 popular faces. Fonts are from URW's type library, which includes contemporary designs and classics licensed from sources such as ITC. Each font includes about 1000 kerning pairs. All the fonts are unlocked and available for instant access. 512K min. memory. \$895; 1000-page specimen book \$49.95. URW, 603/882-7445, 800/229-8791; fax 603/882-7210.

Who Built America

A survey of American history presenting a populist view of past and present by the American Social History Project. Includes QuickTime movies, audio bites, newspaper accounts, and reproductions of historical documents. 2MB min. memory. \$24.95 per volume. The Voyager Company, 310/451-1383, 800/446-2001; fax 310/394-2156.

Who Killed Sam Rupert?

Interactive murder-mystery game created with color video, sound, and animation. To solve the crime, the player has to

check the validity of various types of information, but each activity chosen to help solve the crime carries a time penalty. Game includes a view of the murder scene, where the player can examine objects in detail; a battery of forensic tests; an alibi section, for cross-referencing evidence and alibis; a video press conference, in which the player addresses the media; and a case notebook, where the player can keep key facts, make observations, and keep other material. 4MB min. memory. \$39.99. Creative Multimedia Corp., 503/452-5921, 800/776-9277; fax 503/452-5930.

You Can't Get There from Here

Clips from films made between 1946 and 1960 discuss how to act on a date, how to behave at dinner, the benefits of electricity, and the soothing effects of prescription drugs. QuickTime movies are accompanied by written commentary on the period and the purpose behind the film. 4MB min. memory. \$29.95. The Voyager Company, 310/451-1383, 800/446-2001; fax 310/394-2156.



Padware

tucks under keyboard. All three products are available in green, blue, black, and red. Mouse Cover \$8.95; Mouse Pad \$12.95; Wrist Rest \$14.95. Padware Ergonomic Technology, 617/848-7310; fax 617/849-3280.

BOOKS AND VIDEOS

CWUG's Public Domain Catalog

Lists hundreds of ClarisWorks templates and Mac fonts, graphics, utilities, DAs, and other ClarisWorks-compatible public domain and shareware products. Includes \$2 rebate valid for future purchases from CWUG. Written by CWUG. 80 pages; \$10. ClarisWorks Users Group (CWUG), 313/454-1969; fax 313/454-1965.

Microsoft Excel 4 Companion

Guide to Microsoft Excel 4.0. Teaches novice users how to create, edit, and format an Excel worksheet; incorporate formulas; link spreadsheets; use built-in functions; and print presentation-quality reports. Intermediate to advanced users learn how to create, customize, and

enhance charts, including how to incorporate graphic objects in worksheets. Appendix describes the nine built-in tool bars, showing each tool bar and including a chart of tools and their locations. By the Cobb Group: Douglas Cobb and Judy Mynhier with Mark Dodge, Craig Stinson, and Chris Kinata. 864 pages; \$29.95. Microsoft Press, 206/882-8080, 800/677-7377; fax 615/793-3915.

The Mac Shareware Emporium

Reviews over 450 shareware and free-ware programs—games, educational products, business applications, system extensions, and control panel devices. Each entry has product name, author-contact information, cost, description, and sample screen illustration. Book also has information on how to evaluate products and sources for quality, support, and virus protection, plus a sampler disk with over 30 shareware programs. Written by Bernard J. David and Maria L. Langer. 4MB recommended. 388 pages; \$34.95. Brady, 317/573-2500, 800/428-5331; fax 317/573-2583. **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.



Who Killed Sam Rupert?

ACCESSORIES

Padware

Three products—the Mouse Cover, Mouse Pad, and Wrist Rest—have ergonomic benefits, according to company. Mouse Cover slips over mouse to add curve to surface. Mouse Pad has 20cm diameter and is circular. Wrist Rest has a rounded, sloping edge and an edge that

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.

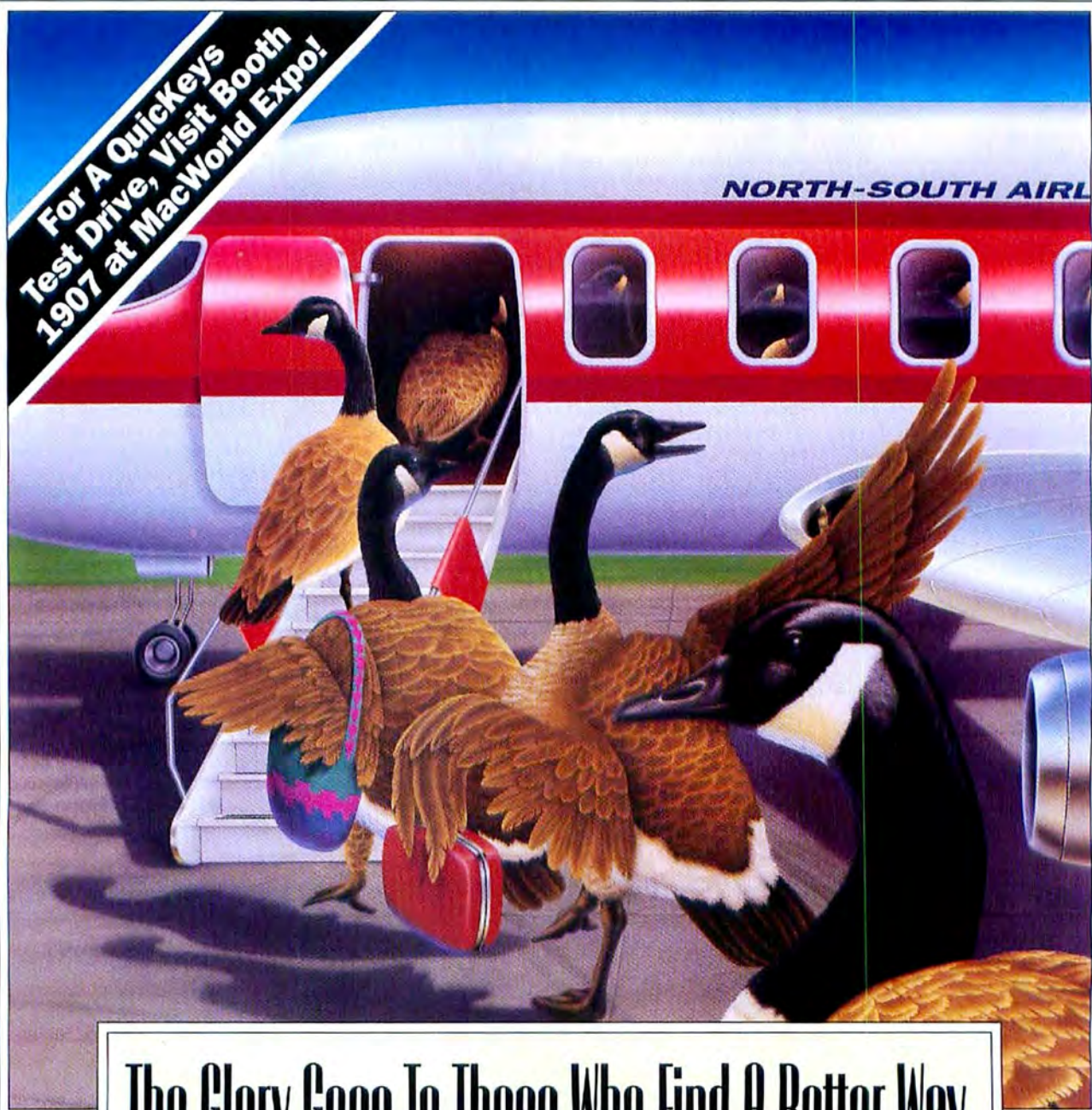


\$479.95



Supra Corporation

**For A QuickKeys
Test Drive, Visit Booth
1907 at MacWorld Expo!**



The Glory Goes To Those Who Find A Better Way.



There's nothing worse than spending hours figuring out a program that's supposed to save you time. New QuickKeys™ 2.1.3 with Instant QuickKeys™ 2.0 helps you set up dozens of shortcuts immediately...right out of the box.

Instant QuickKeys watches what you do, records your actions and makes short work of everything from opening your favorite application to running complex sequences like logging onto E-mail. Two new QuickKeys Extensions let you play QuickTime™ movies and get the

most from your PowerBook®. And, of course, QuickKeys is stable and reliable, whether you're running System 7™ or System 6. Unlock the power of your Macintosh® today with QuickKeys!

For as little as \$10, you can receive QuickKeys 2.1.3!

If you have version 2.1.2 (or 2.1.2a), your upgrade is just \$10, including shipping and handling.

Upgrade cost is slightly higher for all other versions. Order new QuickKeys today. Call 800-523-7638, Dept. CE302.

Offer expires February 26, 1993.



© Copyright 1992 CE Software, Inc. P.O. Box 65560, West Des Moines, IA 50265, U.S.A. QuickKeys and Instant QuickKeys are trademarks of CE Software, Inc. Macintosh is a registered trademark, and QuickTime and System 7 are trademarks of Apple Computer, Inc.

Circle 222 on reader service card

Questions and Tips from Macworld Readers

BY LON POOLE

SYSTEM 7.1, RELEASED LAST October, makes it easier than ever to install multiple languages on a Mac (as described in *Quick Tips*, September 1992). It's the first Mac system software that requires no major reengineering to work with languages that read from right to left, languages whose characters change according to their context, and languages with large alphabets that require two bytes of memory per character (such as Japanese, Chinese, Hebrew, and Arabic). Systems 7.0, 7.0.1, and 6.0.7 work with European languages that use the Roman or Cyrillic script systems, and these system versions have been translated into some of the more complex languages. Two system extensions give System 7.1 its international capabilities. WorldScript I handles bidirectional and contextual script systems, and WorldScript II handles script systems with large alphabets.

Once you've installed WorldScript, how easy is it to use multiple languages? Steven P. Hassman of Garmisch, Germany, wonders whether one can type right-to-left Hebrew in today's Macintosh word processors, and whether a language script's rules for text sorting make it possible to sort foreign language word lists in the correct order for that language, which may differ from the English A to Z.

I tried prerelease versions of System 7.1 and several language scripts—Hebrew, Greek, Cyrillic, and Arabic—with MacWrite II 1.1v2, Microsoft Word 5.0, WordPerfect 2.1, and the word processor in ClarisWorks. All were able to change languages on the fly. For example, I could type some text in English, choose Hebrew from the Keyboard menu (which appears between the Help menu and Application menu when you install multiple languages), choose a Hebrew font from the Font menu, and start typing in Hebrew. The English typing progressed from left to right, and the Hebrew typing went the opposite direction, as it should.

Sorting was another story. Both WordPerfect 2.1 and Word 5.0 have Sort commands, but both alphabetized cor-

rectly only for English. Conclusion: The applications you have will let you get some benefit from installing multiple languages, but developers will have to revise applications (and you'll have to upgrade to those revisions) to take full advantage of System 7's WorldScript.

Changing the Application Font

Q I personally dislike the Geneva font, which my Classic automatically selects. How can I reconfigure my Mac so that, for example, Times is automatically selected each time I open a MacWrite document?

David deClue
Saint Louis, Missouri

A Many application programs and desk accessories use the Mac's standard application font by default. The Mac stores the identity of this font in its parameter RAM—a small amount of battery-powered memory that stores sundry system settings. You can override the application font setting in parameter RAM by installing the free utility software DeFont (available from user groups including BMUG, 510/549-2684) or It's Your Default (from the BCS Mac user group, 617/625-7080). DeFont and It's Your Default are control panels (known as cdevs in System 6) that let you choose any installed font as the application font.

Some programs, including MacWrite II, Microsoft Word, and WriteNow 3.0, do not use the application font. DeFont and It's Your Default do not affect them. To change MacWrite II's standard font, create a new document, choose the font you want used, and choose Save As from the File menu. In the Save As dialog box, choose MacWrite II Stationery from the pop-up menu, name the document MacWrite II Options, and save it in the Claris folder inside the System Folder. (Before saving you can make other changes to the

document's format and content; MacWrite II will apply them to all new documents you subsequently create.) You follow a similar procedure in WriteNow 3.0, using WriteNow's Save As Default Document command instead of its Save As command. In Word 5, the Preferences command has a Default Font option.

Charging a Call

Q Can the White Knight telecommunications program access an alternate long-distance carrier and charge the call to a phone credit card? GEnie, CompuServe, and America Online do not have local numbers for my area. I have to dial 1-800/877-8000 to access Sprint; wait for a tone; dial 0, the area code, and the GEnie access number; wait for another tone; and finally dial a 14-digit authorization code. Can the program do this?

Jeffrey A. Obhrich
Abingdon, Virginia

A White Knight (from The Free-Soft Company, 412/846-2700) and most other communications programs let you enter all the numbers you need to dial as one long string in the space provided for the telephone number, placing one or two commas wherever you need to provide a pause. For example, the 40 characters

18008778000,,0703555
1212,,12345678901234

would cause the modem to dial 1-800/877-8000, pause four seconds (two seconds for each comma), dial 0-703/555-1212, pause four more seconds, and dial 123/456-7890-1234. The problem is that most modems cannot handle a dialing string longer than 38 characters, not counting blank spaces. If you enter a dialing string longer than a modem's limit, the modem reports an error. Some fax modem software gets around this length limit by providing separate spaces for you to enter the

continues



*Charging
modem calls,
measuring
cap height,
tapping Finder
power,
and more*

KEYS TO THE FINDER

Objective	Action
SELECTING ITEMS	
Select an item	Type the item's full or partial name
Select the next or previous item alphabetically	Press tab or shift-tab
Select the next item up, down, left, or right	Press ↑, ↓, ←, or →
Select the desktop item nearest upper right corner	Press ⌘-shift-↑
Select multiple items	Press shift while clicking each item or while dragging to enclose them
OPENING AND CLOSING	
Open the selected item	Press ⌘-O or press ⌘-↓
Open the selected item and close the active window	Press ⌘-option-O or press ⌘-option-↓
Open the folder or disk that contains the selected item	Press ⌘ while clicking the window's title or press ↑
Open the folder or disk that contains the selected item and close the active window	Press ⌘-option while clicking the window's title or press ⌘-option-↑
Close a window while opening an item in it	Press option while opening the item
Close all windows	Press option while clicking the active window's close box
MANIPULATING OUTLINES OF FOLDERS	
Expand or collapse the selected folder	Press ⌘-→ or ⌘-←
Expand or collapse the selected folder and its nested folders	Press option while clicking the triangle next to the folder icon or press ⌘-option-→ or ⌘-option-←
Expand or collapse all folders in the active window	Press ⌘-A and then press ⌘-option-→ or ⌘-option-←
MORE POWER METHOD	
Begin editing the selected icon's name	Press return or enter, or click the name and immediately move the pointer slightly
Zoom a window to fill the screen	Press option while clicking the window's zoom box
Move a window without making it active	Press ⌘ while dragging the inactive window
Copy an item to another folder on the same disk	Press option while dragging the item to the folder or to the folder's open window
Copy an item to the desktop	Press option while dragging the item to the desktop
Dispose of items in the Trash without warnings, and dispose of locked items	Press option while choosing Empty Trash
Align (or don't align) icons to invisible grid as you temporarily move them (temporarily reverses the Views control panel's Always Snap To Grid setting)	Press ⌘ while dragging the icons
See the path from the current window to the disk it's on	Press ⌘ while clicking the window's title
Erase a disk	Press ⌘-option-tab as you insert the disk
Skip installation of all System extensions during one start-up	Hold down the shift key during start-up
Rebuild the desktop	Hold down ⌘-option during start-up or when inserting a disk
Force the active program to quit (you should restart your Mac as soon as possible after doing this)	Press ⌘-option-esc

Power methods and keyboard equivalents for the Finder in System 7. Keyboard equivalents for menu commands aren't listed because you can review them on screen by pulling down the menus.

various parts of the dialing string.

Jeff Dripps of FreeSoft suggests two ways to work around this length limit with White Knight or any communications program that lets you type modem commands directly. With one method you split the dialing string into two or more segments, beginning each with a modem-dialing command (ATDT for touch-tone or ATDP for pulse) and ending each segment except the last one with a semicolon. The semicolon causes the modem to remain in command mode instead of trying to establish communication with a modem at the other end of the phone line. You could type the dialing string cited in the previous paragraph in three segments, pressing return at the end of each line, as

follows (hyphens and spaces are optional):

ATDT 1-800-877-8000;
ATDT 0-703-555-1212;
ATDT 123-456-7890-1234

For the second method, instead of typing multiple dialing commands to have the modem dial the numbers, you can dial them yourself on a telephone connected to the same phone line as the modem. Start by typing the following modem command in the communications program, but do not press return at the end of the line:

ATX1D

Then use the telephone to dial the complete sequence of numbers (access phone number, number of the remote modem, and authorization code). When

you complete the call and hear the remote modem's answering tone, press return on the keyboard, causing the modem to execute the command you typed before. This command tells the modem to pick up the phone without dialing any numbers. Listen on the telephone for the sound of static, which indicates your modem and the remote modem are communicating, and then hang up the telephone.

Unfortunately, neither of these methods works with custom communications programs that only provide space for entering a phone number, such as America Online versions 1.0 and 2.0 and AppleTalk Remote Access 1.0. You can use either method with AppleLink 6.1 by choosing Set Up Connection from the Network menu, and then in the dialog box that appears choosing Manual Connect from the Connection File pop-up menu. Upon connecting, with this setting in effect, AppleLink brings up a dialog box in which you can type modem commands. You click the Continue button in that dialog box when you hear the AppleLink modem's answering tone.

Stop First Page

Q. A year ago or so I read in *Quick Tips* how to get my Personal LaserWriter NT to stop printing that annoying first page every time it's turned on. I've forgotten how to do it and can't find it in my back issues.

Lois Mraz
Los Angeles, California

A. Versions 7.0 and later of Apple's LaserWriter Utility can turn off (and on) the test page (also called the start-up page) on a LaserWriter with PostScript. You can get the latest version as part of System 7.1, which Apple is selling through retail channels.

ATM and Bitmap Fonts

Q. Since I use Adobe Type Manager (ATM), can I remove all but one size and style of each of my bitmap (fixed-size) fonts that correspond to the PostScript fonts in my System Folder? For example, why should I install sizes 10 through 18 in four styles of Palatino when ATM creates for my screen whatever size and style I request if I have at least one bitmap Palatino size and style installed?

Peter Lind
Montreal, Quebec, Canada

A. Although ATM works fine if you have only one bitmap size and style installed for each PostScript font in the System Folder (or in the Fonts folder in System 7.1, or the Extensions folder in

continues

SCREEN

Profit from our experience.

High-end scanning comes to desktop.

Something new in desktop: A compact, high-quality color scanner from the most respected name in color imaging.

A product of intelligent engineering, the DT-S1015 has much in common with the quality scanners we sell to large color separators... the same input/output scanners that have outsold every other manufacturer for six years running.

This drum scanner has a standard SCSI interface for popular Macintosh® and Quadra™ desktop systems. It can be installed in minutes right out of the box. Using the same scanning technology found in scanners costing 10 times as much, the DT-S1015 provides a full range of vibrant color and exquisite image detail while outputting a true cyan-magenta-yellow-black color format.

The DT-S1015 is more than just another desktop scanner... it's the one you've been waiting for.

SCREEN (USA)

A subsidiary of Dainippon Screen Mfg. Co. Ltd.
5110 Tollview Drive, Rolling Meadows, IL 60008

For more information, call:

SCREEN (EAST), NJ (201) 882-1922

SCREEN (MIDWEST), IL (708) 870-1960

SCREEN (WEST), CA (714) 863-9160

SCREEN (CANADA), Ont. (416) 568-4020

Circle 35 on reader service card

Macintosh and Quadra are registered trademarks of Apple Computer, Inc.



System 7.0 or 7.0.1), there are a couple of reasons for installing multiple sizes and styles of bitmap fonts with ATM. One reason is that bitmap text displays faster than text displayed by ATM. The difference is more noticeable on slow Macs; you can make ATM faster by increasing the Font Cache setting in the ATM control panel. Adobe recommends 50K of cache for each PostScript font you use frequently, and there may be separate PostScript fonts for different styles of a single

font that appears in the Fonts menu. If you use plain, bold, and italic Times, for example, then ATM needs the three PostScript fonts TimesRom, TimesBol, and TimesIta, and you should set your ATM Font Cache to 150K for best speed.

A more obscure reason for installing multiple sizes and styles of bitmap fonts with ATM is that documents created with bitmap fonts in screen-oriented programs such as HyperCard and Aldus Persuasion, where text must fit in fixed-width boxes,

may not look right if later displayed with fonts created by ATM. For some sizes and styles of some fonts, ATM may create text whose width doesn't exactly match the corresponding bitmap text. Your choice: leave the bitmap fonts installed or resize text boxes in documents where ATM text doesn't fit.

Finder Power

TIP Most System 7 users have discovered how to use the Views control panel to force icons to align to an invisible grid. If you want to drag an icon or group of icons and place them off the grid, hold down the \mathbb{H} key while dragging.

Tyler Gumm

Winnipeg, Manitoba, Canada

You can tap a great deal of hidden power by pressing the \mathbb{H} and option keys, and much of what you can do with the mouse you can also do with the keyboard alone (see "Keys to the Finder").—L.P.

Measuring Cap Height

TIP Say you want to set a headline and need the cap height (height of a capital letter) to measure 54 points. Because capital letters are smaller than the nominal point size, you can't simply set the type size to 54 points. I've found an easy method to size type to the cap height; it works in QuarkXPress and could probably be adapted to other desktop publishing programs.

1. Enter the headline text on one line and press return at the end of the line.
2. Copy the line of text and paste it on the next line. You now have two copies of the headline text.
3. Select both lines and set the leading of both to the cap height you want.
4. Select the second line and increase the point size gradually, until the cap height of the second line touches the baseline of the type on the line above it (see "Cap Size").

continues

Anti-virus software that's tough on viruses, not on you.

Computer virus problems within your organization can be a nightmare. New Virex® 4 is a network manager's dream. Its powerful network features enable Macintosh network managers to configure and update individual user machines from a single Mac. Network managers can also gather information about virus attacks within the organization. And Virex has always been the easiest anti-virus product to use. With Virex, you won't be tied up with lots of user questions about your anti-virus software.

NEW NETWORK FEATURES

USER-UPDATABLE

EASY TO USE

GREAT SERVICE & SUPPORT



Virex is available in single units and in an attractively-priced 10-PAK. See your favorite retailer to purchase Virex today or call us about our convenient site licensing program. Virex is also available for IBM-PC and compatible computers.

DATAWATCH®

PO Box 51489 • Durham, NC 27717
(919) 490-1277 ext.1022 FAX:490-6672
BBS: 419-1602 (S,I,N)

© 1992 Datawatch Corporation. Datawatch and Virex are registered trademarks of Datawatch Corporation.

Circle 201 on reader service card



Cap Size In QuarkXPress, to set a line of text so the capital letters are a specific size, set the leading to the size you want, duplicate the text on the next line, and increase the size of the second line until it touches the first.

**Still Only
\$399.00**

#1



QuickSCSI—just got faster

New fast SCSI-2 support

- Improve SCSI performance by up to 500%
- Don't let the SCSI limit the performance of the drive you bought
- Take full advantage of the speed and performance of fast SCSI-2
- Supports up to 10MB per second utilizing fast SCSI-2
- SCSI-2 and SCSI support, compatible with existing SCSI devices
- Mirroring for automatic continuous backups

800-288-8754

47421 Bayside Parkway Fremont, California
94538 • 510. 657. 2211 • Fax 510. 683. 9713

Circle 208 on reader service card

"It's not only the least expensive card by a long shot but it also gives the best results in our tests."

***MacUser Buyer's Guide,
July 1992***

"PLI QuickSCSI is the fastest overall."

Macworld, May 1992

Don't settle for second best



MWLD AD-10

This method is much quicker and more accurate than other schemes I've used, such as measuring the height of the type with the ruler or the line tool, or endlessly printing and measuring the results.

*Sam Jennings
San Francisco, California*

Delete Forward

TIP After using an MS-DOS computer for a couple of years to do word processing at work, I became accustomed to deleting forward from the insertion point by pressing the decimal-point key on the keypad with number lock (Num Lock) off. When the company bought a couple of Macs, I found the handy delete-forward key was poorly placed on the extended keyboard, and was completely missing from the Classic's standard keyboard. Instead of training my old fingers to do new tricks in Microsoft Word, I got around the keyboard difference with Word's Commands command (see "Go Ahead and Delete").

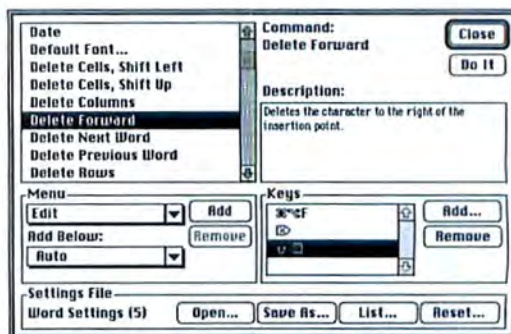
*Jeffrey F. Grandon
Provo, Utah*

Combining System Sounds

TIP The Sound control panel lets you record sounds but not edit them. You can edit and combine sounds

from the Sound control panel using HyperCard's audio palette. For example, repeating the Droplet sound that comes with System 7 makes the sound effect of a flying saucer.

First select the sound you wish to edit from the control panel and use the Copy command to place a copy of the sound on the Clipboard. Next open HyperCard, choose Audio from the Edit menu to bring up the audio palette, and click the Edit button in the audio palette to enable sound editing. Then choose Paste Sound from the Edit menu to paste the sound from the Clipboard into the audio palette; repeat to paste multiple copies of the sound end-to-end. Now choose Select All and Copy from the Edit menu to put a copy of the compound sound on the Clipboard. Switch to the Sound control panel, choose Paste from the Edit menu, and name the compound sound when requested. The new sound is now part of your Sound control panel. If you quit HyperCard or close the audio palette without quitting, you do not need to save the new sound as HyperCard suggests.



Go Ahead and Delete If your keyboard doesn't have a delete-forward key, you can designate one for use in Microsoft Word 4 or 5. In the dialog box for Word's Commands command (under Edit in Word 4; under Tools in Word 5), select Delete Forward in the scrolling list, click the Add button in the Keys section, and press the key or key combination you want to make effective (shift-delete here). Then click the Close button.

Try this variation: In HyperCard, select only a portion of the sound by dragging across the audio palette's close-up view of the wave form. Then copy and repeatedly paste this sound fragment. Another variation: One at a time, copy additional sounds from the Sound control panel and paste them into HyperCard's audio palette.

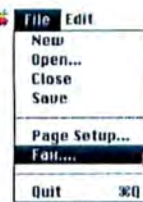
*Paul Hibbard
Houston, Texas*

Remote, 14.4K bps, laptop to desktop.

POWERPORT/GOLD INTERNAL FAX/MODEM



PowerPort/Gold™, the first 14.4K bps internal fax/modem for the PowerBook™, is the product of choice for mobile computing. PowerPort/Gold supports the fastest data communication standards available – optimal for AppleTalk® Remote Access. Using ARA, you can check your E-Mail, access a file server, or files on your desktop computer just as if you were at the office. And our acclaimed GlobalFax™ software, bundled with every product, makes faxing as easy as printing a document.



PowerPort/Gold 12/92



PowerPort/Gold & Silver 11/92



PowerPort 9/92
PowerPort V.32 (Silver) 3/92

THE POWERPORT SERIES

POWERPORT/BRONZE	2400 BPS
POWERPORT/SILVER	9600 BPS
POWERPORT/GOLD	14,400 BPS

* PowerPort/Gold fax transmission and reception at 9600 bps.



Surprise Eraser Add to your repertoire of Kid Pix surprise erasers by pasting any picture into a new PICT resource that you create with ResEdit and number in sequence with the other PICT resources containing pictures of animals.

Personal Surprise

TIP While you're using the eraser tool in Brøderbund Software's Kid Pix, the Surprise icon (the question mark) lets you erase the picture to reveal not a white background but an animal or funny face. Kid Pix chooses the background surprise randomly. You can add your child's favorite picture (or maybe your own favorite) to the collection of surprises with a resource-editing program such as Apple's ResEdit. Use any picture

in the common PICT format; if you can see the picture when you paste a copy into the Scrapbook, it will work.

Begin by making a duplicate copy of the Kid Pix program. Next open your picture with a graphics program, select the picture, and copy it to the Clipboard. Then open ResEdit and use its Open command to open the copy of Kid Pix. A window appears showing an icon for each type of resource in Kid Pix. Find the PICT icon and double-click it to see a window full of numbered miniatures of Kid Pix's PICT resources. Scroll the window until you see the

last animal, and note its number (a lion with number 518 in Kid Pix 1.2). Then choose Create New Resource from ResEdit's Resource menu, which opens an empty window for a new PICT resource. Paste your picture into this window. Next choose Get Resource Info from ResEdit's Resource menu, and in the resource info window that appears change the ID to the number you previously noted plus 1 (number 519 in version 1.2), as shown in "Surprise Eraser." Quit ResEdit, answer-

ing yes when it asks whether you want to save your changes. Now when you use the surprise eraser tool in your special copy of Kid Pix, it randomly selects the picture you added.

Beckie Pack
Napa, California

Kid Pix also uses that collection of PICT images to randomly display a picture when you start the program. You can get ResEdit from user groups, online information services, and APDA (Apple Programmer's and Developer's Association, 800/282-2732 U.S., 800/637-0029 Canada, or 408/562-3910 anywhere).—L.P. **m**

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 addresses 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.

Contributing editor LON POOLE answers readers' questions and selects their tips for this monthly column. His two most recent books are *Amazing Mac Facts* (Microsoft Press, 1991), a collection of the best published tips; and *Macworld Guide to System 7* (IDG Books Worldwide, 1991).

Access. Now from Global Village.

TELEPORT/GOLD DESKTOP FAX/MODEM



Now, when you need to access your office, Global Village provides the complete solution. Introducing TelePort/Gold™, our new 14.4K bps desktop fax/modem. Together, TelePort/Gold and

PowerPort/Gold ensure 14.4K bps access speeds and complete compatibility. And since both PowerPort and TelePort fax/modems use our GlobalFax software, you'll spend less time learning new applications and more time doing business. For more information or for a reseller near you, please call 1-800-736-4821.

THE TELEPORT SERIES	
TELEPORT/BRONZE	2400 BPS
TELEPORT/SILVER	9600 BPS
TELEPORT/GOLD	14,400 BPS

Circle 66 on reader service card



GLOBAL VILLAGE
COMMUNICATION



©1992 Global Village Communication Inc. "Global Village Communication," "PowerPort," "TelePort," "Gold," "Silver," "Bronze," and "GlobalFax" are trademarks of Global Village Communication Inc. All other brand names are trademarks or registered trademarks of their respective holders.

VISIT US AT
MACWORLD BOOTH 2537

THE FUTURE OF CD-ROM IS NOW.

CHOOSING A MOVIE HAS NEVER BEEN EASIER!

TIRED OF STARING AT ROWS AND ROWS OF VIDEOS AT THE RENTAL STORE WONDERING WHAT TO GET? YOU NEED THE *Taste Mate* MOVIE SELECTION SYSTEM. *Taste Mate* USES ARTIFICIAL INTELLIGENCE TO HELP YOU FIND A MOVIE YOU'RE BOUND TO LIKE. SIMPLY ANSWER A FEW QUESTIONS BASED ON YOUR **MOOD** AND *Taste Mate* PROVIDES THE RECOMMENDATIONS.

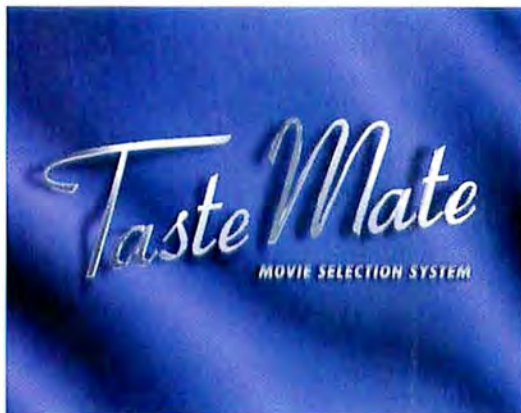
A MOVIE YOU

Taste Mate

VIDEO-SELECT™

40,000 MOVIE TITLES.

THE DATABASE AND



YOU'LL NEVER RENT

WON'T LIKE AGAIN!

FEATURES THE

DATABASE OF OVER

YOU CAN SEARCH

GET SUMMARIES OF

ANY TITLE, PLUS SEE QUICKTIME PREVIEWS OF **HOT NEW RELEASES**. THE *Taste Mate* MOVIE SELECTION SYSTEM IS A MUST FOR MOVIE BUFFS AND WEEKEND RENTERS ALIKE. AND BEST OF ALL... IT COSTS JUST **\$69.95**. ORDER YOUR *Taste Mate* MOVIE SELECTION SYSTEM TODAY!

MACWORLD CD VENTURES. DEFINING A WHOLE NEW GENRE IN CD PUBLISHING.

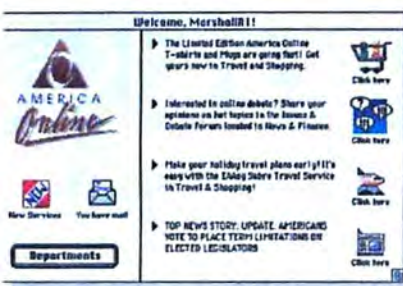


Call 800-821-1177 (x103) Today!

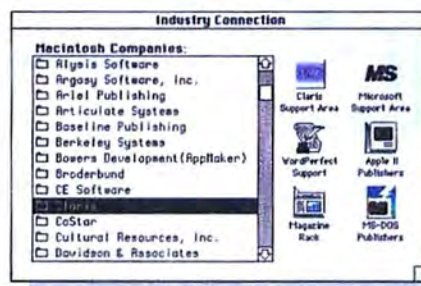
CD RUNS ON ANY COLOR-CAPABLE MACINTOSH WITH MINIMUM 4MB RAM.
*FOREIGN ORDERS PLEASE ADD \$12.50 PER CD. FAX ORDERS CALL 415-543-3984.
MACWORLD CD VENTURES, 501 SECOND STREET, SAN FRANCISCO CA 94107.

Circle 192 on reader service card.

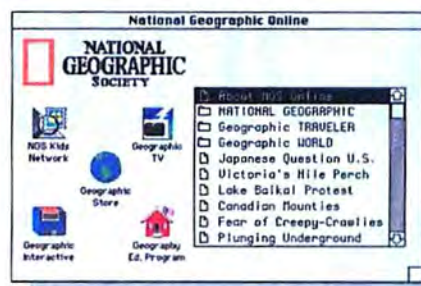
The More Windows You Open, The Cooler It Gets.SM



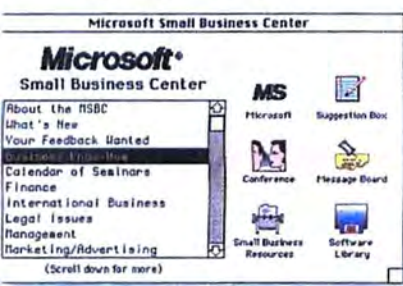
Graphic Windowing Interface



Expert Computing Advice



National Geographic Online



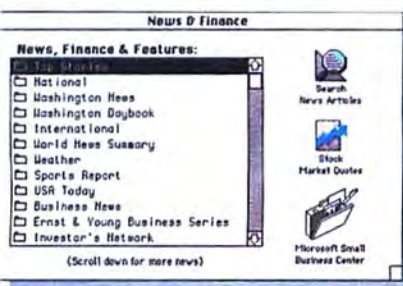
Microsoft® Small Business Center



Fast, Easy Downloading



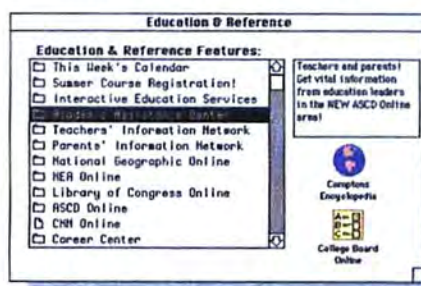
More Than 30,000 Software Files



Searchable News



Stock Quotes & Portfolio Management



Encyclopedia & Homework Help

**NEW!
VERSION 2.0**

Free Trial Offer.
See Other Side
For Details.

Yes! I'd Like To Try America Online — Free.

Send me the free software and trial membership. I understand there's no risk — if I'm not completely satisfied, I may cancel without further obligation.



Name _____

Address _____

City _____ State _____

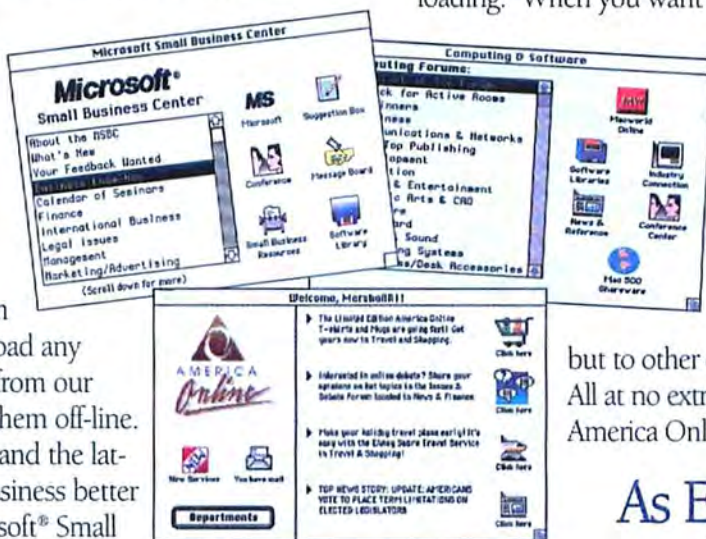
ZIP _____ Phone _____

Try America Online — Free.

There's only one way to get the big picture about America Online. Try it. That's why we make it so easy. We send you the software and let you try it, absolutely free. You'll be impressed by everything you can do with your computer, a modem, and America Online, and how easily you can do it.

Just Point And Click.

Get advice from hardware and software developers, experts and reviewers — even ask them questions directly. Download any of thousands of programs from our software libraries and use them off-line. Monitor your investments and the latest news. Manage your business better with the help of our Microsoft® Small Business Center. Save time and money in hundreds of different ways, from browsing for gifts in our online shopping area to booking your own airline tickets to using our great computing support forums.



New Windows To Open Every Month.

And now America Online offers multi-file downloading. When you want to download several software files, you can select them and click a button. When the downloading is done, you'll automatically be signed off the system.

Also new is our gateway to the Internet, which links you not only to educational and commercial E-mail systems, but to other online and mail services as well. All at no extra charge. With the Internet, America Online connects you to the world.

As Easy To Try As It Is To Use.

If you've never tried America Online, now's the time. If you have in the past, try us again—there's a world of new services available. We're sure you'll love America Online, but don't take our word for it. Try it yourself—absolutely free. We'll send you free software, a free trial membership and free connect time so you can learn just how much you can accomplish when you open our windows. All you have to do is call 1-800-827-6364 ext. 6618 or mail the postage-paid coupon.



1-800-827-6364 Ext. 6618

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 8567 VIENNA, VA

POSTAGE WILL BE PAID BY ADDRESSEE

AMERICA
Online

8619 Westwood Center Drive
Vienna, VA 22182-9806

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



Memory-Maximizing Tips

BY JIM HEID

ARE YOU GETTING THE MOST out of your short-term memory? I refer not to your ability to recall what you ate yesterday, but to your Mac's *random-access memory*—its *RAM*—those chips that provide temporary storage for the Mac's system software as well as for the programs you use and the documents you're working on.

If you've been seeing "not enough memory" error messages lately—or if you've just bought a memory upgrade and you'd like to put that extra space to work—read on. Few of the Mac's components offer more opportunities for fine-tuning than memory. When you understand how the Mac uses memory, you can make a variety of adjustments to improve overall performance, increase the number of programs you can run simultaneously, or speed up a particular program. And none of these adjustments require you to open the Mac. You can fine-tune your memory from the comfort of your mouse.

You Must Remember This

BEFORE LOOKING AT MEMORY-MAXIMIZING specifics, let's step back for the big picture. Let's also make sure we're looking at the same scene, because many Macintosh newcomers confuse the Mac's RAM with its hard drive storage, probably because both are described using the same units of measurement: the kilobyte (K), or a thousand bytes (technically, 1024 bytes); and the megabyte (MB), or 1 million bytes (actually, 1,048,576 bytes).

RAM is temporary storage space formed by a collection of chips soldered onto the Mac's logic board or installed in small, plug-in boards. When the Mac is turned off (whether by you or by a power failure), the contents of RAM disappear faster than punch on New Year's Eve. Most Macs come with between 1MB and 4MB of RAM, which you can expand—more about that later.

A hard drive, by contrast, provides permanent storage (or at least it's designed to—drives can fail, so a regular backup routine is essential). Most Macs include hard drives that can store up to 40MB or 80MB of data; much higher capacities are available.

In the Mac, as in other computers, RAM plays a few roles. RAM holds a large portion of the Mac's fundamental system software (called System 7, although many people are still using older, less-capable system software versions, such as System 6). When the Mac starts up and displays its "Welcome to Macintosh" message, it's loading this RAM-based system software from the hard drive.

During start-up, the Mac also loads *system extensions*, enhancements to the system software. You can tell when system extensions are being loaded—their icons appear along the bottom of the screen. Two popular system extensions include Berkeley Systems' After Dark screen saver (you've probably seen toasters flying across *someone's* screen) and CE Software's QuickKeys, which lets you create keyboard shortcuts.

The final step in the start-up process involves loading the Finder, the program that gives you the desktop and Trash icons. In System 7, the Finder itself uses roughly 500K of RAM—almost four times the total amount of RAM built into the original Macintosh.

The point is that some of the Mac's RAM is filled right off the bat. You can find out how much RAM your system software and extensions use by choosing the About This Macintosh command from the Finder's Apple menu (in System 6, the command is About the Finder). A window appears describing how your Mac's RAM is being used (see "Window into Memory"). This window can be a memory maximizer's best friend.

Make Room for Programs

WHEN YOU START AN APPLICATION program such as Microsoft Word or ClarisWorks, the Mac sets aside some RAM for the program and then copies the program from the hard drive into that memory. Actually, with most programs, only part of the program goes into RAM—the part that implements the program's most common features. When you choose a particular command for the first time since starting

the program, you might notice a short delay as the Mac retrieves the required software routines from the hard drive. (If your hard drive has a front-panel light, it blinks.) When this happens, the Mac is loading one of the program's *code segments* from disk.

Most large programs are divided into numerous code segments. The Mac can load a given segment into memory when it's needed, and it can purge segments from memory to free up space. This scheme allows developers to create programs with smaller minimum memory requirements. On the downside, frequently accessing the hard drive slows performance, especially on a slower Mac such as a Classic. Later, I'll show how to minimize segment loading.

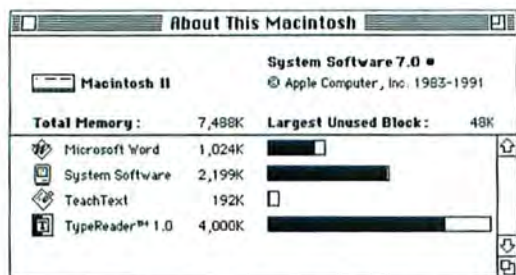
Part of the memory allocated to a program is reserved for the documents you have open as you work. Some programs store an open document entirely in RAM; common examples include integrated packages such as ClarisWorks and Microsoft Works and draw programs such as Adobe Illustrator, Aldus FreeHand, and Claris's MacDraw. With these programs, the maximum size of a document is limited by the amount of its program's free RAM. An example: When you start Microsoft Works 3.0, the Mac gives Works 1536K of RAM. Works' program code takes up about half that amount; roughly 750K remains free for the documents you'll work with.

Other programs don't store an open document entirely in RAM, but instead swap portions of the document to and from the hard drive, keeping in RAM only the portion you're working with at the moment. Most stand-alone word processors—Microsoft Word, WordPerfect, T/Maker's WriteNow—work this way, as do Aldus PageMaker and QuarkXPress and most database managers, including FileMaker Pro. This approach lets you create much larger documents, but moving around within a document can take longer (it's that relatively slow hard drive again).

continues



*How the
Mac
uses memory—
and how
to get the most
out of yours*



Window into Memory System 7's About This Macintosh window displays a bar graph for the system software and for each open application. Each bar shows how much memory is allocated to that program; the dark-shaded portion of each bar shows how much of that RAM the program is actually using.

Whether a program stashes open documents entirely in RAM or swaps them between RAM and the hard drive may seem like a trivial technical point, but it has important ramifications you may need to consider when fine-tuning your short-term memory.

Maximizing Techniques

YOU CAN MAKE FOUR BASIC MEMORY-related adjustments. Notice that each has a potential drawback—weighing each technique's pros and cons is an important part of memory maximizing.

- You can use the Finder's Get Info command to control how much memory a program receives when you open it. If you want to run two programs at the same time but you're a little lean on RAM, you can reduce each program's memory requirements to shoehorn both into memory. Each program is likely to run more slowly, since the Mac has to load and discard segments more frequently. And integrated packages and draw programs are limited to smaller documents. Conversely, if you want a given program to run faster or you want to create larger documents with an integrated package or draw program, you can increase its memory allocation. When a program has more RAM to work in, it doesn't have to go out to the hard drive to load code segments as frequently. But less free RAM is available for other programs. For advice on allocating memory to some popular programs, see "RAM Strategies."

- You can use the Memory control panel to increase or decrease the size of the *RAM cache*. This is a part of the RAM allocated to the system software that holds information recently read from the hard drive. If this information is needed again, the Mac retrieves it from the cache instead of from the hard drive. A larger RAM cache can improve performance if you frequently switch between two programs or perform repetitive tasks. If you work sporadically—if you're never sure which program, command, or document you might

use next—a large RAM cache is less likely to boost performance. In addition, it leaves less free RAM for running other programs. Experiment with various cache sizes (you must restart the Macintosh after each adjustment to put your change into effect). If performance doesn't improve, reset the cache to its original size—or even consider reducing its size to free up RAM for other uses.

- You can use the Memory control panel to activate System 7's *virtual memory* feature. Virtual memory blurs the lines between hard drive and RAM storage by tricking the Mac into thinking that part of the hard drive is actually RAM (see "Virtually Memory"). This lets you run more programs than would otherwise fit into RAM, but switching between programs takes longer than if you had the equivalent amount of real RAM. (Virtual memory doesn't work on the Classic, SE, Plus, LC, or PowerBook 100. To use it on the original Mac II, you need a Motorola 68851 PMMU [Paged Memory Management Unit] chip, which costs roughly \$200.)

In theory, you can also use virtual memory to run a program that's too large to fit into RAM. For example, if you want to run a program that requires 4MB of free RAM on a Mac that has only 3MB free, you could use virtual memory to make up the 1MB difference. In practice,

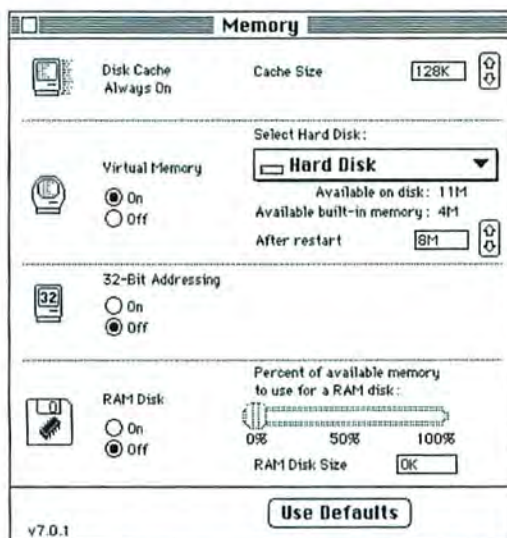
however, this usually delivers painfully slow performance. If you have enough real RAM to accommodate the largest program in your software library, then when you start or switch to that program, it runs at normal speed; switching to or starting other programs is on the slowish side, though, since that's when VM has to swap between RAM and disk.

- You can create a *RAM disk* to speed up a program and extend PowerBook battery life. Like virtual memory, a RAM disk is a software sleight-of-hand. But instead of treating part of the hard drive as RAM, a RAM disk sets aside some memory to act as a hard drive. Because RAM is faster than a hard drive, anything stored on a RAM disk opens at top speed. Most new Macs let you create a RAM disk using the Memory control panel. If your Memory control panel doesn't contain a RAM disk option, use a utility program to create a RAM disk. My favorite is AppDisk, a \$15 shareware program by Mark Adams, available through online services and user groups. Unlike most RAM disk utilities, AppDisk doesn't require you to restart the Mac to remove the RAM disk or change its size. You can also configure AppDisk so that it automatically copies certain files to the RAM disk each time the RAM disk is created.

One drawback to a RAM disk is that the RAM it uses isn't available for running programs. Another drawback is that you need to restore the contents of a RAM disk each time you start up the Mac, because—except on a PowerBook 100—a RAM disk's contents vanish when the power goes.

What should you stash in a RAM disk? Ideally, a copy of the System Folder as well as copies of the application programs you want to run at top speed. Unfortunately, you need a few megabytes of RAM disk space just to hold System 7's bloated System Folder—unless you pare it down to essentials. But don't worry; when you need the extra capabilities, you can always restart from the System Folder on the hard drive. (For tips on paring down the RAM disk's System Folder and using a RAM disk with a PowerBook, see *PowerBook Notes*, in this issue.)

If you're using a PowerBook and you have a RAM disk large enough to accommodate a System Folder and an application program, use the Startup Disk control panel to specify that your Mac start



Virtually Memory On most current Macintosh models, the Memory control panel lets you set aside some hard drive space as an extension of RAM. Here, the RAM in a 4MB PowerBook 170 is being supplemented with virtual memory to create the equivalent of an 8MB machine. The controls at the bottom of the window let you create a RAM disk; if your Mac's Memory control panel doesn't have a RAM Disk section, you need to use a utility such as AppDisk to create a RAM disk.

up from the RAM disk. Then restart. When the desktop reappears, use the PowerBook control panel to put the hard drive to sleep. You can now run from the RAM disk and greatly extend the time between battery charges. You need to wake up the hard drive in order to save docu-

ments on it, though—you can save documents on a RAM disk, but if a system crash or power outage corrupts the RAM disk, you lose your work.

If you don't have enough memory to create a RAM disk that will hold both the

continues

RAM Strategies

To change an application program's memory allocation, select its icon and choose Get Info from the Finder's File menu. Type the desired memory allocation in the Current Size text box (see "Allocating Memory"). You can also use AppSizer, a \$19.95 shareware control panel from Peirce Software, to change memory sizes on the fly—that is, at the moment you start a program. This can be handy if you frequently alternate between various memory-allocation settings depending on the project at hand. AppSizer also allows you to temporarily change the memory allocation of a program located on a CD ROM drive—a feat beyond the Get Info command.

How much of a change should you make? Here are some guidelines for several popular programs.

Microsoft Word 5.0 Word's present memory allocation is 2048K (2MB), but the program will run in as little as 512K. (If you specify 512K, the Finder asks if you're sure you want to set the memory size to less than the suggested minimum. Click on OK.) Performance will be sluggish and the grammar checker and other plug-in modules may not work. If you're creating a stripped-down version of Word, remove unessential plug-in modules and file converters from the Word Commands folder (located within the Word folder). Word 5.1, recently released, offers a minimal installation option.

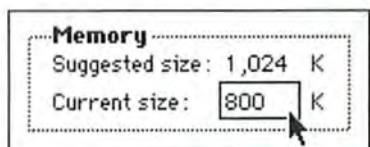
As for increasing Word's memory allocation, you might want to boost it beyond 2048K if you compile large indexes or tables of contents, perform search-and-replace with long documents, or import large scanned images. Increasing or decreasing Word's memory allocation does not affect maximum document length, although significantly decreasing its memory allocation may mean you're unable to search-and-replace or compile indexes with long documents.

ClarisWorks and Microsoft Works These integrated packages store open documents entirely in RAM, so their memory allocation directly affects the size and quantity of the documents you can create. Both programs benefit from a larger RAM allocation by allowing you to create larger documents or open more documents simultaneously. ClarisWorks normally receives 900K, but will run in 768K. Microsoft Works normally receives 1536K, but will accept 675K. (Note that you may not be able to open a large document that you created before you reduced the program's memory size. If this happens, restore the memory allocation to its larger size, open the document, and divide it into a number of smaller ones.)

Aldus PageMaker and QuarkXPress PageMaker 4.2 requires at least 1500K; QuarkXPress 3.1 requires at least 1700K. Reducing either program's memory allocation slows performance and could compromise reliability; also, you may not be able to use some Aldus Additions or Quark XTensions (both add features to their respective programs). You can free up some RAM by removing any import/export filters you don't use. Boosting either program's memory allocation improves performance by reducing segment loading. Both programs provide a greeking option that displays text as gray lines; use this feature to speed up overall scrolling and page display.

Claris MacDraw Pro This draw program normally receives 3000K. On a compact monochrome Mac such as a Classic, you can run the program in as little as 1000K. For creating color documents, however, you'll want to give the program at least 2000K—more if you have a large-screen monitor. See Appendix A in the MacDraw Pro manual for more memory tips.

Adobe Type Manager If you use this popular extension, you can improve the text-display speed of all your programs by opening the ATM control panel and increasing the size of the font cache.



Allocating Memory You can change a program's memory allocation by typing the desired value in the lower-right corner of the Get Info window. Here, a program's memory allocation is being reduced from 1024K to 800K.

FROM THE MAKERS OF AFTER DARK

STAR TREK

THE SCREEN SAVER

Captains Log: Stardate 1992



On our mission to prevent phosphor burn-in...

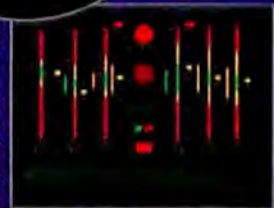


...we found ourselves surrounded by Klingons!



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 User.

Circle 218 on reader service card



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

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 Scandruvan Computer Furniture, Inc. Apple is a trademark of Apple Computer, Inc.

System Folder and an application program, consider using the RAM disk to hold just the application program. The program will open and run at top speed. PowerBook users will still see some battery savings, too, since the PowerBook won't need to access its hard drive as frequently. If there's room, you can store the documents you create on the RAM disk, too, although the hard drive remains the safest place for them.

Extensions, Control Panels, and Memory

I MENTIONED EARLIER THAT SYSTEM extensions—those programs that load during start-up, displaying icons along the bottom of the screen—nibble away at your free RAM. Keep this in mind next time you're tempted to add an extension that promises to boost your productivity or make you chuckle. Flashy extensions or control panels such as After Dark or Bruce Tomlin's SoundMaster (which plays sounds when you insert and eject disks, throw away files, and perform other activities) are especially RAM hungry, as are electronic-mail extensions such as CE Software's QuickMail and Microsoft Mail.

When you're running low on free RAM, disable any extensions you can do without (extensions you *can't* do without might include ones required by a piece of hardware such as a cartridge drive, scanner, or video board). In System 7 you can disable extensions or control panels by manually dragging them out of the Extensions or Control Panels folders, both located in the System Folder. An easier way is to use Ricardo Batista's Extension Manager, a free control panel that lets you activate and deactivate extensions and control panels. Several commercial extension managers are also available.

After you disable some extensions or control panels (whether manually or with an extension manager), choose Restart from the Finder's Special menu. You can also temporarily disable all extensions by restarting and holding down the shift key until you see the "Welcome to Macintosh" message with the text "Extensions off" below it.

System Software and Memory

SYSTEM 7'S FILE-SHARING FEATURES (discussed in last month's column) require nearly 300K of RAM. If you aren't using file sharing, turn it off with the Sharing Setup control panel. The Mac will run slightly faster, too.

If you're using one of the original versions of System 7—version 7.0 or 7.0.1—you might want to get a copy of Apple's System 7 Tune-Up extension, which

continues

200 MB-\$449 Maxtor 7213



External
Maxtor 7213
\$519

Been looking for 200MB to fit in your Mac or out, but the price has been too much? Wait no more. The Maxtor 7213 is the drive for you. Quiet, fast and low-power, the Maxtor 7213 fits in

almost every Mac that can accommodate a 3.5" drive. With a seek time of 16ms and transfer rates as high as 1.3MB per second, you can't find a faster 200 MB drive at a lower price. Don't wait, order today!

Helpful,
knowledgeable
sales
associates

Toll-free
Technical
Support

For Your Powerbook...

Drives



Companion 80* \$499
Companion 120* 599

*Battery-Powered Portable Drive

Companion 80** \$429
Companion 120** 529

**AC-Only Portable Drive

Go*80 \$349
Go*120 469

Quantum internal drives for your PowerBook

Cases



I/O Design
SL (SlimLine) \$67
EX 67
Madson
Cordura \$129
Ballistic Nylon 149
Leather 199

Input



Kensington
NoteBook KeyPad \$109

Modems

APSModem 2400* \$129
APSModem 9600 279
APSModem 14.4 349
Internal Modems for your PB100, 140, 170
\$99 with any other PowerBook Accessory

Supplies

PowerBook Tool kit \$9
Utilitron PowerSwap 25
NiCad Battery 69
PowerBook SCSI Cable 30
RAM...for PB100, 140, 170 Call

30-Day
Money-Back
Guarantee

Disk-for-Disk
Replacement
Warranty

24-hour
BBS with
our latest
software

30-day money-back guarantee. All drive products carry a 30-day money-back guarantee. Your risk in the transaction is the cost of shipping.
Disk-for-disk replacement warranty. 5y Quest, 2y Quantum, Maxtor and DAT drives are warranted for two years. Maxtor 12, 17 GB and Fujitsu drives are warranted for five years. WHEN Quantum 2.5" drives, TEAC drives, all CD-ROM's, VCDs and SuperDisk drives are warranted for one year. Toshiba 350 is warranted for three years.
Prices and specifications subject to change without notice.

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 stable all-platform System software, at least 9.2 MB of compacted publicly-distributable software, and APS Technologies' ALLIANCE POWER TOOLS SCSI format/hard disk partitioning.
Toll-free technical support as often or for as long as you need. Regular hours are 8 am to 6 pm Monday thru Friday, 10 am to 4 pm Saturday, Central Time.

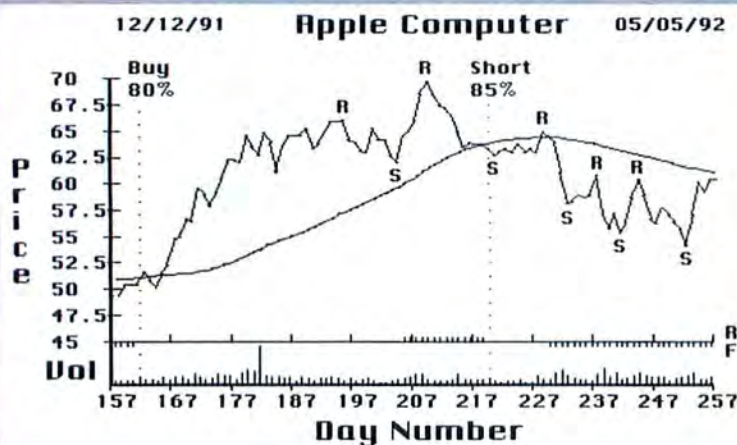
M-F 7AM-9PM CST. SAT 10AM-4PM CST.
Visa/Master Card, Discover, American Express: No Surcharge.
APS Technologies, 2900 S. 29th Hwy., Independence, MO 64057
International 1-816-478-8300. FAX: 1-816-478-4596 (24 Hours)
Toll Free UK: 0800-897-545. Australia: 0014-800-125-875

1-800 235-2752



Circle 273 on reader service card

\$11,750.00 PROFIT IN 5 MONTHS TRADING APPLE COMPUTER STOCK WITH OUR STOCK PROGRAM



Symbol	Type	Purch Date	Quant	Purch Price	Original Cost	Sell Date	Sell Price	Sell Value	P/L
AAFL	Buy	12/18/91	500	\$51.75	\$25,875.00	03/02/92	\$67.75	\$33,875.00	\$8,000.00
AAFL	Short	03/12/92	500	\$62.75	\$31,375.00	04/29/92	\$55.25	\$27,625.00	\$3,750.00

COMPUTERIZED TRADING:

If you had purchased our **Right Time - Stock Program** in December, 1991, followed just the signals for Apple Computer, the rules in the manual and used a little common sense, your profits within the five month period shown above could have been \$11,750.00. Remember, this is a remarkable amount considering that the software cost only \$599.00.

Our **Right Time** software is the best decision support system ever devised for traders. It's the only software that analyzes volume/price, support/demand, and global market trends all at the same time, and can give you profits like those shown here.

AMAZINGLY PRECISE.

The **Right Time**™ programs run on IBM (and compatible) and Macintosh computers. The software is easy to use, amazingly precise, and very, clear in its signals.

You can retrieve and update signals for your stocks, commodities, indices or funds from Dow Jones, Dial/Data in less than 5 minutes per day. What's more, you can play "What If" games and have results in less than a second.

RESULTS: WINNING TRADES.

There are nine **Right Time**™ programs available to help you make the right decisions at the right time.

- Stock Program
- Stock Program/Long Term
- Index Program
- Index Program/I.T.
- Futures Program
- Mutual Funds Program
- Day Trading Program/Index, Futures or Stock

FOR MORE INFORMATION:

Call (714) 721-8603 or write today for our free twenty-four page brochure or to place your order. Each of our intermediate and Long Term programs costs \$599 (combination prices are available) plus shipping and handling (S&H).

We also have demonstration programs for just \$25 (each) plus S&H. Each demo includes our complete manual and the price applies to the program.

Our **Right Time**-Day Trading Programs (Index, Futures or Stock) are priced at \$999 each.



Future results may vary.

All programs not available on all computers.

Circle 25 on reader service card

modifies the system software to use memory a bit more efficiently and to handle low-memory situations better (Tune-Up's features are included in System 7.1). If there isn't enough memory available to start a program, for example, the Finder asks if you want to quit a different program in order to make room. Similarly, if there isn't enough memory to print a document in the background (that is, while you continue to work), the Mac asks if you want to print it immediately or wait until later. Use the About This Macintosh command to find out which system version you're using. If a bullet character (•) appears after the version number, the tune-up is already installed.

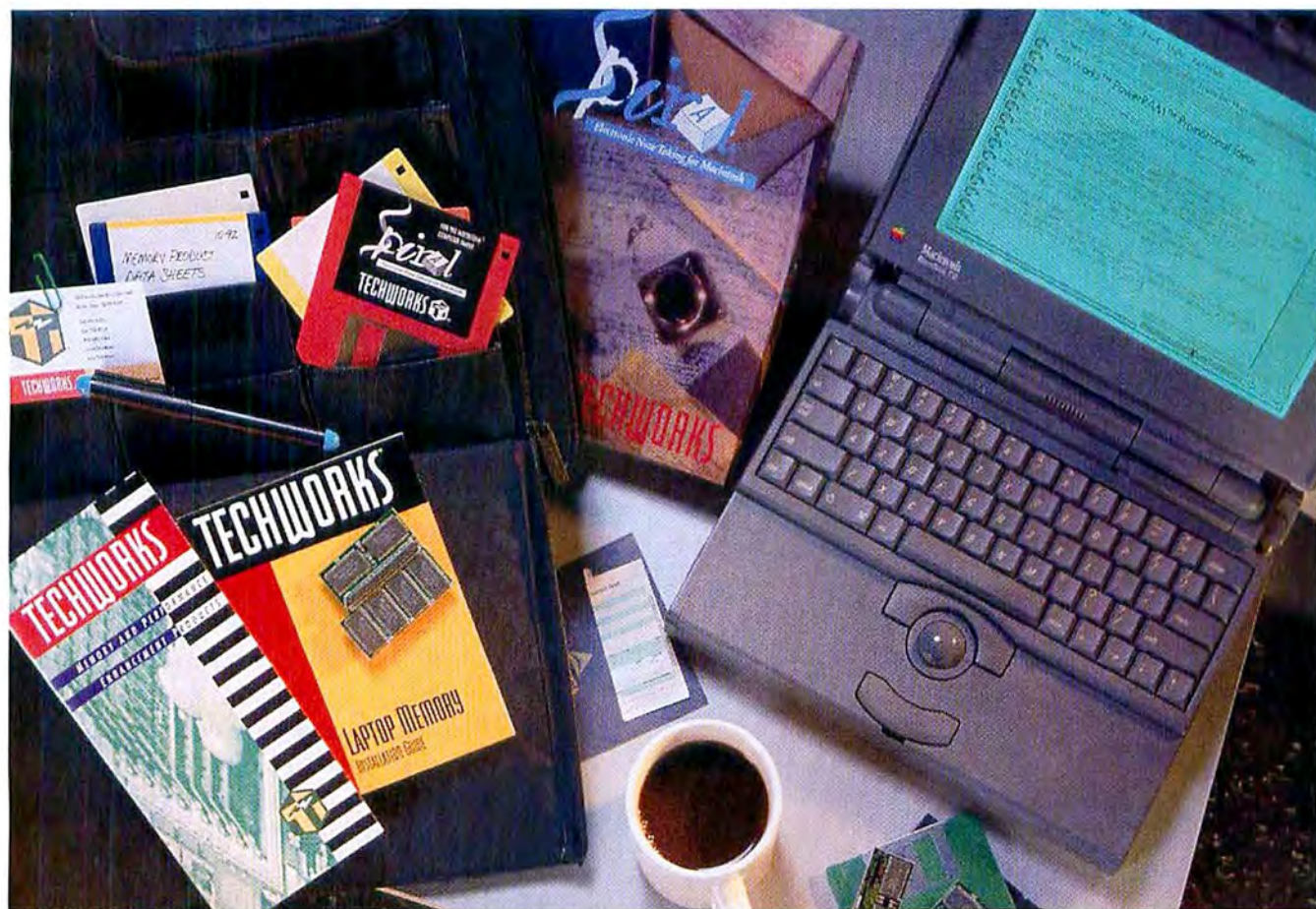
If you use the built-in video port on a Mac IICI or IISI, you can also free some memory by using the Monitors control panel to switch to the black-and-white (monochrome) display mode. The IICI and IISI use part of their main RAM to store the bits that represent the screen image. With a standard 14-inch monitor in the 256-color display mode, this *screen buffer* requires up to 320K. In monochrome mode, the buffer requires only 38K. This tip doesn't apply to any other color Macs, current or discontinued—they provide separate video memory, called *VRAM*.

Of course, the best way to avoid running out of memory is to buy more of it—RAM prices have never been better. If you have a Classic, Plus, or SE, upgrade to 4MB. If you have a PowerBook other than the 100, upgrade to at least 6MB (preferably 8MB) to take advantage of a RAM disk. If you have a color Mac, an SE/30, or a Classic II or Performa 200, consider upgrading to 8MB—or beyond, especially if you work with color scanned images, digital sound, or QuickTime movies. (If you add more than 8MB to a Mac II, IIX, or IICX, use the Mode32 system extension to access all the RAM. It's available free through user groups, Apple dealers, and online services.) For details on adding memory, see "How to Keep Your Mac Current," *Macworld*, May 1992.

But even a hefty RAM upgrade will probably only keep the low-memory messages at bay for a while. They'll return as you acquire increasingly complex programs and become accustomed to running more of them at once. When that day arrives, remember the techniques I've described here—they can help you cram more into your RAM. **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.

POWER TRIP



At the office, in the air, at home, or on the road, you want high-powered PowerBook solutions to get the most out of your portable computing. TechWorks' **PowerRAM™** Memory and **Spiral™** note taking software are the perfect companions for Macs on the go.



TechWorks' PowerRAM Upgrades are available for the PowerBook 100, 140, 145, 160, 170, 180 and Duos in configurations from 2MB up to 20MB. A free installation guide steps you through the entire install.

Spiral makes it easier than ever to keep information organized while you're on the move. Spiral is an easy-to-use note taking application designed for the PowerBook users' unique demands. Spiral is great for taking notes at meetings, organizing

client presentations, cataloging information, and more. Spiral's built-in **battery conservation** features let you use your PowerBook for hours with no need to recharge. Spiral offers other PowerBook Friendly™ options like a large I-beam cursor and on-screen battery charge indicator.

TechWorks' PowerBook solutions are part of our complete family of Mac hardware and software solutions.

Take your PowerBook on a Power Trip today with TechWorks' **PowerRAM™** and **Spiral™**!

FREE GUIDE! 1-800-947-0984



TechWorks, 4030 Braker Lane West, Suite 350; Austin, TX 78759
Business Phone: 512-794-8533; Fax: 512-794-8520

© Copyright 1992 Technology Works, Inc. TechWorks, Spiral, PowerBook Friendly and PowerRAM are trademarks belonging to Technology Works, Inc. All other trademarks mentioned belong to their respective owners.

TECHWORKS™

Circle 131 on reader service card



Double Your Disk Space Without Compressing Files.



If you've got a hard disk bursting at the seams, you need TimesTwo.* It's new from Golden Triangle and it's the most sensible solution for doubling the capacity of your disk without cramming and stuffing files into limited space. Your PowerBook's 40 MB disk becomes 80 MB instantly. Your Ili's 80 MB disk swells to 160 MB. Without ever opening your Mac or installing expensive hardware, you can double your disk space in minutes.



*Priced at just \$149,
TimesTwo is as practical
as it is affordable.*

TimesTwo's revolutionary approach to disk storage leaves your files untouched, so there's never any problem or any delay "unstuffing" them when you need them. And since TimesTwo doesn't compress files, there's never any need for an unpacking utility when you want to pass them on to someone else.



TimesTwo is fully compatible with all Macintosh applications, including file recovery programs like Norton Utilities and MacTools. It works with any SCSI hard disk including SyQuest, Bernoulli and erasable optical disks. You can even double an 88 MB SyQuest cartridge to 176 MB and use it on a Mac that doesn't have TimesTwo installed.

Next time you're running out of storage for your files, don't try to cram more in. Get TimesTwo instead. And give your disk twice the elbow room.



For information or a dealer nearest you call:
800-326-1858

*Patent pending. TimesTwo and the Golden Triangle logo are trademarks of Golden Triangle Computers, Inc. All other trademarks and registered trademarks are the property of their respective owners. Golden Triangle • San Diego, California • 619-279-2100 • FAX 619-279-1061

Circle 195 on reader service card

BY CARY LU

PowerBook

Notes

Building a Lean, Mean Machine

WHEN YOU SET UP A POWERBOOK computer, you can choose between two visions of what a portable computer can be—an extravaganza with nearly all the bells and whistles of a desktop computer, or a lean and mean machine that has just the essential tools.

If extravagance is your style, a PowerBook with sufficient extras will serve you well. One great advantage of the PowerBooks is that they are full-fledged Macs, just as capable in most ways as a desktop Mac. You do have to pay for extra features and put up with such inconveniences as slow start-up, and desktop frills typically require extra hard drive space and RAM. You also need some tolerance for system crashes. The more things you run, the more likely some software will break. See the feature "Expanding Your PowerBook" in this issue if a PowerBook is your sole Mac and you want everything on it.

Personally, I tend to be a minimalist. I think of the PowerBook as *portable*; on the road, I want simplicity and an immediacy that disappeared long ago from my desktop Mac. I turn on my desktop Mac once a day; if it takes two minutes to start, I don't really care. I want my PowerBook ready in an instant to take notes or retrieve information for a meeting. Therefore I forgo all the tricks of my desktop Mac in favor of the essentials. As a result, I can live with much less RAM and hard drive capacity in a PowerBook. But I am not a pure minimalist; I do add a few extras. This thing is a Mac, after all.

Getting Started

HOW MUCH RAM DO YOU REALLY NEED? If your PowerBook has 2MB of RAM, add at least another 2MB. That's usually enough for normal operation, and 4MB will support—just barely—a RAM disk. If



PAUL FRANK-MOORE

you must run multiple applications simultaneously, though, 4MB won't be enough. (PowerBook 100 users may be able to squeak by with only 2MB if they install System 6, as discussed later.)

With a desktop Macintosh, I can't imagine that I will ever have a big enough hard drive. Yet for a PowerBook, even one of Apple's discontinued 20MB drives can be sufficient if you plan carefully. See if you can live with the drive's size before rushing out to replace the drive.

And make sure you can take advantage of all of your hard drive's existing storage capacity. That means repartitioning the drive, because most Macintosh drives—desktop and PowerBook alike—have unused free space. See "How to Unlock the Hidden Storage on Your Hard Drive" for a step-by-step guide to freeing up that space.

Pruning the System Folder

TO BUILD A LEAN, MEAN POWERBOOK machine, you should cut the fat from the

System Folder. Apple's standard installation (Easy Install) of System 7 and 7.1 includes many files that aren't necessary for operation. If you choose Customize and Min System, you get a few unnecessary files and some that you do need. By tossing out unnecessary files, you not only save some drive and RAM space but the PowerBook will start up faster as well.

Actually, you should copy these files to a floppy before you trash them, although you can always restore them from the System floppy disks. Not all these files are on all PowerBooks; use the Find command under the File menu in the Finder to search if necessary.

I'm assuming here that you have done either Easy Install or a standard System install for your Mac model. My trimming was done under System 7; 7.1 savings are in parentheses.

Starting alphabetically in the System Folder, you can toss several Apple menu items: Alarm Clock, Calculator, Note Pad, and Puzzle. (I've kept Key Caps, although you may not need it.) Total savings: 53K (59K in System 7.1).

You can also toss a surprising number of control panels without ill effects. Many are only necessary for setting parameters that you rarely if ever change—and when you need one, you can run it directly from a floppy disk. Map serves no real function. Easy Access helps only if you need to operate the computer one-handedly. Keyboard, Mouse, Labels, and Sound are only necessary to make a change. Similarly, you can remove Date & Time and Numbers, which come with 7.1. Startup Disk lets you start up from an external hard drive. Keep it if you will be using a RAM disk; otherwise, toss it.

Views is also dispensable. Monitors serves two functions. If you have a PowerBook 160, 180, 210, or 230, Monitors lets you set the gray levels on your display. If

continues

you use an external monitor—either through a built-in video adapter or a docking assembly—Monitors lets you manage both displays. For the majority of Power-

Books in use today, Monitors serves no function. Similarly, Color can go unless you have an external display that needs it. The three control panels that deal with file shar-

ing—File Sharing Monitor, Sharing Setup, and Users & Groups—are optional as well. Two more drastic cuts are General Controls and Memory, yet once you have established basic settings and are willing to accept default memory settings, you don't need them. If you toss all these control panels, you can save 201K to 263K. (You can even cut the control panel for the Portable or PowerBook because it isn't absolutely essential, but its control of automatic sleep mode and hard drive operation timing is truly valuable for PowerBooks.)

The Extensions folder contains many optional items as well. Chances are you no longer need Finder Help, the balloon help for Finder. If you need remote access to large computer databases, keep DAL; otherwise toss it (and DAL Preferences in the Preferences folder). Caps Lock (5K) isn't essential, but I find a caps-lock-on indicator in the menu bar is handy, so I've left it on my PowerBook (some recent PowerBooks have an indicator light). Three extensions support file sharing: File Sharing Extension, Network Extension, and AppleShare. If you don't share, you can toss all three, for a total savings of about 331K.

PrintMonitor supports background printing; you can print fine in the foreground without it, and many users rarely print from a PowerBook anyway. You can toss every printer driver except the one you use. You might need a different one if you are traveling and encounter another kind of printer, but you should be able to find any necessary driver on one of the Macs connected to that printer. You do not actually need any printer driver if you are not printing from the PowerBook, but you might want at least one because some applications check for the installed driver to set page margins and pagination. You could select the driver with the smallest size—ImageWriter (46K)—but because setting up on one type of printer and then printing on another sometimes results in changes to page breaks and other spacing, you should install the driver for the type of printer that you use most often. The LaserWriter driver is the most common choice, despite its 218K size.

Voilà: a savings of nearly a megabyte in the Extensions folder alone.

The Font folder contains more dispensable items (it's the Font folder in System 7.1; the System file itself in System 7). First, you can toss out all the sounds, thus saving 20K. When the Macintosh needs to alert you, it produces a beep instead of a distinctive sound—no loss. Standard installation of System 7 includes 1086K of fonts in TrueType format (1189K in System 7.1). You can certainly eliminate some of these, and if you principally work with PostScript

continues

How to Unlock the Hidden Storage on Your Hard Drive

If your Macintosh—desktop or PowerBook—came with a hard drive from Apple, it probably has some hidden storage capacity. I checked a dozen Macs with 40MB hard drives; the hidden storage ranged from 980K to 3.9MB. I found 1.6MB of hidden storage on PowerBook 140s and 170s with 40MB drives; 1.4MB of hidden storage on PowerBook 100s with 20MB drives. Some 160MB drives have as much as 15MB hidden.

Recovering this hidden storage capacity is simple—all you need to do is repartition your disk with the Disk Tools floppy disk that comes in the set of System disks. The procedure is tricky enough that many people say it cannot be done except with a third-party formatting program. Not true; everything you need is right on the System disks.

If you perform this process on a PowerBook, do it while connected to an AC power supply. A battery failure would be inconvenient, to say the least.

- 1
 - First, start the Mac with the Disk Tools floppy disk.
 - Launch Apple HD SC Setup.
 - Select Partition.
 - Select Custom.
 - A map of the disk's partitions appears. At the top is the driver, occupying 16K. In the middle is the available space. At the bottom, in gray, is the "extra" space.
 - Select Details.

The window shows any available storage as free space. If there isn't any, then the disk is already partitioned for maximum capacity.

- 2
 - Select OK, then Done, and Quit *without making any changes*.
 - Now, back up the hard drive. *If you don't, and something goes wrong, you—or at least your data—are dead meat.*
 - Restart with the Disk Tools disk, launch Apple HD SC Setup, and select Partition and Custom.
 - This time, click on the name of your hard drive in the map.
 - Select Remove.
 - At the warning "continuing will destroy the data..." select OK (you did back up, right?).
 - The entire disk map should now be gray except for the driver at the top. Put the mouse pointer just below the Driver partition; click and drag the partition down to the bottom. (If you select the Driver partition by accident, select Done and start over.)

- 3
 - Now a new screen asks you to select the type of partition. Choose Macintosh Volume. You can change the size. You can specify the entire drive space, or you can leave a small area—a kilobyte or two—as free space in case you want to install another partition in the future. Changing partition sizes is easier than creating an entire new one.
 - Select OK.
 - When you get the message "Partitioning was successful," select Done, then choose Quit.
 - Restart the Mac and enjoy the extra space. If you want an easier method, try a third-party formatting program such as Hard Drive TuneUp from Software Architects (206/487-0122), Hard Disk Toolkit from FWB (415/474-8055), or Drive7 from Casa Blanca (415/461-2227).

Why does Apple leave hidden space in its drives? Apparently to round off the drive sizes. Apple gets 40MB drives, for example, from many sources, and the actual capacity varies from 41MB to 45MB. Apple simply partitions and sells them all as 40MB drives.

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/MANOVA/ANCOVA/ANCOVA (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 (QuickStart 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/MANOVA*) ■ 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.



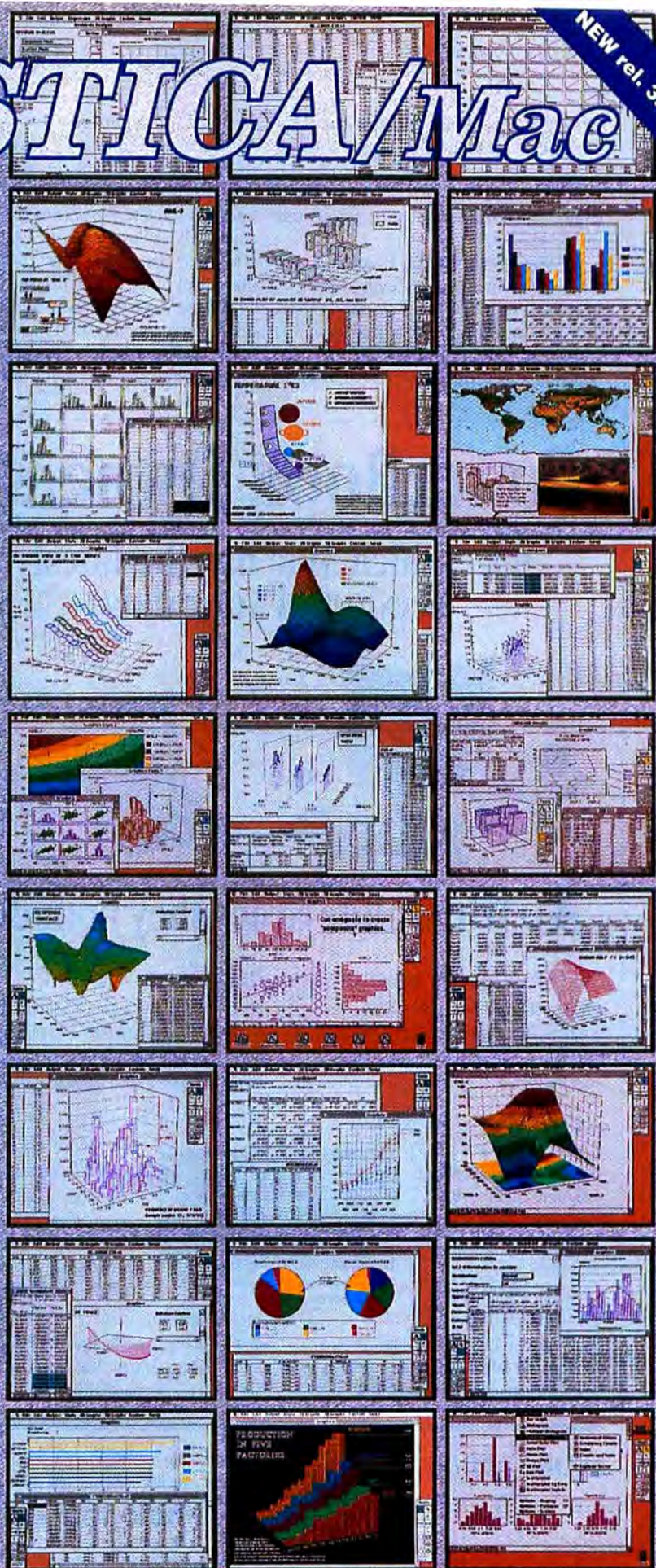
StatSoft™

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 Julsing, 071-230410; France: Version US (1) 40590913; Sweden: AkademikData 018-240035; Hungary: P&D Soft KFT 185-8868; Belgium: TEXMA 10 81 16 28; South Africa: Osiris 12 663-4500; Japan: Tree's Company, Inc. 03-3770-7600

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

Circle 99 on reader service card



fonts, you should probably toss out every font except those needed by the System. This saves you at least 960K of space; you will need to add the PostScript fonts of your choice, however, so that your net savings will be smaller.

If you standardize on PostScript, you may want to add Adobe Type Manager, which takes up 121K of drive space (165K for ATM version 3, which is needed for 7.1) and at least 96K of RAM (the exact amount depends on the size you set for ATM's font

cache). You might try working without ATM first, and add it only if you need it. If you print with a PostScript printer, ATM only affects the legibility of scaled fonts on screen; printed text looks fine. If the printer does not have PostScript, then ATM is necessary for producing clean output from PostScript fonts, but in this case you might as well use TrueType fonts instead. On the other hand, you may print mainly on PostScript printers but occasionally on non-PostScript printers when you are traveling;

then using ATM is better than mixing TrueType and PostScript fonts.

If you do mix TrueType and PostScript, you might want to keep Geneva and New York, TrueType fonts that have no PostScript equivalents. It is especially important to be sure that Times, Helvetica, Palatino, and Courier are not installed as TrueType on some Macs you use and as PostScript on others.

The result of all this pruning is a System Folder that can be as small as 1101K (1129K for System 7.1), compared with more than 3700K for Apple's standard Easy Install System Folder. Now you probably won't want to toss out every possible file and font; most of them do useful things, after all. But you should consider such a stripped-down System Folder if you are squeezed for space. This minimalist approach is also useful for setting up a RAM disk, an essential feature even for the PowerBook user who has everything else.

PowerBook Owners:

Q. Which Mac has the latest version of your data?



A. With Inline Sync™, they both do!

Synchronize Files Automatically

Update your calendars, sales figures, customer lists, correspondence—you name it—automatically. Inline Sync is your solution.

Inline Sync is Convenient

Link any same-named files or folders automatically or manually, even if they have different folder paths on each hard disk. No need to reorganize your hard disks to keep your files up to date!

Synchronize volumes immediately, or on a schedule you define: daily, weekly, monthly, or in the background anytime your Mac is idle.

Inline Sync is Easy to Use

Select files and folders from the simple File List interface. Choose the powerful scripting features to automate file selection by any combination of date, location, name, file type, or file kind.

Inline Sync is Safe

Relax. Inline Sync verifies copied files, lets you know if both copies of a file have changed since the last synchronization, and lets you choose to keep one or both versions.

Inline Sync is time zone aware—it transparently deals with time zone differences and alerts you to clock anomalies.



Any two mounted volumes can be synchronized.



INLINE DESIGN



308 Main Street
Lakeville, CT 06039
203-435-4995
Fax: 203-435-1091

For more information or the location
of a dealer near you, call us today!

1-800-453-7671

Inline Sync is a trademark of Microseeds, Inc. ©1992 Microseeds. Inline Sync requires System 7. Macintosh is a registered trademark, and PowerBook is a trademark of Apple Computer, Inc.

Speedier Computing

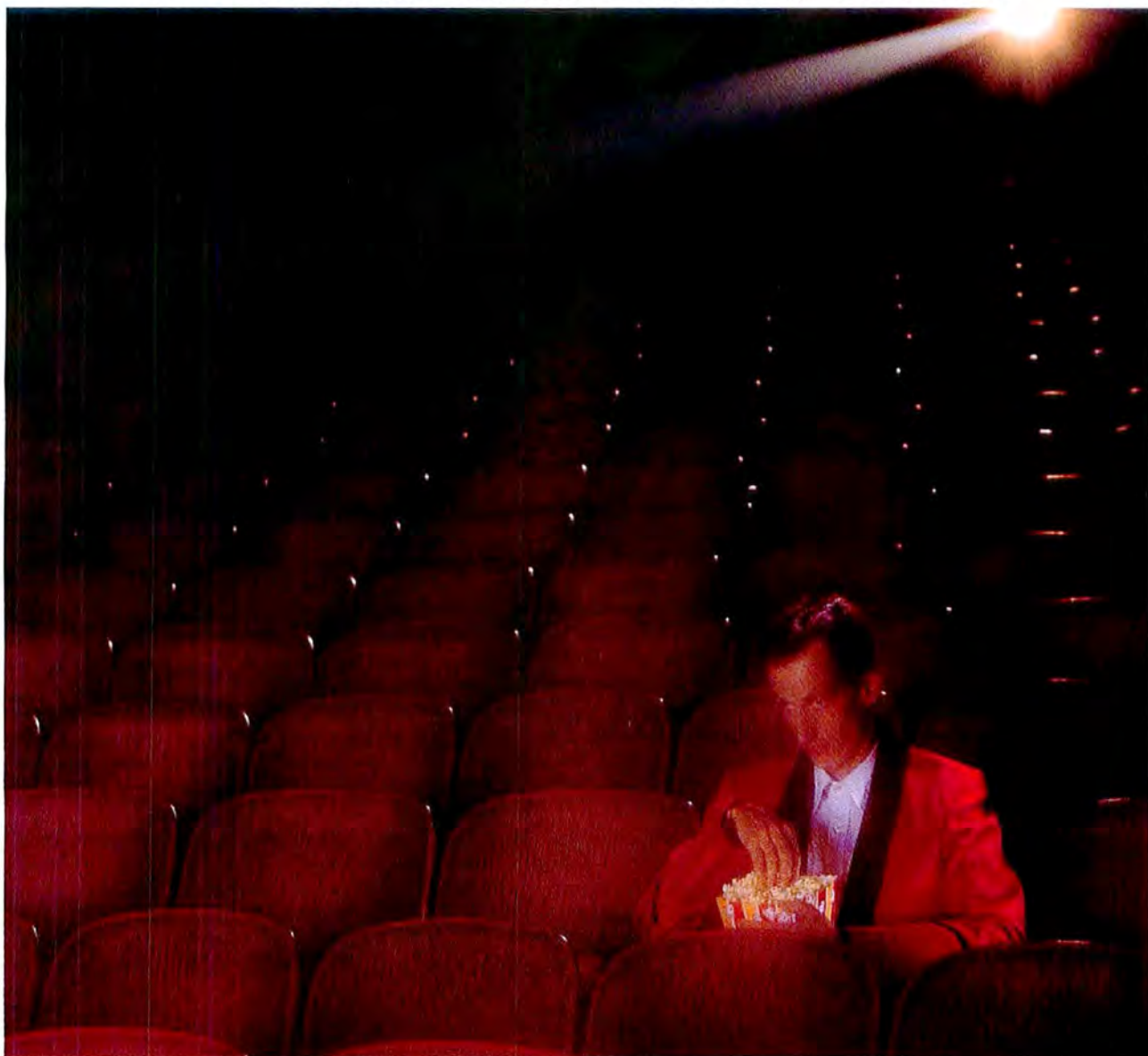
A RAM DISK IS A PORTION OF RAM THAT IS set aside to behave like a disk drive; it's created using the Memory control panel (see "Getting Started with Memory-Maximizing Tips" in this issue for more on RAM disks). To save power during battery operation, PowerBooks are normally set to turn off the hard drive after several minutes of inactivity. When it's time to save a file or retrieve information, you may have to wait for the hard drive to spin up—and it consumes appreciable power in the process. To avoid this wait and save power, you should try a RAM disk, which is much faster than a hard drive.

Caution: RAM is volatile; a RAM disk's contents disappear when the power is switched off or lost. Among the PowerBooks, only the 100 accepts a RAM disk gracefully because its batteries supply continuous power to the RAM even when the computer is shutdown. (That's because the PowerBook 100 ROM was derived from the original Mac Portable, whose large battery also supplied continuous power to RAM.) For all other PowerBooks, the RAM contents disappear during shutdown, one reason to use sleep mode rather than to shut down, when possible.

You can store anything on a RAM disk that you can on a real disk—subject to storage capacity, of course. The ideal RAM disk contains a System Folder, applications, and documents, allowing you to bypass a hard drive altogether—or nearly so. For the safety of your data, copy your documents from the RAM disk to the hard drive from time to time. Battery life goes up considerably with

continues

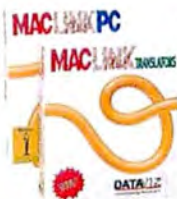
Circle 200 on reader service card



PC To Mac File Exchange Without Translators Is Like A Foreign Film Without Subtitles.

Sharing files between PCs and Macs is no longer a luxury, it is a necessity. But it doesn't have to be a foreign concept.

Lots of products on the market claim to solve your problems of sharing files across platforms, but take a careful look before you buy.



Some, such as disk mounting utilities only give you a partial solution; and when your file appears on screen, you get a big surprise. You can't read a word of it - not your text, not your formatting - it looks like garbage.

You see, transferring your files only gets half the job done. What you need to finish the job is translation. What good is it to simply transfer a file from a PC if you can't decipher it once it hits your Mac?

MacLinkPlus from DataViz is the *total solution* for both file transfer and translation.

It's been on the market since 1984 and has led the way in bridging the gap between PCs and Macs. With over 600 translation combinations for the most popular word processing, spreadsheet, database and graphics applications, you'll find it the strongest translation product with the widest breadth of translation possibilities anywhere!

MacLinkPlus is the solution to virtually any problem you may encounter in moving files between PCs and Macs. And being able to read them - with their formatting intact - once they get there.

Call (800) 733-0030 for more information; We're the one translation company that won't leave you sitting alone in the dark.

DATAVIZTM
THE DATABRIDGE SPECIALISTS

a RAM disk—some people report up to five hours of computing when a screen's backlight is also used sparingly.

If you have 6MB or more of RAM, you can easily create a RAM disk of 2.5MB to 3MB and operate the PowerBook from a System Folder on either the RAM disk or the hard drive. Use the hard drive System Folder when you're plugged into AC power; this folder can have all the resources that you need. The System Folder on the RAM disk can usually be stripped down since you probably don't need that many features during battery operation. You can use the control panel called Startup Disk to move between the hard drive and the RAM disk.

If you have just 4MB of RAM, you can still have a self-contained RAM disk, you just have to plan carefully. Create a 2112K RAM disk; this leaves 2028K available. Then install a completely stripped System 7 folder (from the System installation disks, select Custom and then Min System for your model). After you toss an extraneous file or two, you are left with 848K of RAM disk space under System 7 (803K under System 7.1).

What can you do in 848K of space? Word processing is the most popular application. Microsoft Word 5.0 just barely fits, leaving no room for documents or

even saving a Preferences file, and Word 5.1 does not fit at all. So if you are a Word user and don't want to switch to another program, then use Word 4, which needs 670K of disk space, leaving 180K for documents. The Word 4 file format is compatible with Word 5.

Maybe you should change programs; both WriteNow 3.0 (T/Maker, 415/962-0195) and Nisus Compact 3.31 (Nisus Software, 619/481-1477) load completely into memory and do not need to be in the RAM disk at all. Once launched from a hard drive, neither program needs to go back to the drive except for documents. In practical terms, this means that you can use more space on the RAM disk for documents or other applications. WriteNow is smaller (287K on disk, minimum 325K memory partition) than Nisus Compact (370K on disk, minimum 499K memory partition) because WriteNow does not necessarily load a document completely into memory as Nisus does.

Whatever you do, think twice before you go out to buy a program just for RAM disk use; perhaps you should spend that money on more RAM instead.

And don't forget that you can still run other programs, control panels, and Apple menu items (desk accessories) from the hard drive even if you start the PowerBook from

a RAM disk. On the other hand, the only way to completely avoid turning on the hard drive is to throw the hard drive icon in the Trash (it will reappear after a restart).

If you have the space, you can keep a copy of your RAM disk on the hard drive so you can re-create the RAM disk quickly if necessary. But this means you will have duplicate files on your hard drive, and a duplicate System file can cause trouble. To solve that problem, you can create a folder with every RAM disk file except the System file. If you don't have that much hard drive space, simply mark each component of the RAM disk with a Finder label for easy retrieval. If your System Folder is small enough, you can keep it on a floppy disk. Managing a RAM disk is much easier with System 7.1's separate font folder than with System 7's practice of storing fonts inside the System file itself.

System 6

IF YOU HAVE A POWERBOOK 100, ANOTHER way to cut down the size of the System Folder is to install System 6 instead of System 7, on both the hard drive and a RAM disk. The readily available versions of System 6 do not handle power management

continues

Add It On. Then, Add It Up.



Plusware's
Numeric
Keypad
adds
efficient
numeric
input to
your
PowerBook™
equation.

- 23-key keypad
- 15 programmable function keys
- ADB passthrough port
- weight: 7 oz.; height: 0.6"
- free QuickKeys Lite software
- 30-day, money-back guarantee

For just \$129.00, it all adds up to one great value!

*** BONUS ***

Purchase from Plusware before Dec. 31, 1992 and receive a deluxe PowerBook carrying case (T638L) from Targus - absolutely free!

To order, call
toll-free:
1-800-268-7587
(North America)
Tel: (416) 477-0015
Fax: (416) 477-0250

Numeric Keypad for PowerBook
plusware

PowerBook is a trademark of Apple Computer, Inc.



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

Circle 51 on reader service card

Now, You Can Even Remove The Risk.



A lot more goes into a Mass Microsystems™ removable drive than simply a SyQuest® mechanism.

A good place to start. Yet until the removable drives pass 37 of the industry's most grueling tests, they don't earn our DataPak™ name. Tests that examine every wire. Every connection. Everything. Right down to the rubber feet.

It's obviously a lot more extensive than the typical burn in. But it's the reason Mass Micro DataPaks have the highest rate of reliability anywhere.

An edge we intend to keep. That's why Mass Micro is the first company to include Active Termination on every DataPak 45MB or 88MB, reducing SCSI-related problems that plague other drives.

PadLock™ software is something else you'll find only on our pre-formatted DataCart™ cartridges. Giving you ultimate security and across-the-board SyQuest compatibility.

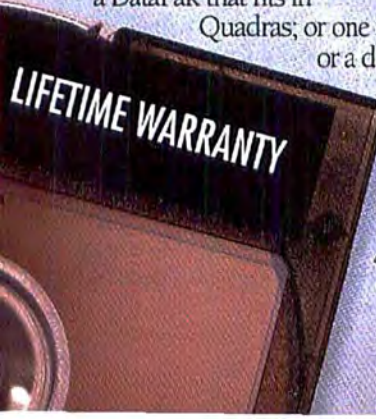
Another Mass Micro exclusive is the number of configurations we offer. Like a DataPak that fits in



Only Mass Micro DataPaks have Active Termination. Without it, SCSI can be a risky business.

Quadrax, or one that sits neatly atop a IIci; or a duet model with two selected drives. Even the free DataCart cartridge that comes with every drive is

How many companies offer a Lifetime Warranty on cartridges? You're looking at it. And one's included with every drive.



the safest bet. Because every cartridge with the DataCart name comes with a lifetime warranty—yet another feature you can't get anywhere else.



Our award-winning DataPak removable cartridge drives are available in two capacities—45MB and 88MB. We also feature more footprint configurations than anyone else in the industry.

Mass Micro stands alone for still another reason: The number of awards we've won for our removables. Nobody's won more MacUser Editor's Choice or user-elected MacWorld World-Class awards. Of course, we have an unfair advantage here. We were the first to bring SyQuest technology to Macintosh and, subsequently, have sold more than anybody else.

So don't take any unnecessary risks. Call Mass Micro at 1-800-522-7979. And ask for our award-winning DataPak. We'll remove any doubt about whose storage to buy.



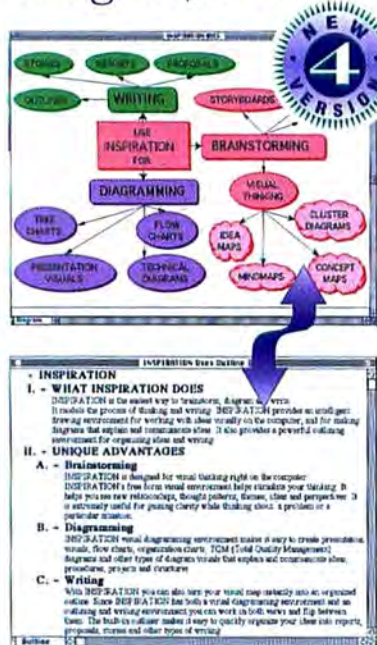
 **MASS**
microsystems

© 1991 Mass Micro, Mass Microsystems, DataPak, PadLock, and DataCart are trademarks of Mass Microsystems. Macintosh and Mac are registered trademarks of Apple Computer, Inc. SyQuest is a registered trademark of SyQuest Technology, Inc.

Circle 164 on reader service card

Inspiration™

The Easiest Way to Brainstorm, Diagram, & Write!



Inspiration is an powerful idea development tool. In Diagram view, brainstorm ideas and easily create presentation visuals. In the integrated Outline view, quickly transform ideas into complete written documents. Great looking diagrams, flow charts, outlines and proposals have never been easier. Call today to learn how Inspiration can help turn your ideas into solutions.

"Inspiration is a brilliant brainstorming, outlining, and writing tool!"

Steven Bobker
Contributing Editor, MacUser

For your **free demo** or to order,
Call **(800) 877-4292**

Inspiration Software, Inc.
2920 SW Dolph Court, Suite 3
Portland, Oregon 97219
503.245.9011 Fax 503.246.4292

©1992 Inspiration Software, Inc.

and the screen brightness correctly, however. System 6.0.8L, produced by Apple for sale outside the United States, fixes these glitches for the PowerBook 100 and adds support for the SCSI disk mode. Unfortunately, there's no official way to get 6.0.8L inside the United States, although it's available in Canada. A minimum System 6.0.8L folder takes up only 410K, some 700K less than a minimum System 7 folder. A full installation of 6.0.8L without printer drivers takes 876K.

You can combine the best of both worlds on a 4MB PowerBook 100 by installing System 7 on the hard drive and creating a 1.5MB RAM disk with a minimal System 6.0.8L. You still have 1MB of RAM disk space available and 2.5MB of main RAM, which is enough for many applications even under System 7. The two Systems have no difficulty sharing files, but they cannot share System resources such as control panels.

(If you have a PowerBook 140 or 170, in practice you cannot run System 6. A few accomplished system software people have converted KanjiTalk 6.0.7.1, a Japanese version of System 6, to be able to run English-language software on the 140 and 170. The conversion process is difficult and incomplete, although the result is operational. Originally this issue about System 6 came up because of delays in the release of System 7 KanjiTalk. KanjiTalk 7 is now available, so newer PowerBook models will not run System 6.)

Sleepy Time

IN ITS POWERBOOK MANUALS, APPLE offers much worthwhile advice on how to avoid trouble. But I find some of its advice too conservative.

Here's one example. A PowerBook comes out of sleep mode much more quickly than it boots from a cold start. Apple says that PowerBooks should be shut down before moving them, and that sleep is suitable only for a stationary unit. The idea is that an accidental keystroke might turn on a sleeping computer during transit, and the hard drive might be damaged. Even so, many people have taken to carrying around their PowerBooks in sleep mode, and the Apple PowerBook managers I spoke to consider the advice overly cautious if not an outright error. (On the PowerBook 100, pressing any key turns on the computer anyway, from either an off state or sleep mode, so there is no difference in risk for accidental start-up with that model.) For safety's sake, save important files to the hard drive before putting the computer to sleep. (And please don't send me the repair bill if your computer gets damaged.)

Plugging In Peripherals

APPLE'S MANUALS ARE SOMEWHAT UNCLEAR about when you can connect devices to, and disconnect devices from, a PowerBook. PowerBooks have three states: on, off, and sleep. You can connect or disconnect any device when your computer is turned off. According to sources I spoke to that make PowerBook peripherals, you can connect or disconnect the AC power adapter and serial port devices at any time, regardless of whether the computer is on, off, or in sleep. According to engineers who develop them, you can connect ADB devices, such as numeric keypads, during sleep; if the device is not a mouse, keyboard, or numeric keypad, you may need to restart the computer for it to recognize the device. Don't plug in an ADB device while the computer is on—you run the risk of shorting the plug and blowing a tiny fuse in the computer. And if you go to an Apple dealer for repairs, you'll have to replace the main logic board, an expensive proposition. A third-party repair shop can replace the fuse for much less money.

Virtually all my sources say to shut down the PowerBook before connecting or disconnecting floppy disk and SCSI connectors. Otherwise, you might have another potentially expensive repair. A few brave souls say that they routinely connect and disconnect SCSI devices without shutting down, only restarting the PowerBook to recognize the device. They do it to preserve the RAM disk—but I wouldn't.

Airport Advice

THE APPLE POWERBOOK MANUAL SAYS "Do not allow your computer or any hard drives or floppy disks to pass through X-ray machines. Have security officials manually inspect your computers and disks." As far as I can tell, there is no basis for this advice; X rays do not appear to damage magnetic media or any other computer component. Some people suggest that the problem is not with the X rays but with the magnetic field produced by the motor driving the conveyor belt through the X-ray machine. I can't find any verifiable reports of damage, however. Engineers who work for computer and disk manufacturers routinely run their computers and disks through X-ray machines, and so do I.


If your experience is different, please share it with me, and any other tips or tricks that make your PowerBook more effective or fun. **m**

CARY LU got his first Mac in the summer of 1983. He is the author of *The Apple Macintosh Book* (Microsoft Press, 1992).

Star Ratings

THE BEST AND WORST FEATURES OF PRODUCTS
REVIEWED IN MACWORLD

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.

3-D/3-D ANIMATION

★★★★ **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

★★★★ **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

★★★★ **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

★★★★ **Infini-D 2.0**, 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

★ **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.

★★ **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

★★★★ **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

★★★ **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

★ **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.

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 1991**, ChipSoft, 619/453-8722, \$79.95. On-screen replicas of IRS forms ease the preparation of tax returns in this personal income tax software, but the help text (lifted from IRS documents) is unclear. Apr 92

★★★★ **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, \$249.

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 2.0.10 (2.2.3)**, ACIUS, 408/252-4444, \$795. The truly high-level computer language of the database still allows control of small details in data representation and display, but to exploit all of its features, you need a programming background.

★★★★ **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 competitive price. Nov 92

★ **Clarix Resolve**, Clarix 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 Technology, 415/961-4110, \$299. Convenient and flexible report-generator includes fast formatting, automatic import, and almost every other item on the wish list of users who need report tables that emphasize cross-tabulation. 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**, Clarix 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

★★★★ **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-style maps of files from your spreadsheet or database. Nov 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 *continues*

Star Ratings

this brainstorming tool. It works best as a vehicle for organizing and developing ideas. Feb 93

★★★★ **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 II, Claris Corp., 408/727-8227, \$599.** Draw task boxes and connect them with lines that define project logic using this project-management software. It links with Resolve to produce seven types of graphs and tables, but other programs offer more elaborate reporting and scheduling options.

★★★★ **Microsoft Excel 4.0, Microsoft Corp., 206/882-8080, \$495.** Create impressive spreadsheets with this upgrade that includes all the features you wished 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 newscheduling and formatting, are packed into this upgraded project-management software. The improved tool bar helps novices schedule tasks with push-button ease. Jan 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 Manager 2.1 (2.2), White Crow Software, 802/658-1270, \$99.** Simple contact- and project-management software is powerful for small databases, but reliance on HyperCard limits its use for low-end Macs. Dec 92

★★ **Office Wiz 1.1 (1.1.2), Oryx Associates, 415/563-9971, \$695.** 4D-based program attempts to integrate calendar and 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

★★★★ **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

★★★★ **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

CAD/DRAFTING

★★★★ **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 features that an architect needs. Jun 92

★★ **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

☐ **Claris CAD, Claris Corp., 408/727-8227, \$899.** Serious but basic CAD package has fallen behind the competition after a long period without an upgrade. Still, it's one of the fastest products available for scrolling and zooming—important for work on large, complex drawings.

★★★★ **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

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 (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

★★★★ **Fontographer 3.5, Altsys Corp., 214/680-2060, \$495.** Versatile tools that allow 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.

★★★★ **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 great 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

☐ **Publish It Easy 2.12 (3.0), Timeworks, 708/559-1300, \$199.95.** Fast even on the slowest Macs, this page-layout program sports a comprehensive mix of features that may eliminate your need for a separate drawing or even database program. But some bugs and a daunting complexity mar this otherwise versatile program.

★★★★ **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 your fonts efficiently and effectively with this type-specimen generator. Printing specimen sheets is a cinch. Jan 93

★★★ **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

DRAWING/ILLUSTRATION

☐ **Adobe Illustrator 3.01, 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 Mac draw program, such as tools to create line and bar graphs.

★★★★ **Aldus FreeHand 3.1, 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

★★★★ **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

☐ **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 well worth the effort. The precision-drawing functions in particular should appeal to many users.

★★★★ **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.

EDUCATION/CHILDREN

★★★★ **A Silly Noisy House 1.0, The Voyager Company, 310/451-1383, \$59.95.** A brightly colored animated world awaits exploration; CD ROM's simple scenes and syrupy songs are perfect for preschoolers. May 92

★★★★ **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

★★★★ **The Complete Annotated Alice 1.0, The Voyager Company, 310/451-1383, \$19.95.** *Alice in Wonderland* fans 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

★★★★ **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

★★★★ **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

★★★★ **MacGlobe 1.3.0, Broderbund 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 normal workbook format is converted into humdrum bits and bytes with these mathematics education games. May 92

★★ **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 decent aid to a more complete curriculum, but it's buggy and of uneven quality. Aug 92

★★★★ **Spelunx and the Caves of Mr. Seudo, Broderbund Software, 415/382-4400, \$49.95.** Anticipated giggles, rich graphics, entertaining sounds, and creative learning activities fill this interactive hyperworld. We recommend it, despite its tiny bugs. Jul 92

★★★★ **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 may 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 the World Is Carmen Sandiego? Deluxe Edition, Broderbund Software, 415/382-4400, \$79.95.** The V.I.L.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

GAMES

★★★★ **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

★★★★ **The Battle of Britain, Deadly, 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, 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

★★ **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

★★★★ **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 yet 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

★★★★ **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

★★★★ **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

★★★★ **Prince of Persia, Broderbund Software, 415/382-4400, \$49.95.** A high tolerance for frustration is necessary to negotiate the 12 mazelike levels of dungeon and palace in this arcade adventure, but amazingly realistic (altogether 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 continues

Star Ratings

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**

★★★★ **The Secret of Monkey Island 1.0**, LucasArts, 415/721-3300, \$59.95. A genuinely amusing, interactive tale of swashbuckling and daring deeds using splendid 256-color graphics and an original sound track. 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, as well as an 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**

★★★★ **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**

★★★★ **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**

★★★★ **Super Tetris**, Spectrum HoloByte, 510/522-3584, \$49.95. Teensy bles 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**

IMAGE EDITING/PAINT

☐ **Adobe Photoshop 2.0.1 (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 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**

★★★ **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 slow speed and disappointing sharpening. **Dec 92**

★★★ **Color It 1.0 (2.0)**, MicroFrontier, 515/270-8109, \$119.95. A magic-wand tool and antialiased brushes and text are among the high-end features found in this low-end color paint program. Occasionally mystifying and buggy, it's still a remarkable bargain. **Apr 92**

★★★★ **Expert Color Paint 1.0**, Expert Software, 305/444-0080, \$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**, 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**

☐ **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.

★★★ **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**

★★★★ **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, it's a must for anyone who uses a Mac for presentations. **Nov 92**

★★ **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, not always successfully. It's brimming with good ideas that are poorly implemented. **Aug 92**

MATHEMATICS/STATISTICS

☐ **Data Desk 3.0**, Data Description, 607/257-1000, \$595. Users with limited formal backgrounds in statistics can perform better analyses with this statistics program than with others.

★★★★ **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**

☐ **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.

★★★★ **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.

★★★ **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**

★★★ **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 4.0**, 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**

MISCELLANEOUS SOFTWARE

★★★ **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 limit its usefulness. **Jun 92**

★★★ **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**

★★★★ **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**

★★★★ **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**

★★★ **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 the flaw's not critical. Jul 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.

★★★ **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

★★★★ **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

★★ **LinksWare 1.4 (2.0)**, LinksWare Corp., 408/372-4155, \$189. Although creating hypertext links between documents stored in nearly any format is relatively simple using this utility, the navigational assistance may be insufficient for complex projects. Aug 92

★★★ **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

★★ **Notify 1.0**, Ex Machina, 718/965-0309, \$149. Innovative wireless transmitter uses 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

★★★★ **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

★★★★ **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

★★★ **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

★★★★ **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

★★★★ **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 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

★★★ **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

★★★★ **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

★★★ **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

★★★★ **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

MULTIMEDIA

★★★★ **Adobe Premiere 2.0**, Adobe Systems, 415/961-4400, \$495. A dream command post for video professionals, this QuickTime video-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

★★★ **Cinemation 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

★★★ **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 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

NETWORKING/CONNECTIVITY

★★★ **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, \$99 or \$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 Mounter 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 sophistication. The impressive scripting facility is countered by poor help features. Jul 92

★★★ **NetMounter 1.00 (1.01)**, Dayna Communications, 801/531-0600, \$99. Reasonably priced utility provides Macs access to Netware file servers without installing 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

★★★ **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

★★★★ **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

★★★★ **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.

continues

Star Ratings

work 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 your 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 680X0. The main drawback is the slow speed.

★★★★ **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 that would please anyone. Dec 92

✓ **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 BBSs 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.

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**, 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 1.01 (2.0)**, Pastel Development Corp., 212/941-7500, \$99.95. In spite of a few rough edges and missed opportunities, this personal organizer is a versatile tool for creating to-do lists, prioritizing tasks, and maintaining a calendar with alarms. Apr 92

✓ **Dynodex**, Portfolio Systems, 408/252-0420, \$89.95. Raw speed is the trade-off for an unappealing screen display with this field-based address-book software. It's fast enough in searching, opening, and saving to be a worthwhile investment.

★★★★ **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, 415/285-1233, \$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 (1.1)**, 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

★★★★ **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

★★ **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

★★ **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 GRAPHICS

★★★★ **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

✓ **Aldus Persuasion 2.1 (2.12)**, Aldus Corp., 206/622-5500, \$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.

★★★★ **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

★★ **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. Jan 93

★★★★ **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

★★★★ **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

★★ **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

★★ **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 Mac fundamentals need polish, but the program offers unique analytic capabilities. Jul 92

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

★★★★ **Object Master 1.0.2**, ACIUS, 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 won't 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

SCIENCE/ENGINEERING

★★★ **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

★★★★ **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, 305/444-0080, \$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

★★★★ **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

★★★★ **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

★★ **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

UTILITIES

✚ **After Dark 2.0**, Berkeley Systems, 510/540-5536, \$495. Turn your screen into an aquarium or a window into 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

★★★★ **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

★★ **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, undutered 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 only creates 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. Picky 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. Jan 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 allowing 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)**, Alysia 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

continues

Star Ratings

★★★★ **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 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

★★ **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

★★ **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, 702/588-9690, \$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

★★ **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 device lets you design, edit, import, and display repeating patterns on your Mac's desktop. Comes with fun, creative predesigned patterns. May 92

★★ **WinWatch 1.52 (1.53), ASD Software, 714/624-2594, \$149.** If your main concern is to track program and file use, this utility will handle the job nicely. Using it for 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, Free-Hand 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

★★ **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

★★★★ **Grade Machine 5.0, Misty City Software, 206/828-3107, \$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-management 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

★★ **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 LivingTrust 1.0, Nolo Press, 510/549-1976, \$79.95.** Gracefully guiding users through the process of drafting a 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

WORD PROCESSORS

★★ **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 5.0, Microsoft, 206/882-8080, \$495.** New features, including drag-and-drop editing, along with an enhanced set of familiar features, add up to a word processor that is kinder and gentler—as well as bigger and slower. Apr 92

★★ **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

★★ **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

★★ **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

★★★★ **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

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 mystify-

ing 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

★★★ **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

★ **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

★★★ **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

INPUT DEVICES

★★★ **A3 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

★★★ **DrawingBoard II, Drawing Pad, CalComp, 800/932-1212, \$645, \$395.** Two likable 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

★★★★ **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

★★★ **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 allows you to customize many of the trackball's functions. Nov 92

★★★ **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 Electronics, 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 datas. Feb 93

★★★★ **The Miracle Piano Teaching System 1.0, SoftwareToolworks, 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, but isn't appropriate for driving 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

★★★★ **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 an Iliac and a Iliac, but the screen is only adequate. Sep 92

★★★★ **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 device is the answer to your prayers. May 92

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 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 timesaver for beginning network managers. It uses AppleTalk only. Jan 93

★★★ **PowerModem, PSI Integration, 408/ continues**

Some people
put the homeless out
of their minds.
Christine Vigil put
them on-line.

In 1906 St. Vincent de Paul was founded to help people left homeless by the San Francisco Earthquake. Today, they're an organization that helps thousands of homeless people nationwide. By finding them shelter, medical care, rehabilitation, and jobs.

That's where Christine came in. Before she got involved, St. Vincent de Paul worked with 75 other San Francisco social service agencies matching homeless people with available jobs. The Job Finders Alliance worked hard, but since they only communicated by memo and phone, it could take up to three weeks to match a qualified person with an open job.

By using her computer skills, Christine was able to put St. Vincent's on-line, and make the whole process more efficient. As a direct result of her efforts, today St. Vincent's has been able to find jobs for their people far more rapidly. And make better matches, because they have access to a comprehensive database.

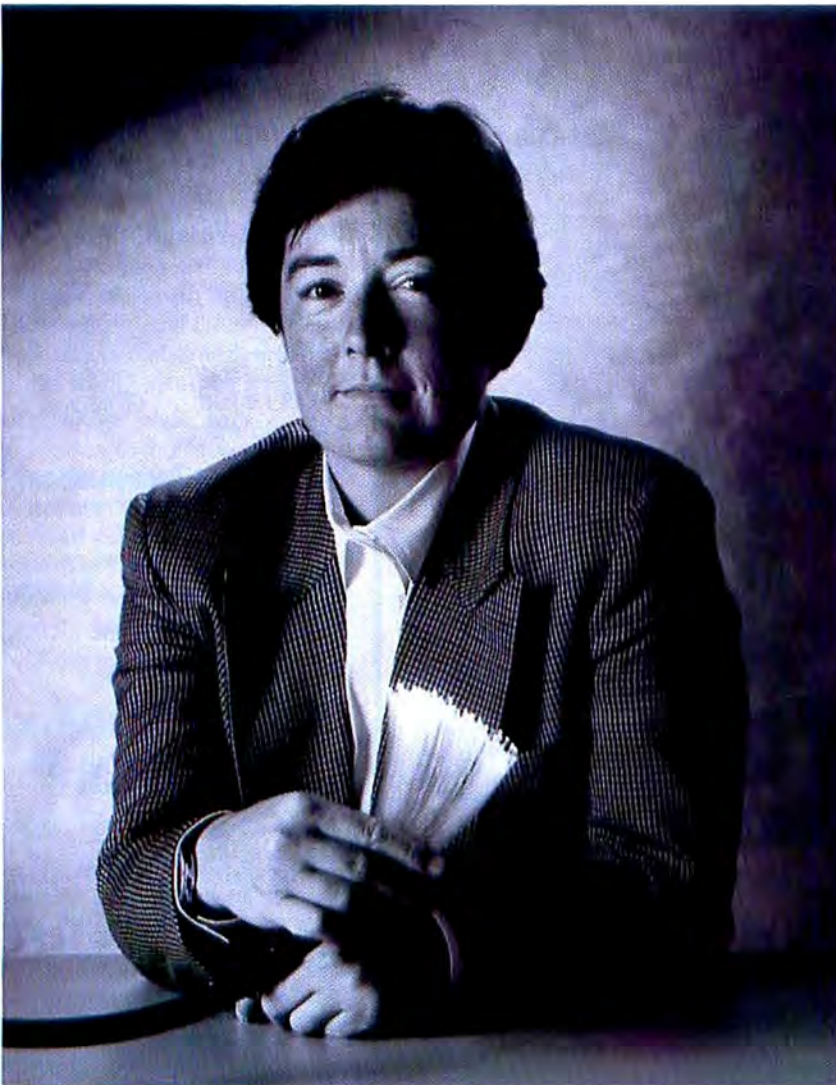
Of course Christine is just one example. There are a lot of ways you can put your special computer skills to a much appreciated use, whether you specialize in telecommunications, system debugging, or basic software training. To know more, call CompuMentor™ at 1-800-659-3579. We'll put you in touch with a local non-profit organization whose needs are compatible with your area of expertise.

There are many ways to make a difference in the world. Sometimes it's simply doing what you already do best.

CompuMentor™

People helping computers help people.

89 Stillman Street, San Francisco, CA 94107



MACWORLD 1992 Index

COMPILED BY ERFERT FENTON

THIS INDEX COVERS THE 12 ISSUES OF MACWORLD PUBLISHED DURING 1992. IT LISTS MOST PRODUCTS ALPHABETICALLY AND UNDER SUBJECT HEADINGS. SOME TOPICS ARE CROSS-REFERENCED. (READERS WHO LOOK FOR CALENDAR PROGRAMS, FOR EXAMPLE, ARE ALSO REFERRED TO PERSONAL INFORMATION MANAGERS.) BOLDFACE PAGE NUMBERS INDICATE A MAJOR REFERENCE. AN ELECTRONIC VERSION OF THIS INDEX CAN BE DOWNLOADED FROM THE LIBRARY WITHIN THE MACWORLD RESOURCES FOLDER IN THE MACWORLD FORUM ON AMERICA ONLINE.

2FAST Bullet and 2FAST Single high-capacity hard drives, May 156
3Com EtherLink/NB and Ethernet/NB TPX Ethernet boards, May 150
3 in Three, Jan 146, Feb 282
3M Brand Model 5300 and Model 5900 projection panels, Dec 185
3M Diskette Head Cleaning Kit, Jan 207
4CAST Digital Color Printer, Apr 136
4-D Boxing, Sep 294
4D Server, Dec 171
4th Dimension, Dec 171
Draw Preferences option, Aug 193
TextPert 4d External, Apr 125
6C OmniMedia scanner, Feb 197
10 Minute Guide to System 7, Apr 212
10 Minute Guide to the Mac, The, Feb 193

A

A³ Mouse, Jun 154, 188
A³ Trackball, Jun 154
A4 Accounting, Nov 116

Abbreviation expanders, Aug 181

Abegg, Martin, Mar 296
About This Macintosh dialog box, Nov 205

Accel-a-Writer 8000 printer, Jun 129

Accel-a-Writer PostScript/accelerator, Apr 117, Sep 240

Access/Hub, Nov 101

AccessPC, Oct 188

Accountant Inc., Nov 116

Accounting, Mar 217, Nov 116, 219

Business Sense, Feb 17, Oct 78

Components, Sep 285, Nov 116

Managing Your Money, Apr 113

M.Y.O.B., Mar 214, Jul 182, Nov 116

personal finance programs, Mar 217

Quicken, Jul 182

small-business, Nov 219

Snow Report Writer, Aug 101

ACCPAC Simply Accounting, Nov 116

AcuText OCR, Jan 46, Jul 174

Acetate for Macintosh graphics tablet, Aug 177

ACS300 Computer Speaker System, Nov 172

Ad, Jul 127

AdLink, Feb 214

Adobe Illustrator, Jan 132, Mar 229

choosing tints, Jul 244

creating scalloped border, Dec 300

trapping, May 166

Critical Eye: Inside Advertising, The, Apr 119

After Dark, Jun 241, 243, Dec 287

Lunatic Fringe, Oct 228

Movies in the Dark, Sep 359

Star Trek: The Screen Saver, Dec 185

AgentDA, May 127, Sep 310

Agfa Focus Slide Scanner, Oct 156

Agfa PCR II film recorder, Aug 146

Agfa TabScript C500 printer, Apr 136

Agfa XPress Scan, Feb 214

A-Hive Jr removable-media drive, Nov 132

A/Cu, Feb 214

AirMouse Remote Control, Jun 154

Aldus Additions, Feb 214

Aldus FreeHand, Jan 132, 223, Jun 202, Oct 43

Insights, Jan 223

making crop marks, Aug 192, Dec 297

scaling custom fills, Apr 224

scaling text on a path, Feb 312

Zephyr Palettes for FreeHand, Jul 218

Aldus Gallery Effects, Apr 185, Jul 42

Aldus IntelliDraw, Aug 93

Aldus PageMaker, Feb 208, May 173, Aug 38, 203, Nov 227

add-ons and utilities, Feb 214

altering fonts in, May 218

books, Mar 121

CheckList, Feb 289

dashed lines, Nov 214

Insights, Nov 227

PageMaker Dictionaries, Feb 214

problem printing hairlines on a Linotron, Jan 93

stretching type, Sep 345

TextPert Addition, Apr 125

Zephyr Palettes for PageMaker, Jul 218

Aldus Personal Press, Feb 208

Aldus Persuasion, Jul 154

Insights, Oct 237

Aldus PrePrint, Feb 214

Aldus Super 3D, Feb 246

Aldus SuperPaint, Jan 132, Mar 164, 179

altering fonts in, May 218

Aliases, Jun 135

Aliases, System 7, Feb 331

naming, Feb 331, Jul 244

Allas Sketch, Mar 123, Jun 176, Aug 155, Dec 23

AlisaMail, May 17

AlisaTalk for Unix, Feb 199

Allegro CD ROM drive, Oct 144

Alliance Peripheral Systems

APS hard drive series, Aug 132

AlphaScan LS monitor, Sep 254

ALSoft Power Utilities, Aug 168

Amazing Paint, Mar 164

American Discovery, May 197

American Heritage Electronic Dictionary, Jun 229

AMIX, Sep 195

Animation

Animation Clips, Jun 213

Cinematic, Mar 121, Jul 154, 208

ElectricImage Animation System, Feb 246, Jun 176

On the Air, Jul 154

ProMotion, Mar 121, Nov 164

Animation Clips, Jun 213

APDA, Jan 208

Apple CD 150 CD ROM drive, Jul 123, Oct 144

AppleColor High-Resolution RGB Monitor, Jan 124, Mar 134

Apple Color Matching System, Jun 125

Apple Computer

Apple Events Developers Association, May 119

Apple Library Users Group, Jul 137

Macintosh clones, May 21

Quorum Compatibility Engine lawsuit, Nov 45

Windows-compatible products, Jul 123

Worldwide Disability Solutions Group, May 63

AppleCOREspondent, The, Jun 83

Apple Desktop Bus Mouse, Jun 154

Apple Ethernet LC Card, May 150

Apple Ethernet N8 Card, May 150

Apple File Exchange, Mar 152

Apple Hard Disk, Aug 132

Apple Library Users Group, Jul 137

Apple Macintosh Book, The, Jan 188, Aug 97

Apple Macintosh Portrait Display, Jul 160

Apple menu, ordering items in, Jan 211, May 217

Apple Programmer's and Developer's Association, Jan 208

AppleTalk Remote Access, May 217

Appointment managers, In Control, Jan 19

APS hard drives, Feb 218

APS high-capacity hard drives, May 156

APS SyQuest removable-media drive, Nov 132

Aqua Blooper Piper, Feb 282

ArchiCAD, Feb 187, Jun 199

Architecture programs

ArchiCAD, Feb 187, Jun 199

Architition II, Aug 97

AutoCAD Release 11, Dec 250

DesignCAD Macintosh, Nov 159

ModelShop, Mar 176

Tree, Dec 187

Uppfront, Jun 129

Archtition II, Aug 97

ArcLink, Jul 21

Arctic Data Interactive, Jul 127

Arcus slide scanner, Oct 156

ArcView, Jan 152

Armor Alley, Jan 146

Art and Virtual Environments Project, Oct 119

Art of Darkness, Dec 287

Artemis Schedule Publisher, Apr 146

Artificial Intelligence

CB Sim, Oct 117

NueX, Oct 210

ArtiScan 6000C slide scanner, Oct 156

Artisan AS8000 slide scanner, Oct 156

ArtMixer, Sep 191

Ashlar Vellum, Feb 187

Aspects, Jun 227

Assembly View, Apr 123

Astrology programs, Apr 63

Atan Express, Feb 214

At Ease, Dec 53

Athena Portable hard drive series, Aug 132

Atlas Pro, Feb 193, Nov 149

Audioshop, Sep 318

AudioTrax, May 195

AutoCAD, Aug 95

Release 11, Dec 250

AutoDoubler, Jun 125, Sep 273, Dec 37

Automobile Power Adapter, Sep 327

Auto Mouse mouse cover, Nov 101, Dec 287

Autopage, Feb 214

A/UX, Feb 193, Nov 178

Auxiliary Power Pack, Sep 327

Avenue Accounting Collection, Nov 116

Aware, Nov 116

Azimuth, Jan 152, Feb 277

B

Baby Name Scrambler, Dec 288

Backmatic, Feb 284

Backup utilities

DiskFit Pro, Apr 187

FastBack Plus, Apr 202, Dec 187

Redux Deluxe, Dec 187

Retrospect, Dec 187

SnapBack, Nov 89, Dec 276

Bar Code Pro, Sep 297

Barneyscan CIS 3515 slide scanner, Oct 156

Basics of Desktop Publishing on the Macintosh, Jun 83

Bat, The, Aug 181, Oct 198

Battery Charger/Reconditioner for PowerBooks, Sep 327

BeagleWorks, Jun 160

BeHierarchic, May 217

Bernoulli drives, Feb 323

Bernoulli MacInsider 90 removable-media drive, Apr 117

Bemoulli Transportable Pro removable-media drive, Nov 132

BetterWriters printer driver, Jul 204, Oct 43

Beyond CyberPunk, Aug 109, Dec 288

Bézier Systems BP3670 printer, Feb 199, Sep 240

Bibliographic programs

EndNote Plus, Sep 312

Pro-Cite, Jan 20, Jun 207

Big Book of Amazing Mac Facts, The, Jan 188

Big Mac Book, The, Jan 188

Billing

Job Cost/Time Billing, Aug 179

TimeSlips III, Sep 294

BIPlane, Nov 59

Blade, Sep 314

BMUG newsletter, Jun 83, May 119

BMUG Shareware Disk Catalog, May 119

Boards

Accel-a-Writer PostScript/accelerator, Apr 117, Sep 240

accelerators, Jun 146

BookView Imperial color monitor board, Aug 105

BridgePort ESI-2671A, Jul 127

Classic Performer accelerator, Sep 41

Codenet 9550 and 9553 FDDI, Nov 101

color display, Mar 134

ColorLink DC/T graphics/Ethernet, Aug 103

ColorSnap 32+ video-capture, Feb 214, Mar 140, Oct 170

ComboCache IISI RAM cache, Jan 19

ComputerEyes B/W and ComputerEyes/Pro video-capture, Mar 140

continues

- Data Canon II NuBus accelerator, Feb 199
 Digital Film video-capture, Feb 240, Oct 170
 Display Research Laboratory MR Shot 1/LC video-capture, Oct 170
 DoubleColor LX display adapter, Aug 103
 Dycam Model 1 video-capture, Mar 140
 EtherFlex Ethernet, Feb 193
 Ethernet, May 150
 Expanse N88 NuBus expansion chassis, Mar 121
 Expansion II NuBus expansion chassis, Mar 115
 EyeQ Authoring System video-capture, Oct 170
 EyeQ Delivery Board video-capture, Feb 187, 240
 FastCache Quadra cache, Nov 87
 Focus Ethernet, Nov 95
 image compression, Mar 146
 ImagePak Still Compression Board, Mar 146
 ImagePro accelerator, Apr 113
 InterTalk LAN router, Jan 20
 ISDN NB Card, Jan 19
 MacVision Color and MacVision Grayscale video-capture, Mar 140
 MediaTime video-capture, Oct 170
 Neotech Image Compressor, Mar 146
 Notebook Display Adapter, Feb 187, Sep 290, Nov 42
 Nutmeg graphics adapters for Classic, Mar 125
 NuVista+ video-capture, Mar 140, Oct 170
 PaintBoard II graphics/accelerator, Aug 93
 Performance/040 accelerator, Feb 189, Oct 181
 PicturePress Accelerator, Mar 146
 PowerCache Adapter LC accelerator, Aug 105
 PrecisionColor 24XP color adapter/accelerator, Sep 185
 PrecisionColor series color display/accelerator, Oct 21
 QuickCapture video-capture, Mar 140
 QuickImage 24 video-capture, Mar 140, Oct 170
 QuickPack video-capture, Feb 240, Aug 103
 QuickView Studio QT video-capture, Oct 170
 QuickView Studio video-capture, Mar 140
 Radius graphics boards in MultiSync monitors, Apr 127
 Radius Rocket 33 accelerator, Jun 19
 Radius Rocket 68040 accelerator, May 113
 Radius Rocket accelerator, Oct 181
 RadiusTV video-capture, Mar 140, Oct 170
 RasterOps 24STV video-capture, Feb 240, Mar 140, Oct 170
 RasterOps 24XLTV video-capture, Mar 140, Oct 170
 RasterOps MediaTime video-capture, Mar 140
 RasterOps MxTV video-capture, Oct 170
 RasterOps Video ColorBoard 364 video-capture, Mar 140
 RT-24 graphics accelerator, Mar 121
 SCSI-2 Booster for Radius Rocket, Dec 181
 SiliconExpress II accelerator, Jun 137
 Spectrum/24 PDQ Plus graphics adapter/accelerator, May 17
 Spigot & Sound video/audio capture, May 115
 StarTech 860Edge NuBus accelerator, Feb 199
 Storm Card compression, Apr 127
 SuperServer-C transputer processor, Mar 115
 SuperSqueeze Still-Image Compression Card, Mar 146
 SuperView color monitor board for PowerBooks, Aug 109
 ThunderStorm Photoshop accelerator, Sep 21
 TokaMac II FX accelerator, Apr 119, Oct 181
 TokaMac ELC accelerator, Aug 95
 TokaMac series accelerators, Jul 129
 Token Ring 4/16 NB Card, Feb 189
 TransWarp 040 and TransWarp LC accelerators, Apr 125
 TurboStar accelerator, Dec 173
 Universal PowerCache accelerator, Nov 87
 video-capture, Feb 187, 240, Mar 140, Oct 170
 Video Image series video-capture, Mar 140
 VideoLogic DVA-4000/ Macintosh video-capture, Oct 170
 VideoSpigot Pro video-capture, Feb 240, Oct 170
 VideoSpigot video-capture, May 172, Sep 359, Oct 170
 VideoTime video-capture, Apr 113, May 119, Oct 170
 VideoVision video-capture, Oct 115, 170
 WTI-Moonraker video-capture, Oct 170
- BookEndz, Sep 327**
Books
 10 Minute Guide to System 7, Apr 212
 Apple Macintosh Book, The, Aug 97
 Basics of Desktop Publishing on the Macintosh, Jun 83
 BMUG Newsletter for Spring 1992, May 119
 BMUG Shareware Disk Catalog, May 119
 Computer Catalogs, Jun 83
 Computers & Visual Stress, Apr 69
 Danny Goodman's Macintosh Handbook, Aug 97
 Dead Mac Scrolls, The, Oct 227
 Desktop Publisher's Survival Kit, Apr 123
 Digital Color Prepress, Volume Two, Mar 211
 disk-based, Jun 226, Aug 166
 Dvorak's Inside Track to the Mac, Aug 97
 Introduction to Macintosh System 7, Apr 211
 introductory Macintosh, Feb 193, Aug 97
 Little System 7 Book, The, Apr 212
 Macintosh, Jan 187
 Macintosh Bible Guide to System 7, The, Apr 211
 Macintosh Services Directory, Jun 83
 Mac Made Easy, The, Aug 97
 Mac Shareware 500, The, Nov 59, Dec 189
 Mac Shareware Emporium, The, Dec 189
 Mac System 7: Everything You Need to Know, Apr 211
 MacWeek Guide to System 7, Apr 211
 Macworld Guide to System 7, Apr 212
 Microsoft Word, Jun 125
 PageMaker 4 by Example for the Macintosh, Mar 121
 PageMaker 4.0 for the Macintosh Made Easy, Mar 121
 programming, Jan 207
 Programming for System 7, Apr 212
 Publish Magazines & Newspapers with a Macintosh Computer, Apr 123
 QuarkXPress, Apr 123, Oct 115
 Real World PageMaker 4, Mar 121
 shareware, May 119, Dec 189
 System 7, Apr 211
 System 7 Book, The, Apr 211
 System 7 Revealed, Apr 212
 Understanding Computers, Nov 87
 Using the Macintosh With System 7, Apr 212
 Which Macintosh Should I Buy?, Nov 87
- BookView Imperial color monitor board for PowerBooks, Aug 105**
Bose RoomMate stereo speakers, Jun 201
Braille translator for Macintosh, May 63
Brother HL-4PS printer, Sep 240
Brother HT-500PS printer, Apr 136
Bug's floppy disk labels, Feb 187
Bullet 030 accelerator board, Jun 146
Bulletin boards. See Online services
Bureau Edition, Feb 17
BureauExpress and BureauExpressPM, Feb 214
Business Sense Integrated Accounting Software, Feb 17, Oct 78, Nov 116
Butler, Mar 125
- C**
 Cable Safe security cable, Sep 327
 Cabletron E6000 DNI Ethernet board, May 150
 Cachet, Jul 131, Dec 240
 CA-Cricket Draw III, Jan 132, May 176
 CA-Cricket Graph, May 127
 CA-Cricket Presents, Jul 154
 CAD, Mar 33, 34, Jun 35
 2-D orthogonal to 3-D isometrics tip, May 220
 ArchiCAD, Feb 187, Jun 199
 Ashlar Vellum, Feb 187
 AutoCAD, Aug 95
 AutoCAD Release 11, Dec 250
 DesignCAD Macintosh, Nov 159
 Form Z, Feb 191
 MiniCad+, Jul 129
 PowerDraw, Sep 195
 VersaCAD, Feb 187
 Calculus T/L, Jun 172
Calendar programs. See also Personal Information managers
 AgentDA, Sep 310
 Cathy, Sep 318
 DateBook, Jun 129, Oct 209
 DayMaker, Mar 123, Apr 204, Jun 129, Dec 169
 Easy Alarms, Nov 184
 Far Side, The, Sep 318
 First Things First, Apr 200, Dec 23
 Now Up-to-Date, Mar 125, Oct 210, Dec 177
 Random House Word-A-Day, Sep 318
 CameraMan, Jul 129, Sep 292
 Cancer Information Guide, Aug 105
 Canon Color Laser Copier 500, Apr 136
 Canon RC250 still-video camera, Jun 197
 Canon USA FP-510 Full Color Printer, Apr 136
 CanOpener, Mar 19
 Canvas, Jan 132, 163, Mar 164, Aug 191, Sep 66
 Insights, Jun 255
 presentations, Jul 154
 Capitalist Pig, Sep 299
 Capture, Feb 293
 Carbon Copy Mac, Apr 189
 Cards. See Boards
 Carousel, Jul 129
 Casper voice recognition, Sep 75
 Castle of Dr. Brain, The, Dec 270
 CatchWord Pro OCR, Jul 174
 Cathy, Sep 318
 CB Sim, Oct 117
 CC-Mail, Feb 234, Jun 123
 cdevs, resolving conflicts, May 218
 CD ROM, Apr 158
 ADAM, Jul 133
 Apple CD 150 CD ROM drive, Jul 123
 Arctic Data Interactive, Jul 127
 CELLebration, Apr 125
 creating, Apr 158
 drives, Feb 323, Oct 144
 Electronic Map Cabinet, Jan 152
 From Alice to Ocean, Nov 95, Dec 287
 Illustrated Civil War, The, Jan 109
 InnerView, Oct 121
 Into the Woods, Mar 117
 Johannes Brahms, A German Requiem, Mar 198
 Just Grandma and Me, Aug 166
 Kodak Photo CD, May 127, Oct 121, 144, Dec 23
 Macworld Interactive, Oct 25
 Micro/CD-ROM series drives, Oct 121
 Mister X, Jun 135
 Nautilus, Mar 197
 NEC CDR-36M and CDR-73M drives, May 125
 NEC Intersect CDR-36M CD ROM drive, May 182
 Oxford English Dictionary, Aug 101
 phone bills on, May 127
 Screen Caffeine, Jan 180
 Sony CDU-561 drive, Nov 101
 Spaceship Warlock, Jan 146
 SpeedyCD, Nov 176
 Stat-Ref., Feb 197
 Stringers, Nov 89
 Total Baseball, Oct 123
 Verbum Interactive, Feb 280
 Virtual Museum, The, Mar 123
 Writures, Jan 180, Feb 246
 ZIP4 zip code database, May 193
 "CELL"ibration, Apr 125
 Centesimals, calculating, Jun 241
Charts. See Graphs
 CheckFree, Mar 217
 CheckList, Feb 214, 289
 Checkmark MultiLedger and Payroll, Nov 116
 CheckWriter, Nov 116
 CheckWriter II, Mar 217
 Chinook CP-5500 hard disk, Mar 123
 Christmas gift ideas, Dec 287
 CI-8 Laser Printer, Nov 101
 Cinemation, Mar 121, Jul 154, 208
 Cirrus hard drive series, Feb 218, May 156, Aug 132
 Citadel with Shredder, Jun 225
 C. Itoh ProWriter Printer, Nov 168
 Claris, commentary, Jun 75
 Claris Resolve, Jan 162, Jul 168, 247
 scripts for, Jan 20
 ClarisWorks, Mar 174, Jun 160, Sep 41, 367
 Classic Performer accelerator board, Sep 41
 ClassManager and ClassManager/Plus, Feb 214
Clip art
 Animation Clips, Jun 213
 ClipMedia, Nov 188
 Comic Strip Factory, Dec 282
 FaxMania, Jul 133
 graphics-cataloging programs, Feb 264
 maps, Jan 152
 Megatools, Dec 282
 textures, Jan 180
ClipMedia, Nov 188
Clones, Macintosh, Jan 107, May 21, 113
CloseView, May 63
Club Mac hard drives, Feb 218, May 156
CMS Enhancements PD Removable drive, Nov 132
Cobra hard drive series, Feb 218, May 156, Aug 132
Codenet 9550 and 9553 FDDI boards, Nov 101
Codex 326XFast series modems, Aug 93
Cole Papers, The, Jun 83
Colons in file names, Aug 191
Color
 Apple Color Matching System, Jun 125
 calibration across devices, Jul 131
 correction, Jul 131, Dec 240
 output, Apr 136, 227
 overview of, Jan 141
 separation, May 166
Color Connect and Color Connect Scan, Oct 119
Color copiers, connecting Macs to, Oct 119
ColorDisplay/21 monitor, Sep 254
ColorFast film recorder, Aug 146
Color II, Mar 164, Dec 185
ColorLink DC/T graphics/Ethernet board, Aug 103
Color MacCheese, Mar 164
ColorMaster Plus 6603PS printer, Apr 136
Colomate PS80 printer, Apr 136
ColorMax monitor, Jan 124, Sep 254
Colorcor Corporation CP4007, Apr 136
ColorPage E16 monitor, Jan 124, Mar 134, Sep 254
ColorPage printer, Apr 136
ColorPage T16 monitor, Jan 124
ColorPage T16 II monitor, May 121
Color Pivot/LE monitor, Jul 21, Aug 21
Color Pivot monitor, May 125
ColorPoint P5 Model 4 and PSX Model 4 printers, Apr 136
ColorQuick for the Macintosh printer, Apr 136
ColorRight printer, Apr 136
ColorScript 100 Model 10 and Model 301 printers, Apr 136
ColorScript 210 and 230 printers, Nov 21
ColorSnap 32+ video-capture board, Feb 214, Mar 140, Oct 170
Colorsqueeze, Mar 146
ColorStudio, Mar 175
ColorWorks A502C and A522C overhead projection panel, Nov 89
ComboCache IISI RAM cache board, Jun 19
Comic Strip Factory, Dec 282
CommLink/Plus, Feb 214
Common Sense, May 113
Communications. See also Modems; Networks; Online services
 AppleTalk Remote Access, May 217
 CommLink/Plus, Feb 214
 Data Access Language Server, Dec 23
 digital data communications, Feb 224
 electronic magazines, Jun 23
 InfoTAC personal communicator, Dec 173
 ISDN, Feb 224, Jun 23
 MacEDI, Oct 115
 MacIntercomm, Dec 187
 MicroPhone II, Jul 200
 NAPLPS standard, Jan 109
 Notify, Jun 213
 PersonToPerson, Oct 125
 remote file sharing, May 217
 Timbuktu/Remote, Jan 111, May 217
 VersaTerm and VersaTerm Pro, Oct 21
 Visit Video, Oct 113
 White Knight, Aug 211
 WordLink, Sep 21
- Compact Pro, Mar 201**
Compaq PageMarq 15 and PageMarq 20 for Macintosh printers, Nov 85
Compatible Systems Ether2 Ethernet board, May 150
Compatibility Checker, Apr 221
Compatibility Engine, May 113
Complete Annotated Alice, The, Jun 226
Complete Half-Page Scanner/CS, The, Mar 180
Components, Sep 285, Nov 116
Compose Yourself, Oct 215
Compression, Mar 146
 AutoDoubler, Jun 125, Sep 273
 More Disk Space, Jun 125, Sep 273
 PACo, Feb 240

PicturePress, Jan 19
QuickPress, Feb 240
QuickTime, Sep 359
Stuffit for decompressing
DOS files, Jun 37
Stuffit SpaceSaver, Jun 125
CompuServe Information
Manager, Dec 242
Computer-aided design. See
CAD
Computer Catalogs, Jun 83
Computer Era, commentary,
Feb 55, May 32
ComputerEyes B/W and
ComputerEyes/Pro video-
capture boards, Mar 140
Computerized Animated
Vocabulary of ASL, Apr
115
Computerized Classic
Accounting, Nov 116
Computer Professionals for
Social Responsibility, Nov
37
Computers & Visual Stress,
Apr 69
Compute server, Apr 119
Computing Teacher, The, Jun
83
ComStation data/fax modems,
Jun 225
Concentrator, Sep 191
Concorde high-capacity hard
drives, May 156
Condor 130e and 650e
erasable optical drives,
Aug 101
Connections, Jan 117, Apr 178,
Nov 166
ConstructionMac, Oct 206
Contact-management
programs
Act, Jul 127
Address Book Plus, Jul 182
Dynodex, Feb 274, Jul 182,
Aug 21
Office Manager, Dec 280
Officemaster, Jan 137
TouchBase, Jul 182, Aug
172
Control panels, memory
requirements, Oct 225
Cool Mac After Dark, Dec 287
Cool Mac Sounds, Nov 188
CopyBridge, Feb 214
CopyFlow and CopyFlow
Reports, Feb 214
Copyright issues in multime-
dia, Jun 135
Copyright utility, Nov 101
Copy Specs, Feb 214
Cordless SuperMouse, Dec
284
Corel Draw for Macintosh, Sep
195
Correct Grammar, Aug 179
Correct Letters, Jul 208
CorrectPrint 300 printer, Jan
107, Apr 136
Correct Quotes, Jun 230
Correct Writing, Sep 322
Co-Writer, May 63
CPU, standing on end, Aug
191
Crash Barrier, Apr 208, Aug 38
Creepy Castle, Jun 227
Critical Eye: Inside Advertising,
Apr 119
Cross Country, Jul 213
CrossTarget, Dec 181
CRTs. See Monitors
CrystalPrint Publisher II printer,
Sep 240
Cutting Edge 15" Full Page
Monochrome and
Grayscale Displays, Jul 160
Cutting Edge 19" Dual Page
Monochrome and
Grayscale Displays, Jul 160
Cutting Edge hard drives, Feb
218, May 156
Cyberblast, Sep 324

D

Danny Goodman's Macintosh
Handbook, Aug 97
Darwin, Jun 131
Dashes XTension, Feb 214
Data Access Language Server,
Dec 23
Data analysis
LabView, Jun 129
MacSpin, Mar 196
Muse, Jun 190
PEMD Discovery, Apr 187
SuperAnalyst, Mar 191
Databases
4th Dimension, Apr 125,
Aug 193, Dec 171
Apple-Microsoft connectiv-
ity, Oct 21
Butler, Mar 125
commentary, Jul 99
Data Access Language
Server, Dec 23
DataEdit, Mar 125
Enterprise Data Access/SQL,
Mar 125
FileMaker Pro, Jan 210, Aug
95, Nov 216
Information Access Vehicle,
May 115
Mariah, Feb 264, Dec 297
NuBase for the Mac, Jan
184, Mar 119
NuBase Pro, Sep 299
Omni 7, Mar 119, Dec 244
Omni 7 Plus, Mar 119
Panorama, Jul 99
Panorama II, May 196
PowerPlay EIS, Apr 119
Snow Report Writer, Aug
101
Spreadbase, Sep 189
Data Canon II NuBus
accelerator board, Feb 199
DataClub Classic and
DataClub Elite file servers,
Aug 164, Nov 41
DataDrive removable-media
drives, Nov 132
DataEdit, Mar 125
DataPak MO/128 magneto-
optical drive, Mar 121
DataPak MO/650 magneto-
optical erasable drive, Nov
91
Datapack removable-media
drives, Nov 132
DataPivot, May 189
DataPort hard drives, Feb 218
DataPort Twin removable-
media drive, Nov 132
Data presentation, Oct 164
Dataproducts LZR 960 printer,
Jul 212, Sep 240
Dataproducts LZR 965 printer,
Oct 115
Dataproducts LZR 1560
printer, Mar 119, Sep 288
Data recovery, Dec 212
DataShaper, Feb 214
DateBook, Jun 129, Oct 209
Da Vinci eMail, Jun 123
DayMaker, Mar 123, Apr 204,
Jun 129, Dec 169
DaynaPort E/I-II Ethernet
board, May 150
DaynaStar MiniHub, Mar 113
Dead Mac Scrolls, The, Oct
227
Dead Sea Scrolls, photo
archiving on Mac, Jul 125
DeBabelizer, Dec 171
Decisions, Decisions, Aug 101
Default Settings, Feb 214
Deleted files, tracking, Nov
206
DeltaGraph Professional, May
178, Jul 154
Delta Systems Server hard
drives, Feb 218, May 156
Demos, Nov 89
Deneba ArtWorks, Nov 87

Descartes, Jan 152
DesignCAD Macintosh, Nov
159
Designer/24 20" Color System
monitor, Jan 124
DesignJet 600 plotter, Nov 95
DesignScript, Feb 214
DesignStudio, Jan 42, Feb 33,
208
annexes, Feb 214
Desk, Jun 160
Desk accessories
AgentDA, May 127
memory requirements, Oct
225
DeskDraw, Jan 132
DeskPaint, Jan 132, Mar 164
DeskPic, Jun 243
DeskPicture, Jun 243
Desktop
creating pattern for, Jun 243
viewing items by name
under System 7, Aug 192
Desktop Lawyer, The, Apr 206
Desktop Publisher's Survival
Kit, Apr 123
Desktop publishing, Aug 203.
See also Aldus PageMaker;
Page-layout programs;
Prepress Systems;
QuarkXPress
books on, Apr 123, Jun 83
choking, Feb 185
color separation, May 166
Matrix, Mar 117
newsletters on, Jun 83
QuarkCopyDesk, Mar 117
QuarkDispatch, Mar 117
tips, Aug 203
trapping, Feb 185, Dec 23
Desktop Sounds, Nov 188
Developers, Macintosh, Jan 31
DGR 256REM erasable optical
drive, Dec 173
DiamondDrive hard drives, Feb
218, May 156
DiamondDrive Portable hard
drive, May 156, Aug 132
Diamond Pro series monitors,
Feb 17, Sep 254
Diamond Scan series monitors,
Sep 254
Diconix M150 Plus printer, Sep
240
Dictionaries, Jun 229
Oxford English Dictionary,
Aug 101
Picture It French-English
dictionary, Aug 178
Diet Balancer, The, Dec 276
DigiMac, Feb 214
Digital audiotape drive, May
121
Digital Color Prepress, Volume
Two, Mar 211
Digital Film video-capture
board, Feb 240, Oct 170
Digital Media, Jun 84
Digital Micronics Floptical Disk
Drive, Nov 132
Digital Palette film recorder,
Aug 146
Digitizing tablets. See Graphics
tablets
Disabled computer users
CloseView, May 63
Co-Writer, May 63
Easy Access, May 63, 217
High Tech Center, Jun 137
Ke-mx interface, May 63
Macintosh Disability
Resources, May 63
OutSpoken, May 63
ScreenDoors, May 63
Telepathic, May 63
Unicom Smart Keyboard,
May 63
use of Mac by, May 63, 119
Write This Way, Jan 115
Disk cataloging programs, Oct
48
DiskDoublers, Mar 201

Disk drives, floppy. See also
Hard drives; Optical drives;
Removable-media drives
cleaning, Jan 207
QuadFlextra, Apr 208
SuperDrive, May 217
DiskKeeper, Oct 48
DiskFit Pro, Apr 187
Diskless Mac, Mar 117
DiskMount, Feb 185
DiskKover hard drives, Feb
218, May 156
DiskKover removable-media
drives, Nov 132
DiskPaper, Feb 21
DiskTop, Jul 224
DiskTwin, Jan 173
Display Research Laboratory
MR Shot 1/LC video-
capture board, Oct 170
Displays. See Monitors
DIVA VideoShop, Feb 240, Jul
201, Sep 359, Oct 170
DJK Development DJK hard
drive, Feb 218
DJK Development MS hard
drives, May 156, Aug 132
DocuComp, Nov 21
DocuComp II, Nov 170
Document Interchange, Feb 21,
Jul 129
Documentum, Oct 125
Dolby, Thomas, Apr 298
Dolphins, use of Mac by, Jul
131
DOS. See IBM PC-Macintosh
connectivity
DOS Mounter, Oct 188
DoubleColor LX display
adapter board, Aug 103
DoveFax and DoveFax+ for
NuBus fax modems, Mar
125
Dow Jones Market Analyzer
Plus, Jul 133
DrawingBoard II graphics
tablet, Jun 154, Jul 204
DrawingCard ChromaVision
Plus monitor, Jan 124
DrawingCard GrayVision
monitor, Jul 160
DrawingPad graphics tablet,
Jul 204
Draw programs, Jan 132
Drive7, Feb 185, Mar 211
Dr. Macintosh, Jan 188
Dvorak's Inside Track to the
Mac, Aug 97
Dycam Model 1 still-video
camera, Jun 197
Dycam Model 1 video-capture
board, Mar 140
DynaPerspective, Mar 115
DynaTec Automation Systems
CDS 650 CD ROM drive,
Oct 144
Dynodex, Feb 274, Jul 182,
Aug 21
DynoPage, Mar 71
DynoPage Lite, Dec 23

E
Earthquest Explores Ecology,
Feb 278
Easter eggs
About the Finder, May 217
Microsoft Excel, Apr 224
Easy Access, May 63, 217
Easy Alarms, Nov 184
EasyPrint, Oct 202
Eco-Adventures series, Nov
184
EcoSys aSi printer, Aug 93
EdScheme, Nov 180
Education, Sep 25, 83, 218,
232, 237, Dec 39
Adventures of Jasper
Woodbury, The, Sep 189
AIDS education kiosk, May
125
American Discovery, May
197
Cancer Information Guide,
Aug 105
"CELL"ibration, Apr 125
Computerized Animated
Vocabulary of ASL, Apr
115
computers and, Sep 25, 83,
218, 232, 237, Dec 39
Critical Eye: Inside Advertis-
ing, Apr 119
Darwin, Jun 131
Decisions, Decisions, Aug
101
Earthquest Explores Ecology,
Feb 278
Eco-Adventures series, Nov
184
Elementary Signer, Apr 115
Engines of Change, The, Jul
137
Fingerspeller, Apr 115
Fingerzoids, Apr 115
Fun Physics, Dec 288
Grade Machine, Dec 263
Headline Harry and the
Great Paper Race, Sep 197,
Dec 270
Illustrated Civil War, The,
Jan 109
interactive display at
American Museum of
Natural History, Mar 119
Interactive Physics II, Mar
117
Johannes Brahms, A
German Requiem, Mar 198
Louvre, The, Jan 168
Mac-related publications,
Jun 83
Making the Grade, Dec 263
Math Shop series, May 191
Michelangelo: Self-Portrait,
Feb 287
Miracle Piano Teaching
System, The, Oct 199, 215
music lessons, Oct 215
New Math Blaster Plus, Mar
194
Number Munchers, Jun 192
OutNumbered, Feb 291
Palton Strikes Back: The
Battle of the Bulge, Jun 208
Picture It French-English
dictionary, Aug 178
robot controllers, May 127
Shakespeare and the Globe
Theatre, Aug 103
SimAnt, Apr 200, Dec 226
SimCity, Oct 117
SimEarth, Jan 146
SimLife, Nov 95
SmartMoney, Apr 127
Spelnuk, Jul 206
StudyWare for the SAT, Jun
204
Super Munchers, Jun 192
Swamp Gas, Jan 179
TeMath, Apr 206, Jun 172
Time Treks, Sep 312
Virtual Museum, The, Mar
123
Wavemaker, Jun 125
Where in the World Is
Carmen Sandiego?, Oct
200
Word Munchers, Jun 192
EfiColor, Jul 131
Ehman 15" Full Page Mono-
chrome and Grayscale
Displays, Jul 160
Ehman 19" Dual Page
Monochrome and
Grayscale Displays, Jul 160
Ehman 20" Trinitron 24-bit
Color System monitor, Jan
124
Ehman hard drives, Feb 218,
May 156, Aug 132
Ehman Inc., commentary, Aug
65, Oct 75
EIS Toolkit, Aug 97

Elektron Applied Imaging Slide
Scanner, Oct 156
ElectricImage Animation
System, Feb 246, Jun 176
Electromagnetic radiation, Feb
36
Electronic Frontier Foundation,
Nov 37
Electronic magazines, Jun 23
Electronic Map Cabinet, Jan
152
Electronic Musician, Jun 83
Electronic Newspaper, Apr 117
Electronic publishing, Oct 25
Electronic Scrapbook, The, Aug
105
Electronic Thangka: An
Interactive Exploration of
Tibetan Painting, May 121
Elementary Signer, Mar 134,
Apr 44, 115, Jun 40, Sep
254
ELF emissions, Aug 40
ELF ProTech, May 125
E-mail, Feb 234
AlisaMail, May 17
cc:Mail, Jun 123
Da Vinci eMail, Jun 123
FirstClass, Jul 133
O/M standard, Jan 19
privacy guidelines, Jan 20
QuickMail, Jun 123, Sep 21
updating with Tempo
macro, Jun 36
Vendor Independent
Messaging, May 17
E-Machines T16 II monitor,
Sep 254
E-Machines T19 monitor, Jan
124, Sep 254
E-Machines T19 II monitor,
Nov 97
E-Machines TX monitors, Jan
124
Encryption, Aug 57
Encyclopedia Macintosh, Jan
187
EndNote Plus, Sep 312
Energy requirements of Macs
and peripherals, Mar 71
Engines of Change, The, Jul
137
Enterprise Data Access/SQL,
Mar 125
Entertainment. See Games
EntryPaq, Nov 178
Envelopes, printing on
LaserWriter, Feb 308
Environmental concerns,
computer-related, Mar 71,
Aug 93, 101
low-power Macs, Oct 123
SolarPower solar panel, Oct
21
Environmental Protection
Agency, Macintosh use
restricted by, Feb 197
EPS Exchange, Feb 291
Epson EPL-7500 printer, Sep
240
Equal, Nov 45
Erasable optical drives. See
Optical drives
ETC DataDrive hard drive
series, Aug 132
Ether10-T Starlet hub, Nov 101
EtherFlex Ethernet board, Feb
193
EtherMac series Ethernet
boards, Jul 133
Ethernet. See also Networks
10BaseT hubs, Jun 166
Access/Hub, Nov 101
Asanté Technologies EN/SC
10T SCSI-to-Ethernet
adapter, Feb 187
boards, May 150
ColorLink DC/T graphics/
Ethernet board, Aug 103
connecting LocalTalk
printers to, Jul 123
continues

- Ether10-T Starlet hub, Nov 101
- Etherflex board, Feb 193
- EtherMac series Ethernet boards, Jul 133
- EtherPrint and EtherPrint Plus, Dec 264
- Ether Write, Dec 264
- Focus Ethernet boards, Nov 95
- networks, May 150
- Ethernet Kit Ethernet board, May 150
- EtherNode 16 NB Ethernet board, May 150
- EtherPort II Ethernet board, May 150
- EtherPrint and EtherPrint Plus, Dec 264
- Ether Write, Dec 264
- Everex LaserScript LX printer, Sep 240
- Excel. See Microsoft Excel
- Executor, Jan 107
- Expanse NBB NuBus expansion chassis, Mar 121
- Expert Astronomer, Dec 268
- Expert Color Paint, Jun 210
- ExpertWriter, Jul 21
- Explore Missouri Streams, Oct 121
- Exposure Pro, Feb 293
- Expressionist, Apr 117
- Expresso Personal Slide Scanner, Oct 156
- Express removable-media drives, Nov 132
- Extension Manager, May 218
- Eyeballs, Jul 242
- EyeQ Authoring System video-capture boards, Oct 170
- EyeQ Delivery video-capture board, Feb 187, 240
- EyeQ Development Platform, Feb 187
- Eyestrain, computer-related, Apr 69
- F**
- Fair Witness, Feb 17, Jun 129, Oct 198
- Far Side, The, Sep 318
- FastBack Plus, Apr 202, Dec 187
- FastCache Quadra cache board, Nov 87
- FastLabel, May 200
- FastNet III N Ethernet board, May 150
- FastTrack Resource, Apr 146
- FastTrack Schedule, Apr 146, May 115
- FatBits, Jun 83, Sep 41
- FaxMania, Jul 133
- Fax modems
- ComStation data/fax modems, Jun 225
- DoveFax and DoveFax+ for NuBus, Mar 125
- Net Upgrade for ComStation fax modems, Apr 117
- PowerModem IV for PowerBooks, Dec 189
- PowerModem data/fax, Jun 131, Jul 189
- PowerPort/Gold data/fax, Dec 248
- PowerPort/V.32, Jun 215
- QuickTel Xeba 9600, Apr 204
- Ringo line manager, May 189
- Sportster 2400 and Sportster 14,400 Mac&Fax, Jun 131
- SupraFaxModem V.32, Jun 121
- SupraFaxModem V.32bis, Jun 121, Aug 171
- TelePort/FullFax data/fax, Aug 158
- TelePort series, Dec 189
- Ultima Home Office, Oct 206
- FaxOCR, Jun 131
- Felix, Jun 154, Sep 42
- Fetch, Oct 123
- Fields & Operators, Jun 172
- File compression, Mar 146, 201
- File Interchange, Feb 21
- FileMaker Pro, Aug 95
- automated entries, Nov 216
- sorting value lists, Jan 210
- File-transfer utilities, Oct 188
- FilmPrinter Turbo II film recorder, Aug 146
- Film recorders, Apr 227, Aug 146
- Final Frontier, The, Mar 115
- Finder
- add-ons, Jul 223, Nov 166, Dec 53
- commentary, Dec 53
- Fingerspeller, Apr 115
- Fingerzoids, Apr 115
- First Book of the Mac, The, Jan 187
- FirstClass, Jul 133
- First Things First, Apr 200, Dec 23
- Flash-It, Feb 294
- FlexiSign, Jun 129
- Flexware II, Nov 116
- Floppy disk drives
- Floptika, Sep 287
- Floptika 5020FL, Sep 287
- Floptipak 21 optical drive, Oct 117
- Infinity Floptical 21MB, Sep 287
- Floppy disks
- Bug's labels, Feb 187
- failure of 800K formatted as 1.44MB, Feb 36
- recycled, Mar 71
- using MS-DOS disks with Macintosh, Feb 308
- Floptika floppy disk drive, Sep 287
- Floptical 5020FL floppy disk drive, Sep 287
- Floptika removable-media drive, Nov 132
- Floptipak 21 optical drive, Oct 117
- Floptipak removable-media drive, Nov 132
- Focal Point, Nov 97
- Focus Ethernet boards, Nov 95
- FolderBolt, Jun 208
- Font/DA Mover, Jun 241
- FontMonger, Oct 233
- Fontographer, Oct 233, Nov 170
- Fonts
- Adobe Type Manager, Jul 241
- altering in PageMaker, May 218
- customizing, Oct 233
- Fontographer, Oct 233, Nov 170
- handwriting converted to, May 119, Dec 272
- Incubator, The, Apr 113, Sep 264, Oct 233
- KernEdit, Jun 123
- LetraStudio, Oct 190
- MasterJuggler, Sep 346
- MenuFonts, May 180, Sep 46
- Multiple Master, Jan 19, Jul 188, Sep 264
- PersonalFont, Dec 272
- Pixar Typestry, Oct 119, Nov 148
- placement of, under System 7, Sep 346
- PostScript, Jul 241
- screen and printer, Jul 241
- StrataType, Oct 21
- stretching type in PageMaker, Sep 345
- Suitcase, Sep 346
- TrueType, Jul 241, Sep 240, Oct 225
- TypeChart, Jun 123
- FontStudio, Oct 233
- Forms
- FormsExpert, Jun 131
- InfoX, Mar 123
- Conversion Kit, Jun 19
- FormsExpert, Jun 131
- Form 2, Feb 191, 246
- Forle film recorder, Aug 146
- Fractal Design Painter, Feb 266, Mar 19, 164, Aug 154
- FrameMaker, Feb 208, Mar 181
- Freedom 120 hard drive, Sep 316
- Freedom of Press, Sep 240
- FreeHand. See Aldus FreeHand
- Freeware. See Public domain/shareware
- FriendlyNet Card Ethernet board, May 150
- From Alice to Ocean, Nov 95, Dec 287
- Ful/Text, Aug 109
- Funk & Wagnalls Standard Desk Dictionary, Jun 229
- Fun Physics, Dec 288
- fx/Overdrive and fx/Overdrive-II accelerator boards, Jun 146
- F(x), Jun 172
- G**
- GAIA, Jan 152
- Games, Jan 146, Dec 226
- 3 in Three, Jan 146, Feb 282
- 4-D Boxing, Sep 294
- 1991 Hall of Fame, Jan 146
- 1992 Hall of Fame, Dec 226
- American Discovery, May 197
- Aqua Blooper Piper, Feb 282
- Armor Alley, Jan 146
- Blade, Sep 314
- Capitalist Pig, Sep 299
- Castle of Dr. Brain, The, Dec 270
- Creepy Castle, Jun 227
- Cyberblast, Sep 324
- Eco-Adventures series, Nov 184
- Fingerzoids, Apr 115
- Glider, Jan 146, Feb 278
- Go Master, Dec 278
- Hardball II, May 197
- Harpoon, Jan 146
- Headline Harry and the Great Paper Race, Sep 197, Dec 270
- Helicats Over the Pacific, Dec 226
- Hole-In-One Miniature Golf, Mar 184
- Indiana Jones and the Last Crusade, Jan 146
- Klondike, Sep 66
- Loom, Jan 146
- Lunatic Fringe, Oct 228
- Math Shop series, May 191
- Microsoft Flight Simulator, Mar 181
- Mission Thunderbolt, Dec 226
- New Math Blaster Plus, Mar 194
- Nobunaga's Ambition, Jun 202
- Number Munchers, Jun 192
- OutNumbered, Feb 291
- Patton Strikes Back: The Battle of the Bulge, Jun 208
- PGA Golf Tour, Jan 146
- Prince of Persia, Sep 292, Dec 226
- Puzzle Master, Mar 182
- Red Baron, Nov 185
- Secret of Monkey Island, The, Sep 314, Dec 226
- Shanghai II, May 194
- Sherlock Holmes, Consulting Detective, Aug 173
- Sid Meier's Railroad Tycoon, Jan 146
- Silly Noisy House, A, May 195
- SimAnt, Apr 200, Dec 226
- SimCity, Oct 117
- SimEarth, Jan 146
- SimLife, Nov 95
- Spaceship Warlock, Jan 146
- Spaceward Ho, Aug 173
- Spectre, May 180, Jul 244, Aug 38, Dec 226
- Spelunks, May 121, Jul 206
- Splat'ers, Mar 198
- Super Munchers, Jun 192
- Super Tetris, Oct 200
- Swamp Gas, Jan 179
- Tesseract, Jan 146
- Time Treks, Sep 312
- Tristan, Mar 193, Dec 226
- Vette, Jan 146, 210
- V for Victory, Dec 226
- Warlords, Dec 280
- Where in the World Is Carmen Sandiego?, Oct 200
- Word Munchers, Jun 192
- Wordtris, Jun 210, Dec 226
- GatorLink server, Nov 95
- GCC BLP Elite printer, Jan 109
- GCC BLP series printers, Sep 240
- GCC ColorTone printer, Jun 123
- GCC PLP II and IIS printers, Sep 240
- GCC WideWriter 360 printer, Sep 240
- Gemini Classic and Gemini Ultra accelerator boards, Jun 146
- Generation Analog Full-Page Display, Jul 160
- Generation Systems 16" and 19" Trinitron monitors, Sep 254
- Generation Systems 16" Color Display, Sep 254
- Generation Systems 20-Inch Color Display, Sep 197
- Generation Systems 20" Ikegami monitor, Sep 254
- Generation Systems External and Portable hard drive series, Aug 132
- Generation Systems Removable Drives, Nov 132
- Generation Two Page Display, Jul 160
- GeoQuery, Jan 152, Nov 185
- Geovista, Jan 152
- Getting Started with Microsoft Word for the Apple Macintosh, Jun 125
- GIFConverter, Jun 243
- GigaTower II high-capacity hard drives, May 156
- Glider, Jan 146, Feb 278
- Global Perspective, Jan 152
- Global Warming: Understanding the Forecast, Nov 97
- Glue, Feb 21, Aug 21
- Gofer, Jun 188
- Go Master, Dec 278
- Grade Machine, Dec 263
- GrafIXChange, Feb 214
- Zoom, Aug 97
- Graphics
- Photoshop: Aldus FreeHand; Aldus SuperPaint; CAD
- 3-D modeling, Feb 246
- Aldus Gallery Effects, Apr 185, Jul 42
- Aldus IntelliDraw, Aug 93, Nov 160
- Alias Sketch, Aug 155, Dec 23
- ArtMixer, Sep 191
- CA-Cricket Draw III, Jan 132, May 176
- Canvas, Jan 132, 163, Mar 164, Jun 255, Jul 154, Aug 191, Sep 66
- cataloging programs, Feb 214, 264, Oct 123
- Color II, Apr 202, Dec 185
- Comic Strip Factory, Dec 282
- Corel Draw for Macintosh, Sep 195
- DeBabelizer, Dec 171
- Deneba ArtWorks, Nov 87
- DeskDraw, Jan 132
- DeskPaint, Jan 132, Mar 164
- draw programs, Jan 132
- DynaPerspective, Mar 115
- EPS Exchange, Feb 291
- Expert Color Paint, Jun 210
- Fetch, Oct 123
- Fractal Design Painter, Feb 266, Mar 19, 164, Aug 154
- GIFConverter, Jun 243
- ImageAccess, Oct 21
- image-transfer system for fabric, Jun 123
- Infiniti-D, Jun 176, Oct 40
- Kid Pix Companion, Oct 208
- Kodak Renaissance, Sep 191, Dec 246
- LightBox, Oct 123
- LightWave 3D, Aug 50
- MacDraw II, Jan 132
- MacDraw Pro, Jan 132, Jul 21, 154
- Macintosh Masters, Apr 152
- MacRenderMan, Jun 176
- MacroMind Three-D, Jun 176
- MacTOPAS, Jun 176
- map clip art, Jan 152
- Megatons, Dec 282
- Michael's Draw, Jan 132
- paint programs, Mar 164
- PosterWorks, Feb 17
- Presenter Professional, Jun 176
- Ray Dream Designer, Jun 19, 176, Sep 276
- rendering, Jun 176
- RVC/Mac, Jun 19
- Satellite 3D, May 125, Jul 210
- Sculpt 3D/4D, Jun 176
- Search, Oct 123
- Showplace, Jun 185
- Sketcher, Oct 125
- Smoothie, Nov 176
- StarTech 860Edge NuBus accelerator, Feb 199
- Stratavision 3D, Jun 121, 176
- Tech 2-D, Aug 97
- textures, Jan 180
- Tree, Dec 187
- Turbo 3-D, Sep 193
- UltraPaint, Jan 132
- Upfront, Jun 129
- Verbum Interactive CD-ROM, Feb 280
- Verbum magazine, Jun 83
- Wallpaper, Apr 117, May 193
- WaterColor, Nov 97
- Zephyr Palettes for FreeHand, Jul 218
- Zeppo, Aug 103
- Zeus, Aug 176
- Zoom, Aug 97
- Graphics Import and Rotation, Feb 214
- Graphics Link Plus+, Mar 152
- Graphics tablets, Jun 154
- Accurat for Macintosh, Aug 177
- DrawingBoard II, Jul 204
- DrawingPad, Jul 204
- GraphicsVu, Mar 152
- GraphMaster, May 177, Jul 154
- GraphPorter, Mar 152
- Graphs
- CA-Cricket Graph, May 127
- DeltaGraph Professional, May 178, Jul 154
- GraphMaster, May 177, Jul 154
- GraphPorter, Mar 152
- in HyperCard, Mar 214
- Igor, Sep 189
- KaleidaGraph, Jul 154
- MacSpin, Mar 196
- OrgChart Express, Mar 121
- presentation tips, Oct 164
- SignalPlot, Jan 115, Jul 202
- SuperAnalyst, Mar 191
- Grappler, Dec 298
- Grappler IIS, Sep 240
- Gravis MouseStick, Jun 154
- Gravis SuperMouse, Jun 154
- Great Gantt, Apr 146
- Great Plains Accounting, Nov 116
- tech-support policy, Apr 39
- GreatWorks, Jan 164, Apr 119, Jun 160
- Grids & Guides, Feb 214
- Grid Layout, Feb 214
- Groupware, Jan 19
- Aspects, Jun 227
- Instant Update, Feb 287
- Lotus Notes, Oct 113
- Marco Polo, Dec 177
- MarkUp, Dec 177
- Professional Assistant, Jan 111
- QuarkCopyDesk, Feb 185
- QuarkDispatch, Feb 185
- GUM, Nov 89
- H**
- Half-QWERTY, Aug 181
- HAM, Apr 185, May 217, Jul 223
- Hammer Disk removable-media drives, Nov 132
- Hammer high-capacity hard drives, May 156
- HandiWorks, Feb 197, Jun 160
- Hand-Off II, Jul 223
- Handwriting fonts, May 119, Dec 272
- Hardball II, May 197
- Hard Disk Toolkit, Feb 185, 273, Mar 211
- Hard drives, Feb 218, May 156, Aug 132. See also Removable-media drives
- bypassing internal, Jan 208
- Backmatic, Feb 284
- Bemouli MacInsider 90 removable-media drive, Apr 117
- Chinook CP-5500, Mar 123
- commentary on market, Feb 63
- disk-management software, Feb 185
- disk-mirroring systems, Jan 20, 173
- DiskTwin disk-mirroring system, Jan 173
- Ehman Inc., commentary, Aug 65, Oct 75
- Freedom 120, Sep 316
- Hard Disk Toolkit, Feb 185, 273, Mar 211
- high-capacity, May 156
- Jasmine drive system 7 upgrade, Mar 19
- leaving on, Jun 37, Sep 46
- LiteDrive PowerBook series, Feb 187
- low-capacity, Aug 132
- MacinStore Speed Array, Nov 87
- Micro/Mirror, Jan 20
- Micro/Raven040, Jan 20
- midrange, Feb 218
- NiniArray, Sep 191
- Nova N900, Jan 115

- PLI 120MB 2.5" Turbo internal hard drive, Dec 181
PocketDrive series, Aug 109
ProDrive series, Dec 181
repairing, Dec 212
Roadrunner 40i and 80i, May 115
Sledgehammer Array, Sep 191
Storage Dimensions series for Quadras, Mar 19
System 7 compatibility, Mar 211
Twint disk-mirroring system, Jan 173
UltraDrive series, May 119
updating driver, Mar 211
utilities, Mar 211
Harpoon, Jan 146
Harslem, Eric, interview, Sep 169
Hasselblad Macsie 35A slide scanner, Oct 156
HD Index hard drive, Aug 132
HD Porta-Drive hard drive, Feb 218
Headline Harry and the Great Paper Race, Sep 197, Dec 270
Hellcats Over the Pacific, Dec 226
Hello, Aug 21
Helmsman, Jul 129
Help, Feb 273
Hewlett-Packard DesignJet printer, Mar 115
High Tech Center, Jun 137
HiQ, Jun 172, Oct 202
Hitachi Home Electronics CDR-1750S CD ROM drive, Oct 144
HitchHiker hard drive series, Aug 132
Hole-In-One Miniature Golf, Mar 184
Home office, managing, Jul 182
Horoscope programs, Apr 63
Horse Race Analyzer, Dec 288
Hot, Horny & Healthy, May 125
Hot Keys, May 194
Household devices, remote-control of, May 113
HP DAT Macintosh Backup Solution digital audiotape drive, May 121
HP DeskWriter 550C printer, Dec 169
HP DeskWriter C Printer, Apr 136
HP DeskWriter printer, Sep 240
HP LaserJet IID and IID printers, Jul 127
HP LaserJet IIP printer, Sep 240
HP LaserJet IIP printer, Jan 177, Sep 240
HP LaserJet PostScript Cartridge Plus, Jun 137
HP PaintJet XL300 printer, Jul 127, Oct 184
HP PaintWriter and PaintWriter XL printers, Apr 136
HP ScanJet IIC scanner, Jan 279
HP ScanJet IIP scanner, Jul 125, Aug 170
HyperBots, May 127
HyperCard, Beyond CyberPunk, Aug 109, Dec 288
Can't Peek option, Feb 306
Complete Annotated Alice, The, Jun 226
Connections, Jan 117, Apr 178
Correct Quotes, Jun 230
Darwin, Jun 131
Earthquest Explores Ecology, Feb 278
- Engines of Change, The, Jul 137
graphs, Mar 214
HyperBots, May 127
HyperKit Emcee, Jul 154
HyperMovie Player, Sep 359
HyperPub, Jun 83
JFK assassination stack, May 109, Oct 67
Macintosh Disability Resources, May 63
NumberFormat property, Aug 192
PEMD Discovery, Apr 187
Presentation Passport, Jul 154
QuickMap, Jan 152
salvaging damaged stack, Jan 208
setting user level to Painting, Nov 205
Speech Master, Dec 288
Student's/Writer's Dreamtools, Mar 186
HyperKit Emcee, Jul 154
HyperMovie Player, Sep 359
HyperPub, Jun 83
HyperSpace Shuttle erasable optical drive, May 109
HyperTax Tutor, Apr 182
- I**
IBM LaserPrinter 6A, Jul 129, Sep 240
IBM LaserPrinter 10A, Jul 129, Aug 158
IBM LaserPrinter series printers, Mar 113
IBM PC-Macintosh connectivity, Mar 152, Oct 188
BridgePort ESI-2671A printer-sharing board, Jul 127
connecting Mac LC to VGA monitor, Feb 305
Macintosh PC Exchange, Mar 19
Mac-to-DOS, Jul 39
Microsoft LAN Manager, Feb 187
SoftPC Windows, Nov 21
Stuffit for decompressing DOS files, Jun 37
Token Ring 4/16 NB Card, Feb 189
ICEman, Mar 123
Icons
customizing, Feb 331, Oct 227
ClarixWorks, Mar 174, Jun 160, Sep 41, 367
Desk, Jun 160
GreatWorks, Jan 164, Apr 119, Jun 160
HandiWorks, Feb 197, Jun 160
Microsoft Works, Jun 160, Jul 125
Professional Assistant, Jan 111
IntelliDraw, See Aldus IntelliDraw
Interactive Brainwave Visual Analyzer, Dec 169
Interactive Physics II, Mar 117, Dec 272
Internet access, Sep 21
InterRoute/5, Sep 191
InterSect CDR-37 and CDR-74 CD ROM drives, Oct 144
InterTalk, Jan 20
Into the Woods, Mar 117
Intouch, Mar 193
Introduction to Macintosh System 7, Apr 211
Intro to MIDI, Oct 216
Invisible Site: A Virtual Show, Jun 121
Iris 3024 Color Ink Jet Printer, Apr 136
Iris SmartJet Series 4012 printer, Apr 136
- 324
Imapro Corporation QCS-600 slide scanner, Oct 156
InBox, Feb 234
In Control, Jan 19, May 196, Jun 129
Incubator, The, Apr 113, Sep 264, Oct 233
Index Elite Removable drive, Nov 132
Index hard drives, Feb 218, May 156
Indiana Jones and the Last Crusade, Jan 146
Infini-D, Feb 246, Jun 176, Oct 40
Infinity Floptical 21MB erasable optical drive, Sep 195
Infinity Floptical removable-media drive, Nov 132
Infinity series removable-media drives, Sep 195, Nov 132
Infolio notebook computer, Jan 117
Infolynx, Jul 154
Information Access Vehicle, May 115
Information managers
Connections, Jan 117
ThoughtPattern, Jan 111
Informed TrueForm Conversion Kit, Jun 19
InfoTAC personal communicator, Dec 173
In-House Accountant, Nov 116
INITs, resolving conflicts, May 218
InnerView, Oct 121
InPosition, Feb 214
Input devices, Jun 154. See also Keyboard, Mice, Trackballs
A' Mouse, Jun 154, 188
Bat, The, Aug 181, Oct 198
for disabled users, May 63
MouseMan, Jun 188
TrackMan, Jun 154, 188
InsertSpace, Feb 214
Inside the Apple Macintosh, Jan 188
Insight optical-magnetic drive, Sep 195
Instant Update, Feb 287
InSync, Nov 21
Integrated applications, Jun 160
BeagleWorks, Jun 160
ClarixWorks, Mar 174, Jun 160, Sep 41, 367
Desk, Jun 160
GreatWorks, Jan 164, Apr 119, Jun 160
HandiWorks, Feb 197, Jun 160
Microsoft Works, Jun 160, Jul 125
Professional Assistant, Jan 111
IntelliDraw, See Aldus IntelliDraw
Interactive Brainwave Visual Analyzer, Dec 169
Interactive Physics II, Mar 117, Dec 272
Internet access, Sep 21
InterRoute/5, Sep 191
InterSect CDR-37 and CDR-74 CD ROM drives, Oct 144
InterTalk, Jan 20
Into the Woods, Mar 117
Intouch, Mar 193
Introduction to Macintosh System 7, Apr 211
Intro to MIDI, Oct 216
Invisible Site: A Virtual Show, Jun 121
Iris 3024 Color Ink Jet Printer, Apr 136
Iris SmartJet Series 4012 printer, Apr 136
- ISDN, Feb 24, Jun 23
ISDN NB Card, Jan 19
ISDN System Adapter, Jan 20
PhonePro ISDN, Dec 185
- J**
Jazz through MIDI, Oct 215
JFK assassination stack, May 109, Oct 67
JMP, Feb 284
JMP Design, Oct 119
Job Cost/Time Billing, Aug 179
JobTracker, Dec 252
Johannes Brahms, A German Requiem, Mar 198
Jolt PS PostScript color printer, Jan 117
JPEG compression, Jan 19, Mar 146
Storm Card compression board, Apr 127
Just Grandma and Me, Aug 166
JX-735 Sharp Ink Jet Color Image Printer, Apr 136
- K**
Kaboom for Macintosh, Nov 187
KaleidaGraph, Jul 154
Kenix, May 63
KemEdit, Jun 123
Keyboard
layout alternatives, Aug 181
Sara Keys keyboard-emulation program, Mar 125
switching between multiple layouts, Sep 346
System 7 changes in key mapping, Sep 345
Unicom Smart Keyboard, May 63
Keyliner, Feb 214
KeyPlan, Apr 146
Kid Pix Companion, Oct 208
Kiwi Power Windows, Jul 220, 224
Kondike, Sep 66
Kodak Diconix Color 4 printer, Apr 136
Kodak Photo CD, May 127, Oct 121, 144, Dec 23
Kodak Renaissance, Sep 191, Dec 246
Kodak RFS 2035 film scanner, Oct 123
Kodak XL 7700 printer, Apr 136
Koko the gorilla, Macintosh speech synthesis for, Feb 191
Kurta IS/ADB graphics tablet, Jun 154
- L**
Labels, May 199
checking alignment, Jun 245
LaserWriter label options, Feb 308
MacEnvelope, Jul 182
MacLabelPro, Jul 182
LabelWriter II, May 199
LabView, Jun 129
La Cie ZFP series hard drives, Feb 218, May 156, Aug 132
LanRover/L communications server, May 125
LanWay Ethernet board, May 150
Lapis Dual Page Display, Jul 160
Lapis Dual Page Gray Scale Display, Dec 187
Lapis Full Page Display and Gray Scale Display, Jul 160
- LapLink Mac III, Mar 152
LapStrip, Sep 327
LapTrack, Oct 125
LaserBridge, Jul 123
Lasergraphics LFR series film recorders, Aug 146
LaserScript LX printer, Feb 257
LaserWriter printer
inexpensive way to connect to Mac, May 221, Sep 345
label options, Feb 308
printing single envelope on, Feb 308
toner cartridge options, Feb 308
Latitude, Nov 45
LeafScan 35 slide scanner, Oct 156
Legal LetterWorks, Apr 206
Legal programs
Desktop Lawyer, The, Apr 206
Legal LetterWorks, Apr 206
LivingTrustBuilder, Mar 191
Nolo's Living Trust, Aug 174
TrustMaker, Mar 191
LetaStudio, Oct 190, 233
LetterPerfect, Jun 135
Liberty Systems 50 and 70 series hard drives, Feb 218
Liberty Systems 115 CD-ROM drive, Oct 144
Liberty Systems 115 Series Bernoulli removable-media drive, Nov 132
Liberty Systems 115 Series SyQuest removable-media drives, Nov 132
Liberty Systems 520MB hard drive, May 156
Liberty Systems hard drives, May 156, Aug 132
Liberty Systems Series 50 Floptical removable-media drive, Feb 193
LightBox, Oct 123
LightningScan Pro, Jun 225
Lightscan 400PS scanner, Jul 174
LightWave 3D, Aug 50
Liken, Nov 21
LinksWare, Aug 171, Nov 42
Linotype-Hell Color Printer 30, Apr 136
Listen, Oct 216
LiteDrive PowerBook series hard disks, Feb 187
Little Mac Book, The, Jan 188
Little Mouse ADB, Jun 154
Little System 7 Book, The, Apr 212
LivingTrustBuilder, Mar 191
Logical Collection, The, Mar 115
Loom, Jan 146
Lotus 1-2-3 for Mac, Apr 174, Jul 168, 247 Nov 41, Dec 211
Lotus Notes, Oct 113
Louvre, The, Jan 168
Loviell Computer Removable drives, Nov 132
Low-cost software, Nov 59
Lunatic Fringe, Oct 228
L-View MultiMode monitor, Jul 160
Lynx Trackball, Jun 154
- M**
Mac320, Mac330, and Mac340 terminal emulators, Mar 19
Mac1000 Ethernet board, May 150
MacApp, Apr 117
MacBottom hard drive series, Aug 132
MacBreadboard, Dec 266
MacCD/LX CD ROM drive, Oct 144
MacCon3 for NuBus Ethernet board, May 150
MacConnect Ethernet Card, May 150
MacCon+ Ethernet board, May 150
MacDirect 425MB and 520MB hard drives, May 156
MacDirect removable-media drives, Nov 132
MacDraw II, Jan 132
MacDraw Pro, Jan 132, Jul 21 presentations, Jul 154
MacEDI, Oct 115
MacEnvelope, Jul 182
MacGIS, Jan 152
MacGlobe, Apr 199
MacHam, Jun 125
MacHoroscope, Apr 63
MacInStore Single and MacInStore ZFP high-capacity hard drives, May 156
MacInStore Speed Away hard drive array, Nov 87
MacInStore ZFP hard drives, Feb 218
MacInTax, Mar 123, 217, Apr 182
MacIntercomm, Dec 187
Macintosh
choosing which model to buy, Jan 213, Dec 208
electrical requirements, Dec 297
repairing, Oct 227
Macintosh IIci, Jan 213, Dec 208
speeding up built-in video, Sep 348
Macintosh IIx, Jan 213
Macintosh IIsi, Jan 213, Dec 208
ComboCache IIsi RAM cache board, Jun 19
SIMM incompatibilities, Jan 207
speeding up built-in video, Sep 348
Macintosh IIfx, Dec 206, 208
Macintosh 16" Color Display, Mar 115, Jun 184, Sep 254
Macintosh 20" Color Display, Sep 254
Macintosh Bible, The, Jan 187
Macintosh Bible Guide to System 7, The, Apr 211
Macintosh Classic, Jan 213
Macintosh Classic II, Jan 213, Dec 208
Macintosh clones, Jan 107, May 21, 113
Macintosh Companion, The, Jan 188, Feb 193
Macintosh Duo Dock, Dec 208
Macintosh Education Software Collection, Jun 83
Macintosh LC, Jan 213
IBM monitor with, Feb 305
SIMM incompatibilities, Jan 207
Macintosh LC II, May 136, Dec 208
Macintosh Masters, Apr 152
Macintosh PC Exchange, Mar 19, Oct 188
Macintosh Performa series, Nov 111
Macintosh Plus, upgrading, Oct 226
Macintosh PowerBook series, May 31, Dec 27
accessories, Sep 327
Asanti Technologies EN/SC 10T SCSI-to-Ethernet adapter, Feb 187
attaching SCSI devices, Aug 38
battery cases from Apple, Jun 19
carrying cases, Aug 193, Sep 328
continues

- commentary, Dec 27
disk drive problems, Mar 19
external monitor support,
Aug 105, 109, Sep 290
faulty displays on 170, Jul
71, Oct 37
fishing reel as carrying case
for 100, Aug 193
GUM utilities, Nov 89
internal fax modems, Jun
131
LiteDrive PowerBook series
drives, Feb 187
Notebook Display Adaptor
boards, Feb 187, Nov 42
PLI 120MB 2.5" Turbo
internal hard drive, Dec 181
Pocket Fax Modem, Feb
187
PowerBook 100, Jan 213
PowerBook 140, Jan 213
PowerBook 145, Oct 113,
Dec 200, 208
PowerBook 160, Dec 200,
208
PowerBook 170, Jan 213,
Feb 258, Jul 71, Oct 37
PowerBook 180, Dec 200,
208
PowerBook Duo 210 and
230, Dec 192, 208
PowerModem, Feb 187
PowerPort/Gold data/fax
modem, Dec 248
power sources, Sep 327
printing via fax machine
with 170, Jul 244
replacing trackball with
mouse, Jul 242, Aug 191
SolarPower solar panel, Oct
21
technical-support phone
number, Feb 17
Ultimate Power Upgrade,
Sep 193
Macintosh Programming
Fundamentals, Jan 207
Macintosh Quadra series
NuBus expansion, Mar
121
Quadra 700, Jan 213, Dec
208
Quadra 900, Jan 213
Quadra 950, Jul 148, Dec
208
removable-media drive for
Quadra 900, Apr 117
software compatibility
problems, Mar 160
Macintosh Services Directory,
Jun 83
MacLabelPro, Jul 182
MacLand hard drives, May
156, Aug 132
MacLand removable drives,
Nov 132
MacLinkPlus/PC, Mar 152,
184
Mac Made Easy, The, Aug 97
MacMenlo terminal emulator
for Tandem Guardian OS,
Aug 21
MacMoney, Mar 217, Nov 116
MacPaint, Mar 164
MacPalette II printer driver,
Sep 324
MacPocket hard drive, Aug
132
MacPrePress, Jun 83
MacPrint, Sep 240
MacProducts USA 030 RailGun
accelerator board, Jun 146
MacProject II, Apr 146
MacProject Pro, Oct 121
MacQuill, Jun 135, Aug 168
MacRecorder Voice Digitizer,
Feb 17, May 221
MacRenderMan, Feb 246, Jun
176
MacroMind Three-D, Feb 246,
Jun 176
Macros
Hot Keys, May 194
Microsoft Excel page-setup
macro, Feb 305
Tempo, Jul 131
updating E-mail with
Tempo, Jun 36
word processor, Jun 247
MacSchedule Plus, Apr 146
MacShareware 500, The, Nov
59, Dec 189
MacShareware Emporium,
The, Dec 189
Mac-Sop hard drive, Aug 132
MacSpeaker external speaker,
Jun 201
MacSpin, Mar 196
MacStep-Flexo Step & Repeat,
Feb 214
Mac Street Journal, The, Jun 83
Mac System 7: Everything You
Need to Know, Apr 211
MacTel Technology Sony 19"
monitor, Sep 254
Mac-to-DO5, Jul 39
MacTools, Oct 179, Dec 212
MacTools Deluxe, May 121,
Nov 206
MacTOPAS, Feb 246, Jun 176
MacTrac trackball, Jun 154
MacVision Color and
MacVision Grayscale
video-capture boards, Mar
140
MacWeek, Jun 83
MacWeek Guide to System 7,
Apr 211
Macworld Complete Mac
Handbook, Jan 187, Feb
193
Macworld Expo, commentary,
Apr 21
Macworld Guide to Microsoft
Word, Jun 125
Macworld Guide to System 7,
Apr 212
Macworld Interactive, Nov 25
Macworld Lab, Jun 27, Aug 25,
Nov 38
Macworld Read Me First Book,
Feb 193
MacWrite II, Sep 248
Magellan series accelerator
boards, Jun 146
MagentaCase PowerBook
carrying case, Sep 328
Magic, Jul 154, Aug 172
Magic CD ROM drive, Oct 144
MagicDrive hard drives, Feb
218, May 156
Magic Typist, Aug 181
MagicView 14" and 20" Seiko
monitors, Jan 124
Magnavox Mac Display
9CM080 monitor, Mar 134
Magnavox MagnaScan/17 and
MagnaScan /20 monitors,
Sep 254
Magnet, Jul 131
MagOptic removable-media
drive, Nov 132
Mail-order Macs, warranties
on, Jul 241
MakeBooklet, Feb 214
Making the Grade, Dec 263
Managing Your Money, Mar
217, Apr 113, Nov 116
Manspro Accounting Software,
Nov 116
Manufacturing, Assembly
View, Apr 123
MAP II, Oct 121
MapArt, Jan 152
MapGrafix, Jan 152
MapInfo, Jan 152, Jul 21, Sep
189
Maple V, Feb 199, May 190,
Jun 172
MapMaker, Jan 152
Mapping programs, Jan 152
ArcLink, Jul 21
Atlas Pro, Feb 193, Nov 149
Azimuth, Feb 277
GeoQuery, Nov 185
MacGlobe, Apr 199
MAP II, Oct 121
MapInfo, Jan 152, Jul 21,
Sep 189
PinPoint, Dec 173
World Atlas, Apr 199
MaraThon Racer series
accelerator boards, Jun 146
Marco Polo, Dec 177
Mariah, Feb 264
merging databases, Dec 297
Mariner, Nov 59
MarketPlace Business, Feb 262
MarkUp, Dec 177
Mass Microsystems 19" Rival
Color Display System, Sep
254
MasterFinder, Jul 223, Nov
166
MasterJuggler, Sep 346
MasterWord, Dec 189
MathCAD, Jun 172, Sep 42
Mathematica, Jun 172
Math programs, Jun 172
Adventures of Jasper
Woodbury, The, Sep 189
Calculus T/L, Jun 172
Expressionist, Apr 117
Fields & Operators, Jun 172
Fit2, Jun 172
HiQ, Jun 172, Oct 202
Maple V, Feb 199, May
190, Jun 172
MathCAD, Jun 172, Sep 42
Mathematica, Jun 172
Math Shop series, May 191
MatLab, Jun 172
Models, Mar 186, Jun 172
New Math Blaster Plus, Mar
194
Number Munchers, Jun 192
OutNumbered, Feb 291
PowerMath II, Jun 172
Simulink, Dec 268
TerMath, Apr 206, Jun 172
Theorist, Jun 172
Math Shop series, May 191
MatLab, Jun 172
Matrrix, Mar 117
Mavis Beacon Teaches Typing,
Aug 182, Nov 38
Max, Jul 131, Sep 193
MaxAppleZoom, Feb 35
MaxNet, Aug 95, Oct 117
MaxPage, Feb 208
MediaTime video-capture
board, Oct 170
Medical programs
ADAM, Jul 133
Cancer Information Guide,
Aug 105
Iliad, Nov 87
Myocardial Perfusion
Imaging Atlas and
Videodisc, Dec 189
Stat-Ref, Feb 197
Surgeon 3, The Brain, Sep
322
VoxelView, Feb 191
Mega Drive Systems M1 and
XM hard drive series, Aug
132
Megagraphics monitor, Nov 91
Megatons, Dec 282
Memory. See also SIMMs
adding, May 142
amount used by System
under System 7, Feb 306
more RAM under System 7
for Mac II, Ix, Ix, SE/30,
Jan 93
recommendations, Jan 213
virtual memory limitations,
Feb 305, Jul 242
MenuChoice, Jul 223
MenuFonts, May 180, Sep 46
Mercury Classic and Mercury
030/SE accelerator boards,
Jun 146
Mercury External removable-
media drives, Nov 132
Mercury high-capacity hard
drives, May 156
Metamorphosis Professional,
Oct 233
MIBAC Music Lessons, Oct
216
Mice, Jun 154
A' Mouse, Jun 188
Auto Mouse mouse cover,
Nov 101, Dec 287
Cordless SuperMouse, Dec
284
MouseMan for the Mac,
Jun 188, Sep 44
SICOS Cordless Recharge-
able Mouse, Jun 206
Michael's Draw, Jan 132
Michelanigoli: Self-Portrait,
Feb 287
Mickey, Mar 113
Micro/CD-ROM drives, Oct
121, 144
Microcom's Utilities, Dec 212
MicroCosm, May 109
Micro/Max, high-capacity hard
drives, May 156
Micro/Mirror, Jan 20
MicroNet Technology MS hard
drives, Feb 218
MicroNet Technology SB-
TMO-1000 erasable
optical drive, Oct 125
MicroNet Technology SCSI
Manager, Feb 199
MicroNet Technology gray-scale
adapter for monochrome
monitor, Jun 40
MicroPhone II, Jul 200
Micro Planner Manager and
Micro Planner X-Port, Apr
146
MicroPlayhouse, Sep 185
Micro/Raven040 hard disk
series, Jan 20
Microsoft Excel, May 109, Jul
168, 247, Oct 178
frequency distribution
formula, Jun 244
lowering memory require-
ment, Apr 224
page-setup macro, Feb 305,
Jun 241
Microsoft Flight Simulator,
Mar 181
Microsoft LAN Manager, Feb
187
Microsoft Mail, Feb 234
Microsoft PowerPoint, Jun 154
Microsoft Project, Apr 146
Microsoft Word, Feb 191, Apr
175, Jun 247, Jul 63, 259,
Sep 248
add-ons, Dec 189
books, Jun 125
changing text size quickly,
Nov 206
commentary, Jul 63
copying headers and footers
between documents, Aug
191
drag and drop text, Dec 300
Insights, Jul 259
MasterWord, Dec 189
thesaurus, Jun 230
WordBasic, Feb 191
Microsoft Works, Jun 160, Jul
125
Micro/Stack-515 hard drive,
May 156
Micro/Sync, high-capacity hard
drives, May 156
Microtech hard drive, Feb 218
Microtech OR500e optical
drive, May 115
MicroTrac trackball, Mar 182,
Jun 154
MidSchool, Oct 215
Millennium External remov-
able-media drives, Nov
132
MindLink, Nov 97
Mindset, Apr 63
MiniArray hard drive array, Sep
191
MiniCada+, Jul 129
MiniPak hard drives, Feb 218,
May 156, Aug 132
Minilab, Jun 207
Mira 35 slide scanner, Jun 121,
Oct 156
Miracle Piano Teaching
System, The, Oct 199, 215
Mirror 16-inch Color Display,
Aug 109
Mirror 19-inch Two Page
Display, Jul 160
Mirror 600 Color Scanner, Apr
189
Mirror Portrait Display, Jul 160
MirrorImage 309 printer, Jul
137, Sep 240
MirrorImage 415 printer, Jul
137
Mirror Technologies 16" and
19" Trinitron monitors, Sep
254
Mirror Technologies 16" Color
Display, Sep 254
Mirror Technologies 20"
Ikegami monitor, Sep 254
Mirror Technologies CD-ROM
Drive, Oct 144
Mirror Technologies external
hard drive series, Aug 132
Mirror Technologies hard
drives, Feb 218, May 156
Mirror Technologies removable
drives, Nov 132
Mission Thunderbolt, Dec 226
Mister X, Jun 135
Mitsubishi Electronics America
G370 and S340 printers,
Apr 136
Mitsubishi International CHC-
445 and CHC-5445
printers, Apr 136
Mitsubishi International SC-
7500 slide scanner, Oct
156
Mobile Vista removable-media
drives, Nov 132
Mobius One Page 030 Display
accelerator board, Jun 146
Mobius One Page Monitor, Jul
160
Mobius Two Page Display, Jul
160
Mode32, Jan 93
Models, Mar 186, Jun 172
ModelShop, Mar 176
Modems, Aug 140. See also
Fax modems
buying tips, Aug 140
Codex 326XFast series, Aug
93
ComStation data/fax, Jun
225
Motorola wireless, May 113
NetModem V2400, May
217
Pocket Fax Modem, Feb
187
PowerModem data/fax, Feb
187, Jul 189
PowerPort/Gold data/fax,
Dec 248
PowerPort/V.32, Jun 215
QBlazer, Jan 109, May 192
remote file sharing, May
217
TelPort/FullFax data/fax,
Aug 158
Mondo 2000, Jun 83
Monet, Mar 164
Monitors, Jul 160, Mar 134,
Sep 254
24-bit color, Jan 124
AppleColor High-Resolution
RGB Monitor, Mar 134
color, Mar 134, Sep 254
ColorPage E16, Mar 134
ColorPage T16 II, May 121
Color Pivot, May 125
Color Pivot/LE, Jul 21,
Aug 21
Diamond Pro series, Feb 17
Dual Page Gray Scale
Display, Dec 187
E-Machines T19 II, Nov 97
eyestrain caused by, Apr 69
Generation Systems 20-inch
Color Display, Sep 197
gray-scale, Jul 160
IBM monitor with Macin-
tosh LC, Feb 305
Macintosh 16" Color
Display, Mar 115, Jun 184
Magnavox Mac Display
9CM080, Mar 134
Megagraphics, Nov 91
Micon Technology gray-
scale adapter, Jun 40
Mirror 16-inch Color
Display, Aug 109
monochrome, Jul 160
MultiMode 120, Sep 185
multiple-monitor setup, Jun
243
MultiSync 3FGx and 4FG,
Mar 134
MultiVision 875 Plus, Dec
189
Nutmeg graphics adapter
boards for Classic, Mar 125
PowerBase I adapter for
PowerBooks, Dec 187
PowerPage, Apr 125
PrecisionColor Display/20,
Jan 20
Radius graphics boards in
MultiSync monitors, Apr
127
RasterOps/20 and
RasterOps/20T MultiScan
Color Displays, Oct 113
RasterOps Sweet Sixteen
System, Apr 113
RealTech 19" Trinitron, Mar
121
ReliSys Model RE-1422, Feb
193
Seiko CM1445, Mar 134
SilverView Pro, Sep 185
Sony CPD-1304, Mar 134
SuperMatch 17 Multimode
Color Display, Apr 125
Walk, The, Dec 169
Montage FR2 film recorder,
Aug 146
More, Jul 154
More After Dark, Dec 287
More Disk Space, Jun 125, Sep
273
Morph, Nov 85, 152
Motion Works ProMotion, Mar
121, Nov 164
Motorola wireless modem,
May 113
Mouse Keys, May 217
MouseMan for the Macintosh,
Jun 154, 188, Sep 44
Mouse Paw, Dec 287
MousePenMac, Jun 154
Mouse-Trak trackball, Nov 162
Movies in the Dark, Sep 359
Mr. Sound FX, Nov 187
MS Word Extensions, Feb 214
Multi-Ad Kreation, Jan 20
Multi-Ad Search, Feb 264
MultiC, Aug 97
MultiClip, Jul 21
MultiGate Hub 2 bridge/
router, Jul 127
Multimedia, Jul 154. See also
Animation; CD ROM;
QuickTime
Cinematic, Mar 121, Jul
154, 208
copyright information
database, Jun 135
Magic, Jul 154, Aug 172
SMSG, Feb 189
MultiMode 120 monitor, Sep
185
MultiMode Color Display, Sep
254

Multiple Master typefaces, Jan 19, Jul 188, Sep 264
incompatibility with PostScript clone printers, Sep 240
MultiSync 3FGx and 4FG monitors, Mar 134
MultiSync 5FG and 6FG monitors, Sep 254
Multiuser Desktop Accounting, Nov 116
MultiVision 875 Plus monitor, Dec 189
Muse, Jun 190
Music, Oct 215. See also Sound
Adventures in MusicLand, Oct 216
AudioTrax, May 195
Compose Yourself, Oct 215
Electronic Musician, Jun 83
interactive sound sculptures, Sep 193, 195
Into the Woods CD ROM, Mar 117
Intro to MIDI, Oct 216
Jazz through MIDI, Oct 215
Johannes Brahms, A German Requiem, Mar 198
Listen, Oct 216
Max, Jul 131, Sep 193
MaxNet, Aug 95, Oct 117
MiBAC Music Lessons, Oct 216
MidSchool, Oct 215
Miracle Piano Teaching System, The, Oct 199, 215
Practica Musica, Oct 216
Stringers, Nov 89
Vision, Sep 195
MVP Mouse trackball, Jun 154
MyAdvancedLabelMaker, May 200
Myro-Comp Page, Feb 214
M.Y.O.B., Jul 182, Nov 116
printing packing lists, Mar 214
Myocardial Perfusion Imaging Atlas and Videodisc, Dec 189

N

Nano USA monitors, Sep 254
NAPLPS videotext standard, Jan 109
Nautilus, Mar 197
NEC CDR-36M and CDR-73M CD ROM drives, May 125
NEC Intersect CDR-36M CD ROM drive, May 182
NEC Silentwriter Model 95 printer, Mar 117
fax device installed in, May 125
Neotech Image Compressor board, Mar 146
NetModem V2400, May 217
NetMounter, Apr 115, Sep 310
NetScope Probe and NetScope Console, Apr 115
Net Upgrade, Apr 117
NetWare for Macintosh, Jan 115
Networks. See also E-mail; Ethernet
10BaseT hubs, Jun 166
Access/Hub, Nov 101
Active Memory organizer, Aug 178
Asanté Technologies EN/SC 10T SCSI-to-Ethernet adapter, Feb 187
BridgePort ESI-2671A printer-sharing board, Jul 127
Carbon Copy Mac, Apr 189
Codenet 9550 and 9553 FDDI boards, Nov 101
ComStation data/fax modems, Jun 225
Concentrator, Sep 191
DataClub Classic and DataClub Elite file servers, Aug 164, Nov 41
DaynaStar MiniHub, Mar 113
Diskless Mac, Mar 117
Ether10-T Starlet hub, Nov 101
EtherFlex Ethernet board, Feb 193
Ethernet, May 150
EtherPrint and EtherPrint Plus, Dec 264
Ether Write, Dec 264
frame-relay services, Mar 121
GatorLink server, Nov 95
InterRoute/5, Sep 191
InterTalk, Jan 20
ISDN NB Card, Jan 19
ISDN System Adapter, Jan 20
LanRover/I communications server, May 125
LaserBridge, Jul 123
MicroNet SCSI Manager, Feb 199
Microsoft LAN Manager, Feb 187
MultiGate Hub 2 bridge/router, Jul 127
NetMounter, Apr 115, Sep 310
NetScope Probe and NetScope Console, Apr 115
Net Upgrade, Apr 117
NetWare for Macintosh, Jan 115
NetWorks, Jun 226
Network Supervisor, Aug 177
Network Vital Signs, Apr 115
Now Up-to-Date, Mar 125, Oct 210, Dec 177
PacerForum, Jul 218
PersonToPerson, Oct 125
PhoneNet Manager's Pack, Mar 197
PhoneNet StarController 377 and 357, Jan 20
privacy issues, Aug 57
Python server, Nov 87
QuickMail, Sep 21
Retriever Plus, Dec 171
RouterCheck, Oct 212
SerialWay, Jan 20
ShadowWriter, Sep 21
SnapBack, Dec 276
StarRouter, Sep 191
Status Mac, May 190
TechWorks Net Utilities, Oct 117, Dec 278
Timbuktu/Remote, Jan 111
Token Ring 4/16 NB Card, Feb 189
TransTalk, Jan 20
Vines, Feb 187
Viper server, Nov 87
Virex, Dec 171
NetWorks, Jun 226
Network Supervisor, Aug 177
Network Vital Signs, Apr 115
New Age software, Apr 63
NewGen 300pp printer, Sep 240
NewGen OL830 and OL840 printers, Sep 240
NewGen Turbo PS/400p printer, Sep 240
NewLife series accelerator boards, Jun 146
New Math Blaster Plus, Mar 194
NewMedia, Jun 83
NewsEdit, Feb 214
Newsletters, Mac-related, Jun 83
NewsLink, Feb 214
Newton, Aug 129
Next machine, running Mac software on, Jan 107

NightWatch II, Nov 174
Nikon CP-3000 Full Color Printer, Apr 136
Nikon LS-3510AF Film Scanner, Sep 297, Oct 160
Nisus, May 115, Sep 248
Nisus Compact, Aug 170
Nisus XS, Sep 21
Nobunaga's Ambition, Jun 202
Nok Nok, Oct 209
Nolo's Living Trust, Aug 174
Norton Utilities for Macintosh, Jul 137, Oct 179, Nov 206, Dec 212
Notebook computers. See also Macintosh PowerBook series
InfoLio, Jan 117
Outbound Notebook System 2030E, Apr 113
Outbound Notebook System 2030S, Apr 113, Sep 274
Notebook Display Adaptor boards, Feb 187, Sep 290, Nov 42
NoteBook Traveler PowerBook carrying case, Sep 328
Notepac PowerBook carrying case, Sep 328
Notify, Jun 213
Nova hard drives, May 156, Aug 132
Nova N900i hard drive, Jan 115
Now Up-to-Date, Mar 125, Oct 210, Dec 177
Now Utilities, Feb 289, Jul 223, Oct 225
NuBus expansion chassis, Mar 115, 121
NuBase for the Mac, Jan 184, Mar 119
NuBase Pro, Sep 299
NueX, Oct 210
Number Munchers, Jun 192
Nutmeg 19 and 19G monitors, Jul 160
Nutmeg 19C Monitor, Jan 124
Nutri-Calc Plus, Dec 276
NuVista+ video-capture board, Mar 140, Oct 170

O

Oasis, Mar 164
OCE, Feb 189
Océ Graphics G5241-PS printer, Apr 136
OCR, Jul 174
AccuText, Jan 46
FaxOCR, Jun 131
OmniPage, Jun 241
OmniPage Direct, Jul 133
ReadingEdge, Jul 174
Read-It Pro, Jul 21
Readstation, Jul 174
TextPert, Apr 125, Jul 174
TextPert add-ons, Apr 125
TextReader, Jun 135, Jul 174
Typist Plus Graphics, Mar 196
Wordscan and Wordscan Plus, Jun 194, Oct 42
Office Manager, Dec 280
Officemaster, Jun 137
Office Wiz, Nov 180
Official QuarkXPress 3.0 Handbook, The, Oct 115
Ofoto, Mar 19
OLE, Mar 113
OMI standard, Jan 19
OmniMedia 6cx slide scanner, Oct 156
OmniPage and OmniPage Professional OCRs, Jun 241, Jul 174
OmniPage Direct OCR, Jul 133
OmniS 7, Mar 119, Dec 244
OmniS 7 Plus, Mar 119
OmniType OCR, Jul 174

On Cue II, Jul 223
OneScanner, Feb 256
Online magazines, Oct 25
Online services
AMIX, Sep 195
CompuServe Information Manager, Dec 242
digitized sounds on, Nov 187
discussion forums, Mar 65
Electronic Newspaper, Apr 117
Internet, Sep 21
Senior Net, Aug 105
Whistleblower 885, Apr 17
On Location, Jun 188
On the Air, Jul 154
Opcode, upgrade policy, Apr 39
Open Collaboration Environment, Feb 189
Open command, canceling, Nov 214
Open Mail Interface standard, Jan 19
Open Plan/Mac, Apr 146
Optical character recognition. See OCR
Optical drives, Feb 323, Sep 287, Nov 124
Condor 130e and 650e erasable optical drives, Aug 101
DataPak MO/128, Mar 121
DataPak MO/650 magneto-optical erasable drive, Nov 91
DGR 256REM erasable, Dec 173
Floptipak 21, Oct 117
HyperSpace Shuttle, May 109
Infinity Floptical 21MB erasable optical, Sep 195, 287
Insite optical-magnetic drive, Sep 195
Micronet Technology 58-TMO-1000 erasable, Oct 125
Microtech International ORE50e, May 115
Pinnacle Micro PMO-650, Aug 21
Procom Floptika 20/M optical-magnetic, Aug 105
Sumo Systems S5630 rewritable, Feb 189
UltraDrive 120MO, Oct 115
Optima 200 hard drive, Feb 218
Optix NLS, Nov 97
Organizers. See Calendar programs; Personal information managers
OrgChart Express, Mar 121
Outbound Notebook System 2030E and 2030S, Apr 113
OutNumbered, Feb 291
OutSpoken, May 63
Overset, Feb 214
Oxford English Dictionary online, Aug 101

P

PacerForum, Jul 218
PACO, Feb 240
PageBrush Color for the Mac scanner, Feb 280
PageBrush Professional scanner, Jun 206
Page Director, Feb 214
Page-layout programs, Feb 208, Aug 203. See also Aldus PageMaker; QuarkXPress
DesignStudio, Jan 42, Feb 33
FrameMaker, Mar 181
Kodak Renaissance, Sep 191, Dec 246

MacQuill, Jun 135, Aug 168, Sep 248
Multi-Ad Creator, Jan 20
Publish It Easy, Dec 185
QuarkCopyDesk, Feb 185
QuarkDispatch, Feb 185
ReadySetGo, May 17
Taste, May 192, Aug 203
utilities, Feb 214
PageMaker. See Aldus PageMaker
PageMaker 4 by Example for the Macintosh, Mar 121
PageMaker 4.0 for the Macintosh Made Easy, Mar 121
PagePort, Feb 214
PageView GS and Portrait monitors, Jul 160
PaintBoard Li graphics/accelerator board, Aug 93
Painter. See Fractal Design Painter
PakWorks, Mar 202
Palos, Feb 214
Panasonic EPL-8543 printer, Apr 136
Panasonic KX-P4455 printer, Sep 240
Panasonic LK-MC5015 CD ROM drive, Oct 144
Panorama, Jul 99
Panorama II, May 196
Paper, recycled, Mar 71
ParaFont, Oct 233
Pario, Jun 123
Passport XL removable-media drives, Nov 132
Pastel TravelCase, Sep 328
Patton Strikes Back: The Battle of the Bulge, Jun 208
PC Market Monitor, Jun 83
PCPC II monitor, Jan 124
PC Street Price Index, The, Jun 83
PDQ Removable drives, Nov 132
Peachtree Accounting for Macintosh, Nov 116
Peachtree Insight Accounting for Macintosh, Nov 116
Pearl Controller, May 127
PEMD Discovery, Apr 187
Performa. See Macintosh Performa series
Performance/040 accelerator board, Feb 189, Jun 146, Oct 181
Performer CD ROM drive, Oct 144
Peripheral Vision Storage PV hard drives, Feb 218, May 156
Personal ColorPoint printer, Feb 185
Personal ColorPoint PS printer, Apr 136
Personal digital assistant, Jul 125, Sep 21
Newton, Aug 129
Personal finance programs, Mar 217, Nov 116
PersonalFont, Dec 272
Personal information managers
Act, Jul 127
Active Memory, Aug 178
AgentDA, May 127
Connections, Apr 178, Nov 166
DateBook, Jun 129, Oct 209
DayMaker, Mar 123, Apr 204, Jun 129, Dec 169
Dynodex, Feb 274, Jul 182, Aug 21
Fair Witness, Jun 129
First Things First, Apr 200
In Control, May 196, Jun 129
Intouch, Mar 193
Now Up-to-Date, Mar 125, Oct 210, Dec 177
PowerTrax, Apr 178

ThoughtPattern, Jun 129
TimeBook, Sep 193
TouchBase, Jun 129
Personal Label Printer, May 199
Personal LaserWriter LS printer, Sep 240
background printing, Jun 207
PostScript/accelerator board for, Apr 117
Personal LaserWriter NTR printer, May 136, Sep 240
Personal Writer PW10SL graphics tablet, Jun 154
PersonToPerson, Oct 125
Perspective, Sep 316
Persuasion. See Aldus Persuasion
PGA Golf Tour, Jan 146
Phaser II PX and PXI Color Printers, Apr 136
Phaser II PXe printer, Jun 131
Phaser IISD printer, Sep 197
Phaser III PXI Color Printer, Apr 136
PhoneNet Card for Ethernet, May 150
PhoneNet Manager's Pack, Mar 197
PhoneNet StarController 377 and 357, Jan 20
Phone Number Names, Dec 288
PhonePro ISDN, Dec 185
Photoshop. See Adobe Photoshop
Physics
Fun Physics, Dec 288
Interactive Physics II, Dec 272
PictureBook+, Feb 264
Picture II French-English dictionary, Aug 178
PicturePress accelerator board, Jan 19, Mar 146
Picturessque, Feb 294
Picturess This, Mar 152
PIMs. See Personal Information managers
P.J.N.K. Press, Feb 214
Pinnacle Micro PMO-650 optical drive, Aug 21
PinPoint, Dec 173
PinPointXT, Feb 214
Pivot monitor, Jul 160
Pixar Typestry, Oct 119, Nov 148
PixelBurst Processor chip, Dec 171
PixelPaint and PixelPaint Professional, Mar 164
Platinum hard drives, Feb 218, May 156
PLI 120MB 2.5" Turbo internal hard drive for PowerBooks, Dec 181
PLI CD-ROM drive, Oct 144
PLI PL high-capacity hard drives, May 156
Plots Unlimited, Jul 208
Plottergeist, Mar 115
PL Turbo hard drives, Feb 218, Aug 132
PMcopyFII, Feb 214
PMProKit, Feb 214
PMProPages, Feb 214
PMTracker, Feb 214
PocketDrive hard drives, Aug 109, 132
Pocket Fax Modem, Feb 187
PocketHammer hard drives, Feb 118, May 156, Aug 132
Polaroid CS-500 scanner, Mar 125
Popcorn, Sep 359
Porta-Drive CD ROM drive, Oct 144
PosterWorks, Feb 17
PostScript emulators, Sep 240
continues

- PostScript fax device, May 125
 PostScript Language Facsimile Option, May 125
 PostScript Level 2
 adding to HP LaserJet series printers, Jun 137
 TI microLaser Turbo printer, Jul 192
 Power Adapter DC7.5PB, Sep 327
 PowerBase I monitor adapter for PowerBooks, Dec 187
 PowerBook Carrying Case, Sep 328
 PowerBook Case 7373, Sep 328
 PowerBooks. See Macintosh PowerBook series
 PowerBundle, Dec 37
 PowerBundle Carry Case, Sep 329
 PowerCache accelerator board, Jun 146
 PowerCache Adapter LC accelerator board, Aug 105
 PowerDraw, Sep 195
 PowerDrive hard drives, Feb 218, May 156
 PowerDrive removable-media drives, Nov 132
 PowerKey, Mar 71, May 217, Dec 274
 PowerKey Remote, May 217
 Power Mac hard drive, Aug 132
 PowerMath II, Jun 172
 PowerMenus, Dec 266
 PowerMerge, Sep 21
 PowerModem series fax modems, Feb 187, Jun 131, Jul 189, Dec 189
 PowerPage monitor, Apr 125
 Power Partner, Sep 327
 PowerPlay, Apr 119, Aug 166
 PowerPoint. See Microsoft PowerPoint
 PowerPort/Gold data/fax modem, Dec 248
 PowerPort/V.32 data/fax modem, Jun 215
 PowerPrinter printer, May 17, Sep 240, Dec 298
 Power supply, overseas requirements, Apr 222
 PowerTrax, Apr 178
 PowerVision, Mar 121
 Practica Musica, Oct 216
 PrecisionColor 24XP color adapter/accelerator board, Sep 185
 PrecisionColor Display/19 monitor, Sep 254
 PrecisionColor Display/20 monitor, Jan 20, Sep 254
 PrecisionColor series color display/accelerator boards, Oct 21
 Premiere. See Adobe Premiere
 Premier Notebook Leather Case, Sep 328
 Prepress systems, Jan 44
 color issues, May 166
 Digital Color Prepress, Volume Two, Mar 211
 MacPrePress newsletter, Jun 83
 Presentation Passport, Jul 154
 Presentation programs, Jul 154
 Aldus Persuasion, Oct 237
 PowerVision, Mar 121
 QuickTime support added, Mar 121
 Smoothie, Nov 176
 Presenter Professional, Feb 246, Jun 176
 Prince of Persia, Sep 292, Dec 226
 Printers/printing, Apr 136, 227, Sep 240. See also LaserWriter printer
 Accel-a-Writer IX PostScript/accelerator board, Apr 117
 Accel-a-Writer 8000, Jun 129
 Adobe Type 1 Coprocessor chip, Jan 19
 Apple toner cartridge recycling program, Jul 125
 BetterWriters driver, Jul 204, Oct 43
 Blezier Systems BP3670 thermal ink-jet, Feb 199
 BridgePort ESI-2671A board, Jul 127
 CI-8 Laser Printer, Nov 101
 C. Itoh ProWriter Printer, Nov 168
 cleaning ink jets, Sep 348
 color, Apr 136, 227
 ColorScript 210 and 230, Nov 21
 Compaq PageMarq 15 and PageMarq 20 for Macintosh, Nov 85
 connecting LocalTalk printers to Ethernet network, Jul 123
 CorrectPrint 300, Jan 107
 Dataproducts LZR 960, Jul 212
 Dataproducts LZR 965, Oct 115
 Dataproducts LZR 1560, Mar 119, Sep 288
 DynaPage, Mar 71
 EasyPrint, Oct 202
 EcoSys aSi, Aug 93
 Excel page-setup macro, Feb 305
 GCC BLP Elite, Jan 109
 GCC ColorTone, Jan 123
 Grappler, Dec 298
 Grappler IIsp, Sep 240
 HP DesignJet, Mar 115
 HP DeskWriter 550C, Dec 169
 HP LaserJet IIIP PostScript, Jan 177
 HP LaserJet PostScript Cartridge Plus, Jun 137
 HP LaserJet series, Jun 137, Jul 127
 HP PaintJet XL300, Jul 127, Oct 184
 IBM LaserPrinter 6A, Jul 129
 IBM LaserPrinter 10A, Jul 129, Aug 158
 IBM LaserPrinter series, Mar 113
 ImageWriter II color printing, Sep 345
 Jolt PS PostScript color, Jan 117
 labels, May 199, Jun 245, Jul 182
 LaserScript LX, Feb 257
 MacPalette II driver, Sep 324
 MacPrint, Sep 240
 MirrorImage 309 and 415, Jul 137
 NEC Silentwriter Model 95, Mar 117, May 125
 personal, Sep 240
 Personal ColorPoint thermal-transfer, Feb 185
 Personal LaserWriter LS, background printing, Jan 207
 Personal LaserWriter NTR, May 136
 Phaser II Pxe, Jun 131
 Phaser IISD, Sep 197
 PixelBurst Processor chip, Dec 171
 PlotterJet, Mar 115
 PostScript emulators, Sep 240
 PowerPrint, May 17, Sep 240, Dec 298
 ProofPositive, Dec 185
 QMS 860 Print System, Oct 21
 QMS-PS 1700, Apr 127
 QMS-PS 3200 Print System, Dec 171
 RasterOps CorrectPrint 300, Oct 199
 RealTech Laser 400, Sep 288
 recycled paper and toner cartridges, Mar 71
 reduced-size pages, Mar 71
 ShadowWriter, Sep 21, 240
 Spectra Star Model 450, Jun 125
 StyleWriter, Jan 207, Mar 33, Sep 274, Dec 298
 tabloid pages, Sep 348
 TI microLaser Turbo, Jul 192
 toner cartridge options, Feb 308
 toner cartridge refills, Jul 241
 transferring images to fabric, Jun 123
 TrueType printing problems, Sep 240, Oct 225
 TurboPS/880, Jul 137
 using non-Mac printers with Macs, Sep 240, Dec 298
 Printer's Spreads, Feb 214
 PrismView II monitor, Sep 254
 Privacy, network surveillance, Aug 57
 Processors, Oct 136
 Pro-Cite, Jan 20, Jun 207
 ProColor Premier film recorder, Aug 146
 Procom Floptika 20/M optical/magnetic drive, Aug 105
 Procom hard drive, Feb 218
 Procom MD hard drive series, May 156, Aug 132
 Procom MRD removable-media drives, Nov 132
 ProDrive series hard drives, Dec 181
 Professional Assistant, Jan 111
 Professional Catalog Link, Feb 214
 Profitability Professional, Nov 116
 Programming
 books on System 7, Apr 212
 EdScheme, Nov 180
 introductory books, Jan 207
 license proposed for programmers, Jan 73
 MacApp, Apr 117
 Mac developers, Jan 31
 MultiC, Aug 97
 Prograph, Jun 204
 Serius Developer and Serius Programmer, Apr 123
 TextPort Developer's Toolkit, Apr 125
 Think C, Jul 210
 Think Pascal, Aug 176
 UserLand Frontier, Jul 190
 Programming for System 7, Apr 212
 Prograph, Jun 204
 Project. See Microsoft Project
 Project-management programs, Apr 146
 Fair Witness, Oct 198
 FastTrack Schedule, May 115
 MacProject Pro, Oct 121
 Microsoft Project, Sep 197
 Office Manager, Dec 280
 PSS, Dec 173
 TeamAgenda, May 127
 Project Scheduler 4 for the Macintosh, Apr 146
 ProMotion, Mar 121, Nov 164
 ProofPositive printer, Dec 185
 Publisher, Feb 214
 Preview/24 20" Color System monitor, Jan 124
 Proxima Ovalon LCD projection panel, Aug 103
 P55, Dec 173
 Psychic Reward, Apr 63
 Public domain/shareware, Nov 59
 Bifane, Nov 59
 BMUG Shareware Disk Catalog, May 119
 books on shareware, Dec 189
 DeskPic, Jun 243
 Extension Manager, May 218
 EyeBalls, Jul 242
 GIFConverter, Jun 243
 HyperMovie Player, Sep 359
 Image, Nov 59
 Mariner, Nov 59
 MenuChoice, Jul 223
 Movies in the Dark, Sep 359
 QuickTime Extras, Sep 359
 SCSI Probe, May 223
 Typell4Me, Aug 181
 ZTerm, Nov 59
 Publication Locking, Feb 214
 Publications, Mac-related, Jun 83
 Public Utilities, Aug 105
 Publish It Easy, Feb 208, Dec 185
 Publish Magazines & Newspapers with a Macintosh Computer, Apr 123
 Push-Button Market Analysis, Jul 21
 Puzzle DA, customizing, Feb 334
 Puzzle Master, Mar 182
 Puzzler, The, Feb 214
 Python server, Nov 87
 QBlaizer modem, Jan 109, May 192
 QMS 860 Print System, Oct 21
 QMS-PS 410 printer, Sep 240
 QMS-PS 1700 printer, Apr 127
 QMS-PS 3200 Print System printer, Dec 171
 Q5Pool, Feb 214
 QTools, Feb 214
 QuadFlextra disk drive, Apr 208
 QuadFlextra removable-media drive, Feb 193, Nov 132
 Quadra series. See Macintosh Quadra series
 Quantum Passport XL series removable-media drives, Mar 119, Oct 208
 QuarkXPress, Feb 208, Jul 199, Aug 203, Dec 23
 add-ons and utilities, Feb 214
 books, Apr 123, Oct 115
 QuarkCopyDesk, Feb 185, Mar 117
 QuarkDispatch, Feb 185, Mar 117
 Quark Kensions, Feb 214
 reversed text, Nov 216
 tech-support policy, Apr 39
 tinting rows in table, Dec 302
 tracking, May 32
 QuickCapture video-capture board, Mar 140
 Quickden, Mar 217, Jul 182, Nov 116
 QuickKeys, Insights, Apr 233
 QuickImage 24 video-capture board, Mar 140, Oct 170
 QuickMail, Feb 234, Sep 21
 MHS support, Jun 123
 QuickMap, Jan 152
 QuickPack video-capture board, Feb 240, Aug 103
 QuickPress, Feb 240, Apr 127
 QuickRing, Sep 185
 QuickTel Xeba 9600 fax modem, Apr 204
 QuickTime, Sep 359, Oct 67, 170. See also Boards, video-capture
 Adobe Premiere, May 172, Sep 359, Oct 170, Nov 85
 After Dark-Wild Magic conflict, Jun 241
 CameraMan, Jul 129, Sep 292
 canned video clips, Sep 359
 commentary, Oct 67
 DiVA VideoShop, Feb 240, Jul 201, Sep 359, Oct 170
 EyeQ Delivery Board, Feb 187, Sep 359
 HyperMovie Player, Sep 355
 in presentation programs, Mar 121
 introduction to, Sep 359, Oct 170
 JPEG image compression, Mar 146
 Morph, Nov 85, 152
 Movies in the Dark, Sep 359
 Popcom, Sep 359
 QuickPak video-capture board, Aug 103
 QuickPress, Apr 127
 QuickTime Extras, Sep 359
 Silicon Graphics support, Aug 21
 Spectator, Dec 181
 TPTV, Jun 135
 video-editing tools, Feb 240, Sep 359
 VideoFusion, Nov 85
 Wild Magic, Jun 241
 QuickTools, Jul 224
 QuickView Studio QT video-capture board, Oct 170
 QuickView Studio video-capture board, Mar 140
 Quick30 accelerator board, Jun 146
 Quorum Compatibility Engine, Nov 145
 QXedit, Feb 214
 Radius Color Display and ColorDisplay/21 monitors, Jan 124
 Radius Full Page Display, Jul 160
 Radius Rocket 25i accelerator board, Jun 146
 Radius Rocket 33 accelerator board, Jun 19
 Radius Rocket 68040 accelerator board, May 113
 Radius Rocket accelerator board, Jun 146, Oct 181
 Radius TPD/19 and TPD/21 monitors, Jul 160
 RadiusTV video-capture board, Mar 140, Oct 170
 RAM
 management, Nov 205
 upgrades, Mar 211, May 142, Aug 37
 Rancho Technology RT5000 Mac removable-media drive, Nov 132
 Random House Encyclopedia, The, Jun 230
 Random House Word-A-Day, Sep 318
 Rapport adapter, connecting SuperDrive with, May 217
 RasterOps 19" and 21" Color HiTachi monitors, Jan 124
 RasterOps 19" and 21" Mono/Gray Scale Monitors, Jul 160
 RasterOps 19" Color Trinitron monitor, Jan 124
 RasterOps/20 and RasterOps/20T MultiScan Color Displays, Oct 113
 RasterOps 24STV video-capture board, Feb 240, Mar 140, Oct 170
 RasterOps 24XLTV video-capture board, Mar 140, T
 Oct 170
 RasterOps 2075 20" Color Trinitron monitor, Sep 254
 RasterOps 2168 21" Color Monitor, Sep 254
 RasterOps CorrectPrint 300 printer, Oct 199
 RasterOps Dual Scan monitor, Sep 254
 RasterOps Espresso Personal Slide Scanner, Apr 199
 RasterOps MediaTime video-capture board, Mar 140
 RasterOps MxTV video-capture board, Oct 170
 RasterOps Video ColorBoard 364 video-capture board, Mar 140
 RateFinder, Jun 224
 Ray Dream Designer, Feb 246, Jun 19, 176, Sep 276
 Rea, Jim, interview, Jul 99
 ReadingEdge, Jul 174
 ReadIt Personal and ReadIt Pro OCRs, Jul 174
 ReadIt Pro OCR, Jul 21, 174
 ReadRight for Macintosh OCR, Jul 174
 ReadStation OCR, Jul 174
 ReadySetGo, Feb 208, May 17
 RealTech 19" Trinitron monitor, Mar 121
 RealTech Laser 400 printer, Sep 288
 RealTech Laser printer, Sep 240
 RealTech Scan 800 slide scanner, Oct 156
 Real World PageMaker 4, Mar 121
 Recognize OCR, Jul 174
 Recycled computer accessories, Mar 71
 Red Baron, Nov 185
 Redux Deluxe, Dec 187
 Relax Technology Plus hard drive, Aug 132
 Relisys Model RE-1422 monitor, Feb 193
 ReMind, Dec 187
 Remote file sharing, May 217
 Removable-media drives, Feb 323, Nov 132
 Infinity series, Sep 195
 Liberty Series 50 Floptical, Feb 193
 QuadFlextra, Feb 193
 Quantum Passport XL 240, Oct 208
 Quantum Passport XL series, Mar 119
 SyQuest SQ2542A and SQ3105, Aug 21
 Renaissance. See Kodak Renaissance
 Rendering, Jun 176
 Alias Sketch, Mar 123, Jun 176, Aug 155, Dec 23
 Infiniti-D, Oct 40
 Ray Dream Designer, Feb 246, Jun 19, 176, Sep 276
 Syntron, Aug 97
 Zoom, Aug 97
 ResEdit, Jun 243
 Resize XT, Feb 214
 Resolve. See Claris Resolve
 Retrieve, Nov 174
 Retriever Plus, Dec 171
 Retrospect, Dec 187
 RGB Technology CB8000X printer, Apr 136
 Rhyme Design, Jun 230
 Ricoh cartridges, Feb 323
 Rightsbase, Jun 135
 Ringo, May 217, 189
 Rival Monochrome and Grayscale Displays, Jul 160
 Roadrunner 40i and 80i hard disks, May 115
 Robots, Macintosh-controlled
 Lego, May 123
 NASA, Oct 123

Rodime Systems Plus removable-media drives, Nov 132
 RollerMouse trackball, Jun 154
 Rotation, Feb 214
 RouterCheck, Oct 212
 RT-24 graphics accelerator board, Mar 121
 RTXT format, Feb 21
 RunPC, Mar 152
 RVC/Mac, Jun 19

S

Sara Keys, Mar 125
 Satellite 3D, May 125, Jul 210
 SBT Mac Series Six Plus, Nov 116
 ScanMaker II and ScanMaker IIxE scanners, Nov 91
 ScanMaker 1850S slide scanner, Oct 156
 ScanMan Model 32 scanner, Mar 180, Jul 174
 ScanMatch, May 191
 Scanners, Oct 150. See also OCR: Slide scanners
 6C OmniMedia, Feb 197
 Complete Half-Page Scanner/GS, The, Mar 180
 HP Scanlet IIC, Jan 279
 HP Scanlet IIP, Jul 125, Aug 170
 LightScan Pro, Jun 225
 Lightscan 400PS, Jul 174
 Mirror 600 Color Scanner, Apr 189
 Ofoto, Mar 19
 OneScanner, Feb 256
 overview, Oct 150
 PageBrush Color for the Mac, Feb 280
 PageBrush Professional, Jun 206
 Polaroid CS-500, Mar 125
 ScanMaker II and ScanMaker IIxE, Nov 91
 ScanMan Model 32, Mar 180, Jul 174
 ScanMatch, May 191
 Typist Plus Graphics, Mar 196
 Scan-X color slide scanner, Oct 156
 Schedulers. See Calendar programs; Personal information managers; Project-management programs
 Scrapbook, map and sound in, Feb 305
 Screen Caffeine, Jan 180
 Screen-capture utilities, Feb 293
 ScreenDoors, May 63
 Screens. See Monitors
 Screenshot, Feb 293
 SCSI, Introduction to, May 223
 SCSI-2 Booster board for Radius Rocket board, Dec 181
 SCSI Probe, May 223
 SCSI/LinX, Feb 214
 Sculpt 3D and 4D, Feb 246, Jun 176
 Search, Oct 123
 Secret of Monkey Island, The, Sep 314, Dec 226
 Security
 Cable Safe, Sep 327
 Citadel with Shredder, Jun 225
 encryption, Aug 57
 FolderBolt, Jun 208
 NightWatch II, Nov 174
 RSA device, Jul 123
 Shredder, Apr 17, Jul 213
 Seiko Instruments CM1445 monitor, Jan 124, Mar 134
 Seiko Instruments CM1760LR monitor, Sep 254
 Senior Net, Aug 105

Sensible Grammar, Nov 172
 Sequencer, Jun 135, Dec 274
 SerialWay, Jan 20
 Series Developer and Series Programmer, Apr 123
 Service Bureau XTension, Feb 214
 SetInset, Feb 214
 SetSnap, Feb 214
 Solomon, Susan, Feb 414
 Sonar Bookends, Feb 214
 Sonar TOC, Feb 214
 Sonic Ethernet Series Ethernet board, May 150
 Sony CDU-561 CD ROM drive, Nov 101
 Sony CDU7211W CD ROM drive, Oct 144
 Sony CPD-1304 monitor, Mar 134
 Sony CPD-1604S monitor, Sep 254
 Sony GDM-1936 monitor, Sep 254
 Sony UP-D7000 Color Printer, Apr 136
 Sound
 ACS300 Computer Speaker System, Nov 172
 activating with QuickKeys, Nov 214
 AudioTrax, May 195
 bonus sound in System 7
 Scrapbook, Feb 305
 Bose RoomMate stereo speakers, Jun 201
 Casper voice recognition, Sep 75
 custom start-up sound, May 221
 external speakers, Jun 201
 Focal Point, Nov 97
 MacRecorder Voice Digitizer, Feb 17, May 221
 MacSpeaker external speaker, Jun 201
 recording devices, Feb 17, May 221
 Sound Bytes, Jan 115
 sound-clip collections, Nov 187
 Star Trek sound effects, Mar 115
 suppressing at start-up, Dec 297
 Voice Impact, May 221
 voice-recognition programs, Apr 180, Sep 75
 voice synthesizer for Koko the gorilla, Feb 191
 Sound Bytes, Jan 115
 SoundClips, Nov 187
 SoundFX, Nov 188
 Sound Machine, Nov 188
 Spaceship Warlock, Jan 146
 Space Shuttle, Macintosh aboard, Aug 101
 Space Voyager, Mar 123
 Spaceward Ho, Aug 173
 Spectator, Dec 181
 Spectra Star 430 and 440 printers, Apr 136
 Spectra Star 450 film recorder, Aug 146
 Spectra Star Model 450 printer, Jun 125
 Spectre, May 180, Jul 244, Aug 38, Dec 226
 SpectreScan QX, Feb 214
 SpectreSeps QX, Feb 214
 Spectrum/24 PDQ Plus graphics adapter/accelerator board, May 17
 Speech Master, Dec 288
 SpeedyCD, Nov 176
 SpellBound XTension, Feb 214
 Splunk, May 121, Jul 206
 Spigot & Sound video/audio capture board, May 115
 Splatters, Mar 198
 Sportster 2400 and Sportster

Software Bridge/Mac, Mar 152
 Software Digest Macintosh Ratings Report, Jun 83
 Software licenses, transfer of, Feb 305
 Software Reviews on File, Jun 83
 SolarPower solar panel for PowerBooks, Oct 21
 Solomon, Susan, Feb 414
 Sonar Bookends, Feb 214
 Sonar TOC, Feb 214
 Sonic Ethernet Series Ethernet board, May 150
 Sony CDU-561 CD ROM drive, Nov 101
 Sony CDU7211W CD ROM drive, Oct 144
 Sony CPD-1304 monitor, Mar 134
 Sony CPD-1604S monitor, Sep 254
 Sony GDM-1936 monitor, Sep 254
 Sony UP-D7000 Color Printer, Apr 136
 Sound
 ACS300 Computer Speaker System, Nov 172
 activating with QuickKeys, Nov 214
 AudioTrax, May 195
 bonus sound in System 7
 Scrapbook, Feb 305
 Bose RoomMate stereo speakers, Jun 201
 Casper voice recognition, Sep 75
 custom start-up sound, May 221
 external speakers, Jun 201
 Focal Point, Nov 97
 MacRecorder Voice Digitizer, Feb 17, May 221
 MacSpeaker external speaker, Jun 201
 recording devices, Feb 17, May 221
 Sound Bytes, Jan 115
 sound-clip collections, Nov 187
 Star Trek sound effects, Mar 115
 suppressing at start-up, Dec 297
 Voice Impact, May 221
 voice-recognition programs, Apr 180, Sep 75
 voice synthesizer for Koko the gorilla, Feb 191
 Sound Bytes, Jan 115
 SoundClips, Nov 187
 SoundFX, Nov 188
 Sound Machine, Nov 188
 Spaceship Warlock, Jan 146
 Space Shuttle, Macintosh aboard, Aug 101
 Space Voyager, Mar 123
 Spaceward Ho, Aug 173
 Spectator, Dec 181
 Spectra Star 430 and 440 printers, Apr 136
 Spectra Star 450 film recorder, Aug 146
 Spectra Star Model 450 printer, Jun 125
 Spectre, May 180, Jul 244, Aug 38, Dec 226
 SpectreScan QX, Feb 214
 SpectreSeps QX, Feb 214
 Spectrum/24 PDQ Plus graphics adapter/accelerator board, May 17
 Speech Master, Dec 288
 SpeedyCD, Nov 176
 SpellBound XTension, Feb 214
 Splunk, May 121, Jul 206
 Spigot & Sound video/audio capture board, May 115
 Splatters, Mar 198
 Sportster 2400 and Sportster

14,400 Mac&Fax fax modems, Jun 131
 Spreadsheet, Sep 189
 Spreadsheets, Jul 168, 247.
 See also Microsoft Excel
 BiPlane, Nov 59
 Claris Resolve, Jan 20, 162, Jul 168, 247
 Lotus 1-2-3 for Macintosh, Apr 174, Jul 168, 247, Nov 41, Dec 211
 Mariner, Nov 59
 Spreadsheet, Sep 189
 tips, Jul 247
 Toolbox, Jan 20
 Wings, Jan 20, Aug 101
 SQL databases, Mar 125
 Stack collision with heap error message, Dec 297
 StarRouter, Sep 191
 StarTech 860Edge NuBus accelerator board, Feb 199
 Star Trek
 AudioClips, Nov 187
 screenaver, Dec 185
 sound effects, Mar 115
 Start-up failure caused by mouse, Feb 312
 StarWorks, Dec 185
 Statistica/Mac, Apr 115
 Statistics
 JMP, Feb 284
 JMP Design, Oct 119
 MacSpin, Mar 196
 Minitab, Jun 207
 PEMD Discovery, Apr 187
 Statistica/Mac, Apr 115
 StatView, Sep 193, Nov 182
 SYSTAT, Apr 115
 USA GeoGraph, Nov 21
 Stat-Ref, Feb 197
 Status Mac, May 190
 StatView, Sep 193, Nov 182
 Step-by-Step Electronic Design, Jun 83
 Step-by-Step Graphics, Jun 83
 StickyBusiness, May 199
 Sticky Keys, May 217
 Stongray trackball, Jun 154
 Stock market programs
 Dow Jones Market Analyzer Plus, Jul 133
 Push-Button Market Analysis, Jul 21
 Storm Card compression board, Apr 127
 StoryLine, Aug 174
 Storyspace, May 121
 StrataType, Oct 21
 StrataVision 3D, Feb 246, Jun 121, 176
 Stringers, Nov 89
 Student's/Writer's Dreamtools, Mar 186
 Studio/1, Studio/8, and Studio/32, Mar 164
 StudyWare for the SAT, Jun 204
 Stuffit
 Classic, Mar 201
 decompressing DOS files with, Jun 37
 Deluxe, Mar 201
 SpaceSaver, Jun 125
 StylePro, Feb 214
 StyleWriter printer, Mar 33, Sep 274
 background printing, Jan 207, Dec 298
 Suitcase, Sep 346
 SummaSketch II ADB graphics tablet, Jun 154
 Sumo Systems S5630 rewritable optical drive, Feb 189
 Super 7 Utilities, Sep 197
 SuperAnalyst, Mar 191
 SuperDisk, Mar 202
 SuperDrive Upgrade Kit, May 217
 SuperGlue, Feb 21, Aug 21
 SuperMac 21" Platinum Two-

Page Display, Jul 160
 SuperMac Technology 19" Dual Mode Trinitron Display monitor, Jan 124
 SuperMac Technology 19" SuperMatch Color Display monitor, Jan 124
 SuperMatch 17 monitor, Sep 254
 SuperMatch 17 Multimode Color Display monitor, Apr 125
 SuperMatch 20 Color Display, Sep 254
 SuperMatch 20" Dual Mode Trinitron monitor, Sep 254
 SuperMatch 21 Two-Page Color Display, Jan 124, Sep 254
 SuperMunchers, Jun 192
 SuperPaint. See Aldus SuperPaint
 SuperServer-C transputer processor boards, Mar 115
 SuperSqueeze Still-Image Compression Card, Mar 146
 Super Tetris, Oct 200
 SuperView color monitor board for PowerBooks, Aug 109
 SupraFaxModem V.32, Jun 121
 SupraFaxModem V.32bis, Jun 121, Aug 171
 SurfaceView, Jun 129
 Surgeon 3, The Brain, Sep 322
 Surge Raptor Remote power strip, Dec 287
 Swamp Gas, Jan 179
 Sweet 16 monitor, Sep 254
 Swivel 3D Pro, Feb 246
 SwivelArt, maps, Jan 152
 Swivel base for Macintosh, Feb 308
 Sword, The, Aug 181
 Syllabus, Jun 83
 Synchronicity, Apr 63
 Syntrion, Aug 97
 SyQuest drives. See Removable-media drives
 SYSTAT, Apr 115
 System, Nov 140, Dec 232
 System 7, Feb 331, Apr 166, May 55, Aug 37
 books, Apr 211
 changes in keyboard mapping, Sep 345
 Compatibility Checker, Apr 221
 copying multiple icon names, Jul 244
 disappearing folders, Jul 21
 Easter eggs, Feb 334
 Finder, Dec 53
 font placement, Sep 346
 Insights, Feb 331
 memory management, Feb 306, Apr 166, Dec 300
 preventing items in Startup Items folder from opening, Aug 191
 problems with, May 55, Aug 37
 program compatibility, Apr 166
 reducing system software memory size, Apr 221
 Super 7 Utilities, Sep 197
 switching between multiple keyboard layouts, Sep 346
 System 7 Pack, Dec 288
 Tune-Up, Apr 166, Aug 38, Nov 205
 utilities, Dec 288
 viewing Desktop items by name, Aug 192
 System 7 Book, The, Apr 211
 System 7 Pack, Dec 288
 System 7 Revealed, Apr 212
 System 7 Tune-Up, Apr 166, Aug 38, Nov 205
 SystemPro and SystemPro Sony monitors, Jan 124

T

Tableau, Feb 214
 Table Editor, Feb 214
 Tablets. See Graphics tablets
 Tableworks, Feb 214
 Tactician, Jan 152
 Tandem Guardian OS terminal emulator, Aug 21
 Tape drives, Dec 218
 Task Monitor for the Mac, Apr 146
 TASS Optical World EFL20 removable-media drive, Nov 132
 Taste, May 192, Sep 248
 Taxes
 MacInTax, Mar 123, 217, Apr 182
 preparing for home office, Jul 182
 software amortization, Jul 44
 Tax programs, MacInTax, Mar 123, 217, Apr 182
 TeamAgenda, May 127
 Tech 2-D, Aug 97
 Technical support hotlines, Mar 38
 TechWorks NetUtilities, Oct 117, Dec 278
 Teepee, Macintosh in, Jun 135
 See also Igloos
 Teleconferencing, Sep 21
 Telepathic, May 63
 TelePort/FullFax data/fax modem, Aug 158
 TelePort series fax modems, Dec 189
 TeMath, Apr 206, Jun 172
 Tempo, Jul 131
 updating e-mail with, Jun 36
 Terminal emulators
 Mac320, Mac330, and Mac340, Mar 19
 MacMemo, Aug 21
 Tandem Guardian OS, Aug 21
 Vicom Terminal Emulator, Aug 156
 ZTerm, Nov 59
 Tesserae, Jan 146
 Text America DM5021 CD-ROM drive, Oct 144
 TextPert Addition and TextPert 4d External, Apr 125
 TextPert Developer's Toolkit, Apr 125
 TextPert OCR, Jul 174
 Textures, Feb 246
 TextureSynth, Jan 180, Feb 246
 Theorist, Jun 172
 ThePage, Jun 83, Sep 41
 Thesauruses, Jun 229
 Thesaurus reX, Feb 214
 Thunder, Jun 229, Jul 202, Aug 181
 Think C, Jul 210
 Think Pascal, Aug 176
 Third Wave Computing high-capacity hard drives, May 156
 Third Wave Computing R removable-media drives, Nov 132
 ThoughtPattern, Jan 111, Jun 129
 Thumbelina trackball, Mar 182, Jun 154
 Thunder, Jun 229, Jul 202, Aug 181
 ThunderStorm Photoshop accelerator board, Sep 21
 TidBits, Sep 41
 Tiles, May 176, Jul 224
 Timbuktu/Remote, Jan 111, May 217
 TimeBook, Sep 193
 TimeLog, Jul 182, 206
 TimeSlips II, Mar 19, Sep 294
 continues

TimeStamp, Feb 214
 Time Treks, Sep 312
 TI microLaser series printers, Sep 240
 TI microLaser Turbo printer, Jul 192
 TMS Express, Feb 214
 Todd Enterprises TCDR-7050 CD ROM drive, Oct 144
 TokaMac II FX accelerator board, Apr 119, Oct 181
 TokaMac ELC accelerator board, Aug 95
 TokaMac series accelerator boards, Jun 146, Jul 129
 Token Ring 4/16 NB Card, Feb 189
 Toolbox, Jan 20
 Total Baseball, Oct 123
 Total Peripherals Q high-capacity hard drive, May 156
 Total Peripherals QX and QX Compact hard drive series, Aug 132
 Total Peripherals TP hard drives, Feb 218
 TouchBase, Jun 129, Jul 182, Aug 172
 Touchstone, Feb 240
 TP-Removables drives, Nov 132
 TPTV, Jun 135
 Trackball ADB, Jun 154
 Trackballs, Jun 154
 MicroTrac, Mar 182
 Mouse-Trak, Nov 162
 replacing with marble on PowerBooks, Jul 242, Aug 191
 SiCOS Cordless Trackball,

Jun 206
 Thumbelina, Mar 182, Jun 154
 TrackMan for the Macintosh, Jun 154, 188
 Turbo Mouse, Nov 162
 TrackMan for the Macintosh trackball, Jun 154, 188
 Training, tutorial disks and videotapes, Apr 44
 Transformers, Apr 222
 Transparent Language, Oct 212
 TransTags, Feb 214
 TransTalk, Jan 20
 TransWarp 040 and TransWarp LC accelerator boards, Apr 125
 TransWarp series accelerator boards, Jun 146
 Trapping, Feb 185, May 166
 IslandTrapper, Dec 23
 TrashMaster, Apr 17
 with Incinerator, Jul 213
 Travel agents, use of Macs by, Oct 119
 Tree, Dec 187
 Tristan, Mar 193, Dec 226
 TrueLaser printer, Sep 240
 T-Script, Sep 240
 T-shirts, image-transfer system, Jun 123
 Tsunami hard drives, Feb 218, May 156, Aug 132
 Tuplex, Apr 119
 Turbo 3-D, Sep 193
 Turbo Mouse ADB trackball, Jun 154
 Turbo Mouse trackball, Nov 162
 TurboPS/880 printer, Jul 137

TurboStar accelerator board, Dec 173
 Twinkl, Jan 173
 Type. See Fonts
 TypeChart, Jun 123
 Typelt4Me, Aug 181
 TypeReader OCR, Jun 135, Jul 174
 Type Right, Aug 182
 TypeStyler, Oct 233
 Typing Instructor Encore, Aug 182
 Typing tutors, Aug 181, 182
 Typist Plus Graphics OCR, Mar 196, Jul 174

U

Ultima Home Office fax modem, Oct 206
 Ultimate Notebook EX PowerBook carrying case, Sep 329
 Ultimate Power Upgrade, Sep 193
 UltraDrive 120MO magneto-optical drive, Oct 115
 UltraDrive hard drives, Feb 218, May 119, 156, Aug 132
 UltraDrive removable-media drive, Nov 132
 UltraPaint, Jan 132
 UltraScript Mac, Sep 240
 Umax Technologies UC630 Color Scanner slide scanner, Oct 156
 Umax Technologies UC1200S slide scanner, Oct 156

Understanding Computers, Nov 87
 Unicorn Smart Keyboard, May 63
 Universal document architecture, Feb 21, 189
 Universal PowerCache accelerator board, Nov 87
 Unix
 AlsaTalk for Unix, Feb 199
 A/UJX, Feb 193, Nov 178
 running Mac software under, May 113
 UpDiff, Nov 21, Dec 282
 Upfront, Mar 123, Jun 129
 Upgrades, May 146, Oct 226, Dec 67
 USA GeoGraph, Nov 21
 Used computers, sources for, Nov 59
 User groups, Mar 38
 Apple Library Users Group, Jul 137
 newsletters, Jun 83
 UserLand Frontier, Jul 190
 Using the Macintosh With System 7, Apr 212
 Utilities
 abbreviation expanders, Aug 181
 AccessPC, Oct 188
 After Dark, Jun 241, 243
 ALSoft Power Utilities, Aug 168
 AutoDoubler, Jun 125, Sep 273, Dec 37
 Backmatic, Feb 284
 backup, Dec 187
 BehHierarchic, May 217
 CameraMan, Jul 129, Sep 292

CanOpener, Mar 19
 Capture, Feb 293
 Checklist, Feb 289
 Compatibility Checker, Apr 221
 compression, Mar 201, Sep 273
 Copyright, Nov 101
 Crash Barrier, Apr 208, Aug 38
 DeBabelizer, Dec 171
 DeskPict, Jun 243
 DeskPicture, Jun 243
 DiskKeeper, Oct 48
 DiskFit Pro, Apr 187
 DiskMount, Feb 185
 DiskTop, Jul 224
 DiskTwin, Jan 173
 DOS Mounter, Oct 188
 Drive7, Feb 185, Mar 211
 DynoPage, Mar 71
 Easy Access, May 63, 217
 EasyPrint, Oct 202
 EPS Exchange, Feb 291
 Exposure Pro, Feb 293
 Extension Manager, May 218
 FastBack Plus, Apr 202
 file exchange, Mar 152
 file finders, Jun 188
 file transfer, Mar 184, Oct 188
 Flash-It, Feb 294
 FolderBolt, Jun 208
 Font/DA Mover, Jun 241
 for Aldus PageMaker, Feb 289
 for page-layout programs, Feb 214
 for System 7, Dec 288
 GIFConverter, Jun 243
 Glue, Feb 21, Aug 21
 Gofer, Jun 188
 HAM, Apr 185, May 217, Jul 223
 Hand-Off II, Jul 223
 Hard Disk Toolkit, Feb 185, 273, Mar 211
 hard drive backup, Jan 173
 hard drive management, Feb 185
 Hello, Aug 21
 Help, Feb 273
 Hot Keys, May 194
 Image Grabber, Feb 294
 KernEdit, Jun 123
 Kiwi Power Windows, Jul 220, 224
 LinksWare, Aug 171
 Macintosh PC Exchange, Oct 188
 MacTools, Oct 179, Dec 212
 MacTools Deluxe, May 121, Nov 206
 Magnel, Jul 131
 MasterFinder, Jul 223, Nov 166
 MasterJuggler, Sep 346
 MenuChoice, Jul 223
 MenuFonts, May 180, Sep 46
 Microcom's Utilities, Dec 212
 More Disk Space, Jun 125, Sep 273
 MultiClip, Jul 21
 NetMounter, Sep 310
 NetWorks, Jun 226
 Network Supervisor, Aug 177
 Nok Nok, Oct 209
 Norton Utilities for Macintosh, Jul 137, Oct 179, Nov 206, Dec 212
 Now Utilities, Feb 289, Jul 223, Oct 225
 On Cue II, Jul 223
 On Location, Jun 188
 PICTuresque, Feb 294
 PowerMenus, Dec 266
 PowerMerge, Sep 21

Public Utilities, Aug 105
 QuickKeys?, Apr 233
 QuickTools, Jul 224
 ResEdit, Jun 243
 Retrieve, Nov 174
 RouterCheck, Oct 212
 ScanMatch, May 191
 screen-capture, Feb 293
 Screenshot, Feb 293
 SCSI Probe, May 223
 Shredder, Apr 17, Jul 213
 Snap, Feb 294
 SnapBack, Nov 89, Dec 276
 Snapshot, Feb 294
 Snapper, Feb 294
 Spectator, Dec 181
 Status Mac, May 190
 Stuffit, Jun 37
 Stuffit Classic, Mar 201
 Stuffit Deluxe, Mar 201
 Stuffit SpaceSaver, Jun 125
 Suitcase, Sep 346
 Super 7 Utilities, Sep 197
 SyncCamera, Apr 221
 System 7 Tune-Up, Apr 166, Aug 38, Nov 205
 TechWorks NetUtilities, Oct 117, Dec 278
 Ties, May 176, Jul 224
 TimeLog, Jul 206
 TrashMaster, Apr 17, Jul 213
 Twinkl, Jan 173
 Virex, Dec 121
 Wild Magic, Feb 240, Jun 241
 WindowWatch, May 121, Jul 206
 Workspace, Jul 220, 224

V

VAX-Macintosh connectivity, AlsaTalk for Unix, Feb 199
 VDeck Hi8 VCR, Jan 111
 Vendor Independent Messaging, May 17
 Ventura Publisher, Macintosh Edition, Feb 208
 Verbum Interactive, Feb 280
 Verbum magazine, Jun 83
 Verité film recorder, Aug 146
 VersaCAD, Feb 187
 VersaTerm and VersaTerm Pro, Oct 21
 VersionMaster, May 182, Oct 42
 Vertical CPU Stand, Aug 191
 Vette, Jan 146, 210
 V for Victory, Dec 226
 Vicom Terminal Emulator, Aug 156
 Video. See also Boards, video-capture
 Canon RC250 still-video camera, Jun 197
 capture, Mar 140
 DiVA VideoShop, Feb 240, Jul 201, Sep 359, Oct 170
 Dycam Model 1 still-video camera, Jun 197
 Proxima Ovation LCD projection panel, Aug 103
 QuickPak video-capture board, Aug 103
 QuickTime video-editing tools, Feb 240, Oct 170
 recording flicker-free Mac screen with camcorder, Apr 221
 StarWorks, Dec 185
 VDeck Hi8 VCR, Jan 111
 VideoVision video-capture board, Oct 115
 Video capture, Mar 140
 Video Companion, Mar 194
 Video conferencing, Oct 113
 VideoFusion, Nov 85
 Video Image series video-capture boards, Mar 140
 VideoLogic DVA-4000/Macintosh video-capture

IF YOU HATE TO WAIT...



ASK US
 ABOUT
 OUR
 NEW
 50 MHz
 VERSION

Accelerator-Video Board starts at \$695.
 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 & 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

System Technology Corp. • 1860 Fern Palm Dr. • Edgewater, FL 32141 • Tech Support 904-428-0411 • Fax 904-428-0765
 —A Division of Novy Systems, Inc.—

Circle 202 on reader service card

board, Oct 170
 VideoPaint, Mar 164
 VideoShop. See DIVA
 VideoShop
 VideoSpigot Pro video-capture
 board, Feb 240, Oct 170
 VideoSpigot video-capture
 board, May 172, Oct 170
 VideoTime video-capture
 board, Apr 113, May 119,
 Oct 170
 VideoVision video-capture
 board, Oct 115, 170
 Vines, Feb 187
 ViperDrive removable-media
 drive, Nov 132
 Viper server, Nov 87
 Vitex, Dec 171
 Virtual memory, Feb 305, Jul
 242
 limitations, Feb 305
 Virtual Museum. The, Mar 123
 Virtual reality, Mar 34, May
 109
 Art and Virtual Environ-
 ments Project, Oct 119
 Focal Point, Nov 97
 Invisible Site: A Virtual Sho.
 Jun 121
 Vines, Jan 117, Feb 199, Mar
 123, Apr 119, May 125,
 Jun 129, Jul 129, Aug 95,
 Sep 191, Oct 117, Nov 89,
 Dec 177
 Computer Virus and Security
 Conference proceedings,
 Feb 17
 Vitex, Dec 171
 Vision, Sep 195
 Visionary1A and Visionary/Q,
 Feb 214
 Visit Video, Oct 113
 Vista CD ROM drive, Oct 144
 Vista hard drives, Feb 218,
 May 156, Aug 132
 Vivarium Project, Feb 191
 Voice Express, Apr 180
 Voice Impact, May 221
 Voice Navigator, Oct 123
 Voice Navigator II, Apr 180
 Voice recognition, Apr 180,
 Sep 75, Oct 123
 Voice synthesis, Jan 115
 VoxView, Feb 191
 Voyager 030 accelerator board,
 Jun 146

W

Wacom SD-421E and SD-510C
 graphics tablets, Jun 154
 Walker, Lloyd, May 288
 Wall, The, Dec 169
 Wallpaper, Apr 117, May 193
 Wang WP/PC XTensions, Feb
 214
 Warlords, Dec 280
 Warranties on mail-order
 Macs, Jul 241
 WaterColor, Nov 97
 Wavemaker, Jun 125
 WealthBuilder, Dec 177
 Wearable and Portable
 Computers Design Project,
 Nov 91
 Where In the World is Carmen
 Sandiego?, Oct 200
 Which Macintosh Should I
 Buy?, Nov 87
 Whistleblower BBS, Apr 17
 White Knight, Insights, Aug
 211
 Wild Magic, Feb 240, Jun 241
 WindoWatch, May 121, Jul
 206
 Wingz, Aug 101
 scripts for, Jan 20
 WireManager, Feb 214
 Word. See Microsoft Word
 Word 5 Companion, Macin-
 tosh Edition, Jun 125
 WordBasic, Feb 191

Word Finder Plus, Jun 229
 Word for Word Macintosh,
 Mar 152
 Word Munchers, Jun 192
 WordPerfect for the Macin-
 tosh, Jun 215, 247, Sep 44,
 248
 WordPerfect Office, Feb 234
 WordPerfect XTensions, Feb
 214
 Word processors, Sep 248. See
 also Microsoft Word
 customizing, Jun 247
 ExpertWriter, Jul 21
 LetterPerfect, Jun 135
 MacQuill, Jun 135, Aug
 168, Sep 248
 MacWrite II, Sep 248
 Nisus, May 115, Sep 248
 Nisus Compact, Aug 170
 Nisus XS, Sep 21
 ruler length, Jun 243
 Taste, May 192, Sep 248
 WordPerfect for the
 Macintosh, Jun 215, 247,
 Sep 44, 248
 WriteNow, May 115, Sep
 248, 272
 Writing Center, The, Jan
 175
 WordScan and WordScan Plus
 OCRs, Jun 194, Jul 174,
 Oct 42
 Wordtris, Jun 210, Dec 226
 Workspace, Apr 115, Jul 220,
 224, Oct 40
 World Atlas, Apr 199
 World-Class Awards, Aug 120
 Worldview, Jul 129
 WORM drives, Feb 323
 Wrappers, Jan 180, Feb 246
 Wrist Rescue III, Dec 287
 Wrist Saver, Dec 287
 WriteNow, May 115, Sep 248,
 272
 Writer's aids. See also
 Bibliographic programs;
 Dictionaries; Thesauruses
 Correct Grammar, Aug 179
 Correct Letters, Jul 208
 Correct Writing, Sep 322
 Plots Unlimited, Jul 208
 Sensible Grammar, Nov 172
 StoryLine, Aug 174
 Write This Way, Jan 115
 Writing Center, The, Jan 175
 WTI-Moonraker video-capture
 board, Oct 170

X

Xdata, Feb 214
 XMacro, Feb 214
 XPress. See QuarkXPress
 XSite, Feb 214
 Xstyle, Feb 214
 XTension Manager, Feb 214
 XTND, Mar 152

Y

Year in Review, Feb 228
 Your Computer Revealed
 series, Oct 136, Nov 140,
 Dec 232

Z

Zephyr Palettes for FreeHand,
 Jul 218
 Zephyr Palettes for PageMaker,
 Jul 218
 Zephyr supercomputers, Aug
 97
 Zeppo, Aug 103
 Zeus, Aug 176
 Zip code database, May 193
 Zoom, Aug 97
 ZPA, May 193
 ZTerm, Nov 59 **m**

Invest In Futures.



There's probably no greater return on an investment than when you give to the Boys & Girls Club. You'll be helping the Club provide the guidance and inspiration young girls and boys need to achieve success for themselves and progress for America.

Make a contribution today, so they can make one tomorrow.



BOYS & GIRLS CLUB

The Club that beats the streets.

MACBEST

1-800-530-5050

International (816) 741-6587

Fax (816) 741-6847

Computers

\$1289



Classic II 4/80

with

Microsoft Works 3.0

CLASSIC II 4/40	\$999	QUADRA 700 4/0	\$3499
MAC LC II 4/40	1099	QUADRA 950 8/0	5499
MAC LC II 4/80	1199	PB 145 4/40	1999
MAC IISI 5/160	1899	PB 160 4/40	2269
MAC IICI 5/0	2199	PB 180 4/80	3849
MAC IICI 5/230	2699	DUO 210 4/80	2099
MAC IIVX 5/80 w/CD	2849	DUO 230 4/80	2449

\$1179

Monitors

MITSUBISHI

Diamond Pro17

APPLE 12" RGB	\$399	NEC 5FG	\$1299
APPLE 13" RGB	479	SEIKO 14" COLOR	449
NEW APPLE 14" RGB	549	SONY 1304S	599
APPLE 16" RGB	1229	SONY 1604	1099
APPLE 21" RGB	2999	DIAMOND PRO 14	499
NEC 3FGX	699	SUPERMAC 17T	1099
NEC 4FG	789	SUPERMAC 21 COLOR	2549

Printers

\$499

GCC TECHNOLOGIES



WriteMove II

PERSONAL LASER LS	\$899	GCC BLP ELITE 8	\$1399
PERSONAL LASER NTR	1689	HP LASERJET 4M	2148
LASERWRITER IIF	2199	HP DESKWRITER	399
LASERWRITER IIG	2789	HP DESKWRITER 550C	779
GCC BLP ELITE	1149	NEC MODEL 95	1429

\$349

Peripherals



SupraFAXModem V.32bis

STANDARD KEYBOARD	\$89	UMAX UC 630	\$1149
EXTENDED KEYBOARD	159	PSI POWERMODEM	199
DUO DOCK	999	APPLE EXPRESS MODEM	299
MACPRO PLUS KYBRD	139	RASTEROPS 24SX	549
TURBO MOUSE 4.0	129	RADIUS 24XP	549

Software

\$145



SNOOPER

Kit w/Nubus

MS WORD 5.1	\$295	STAR TREK SCREEN SAVER	\$36
MS EXCEL 4.0	299	MS FLIGHT SIMULATOR	41
MS WORKS 3.0	159	SIMANT	38
MS OFFICE	459	SIMCITY	32
QUICKEN	49	FALCON MC	42
QUARK EXPRESS	559	PRINCE OF PERSIA	37
SNOOPER SW ONLY	115	RED BARON	41

Overnight shipping on software only \$3

Toll free technical support

Free overnight shipping on Apple Warranty Repairs



C.O.D.

2631A NE Vivion, Suite 27 • Kansas City, MO 64118

M-F 9:00 - 7:00 CST SAT 10:00 - 4:00 CST

Prices are subject to change without notice - this usually means lower. COD orders are shipped via Airborne Express only and subject to a shipping and COD charge. Returns subject to a restocking fee. Not responsible for typographical errors. Product names are trademarks or registered trademarks of their respective holders.

Circle 98 on reader service card

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	
112	Abacus Concepts, Inc.	19	800/666-STAT	205	GCC Technologies	259/260	800/422-7777	23	88	National Instruments	250	800/433-3488
317	Advanced Business Center	227	800/274-7747	209	GCC Technologies	278/279	800/422-7777	IBC	NEC Technologies	16	800/NEC-INFO	
22-23	Agfa Scanners	83	800/685-4271	66	GDI Softworks	42	800/663-6222	227	NEC Technologies	17	800/NEC-INFO	
118-119	Aldus	—	—	264-265	Global Village	66	800/736-4821	250	Nisus	289	619/481-1477	
273	Alliance Peripheral Systems	273	800/835-2752	388	Global Village	248	800/736-4821	388	Nordic Software	168	402-488-5086	
348-349	Alliance Peripheral Systems	31	800/835-2752	276	Golden Triangle	195	800/326-1858	306	Novy Systems	202	800-638-4784	
384	Alysis	—	—	10-11	Hewlett Packard	—	—	14-15	Now Software	49	800/237-3611	
267-268	America OnLine	—	800/827-6364	108-109	Hewlett Packard	—	—	203	nView Corp.	117	800/736-8439	
8	Anthro	—	800/325-3841	231	Hewlett Packard	—	—	383	O.C.E.A.N. Microsystems	62	800/944-6232	
35	Apple	—	—	76	Image Club	—	—	52	Palomar Software	228	619/721-7000	
90-91	Apple	—	800/795-1000	20	Image Smith	—	800/U SN00PY	106	Passport Designs Inc.	271	415/726-0280	
104-105	Apple	—	800/795-1000	280	Inline Design	200	800-453-7671	54-55	Pinnacle Micro	115	800/553-7070	
49	A T & T Paradyne	265	800/554-4996	221	Insignia Solutions	72	800/848-7677	263	PLI	208	800/288-8754	
271	Berkeley Systems	218	800-248-0800	284	Inspiration Software	205	800/877-4292	282	Plusware, Inc.	51	800/268-7587	
339-341	BottomLine Distribution	—	900/420-3636	64	Jian	241	800/346-5426	102	PORT	123	800-242-3133	
258	C E Software	222	—	4	Kensington	—	800/535-4242	334	Printer Connection	55	714/758-8832	
60-61	Caere	162	800/535-SCAN	92	Kent Marsh, Ltd.	225	800/325-3587	181	Prometheus Products	288	800/477-3473	
12	Canon USA	110	800/221-3333	93-100	La Cie	246	800/999-1182	383	Quantum Leap Technologies	101	800/762-2877	
53	Canon/DEC	—	800/422-7777	82	Lapis	258	800/431APIS	249	Quickline Conference	285	415/904-0808	
197	Canon/QMS	191	800-422-2769	219	LaserMaster	43	800/950-6868	38-39	Radius	—	800/227-2795	
386-387	Casady & Greene	32	800/359-4920	41	Leader Technologies	79	800-922-1787	199-201	RasterOps	—	800/729-2656	
44	Checkmark Software	—	800/444-9922	383	Liberty Systems	45	408/983-1127	239	RasterOps	—	800/729-2656	
57	Chinon America, Inc.	64	800/441-0222	254	Logical Solutions	169	612-659-2495	116	Real World Corporation	229	800/678-6336	
59	Chinon America, Inc.	223	800/444-0222	18-19	Lotus Development	—	800-TRADEUP	320	Relax Technology	212	510/471-6112	
191	Chipsoft	—	800-487-8297	344	Mac and More	85	800/945-1MAC	385	Software Insurance Agency, Inc.	197	800/848-3469	
318-319	Club Mac	96	800/258-2650	336-337	Mac Center	—	800/950-0950	272	ScanCo	—	800/722-6263	
211	Compuserve	319	800-848-8199	346-347	Mac Products USA	175	800/MAC-USA1	241	Schor Corporation	—	415/570-7700	
382	ComputaLabel	116	800/289-0993	68-75	Mac Zone, The	70	—	261	Screen USA	35	708/870-7400	
295	Computer Care	73/76	800/950-2273	327-333	Mac's Place	209	800/367-4222	383	Secure-It	239	800-451-7592	
36	Contemporary Cybernetics	188	804/873-9000	62	MacAcademy	106	800/527-1914	45	Sharp Electronics Inc.	109	201/529-8731	
120	Curtis Manufacturing	20	603/532-4123	307	MacBest	98	800/530-5050	193	Sigma Designs	176	800/845-8086	
272	Dantz Development	26	510/849-0293	26-33	MacConnection	—	800/800-3333	294	Software Security	95	800/333-0407	
282	Data Desk	108	607/257-1000	351	MacDepot	144	800/222-2808	20	Sophisticated Circuits	184	800-827-4669	
281	Dataviz	36	800/733-0030	232	MacDirect	58	800/621-8467	56	Sophisticated Circuits	237	800-827-4669	
262	DataWatch/Microcom	201	919-490-1277	213	MacFriends	—	800/331-1322	86	Spectrum Holobyte	214	510/522-3584	
65	Dayna Communications	145	801/531-0600	324-325	MacLand	40	800/888-8779	58	Specular Int'l	112	413/549-7600	
9	Deneba Software	57	800/6CANVAS	335	MacNews	172	800/243-9383	314	Spin Peripherals	148	800-466-1200	
321	DGR Technologies	53	800/235-9748	326	Macs 4 Less	30	800/475-6227	279	Statsoft	99	918/583-4149	
323	DGR Technologies	286	800/235-9748	182-187	MacWarehouse	150	800/255-6227	215	SuperMac Technology	88	800-334-3005	
315	Dr. Mac	177	800/825-6227	34,266	Macworld Cd Ventures	194	800/821-1177	256-257	Supra	—	800/967-8772	
46-47	E-Machines	303	800/34GRAPH	316,382	Macworld CD Ventures	217	800/631-1700	21	Symantec	—	—	
114-115	Eastman Kodak	137	800/242-2424	240	Macworld Expo Japan	—	—	122	Symantec	—	—	
228-229	Eastman Kodak	287	800/242-2424	255	Macworld Expo Tokyo	—	—	274	T B S P	25	800/755-TBSP	
48	Educational Resources	28	800/624-2926	338	Macworld Interactive	—	415/904-0889	40	Technworks	268	800/879-7745	
390-391	Educorp	157	800/843-9497	248	Mass Microsystems	207	800/522-7979	275	Technworks	131	800/685-3682	
86	Engineered Software	12	919/299-4843	283	Mass Microsystems	164	800-522-7979	67	Teknosys	18	800/873-3494	
78-79	Epson America Inc.	—	800/BUY EPSON	195	Mathsoft, Inc.	34	800/628-4223	101	Tektronix	143	800/835-6100	
81	Epson America Inc.	—	800/BUY EPSON	87	MAXA Corporation	182	800/788-MAXA	84-85	Texas Instruments	313	800/527-3500	
345	ETC Peripherals	4	800/876-4ETC	251	MAXA Corporation	270	800/788-MAXA	342-343	Thirwave Computing	156	800/284-0486	
50-51	Expervision, Inc.	170	—	216-217	Maya Computer	—	802/496-7650	124-125	Tiger Software	114	800/666-2562	
312-313	Express Direct	81	800/535-3252	242	MECA Software	—	800/288-6322	63	Trend Micro Devices	203	800/228-5651	
110	Extreme Systems	142	800/995-2334	24	MicroNet	139	714/837-6033	252	Trendsetter Software	—	800/825-1825	
17	Fifth Generation Systems	151	800/477-8212	223	MicroNet Technology, Inc.	113	714/837-6033	89	TwinCom	178	800/723-2962	
389	Fractal Design	190	408/688-8800	IFC-1	Microsoft	—	800/426-9400	225	Wacom	—	800/724-4077	
207	GCC Technologies	266/267	800-422-7777	42-43	Microsoft	—	800/323-3577	16	Wellham Research	—	800/441-MATH	
				253	Microtech International	254	800/325-1895	13	Xante Corp.	1	800/926-8839	
				246	Microtek Lab, Inc.	146	800/654-4160	237	Xante Corp.	2	800/926-8839	
				2-3	Mirror Technologies	122	800/643-3374					
				6-7	Mirror Technologies	125	800/643-3378					
				296	Multi Ad Services	126	800/447-1950					

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 April 19, 1993 S1 February 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

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											
BUSINESS											
112	Abacus Concepts, Inc.	19	279	Statsolt	99	82	Lapis	258	MISCELLANEOUS		
258	C E Software	222	384	Utilities	—	232	MacDirect	58	390-391	Educorp	157
44	Checkmark Software	—	386-387	Casady & Greene	32	335	MacNews	172	8C	Kensington	—
211	Compuserve	319	272	Dantz Development	26	2-3	Mirror Technologies	122	282	Plusware, Inc.	51
282	Data Desk	108	262	DataWatch/Microcom	201	18C	NEC Technologies	16	SERVICES		
221	Insignia Solutions	72	17	Fifth Generation Systems	151	203	nView Corp.	117	ON-LINE		
284	Inspiration Software	205	66	GDT Softworks	42	199-201	RasterOps	—	267-268	America OnLine	—
254	Logical Solutions	169	276	Golden Triangle	195	45	Sharp Electronics Inc.	109	211	Compuserve	319
242	MECA Software	—	92	Kent Marsh, Ltd.	225	193	Sigma Designs	176	TRADESHOWS/CONFERENCES		
42-43	Microsoft	—	41	Leader Technologies	79	EXPANSIONS/UPGRADES			240	Macworld Expo Japan	—
IFC-01	Microsoft	—	254	Logical Solutions	169	110	Extreme Systems	142	255	Macworld Expo Tokyo	—
116	Real World Corporation	229	251	MAXA Corporation	270	HARD DISKS/STORAGE			249	Quicktime Conference	285
241	Scitor Corporation	—	87	MAXA Corporation	182	273	Alliance Peripheral Systems	273	TRAINING		
279	Statsolt	99	296	Multi Ad Services	126	348-349	Alliance Peripheral Systems	31	62	MacAcademy	106
274	T B S P	25	14-15	Now Software	49	57	Chinon America, Inc.	64	ACCESSORIES		
CAD/CAM			52	Palomar Software	228	59	Chinon America, Inc.	223	FURNITURE		
86	Engineered Software	12	122	Symantec	—	318-319	Club Mac	96	8	Anthro	—
195	Mathsoft, Inc.	34	21	Symantec	—	36	Contemporary Cybernetics	188	272	ScanCo	—
16	Wolfram Research	—	67	Teknosys	18	321	DGR Technologies	53	MISCELLANEOUS		
CD ROM			63	Trend Micro Devices	203	323	DGR Technologies	286	382	ComputaLabel	116
114-115	Eastman Kodak Company	137	VERTICAL			93-100	La Cie	246	102	PORT	123
266	Macworld CD Ventures	192	241	National Instruments	250	383	Liberty Systems	45	MAIL ORDER		
316	Macworld CD Ventures	217	274	T B S P	25	346-347	Mac Products USA	175	317	Advanced Business Center	227
34	Macworld Cd Ventures	194	WORD PROCESSING			324-325	MacLand	40	273	Alliance Peripheral Systems	273
382	Macworld CD Ventures	283	250	Nisus	289	248	Mass Microsystems	207	348-349	Alliance Peripheral Systems	31
338	Macworld Interactive	—	MISCELLANEOUS			283	Mass Microsystems	164	339-341	BottomLine Distribution	—
383	Quantum Leap Technologies	101	60-61	Caere	162	24	MicroNet	139	318-319	Club Mac	96
381	Sumeria	—	50-51	Expervision, Inc.	170	223	MicroNet Technology, Inc.	113	321	DGR Technologies	53
COMMUNICATION			66	GDT Softworks	42	253	Microtech International	254	323	DGR Technologies	286
258	C E Software	222	284	Inspiration Software	205	383	O.C.E.A.N. Microsystems	62	315	Dr. Mac	177
281	Dataviz	36	251	MAXA Corporation	270	54-55	Pinnacle Micro	115	48	Educational Resources	28
EDUCATIONAL			87	MAXA Corporation	182	263	PLI	208	390-391	Educorp	157
48	Educational Resources	28	16	Wolfram Research	—	320	Relax Technology	212	345	ETC Peripherals	4
20	Image Smith	—	HARDWARE			342-343	Thirdwave Computing	156	344	Mac and More	85
388	Nordic Software	168	BOARDS			INPUT DEVICES			336-337	Mac Center	—
ENTERTAINMENT			295	Computer Care	73/76	120	Curtis Manufacturing	20	346-347	Mac Products USA	175
386-387	Casady & Greene	32	110	Extreme Systems	142	e4	Kensington	—	68-75	Mac Zone, The	70
280	Inline Design	200	306	Novy Systems	202	282	Plusware, Inc.	51	327-333	Mac's Place	209
388	Nordic Software	168	38-39	Radius	—	20	Sophisticated Circuits	184	307	MacBest	98
86	Spectrum Holobyte	214	199-201	RasterOps	—	56	Sophisticated Circuits	237	26-33	MacConnection	—
GRAPHICS/DTP			239	RasterOps	—	225	Wacom	—	351	MacDepot	144
118-119	Aldus	—	215	SuperMac Technology	88	MODEMS			324-325	MacLand	40
9	Deneba Software	57	275	Technworks	131	264-265	Global Village	66	335	MacNews	172
228-229	Eastman Kodak	287	CD ROM			388	Global Village	248	326	Macs 4 Less	30
389	Fractal Design	190	114-115	Eastman Kodak Company	137	181	Prometheus Products	288	182-187	MacWarehouse	150
76	Image Club	—	COMPUTER SYSTEMS			256-257	Supra	—	216-217	Maya Computer	—
296	Multi Ad Services	126	104-105	Apple	—	89	TwinCom	178	2-3	Mirror Technologies	122
MULTIMEDIA			35	Apple	—	NETWORKING			6-7	Mirror Technologies	125
20	Image Smith	—	90-91	Apple	—	49	AT & T Paradyne	265	334	Printer Connection	55
106	Passport Designs Inc.	271	339-341	BottomLine Distribution	—	46-47	E-Machines	303	320	Relax Technology	212
58	Specular Int'l.	112	312-313	Express Direct	81	275	Technworks	131	314	Spin Peripherals	148
MUSIC			307	MacBest	98	PRINTERS			342-343	Thirdwave Computing	156
106	Passport Designs Inc.	271	213	MacFriends	—	53	Canon/DEC	—	124-125	Tiger Software	114
NETWORKING			326	Macs 4 Less	30	207	GCC Technologies	266/267	PERSONAL		
65	Dayna Communications	145	385	Saleware Insurance Agency, Inc.	197	205	GCC Technologies	259/260	213	MacFriends	—
62	Palomar Software	228	DIGITIZERS/SCANNERS			209	GCC Technologies	278/279	242	MECA Software	—
40	Technworks	268	22-23	Agla Scanners	83	10-11	Hewlett Packard	—	92	Kent Marsh, Ltd.	225
PERSONAL			60-61	Caere	162	231	Hewlett Packard	—	383	Secure-It	239
213	MacFriends	—	78-79	Epson America Inc.	—	219	LaserMaster	43	294	Software Security	95
242	MECA Software	—	81	Epson America Inc.	—	336-337	Mac Center	—	63	Trend Micro Devices	203
SECURITY			50-51	Expervision, Inc.	170	227	NEC Technologies	17	STATISTICAL		
92	Kent Marsh, Ltd.	225	232	MacDirect	58	334	Printer Connection	55	112	Abacus Concepts, Inc.	19
383	Secure-It	239	246	Microtek Lab, Inc.	146	101	Tektronix	143	282	Data Desk	108
294	Software Security	95	6-7	Mirror Technologies	125	84-85	Texas Instruments	313	88	National Instruments	250
63	Trend Micro Devices	203	261	Screen USA	35	13	Xante Corp.	1	DISPLAY		
STATISTICAL			225	Wacom	—	237	Xante Corp.	2	46-47	E-Machines	303
112	Abacus Concepts, Inc.	19	DISPLAY			VIDEO			312-313	Express Direct	81
282	Data Desk	108	46-47	E-Machines	303	12	Canon USA	110	ADVERTISER INDEX		
88	National Instruments	250	312-313	Express Direct	81	295	Computer Care	73/76	INDEX		



- FREE 2-year Warranty
- FREE Data Recovery
- FREE Technical Support



\$549
PLI Infinity 44 Removable
comes with cartridge
PLI 88 Removable \$639



\$1,395
PLI Infinity Optical 3.5"
128MB on one 3.5" cartridge
30-Year Warranty on cartridge!



\$349
PLI Infinity Floptical
21 MB on one 3.5" floppy disk

PLI MiniArrays
Lightning fast data transfer • Available in
240MB to 4GB capacities • Includes
Free QuickSCSI • Call for best pricing.

WE CARRY THE FULL LINE OF
PLI STORAGE DEVICES

AUTHORIZED DIRECT PLI
RESELLER

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 PLI before returning. All warranties on
Microsoft or Apple brand products sold by Express
Direct will be honored by Express Direct or its authorized
agents only. All other manufacturer's warranties still apply.

CALL EXPRESS DIRECT
800-535-3252

Express Direct is the Mac- Call us for the Best Price, Comp



NewGen Turbo PS/400p \$1,675

Canon engine • 35 Fonts • RISC PostScript
Processing • 3MB RAM, expandable to 16MB
• PC-Mac autoswitching



400 dpi



"Superior
image quality"
—MacUser, Sept '92



**NewGen
Turbo
PS/ 300p**
Canon
Engine • 35
Fonts

\$1,225

600 dpi • 11"x17"

Introductory Price!



New!

NewGen Turbo PS/660 B • RISC
• 8ppm • Canon engine • Ethernet & SCSI ports
• PC-Mac autoswitching • 35 fonts • 6MB RAM

100% Compatibility Guaranteed

All Newgen Printers are guaranteed to
be fully compatible with your system.
Call for details.

800 dpi **\$3,195**

NewGen Turbo PS/880 • Canon engine
• RISC Processor • SCSI & Ethernet ports
• 12MB RAM • 35 fonts • PC-Mac autoswitching

AUTHORIZED DIRECT NEWGEN RESELLER

Apple Macs

Mac IIsi, 3/40	\$1,195
Mac IIfx, 5/0	\$2,145
NEW Mac IIfx, 4/80	NEW
Mac Quadra 700, 4/0	\$3,395
Mac Quadra 950, 4/0	CALL
Mac PowerBooks	CALL

We specialize in Custom Configurations



All Macs aren't created equal.
We install PLI internal drives
complete with 2-5yr warranties.



4MB Ram, 105 MB PLI HD • E-Machines T16 II; 16"
display with accelerated 24-bit color card • Apple ext. keyboard
• NewGen 11x17" laser printer • UMax 600dpi color scanner
• PLI 44MB removable **Complete System \$11,995**

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)



**IN STOCK!
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 ExpressCare 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

**Special
Price!**



FREE
Calera WordScan
OCR Software
\$295 Value

Umax UC630 Color Scanner
600 dpi • 24-bit • Color, Black/White &
Grey Scale • Includes full Photoshop

**NEW!
800 dpi**



\$1,495

Umax UC840 Color Scanner
800 dpi • 24-bit • Color, Black/White &
Grey Scale • Includes full Photoshop



\$2,895

Umax 1200S Color Scanner
pictured with optional transparency option
1200 dpi • One Pass design • 30-bit
• Includes full Photoshop

Umax Transparency Option
User-installable option for high-resolution
scanning of slides, transparencies and
x-rays • Works with
UC630, UC840 &
1200S

Call

**AUTHORIZED DIRECT UMAX
RESELLER**

Express Hours (central time):
M-F 8am-7pm; Sat 10am-2pm
24hr Fax, 7 days/week

**EXPRESS
DIRECT**

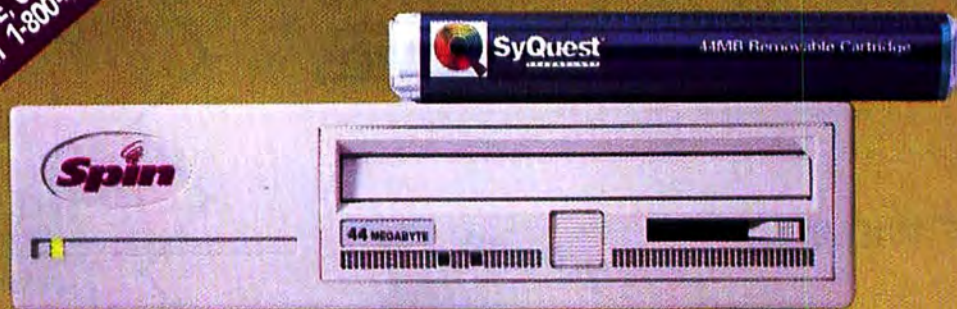
"The Mac Systems Company"

800-535-3252

**International Orders Shipped Daily
FAX 312.549.6447**

Circle 81 on reader service card

YOU WON'T FIND A BETTER DRIVE, OR A BETTER
VALUE, ANYWHERE. CALL US AT 1-800-466-1200.



44MB removable SyQuest® drive. With cartridge (a \$61 value).
88MB Syquest Drive: \$499 2-year warranty. Additional cartridges: 44MB, \$61. 88MB, \$99.

\$399



	40MB	105MB	210MB	425MB	870MB	1.2 GB
	Quantum ELS	NEC D3856	Maxtor 7213	Quantum Pro	Toshiba MK-438	Toshiba MK-538FB
Internal Hard Drive	\$199	\$299	\$479	\$929	\$1,179	\$1,479
External Hard Drive	\$289	\$379	\$539	\$999	\$1,249	\$1,549

MEGABYTES AT EASY-TO-SWALLOW PRICES.

Have you heard the one about the peripherals manufacturer who decided to start a price war? Guess who wins. You do.

You get top-quality removable SyQuest hard drives, cartridge included. Or hard drives with industry-acclaimed drive mechanisms. Plus great customer service. And a 30-day, money-back, no-questions-asked guarantee. No joke.

Just call 1-800-466-1200, 9 to 9 Eastern. Kind of makes the idea of buying anywhere else seem laughable, doesn't it?



To Order Call:
1-800-466-1200
FAX: 1-617-965-6257

Spin™
PERIPHERALS

GUARANTEED LOWEST PRICES!

**Over
2,500
items
in stock**

**THIS MONTH'S
SPECIALS**



Dr. Mac is your **best mail order source** because we offer you the lowest prices, overnight delivery and money back guarantees. We guarantee overnight delivery to every address in the continental U.S.A.* If you don't get your in-stock order the next day, **we pay the shipping!** If you are not 100% satisfied with the products you purchased, return within 30 days for a full refund. Please ask if the item you wish to purchase carries a money back guarantee when you order (see policies for details). Let Dr. Mac take care of all your Macintosh needs.



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!**



MORPH 1.1

Morph™ smoothly transforms one image into another, creating dazzling images and effects. Whether it is last year's car model turning into this year's, or a futuristic cyborg villain disguising itself as the valiant heroine, this effect has astounded audiences all over the world. It's fast, easy-to-use, and is also QuickTime-savvy and System 7 savvy. Item # GR910



PUBLISH IT! EASY 3.0

Includes page layout, word processing, graphics, and typesetting tools, within a built-in database/mail-merge program, and exclusive slide-show feature. New features for the upgrade are support for upgrade tags; multiple ruler guides; the ability to change specifications on grouped objects; an expanded tool palette with new tools for drawing grids diamonds, arcs, Bezier curves, radial spokes, and other shapes; and graduated fills for rectangles. The upgrade also offers support for color TIFF images, with image control for greyscale and color PICT2 and TIFF images. Item # T134-801.



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



MACINTAX

Now even complicated tax returns are easy. Only MacIntax has EasyStep, a revolutionary new tax preparation system that leads you through your tax returns from start to finish, guiding you every step of the way. MacIntax includes over 90 forms, schedules, and worksheets, complete IRS instructions, tax help in plain English, itemizations, and EasyStep. You can print an IRS approved form on most printers. State versions available.



THE ETHERBRIDGE SERIES

Sonic Systems' family of products makes Ethernet Easy! Three software packages which allow Macs & LocalTalk devices to be easily hooked up to the Ethernet network with no additional Ethernet hardware. The series includes PowerBridge, LaserBridge, and SuperBridge. **The Diskless Mac (TDM)** allows Mac to boot remotely over an Ethernet network-no hard or floppy disks needed. (Sold in 5 packs) **RADAR** is a complete network administration program featuring asset management, software updating, and network alarms. We also carry Sonic's full line of other quality Ethernet products - call 1-800-825-6227 for details.



MACINTERCOMM

MacIntercomm is the only telecommunications program with true multitasking that offers completely invisible file transfers no matter what else you do on your Mac. A scripting language of unprecedented power with automatic script recorder automates even the most complex tasks. MacIntercomm defines a new standard in telecommunications. Item # MERC10.



SMARTCOM II 3.3

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.



TYPEREADER 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

**CALL NOW
FOR YOUR
FREE
CATALOG!**



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 RA# before return. Retain original packaging. Restocking fee may apply. Low price guarantee good at time of purchase only.

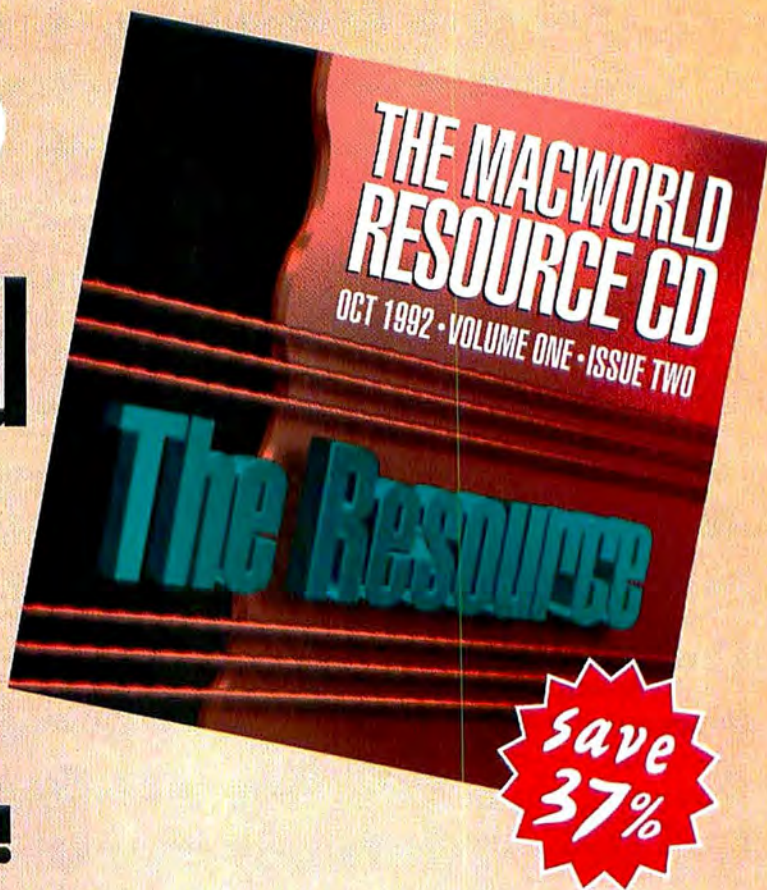
Circle 177 on reader service card
Fax: (818) 504-9380 or (818) 504-2159
11050 Randall Street, Sun Valley, CA 91352 • (818) 504-1800

Dr. Mac
1-800-825-6227
Visit our booth at MacWorld Expo - Moscone #443

CALL DR. MAC 1-800-825-6227

Try Before You Buy!

Special Charter Subscription Offer!



When was the last time you bought a new car without taking a test drive? Too risky, right? So why should you spend hundreds, maybe thousands, of dollars on the purchase of your Macintosh® products without trying them out first?

You shouldn't.

You want to view demos. Print literature. Compare product features. And work with **FREE** trial software.

That's why Macworld CD Ventures™ has introduced an intelligent new way to make your purchasing decisions easier. We'll let you "kick the tires" before you buy with **The Macworld Resource CD.™**

The Resource is a high-tech consumer toolkit complete with trial software, product demonstrations and printable information from top Macintosh hardware and software companies.

Call toll-free for faster delivery!
1-800-631-1700 ext. 101

If you buy Macintosh products, The Macworld Resource CD is for you. Take advantage of our Special Charter Subscription Offer and subscribe today. You save over 37% off the single edition price of \$19.95.

☐ **YES!** Please send me a one-year (4 quarterly CDs) *Macworld Resource CD* subscription for only \$49.95.

☐ **YES!** Please send me the Fall '92 edition of *The Macworld Resource CD* for only \$19.95.

Name

Company

Address

City/State/Zip

☐ Payment Enclosed ☐ M/C ☐ Visa

Card Number Exp. Date

Signature

Clip and return to: **Macworld CD Ventures,
P.O. Box 105443, Atlanta, GA 30348-5443**

Note: GA, NJ, CA and IL residents add applicable sales tax. Special Shipping and Handling: Residents of Mexico add \$5 for single issue order and \$20 for one-year subscription. Residents of Canada add \$5 plus \$1.75 GST for single issue order and \$20 plus \$4.90 GST for one-year subscription. Foreign residents add \$12.50 for single issue order and \$50 for one-year subscription.

Payment must be made by check, money order, Visa, or MasterCard.

The Resource features:

TECH REPORT: The first QuickTime™ "TV Program," a 30-minute interactive show on the latest technology trends.

PRODUCTWORLD: Your interactive consumer toolkit. Get detailed product literature; run interactive demos; get "hands-on" with trial software.

THE DIRECTORY: An up-to-date, comprehensive database of thousands of Macintosh products.

The Macworld Resource CD. Employing the latest multimedia technology. Delivering the hottest products for your personal evaluation. Bringing you the power to make informed buying decisions. Subscribe to **The Resource** today.



Circle 217 on reader service card

THE MAC SOLUTIONS HOUSE

ADVANCE BUSINESS CENTER

HOURS (Pacific Time):
Mon-Fri. from 6:00 AM
Saturday 9am to 2pm

1 (800) 723-8262

SERVICE

- Member of the Better Business Bureau
- Toll-Free Ordering & Technical Support
- Express Delivery Available anywhere in the world
- Once you place your order, your system will be configured to YOUR needs, then burned in and tested before shipped
- Education, Government & Technical P.O.'s Accepted



SUPPORT

- All Peripherals backed by a 30-Day satisfaction money-back guarantee (see details at bottom)
- TWO-YEAR Service Plan Available: 72-Hour Express Repair 1st Year/ + a 2nd Year Extended Warranty
- Buy with Confidence, as ABC is a strong, rapidly growing company with both Mac & PC experience



SALES & FINANCING

WE ARE THE MAC SALES, FINANCING AND LEASING EXPERTS. FOR PERSONAL FINANCING OR BUSINESS LEASING, CALL US FIRST!

THREE GREAT REASONS TO LEASE FROM ABC:

1. LEASING IS TAX DEDUCTIBLE
2. LEASING PROTECTS FROM OBSOLESCENCE
3. 24-HOUR APPROVALS IN MOST CASES



MASS MICROSYSTEMS



MM DATAPAK 45.....	\$ 495
44MB SYQUEST REMOVABLE CARTRIDGE DRIVE w/2 YEAR WARRANTY	
MM DATAPAK 88.....	\$ 619
88MB SYQUEST REMOVABLE CARTRIDGE DRIVE w/2 YEAR WARRANTY	
MM DIAMOND DRIVE 1000.....	\$ 2159
1 GIGABYTE HIGH PERFORMANCE DRIVE	
MM DIAMOND DRIVE 1500.....	\$ 2759
1.5 GIGABYTE HIGH PERFORMANCE DRIVE	
MM DATAPAK MO/650.....	\$ 2990
650MB Removable OPTICAL cartridge drive	
MM DATAPAK MO/128 (128MB OPTICAL CARTRIDGE DRIVE).....	\$ 1459
MM FLOPPYPAK 21.....	\$ 429
Stores 21 MegaBytes of Data on a single 3.5" Floppy-Sized Cartridge	

Mac Systems



APPLE MAC
QUADRA 700
SUPER SYSTEM

\$249 mo.*

Quadra 700 w/8MB RAM, 120 MB HD, E-Machines T16II Color Monitor & 24-Bit Color VRAM, NewGen 400 DPI Laser Printer, Ext. Keyboard, Relisys 600 DPI Color Scanner, Mass Micro 44MB Syquest Drive, and Quark XPress & Adobe PageMaker Software, Bundled w/Symantec GreatWorks, Norton Utilities, Maxa Snooper & Drive 7 Software



APPLE NEW!
POWERBOOK 180

- PowerBook 180 (32MHz, Math Co-Processor, 4MB RAM, 80MB Hard Drive)
- 16 Gray Scale ACTIVE MATRIX Screen
- Bundled w/Symantec GreatWorks, Norton Utilities, Drive 7 & Maxa Snooper Software

\$4299/\$161 mo.*

ALL ARE BUNDLED WITH SYMANTEC GREATWORKS,
NORTON UTILITIES, DRIVE 7 & MAXA SNOOPER

APPLE Mac LC II 4/40.....	\$ 1295/\$ 53 mo.*
APPLE Mac IIx 5/211.....	\$ 2969/\$ 111 mo.*
APPLE NEW! Mac IIx 5/120.....	\$ 3119/\$ 117 mo.*
APPLE Mac PowerBook 145 4/80.....	\$ 2595/\$ 97 mo.*
APPLE NEW! Mac PowerBook 160 4/80.....	\$ 2880/\$ 108 mo.*
APPLE NEW! Mac PowerBook DUO 210 4/80.....	\$ 2330/\$ 88 mo.*
APPLE Mac Quadra 700 4/340.....	\$ 4399/\$ 165 mo.*
APPLE Mac Quadra 950 8/510.....	\$ 6795/\$ 254 mo.*



E-MACHINES

T16 IIMR COLOR MONITOR

\$1794

Highly Rated 16" Multi-Res. Trinitron Color Monitor



NEWGEN PS 400P
400 DPI Laser Printer

\$1650/
\$ 62 mo.*

NEWGEN PS 880
800 DPI Laser Printer

\$2995/
\$112 mo.*

MAXA NEW! SNOOPER 2.0



\$109

Snooper 2.0 & Virex

\$139

Snooper 2.0 & Virex w/NUBUS diagnostics Card

COMPREHENSIVE DESKTOP DIAGNOSTICS KIT

- Revolutionary new standard for Mac Diagnostic and testing tools • Checks your hardware and identifies any problems • New version bundled with VIREX!
- Available with and without NuBus Board



RELISYS SCANNERS

RELISYS 600 DPI COLOR SCANNER.....\$ 1095/41 mo.*

- 3 Pass, 24-Bit Color Scanner with Excellent Innovations
- Uses Proprietary COLD-LAMP Technology:
 - Shortens Warm Up Time
 - Eliminates cooling fans for Increased Reliability & Accuracy
 - Provides Accurate, Dust-Free Scanning
 - Automatically turns off lamp when not in use (extends Life of Optics & Saves Operating Costs!)
- Includes ADOBE PHOTOSHOP SOFTWARE

RELISYS 800 DPI COLOR SCANNER.....\$ 1395/53 mo.*

CALL ABOUT PRICES ON SHEET FEEDERS!



HP NEW!! COLOR
DESKWRITER 550 C

\$749

HP DESKWRITER.....\$ 399

SEIKOSHA MAC PRINTER

ImageWriter II Compatible.....\$ 245

Ask About New Wide carriage Model Too!

SEIKO INSTRUMENTS



SEIKO CM 1445 14"
Trinitron Color Monitor
\$ 475

SEIKO PERSONAL COLORPOINT PSE



Twice as Fast as the HP XL 300 PS, and Cost per Copy up to 6 Times Cheaper! High Quality Color Printer prints Presentation Quality output on High Quality Plain Paper & on Transparency Film Smear-Free.
\$ 2995/112 mo.*

C.O.D. ORDERS: ADD \$5.00 on Federal Express. Money Orders & Cashier's Checks are accepted, no company or personal checks please. Shipping: Please Call for Shipping methods and rates. California residents (only) add 8.25% for sales tax. Mail Orders: Please send money orders or cashier's check for faster service. Allow 10 days for personal checks to clear. If ordering by credit card, include expiration date & billing address. Return Policy: 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 opened and used Printers and Computers. No Returns on Opened Software packages. No Refunds on Freight. Conditions: Prices are subject to change without notice. All items subject to availability. We reserve the right to refuse to sell to anyone. Credit Cards: We accept Visa, MasterCard, American Express and Discover. Not responsible for typographical errors. All information presented believed accurate at time of printing. Information subject to change without notice.

1 (800) 723-8262

FOR INTERNATIONAL SALES
CALL: (310) 325-2687

(800) 723-8262 / (800) 274-7747
(310) 325-1422 / Fax: (310) 325-4073
23510 Telo Ave. #5, Torrance, CA 90505

ADVANCE BUSINESS CENTER

Circle 227 on reader service card

FEATURING



SyQuest®
REMOVABLE
TECHNOLOGY

ClubMac 44mb	SQ555	Actual MAC Capacity: 42mb	\$398
ClubMac 88mb	SQ5110	Actual MAC Capacity: 84mb	\$498
ClubMac Dual 44mb			\$749
ClubMac Dual 88mb			\$919
ClubMac Dual 44mb & 88mb*			\$889
Internal 44mb for Quadra 900 / 950			\$388
Internal 88mb for Quadra 900 / 950			\$488
44mb Cartridge	(10 pack-\$62 each)		\$64
88mb Cartridge	(10 pack-\$96 each)		\$99

SyQuest Drives include a TWO Year Warranty, one cartridge & necessary cables, SCSI Director™ v.2.4 Formatting Utility. * Includes (1) 44mb & (1) 88mb cartridge • SyQuest Cartridges carry a ONE Year Warranty.

**NOW
AVAILABLE**
SyQuest Drives
for
Quadra 900/950



**New
Pro Drives**

Quantum

Unformatted Capacity	Model	Average Access	Actual MAC Capacity	Internal	External
Go Drives 2.5" Low Profile for PowerBooks					
80mb	GO*80	17ms	80mb	\$329	\$429
120mb	GO*120	17ms	120mb	\$459	\$559
ELS Drives 3.5" Low Profile & Low Power					
42mb	ELS42	19ms	40mb	\$185	\$245
85mb	ELS85	17ms	82mb	\$249	\$309
127mb	ELS127	17ms	124mb	\$329	\$389
170mb	ELS170	17ms	160mb	\$359	\$419
LPS Drives 3.5" Low Profile & High Performance					
240mb	LPS240	10ms	234mb	\$549	\$609
525mb	LPS525	10ms	525mb	\$1089	\$1149
PRO Drives 3.5" High Capacity & Performance					
425mb	PRO425	19ms	406mb	\$899	\$959
700mb	PRO700	10ms	700mb	\$1279	\$1339
1.0GIG	PRO1050	10ms	1.0GIG	\$1569	\$1629
1.2GIG	PRO1225	10ms	1.2GIG	\$1749	\$1809

ELS, LPS, and PRO drives have a TWO Year Warranty. GoDrive have a ONE Year Warranty.

**5 YEAR
WARRANTY**

FUJITSU

Unformatted Capacity	Model	Description		Actual MAC Capacity	Internal	External
425mb	M2623SA	3.5" Half Height	9ms	405mb	\$899	\$1029
520mb	M2624SA	3.5" Half Height	9ms	496mb	\$1029	\$1095
1.2GIG	M2266	5.25" Full Height	14.5ms	1029mb	\$1589	\$1689
2.0GIG	M2652	5.25" Full Height	14.5ms	1.6GIG	\$2585	\$2685

NEW!

CONNER

Unformatted Capacity	Model	Description		Actual MAC Capacity	Internal	External
85mb	CP30080E	3.5" Low Profile	17ms	82 mb	\$239	\$299
120mb	CP30100	3.5" Low Profile	19ms	116 mb	\$319	\$379
170mb	CP30170E	3.5" Low Profile	9ms	160 mb	\$339	\$399
212mb	CP30200	3.5" Low Profile	9ms	206 mb	\$469	\$529
540mb	CP30540	3.5" Low Profile	8.5ms	515 mb	\$1095	\$1155

ClubMac OPTICAL Drives

Model		Capacity	Description	Seek	External
CMO-OD3000	Teac	128mb	3.5" Half Ht	45ms	\$1049
CMO-LF3004	Panasonic	128mb	3.5" Half Ht	45ms	\$1169
CMO-3100E	Ricoh	128mb	3.5" Half Ht	45ms	\$1249
CMO-3051E	Ricoh	594/652mb	5.25" Full Ht	28ms	\$2695
CMO-5030E2	Ricoh	594/652mb	5.25" Full Ht	66.7ms	\$2149
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.

Maxtor

Price Point
and
Performance



Unformatted Capacity	Model	Description		Actual MAC Capacity	Internal	External
120mb	7120XT	3.5" Low Profile	15ms	121mb	\$315	\$375
207mb	7213	3.5" Low Profile	15ms	202mb	\$475	\$535
330mb	LXT-340	3.5" Half Height	15ms	324mb	\$675	\$735
535mb	LXT-535	3.5" Low Profile	12ms	510mb	\$999	\$1059
645mb	XT-8760S	5.25" Full Height	16.5ms	639mb	\$1229	\$1329
1.2GIG	PO-12S	5.25" Full Height	13ms	997mb	\$1519	\$1619
1.7GIG	PO-17S	5.25" Full Height	13ms	1433mb	\$1759	\$1859

Maxtor 3.5" Drives include a ONE Year Warranty.
Maxtor 5.25" Drives include a TWO Year Warranty.

Seagate

ELITE SERIES



Unformatted Model Capacity	Description				Actual MAC Capacity	Internal	External	
645mb	ST4767N	5.25"	Full Ht	W-R II	11.9ms	634mb	\$1529	\$1629
1.2GiG	ST41200N	5.25"	Full Ht	W-7	15ms	989mb	\$1579	\$1679
1.6GiG	ST41651N	5.25"	Full Ht	W-8	15ms	1350mb	\$1919	\$2019
2.1GiG	ST42100N	5.25"	Full Ht	W-9	12.9	1900mb	\$2149	\$2249
1.6GiG	ST41600N	5.25"	Full Ht	Elite-1	11.5ms	1307mb	\$2089	\$2189
2.4GiG	ST42400N	5.25"	Full Ht	Elite-2	11ms	2050mb	\$2969	\$3069
3.4GiG	ST43400N	5.25"	Full Ht	Elite-3	11ms	2750mb	\$4149	\$4249

Seagate Drives include a ONE Year Warranty.

TAPE BACKUP Systems

Bundled with
RetroSpect v.1.3c
Backup Software



Capacity	Model	Description	Media	Internal	External
155mb	Teac MT2ST/N50	Analog	CT600N	\$459	\$489
600mb	Teac MT2ST/F50	Analog	CT600F	\$669	\$699
2.0GIG	ARDAT	DAT, DDS	4mm	\$1219	\$1249
2.0GIG	WangDAT 1300XL	DAT, DDS	4mm	\$1299	\$1329
3-5GIG	WangDAT 3200	DAT, DDS-DC	4mm		\$1549
2.0GIG	HP 35470A	DAT, DDS	4mm	\$1349	\$1389
3-5GIG	HP 35480A	DAT, DDS-DC	4mm	\$1539	\$1569
2.2GIG	Exabyte EXB-8200	Digital/Helical	8mm		\$1949
5.0GIG	Exabyte EXB-8500	Digital/Helical	8mm		\$2999

Includes RetroSpect v.1.3c Backup Software, One Tape and ONE Year Warranty

NEW
Lower Prices

DAYSTAR
DIGITAL



PowerCache

(Classic, SE, LC, SE/30, II, IIfx, IIsi, IICI)

	w/o FPU	w/ FPU		
16 MHz PowerCache	\$399	\$459	FastCache IIsi	\$279
33 MHz PowerCache	\$539	\$659	FastCache IIsi with 68882	\$349
40 MHz PowerCache	\$749	\$909	FastCache IICI	\$215
50 MHz PowerCache	\$1079	\$1319	FastCache 040 (Q700/900)	\$259
Equalizer LC	\$169	\$239	FastCache 040 (Q700/900/950)	\$399
PowerCache Adapter	\$40		DualPort IIsi	\$165
			PowerMath LC	\$115
			33MHz Turbo 040	\$Call

*PowerCache Adapter not included

ASANTÉ Networking

MACCON+ 64K Thick/Thin or Thick/10BaseT	\$159
MACCON 3 64K Thick/Thin/10BaseT (Most MACs)	\$209
Friendly Net Adapter Thick or Thin or 10BaseT	\$79
EN/SC10T SCSI Ethernet with 10BaseT	\$249
EN/SC10TPB SCSI Ethernet with 10BaseT for PowerBooks	\$309
EN/SC SCSI Ethernet w/ Thick, Thin, 10BaseT	\$349
EN/SCPB SCSI Ethernet w/ Thick, Thin, 10BaseT for PowerBooks	\$285
10THub - 12 port 10BaseT Hub / 8 port 10BaseT	\$499 / \$249
12 Port Smart Hub	\$Call for Pricing and Options

Farallon

EtherMac 16K Thick/10BaseT or Thick/Thin NuBus	\$157
EtherMac 64K Thick/Thin/10BaseT Most Macs	\$206
EtherMac 64K Thick/Thin/10BaseT SE30/IIsi	\$237
10THub Starlet 9 Port	\$249

Macintosh Memory

PowerBook 140/170	Quadra 950	Video (Q700/900)
2MB Memory Module \$Call	16mb Module \$Call	256 VRAM \$Call
4MB Memory Module \$Call	256 VRAM \$Call	Macintosh Memory
6MB Memory Module \$Call	Mac IIfx	1mb X 8 - 80ns \$Call
PowerBook 160/180 \$Call	1mb X 8 - 80ns \$Call	2mb X 8 - 80ns \$Call
Duo 210/230 \$Call	4mb X 8 - 80ns \$Call	4mb X 8 - 80ns \$Call
	16mb X 8 - 80ns \$Call	16mb X 8 - 80ns \$Call

Modems

PSI		
PowerModem (24/96/48 S/R fax modem)	\$135	
PowerModem II (24/96/96 S/R fax modem)	\$235	
PowerModem III / IV	\$339 / \$419	
Global Village (for PowerBooks)		
PowerPort Bronze (24/96 S/R fax modem)	\$195	
PowerPort Silver (96/96 S/R fax modem)	\$365	
PowerPort Gold (14,400 S/R fax modem)	\$429	
TelePort Bronze/Silver/Gold	\$199/\$349/\$435	
Supra FAXmodem	\$339	

Scanners

MICROTEK		
ScanMaker II	\$889	
ScanMaker IIXE	\$1185	
EPSON		
ES-600C	\$1139	
ES-800C	\$1429	
Auto. Doc. Feeder	\$429	
Transparency Option	\$739	



Graphic Displays

SuperMatch 20" Multimode Trinitron	\$2525
SuperMatch 20" Color	\$1515
SuperMatch 17" Trinitron	\$1089
21" Platinum (Black and White)	\$999
Platinum 20 Full-Page	\$929
Digital Video Boards / Acceleration	
Video Spigot (NuBus / IIsi / LC)	\$379/\$339/\$255
VideoSpigot Pro (NuBus or IIsi)	\$1095
Spigot and Sound NuBus / Pro	\$489 / \$1179
ThunderStorm	\$845

Graphic Cards

Thunder/24	\$2345
Thunder/8	\$1169
Spectrum/24 Series III	\$839
Spectrum/24	\$755
Spectrum/24 Accelerator	\$419
Spectrum/8-24 PDQ	\$829
Spectrum/8 Series III	\$419

Graphic Cards*5 Year Warranty
Graphic Displays*3 Year Warranty

RASTEROPS
THE ART & SCIENCE OF COLOR™



Color Display Adapters

RasterOps 24XLI	\$1939
PaintBoard 24 / Li	\$1549 / \$299
RasterOps 8XLI / 8XL	\$929 / \$465
RasterOps 24Mx / MxQ	\$1165
RasterOps 24Sx	\$619
Multimedia	
RasterOps 24XLTV	\$2699
MediaTime	\$1549
RasterOps 24STV	\$779
RasterOps VideoTime	\$1165

Graphic Displays

CorrectColor/20T MultiScan	\$3965
21" Color (2168)	\$2679
20 Multimode Color (2085H)	\$1345
20T MultiScan Trinitron (2075M)	\$2599
21" Mono/Gray Scale (2110)	\$999
15" Mono/GS Portrait (1510)	\$505
ClearVue/SD21 (2570)	\$1399
16" Sweet 16 Color (1649)	\$1165



NEC

Model 95	\$1379
Model 95FX (with FAX)	\$1859
Model 97	\$1749
Model 97FX (with FAX)	\$2199

NEC Silentwriter Model 95 / 97 Features:

- Adobe PostScript Level 2 • 6 ppm (Model 97 • 10 ppm) • 300 dpi • 35 fonts
- 2 MB RAM standard • Auto Interface Monitoring • AppleTalk, Serial & Parallel



MultiSync Monitors

MultiSync 3FGx (15")	\$629
MultiSync 4FG (15" with AccuColor)	\$759
MultiSync 5FG (17" with AccuColor)	\$1315
MultiSync 6FG (21" with AccuColor)	\$2399
Mac FG 8X / 24X Interface	\$659 / \$1235



CDR-74 Gallery Bundle	\$799
CDR-74 with Mac Interface	\$599
PC Bundles Available	
CDR-74 PC Gallery Bundle	\$799
CDR-74 with PC Interface	\$599



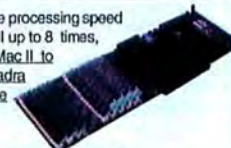
CDR-25 Express Bundle	\$395
PC Bundles Available	
CDR-25 PC Express Bundle	\$395



6 NEW
Gallery
Titles

radius

Increase the processing speed of the Mac II up to 8 times, allowing a Mac II to exceed Quadra performance



Accelerators

Radius Rocket 25i	\$1199
Radius Rocket	\$1599
Radius Rocket 33	\$1999
RocketShare	\$419
SCSI-2 Booster	\$249
Radius Displays	
Color Display/21	\$2979
PrecisionColor/20	\$2385
PrecisionColor/19	\$2089
PrecisionColor Pivot	\$Call
Full Page Display	\$579
Two Page Display/19	\$899
Two Page Display/21E	\$1335

Radius Video Cards

VideoVision	\$1929
PrecisionColor 8 Interface	\$499
PrecisionColor 8X Interface	\$729
PrecisionColor 8XJ Interface	\$495
PrecisionColor 24X Interface	\$1629
PrecisionColor 24XP Interface	\$495
PrecisionColor 24XK Interface	\$829
Color Pivot Interface	\$505
Mono. Pivot Interface	\$249
Two Page Display Interface	\$395
PowerView	\$499

Warranties...

- 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 specified.

Returns...

- 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.

ClubMac

MACWORLD EXPOSITION

1-800-258-2650

Booth #3677

VISIT US AT
MACWORLD EXPOSITION
MOSCONE CENTER, SAN FRANCISCO
JANUARY 6-9, 1993

Sales, Info (714)768-8130
Tech Support (714)768-1490
24 Hr Fax Line (714)768-9354
3 Musick • Irvine, CA 92718

1-800-258-2650

1-800-258-2650

1-800-258-2650

Video Boards, Monitors and Packages

20" Trinitron
\$1,799
Monitor Only



Complete Packages:
256 Color - \$1,999
16 Million Color - \$2,649

Fantastic value! 20" Trinitron multi-sync flat screen color monitor with micro-processor control and video adjustments - self-calibrates to most any video input. State-of-the-art design. Tilt and swivel base. Full one-year parts and labor warranty.

20" Sampo Grayscale
Includes 20" Monitor, 8-Bit Video Board, & Cable Complete!



\$799
Monitor Only \$599

Special Value! An affordable high quality, 20 inch grayscale monitor package - complete - for less than \$800! The Sampo 20" OfficePro II grayscale is featured by many "major brands" for hundreds more! Why pay extra! If you are not satisfied we will give you your money back!

14" Color Monitor \$359 • 14" Color Package \$499

- 14" Color Monitor Only 359
- 14" Color Monitor - 256 Color Package 499
- 20" Grayscale Monitor Only - Sampo 599
- 20" Grayscale - 256 Package - NuBus 799
- 20" Grayscale - 256 Pkg.- LC, LCII, SE/30 .. 999
- 20" Grayscale Monitor Only - Ikegami 799
- 20" Grayscale - 256 Package - NuBus 999
- 20" Grayscale - 256 Pkg.- LC, LCII, SE/30 1,199
- 20" Trinitron Monitor Only 1,799
- 20" Trinitron - 256 Color Package 1,999
- 20" Trinitron - 16 Million Color Pkg. 2,649

We feature RasterOps Products **RASTEROPS**

- PaintBoard 24 .. 1,529 PaintBoard LI 829
- 24STV 789 8XL 479
- ClearVue/Classic .. 229 ClearVue/SE 329
- ImagePak Still Compression 319

Call for up-to-date prices and information on product additions!

Rewritable Optical Drives



as low as...

\$1,499
600 Meg. ISO Optical

- Industry Standard - ISO Certified
- Macintosh - IBM - SUN Compatible
- Low Cost - High Performance

Large, fast and affordable. We offer a variety of solutions for your large capacity data storage needs. 110220 VAC.

- 600 Meg. Ricoh ISO 5030E-I 1,499
Wholesale prices - limited quantity!
Lowest cost per megabyte - 67 ms. average access.
- 600 Meg. Optimum ISO Model 750 1,799
Premium Quality at Low Cost - 60 ms. average access.
- 600 Meg. Ricoh ISO 5030E-II 2,199
Lowest cost per megabyte - 67 ms. average access.
- 600 Meg. Ricoh ISO 5031E New! 2,699
High performance - 35 ms. average access.



128 Meg. Optical
Macintosh & IBM compatible **\$1,149**

Each 3-1/2" erasable optical cartridge holds over 120 megabytes of data! The Sierra MO (shown) is ideal primary or backup storage device for IBM or Macintosh personal computers. Complete package - includes SCSI cable, Mac software, and external power supply. Specify 110 or 220 VAC.

- Includes media, software & cables!
- 128 Meg. Ricoh ISO 1,299
- 128 Meg. Epson ISO 1,149
- 128 Meg. Cartridge - Each 39
- 128 Meg. Cartridge - 10 Pack 349

Modems

- Xebra FAX/Modem 2400/9600 129
v.42bis 9600 bps FAX and 2400 bps modem. Includes QuickLink II Mac software & cable. Hayes compatible, self diagnostics.
- PowerBook Portable FAX/Modem 199
Selectek battery powered v.42bis 9600 bps FAX and v.22bis 2400 bps MNP 5 modem. Includes charger, Mac software and cable.

Supra Modems

All Supra Products have a 5-year Warranty

- Supra Modem 2,400 89
v.22bis 2,400 bps modem. No software or cables.
- Supra Modem 2,400 - MacPac 119
v.22bis 2,400 bps modem (9,600 with data compression). Complete package includes Macintosh software and cable.
- SupraFAX Modem Plus 2,400 199
2,400 bps modem/9,600 send-receive FAX. v.42bis data compression for up to 9,600 bps data in a low-cost package. Includes STI Technologies and MicroPhone software and cable.
- SupraFAX Modem v.32 9,600 299
9,600 bps modem/9,600 send-receive FAX. v.42bis data compression for up to 38,400 bps data. Includes STI Technologies and MicroPhone software and cable. Performance and low-cost!



\$349
SupraFAX Modem v.32bis 14,400 349
14,400 bps modem/14,400 send-receive FAX. v.42bis data compression for up to 57,600 bps data. Includes STI Technologies and MicroPhone software and cable. Complete! Why pay more?

Ethernet



ASANTÉ

- Asanté MacCon3 - 64K 199
The 3-in-1 (Thick, Thin and 10BaseT) Ethernet card for most expandable Macintoshes including the IIx and SE/30. Not available for the LC or LCII.
- Asanté MacCon+ - 64K 159
Economical, 64K high-performance Ethernet for almost every model of Macintosh. Select either Thick/Thin or Thin/10BaseT. The MacCon+ LC, LCII and Ix models have a socket for a co-processor.
- Asanté FriendlyNet Adapters 79
Designed to work with the new Apple Ethernet cabling system - a plug-and-play networking system which makes Ethernet connectivity as simple and easy as LocalTalk.
- Asanté 10BaseT Hub/8 239
An economical way to expand your Ethernet network using unshielded twisted pair wiring (10BaseT). Supports IEEE specifications.
- Asanté 10BaseT Hub/12 479
A more sophisticated and larger version of the Asanté 8-port Hub. The most economical way to expand your Ethernet network using unshielded twisted pair (UTP, 10BaseT). Fully supports IEEE specifications.
- Asanté Print 349



SyQuest Drives

- SyQuest 44 Meg. Cartridge - Each 68
- SyQuest 44 Meg. Cartridge - 10-Pack 619
- SyQuest 88 Meg. Cartridge - Each 109
- SyQuest 88 Meg. Cartridge - 10-Pack 959

2-Year Warranty



Complete System - Includes cables, carrier, and software.
All drives are pretested and are warranted for 24-months. The Relax Mobile is a complete package - all cables and software are included - at no additional charge!

\$399 \$499
SyQuest 44 SyQuest 88

Call for our new Catalog! Over 500 items!

Hard Disk Drives

- | | Internal | External |
|--|----------|----------|
| Seagate 3-1/2" Half Height | | |
| 108 Meg. - ST1133N, 15 ms. | 299 | 359 |
| 240 Meg. - ST3283N, 12 ms. | 569 | 629 |
| 510 Meg. - ST1581N, 14 ms. | 1,139 | 1,199 |
| 5-1/4" Full Height - WREN | | |
| 300 Meg. - ST4350N, 16.5 ms. | 939 | 999 |
| 600 Meg. - ST4702N, 16.5 ms. | 1,339 | 1,399 |
| 1.0 Gig. - ST4120N, 15 ms. | 1,639 | 1,699 |
| 1.4 Gig. - ST41651N, 15 ms. | 1,999 | 2,059 |
| 1.9 Gig. - ST42100N, 12.9 ms. | 2,539 | 2,599 |
| 5-1/4" Full Height - WREN Runner | | |
| 330 Meg. - RUNNER, 10.7 ms. | 1,039 | 1,099 |
| 660 Meg. - RUNNER, 11.9 ms. | 1,439 | 1,499 |
| 5-1/4" Full Height - ELITE Ultra-High Performance | | |
| 1.4 Gig. - ELITE-I, 11.5 ms. | 2,139 | 2,199 |
| 2.1 Gig. - ELITE-II, 11 ms. | 2,939 | 2,999 |
| 3.5 Gig. - ELITE-III, 11 ms. | 3,939 | 3,999 |
| Fujitsu 3-1/2" Half Height | | |
| 425 Meg. - 26235A, 9 ms. | 1,039 | 1,099 |
| 520 Meg. - 26245A, 9 ms. | 1,139 | 1,199 |
| 5-1/4" Full Height | | |
| 960 Meg. - 22665A, 11.5 ms. | 1,639 | 1,699 |
| 1.7 Gig. - 26525A, 11.5 ms. | 2,639 | 2,699 |
| Toshiba 3-1/2" Half Height | | |
| 880 Meg. - MK4308F, 9 ms. | 1,239 | 1,299 |
| 1.2 Gig. - 26245A, 9 ms. | 1,839 | 1,899 |

- | | Internal | External |
|--|----------|----------|
| Conner 3-1/2" Half Height | | |
| 42 Meg. - CP3040, 25 ms. | 239 | 299 |
| 85 Meg. - CP-30080E, 17 ms. | 299 | 359 |
| 120 Meg. - CP-30100, 19 ms. | 359 | 419 |
| Quantum 3-1/2" ELS | | |
| 42 Meg. - ELS42, 19 ms. | 189 | 249 |
| 85 Meg. - ELS85, 17 ms. | 269 | 329 |
| 127 Meg. - ELS127, 17 ms. | 329 | 389 |
| 2-1/2" - "Go-Drive" Series - for PowerBook only | | |
| 80 Meg. - Go-Drive 80, 16 ms. .. | 339 | 399 |
| 120 Meg. - Go-Drive 120, 16 ms. | 499 | 559 |
| 3-1/2" PDS Series | | |
| 1.2 Gig. - PD1225S, 11 ms. | 1,839 | 1,899 |
| Maxtor 3-1/2" Low Profile/Low Power | | |
| 120 Meg. - 7120S, 17 ms. | 339 | 399 |
| 5-1/4" Full Height | | |
| 645 Meg. - XT8760, 16.5 ms. | 1,399 | 1,459 |
| 1.0 Gig. - Panther, 13 ms. | 1,499 | 1,559 |
| 1.5 Gig. - Panther, 13 ms. | 1,799 | 1,859 |
| Hewlett Packard 3-1/2" Half Height | | |
| 400 Meg. - HP2235, 12.6 ms. | 939 | 999 |
| 1.0 Gig. - HP2247, 12.6 ms. | 2,039 | 2,099 |
| 5-1/4" Full Height | | |
| 1.0 Gig. - HP9755B, 13.5 ms. | 1,939 | 1,999 |
| 1.3 Gig. - HP9756B, 13.5 ms. | 2,399 | 2,459 |

CoStar Printers



\$479
CoStar

AddressWriter envelope and label printer

AddressWriter Printer 479
It takes only 15 seconds to print a #10 size envelope using the AddressWriter's 144 x 144 impact dot-matrix print head. Attaches directly to your computer or share on a network with the optional AppleTalk Adapter. Holds 100 envelopes or 200 postcards. The optional label feeder will handle a pin-fed labels for added convenience and value.

- Label Feeder Adapter 75
- AppleTalk Network Adapter 189
- AppleTalk 5-User Site License 139



LabelWriter II Plus
personal label printers

\$199

The LabelWriter II and II Plus use thermal technology to produce high-quality labels. It takes less than 7 seconds to print a label. Attach directly to your computer or share on a network with the AppleTalk Adapter.

- LabelWriter II Mac 199
Handles up to 350 labels per roll. Max label size: 1-1/8" x 3-1/2". Prints one label in 3-1/2 seconds.
- LabelWriter II Plus Mac 299
Handles up to 700 labels per roll. Max label size: 2-1/4" x 4". Prints one label in 3-1/2 to 7 seconds.
- AppleTalk Network Adapter 189
- AppleTalk 5-User Site License 139

Tape Drives

Tape Drives include: media; software; and cables!

- 160 Meg. Tape Vista - TEAC 499
- 250 Meg. Tape Vista - Archive 699

600 Meg. Tape Vista - TEAC 779
"Editor's Choice Award" - MacWorld Dec. '92

- 2.0 Gig. DAT Sierra - R-Byte 1,199
- 2.0 Gig. DAT Sierra - Archive 1,299
- 2.0 Gig. DAT Sierra - Hewlett Packard 1,399
- 2.2 Gig. Tape Vista - Exabyte 1,949
- 5.0 Gig. Tape Vista - Exabyte 3,199
- 8.0 Gig. DAT Sierra - R-Byte (New!) .. 1,399
- 8.0 Gig. DAT Sierra - Archive 1,499
- 8.0 Gig. DAT Sierra - Hewlett Packard 1,599

8.0 Gig. DAT Tape
Transportable backup solution for the Mac. Backup software and tape included!
\$1,599 **hp HEWLETT PACKARD**

510-471-6112
RELAX TECHNOLOGY
3101 Whipple Road
FAX: 510-471-6267
TEL: 510-471-6112

We will BEAT any competitor's price for comparable product - call for details!

Call or FAX for FAST SERVICE! No surcharge for credit cards, terms available for approved accounts. Purchase Orders accepted. We ship via Federal Express.

THE MAX FOR THE LC, LCII, AND PERFORMA 400.

TRANSFORM THE MACINTOSH LC, LC II AND PERFORMA 400
INTO A POWERHOUSE MACINTOSH WORKSTATION.

▶ THREE SLOTS INSTEAD OF ONE

The MAX gives you three true PDS expansion slots. Now you can utilize any combination of accelerators, ethernet cards, multimedia boards and large screen video solutions - all at once.

▶ TWO INTERNAL HARD DRIVES

The MAX offers a second internal hard drive bay that allows installation of low profile and 3.5" half-height hard drives.

▶ ENERGIZE YOUR LC

The MAX adds a supplemental 40-watt universal power supply, more than doubling the Mac LC's power capacity.

▶ PLUG-AND-PLAY

Best of all, The MAX is a breeze to install - just unpack it and stack it. Assembly takes just seconds while the MAX snaps into place.



DGR's MAX SUPPORTS
ALL APPLE-COMPATIBLE PDS
EXPANSION CARDS, INCLUDING:

APPLE IIe EMULATION CARD	ENVISIO
APPLIED ENGINEERING	FARALLON
ASANTÉ	FUSION DATA
DAYNA	LAPIS
DAYSTAR DIGITAL	RASTEROPS
E-MACHINES	RADIUS
	SUPERMAC
	TECHNOLOGY WORKS

\$349

DGR's MAX INCLUDES:

Supplemental 40-watt
Power Supply

Second Internal Hard
Drive Bay

3-slot PDS Expansion

Quite simply, the ability to expand your LC.

In one pure solution, The MAX provides additional power, internal real estate for hard drive expansion, and three slots for any Apple-compatible PDS expansion cards. Imagine adding greater speed, video power and networking capabilities to a low-cost Mac - and that's just the beginning! MAX installation is simply plug-and-play. In just seconds The MAX snaps into place between the Macintosh CPU base and the LC lid. No tools are needed, no parts discarded, and the Macintosh is in no way permanently altered.

Above all else, The MAX is an integrated solution designed to complement the aesthetic of Macintosh computing. Call DGR Technologies, and take your LC to the MAX.

Backed by the DGR Technologies 30-day money-back guarantee, one-year warranty and toll-free technical support. Call toll-free for more information.



ORDER
DIRECT

800-235-9748



DGR
TECHNOLOGIES

To order call TOLL FREE Monday-Friday 8am to 7pm CST. DGR Technologies accepts MC, Visa, Discover, Pre-Paid, & COD Orders.
DGR TECHNOLOGIES 1219 West Sixth, Suite 205 Austin, Texas 78703 • 512/476-9855 • Fax 512/476-6399 • AppleLink: DGR

Circle 53 on reader service card

© DGR Technologies Inc.
Macintosh and Mac are registered trademarks of Apple
Computer Inc. All brands and product names are trademarks
of their respective holders.

DW32

Put Our List On Your List

Our list can help you do the other things you have on your list. Such as buy a car. . . estimate social security. . . start the diet. . . check out investments. . .



Our list is the *Consumer Information Catalog*. It's free and lists more than 200 free and low-cost government booklets on employment, health, safety, nutrition, housing, Federal benefits, and lots of ways you can save money.

So to shorten your list, send for the free *Consumer Information Catalog*. It's the thing to do.

Just send us your name and address. Write:

**Consumer Information Center
Department LL
Pueblo, Colorado 81009**



A public service of this publication
and the Consumer Information Center
of the U.S. General Services Administration

128MB



The Portable Solution

DGR Technologies offers a new solution to hard disk storage with the 128REM Turbo™. This 3.5" 128MB optical drive boasts over a 50% increase in performance over current optical standards, with a seek time of less than one millisecond track to track, and sustainable transfer rate of 768 kbytes/second. In addition, the 128REM Turbo™ offers a new portability, storing 128 megabytes of removable, erasable optical storage on 3.5" disks in a compact external drive format. The small external dimension saves desk space in the office, and easily slides into a briefcase for convenient transport. Ensuring future compatibility, the 128REM Turbo™ conforms to both ANSI and ISO standards for the 3.5" magneto-optical format. All DGR Technologies magneto-optical drives come ready to use – complete with a cartridge, toll-free technical support, and the DGR Technologies one-year warranty and 30-day money-back guarantee. DGR Performance. DGR Reliability. DGR Technologies.

▶ **DGR 128REM Turbo Portable**
128MB Epson Mechanism 768Kb/s
34ms Access. 1ms Short Seek

\$1199

▶ **DGR 256REM**
256MB MOST Mechanism 1.23Mb/s
35ms Access. 12ms Short Seek

\$1699

▶ **DGR Cartridge**
NEW! DGR Technologies 3.5" Data
Storage Cartridges

128MB **\$59**

256MB **\$99**

NEW! Anubis™ driver
software – up to 35%
faster than FWB Hard
Disk ToolKit PE™



DGR Technologies, Inc.

800-235-9748

AppleLink: DGR



To Order Call TOLL FREE Monday-Friday 8am to 7pm CST
1219 West Sixth, Suite 205 • Austin, Texas 78703 • 512/476-9855 • Fax 512/476-6399
We accept MC, Visa, Discover, Pre-Paid, COD, & Wire Transfer Orders.

Circle 286 on reader service card



One Year
Warranty



30-Day Money
Back Guarantee

DW32

MacLand®

HARD DRIVES



Hard Drives

Quantum

INTERNAL

42MB	\$199
85MB	\$299
105MB	\$329
127MB	\$359
170MB	\$399
240MB	\$599
425MB	\$899



MacLand
HARD DRIVE MANUAL



TWO YEAR WARRANTY!

EXTERNAL

42MB	\$279
85MB	\$379
105MB	\$399
127MB	\$429
170MB	\$479
240MB	\$679
425MB	\$999

All MacLand Drives are pre-tested, pre-formatted, and come complete with our own installation and reference manual, DiskMaster Plus™ formatting and utility software, cables and two-year warranty. 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 one-year warranty. Cartridge not included.

44 Megabyte Hard Drives \$379

Cartridges:

10 Pak-ea.

\$62

5 Pak-ea.

\$63

Singles

\$64



88 Megabyte Hard Drives \$449

Cartridges:

10 Pak-ea.

\$92

5 Pak-ea.

\$95

Singles

\$97



Memory

1MB 80ns
\$49

2MB 80ns
\$79

4MB 80ns
\$149

LC/VC II VRAM
upgrade
\$95

Quadra VRAM
upgrade
\$59

Please call
for other upgrades

Removable Hard Drives

Videos

MacAcademy Video Training Tapes

4th Dimension
Accountant Inc.
Canvas 3.0
ClarisWorks
Design & Layout
Dollars & Sense
Excel 3.0
Excel 4.0
FileMaker Pro 1.0
FileMaker Pro 2.0

Font Management
Freehand 3.1
Hypercard 2.0
Illustrator 3.2
Lotus 1-2-3
MacDrawPro 1.0
MacProject II 2.5
MacWrite II
Macintosh 6.0
Macintosh 7.0

MacroMind Director
Microsoft Works
Networking Small
Pagemaker 4.2
Paints & Draws
Persuasion 2.0
Photoshop 2.0
Powerpoint 2.0
QuarkXPress 3.1
Quicken 3.0

Resolve
Superpaint 3.0
System 7
Utilities, CDEV'S & Inits
Wingz 1.1
Word 5.0
WordPerfect

**\$39
each**



Printers

LZR 1560™
\$2,995

- 11" X 17"
- 300 or True 400 Dots-Per-Inch Resolution
- Postscript Level 2
- 15 Pages Per Minute
- RISC-Based Controller
- Dual Bin
- Legal, Letter, Envelopes and Transparencies

LZR™ 960
\$1,495

- Smallest Footprint
- Powerful, RISC- Based Processor
- PostScript Level 2
- "Getting Started" Video Tape
- Legal, Letter, Envelopes and Transparencies
- **2-Year Warranty**



Instant Credit NOW!

With the MacLand Credit Card you can charge your purchases and pay for them in easy monthly installments. Credit applications can be taken over our toll free 800 number. Most applications are approved the same day! Call today and get the details on how to obtain your own personal MacLand Credit Card.



600 X 600 DPI!

NEW!

LZR 965™
\$2,395

- **8 Megs of Ram!**
- Postscript Level 2
- Powerful RISC-Based Processor
- Legal, Letter, Envelopes and Transparencies
- **2-Year Warranty**

Monitors



Orion MacScan Ultra
\$349
One-Year Warranty



Magnavox
\$429
Two-Year Warranty



MacLand
\$399
Two-Year Warranty

Scanners

Microtek:

ScanMaker II **\$899**
ScanMaker IIxe **\$1199**

Relisys:

600 DPI Color Scanner **\$849**
800 DPI Color Scanner **\$1099**

New Products

Limited Time Offer!

From now until Dec. 31, 1992 you can purchase the MLI Cordless Supermouse and Symantec's Norton Utilities for **ONLY \$129!**

Introducing the MLI Cordless Supermouse!

- Cordless Design
- Pin Point Accuracy
- 400 Dots Per Inch
- Uses Less Desktop Space

Just **\$79**



AIRBORNE EXPRESS.

Call Us
For Pre-Owned Macintosh Systems!

Product names are trademarks or registered trademarks of their respective holders.

Circle 40 on reader service card

ATTENTION: BUSINESS, GOVERNMENT, EDUCATIONAL INST., MILITARY
• For 30 day PO. for same day shipment • P.O.'s accepted on approved accounts • All shipments are FOB origin. • Prices do not include freight • Favorable terms offered to established accounts. • LEADING system available. Call for details and pricing!



1-800-888-8779

4685 S. Ash/Tempe, AZ 85282 (602) 820-5812
24 HR. FAX: (602) 345-2217

C.O.D.'s payable with Cashier's Check or Money Order.
All shipments made by Airborne Express standard Air which is 1-2 day service. Call for shipping costs. Products purchased in error are subject to 20% restocking fee. All prices subject to change without notice. All products subject to availability.

Macs 4 Less

1-800-475-MACS
1-800-475-6227

Every computer is tested
before we ship it to you!

The Macs 4 Less Difference

Most systems are in stock
One year written warranty
Knowledgeable staff
Competitive Prices

\$4,959

with Free Shipping!

IIVX Small Business Special
8 RAM /127 HD
512K VRAM
14" Hi-Res Color Monitor
MacPro-Plus Ext. Keyboard
Ti MicroLaser Plus PS17
Leasing Terms Available

Peripherals

SupraFAXModem\$349
V.32bis™ Complete w/all software & cable
Kensington Turbo Mouse\$120
Silhouette Trackball\$85
MacPro Plus\$129
Ti MicroLaser Plus PS17\$1,299
Ti MicroLaser Plus PS35\$1,399
Ti MicroLaser XL Turbo\$3,399

Software

Quark Express\$579
Aldus Pagemaker\$509
Aldus Freehand\$409
Aldus Personal Press\$169
Publish-it Easy!\$119
Wordperfect\$299
Microsoft Word\$329
Microsoft Office\$479
Microsoft Excel\$329
Microsoft Works\$169
Clarix Works\$199
Clarix MacDraw Pro\$289
Clarix Filemaker Pro\$329
Teleware M.Y.O.B.\$149
Universal SoftPC\$199
After Dark/M.A.D.\$45
PGA Tour Golf\$45

\$1,979

with 2-Day Shipping!

LCII Home Office
LCII 6 RAM /127 HD
14" Hi-Res Color Monitor
MacPro-Plus Ext. Keyboard
512K VRAM
Microphone / Mouse
Leasing Terms Available

All Systems include all cables and hook-ups.

LC II Systems

Includes MacPro-Plus Extended Keyboard, Mouse,
Microphone and 14" Hi-Resolution Color Monitor

Lease from\$75/mth 4/80\$1,769
4/40\$1,599 8/80\$1,919

II Si Systems

Includes MacPro-Plus Extended Keyboard, Mouse,
Microphone and 14" Hi-Resolution Color Monitor

Lease from\$79/mth 5/80\$2,329
3/40\$2,099 17/240\$3,189

II Ci Systems

Includes MacPro-Plus Extended Keyboard, Mouse,
32K Cache Card and 14" Hi-Resolution Color Monitor

Lease from\$99/mth 8/80\$3,159
5/40\$2,899 17/240\$3,904
5/80\$2,999 20/425\$4,264

II VX Systems

Includes MacPro-Plus Extended Keyboard,
Mouse and 14" Hi-Resolution Color Monitor

4/80CALL 5/80 w/CDCALL

Macs 4 Less Inc.

12407 Mopac Expy. #101-302
Austin, TX 78766-9700

M - F 8 - 7 Sat: 10 - 4
1-512-251-1151

We accept C.O.D. and Prepaid Orders (Cashiers' Checks and Certified Checks). Leases are based on minimum system & estimated costs. Prices are subject to change. Returns and refused shipments are subject to a restocking fee. Not responsible for typographical errors.

Circle 30 on reader service card



Cool The Sun

Half the fun of planting a tree is imagining what it will be like in a few years. Our tree will branch out to shade us from the summer sun, help cool our home and the neighborhood, and conserve energy in the process. It will provide a home for songbirds, and will remind us of the special times we share together.

You can cool and beautify your home, 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

Pssst! Is that a PowerBook you're using? Have we got a deal for you!

That's right. We've got great deals on all the products you need for your PowerBook, plus a special edition PowerBook t-shirt (a \$21 value!). It's absolutely **FREE** when you buy a product from this page, front or back. This long-sleeved, 100 percent cotton shirt comes in comfy large and extra-large. It's our exclusive design and shows everyone that you love your PowerBook, and Mac's Place of course.

We've got all the products to make your PowerBook more powerful. And there's no better place to get them than Mac's Place. Since we use Macs exclusively and test every product before we sell it, our consultants know these products better than anyone.



FREE

And check out the great prices. Mac's Place is simply the best place to get products for your Mac.

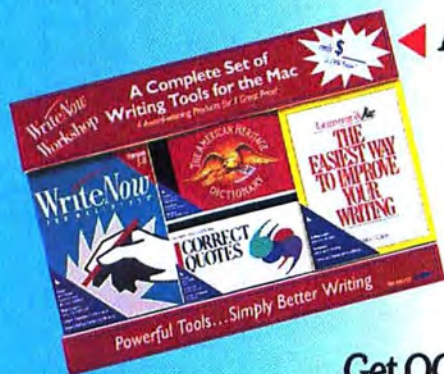
So when you order a product for your PowerBook from this page, front or back, be sure to tell your Mac consultant you want your **FREE** t-shirt. And if you buy \$500 or more of products from any page in this ad, we'll ship your order **FREE!** (U.S. only.) But hurry. These deals are only good through February 28, 1993.*

Mac's Place

5582 PowerBook t-shirt (L)\$21.

5581 PowerBook t-shirt (XL)\$21.

Or **FREE** with the purchase of any product on this page, front or back.



◀ A complete set of writing tools.

This bundle of four award-winning packages is designed to improve your writing. **WriteNow 3.0** is the fastest and easiest Mac word processor and its size and speed make it a great choice for the PowerBook. The bundle includes Grammatik Mac 2.0, the American Heritage Dictionary, and Correct Quotes, free!

T/Maker •

5308 WriteNow Workshop Bundle\$139.

5309 WriteNow Workshop Bundle Competitive Upgrade\$99.

Get OCR technology for your PowerBook.

The **PowerModem IV** is an internal 14,400 bps V.32bis send/receive fax/data modem. It features OCR technology so you won't waste time rekeying information you receive in faxes.** Other features include automatic answer and redial, an automatic activity log, and scheduled transmission options.

**Modems ordered before 1/1/93 will receive a free OCR software upgrade with registration.

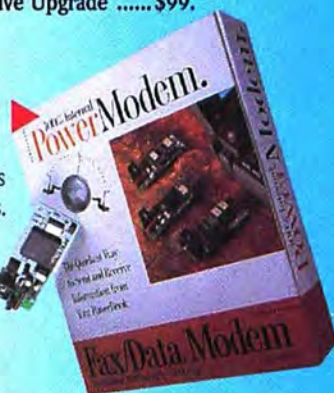
After that date, OCR is included with your modem.

PSI •

5339 PowerModem IV, 14.4, V.32bis\$438.

5454 PowerModem III, 9600/V.32\$329.

5455 PowerModem II, 9600/V.42bis\$248.



◀ Connect your PowerBook to another machine with ease.

Use your PowerBook like never before. With **Laptop Liberator**, any PowerBook can act as an external hard drive. Connect it to a desktop Mac or PC and transfer files back and forth. **Laptop Liberator** uses a PowerBridge connector and an Apple SCSI Disk Adapter to make the connection.

Software Architects

5267 Laptop Liberator\$198.



Get all the memory you need.

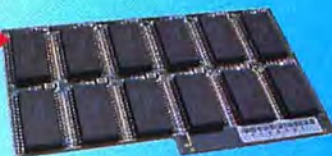
Even for the latest 160, 180, 210, and 230 PowerBook models! Newer Technology specializes in low power consumption PowerBook memory with a card for every PowerBook, old or new. They're easy to install and designed with all-important battery life in mind. Call about the complete line of PowerBook memory.

Newer Technology

5371 PowerBook 210/230 DRAM 12MB\$714.

5368 PowerBook 160/180 DRAM 8MB\$530.

5310 PowerBook 140/170 DRAM 6MB (pictured)\$279.



*All offers expire February 28, 1993, unless otherwise indicated.

Call 1-800-367-4222 or Fax your P.O. 1-206-881-3090

• 30-60 Day Money Back Guarantee

Mac's Place

1-800-367-4222 US & Canada • POWERBOOK RECOMMENDED

Put more power in your PowerBook.

POWERBOOK RECOMMENDED • 1-800-367-4222 US & Canada



Automate file tasks.

And at a special price — \$10 off!* With **Magnet**, you can easily create helpful agents to automate tasks. All you do is tell **Magnet** what files to find, what you want done with them, and when. **Magnet** carries out your instructions invisibly and without further supervision. You can even schedule actions to occur at regular intervals or when you shut down your Mac.

No Hands Software •
4860 Magnet \$78.*

Every PowerBook needs a good planner.

DayMaker 2.0 is faster and filled with new features. A Recurring Events function schedules upcoming events with more flexibility. The "To Do" view organizes "to do" items. Reports can be previewed before printing and will be sharper with integrated DYNOPAGE. Network version capabilities include easy set-up, multiple access levels, and easy administration.

Pastel Development •
5261 DayMaker 2.0 \$82.
5263 DayMaker 2.0 Network 5-Pack \$318.



NEW PRODUCT!



The industry's smallest high-speed Ethernet connector.

The **DaynaPORT SCSI/Link** combines speed and compact size to create the ideal Ethernet connector for PowerBooks. It includes two SCSI ports, a SCSI ID switch, and a built-in terminator. Order before January 31, 1993, and you'll get NetMounter, Dayna's versatile utility for connecting to Novell NetWare, free. (A \$99 value!)

Dayna Communications
4295 DaynaPORT SCSI/Link Thick/Thin \$298.
4296 DaynaPORT SCSI/Link 10BaseT \$298.
4297 DaynaPORT SCSI/Link Thick/Thin/10BaseT \$348.

"The best case I have seen." — MacUser

That's high praise! The **Computer Traveler** holds your PowerBook securely and expands with an exterior zipper to hold a portable printer. It has a two inch wide shoulder strap with non-skid pad, a comfy leather handgrip, and lots of pockets for diskettes and more.

It's waterproof, rugged, easy to clean, and guaranteed for five years.

Tenba
5589 The Computer Traveler \$94.



NEW PRODUCT!

Get the big picture and save \$200.

Save \$200 on **SuperView** when you buy a SuperMatch 17" monitor!* **SuperView** lets you connect your PowerBook 140 or 170 to desktop displays, video projection systems, and standard TV monitors. It supports displays of up to 20 inches with 1024 x 768 resolution and lets you connect to standard TV monitors of all sizes without an external video encoder.

SuperMac •
5579 SuperView \$699.
5599 SuperView w/purchase of SuperMatch 17" monitor \$499.*
4167 SuperMatch 17" monitor \$998.



NEW PRODUCT!

This internal modem receives wake up calls.

The **SupraFAXModem 144PB** gives you 14,400 bps fax and data communications on a card that fits inside your PowerBook. You can even send and receive faxes when your PowerBook is turned off. Wake Up mode turns your PowerBook on when the modem receives a call and, when combined with the included fax software, can send scheduled faxes when rates are lowest.

Supra •
5575 SupraFAXModem 144PB \$298.



NEW PRODUCT!

Mac'sPlace

Call 1-800-367-4222 or Fax your P.O. 1-206-881-3090

• 30-60 Day Money Back Guarantee

*All offers expire February 28, 1993, unless otherwise indicated.

No one knows Macs like we know Macs.

Apple QuickTime Starter Kit

This kit includes everything you need to get started with QuickTime – the QuickTime INIT, Movie Player, Movie Converter, PICT Compressor, and a CD-ROM full of QuickTime movies you can integrate into your work. It also includes a how-to manual on using QuickTime.

Apple Computer

4608 QuickTime Starter Kit \$158.

Apple Font Pack

This is a carefully chosen selection of 43 TrueType fonts from the world's leading type foundries. They are expertly crafted to provide excellent results – maximum legibility on screen and crisp output on paper. The Apple Font Pack includes new display, text, and symbol faces to give you a wide range of type choices.

Apple Computer

5248 Apple Font Pack \$68.

Macintosh PC Exchange

Now you can conveniently work with PC files from 3.5" or 5.25" DOS and Windows disks on your Mac. Just insert the disk into your Apple SuperDrive or compatible floppy disk drive. Subdirectories on the disk appear as folders, and data files as documents. You can open, change, and save DOS documents just like they were Mac files.

Apple Computer

4609 Macintosh PC Exchange \$69.

System 7.1

The latest System 7 version, System 7.1, installs easily with one click of the mouse. A new font folder for central installation and storage and World Script support for complex character sets such as Japanese are new features. System 7.1 also includes all the fixes now included in the System 7 Tune-Up extension. And for a limited time, you get At Ease free with System 7.1.

Apple Computer

5255 System 7.1/At Ease \$98.

5485 System 7.1 Multipack (10-user) \$388.

At Ease

Put your mind at ease. You choose which applications you'll allow others to access and put them on the At Ease desktop. Then those applications open with a single click and the rest of your hard disk is protected by a password. The At Ease desktop has no trash can, so all your files are safe. It's great for homes with computers and children.

Apple Computer

5247 At Ease \$49.

DateBook/TouchBASE bundle

Get organized with this bundle at a fantastic price. **DateBook** is the ultimate personal time manager. It combines calendar, scheduling, alarms, and To-Do lists to keep track of all your daily activities. And **TouchBASE** keeps all of your personal contacts at your fingertips. Together they form a powerful personal information manager.

After Hours Software

5002 DateBook/TouchBASE Bundle \$98.

Snooper 2.0

New Snooper 2.0, the desktop diagnostic for the Macintosh, performs over 200 tests and benchmarks on all hardware and identifies any problems. This revolutionary software not only saves you time and money, it increases your awareness of what's going on inside your Mac. And for a limited time, Snooper comes with Virex anti-viral software for the Mac, free.

MAXA Corporation

5376 Snooper 2.0 w/Virex \$128.

5377 Snooper 2.0 – NuBus Card w/Virex \$178.

Aldus SuperPaint 3.0

SuperPaint does it all. And at a special low price. 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 SuperPaint 3.0 \$98.

Call 1-800-367-4222 or Fax your P.O. 1-206-881-3090

• 30-60 Day Money Back Guarantee

Mac'sPlace

1-800-367-4222 US & Canada • Visa/MC/AMEX/Discover accepted

We'll help you get the right products for your needs.

1-800-367-4222 US & Canada • Visa/ MC/ AMEX/ Discover accepted



Infini-D 2.0/BackBurner

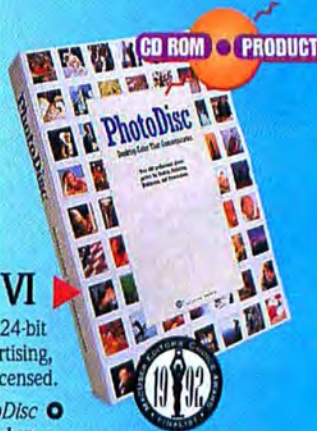
Infini-D 2.0 is up to 500 percent faster than other rendering programs, can produce broadcast-quality images and animations, and imports and exports QuickTime! It's a great addition for artists using programs like Illustrator, Photoshop, or Premier. And BackBurner does networked background rendering in a fraction of the usual time.

Specular
4818 Infini-D 2.0 \$648.
5570 BackBurner \$370.
5574 BackBurner 5 Pack Add-on \$928.

PhotoDisc CD Vol. I - VI

Get instant access to hundreds of pixel-perfect photographs! Each image is in spectacular 24-bit color, and shot by top-notch professionals. You're free to use PhotoDisc images in all your advertising, newsletters, and multimedia presentations because they're all model-released and licensed.

PhotoDisc CD-ROM Vol. I - VI \$288/per volume.
5522 PhotoDisc MultiMedia Sampler \$37.



VideoFusion

Now the same special effects you've seen in television and film presentations can be created on your Macintosh. VideoFusion lets you add magic to your QuickTime movies, video productions, and presentations. Using standard Mac terminology like "cut," "copy," and "paste," you can apply the latest special effects from VideoFusion's library or create your own. Four stars from *MacWEEK!*

VideoFusion
5165 VideoFusion \$448.



Morph

Morphing is the popular new special effect you've seen in feature films, music videos, and television commercials. This breakthrough application allows you to smoothly transform two or more images into each other creating QuickTime movies, PICS animations, and still images. Morph is fast, easy to use, and requires no special skills.

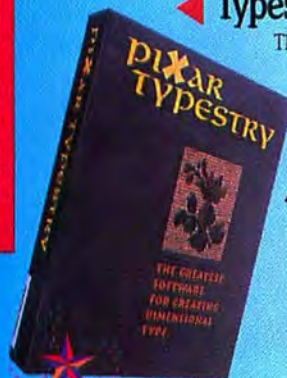
Gryphon Software
5513 Morph \$95.



Typestry

This exciting new software creates dimensional text from PostScript Type 1 and TrueType fonts. Typestry uses RenderMan to transform simple words into extraordinary pictures. It accurately simulates metals, woods, or other types of surfaces which can be used to decorate text. Users can also move, rotate, scale, and extrude words.

Pixar
5123 Typestry \$184.
4554 ShowPlace/MacRenderMan 1.1.1 CD-ROM \$318.



Series 1 Photography Filters

Hot new PhotoShop filters! Series 1 Photography Filters are software filters for Photoshop that emulate 35mm camera optical filters. Now you can generate optical effects other than the painterly effects of Aldus Gallery Effects. These filters are perfect for both the graphic artist and the photographer creating ads, brochures, advertising, and video presentations.

Andromeda Software
5161 Series 1 Photography Filters \$79.



Painter 1.2/ArtZ 6"x 8" Tablet bundle

Simulate the tools and textures of natural media with *Painter*, the remarkable 24-bit color paint program. Create original art or apply natural media effects to other artwork, including scanned images. 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 / Wacom Technology
4694/5355 Painter 1.2 / ArtZ 6" x 8" Tablet \$508.



Sketcher 1.0

Create realistic natural-media effects on your Mac with Sketcher, the affordable yet revolutionary program for creating grayscale graphics and retouching images. Sketcher duplicates the effects of traditional tools and textures. Use dozens of brushes, pens, chalks, and even paper grains and image processing tools to apply your artist's touch to the desktop.

Fractal Design
5052 Sketcher 1.0 \$98.



Mac's Place

Call 1-800-367-4222 or Fax your P.O. 1-206-881-3090

• 30-60 Day Money Back Guarantee

We want you to get the most from your Mac.

WorldLink

Be a part of the Internet with just your Mac, a modem, and WorldLink. You'll have access to over 15 million people via e-mail, countless files to download, and all the other resources the Internet has to offer. Your first 30 days of access are free; a monthly service charge applies thereafter.

InterCon
5195 WorldLink \$26.

DataPlace Hard Drives

These are the most reliable drives around. Preformatted with the included DP Formatter. Plus, they're ready to use right out of the box. And they come with three more free utilities: MacTools 2.0, Stuffit SpaceSaver, and Kaboom! SE. Each also includes manuals, cables, a two- or five-year warranty, and technical support from Mac's Place.

DataPlace
5277 DP+ 42MB Quantum External Drive \$328.
5278 DP+ 85MB Quantum External Drive \$422.

Call for pricing on the complete line of DP+ Drives.

MacIntercomm

The first and only telecommunications program with true multitasking that offers completely invisible file transfers. With a scripting language of unprecedented power, full protocols and terminal emulation, you'll agree that MacIntercomm defines the new standard in telecommunications. Includes a SmartDial feature for traveling users, and many more features.

Mercury Systems
5111 MacIntercomm \$78.

Stuffit Deluxe & Stuffit SpaceSaver

Only Stuffit Deluxe 3.0 can solve all your compression needs from archiving to transparent compression. Stuffit will save you time and money on file transfers over your modem or network. It's the standard for all electronic services and the most efficient compression product available. Also includes Stuffit SpaceSaver. Unlike other compression products, Stuffit SpaceSaver increases disk space with lightning speed and without effort on your part. Direct it to work while your Mac is idle or when you request. SpaceSaver is the least expensive, most productive, and easiest-to-use compression product.

Aladdin Systems
4971 Stuffit Deluxe \$68.
4969 Stuffit SpaceSaver \$38.

SONY Data Media

Save your data with confidence. SONY brings you innovative products to protect your information. Diskettes, data cartridges, and magneto optical disks give you durability and reliability. Call Mac's Place to learn more about all the SONY products to meet your needs.

SONY
5612 3.5" DD Color 10-pack \$10.
3090 3.5" HD 10-pack \$15.
3687 Data Grade 90M 2 GB DAT Tape \$22.
4474 MO Rewritable 650MB 5.25" \$138.

Disk Café

If you use drives from different manufacturers, you need to format them all with the same utility. Disk Café is a complete storage formatting utility that works with nearly every drive available. So it can prevent compatibility problems including data loss. And its advanced diagnostic tools detect and repair disk defects.

Bering Industries, Inc.
5121 Disk Café \$45.

IT'S EASY TO ORDER!

ORDERING INFORMATION

- 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 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 weekends. (For you East Coasters, this means you can call us until 1 a.m. weekdays and still receive your in-stock item that morning!)

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.
- 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

- 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.

Like all aspects of Mac's Place operation, this ad was entirely assembled using Macintosh technology. No paste-up. No stripping. No kidding. ©1992 Mac's Place, Inc. Mac's Place and the Mac's Place logo are trademarks or registered trademarks of Mac's Place, Inc. All other marks remain the property of their respective companies. All prices and promotions are subject to change without notice. Not responsible for typographical errors.

Call 1-800-367-4222 or Fax your P.O. 1-206-881-3090

• 30-60 Day Money Back Guarantee

Mac's Place

1-800-367-4222 US & Canada • Visa/MC/AMEX/Discover accepted

Order \$500 or more and we'll ship your order free.*

GamePad Mac

Perfect for all Mac games. Use the thumb-operated pad as a mouse on "point-and-click" games. The keystroke option gives you directional control for "keyboard only" games. Or screw in a joystick for hand-held control. Set-up is a breeze. Works on Macs from the SE to Quadra, including PowerBook.

Advanced Gravis •
5172 GamePad Mac \$34.

Bernoulli MacTransportable 90 PRO

Get all the storage reliability you'd expect from Bernoulli for 40 percent less! The new MacTransportable doesn't require an interface kit. Everything you need to get up and running is in the box including a 90MB cartridge. Ask about the NEW Bernoulli MacTransportable 150.

IOmega •
5012 Bernoulli MacTransportable 90 PRO \$499.
5609 Bernoulli MacTransportable 150 Call.

Lemmings

Lemmings for the Mac has arrived! Now Mac owners can demonstrate their game playing smarts and test their sanity, saving mobs of imperiled green-haired rodents from certain doom. Lemmings for the Mac brings you 120 levels of original and intellectually challenging gameplay.

Psygnosis
5459 \$35.

TimesTwo

TimesTwo actually makes your hard disk bigger rather than making your files smaller! A one-time installation converts your hard disk to twice its original size in minutes, leaving your data unchanged. It's completely compatible with all Mac software and works with all SCSI and erasable optical disks.

Golden Triangle •
5233 TimesTwo \$99.

M4 Tank Simulator

You and your buddies go for a ride. Only it's WWII, it's a long way to Germany, and your ride is on an M4 Sherman tank. Full color, sound, and voice-commands give this authentic simulation a dramatic realism.

Deadly Games •
5360 M4 Tank Simulator (w/headphones, color) \$34.
3895 Battle of Britain II (color) \$34.
3894 Bomber 2 (w/headphones) \$31.

Virex

Virex detects and repairs files infected by all known Mac viruses. Then it prevents infection by continuously monitoring files and performing instantaneous repairs. It also keeps your network virus-free with scheduled virus scans. Virex is updated frequently to combat new viruses, and all registered users receive one free update.

DataWatch •
5234 Virex 4.0 \$62.
5235 Virex 4.0 10 Pack \$428.

Universal PowerCache Card

Award-winning PowerCache is a 68030 CPU accelerator that offers speed increases from 200% for a IIci to 1,000% for a Mac Classic. Universal PDS design supports 14 Macs, leaves NuBus slots empty. Guaranteed 100% compatible running at full speed. Adapters (required for most installations) may be swapped with DayStar at no charge. Classic and SE users may purchase adapters that support monochrome monitors.

DayStar Digital •
3744 PowerCache 50MHz w/FPU \$1398.
Call for complete pricing on all DayStar Digital products.

Power Merge

Make sure you're working on the latest version of your files when using a PowerBook and a desktop Mac with PowerMerge. It's the first software that not only tells you where the latest version resides - it puts all versions in sync. It includes conflict notification, a history log, and updating via network or removable media.

Leader Technologies •
5010 PowerMerge \$79.

Mac'sPlace

Call 1-800-367-4222 or Fax your P.O. 1-206-881-3090
• 30-60 Day Money Back Guarantee

*U.S. only. Offer expires Feb. 28, 1993.

1-800-367-4222 US & Canada • Visa/MC/AMEX/Discover accepted

You won't sacrifice service for bargains here.



Microsoft Word 5.1

Upgrade to Microsoft's newest Word, and get more tools that make every day easy. Just click buttons on the new unique customizable toolbar to do dozens of common tasks in one step – tasks like checking spelling, making envelopes, and adding bullets. Or change the buttons to best suit your own tasks.

Microsoft •

5567 Microsoft Word 5.1\$294.
5571 Microsoft Works 5.1 version Upgrade\$124.

Expand the memory of your Mac! More memory means increased task processing and the ability to switch between several applications running at once. Also includes the Mac's Place installation manual, the most complete SIMM installation guide available.

SIMMs



Mac's Place

SIMMs Call.

Atlas Pro

Import data from your spreadsheet or data management program and turn it into striking presentation-quality maps with Atlas Pro. It's an analysis tool that gives brilliant show-quality results. And it's bundled with a wealth of geographic data sets taken from the 1990 census, hundreds of digital maps, and lots of additional data.

Strategic Mapping Inc. •

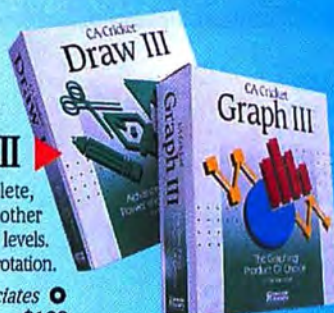
5458 Atlas Pro\$498

CA-Cricket Graph III/CA-Cricket Draw III

With CA-Cricket Graph III, you can convert text or data into a complete, professional-looking graph in seconds. Choose from scatter, pie, area, and many other options. CA-Cricket Draw III is the object-oriented bezier drawing program for all ability levels. It includes Postscript support, full-featured text processing, and special text effects like rotation.

Computer Associates •

5001 CA-Cricket Graph III\$128.
4218 CA-Cricket Draw III\$168.

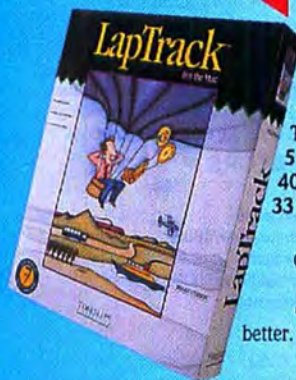


LapTrack for the Mac

Great for PowerBooks! Record time and expenses more easily than ever before – whether you're in the office or in the field. Reports include time and expense sheets, budgeting, productivity analysis reports and graphs. Address book feature allows you easy access to each client.

Timeslips Corp. •

5110 LapTrack\$52.
4096 Timeslips III V.2.1\$192.
3312 Timeslips Accounting Link\$49.

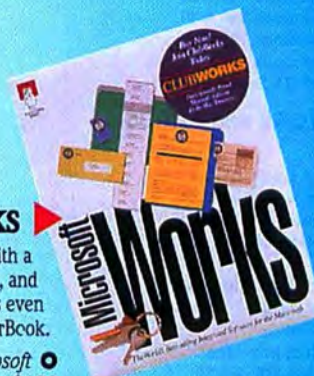


Microsoft Works

Get the tools you need to combine words, numbers, and graphics any way you want. With a word processor, database with reporting, spreadsheet with charting, drawing, and communications, Works is the best-selling integrated software for the Mac. And now it's even better. Version 3.0 is faster, easier, better integrated, and runs on all Macs, including the PowerBook.

Microsoft •

5068 Microsoft Works version 3.0\$159.
5071 Microsoft Works version 3.0 Upgrade\$79.

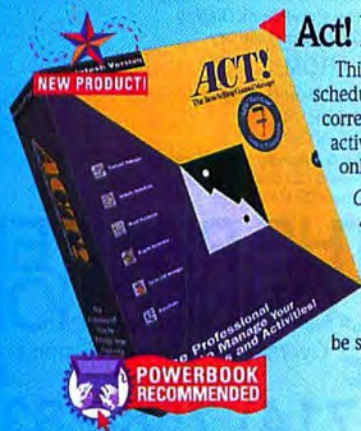


Act! For The Mac

This unique, integrated contact and calendar management solution handles your hectic schedule. Act! schedules calls, meetings, and to-do's; generates a variety of written correspondence; and automatically remembers every detail about each contact and activity. If you're using another planning or contact program, you can switch to Act! for only \$89! Call for details about the Competitive Trade-up offer.

Contact Software •

4970 Act! For The Mac\$258.
5592 Act! Competitive Trade-up\$89.



Hayes for the Mac

HayesConnect-Network serial device sharing software allows any serial device to be shared over a network from a server. SmartCom II V.3.3 – the most reliable easy-to-use Mac communication software. Ask about the \$40 manufacturer's rebate offer!

Hayes Microcomputer Products

1628 SmartCom II V.3.3\$83.
4314 Hayes Connect\$74.



Call 1-800-367-4222 or Fax your P.O. 1-206-881-3090

• 30-60 Day Money Back Guarantee

Circle 209 on reader service card

Mac's Place

1-800-367-4222 US & Canada • Visa/MC/AMEX/Discover accepted

LOWEST PRICES HERE



Newgen Turbo PS/440B

\$3495

11x17 - 400 d.p.i.



Microtek II XE

\$1159

1200 d.p.i. - w/Photoshop

SYSTEMS

Mac LC II 4/80	1295
Mac IICI - 5 meg	2259
Mac IICI - 5/120	2750
Mac IISI - 5/80	1895
Extended Keyboard	159
Mac Quadra 700 - 4 meg	3550
Mac Quadra 700 - 4/120	3959
Mac Quadra 700 - 4/210	4195
Mac Quadra 950 - 8 meg	Call
Mac Quadra 950 - 8/210	Call
Mac Quadra 950 - 8/540	Call
Mac Powerbook 145 4/40	1995
Mac Powerbook 145 4/80	2450
Mac Powerbook 160 4/40	2289
Mac Powerbook 160 4/80	2495
Mac Powerbook 180	Call
Macintosh VX Systems	Call

MONITORS and CARDS

IDEK	
15" SVGA Color Display	595
17" Autoscans SVGA Color	995
21" Autoscans SVGA Color	1795
21" Autoscans 80 KHz Color Radius	2495
19" Precision Color Display	2290
21" Color Display	2795
Color Pivot	1249
Color Pivot Interface	
II, LC, IISI, SE, SE/30	515
Pivot Display for Built-In Video	799
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	1299
Rocket Accelerator 33 Mhz w/mathco	1999
Apple	
Apple 13" Highres	649
Seiko	
Seiko CM-1445	569
Sony	
Sony 14" Trinitron	609
SuperMac	
Platinum 19" Display	964
Platinum 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	399
Dual Mode Trinitron 19"	2459

MONITORS and CARDS (cont.)

Thunder/8	1139	
Thunder/24	2295	
Spectrum 8.24 PDQ	839	
Spectrum 24 PDQ+	1539	
Magnavox		
14" Color Monitor	499	
DRIVES		
Quantum 105 Pro	Ext. 469	Int. 369
Quantum 210 Pro	835	710
Quantum 240 Pro	909	789
Maxtor 120	489	369
Maxtor 213	729	609
Maxtor 340	1229	1099
Maxtor 180 meg	1800	1679
Seagate 1.2 gigabyte	2269	2149
Syquest 44MB	499	
Syquest 88MB	859	
Internal Drive Kit		29
Syquest 44MB cartridge		69
Road Runner 80 meg for Powerbook		369
Fujitsu 425 meg 5 year warranty		1200

PRINTERS

TI Turbo PS35	1495
Microtek TrueLaser	1059
TI Microlaser PS35	1319
TI Microlaser PS17	1209
QMS PS410	1475
NEC Model 95	1389
Apple Stylewriter	340
Apple Laserwriter III	2499
Apple Laserwriter IIg	3279
HP Deskwriter	389
HP Deskwriter Color	639
HP IIp for Mac	1539
HP IIip for Mac	1749
HP IV for Mac	1995
HP IISI for Mac	4639
HP Deskwriter Ink Cartridge	18
Appletalk Connectors	25
HP Deskwriter 550C	759
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

SCANNERS

Logitech ScanMan 32	279
Microtek II	859
Microtek II XE (1200 dpi) w/Photoshop	1159
Microtek 1850s Slide Scanner	1395
Umax UC-630 w/Photoshop	1129
Caere Typist	429

SOFTWARE

Microsoft Word	289
Microsoft Excell	309
Aldus Pagemaker	497
Calera Wordscan	95
Adobe Photoshop 2.0	515
Quark Express 3.0	579
Caere Omnipage	495

MODEMS

Zoom	
FX9624 Plus 2400 BPS	125
Modem MX 2400S w/SendFax 9600 BPS	95
v.32 Turbo w/v.42bis w/MNP Software	325
Supra Fax Modem 14.4 v.32bis (ext.)	345
Supra Fax Modem 96/96 (ext.)	279
PSI for Powerbook 140 & 170	
internal 9600/2400	225
Global Village Bronze 96/24 for Powerbook	235
Global Village Silver 96/96 for Powerbook	400
Global Village Gold 14.4/96 for Powerbook	635

ACCELERATORS

Daystar	
40 Mhz Powercache	765
40 Mhz Powercache w/68882	895
50 Mhz Powercache	1075
50 Mhz Powercache w/68882	1495
Radius Rocketshare	415

MEMORY

1 meg for LC/C/VI	34
4 meg for LC/C/VI	125
Powerbook 140 & 170 4 meg	175
Powerbook 140 & 170 6 meg	255
Envisio Powerbook Display	
Adapter and memory	Call

CD - ROMS

NEC CDR-74 Gallery	875
NEC CDR-74	675
NEC CDR-37	495
Smart & Friendly w/Cable and Classic CD Collection	395
Super CD Collection	495

THE PRINTER CONNECTION

Overnight and Federal Express Shipping Available

(714) 758-8832

fax (714) 635-1752

1831 W. Lincoln Anaheim, CA

Our **New** Prices Have the Competition Seeing Red!

SONY



Sony 14" Color Trinitron
14" display with 24-bit color card \$799

MICROTEK

24-BIT
COLOR



Microtek Scanmaker II with Photoshop LE
Fast 1200 dpi. Its 24-bit color for the price of grayscale!

Macintosh



Mac LC II 4/40 (price is for cpu only)
LC II with 14" color display & keyboard \$1,595

Displays & Cards

Apple 12"/13"/14" 399/469/569
Sony 1304/1604 Call/1049
Magnavox 14" Call
E-Machines T16 II/T19 II 1295/2395
E-Machines Color Video Cards Call

radius

Radius 24Xp, 24Xk, 8Xj 499/849/499
Radius VideoVision 1995

RASTEROPS

20" Color Hitachi Display 1495
20" Color Trinitron Display 2395
8XL 8-bit color 459
PaintBoard Li/PaintBoard 24 849/1539

Printers

TEXAS INSTRUMENTS

Turbo

Includes AppleTalk

TI microLaser TURBO RISC Processor, 9 ppm, 300dpi, 35 fonts

\$1,545

TI microLaser PS-17 1245
TI microLaser PS-35 1395

Scanners

MICROTEK

24-BIT

Color

\$1,139

NEW ScanMaker IIxc
For high-end prepress scanning, lightning fast, 1200 dpi, 24-bit color w/ScanMatch calibration software & full Photoshop

Microtek Scanmaker 1850S 1395
1850 DPI, 24-bit color 35mm Slide Scanner with full Photoshop 2.01

Mac Cpu's

Mac Classic II, 4/40 995
Mac LC II, 4/40 1145
Mac IIsi, 3/40 1395
Mac IIfx, 5/0 Call
NEW Mac IIvx, 5/0 NEW
Mac Quadra 700/ 950 3395/NEW
PowerBooks Call

Mac Systems

Macs

LC II Color System \$1,795
Mac LC II, 4MB RAM/80HD,
Magnavox 14" Color Display, Apple
Keyboard, Mouse, System 7 & Hypercard

Mac II ci System

\$2,995

IIci Color Graphics System
Mac IIfx 5MB/40HD, Magnavox 14"
Color Display, Apple Keyboard,
Mouse, System 7 & Hypercard

NEW IIvx System \$3,195
Mac IIvx 4MB/80HD, Magnavox 14"
Color Display, Apple Keyboard, Mouse,
System 7 & Hypercard

Service • Selection • Savings
Call MacNews for all your Mac needs!

LAPIS COLOR

Cards

For Mac Plus, Classic, SE,
SE/30, LC, LC II, IIsi, II-
family & Quadras



8-bit for SE/30, II's & Quads 399
8/16-bit for SE/30, II's & Quads 499
24-bit for SE/30, II's & Quads 599
LC-TV lets LC's work w/any TV 349
Let us help you pick the right card!

QMS 410/815MR/860 1495/3595/4195
Apple LaserWriter IIfx/IIG 2395/3195
JetFill HP /HP high capacity 15/29
JetFill Apple-Canon/ HP Deskjet 15/64

Drives & Storage

PLI Removable 44/88 549/679
PLI Optical 3.5"/5.25" 1395/2895
PLI Floptical 399
PLI Quick SCSI 329

Networking

ASANTÉ

All products in stock at lowest prices CALL

Asanté 64K cards/10BaseT Hub 169/269
Dayna EtherPrint/Asanté Print 349/369

Modems

TLOGICODE

Quicktel Xeba

9624 Fax/Receive

Fax and receive at 9600 bps. Standard through-put up to 9600 bps with V.42bis data compression.

\$139

Xeba 2400 data modem 69
Xeba 9696 fax w/V.42bis 279
Xeba 14400 Fax/receive w/V.42bis 299

Circle 172 on reader service card

Mac News

1555 SHERMAN AVENUE

SUITE 361 • EVANSTON, IL 60201

MacNews Hours: M-TH 8am-7pm; Fri til 6pm (CT) Sat 10am-2pm

1-800-243-9383

Toll-Free 24hr Fax 800-243-9385 • Int'l Fax 312-871-4556

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.



**Nº 1 IN
VALUE**

MACCENTERTM

The Center Of The Macintosh UniverseTM

**1 Meg TI
Upgrade \$49**



**2 Meg NEC
Upgrade \$159**



NEC

Silentwriter Model 95 \$1379
Silentwriter Model 95FX \$Call!
Silentwriter Model 97 \$Call!

QMS

PS 860 Hammerhead (11x17) \$4099
PS 815MR \$3895

Hewlett Packard

LaserJet 4M NEW! 600 dpi \$Call!
Deskwriter \$395
Deskwriter C \$679

LEXMARK

All Models including 10A & 10L \$Call!

**ALL PRINTER PRICES
INCLUDE FREE TONER**



**TEXAS
INSTRUMENTS**

microLaser Plus PS17 \$1199
microLaser Plus PS35 \$1329
microLaser Turbo \$1499

SHARP

H9600PS NEW! 600 dpi \$Call!

MACINTOSH SYSTEMS

We Stock
PowerBook
Batteries, Battery
Chargers, Carrying
Case, Modems and
Display Adapters.



PowerBook 145 4.40 \$1999
PowerBook 160 4.40 \$Call!
PowerBook 180 4.80 \$Call!

Accessories

PowerBook 140/170 Batteries (2 hr) \$79
PowerBook 140/170 Batteries (3 hr) \$89
Lind Full Cycle Battery Charger \$188
Envisio Display Adaptor (4 MB) \$1049
E-Machines PowerLink DeskNet \$Call!
Quadra 700 (with System Purchase!) \$3499
Quadra 950 \$Call!

We also stock Ili, Ilii, Iliix,
PowerBook 210 & 230 models.

OPTICAL DRIVES

**256 MB
3.5"
Optical**



Ask about our
FREE Puma
software bundles!!

PUMATM
captured, but not tameTM

Puma 128 MB 3.5" Drive \$1399
Puma 256 MB 3.5" Drive \$Call!

- ★ Puma 256 reads & writes ISO/ANSI standard 128 MB cartridges and a true, non-compressed 256 MB
- ★ Fast transfer rate up to 1.2 MB /second
- ★ Fast 35 ms access time
- ★ Optical reliability (10 year Data Life)

128/256 Meg 3.5" Cartridge \$59/\$99
600 Meg 5.25" Cartridge \$105

All Puma Optical drives include one cartridge, a universal power supply, 12 megs of shareware, SCSI & power cables, and a one year warranty. Five Year Warranty available!

CD-ROM



**NEC
CD-EXPRESS**

*includes CDR-25, 10 CD's
and two speakers \$429
CDR 37 w/ MultiSpin \$379
CDR 74 w/ MultiSpin \$569
CDR 74 w/ Gallery \$849



TOSHIBA

Fastest CD ROM Available!
195ms access \$Call!

NETWORKING

Asante

16k Cards (Nubus) \$169
64k Cards (Nubus) \$219
Asante Print \$369
EN/SC PowerBook \$368

Dayna

EtherPrint \$339
DaynaPORT E/II-T \$149
DaynaPORT SCSI \$269
DaynaSTAR MiniHub \$269

Cayman

GatorBox CS \$1999
GatorPrint \$399

Shiva

LanRover/L \$599
Netmodem/E \$1479

MODEMS

SupraFAXModem

The SupraFAXModem V.32bis
is the only 14,400 bps
modem with 14,400 bps send
and receive fax!



SupraFAXModem V.32bis w/sh/cbl \$349
SupraFAXModem V.32 wa/sh/cbl \$329
Powerbook 14.4/14.4 internal \$Call!

SCANNERS



UMAX
UC630 600 DPI \$1139
UC840 800 DPI \$Call!
UC1200 1200 DPI \$3069

Sharp
JX-320 \$Call!
JX-450 \$Call!

HARD DRIVES

Falcon MICROPLUS[®] Drives

	Int	Ext
385 MB	4.4 ms \$1099	\$1199
648 MB 3.5" 10 ms	Call!	Call!
760 MB	4.6 ms \$1399	\$1499
1.2 Gig	4.1 ms \$1999	\$2099
1.2 Gig 3.5" 10 ms	Call!	Call!
1.5 Gig	4.1 ms \$2299	\$2399
1.6 Gig	<11.5 ms \$2999	\$3099
2.0 Gig	3.9 ms \$3399	\$3499
2.4 Gig	<11.5 ms Call!	Call!

Thirty-Day Money Back Guarantee!

SUPER CAPACITYTM



GOLDEN TRIANGLE

Drives include and are formatted with Golden Triangle's DiskMakerTM. Microplus drives are SCSI-2 and Fast SCSI-2, System 7 & A/UX compatible, carry a 5 Year Warranty, include brackets or metal cases, universal power supplies, cables and 12 MB of shareware. MacCenterTM also carries fine drives from FWB, Fujitsu, Quantum, Toshiba, Hitachi and Microplus. Drive capacities are manufacturer's unformatted specifications. Formatted capacities will be less. Access times are effective access times based upon operation of hardware caches.

WE CARRY MAC SYSTEMS! CALL 800-950-0950 FOR A FREE CATALOG!

Prices valid 12/28/92 - 1/28/93

MACCENTER™

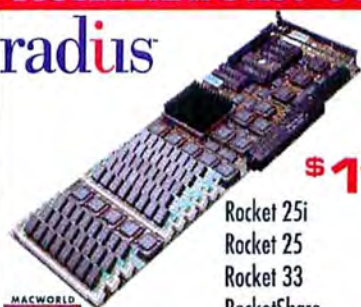
The Center Of The Macintosh Universe™

Nº 1 IN

SERVICE

ACCELERATORS: 68040 & 68030

radius



\$1199

Rocket 25i	\$1199
Rocket 25	\$1599
Rocket 33	\$1999
RocketShare	\$429



**NEW YEAR'S
ROCKET SPECIALS!**

NEWER™

fx/Overdrive II	\$329
Quadra 700/Overdrive	\$259
Quadra 900/Overdrive	\$119
Image Magic-Quadra/PDS	\$699

DAYSTAR
D I G I T A L

SALE!

"...this is one Mac purchase you'll never regret."
MacWEEK 9/17/91



All PowerCards & PowerCaches are brand new, in original DayStar boxes. All sales final.



PowerCards

40 MHz PowerCard 030 (Ilex only)	\$599
50 MHz PowerCard 030 (II, Ilex, Ilexx)	\$899

PowerCaches (Non-Universal & Universal)

40 MHz PowerCache 030	\$599/\$799
50 MHz PowerCache 030	\$899/\$1099

SYQUEST DRIVES

**Eagle™
SyQuest**

\$399
Buy an Eagle™
and get two
44MB cartridges
for only **\$89!**



Eagle 44 **\$399**
Eagle 88 **\$499**

44 Meg Cartridge	\$65
88 Meg Cartridge	\$99

All Eagle SyQuest drives come with a metal case, a universal power supply, 12 megs of shareware, SCSI & power cables and a two year warranty. Ask about our **Five Year Warranty**.

MONITORS

NEC

MultiSync 3FGx	\$639
MultiSync 4FG	\$759

SONY

1604S 17"	\$1099
1304 14"	\$649
1320 For LC	\$399



19" Dual
Page Monitor

\$739
grey-scale



1024 x 828 Resolution
@ 74 dpi, with a 75 Hz
Flicker-Free refresh rate,
same as the Apple Two-
Page Display. Available
for all Macintoshes.



E-MACHINES

T16 II	\$1295
T19 II	\$2395
Futura Color Cards from only	\$399

Almost Gone!

radius **\$1895**

21" MONITORS AT A 19" PRICE!

PrecisionColor 21	\$1895
PrecisionColor 20	\$2459
Color Pivot	\$1275
PrecisionColor 24Xp	\$499

SIMMS

4 Meg 80ns **\$115**
LIFETIME WARRANTY (with trade in)

1 Meg 80ns **\$35**

2 Meg 80ns **\$62**

6 Meg PowerBook Memory **\$259**

Due to the extremely volatile state of SIMM pricing as we went to press, all memory prices subject to change without notice.

- **No Surcharge Or Minimum** with MasterCard and Visa.
- **Your credit card is not charged** until your order is shipped.
- **Personal checks, company checks,** money orders and cashier's checks are accepted; money orders and cashier's checks clear immediately, please allow ten days for personal and company checks to clear.
- **APD and FPO orders are accepted** with no minimum or surcharge.
- **Purchase Orders:** Educational, Government and Institutional purchase orders are accepted with thirty (30) day terms. Corporate POs accepted with 30 day terms upon credit approval. No minimum or surcharge for purchase orders.
- **International Orders:** No minimum orders or surcharge for international orders, whether placed by mail, fax or telephone.
- **Money Back Guarantee:** Most products carry a manufacturer's 30 or 60 day money back guarantee. Please ask for details when ordering.
- **All prices, promotions and product availability** are subject to change without notice. We regret we cannot be responsible for typographical errors and cannot guarantee compatibility of all products.
- **All returns must have an authorization number.** Please call 512-445-6483. All returns or refused shipments are subject to a restocking fee.

Hours:



8:00 am - 8:00 pm CST M-F
10:00 am - 4:00 pm CST Saturday
Sunday: Call, you may get lucky.



MACCENTER™

4930 South Congress, Suite 303 • Austin, Texas 78745

FAX 512-444-3726
International Orders 512-445-5114

800 950 0950



MACWORLD INTERACTIVE

THE MULTIMEDIA MAGAZINE



MacWorld Interactive™ is the interactive, multimedia version of Macworld Magazine. Each CD ROM issue contains selected articles from MacWorld with QuickTime™ movies, multiple languages, voice/sound and interactive navigation of the CD.

Macworld Interactive™ is a trademark of Sumeria, Inc. QuickTime™ is a trademark of Apple Computer, Inc.

Features for Winter issue include:

- QuickTime™ Your First Time
- The 1992 Game Hall of Fame
- Sound, How To

SUMERIA

SUBSCRIBE NOW

Name_____

Company_____

Address_____

City_____State_____Zip_____

Phone_____

Visa/MC_____Exp._____

Signature_____

Check or money order payable to:
SUMERIA INC.

329 Bryant Street, Suite 3D

San Francisco, CA 94107

Phone orders: 1-415-904-0889

Fax orders: 1-916-677-3919

- | | | |
|--------------------------|--|-----------|
| <input type="checkbox"/> | Macworld Interactive™
(Volume 1/ Fall CD) | \$29.95* |
| <input type="checkbox"/> | Macworld Interactive™
(One Year Subscription/ 5 CD's) | \$129.95* |

* All orders payable in U.S. Dollars. Add \$8 shipping cost to subscription orders (5 CD's). Add \$2.50 shipping to single CD orders. Residents of CA, add applicable sales tax. Foreign orders add \$5 per CD (\$25 for Sub. orders). Please allow 5-8 weeks for delivery.

Macintosh® Systems



POWERBOOK 145	POWERBOOK 160	POWERBOOK 180	POWERBOOK DUO 210	POWERBOOK DUO 230	MACINTOSH CLASSIC II	MACINTOSH LC II	MACINTOSH IIsx	MACINTOSH IIfx	MACINTOSH IIfx	MACINTOSH QUADRA 700	MACINTOSH QUADRA 950
CONFIGURATION											
4MB RAM 40MB DRIVE \$1999	4MB RAM 40MB DRIVE \$2270	4MB RAM 80MB DRIVE \$3840	4MB RAM 80MB DRIVE \$2099	4MB RAM 80MB DRIVE \$2439	4MB RAM 40MB DRIVE \$990	4MB RAM 40MB DRIVE \$1159	3MB RAM 40MB DRIVE \$1315	5MB RAM DRIVE OPTIONAL \$2249	4MB RAM 80MB DRIVE \$2599	4MB RAM DRIVE OPTIONAL \$3499	8MB RAM DRIVE OPTIONAL \$5475
4MB RAM 80MB DRIVE \$2349	4MB RAM 120MB DRIVE \$2945	4MB RAM 120MB DRIVE \$4179	4MB RAM 80MB DRIVE \$2105	4MB RAM 120MB DRIVE \$2775	4MB RAM 80MB DRIVE \$1119	4MB RAM 80MB DRIVE \$1249	5MB RAM 105MB DRIVE \$1925	5MB RAM 240MB DRIVE \$2725	5MB RAM 80MB DRIVE CD-ROM \$2859	4MB RAM 240MB DRIVE \$3999	8MB RAM 240MB DRIVE \$5899
SPECIFICATIONS											
25MHz 68030 OPTIONAL FPU	25MHz 68030 OPTIONAL FPU	33MHz 68030 68882 FPU	25MHz 68030 OPTIONAL FPU	33MHz 68030 OPTIONAL FPU	16MHz 68030 OPTIONAL FPU	16MHz 68030 OPTIONAL FPU	20MHz 68030 OPTIONAL FPU	25MHz 68030 68882 FPU	33MHz 68030 OPTIONAL FPU	25MHz 68040 BUILT-IN FPU	33MHz 68040 BUILT-IN FPU
10" MONO ACTIVE MATRIX	10" 16-GRAY BACKLIT LCD	10" 16-GRAY ACTIVE MATRIX	9" 16-GRAY 8-BIT VIDEO OUT	9" 16-GRAY 16-BIT VIDEO OUT	BUILT-IN MONOCHROME	8-BIT 12 OR 13" VIDEO OUTPUT	8-BIT 12 OR 13" VIDEO OUTPUT	8-BIT 13" VIDEO OUTPUT	8-BIT 12 OR 13" VIDEO OUTPUT	8-24BIT 12-21" VIDEO OUTPUT	8-24BIT 12-21" VIDEO OUTPUT
1 PDS	1 PDS	1 PDS	DOCK CONNECTOR	DOCK CONNECTOR	1 PDS	1 PDS	1 PDS/NUBUS	1 PDS & 3 NUBUS	1 PDS / 3 NUBUS	1 PDS & 2 NUBUS	1 PDS & 5 NUBUS



BOTTOM LINE 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.

ΕΞΗΓΗΠΕΤΟΥΜΕ ΔΙΕΘΝΕΙΣ ΠΑΡΑΤΗΛΕΙΣ
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
МБІ ГОБОРМ ІТО-РЬСЬКОЇ

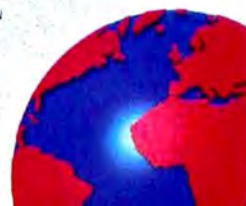
INTERNATIONAL ORDERS

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.

HOW TO ORDER: CALL 900-420-3525. \$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 TAX: 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: BW32



BOTTOM LINE



Macintosh technology is getting really cool these days. That means difficult choices and tough decisions. We may not have all the answers, but we can definitely point you in the right direction.

When it's all said and done, we want to be your Macintosh resource.

And that's our Bottom Line.

COLORPAGE T-16 II Two-page, 16-inch Trinitron display	\$1299	ROCKET 040 33 33MHz 68040 accelerator	\$1979	E-MACHINES POWERLINK PRESENTER Connects PowerBook Duo to large-screen displays	\$469
COLORPAGE T-19 II Two-page, 19-inch Trinitron display	\$2295	ROCKET 040 25 / 25i Rocket 25 - 25MHz 68040 accelerator with FPU Rocket 25i - 25MHz 68040 accelerator	\$1585/\$1195	E-MACHINES POWERLINK DESKNET Adds Ethernet capability & connects PowerBook Duo to large-screen displays	\$659
FUTURA SX Accelerated 24-bit color NuBus interface for 16" display	\$499	NEW! ROCKET SHARE Allows multi-processing with one or more Radius Rocket	\$409	SIGMA DESIGNS POWER PORTRAIT 16-inch portrait display plugs directly into PowerBook	\$459
FUTURA SX/8 Accelerated 8-bit color NuBus interface for 16" display	\$395	VIDEOVISION Color interface with video capture	\$1899	RADIUS POWER VIEW External 8-bit color interface for Macintosh PowerBooks	\$499
FUTURA MX Accelerated 24-bit color NuBus interface for 19" display	\$879	PRECISION COLOR 24xp / 24xx Accelerated 24-bit interface for 16" 7 20" displays	\$479/\$789	GCC WRITE MOVE II Portable inkjet printer designed for PowerBook	\$525
FUTURA LX Accelerated 24-bit color NuBus interface for 21" display	\$979	PRECISION COLOR 24x Accelerated 24-bit interface for 21" display	\$1675	PSI POWERMODEM IV 14400	\$425
DOUBLECOLOR LX 8-bit color interface for 21" display	\$619	PRECISION COLOR 8xj Accelerated 8-bit color interface, upgradeable	\$475	PSI POWERMODEM 24/96	\$149
DOUBLECOLOR LC 8-bit color interface for 16" display with LC	\$399	PRECISION COLOR DISPLAY 20" Two-page, 20-inch color display	\$2325	GLOBAL VILLAGE POWERPORT GOLD	\$499
DOUBLECOLOR SX 8-bit color interface for 16" and 4-bit color for 19" display	\$345	PRECISION COLOR DISPLAY 19" Two-page, 19-inch color display	\$1989	CONNECTIX CPU POWERBOOK UTILITIES	\$46
COLORLINK SX/T Accelerated 24-bit color interface with 10-base-T	\$649	NEW! PRECISION COLOR PIVOT Full-page Multisync color display portrait & landscape	\$925	AE DATALINK & AXCELL BUNDLE	\$709
COLORLINK EX/T Accelerated 24-bit color interface with 10-base-T	\$595	MONOCHROME TWO-PAGE DISPLAY 19" Two-page, 19-inch monochrome landscape display	\$869	DAYNA SCSILINK EXTERNAL PB ETHERNET	\$289
COLORLINK DC/T Accelerated 8-bit color interface with 10-base-T	\$469	MONOCHROME TWO-PAGE DISPLAY 21" Two-page, 21-inch monochrome landscape display	\$1115	APPLE POWERBOOK DUODOCK	\$999
				APPLE POWERBOOK BATTERY	\$89
				APPLE POWERBOOK BATTERY RECHARGER	\$99
				KENSINGTON POWERBOOK NUMERIC KEYPAD	\$95
				BAGS, CARRYING CASES, ACCESSORIES	CALL



NEC SILENTWRITER 95 300DPI, Postscript Level 2 Auto PC/Mac Switching, 6ppm	RASTEROPS CORRECTPRINT 300 300 DPI Dye Sublimation	QMS 860 HAMMERHEAD 600DPI, 8ppm, Tabloid 11x17, RISC, 12MB RAM	HP DESKWRITER \$374 HP 550C \$715	TI MICROLASER TURBO 9ppm, Postscript Level 2, RISC	GCC PLP II 300 DPI Laser Printers
\$1359	\$6899	\$4025		\$1474 PS/17 \$1175 PS/35 \$1319	\$799



ASANTE 10BASET HUB 10BaseT Hub with 9 ports	GLOBAL VILLAGE TELEPORT GOLD 14400bps Send/Receive Fax/Data Modem	6 x 9 STANDARD TABLET 6 x 9 pressure-sensitive digitizing tablet	UNIVERSAL POWERCACHE ALL DAYSTAR POWER CACHES INCLUDE ADAPTOR Choose any DayStar model:
ASANTE MACCON +16 64K Thick/Thin Ethernet card with 64K RAM buffer for Mac II	GLOBAL VILLAGE TELEPORT SILVER 96/96 Send/Receive Fax/Data Modem	12 x 12 STANDARD TABLET 12 x 12 pressure-sensitive digitizing tablet	33MHz POWERCACHE .....\$579
CAYMAN GATORBOX CS AppleTalk to Ethernet Gateway	GLOBAL VILLAGE TELEPORT BRONZE 24/96 Send/Receive Fax/Data Modem	12 x 12 ELECTROSTATIC TABLET 12 x 12 pressure-sensitive digitizing tablet	33MHz POWERCACHE WITH 68882 FPU .....\$709
DAYNAPORT E/II Thin Ethernet/AUI card for Mac II	PRACTICAL PERIPHERALS PM14400 FXSA 14400bps Send/Receive Fax/Data modem	12 x 18 STANDARD TABLET 12 x 18 pressure-sensitive digitizing tablet	40MHz POWERCACHE .....\$775
DAYNA ETHERPRINT / PLUS Serial/Thin/AUI connection for LocalTalk printer Serial/Thin/AUI connection for multiple LocalTalk devices	PROMETHEUS ULTIMA HOME OFFICE 96/96 Send/Receive Fax/Data modem	12 x 18 ELECTROSTATIC TABLET 12 x 18 pressure-sensitive digitizing tablet	40MHz POWERCACHE WITH 68882 FPU .....\$935
FARALLON STAR CONTROLLER Intelligent hub with twelve 10Base-T ports & one AUI port	PSI COMSTATION FOUR 9600/4800 send/receive fax/data modem	18 x 28 STANDARD TABLET 18 x 28 pressure-sensitive digitizing tablet	50MHz POWERCACHE .....\$1099
FARALLON TIMBUKTU REMOTE ACCESS PACK Enhances sharing capabilities, includes 9600bps modem	PSI COMSTATION FIVE 14400bps V.32bis send/receive fax/data modem	PAINTER Mac/Win Edgy Award-Winning Digital Painting Software Special price with purchase of Wacom tablet	50MHz POWERCACHE WITH 68882 FPU .....\$1279
SHIVA FASTPATH 5 LocalTalk to Ethernet Gateway	SUPRA V.32BIS / MAC PACKAGE V.32bis send/receive fax/data modem / with cable, software	CORDESS STANDARD STYLUS .....\$59	FASTCACHE IISI 64K 64K Static RAM cache for IIsi
SHIVA NETBRIDGE / TELEBRIDGE Router between remote networks	SUPRA V.32 / MAC PACKAGE V.32 send/receive fax/data modem / with cable, software	FIRM CORDESS PRESSURE-SENSITIVE STYLUS .....\$99	FASTCACHE IICI 64K 64K Static RAM cache for IICI
		SOFT CORDESS PRESSURE-SENSITIVE STYLUS .....\$99	FASTCACHE QUADRA 128K 128K Static RAM cache for Quadra
			DUALPORT IISI PDS adapter adds math chip. IIsi PDS and cache connector
			COMBOCACHE IISI 32K Static RAM cache with two PDS & optional math chip



VIDEOPIGOT / PRO.....\$249/\$1075
Quicktime Movies • Single Slot Digital-video frame grabber
Accelerated 24-bit color interface bundled with VideoPigot

THUNDERSTORM / PRO.....\$809/\$2789
Graphics accelerator
Bundles the ThunderStorm with the Thunder24

SPECTRUM/24 SERIES III.....\$809
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

DIGITALFILM.....\$4499
On-line, digital-video editing system

SUPERMATCH 20-T MULTIMODE TRINITRON\$2399
Two-page, 20-inch Trinitron multimode display

SUPERMATCH 17-T TRINITRON.....\$1049
Full-page, 17-inch Trinitron display

SPECTRUM/24 PDQ PLUS.....\$1489
Accelerated 24-bit color interface for 21" display

SPECTRUM/8+24 PDQ.....\$799
Accelerated 24-bit color interface for 13", 16-bit for 17" & 8-bit for 21"

SUPERMATCH 21 TWO-PAGE COLOR.....\$2775
Two-page, 21-inch color display

PLATINUM 20 / 21 TWO-PAGE.....\$899/\$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

MEDIA TIME.....\$1515
24-bit color interface for 13" with video display/capture

24Sx / 24Mx / 24MXQ.....\$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

8XLI / 24XLI.....\$899/\$1699
Accelerated 8-bit color interface, upgradeable to 24-bit
Accelerated 24-bit 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.....\$2149
Two-page, 20-inch Trinitron display

20" MULTIMODE HITACHI.....\$1325
Two-page, 20-inch Trinitron display

CORRECTPRINT 300.....\$6899
Dye sublimation printer offers 300 dpi output

INFINITY 88 TURBO EXTERNAL.....\$649
88MB SyQuest removable cartridge drives

INFINITY 40 TURBO EXTERNAL.....\$519
44MB SyQuest removable cartridge drives

INFINITY 128MB 3.5" OPTICAL.....\$1549
Removable, rewritable optical cartridge drive

INFINITY 128MB 3.5" OPTICAL INTERNAL.....\$1449
Removable, rewritable optical drive, internal for Quadra

INFINITY FLOPTICAL 21MB.....\$339
Stores 21MB on 3.5" floptical diskettes

INFINITY FLOPTICAL 21MB INTERNAL.....\$299
Stores 21MB on 3.5" floptical diskettes, internal for Quadra

PLI 4GB DAT DRIVE.....\$1399
4GB DAT back-up drive

QUICK SCSI.....\$319
SCSI-2 NuBus host adapter

PLI MINIARRAY 480.....\$2249
480MB fixed hard drive with QuickSCSI

PLI 850MB MINIARRAY.....\$3599
850MB fixed hard drive with QuickSCSI

PLI 1.0GB MINIARRAY.....\$4099
1.0GB fixed hard drive with QuickSCSI

INFINITY OPTICAL 5.25" 600MB SONY.....\$2769
Removable, rewritable optical cartridge drive

INFINITY MAXOPTICAL 1GB.....\$3299
1.0GB Optical disk drive with 35ms average seek time

SILENTWRITER MODEL 95.....\$1369
Laser printer with 6 ppm, 300 dpi output, 2MB RAM

SILENTWRITER 4MB RAM UPGRADE.....\$269
RAM upgrade for SilentWriter Model 95

SILENTWRITER 2MB RAM UPGRADE.....\$125
RAM upgrade for SilentWriter Model 95

SILENTWRITER MODEL 95 FAX UPGRADE.....\$529
Adds fax capability to SilentWriter Model 95

CDR-37.....\$406
Portable CD-ROM Reader

CDR-74.....\$849
Multimedia portable CD-ROM Reader

MULTISync 3FGX / 4FG.....\$629/\$755
15-inch multifrequency color displays

MULTISync 5FG.....\$1349
17-inch multifrequency color displays

MULTISync 6FG.....\$2375
21-inch multifrequency color displays

MACFG 8X.....\$737
Accelerated 8-bit color interface

MACFG 24X.....\$1549
Accelerated 24-bit color interface

COLORMATE 300 PS40.....\$3999
Color laser printer with 17 PostScript fonts & 4MB RAM

COLORMATE 300 PS80.....CALL
Color laser printer with 35 PostScript fonts & 8MB RAM



MICROSOFT WORD 5.1
\$279

**MACACADEMY VIDEO
TRAINING TAPES**
\$36

ADOBE PHOTOSHOP
\$499

QUARK XPRESS 3.2
\$499

QUARK PASSPORT
INTERNATIONAL LANGUAGE SUPPORT
\$1499

**ACT! CONTACT
MANAGER**
\$232

**SONY 14" & 17"
COLOR DISPLAYS**
High Resolution Trinitron
1304 \$599
1604 \$1029

DISPLAYS

APPLE 12" / 14" RGB DISPLAY \$399 / \$545
APPLE 16" RGB PORTRAIT DISPLAY \$1199
SEKO CM-1445 \$449

NETWORKING

ASANTE EN/SC SCSI ETHERNET \$302
DAYNASTAR MINIHUB 12-PORT \$657
FARALLON PHOENIX STAR CONNECTOR \$849
SHIVA ETHERGATE \$1265

PRINTERS

APPLE STYLEWRITER \$339
APPLE PERSONAL LASERWRITER NTR \$1675
APPLE LASERWRITER III / IIG \$2199 / \$2775
DATA PRODUCTS 1560 TABLOID \$2889
DATA PRODUCTS LZR-960 \$1599
DATA PRODUCTS LZR-965 \$2379
GCC BLP ELITE \$1179
GCC PLP II / IIS \$799 / \$1099
GCC WIDE WRITER 360 \$1449
HEWLETT PACKARD DESKWRITER / 550C \$375 / \$715

HEWLETT PACKARD LASERJET 4M
LASER MASTER MAX WRITER 400
NEWGEN PRINTER LINE
OMS PS-410 / PS-860 \$1475 / \$4025
TEKTRONIX COLOR QUICK INKJET
TI MICROLASER PS17 / PS35 \$1175 / \$1319
TI MICROLASER TURBO \$1474

DRIVES & TAPES

INTERNAL / EXTERNAL KIT \$29 / \$99
APPLIED ENGINEERING 1.44 / PLUS \$209 / \$283
BERNOLLI PRO 90MB WITH INTERFACE \$539
DGR 128MB TURBO 3.5" MO \$1199
DGR 256MB 3.5" MO \$1699
FUJITSU 520MB \$1099
FUJITSU 1.2GB \$1489
QUANTUM 127MB ELS \$345
QUANTUM PRODRIVE 240MB \$599
QUANTUM 425MB \$949
ALL SEAGATE DRIVES CALL

SCANNERS

HEWLETT PACKARD SCANJET IIC \$1299
MICROTEK SCANMAKER II / IIXE \$849 / \$1099
MICROTEK 1850 SLIDESCANNER \$1399
SHARP JX320 / JX450 WITH INTERFACE \$999 / \$3999
SHARP TRANSPARENCY ADAPTOR \$849
UMAX SCAN OFFICE GRAYSCALE \$825
UMAX 630 / WITH TRANSPARENCY \$1079 / \$1749
UMAX 840 / WITH TRANSPARENCY \$1599 / \$2273

CALL UMAX 1200 / WITH TRANSPARENCY \$2889 / \$3539
CALL UMAX TRANSPARENCY ADAPTER \$679
CALL COLOR ENCODE SOFTWARE, WITH SCANNER \$149

INPUT/OUTPUT
APPLE EXTENDED KEYBOARD \$170
DATADESK 101 KEYBOARD \$115
KENSINGTON TURBO MOUSE 4.0 \$101
KEYTRONIC MACPRO PLUS KEYBOARD \$115

SNOOPER \$99

SNOOPER \$135
VIREX \$59

SOFTWARE

ADOBE ILLUSTRATOR V.3.2 w/ATM \$335
ALDIS FREEHAND V.3.1 \$369
ALDIS Pagemaker V.4.2A \$475
CANVAS V.3.0 \$239
CLARIS WORKS V.1.0 \$184
CONNECTIX POWERBOOK UTILITIES \$46
EFI CACHET \$459
FILEMAKER PRO V.2.0 \$244
FOXBASE +MAC V.2.1 \$265
FRACTAL DESIGN PAINTER V.1.2 \$229
MACROMIND DIRECTOR V.3.1 \$849
MICROSOFT EXCEL V.4.0 \$299

MICROSOFT OFFICE V.2.5 \$489
MS PROJECT / WORKS \$429 / \$159
MINICAD V.4.0 \$469
NORTON UTILITIES MAC V.2.0 \$88
OMNIPAGE / OMNIPAGE PRO \$449 / \$599
PIXAR TYPESTYR \$159
RETROSPECT V.1.3 \$131
STRATAVISION 3D V.2.5 \$549
TYPESTYLER V.2.0 \$122
WORDPERFECT V.2.1 \$265

MODEMS & FAXES

DOVEFAX / DOVEFAX PLUS \$175 / \$225
HAYES ULTRA 9600/SC II \$675
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

ACCELERATORS AND CACHE

AE QUICKSILVER IIS WITH FPU \$245
AE TRANSWARP LC 33MHz WITH FPU \$895
DGR TECH MAX LC EXPANSION CHASSIS \$349
NEWER TECHNOLOGIES QUADRA OVERDRIVE \$119

CD-ROM

CHIVON CD-ROM DRIVE \$525
EMAC CD-ROM DRIVE \$339
TOSHIBA CD-ROM XM 3201A \$685
TYPE GALLERY PS \$229

BOTTOM LINE 1-900-420-3636

\$2 per minute

24-HOUR INTERNATIONAL FAX LINE 512-476-6399 • 1219 WEST 6TH STREET • AUSTIN, TEXAS 78703

BW32

THIRD WAVE SELLS ALL MODELS OF MACS!

**BEST
PRICES!**

QUADRAS — POWERBOOKS



**CALL FOR PRICING
ON ALL MODELS OF
MACINTOSH CPUs**

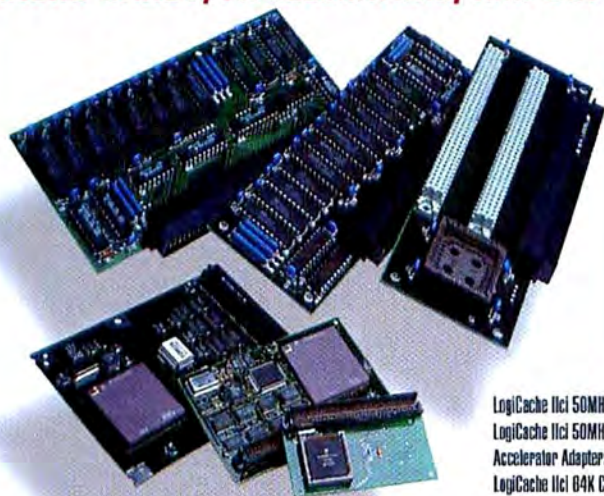
We can help you design your
entire system. Just give one of
our sales consultants a call.

*5 Year Warranty
Rated Number One by MacUser*

ASANTÉ ETHERNET FROM \$169

NuBus or Hsi/SE 30 Thick/Thin or Thick/10T	159.00
NuBus or Hsi/SE 30 Thick/Thin/10T	209.00
LC Thin or LC 10T	159.00
LC Thin/10T	209.00
SE Thick/Thin	159.00
SE Thick/10T	159.00
SE Thick/Thin/10T	209.00
FriendlyNet LC or NuBus	
(w/Thick/Thin/10T Adapter)	209.00
FriendlyNet Hsi (w/Thick/Thin/10T Adapter)	239.00
FriendlyNet Adapters Thick/Thin/10T	89.00
SCSI EtherNet 10T	289.00
SCSI EtherNet 10T (PowerBook)	319.00
SCSI EtherNet Thick/Thin/10T	339.00
SCSI EtherNet Thick/Thin/10T (PowerBook)	369.00
Asante AUI to 10T Adapter	89.00
AsanteHub 1012	849.00
AsanteHub 1700 or 1900 Series	CALL
Asante 10T Hub/8	285.00
Asante 10T Hub/12	559.00

CACHE CARDS, ACCELERATORS, AND COPROCESSORS



**LOGICA HSI
CACHE BUNDLE
ONLY \$249**
INCLUDES 64K CACHE,
DUAL SLOT ADAPTER,
20MHz FPU CHIP

LogiCache Hsi 50MHz w/882	1019.00
LogiCache Hsi 50MHz	939.00
Accelerator Adapters	40.00
LogiCache Hsi 64K Cache	139.00
LogiCache Hsi 64K Cache	149.00
Logica Hsi Dual Slot Adapter	59.00
20 MHz Math chip for Adapter	69.00
DayStar PowerCache 33,40,50 MHz	CALL
DayStar PowerCache above w/882	CALL
Radius Rocket and Radius Rocket 25i	CALL
TokaMac 040 Accelerators for the LC, Hsi, SE 30, Hci, and the Mac II FX	CALL
Logica LC, LC II, or Classic II FPU	69.00

SPEED UP YOUR MAC!

Cache Cards — Up to 50% faster!

FPUs — 100 to 500% faster! (Math functions only)

Accelerators — 200 to 350% faster!

• Daystar • Fusion • Logica • Radius •

DISPLAY SYSTEMS



Seiko 14" Trinitron	479.00
SuperMac 17"	1099.00
SuperMatch 20", Trinitron	1499.00 / 2499.00
ThunderStorm, Spectrum and Thunder cards	CALL
E Machines Complete Line	CALL
Radius Pivot, Color Pivot	CALL
Video Spigot Complete Line	CALL

International Orders call (512) 832-8282 FAX (512) 832-1533 We accept Visa, Mastercard, American Express, and Discover.
Corporate, educational, and government purchase orders accepted. Most deliveries via Federal Express.



THIRD WAVE

1(800)880-0099

OPTICAL 128 FROM \$1199

COMPARE OUR DAT DRIVES TO THEIRS.

	Third Wave DATdrive	The Other Guys
Warranty	5 years	2 years
Price: 2GB	1395.00	1399.00
Compression (8GB)	1595.00	1899.00 (only 5GB)
Firmware Upgrades	From tape	Chip replacement
Upgrade Method	User install	Vendor install
OEM	Hewlett Packard	Archive
Form factor	3.5"	3.5"
MTBF	50,000 hours	40,000 hours
Software	Retrospect	Retrospect

MEDIA

SyQuest 45 or 88 MB cartridge	68.00 / 115.00
DAT cassette 80 or 90 meter	12.00 / 18.00
Optical cartridge (ISO) 512 kb/sector	110.00
Optical cartridge (ISO) 1024 kb/sector	110.00
Optical cartridge 128 MB	39.00

SPECIAL!

Adobe Photoshop 2.01 449.00

PowerBook Accessories

PSI PowerModem	209.00
Global Village Bronze FaxModem	209.00
Global Village Silver/Gold FaxModem	399.00/449.00
Apple PowerBook FaxModem	129.00

Scanners

Agfa ARCUS 1200 dpi	3099.00
UMAX UC830	1099.00
UMAX UC1200	3099.00

STORAGE SYSTEMS REMOVABLE MEDIA

Optical 128P	1199.00
Optical 800	(SONY) 2899.00
45 SR (SyQuest) w/cartridge	409.00
88 SR (SyQuest) w/cartridge	509.00
DATdrive 2GB	1395.00
DATdrive 8GB (five year warranty)	1595.00

DISK DRIVES

	INTERNAL	EXTERNAL
Go•80**	349.00	439.00
Go•120**	489.00	559.00
120 MB	349.00	439.00
240 MB	629.00	719.00
520 MB	1049.00	1139.00
830 MB	1269.00	1359.00
1.2 GB	1599.00	1689.00
1.5 GB/2.0 GB	CALL	CALL



All of our DAT drives include Retrospect 1.3, one DAT cassette, one DAT cleaning cassette, and your choice of SCSI cable. SyQuest, Optical, and DAT available internally for the Quadra 950!

*One Year Warranty

**Internals for PowerBooks only



MEMORY UPGRADES

- 1MB, 2MB, 4MB SIMMs
- 16MB SIMM (list, lic, Quadra 800/950)
- 16MB SIMM (Quadra 700)
- PowerBook 2MB
- PowerBook 4MB
- PowerBook 8 MB
- PowerBook 100 4MB
- PowerBook 100 8MB
- Quadra 700/900 VRAM SIMM
- Quadra 950 VRAM SIMM
- LC 512K VRAM SIMM

SIMM Prices subject to change, reflect cash discount.

CALL
FOR
LATEST
PRICES!

BEST
PRICES!

Quantum GO•120 2.5 inch
16ms internal drive with
Third Wave's 8 megabyte
PowerRAM memory module
—only \$709.00!*

A total of 120MB storage and 8MB
pseudo-static RAM! Send us your
PowerBook and we'll install it free!
*Includes trade in of Apple 2MB module
and drive, Models 140 and 170 only.
Also available—8/80 for only \$599.00

A SPECIAL OFFER FOR
POWERBOOK OWNERS!

8/120 IN YOUR
POWERBOOK
FOR ONLY \$709!

Circle 156 on reader service card

THIRD WAVE COMPUTING, INC. 1826B Kramer Lane Austin, Texas 78758 (800) 880-0099 (512) 832-8282 FAX (512) 832-1583
Toll Free Tech Support line- (800) 844-8283



Your Mail Order SuperStore™

800-945-1MAC East Coast

5426 Beaumont Cte. Blvd., Ste 300 • Tampa, FL 33634

800-945-1MAC West Coast

4730 Walnut, Suite 105 • Boulder, Colorado 80301

800-945-1MAC Tech Support

Mon - Friday 9:00 - 9:00 Saturday* 9:00 - 5:00 Sunday* 12:00 - 5:00 Eastern and Mountain Time Coast Only

Hard Drives...

Quantum

	Internal	External
42 Mb ELS	\$199.00	\$279.00
85 Mb ELS	\$279.00	\$349.00
127 Mb ELS	\$339.00	\$399.00
170 Mb ELS	\$399.00	\$465.00
240 Mb LPS	\$579.00	\$639.00
425 Mb LPS	\$899.00	\$959.00

Seagate

	Internal	External
337 Mb Runner	\$1249.00	\$1349.00
613 Mb	\$1349.00	\$1449.00
676 Mb	\$1285.00	\$1485.00
676 Mb WREN	\$1549.00	\$1649.00
1.2 Gb	\$1749.00	\$1849.00
1.7 Gb	\$2169.00	\$2269.00

hp HEWLETT PACKARD

	Internal	External
402 Mb	\$1179.00	\$1259.00
633 Mb	\$1399.00	\$1449.00
1.0 Gb 3.5"	\$2199.00	\$2299.00
1.0 Gb 5.25"	\$1959.00	\$2059.00
1.6 Gb	\$2399.00	\$2499.00
2.0 Gb	\$3529.00	\$3629.00

TOSHIBA

	Internal	External
877 Mb	\$1275.00	\$1375.00
1.2 Gb	\$1599.00	\$1699.00

Maxtor

	Internal	External
213 Mb (NEW)	\$475.00	\$535.00
340 Mb	\$685.00	\$745.00
760 Mb	\$1225.00	\$1320.00
1.2 Gb	\$1549.00	\$1645.00
1.7 Gb	\$1769.00	\$1869.00

FUJITSU

	Internal	External
425 Mb	\$960.00	\$1025.00
520 Mb	\$1039.00	\$1099.00
778 Mb	\$1249.00	\$1349.00
1.2 Gb	\$1599.00	\$1699.00
1.7 Gb	\$2578.00	



Mac Classic II



Mac Ixx



Mac Icx



Mac LC II



Mac Ili



PowerBook 160 & 180



PowerBook Duo 210 & 230



Quadra 700



Quadra 950

Video...

E-MACHINES

16" E-Machines T16II	\$1299.00
19" E-Machines T19II	\$2345.00
Video Boards	
Double Color LC Board	\$409.00
Double Color SX Board	\$369.00
Double Color LX Board	\$649.00
Futura SX Board	\$489.00
Futura MX Board	\$815.00
Futura LX Board	\$1029.00

SII

CM1445 13" Trinitron RGB	\$525.00
CM1760LR 17" CRT	\$1199.00
19" Trinitron Monitor	CALL
SmartLabel Printer Plus	\$145.00

radius

Monochrome Pivot Monitor	\$745.00
Color Pivot Monitor	\$1299.00
19" Monochrome Monitor	\$932.00
21" Monochrome Monitor	\$1189.00
Video Boards	
Monochrome Pivot	\$259.00
Color Pivot	\$505.00
19"/21" Monochrome	\$395.00
8XJ Video Board	\$515.00
8X Video Board	\$739.00
24XK Video Board	\$859.00
24X Video Board	\$1629.00

SIGMA DESIGNS

Power Portrait Displayer	\$759.00
L-View 19" Black & White	\$929.00
L-View Multiview Adapter	\$299.00
Silver Pro 21" GS	\$1049.00

RasterOps

20" Hitachi Color Monitor	\$1499.00
20T Multi-Scan Color Monitor	\$2769.00
21" Mono/Grey Monitor	\$999.00
21" Color Monitor	\$2752.00
Video Boards	
8XL Video Board	\$469.00
8XLI Video Board	\$924.00
PaintBoard Li Video Board	\$835.00
PaintBoard 24 Video Board	\$1539.00
24XLI Video Board	\$1895.00

Apple

12" Monochrome Monitor	\$239.00
12" RGB Monitor	\$439.00
14" RGB Monitor w/swivel	\$545.00
16" RGB Monitor	\$1279.00
21" RGB Monitor	\$3579.00
Video Boards	
8*24 Video Board	\$545.00
8*24 GC Video Boards	\$1359.00

SUPERMAC™

SuperMatch 17" Multimode	\$1159.00
21" Platinum Monitor	\$919.00
20" Color Dual-mode Trinitron	\$2519.00
21" Color Two-Page Monitor	\$2859.00
Video Boards	
Monochrome Card	\$335.00
Spectrum/8 Series III	\$419.00
Spectrum/8*24 PDQ	\$839.00
Color Card 24	\$489.00
Spectrum/24 Series III	\$839.00
Spectrum/24 PDQ+	\$1569.00

Printers...

TEXAS INSTRUMENTS

microLaser PS17 w/AT	\$1299.00
microLaser PS35 w/AT	\$1419.00
microLaser Turbo w/AT	\$1659.00

QMS

QMS PS 410	\$1499.00
QMS PS 815	\$2999.00
QMS PS 825	\$3499.00
QMS PS 815MR	\$4059.00
QMS ColorScript 210	\$4499.00

Removable Drives...



ETC 45R Removable Drive	\$399
ETC 88R Removable Drive	\$499
ETC Dual 45/88R Removable	\$599


800-846-4MAC Canada
360 Bloor St., Suite 901 • Toronto, Ontario M4W3M3
416-921-2321 International
416-921-4280 FAX

Mac and MORE Japan Coming Soon!

Keyboards...

ETC Extended Keyboard	\$99.00
Apple Extended Keyboard	\$170.00
Apple Standard Keyboard	\$99.00

Networks...

ETC LAN Adapter (10baseT)	\$199.00
ETC Magic Converter II	\$149.00
ETC Ethernet Repeater	\$99.00
ETC 10baseT Hub	\$529.00
ETC DataFlow II thick & thin	\$140.00

Accelerators...

33 MHz PowerCache	\$689.00
40 MHz PowerCache	\$949.00
50 MHz PowerCache	\$1379.00
...prices include Math Coprocessor	
CPU Adapter	\$42.00

Scanners...

UMAX

UC 1200S Color Scanner	\$3579.00
UC 630 600 dpi Color Scanner	\$1149.00
Transparency Option	\$679.00

PowerBooks...

PowerBook 145 4/40 \$2299.00
the PowerBook 145 offers performance of a desktop computer in a portable design. It has a 68030 processor and a backlit supertwist display. It comes with an internal SuperDrive

New for ETC...

ETC DataCAM Multimedia Video Camera

The ETC DataCAM B & W video camera includes the camera with light amplifying infrared LED's to capture images even under the most adverse lighting conditions, built in microphone, speaker, tripod, battery, video and audio cables.

The ETC DataCAM Color video camera includes the camera with built in microphone, speaker, tripod, battery, video and audio cables.



\$279.00

CALL

Terms and conditions: Payment Mac and MORE accepts Visa, MasterCard, C.O.D.s, and Purchase Orders. C.O.D.s are shipped Cash/Certified or Personal/Company Check with approval. Corporate and School Purchase Orders are Net-15 for orders over \$1000 only and are subject to credit approval. Warranties: All warranties on Macintosh or Apple brand products sold by Mac and MORE will be honored by Mac and MORE or its authorized agents only. Mac and MORE does not guarantee compatibility. Like all other Mail-order retailers, Mac and MORE is not an authorized Apple reseller. All other Manufacturers warranties are honored by Mac and MORE and the original manufacturer. Returns: All orders returned or refused will be charged a minimum 15% restocking fee. Call for an RTS before returning. Returns must be in original packing with software seals unbroken. Shipping: For advertised items totaling over \$2500 we will ship to destination in the continental US at no charge. Some large items may not be included in this offer. Ask for details when ordering. Terms, conditions, and prices are subject to change without notice or obligation. All products sold by Mac and MORE are new. We do not sell used equipment. All brand names or product name mentioned are trademarks or registered trademarks of their respective holders. ©1992 Mac and MORE, Inc. All rights reserved. February 92

It's a Vintage Year For Data Compression

The ETC DataPress offers a robust bouquet of features that includes "real-time" hardware data compression, SCSI bus expansion, and more at a price that is pleasing to the palette.

On average, the ETC DataPress doubles the capacity of your drive. It can even compress some files as high as 15-to-1, making the DataPress less expensive than buying another drive for your system.



The making of fine wine is a complicated and time consuming process that should be left to experts. Data compression on the Macintosh® used to be just as difficult—until the invention of the DataPress™.

The DataPress, which ships with *More Disk Space™* by Alysis, offers the fastest and most complete system for

squeezing space out of your hard disk drive. And its speed is unparalleled. The DataPress doesn't use slow background software tricks. When it writes a file to your hard disk, the data is compressed—"real-time"—so that there

is no chance of lost data or time.

Plus, it's easy to use. Just plug the DataPress into the SCSI port on your Macintosh, and install the software. From there, the DataPress can transparently compress and decompress any file anywhere on your SCSI chain—including those on your internal drive! Just save a file and it's compressed. It's that easy.

Besides data compression, the DataPress enables you to expand the capabilities of your SCSI bus. It is a gateway to another complete SCSI chain of seven additional devices.

And there's more. At the core of the DataPress is ETC's SmartPeripheral™ Engine, an innovation that brings dumb peripherals to life. Empowering them to do things they've never done before. In this engine we've used a Flash EPROM that allows you to add future *SPE Options* by "double-clicking" on an auto-installing icon.

What are *SPE Options*? These are programs that run on the DataPress to add features like: disk mirroring, super volumes, RAID, encryption, and continuous off-line storage of removable magnetic media.

So how do you choose the best data compression solution around? It's a lot less intimidating than choosing a good wine. Call 1-800-876-4ETC.



More Disk Space™ from ALYSIS is included with the ETC DataPress to provide the easiest and fastest data compression possible on the Mac!



ETC Peripherals, Inc., 5426 Beaumont Center Blvd.
Tampa, Florida 33634 • 813-884-2863 • 813-888-9535 fax
DataPress, SmartPeripheral and the ETC logo are trademarks of ETC Peripherals, Inc.
Macintosh is a registered trademark of Apple Computer, Inc. More Disk Space is a trademark of Alysis Software, Inc. US Patent Pending. © 1992 ETC Peripherals, Inc. All rights reserved.

Circle 4 on reader service card

MACPRODUCTS
HAS BEEN
CONTINUOUSLY
SHIPPING
MACINTOSH DRIVES
LONGER THAN ANY
OTHER COMPANY!



MAGIC
DRIVE
KIT:
Internal
Kit \$29
External
Kit \$99

ALL MAGIC DRIVES INCLUDE A 1, 2, 3,
OR 5 YEAR WARRANTY & THE MAGIC
30-DAY MONEY-BACK GUARANTEE.

ALL MAGIC EXTERNAL
DRIVES INCLUDE CASE
WITH 40 WATT POWER
SUPPLY, CABLES, ANUBIS
SOFTWARE UP TO 35%
FASTER THAN FWB



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

MACWORLD



WINNER OF THE 1992
MACWORLD MAGAZINE
EDITOR'S CHOICE
AWARD!
- NOVEMBER 1992



MAGIC HARD DRIVES

40MB Hard Drive*	\$195
52MB Quantum LP**	\$219
105/120MB Quantum LP**	\$329/\$359
Go 120MB Quantum**	\$549
240/425MB Quantum**	\$599/\$999
425/520MB Fujitsu*	\$1049/\$1149
830MB Toshiba†	\$1299
Magic 1.2GB Fujitsu††	\$1699
Magic 1.5GB Micropolis††	\$2099
Magic 2.1GB Seagate††	\$2799

MAGIC 256/128 OPTICAL

3.5" Optical Disk Included With All Magic Optical Drives	
Magic 256MB REM MOST Optical*	\$1699
Magic 128MB Turbo Epson Optical*	\$1199
Magic 256/128MB 3.5" Cartridges	\$99/\$59

MAGIC 45R & 88R

Magic 45R/88R SyQuest Drive**	\$449/\$499
SyQuest 45 & 88 Cartridges	\$69/\$119

MAGIC TAPE

Tape Included With All Magic Tape Backup Drives	
Magic 150/250MB Tape Backup*	\$599
Magic 525/600MB Tape Backup*	\$999
Magic 2.0/10GB DAT Backup*	\$1499/\$1299
Magic 2.3/5.0GB 8mm Backup*	\$1995/\$2599

MAGIC CD-ROM

Magic Toshiba CD-ROM (XM3301)	\$549
Magic Toshiba CD-ROM (XM3401)	\$699
Magic NEC CD-ROM (CDR74)	\$699

WARRANTIES:

* 1 YEAR
† 2 YEAR

† 3 YEAR
†† 5 YEAR



MAGIC MEMORY

Each Magic Memory Upgrade is backed by the
Magic Lifetime Guarantee. Magic SIMMs are made
of the highest quality components and designed
specifically for your hardware.

1MB SIMMs \$29
4MB SIMMs \$119

A COMPLETE LINE OF
MEMORY UPGRADES
FOR MACINTOSH
COMPUTERS, PRINTERS
& ACCELERATORS

MAGIC COMMUNICATIONS

MAGIC HARD WORKING TOOLS FOR YOUR MACINTOSH

MAGIC HARD WORKING TOOLS FOR YOUR MACINTOSH

MAGIC FAXMODEMS

MAGIC AFX & PKT FAXMODEMS

2400bps modem. 9600/4800bps, class 1, Group 2 & 3 fax,
software\$89, pocket version \$119

MAGIC AFX-24/96 POWERBOOK FAXMODEM

2400bps modem. 9600bps send & receive, mounts
internally in any Macintosh PowerBook,
Group 3 Class 1 fax\$149

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\$189

MAGIC VFX V.32BIS FAXMODEM

14400bps modem. 14400bps, class 2, Group 3 fax,
V.42bis/V.32bis & MNP5, software\$289

MAGIC MODEMS

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\$259

ALL MAGIC MODEMS INCLUDE
2 YEAR WARRANTY AND 30
DAY MONEY BACK GUARANTEE



NEW!

14400 BPS

POWERBOOK MODEM

MOUNTS INTERNALLY IN ANY MACINTOSH
POWERBOOK, SOFTWARE

\$339

MAGIC AFX-24/96

POWERBOOK FAXMODEM

MOUNTS INTERNALLY IN ANY MACINTOSH
POWERBOOK, GROUP 3, CLASS 1 FAX

\$149

EXTERNAL

2400 BAUD

9600 BAUD &

14400 BAUD MODEMS
& FAXMODEMS

ADVANCED V.42BIS,

V.32BIS & MNP 5

ERROR CHECKING &

DATA COMPRESSION

CAPABILITIES



MACPRODUCTS USA
HOLIDAY COUPONS
MENTION COUPON WHEN
ORDERING BY TELEPHONE

1 MACINTOSH IICX
\$2099 WITH ANY
MAGIC PURCHASE
OF \$1000 OR MORE.

NOT VALID WITH ANY OTHER PROMOTION. GOOD THROUGH
2/30/93. CREDIT CARD OR C.O.D. PURCHASES ONLY.

2 SUPERMAC THUNDER
24 \$2099 WITH ANY
MAGIC PURCHASE
OF \$1000 OR MORE.

NOT VALID WITH ANY OTHER PROMOTION. GOOD THROUGH
2/30/93. CREDIT CARD OR C.O.D. PURCHASES ONLY.

3 NEC SILENTWRITER 2
MDL 95 \$1399 WITH
ANY MAGIC PURCHASE
OF \$750 OR MORE.

NOT VALID WITH ANY OTHER PROMOTION. GOOD THROUGH
2/30/93. CREDIT CARD OR C.O.D. PURCHASES ONLY.

MAGIC MEMORY UPGRADES

1MB SIMMs.....	Starting at \$29
2MB SIMMs.....	\$69
4MB SIMMs for IIsi, Ilic, Quadra.....	\$119
16MB SIMMs.....	\$499
2/4/6MB PowerBook.....	\$99/\$179/\$239
4MB Classic Upgrade.....	\$99
LC VRAM.....	\$59
Quadra VRAM.....	\$29

PRINTER RAM

GCC PLP II/S 1MB.....	\$49
LZR960/Realtech/Quickor 8MB Kit.....	\$499
NEC SilentWriter 2 M90 2MB Upgrade.....	\$249
NEC SilentWriter Model 95 2MB.....	\$139
QMS PS-410/815 4MB Upgrade.....	\$239/\$349
TI 1MB RAM Upgrade.....	\$49
TI Turbo 4MB RAM Upgrade.....	\$399

1MB TI RAM \$49
2MB NEC RAM \$139

ALL MAGIC MEMORY UPGRADES INCLUDE A FULL LIFETIME WARRANTY

MAGIC HARD WORKING TOOLS FOR YOUR MACINTOSH

MAGIC RAILGUN 030 ACCELERATORS FOR MAC SE, PLUS & CLASSIC.

ACCELERATORS AVAILABLE WITH BUILT-IN LARGE SCREEN VIDEO OUTPUT

RAILGUN™ 030 SYSTEM VS. 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
MATH FPU	BUILT INTO 68030	NOT INCLUDED
PMU	BUILT INTO 68030	NOT INCLUDED
VIDEO PATH	32-BIT	16-BIT
VIDEO CLOCK	16, 25, 33, & 40MHz	8MHz
MONITOR RES.	1152 x 876	1024 x 768
VIDEO SUPPORT	ALL 3RD PARTIES	ONLY MOBIUS DISPLAYS
VIRTUAL RAM	USING VIRTUAL 3.0	NOT AVAILABLE
RAM SUPPORT	UP TO 16MB	UP TO 4MB
BASE PRICE	\$999	\$1099



RAILGUN 030

Magic RailGun 16MHz.....	\$399
Magic RailGun 25MHz.....	\$449
▶ Magic RailGun 33MHz.....	\$499
Math CoProcessor Upgrade.....	\$49/\$99
▶ Virtual 3.0 Virtual RAM software.....	\$99

MAGIC ACCELERATORS

Magic LC 030 with CoProcessor.....	\$199
Magic Math LC CoProcessor.....	\$59
Magic Math Classic II CoProcessor.....	\$59
Magic IIsi Dual Slot Card with FPU.....	\$99
Magic Cache Ilic / IIsi 64k.....	\$159

MAGIC HARD WORKING TOOLS FOR YOUR MACINTOSH

4 RADIUS PRECISIONCOLOR 20" \$2399 WITH ANY MAGIC PURCHASE OF \$1000 OR MORE.

NOT VALID WITH ANY OTHER PROMOTION. GOOD THROUGH 2/30/93. CREDIT CARD OR C.O.D. PURCHASES ONLY.

5 MAC POWERBOOK 145 4/80 \$2399 WITH ANY MAGIC PURCHASE OF \$750 OR MORE.

NOT VALID WITH ANY OTHER PROMOTION. GOOD THROUGH 2/30/93. CREDIT CARD OR C.O.D. PURCHASES ONLY.

6 DAYSTAR POWERCACHE 50MHz w/882 \$1099 W/ANY MAGIC PURCHASE OF \$500 OR MORE.

NOT VALID WITH ANY OTHER PROMOTION. GOOD THROUGH 2/30/93. CREDIT CARD OR C.O.D. PURCHASES ONLY.

7 BUY 10 GET ONE FREE 128MB OR 256MB OPTICAL CARTRIDGES.

NOT VALID WITH ANY OTHER PROMOTION. GOOD THROUGH 2/30/93. CREDIT CARD OR C.O.D. PURCHASES ONLY.

MAGIC ACCESSORIES

MAGICNET LOCALTALK

MagicNet singles.....	\$15
MagicNet 10-pack, ea.....	\$10

MAGIC ETHERNET

ETHERNET NUBUS CARDS

ThickNet.....	\$149
ThinNet.....	\$149
10base-T.....	\$149
Transceivers.....	\$85

SCSI ACCELERATOR

Magic SCSI II & Mirror Card & Cable.....	\$299
Magic SCSI II Cable.....	\$49

CALL FOR A FREE MACPRODUCTS USA MAGIC CATALOG.

DIAL OUR FIRST CLASS BBS FOR THE LATEST DRIVER UPDATES AND SOFTWARE VERSIONS. FREE BBS ACCESS SOFTWARE WITH ANY PURCHASE. 512-472-1794 VTI 00-8-1-NONE

MAC

1 800

FAX 512-499-0888
TEL 512-472-8881
CANADA 800-624-9307
SINGAPORE 65-287-5181
CUSTOMER SERVICE
TECHNICAL SUPPORT

MACPRODUCTS USA

LEASE

LEASE A COMPLETE MACINTOSH SYSTEM AT AFFORDABLE RATES. CALL FOR DETAILS.

TERMS & CONDITIONS:

Corporate, Educational purchase orders accepted. Returns subject to a restocking fee. Call for and RMA # before returning merchandise. International orders welcome. Magic includes a 30 Day Money Back Guarantee on all Magic® Products - Excluding Original Shipping. Prices subject to change.

MACPRODUCTS USA

HARD WORKING SINCE 1985

622 8721

608 WEST 22ND
AUSTIN, TEXAS 78705
MALAYSIA TEL 603-734-7330
JAPAN TEL 093-533-5262
512-472-8881 EXT 403
512-472-8881 EXT 403



Great Prices. Priceless Support!

SyQuest 5110c—\$699 The New Standard



Internal
SyQuest 5110c
\$639

You know the SyQuest 44 and 88. Together they are the transportable storage standard in the Macintosh market. True interchangeability has been the only problem in an otherwise idyllic

transportable storage world. Now SyQuest's 5110c solves the problem. With both read and write compatibility with 44MB and 88MB cartridges*, you no longer have to wonder which SyQuest unit to buy.

Quantum

MB	INTL	EXTL
240	\$589	\$659
425	929	999
525*	1149	1219
1225*	1899	1969

Go•Drives

80	\$349	\$499†
120	469	599†

†Battery-Powered portable case for PowerBooks

ELS Drives

42	\$199	\$279
85	259	329
127	329	399
170	369	429

Fujitsu

MB	INTL	EXTL
520	\$1049	\$1149
1.2G	1599	1799
2.0G	2595	2695

Includes Fujitsu's 5-Year Warranty

Toshiba

830	\$1269	\$1339
1.2G	1699	1769

Ask about our \$69 extended-life PowerBook Battery

Ask about APS software specials



Micropolis

MB	INTL	EXTL
1.2G	\$1999	\$2069
2.0G	2899	2999

Includes Micropolis' 5-Year Warranty

Maxtor

120	\$339	\$419
213	499	569
340	699	769
535	999	1079
1.2G	1699	1799
1.7G	1899	1999

Includes new 5-Year Warranty

Call for Macintosh SIMMs Pricing!

APS Technologies

APSModems: Calling all PowerBooks

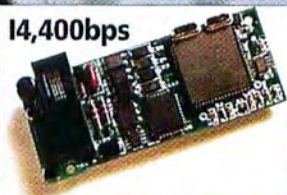


9,600 & 14,400bps
fax/data modems just
\$279 & \$349

9600bps



14,400bps



2400/9600/
4800bps int.
fax modem
\$99*

Pack the power of electronic communication into your PowerBook with an APSModem, fax/data modems for your Powerbook. *For as little as \$99 (regularly \$129) with your purchase of any other

APS PowerBook accessory, outfit your notebook with a 2400 baud Hayes-compatible data modem that sends faxes at up to 9600bps and receives at up to 4800bps. Order one today, fax with it tomorrow.

Helpful,
knowledgeable
sales
associates

Toll-free
Technical
Support

30-Day
Money-Back
Guarantee

Disk-for-Disk
Replacement
Warranty

24-hour
BBS with
our latest
software

SyQuest

Model	EXTL
SQ555	\$399
SQ5110	499
SQ5110c*	699
Dual 44	799
Dual 88	959

*Read/writes 44 and 88MB cartridges but does not format 44MB cartridges

DAT

Model	INTL*	EXTL
APSDAT	\$1499	\$1599
2.6-5 GB Compression DAT		
APSDAT	1199	1299

Desktop & Portable Units
Archive-based Mechanisms
*Quadra 900 and 950

Digital Audio Tapes

Maxell 60-Meter	\$12
Maxell 90-Meter	16

Epson

Model	INTL	EXTL
MO	\$1099	\$1199
Magneto Optical Drive		

SOLA

UPS	
450 watt	\$220
600 watt	330

TEAC

155MB Tape Back-up	\$499
600MB Tape Back-up	799

All tapes drives
include Retrospect
by Dantz Development

Toshiba

CD-ROM 330IB	\$569
Includes five-disc APS CD Library	

30-day money-back guarantee: All drive products carry a 30-day money-back guarantee. Your risk in the transaction is the cost of shipping.
Disk-for-disk replacement warranty: SyQuest, most Quantum, Macintosh and AT drives are warranted for two years. Maxell 1.2, 1.7GB floppy and Magneto optical drives are warranted for five years. Quantum 2.7 drives, TEAC drives, all CD-ROM drives, Epson MOs and SyQuest cartridges are warranted for one year. Toshiba drives are warranted for three years.

*Prices and specifications subject to change without notice.
All hard drives include brackets, cables, cords and LEDs required for operation with the specified Macintosh. All hard drives come preformatted with Apple's System 7.0 software, at least 5.25MB of unexpected publicly distributable software, and APS Technologies ALLIANCE POWER TOOLS SCSI format software disk partitioner.
Toll-free technical support as often or for as long as you need. Regular hours are 9am to 6pm Monday through Friday, 10am to 5pm 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



Wild Should Wild Remain.

"Man always kills the thing he loves, and so we the pioneers have killed our wilderness. Some say we had to. Be that as it may, I am glad I shall never be young without wild country to be young in."

ALDO LEOPOLD

"We need wilderness preserved—as much of it as is still left, and as many kinds . . . It is important to us . . . simply because it is there—important, that is, simply as an idea."

WALLACE STEGNER

"The love of wilderness is more than a hunger for what is always beyond reach. It is also an expression of loyalty to the earth, (the earth which bore us and sustains us), the only home we shall ever know, the only paradise we ever need—if we had the eyes to see."

EDWARD ABBEY

"The clearest way into the Universe is through a forest wilderness."

JOHN MUIR

SIERRA
CLUB



Dept. PA, 730 Polk St., San Francisco, CA 94109



Lowest Prices
Great Service

MAC DEPOT™

1-800-222-2808

Overnight Delivery
30-Day MBG

HARDWARE

ACCELERATORS
DAYSTAR - 30 DAY MONEY BACK GUARANTEE
POWERCACHE 33MHZ \$95.00
POWERCACHE 40MHZ \$95.00
POWERCACHE 50MHZ \$165.00

RADIUS
ROCKET 251 \$1189.00
ROCKET 33MHZ \$989.00
ROCKETSHARE \$399.00
SCSI-2 BOOSTER \$245.00

DISK DRIVES
MASS MICROSYSTEMS
DATAPAK 45 \$459.00
DATAPAK 88 \$589.00

INPUT DEVICES
KENSINGTON
NOTEBOOK KEYPAD \$97.00
TURBO MOUSE 4.0 \$99.00

SOFTWARE TOOLWORKS
MIRACLE PIANO \$329.00

WACOM - 30 DAY MONEY BACK GUARANTEE
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 \$209.00
POWERPORT SILVER \$399.00

U MAX
COLOR SCANNERS
WITH ADOBE PHOTOSHOP

UC1200S \$1139
UC630 \$1399
UC840 (600 DPI) \$2999
UC1200S (1200 DPI) \$699
TRANSPARENCY ADAPTER \$699

POWERPORT GOLD \$545.00
TELEPORT BRONZE \$199.00
TELEPORT SILVER \$369.00
TELEPORT GOLD \$449.00

PSI
POWERMODEM \$159.00
POWERMODEM II \$229.00
POWERMODEM III \$329.00
POWERMODEM IV \$419.00
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
GCC TECHNOLOGIES
PLP II CALL
BLP ELITE CALL
WIDENRITER CALL
WRITEMOVE II CALL

NEWGEN - 30 DAY MONEY BACK GUARANTEE
TURBO PS/300P \$1239.00
TURBO PS/400P \$1645.00
TURBO PS/660 (600DPI) \$2795.00
TURBO PS/880 (800DPI) \$3599.00

MONITORS & VIDEO BOARDS
SEIKO
CM1445 14" \$479.00

FAX your order in:
(310)-214-0932

MACWORLD
EDITORS' CHOICE

hp HEWLETT
PACKARD

3-YEAR WARRANTY

Deskwriter \$379.00
DeskwriterC \$499.00
NEW! 550C \$729.00
Prices include cable!

CM1760LR 17" \$1145.00
CM2070LR 20" \$2299.00

SUPERMAC
SPECTRUM 24 PDG PLUS \$1499.00
SPECTRUM/24 SERIES III \$839.00
THUNDER STORM \$835.00
VIDEOPIGOT NUBUS \$375.00

SUPERMATCH 171 \$1110.00
SUPERMATCH 20T \$2510.00
SUPERMATCH 21 \$2399.00

SOFTWARE

Increases performance of
original Mac II up to 8
times, faster than the
Quadra.

(60338)
Radius
Rocket 33
\$1989!

60887 Full Page Display \$569
55668 PrecisionColor Display/19 \$2059
60602 PrecisionColor Display/20S \$2399
60914 PrecisionColor Pivot \$959
55705 TwoPage Display/19 \$879
60915 TwoPage Display/21E \$1329
60506 PrecisionColor 8XJ \$489
55692 PrecisionColor 24X \$1599
60508 PrecisionColor 24XP \$489
60507 PrecisionColor 24XK \$819
60509 VideoVision \$1989
55915 Rocket 251 \$1189
60603 RocketShare \$399
60604 SCSI-2 Booster \$245

ESTABLISHED 1985

MAC DEPOT™

1-800-222-2808

4453 REDONDO BEACH BLVD.
LAWDALE, CA 90260
Canada Toll-Free: 1-800-548-2512

OUR POLICIES
30-day MBG applies to designated manufacturers only. Call customer service at (310) 214-0932 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.

VISA MasterCard American Express Discover

SNOOPER
SPECIAL OFFER: BUY SNOOPER 2.0
GET VIREX FREE!

DESKTOP DIAGNOSTICS

VIREX

SOFTWARE \$119
KIT \$164

BUSINESS
CAERE
OMNIPAGE \$449.00
OMNIPAGE DIRECT \$219.00
OMNIPAGE PRO \$629.00
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 \$158.00

SYQUEST REMOVABLE HARD DRIVES

MASS
microsystems
Call for pricing
on other drives.

DATAPAK 45 \$459.00
DATAPAK 88 \$589.00

OFFICE \$469.00
WORD 5.0 \$289.00
EXCEL 4.0 \$289.00

DTP & GRAPHICS
ADOBE - 30 Day MBG (Except fonts)
ILLUSTRATOR w/ATM \$359.00
PHOTOSHOP 2.0 \$545.00
ALDUS - 30 Day MBG
FREEHAND 3.1 \$389.00
PAGEMAKER 4.2 \$489.00
CLARIS - 30 Day MBG
MACDRAW PRO 1.5 \$249.00
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
QUICKTIME STARTER KIT \$149.00
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
SALIENT SOFTWARE - 30 Day MBG
AUTODOUBLER \$59.00
SYMANTEC - 30 Day MBG
NORTON UTILITIES V2.0 \$95.00
SAM V3.5 \$75.00

USE OUR TOLL FREE INTERNATIONAL PHONE LINES
Australia 0514 400 125-712, Canada 1 800 346 2512,
Germany 0434 0239, France 15 0590 1599, Italy 1678
7028, Japan 0631 11 1351, Netherlands 06 592 8513
Norway 058 12029, Sweden 0845 55 3420, United
Kingdom 0800 69 1176

Billboard Product Index

Hardware

Peripherals
MacOutlet
800.622.6885353

Monitor
Panelight
800.726.3599354

Peripherals
PCon Inc.
800.726.6462354

Peripherals
Axion
800.8.AXION.1354

Computer Systems
LA Computer
818.719.0007354

PowerBook
Pilot Technologies
800.682.4987355

System Upgrade
MicroMac
714.362.1000355

Software

Astronomy
Carina
510.352.7328355

CD ROM
Neoview
800.880.8888355

Screen Saver
MIFP
800.697.6437356

Music
ARS Nova
800.445.4866356

Graphics
Imspace
800.949.4555356

Video Encoder
Display Tech
800.578.8546356

Multimedia
Hatnet
408.725.2810357

CAD/CAM
Douglas Electronics
510.483.8770357

Multimedia
Diaquest
510.526.7167357

Business Software
Colleague Business
800.926.9965357

Games
Amtex
613.967.7900357

Training
Expert Advisor Video
800.999.1766358

Business Communications
Digit Software, Inc.
301.593.8952358

Utilities
Teletypesetting
617.734.9700358

Kids' Games
O'Connor House
414.734.0259359

Accessories

Music
KORG
800.842.4777358

Printer Refills
DGR Technologies
800.235.9748358

Batteries
BTI
800.982.8284359

Furniture
Agio Designs
800.688.2446359

Catalog Product Index

Hardware

Bar Code360
 Computer Systems360
 Disk Drives366
 Memory Upgrade366
 The LLB Co.367
 Memory Direct.....368
 Peripheral Outlet369
 Peripherals370
 Printers370

Software

Accounting371
 Astrology371

Bar Code371
 BBS371
 Business372
 CAD/CAM372
 CD ROM372
 Clip Art372
 Communications373
 Cooking373
 Custom Development.....373
 Educational374
 Engineering374
 Entertainment374
 Fonts374
 Genealogy374
 Graphics Translators.....375

Human Resources375
 HyperCard Stacks375
 Languages375
 Lottery375
 Mathematics375
 Medical376
 Movies376
 Music/Midi376
 Programming Tools377
 Property Management377
 Real Estate377
 Religion377
 Sales/Marketing377
 Scientific377
 Shareware377

Services

Computer Insurance378
 Computer Repair378
 Data Recovery378
 Desktop Publishing.....378
 Education378
 Laser Recharge379
 Slides379

Accessories

Cases379
 Covers379
 Diskettes379
 Powerbooks379

800-622-6885

Putting Power On Your Desktop



RasterOps

MacOutlet has just acquired the entire supply of RasterOps demo products used for four days at MacWorld Expo Boston. All product carry full factory warranty and are in limited supply.



Dream Come True System

RasterOps 21" Color Hitachi Monitor w/24XLTV \$4599.

RasterOps 21" Color Hitachi Monitor \$2499.

24XLTV

24 bit large screen display board with video \$2499.

Designer System

2075M 20" Trinitron w/24 XLI Package Price \$3899.

24 XLI accelerated color card \$1699.

2075M 20" Multiscan Trinitron \$2299.

With purchase of system

Add a CorrectColor Printer for only \$6399.

PaintBoard II

24 bit board for up to 19" Limited Time \$829.

TOLL FREE LINE FOR BOTH ORDERS
AND TECHNICAL SUPPORT

THREE-YEAR WARRANTY ON ALL
RASTEROPS SUPERMAC AND
DAYSTAR

BEST TECHNICAL SUPPORT AVAILABLE
30 DAY MONEY BACK GUARANTEE

SuperMac

Spectrum 24 Series III/Trinitron System \$3349.

24 bit accelerated card with SuperMatch 20 Multiscan Trinitron

Spectrum 8-24 PDQ SuperMatch 20" Sys. \$2349.

Accelerated video card with 20" SuperMatch

SuperMatch 17T Trinitron Monitor IN STOCK \$1149.

Spectrum 8-24 / 8-24 PDQsi \$839.

All SuperMac products in stock.

Call us about our special board trade-in program.

Call for special education allowance.

NEC

NEW 4FG 15" MultiSync Monitor IN STOCK.

NEW 3FGX 15" MultiSync Monitor IN STOCK.

NEW 5FG 17" MultiSync Monitor IN STOCK.

Lapis

15" Portrait Display with Card \$549.

19" Monochrome with Card \$899.

19" Grayscale with Card \$1199.

SE, SE/30 & Mac II Display Cards \$CALL.

16" 8 Bit DisplayCards for NuBus \$CALL.

Umax

UC630 600dpi Color Scanner w/Photoshop (full ver.) \$1175.

UC1200 1200dpi Color Scanner w/Photoshop IN STOCK

Transparency/Slide Scanner Option \$CALL.

Automatic Document Feeder \$CALL.

Magnavox

Magnavox Professional 14" Color Monitor \$419.

Magnavox 8/24 Bit Color Bundles \$699./\$839.

Magnavox 17" Multiscan Display \$925.



Supra

SupraFax Modem Plus 2400/9600 \$189.

SupraFax Modem 9600/9600 IN STOCK \$299.

SupraFax Modem 14.4 v.32 bis IN STOCK \$379.

E-Machines

E-Machines NEW! T-16 II/SX-24 Trin. Sys. \$1799.

16" Trinitron w/24 bit accelerated video board.

E-Machines NEW! T-16 II/SX-8 Trin. Sys. \$1649.

16" Trinitron w/8 bit accelerated video board. It's upgradeable.

E-Machines NEW! T-16 II/DoubleColor Sys. \$1599.

16" Trinitron w/8 bit accelerated video board. Incredible Value!

Seiko

CM1445 \$549.

14" RGB monitor

DayStar Digital

Universal PowerCache 33MHz \$579.

Universal PowerCache 40MHz \$795.

Universal PowerCache 40MHz w/68882 \$999.

Universal PowerCache 50MHz \$1145.

NEW

MASS Micro Systems

44 Meg Squest Removable Drive \$479.

With Software Bundle and Cartridge



MacOutlet
GRAPHICS DISPLAY SYSTEMS SPECIALISTS

48501 Warm Springs Blvd. #102
Fremont, CA 94539
(510) 623-8890 Fax (510) 623-8894

CALL FOR FREE CATALOG

CALL TOLL FREE
800-622-6885

Monitors

Computer Projection... MacWorld Expo Special



- ◆ Mac / PC / Video Projection
- ◆ Stand-alone & Overhead
- ◆ Active & Passive Matrix Panels
- ◆ Full Line of Overhead Projectors and Accessories

BUY-LEASE-RENT

Located Five Blocks From Show: Stop In For a Demo
101 The Embarcadero, #100-A San Francisco, CA 94105

Panelight
DISPLAY SYSTEMS, INC.

Hours: 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, P.O.s, COO. * Offer Expires January, 31 1993

Save Big On All Major Brands-Call NOW:
Special MacWorld Prices Until Jan. 31

1-800-726-3599

IN SAN FRANCISCO CALL: 415-772-5800

FREE!



OVERHEAD PROJECTOR

Order Before Jan. 31 and
Receive a Hi-Brightness LCD-Friendly
Portable Overhead Projector FREE!*

Peripherals

Network Star Power!

NEW! from P-CON

P-Shooter is the most advanced Network Star Controller available!

- Increased Speed and Power for Phone wire based Local Talk connectors
- ONLY Hub available that Re-clocks, Re-shapes and regenerates data packets
- No special wiring or statistical management software. So easy to use!
- Only \$595 increases your network performance to warp speed.

* Check on other exciting new product releases from P-Con

PCon Inc. 2984 Calle de Las Flores, San Jose CA 95148



P-Con's "P-Shooter"
Network Star Controller

See Us at
Macworld Expo

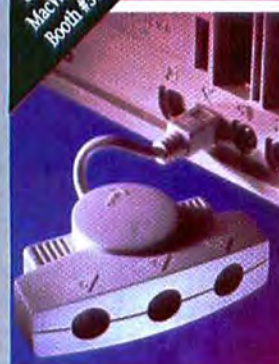
Call Now! (800) 726-6462

(408) 270-3200 International (408) 274-4504 Fax

Peripherals

See Us At
MacWorld SF
Booth #3150

3 Serial Ports For Your Mac!



AXION™

1150 Kifer Rd., Suite 203 • Sunnyvale, CA 94086 • 1-800-8-AXION-1 • 1-408-522-1908 (Fax)

Now you can connect more than three serial devices to the modem port on your Macintosh. The AXION switch is an electronic switchbox that eliminates the hassle and confusion of supporting multiple devices on the modem port!

- Auto-Switch for Comm Toolbox savvy applications
- Electronically controlled through Control Panel or Pull-down menu in any application
- Works with variety of devices such as: Modems, Fax Modems, Label Printers, serial printers, graphics tablets, PC data links, etc.
- \$159 Suggested Retail - Call for nearest dealer. VISA/MasterCard accepted.

Computer Systems

MAC PROFESSIONAL

(818) 719-0007

We guarantee
best pricing.

FAX (818) 719-9115

Power Book 230 4/120	\$2777	MAC II VX 4/80	\$2547	13" Apple Color	\$ 487
Power Book 230 4/80	\$2477	MAC II VX 5/80	\$2777	14" Apple Color	\$ 577
Power Book 210 4/80	\$2077	MAC II VX 4/230	\$2937	15" NEC 3 FBX	\$ 687
Power Book 180 4/120	Call	MAC LC/II SL/Classic	Call	16" Sony 1604	\$1037
Power Book 180 4/80	\$3737	SCANNERS		17" NEC 5 FG	\$1387
Power Book 160 4/120	\$2877	Scan Maker II XE	\$1157	19" Trini Gen. Sys.	\$2127
Power Book 160 4/80	\$2577	UMAX UC 630	\$1087	20" Super MAC Trini	\$2397
Power Book 160 4/40	\$2277	UMAX UC 1200 Color	\$2997	21" NEC 6FG	\$2477
Power Book 145 4/80	\$2277	PLI 88 MB Removable	\$ 557	Complete Product Line of Radius, SuperMAC, Raster Ops and E Machine are available.	
Power Book 145 4/40	\$1997	Syquest 44 MB Removable	\$ 447		
Quadra 950 8 MB	Call	HP Laser 4 M	Call	1 Year Warranty. Please call for current prices. We sell only new products. 15801 Ventura Blvd., Woodland Hills, CA 91364 Dealer & International orders welcome.	
Quadra 950 8/120	\$5777	New Gen 400 P	\$1637		
Quadra 950 16/425	\$6497	New Gen 660 P	Call		
Quadra 700 4/120	\$3677	GCC BLP Elite	\$1197		
MAC II ci 8/120	\$2827	GCC BLP IIS	\$1677		
MAC II ci 8/230	\$2737	GCC Widewriter	\$1447		

CIRCLE 594 ON READER SERVICE CARD

CIRCLE 580 ON READER SERVICE CARD

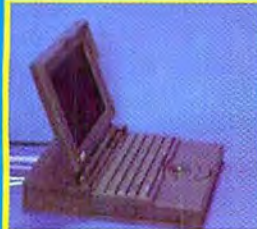
For your ad to appear in The Macworld Shopper, please call **800.888.8622**

BILLBOARD

MACWORLD
MWShopper

PowerBook

System Upgrade



BookEndz, The PowerBook Docking Station

- Eliminates Cable Confusion
- Easily assembles in minutes
- Power supply extension available
- Attach or detach in 2-3 seconds
- Works w/Enviro & Computer Care
- Model BE147 for PB-140/145/170
- BE147 \$129 or BE168 \$129
- Matching security system available
- Uses your connectors
- Matches your PowerBook
- Includes switch extensions
- Works with all rear panel ports
- 1 year warranty
- Model BE168 for PB 160/180
- Mastercard & VISA accepted
- Dealer inquiries welcome

Pilot Technologies, Inc.

See us at MacWorld
Expo Booth #4086

10025 Valley View Road, #156, Eden Prairie, MN 55344

Phone 800-682-4987 or 612-828-6002 FAX 612-828-6806 Patent Pending

CIRCLE 581 ON READER SERVICE CARD

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

CIRCLE 579 ON READER SERVICE CARD

Astronomy



CIRCLE 586 ON READER SERVICE CARD

Voyager II

the Dynamic Sky Simulator™

Now Available! Voyager II - with powerful new features, striking sky pictures, and dynamic planetary animations. Voyager II is an educational tool which will provide years of wonder and discovery.

Nothing Compares \$159.95

Requires Mac with 1 meg of free RAM, hard disk.

System 6.0.5 to 7.0. Color recommended.

Upgrades available.

Carina Software

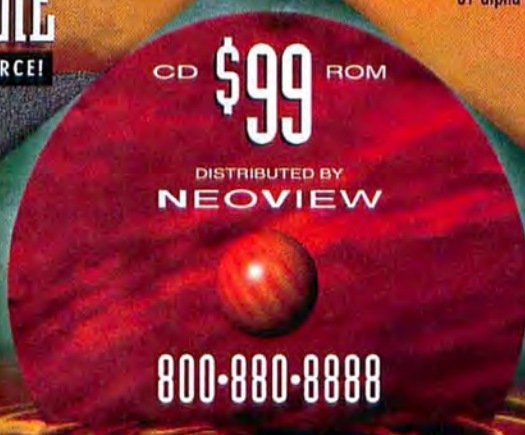
830 Williams Street
San Leandro, CA 94577
(510) 352-7328

Clip Art

SCREEN CAFFEINE™

THE ULTIMATE CD-ROM ART RESOURCE!

DON'T STAY UP ALL NIGHT WORRYING ABOUT TOMORROW'S DEADLINES. SELECT FROM SCREEN CAFFEINE'S GALLERY OF COMPUTER GENERATED IMAGES AND SAVE TIME AND MONEY. USE THE IMAGE AS IS, OR USE THE ALPHA CHANNELS WITH PHOTOSHOP TO CREATE MILLIONS OF PROFESSIONAL GRAPHICS. DON'T LOSE ANOTHER NIGHT'S SLEEP, ORDER SCREEN CAFFEINE TODAY!



224 different backgrounds and textures,
67 alpha channels included, 40MBs of bonus animation!

800-880-8888

30 day return policy, purchase price includes reproduction rights, corporate and educational P.O.s welcomed. NEOVIEW, 8760 Research Blvd, Austin, TX 78759. Fax 512.346.8911

For your ad to appear in The Macworld Shopper, please call 800.888.8622

Screen Saver

SEE US AT
MACWORLD EXPO
BOOTH 3163
MOSCONE CENTER

VERSION 1.0.1

ORDER TODAY

1-800-697-6437
OR FAX (503) 228-9707

Images shown represent randomly selected image sets.

SCREENSAVOR™ THE NEXT PLACE TO GO AFTER DARK™

Get the picture with ScreenSavor, the first full-color, photo-based screen saver. An After Dark/Intermission™ accessory, ScreenSavor features bright, sharp images from renowned photographers Chris Newbert, Ray Atkeson and more. ScreenSavor's unique transition effects alternate images available in a variety of themes:

- ❖ Nasa/Space
- ❖ Wildlife
- ❖ Aircraft
- ❖ Landscapes
- ❖ Trains
- ❖ People
- ❖ Undersea
- ❖ Furry Friends

Requires Mac LC or higher with 2.5 MB RAM. After Dark is a trademark of Berkeley Systems, Inc. Intermission is a trademark of ICOM Simulations, Inc. ScreenSavor is a trademark of MHP Development.



Music

SOMETHING FOR EVERYONE!

Booth #1827 at Expo

Both programs compatible with MIDI (but MIDI is not required.)

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

ARS NOVA • 1-800-445-4866 • Box 637 • KIRKLAND, WA 98083

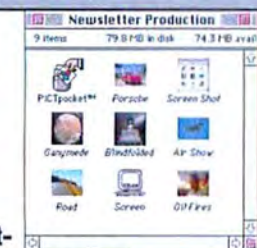
Graphics

The Simplest Image Browser!

KudoPortfolio™: Introducing 3 software utilities to help you see what you're doing

- **PICTpocket™**: The simplest image browser. Quickly organize and locate mixed-media image files. Creates icons that look like your images.
- **Kudo® Font Book™**: The no-nonsense way to compare your fonts. Print and see samples of all fonts on your system. Easy comparison. Easy selection.
- **Kudo® Image Convert™**: Expand your image sources. A simple click and drag converts files from almost any source.

Special Introductory Offer: All 3 ONLY \$79.00!
Free Imaging Reference Guide with Order!
24-hour Response: Mention ad code 18
800-949-4555 or 619-272-0593



IMSPACE SYSTEMS™
Now You See It

Video Encoder

Mac DisplayLink

The Macintosh Link to Video...\$449.

Display Tech Introduces the low cost video display alternative to expensive data monitors for Macintosh II and Quadra computers: the new Mac DisplayLink. Simply connect the Mac DisplayLink to your computer and any regular TV monitor, video projector—even a video tape recorder. The result is high-quality display and recording at a price you can live with. NTSC video plus high-resolution S-Video output gives stable pictures and excellent color for all your presentation text and graphics. The Mac DisplayLink: an indispensable presentation tool!

Simple & Affordable.

Mac DisplayLink 800-578-8546

Requires 4x, 8x24, 8x40GS or compatible video card. Includes all cables. No software required.

For your ad to appear in The Macworld Shopper, please call **800.888.8622**

Now QuickTime Movie Capturing and Hi-8 Video Editing Are Well Within Your Reach



Time Code Based / VISCA™

Discover **QT-Paradise** and **VideoParadise**—new QuickTime capturing and video editing software packages. Used with the **Sony Vdeck**, they turn your desktop into a powerful multi-media system.

Imagine, now you can:

- Create and modify edited video—faster
- Broadcast video off-line—time accurate
- Use and create video database
- Work with storyboard capability
- Enjoy easy, sophisticated, automatic QuickTime capturing

All of this capability at a very affordable price. If you ever considered buying a video editing and production system, but thought it was out of your reach, get ready to discover Paradise. For more information or to order Vdeck, QT-Paradise or VideoParadise contact:

HATNET
Human Art Transfer & Network
20440 Town Center Lane, Suite 4A
Cupertino, CA 95014
Ph: 408•725•2810
Fx: 408•725•0309

Come see us
at the
Sony Booth
#3862
MacWorld '93

CIRCLE 443 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

Multimedia



See the best in
Macintosh video
control for animation
& desktop production:

- DQ-Animaq™
- QuickPass™
- DQ-MAC232™
- Mac ImageNode™

DIAQUEST

DIAQUEST BOOTH #1949 MACWORLD SF
1440 San Pablo Avenue Berkeley California 94702
Phone 510 526 7167 FAX 510 526 7073

CIRCLE 418 ON READER SERVICE CARD

Business Software

The Only Software Your Business May Ever Need

"Definitely worth major consideration..." *MacUser Feb. 1992*



**Finally! Client Management
Integrated with Accounting**

- Client Database with Powerful Search & Sort
- Custom Mailing Lists & Labels
- Invoicing
- "Merge" Letters
- General Ledger
- Bids/Estimates
- Statements
- Accounts Receivable
- Word Processing
- Custom Reports
- Checking Accts
- Job Tracking
- Profit & Loss
- Inventory
- Multi-User
- Balance Sheet

When MacUser magazine awards a business management program 4 1/2 mice, you owe it to yourself to find out why. Ease of use coupled with powerful accounting tools distinguish the new version 3. \$695.

COLLEAGUE
BUSINESS SOFTWARE
10000 Research Blvd., Suite 210, Austin, TX 78759 512/345-9964 Fax 512/345-9965
Call 800/926-9965 for Free Brochure or \$10 Demo Kit

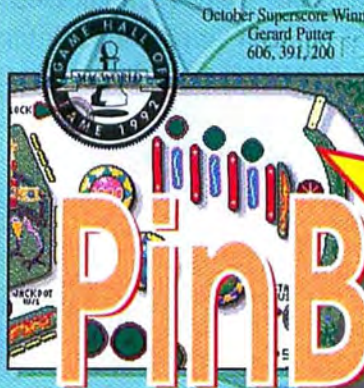
CIRCLE 429 ON READER SERVICE CARD

Games

TRISTAN

A Digital Simulation For
The Color Macintosh.

- TRISTAN Features**
- Authentic Ball Action
 - Wild Pinball Devices
 - Fabulous Sound
 - TILT and Much More!...



To Order:
Contact your
retailer or call
(613) 967-7900

Amtex Software Corp. • PO Box 572 • Belleville Ontario Canada K8N 5H2 • fax (613) 967-7900

CIRCLE 584 ON READER SERVICE CARD

For your ad to appear in The Macworld Shopper, please call **800.888.8622**

Training

Learn 4D and Director the easy way!

Learn 4th Dimension® or MacroMind Director® the easy way... on video. Get started quickly, let an expert show you how, watch an **Expert Advisor Video**. You'll appreciate seeing how Experts, like Richard Wolpert and Marcy Swenson of Afterhours Software, Frank Thompson and Dave Dell'Aquila of TriTech Systems use 4th Dimension or Art Guerrero of Art Guerrero Multimedia Lab use MacroMind Director.



Eight tapes on 4th Dimension, three tapes on MacroMind Director \$59.95 each or in sets 4th Dimension Level 1 Training three tape set \$159.95, Level 2 - five tape set \$249.95, complete eight tape set \$399.95. Complete three tape MacroMind Director Set \$149.95.



**Expert
Advisor
Video**

22323 Sherman Way, Building #6, Suite 200, West Hills, CA 91303
(800) 999-1766 • (818) 992-8858 • FAX (818) 704-0024



CIRCLE 416 ON READER SERVICE CARD

Business Communications

Get More Orders With MacEDI®

EDI (Electronic Data Interchange) is the electronic exchange of business transactions such as purchase orders and invoices. EDI is quickly becoming a criterion for selecting between you and your EDI-capable competitor. Companies are building closer, long-term relationships with fewer suppliers (that can do EDI). Don't get swept out the door when your customers clean house. Don't lose a prospect because you can't do EDI. With MacEDI, your Macintosh can exchange EDI transactions with any computer and EDI software used by your customers.



Digit Software, Inc.

P. O. Box 1425
Silver Spring, MD 20915
(301) 593-8952 Fax: (301) 593-2201

CIRCLE 470 ON READER SERVICE CARD

Music

GOODMAN MUSIC



FEATURING

KORG

World's Largest Selection of Keyboards, Synthesizers, Interfaces, Samplers, Sequencers, Drum Machines, Music Software, DAT Machines, Multitrack Recorders,

& MIDI

For Your Computer



CALL 1(800)842-4777 [in CA. (310) 429-9795] ASK FOR MAC

CIRCLE 590 ON READER SERVICE CARD

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



CIRCLE 593 ON READER SERVICE CARD

Utilities



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

TeleTypesetting

311 Harvard St., Brookline, MA 02146
(617) 734-9700 Fax: (617) 734-3974

New v3.2

**Macworld
Booth #543**

CIRCLE 517 ON READER SERVICE CARD

For your ad to appear in The Macworld Shopper, please call 800.888.8622

Batteries

POWERCHARGER FOR MAC POWERBOOKS 140, 145, 160, 170, & 180

A portable, full cycle conditioner that includes discharging and fast charging capabilities. \$129.95

Powerbook Battery \$69.95

Starter Kit (PowerCharger & Battery) \$149.95



BATTERY TECHNOLOGY, INC.
5700 Bandini Blvd., Commerce, CA 90040
213.728.7874 800.982.8284 Fax: 213.728.7996
Mastercard/Visa Accepted Dealers Welcome



CIRCLE 592 ON READER SERVICE CARD

"Now The Best Mac Desk Is Tailored For You."

Introducing ergonomically crafted,
fully adjustable Macintosh desks from the
"Best Mac Desk" people.

CALL TOLL
FREE (800)
688-2446

VAR INQUIRIES WELCOME
FREE CATALOG!

503.690.1400 FAX 503.690.1444

AGIO Europe 011 41 62 531026 AGIO Japan 011 81 3 3533 0436

agio
BEAVERTON, OREGON

CIRCLE 583 ON READER SERVICE CARD

Furniture



Kids' Games

Easy Access!



*Great values are just
a phone call away.*

MACWORLD
MWShopper

Direct Response. Direct Results.

Kids Love Foo Castle!



The exciting and educational point and click adventure!

This MacroMind-based game, with full color and sound, entertains 3-10 year-olds for hours.

- Amazing 8-bit animation
- Time and alphabet learning games
- Full digitized sound
- Fun action in every room

Requirements: Macintosh Classic II, LC, SE/30, Mac II Series or Quadra.
2 MB RAM minimum. 8-bit color graphics. System 6.05 or later.

Retail Price ~~\$59.95~~
Special Introductory Price **\$39.95**

O'Connor House Software
2207 S. Gladys Ave.
Appleton, WI 54915
(414) 734-0259

CIRCLE 514 ON READER SERVICE CARD

For your ad to appear in The Macworld Shopper, please call 800.888.8622

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 Fifield, 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

European Office:
Rüttistrasse 6
9050 Appenzell, Switzerland
71 87 51 15
71 87 51 17 Fax

USA Headquarters:
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 MW Shopper
today!

Computer Systems

RACKMACS™

GreenSpring expands its line of industrial Macintoshes® to include the LC II, Classic II and Quadra 700.

Classic II and LC II systems combine monitor and CPU in one rack or panel mountable enclosure.

Available rack mounted Mac processors now include IIfx and Quadra 700. Touchscreen option available on rack mounted monitors. Rack mounted keyboard drawer/mouse tray unit also available.



RackMac LC II

GreenSpring Computers
1204 O'Brien Drive, Menlo Park, CA 94025
Tel (415) 327-1200
Fax (415) 327-3808

CIRCLE 519 ON READER SERVICE CARD

Computer Systems



ELITE COMPUTERS & SOFTWARE, INC.

Buy • Sell • Trade • Rent • Lease • Repair • Service • New & Used
"Macintosh Remarketing Specialists Since 1987"

See Us At Macworld #4261
Mac Plus / Classic\$299/694
SE30 2-40 & 4-801299/1449
Mac LC 2-40 New/LC II 949/974
Mac IISI / Mac II 2-40 1099/1099
Mac IIfx / IIfx 4-801599/1599
Mac IIfx / Mac IIfx1899/2419
"We'll Beat Any Dealer Price On Anything, Anywhere!"

Phone: 408-725-1556 • Fax: 408-973-1483
ECS • Post Office Box 756 • Cupertino, CA • 95015-0756 • Hours: Mon. - Fri. 9:00-5:30 • 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

Macintosh

Classic II 4/80	\$1099
LC II 4/160	\$1299
II Si 5/80	\$1649
II Si 5/160	\$1719
II Ci 5/230	\$2649
II Vx 4/80	\$2799
II Vx 5/80 w/ CD ROM	\$2579
II Vx 4/230	\$2899
II Vi 4/230	CALL
QUADRA 700 4/400	\$4099
QUADRA 950 w/ 8MB RAM	\$5249
QUADRA 950 64/16IG	\$7999

Powerbooks	Printers
160 4/80 \$2549	StyleWriter \$329
160 4/120 \$2839	Laser IIfx \$125
170 4/80 \$2999	Laser IIfx \$2699
180 4/80 \$3799	
180 4/120 \$4099	
DUO 230 CALL	

SuperMac	Radius
Thunder Storm Pro 2675	Full Pg Mono \$569
Thunder 24 2199	19" Mono \$849
20T Trinitron 2339	21" Mono \$1089
21" Display 2199	19" Color \$1599
20" Hitachi 1399	20s Color Call
17" Trinitron 1009	21" Color \$1899
Spigot Pro 1009	24xp Card \$489

QMS	Radius
PS-410 \$1399	Precision 8x \$729
PS-815 \$2699	24xk \$799
PS-815MR \$3599	Prec. 24x \$1299
PS-860 \$3849	Rocket 33 \$1899
Color 10p \$4199	Rocket 25i \$1179
Script 10 \$4699	Video Vision 1829

NEWGEN	Specials
PS400P \$1650	NEC 16" Color \$599
PS660 \$2599	16ig Hard Disk \$1249
440B 11X17 CALL	80MB Apple HD \$249
660B 11X17 CALL	JX-600 \$9989
	ScanMaker II \$889
	ScanMaker IIfx \$1179
	ScanMaker 1650 \$1449

UMAX	Specials
630 w/Photoshop 1099	
1200 dpi \$2999	
Trans Option \$699	

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

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) 493-8107 (800) 268-7005

CIRCLE 426 ON READER SERVICE CARD

MAC WEST

1992 - MAC LEADER

CALL US LAST

☆ Powerbooks ☆ Quadra ☆ Printers

☆ IICI ☆ IISI ☆ IIfx ☆ Monitors

FULL LINE

(310) 470-7099

Fax: (310) 470-8099

10837 Santa Monica • LA, CA 90025

CIRCLE 453 ON READER SERVICE CARD

"I saw it in
Macworld!"

For your ad to appear in The Macworld Shopper, please call 800.888.8622

Computer Systems

LATEST

Mac
S · A · L · E
INTERNATIONAL

SPECIALS

NEW/REFURBISHED/USED SALE !!!

QMS SPECIALS

**PS 410
Laser Printer - \$999**

Factory Refurbished with Manufacturers Warranty

**ColorScript 100
Model 10**

USED: \$1,999 - 300 dpi Color Laser

CUSTOM CONFIGURATIONS AVAILABLE

CPU's

USED
Mac Plus - \$359.00
Mac SE 1/20 (800 K) - \$625
Mac II 2/0 - \$949.00
Mac IIfx 1/0 \$1,279.00
Mac Portable 1/40 - \$799.00
Call for latest pricing on
Mac SE/30, IIfx, IIfx, Powerbook, etc.

NEW
Mac Classic 2/40 - \$775.00
Mac LC 2/40 - \$899.00
Mac IIfx 3/40 - \$1,499
Mac IIfx 5/0 - \$2,249.00
Call for latest pricing on
Mac IIfx, Classic II, Powerbook, etc.

Printers

USED
ImageWriter I Wide - \$149.00
Apple Laser IINT - \$1,295.00
Apple Laser IINTX - \$1,595.00
Apple Laser IIf - \$1,999.00
Apple Laser IIf - \$2,499.00

Apple Accessories

ADD-ONS
Portable Keyboards - \$35.00
Mac IIfx NuBus Adapters - \$125.00
Mac LC IIfx Adapters - \$75.00
LocalTalk Board for PC - \$25.00
Hayes 2400B Int. Modem - \$25.00
Apple Stand. Keybd - \$65.00 (used)
Laser Toner - Savings

Monitors

USED
12" Mono - \$175.00
12" RGB - \$325.00
13" Hi-Res RGB - \$450.00
Portrait Display - \$399.00
Two Page Mono - \$799.00
21" Color - \$1,999.00
Apple Univ. Mon. Stands - \$35.00

Radius, RasterOps & SuperMac

USED
TPD Mono - \$799.00
19" Trinitron - \$1,375.00
19" Hitachi - \$1,150.00
• similar savings on other models!

Apple Parts

POWER SUPPLIES
Mac Plus - \$85.00
Mac SE + SE/30 - \$95.00
Mac SE Analog - \$115.00
Mac Classic - \$125.00
Mac LC/LCII - \$125.00
Mac II - \$250.00
Mac IIfx - \$275.00
Quadra 900/950 - \$375.00

LOGIC BOARDS
Mac Plus - \$199.00
Mac SE (800K) - \$225.00
Mac SE (FDHD) - \$275.00
Mac Classic - \$199.00
Mac II - \$475.00
Mac IIfx - \$750.00
Mac Portable - \$250.00
Laser IINT - \$279.00
Laser IINTX - \$579.00

DRIVES VIDEO CARDS
1 bit - \$59.00
4 bit - \$79.00
8 bit - \$95.00
Portrait Displ. - \$25.00
Radius, RasterOps,
SuperMac - \$Blow-Out
20 MB Int - \$115.00
40 MB Int - \$150.00
80 MB - 425 MB - Savings

QMS

PS 810 Postscript Printer - Demo - \$1,399.00
New - \$1,699.00
Turbo (NEW) - \$2,399.00
PS 815 MR Printer - Demo - \$2,749.00
New - \$2,999.00
PS 820 Printer - Demo - \$1,599.00
New - \$1,899.00
Turbo (Demo) - \$2,599.00
PS 2220 - Demo - \$5,500.00
New - \$6,950.00

WE WANT TO BUY YOUR NEW/USED MAC EQUIPMENT

New and Used Mac's

Bought and Sold

Prices Represent Cash Discounts!

1-800-729-7031

Compare Our Prices, Quality & Service.

Mac
S · A · L · E
INTERNATIONAL

Entire Mac Line

Latest Models In Stock

Other Configurations Available

CIRCLE 401 ON READER SERVICE CARD

For your ad to appear in The Macworld Shopper, please call 800.888.8622

Computer Systems

Demo Mac Truckload Sale!

**Portable
2/40
\$799.**

Includes carry
case, battery,
X-former
(reconditioned
& guaranteed)



Brand New!!!

**Mac
IIFX
4/0
\$2699.**



**Wickedly
Fast!!**

**40 MH
of
Power!**

**SE
1-20
\$549.**

(reconditioned & guar-
anteed, Keyboard extra)



UPGRADES

Ilcx to Ilci\$799.
Ilcx to Quadra 7002499.
Ilci to Quadra 7001999.
Mac 128,512 to plus299.
Mac 512ke to plus179.
SE 800k to FDHD (ROMonly)...99.

PRINTERS

Laserwriter\$799.
Laserwriter Plus.....\$999.
Laserwriter IInt.....\$1299.
Laserwriter IIntx.....\$2099.

Powerbook 140 Accelerator!!

You've heard about it! You've read about it! Call for details!!

PARTS

Mac Plus ROMS\$189.
1.44 floppy mech277.
Appletalk PC card49.
Plus logic board149.
LC logic board449.
Mac II logic board549.
Token Ring Card199.
PC 5.25 Drive (no controller)49.

800k floppy mech89.
Plus power supply89.
SE analog board149.
SE logic board149.
Laserwriter IInt lb279.
Coax/Twinax Card199.
Personal SC board39.

SYSTEMS

Plus.....\$379.
Classic 1/0589.
Mac II 0/0999.
LC 2/0699.
Ilcx 0/01399.
Ilci 0/01799.

VIDEO BOARDS

Apple 8-bit\$89.
Apple 1-bit39.
Apple Portrait99.
Apple 2-page mono99.
Rasterops 264269.

**Shreve
Systems**

1200 Marshall St Shreveport LA71101
FAX 318-424-9771 Tech 318-424-7987

800-227-3971

CIRCLE 425 ON READER SERVICE CARD

ACCESS II

USED MAC EQUIPMENT

DON'T BUY OR SELL ANY NEW OR USED EQUIPMENT UNTIL YOU TALK TO US.
WE DEAL EXCLUSIVELY IN MACINTOSH SYSTEMS AND PERIPHERALS.

800-662-5606

26 KEEWAYDIN DRIVE SALEM, NH 03079

CIRCLE 469 ON READER SERVICE CARD

Try Us Free 1-800-858-4MAC

G.T. Industries

California: (818) 785-2800

FAX: (818) 908-5334

**We DEAL on
MAC's & More!**

SPECIAL

MAC IICi/4MB/80HD\$2295

MAC IICi/4MB/230 HD\$2690

■ Free Upgrades ■ Ikegami
■ Macintosh ■ E-Mach
■ RasterOps ■ Syquest
■ GCC ■ Asante
■ Microtek ■ Sharp
■ Radius ■ and More
■ H.P.
■ NEC
■ QMS
■ NewGen
■ DayStar
■ SuperMac

Complete
Service
Department
Trade-ins are
Accepted

CIRCLE 430 ON READER SERVICE CARD

Q U A D R A

750 ▲ 950

NEOVUE 800/880-8888

8760 RESEARCH BLVD AUSTIN TEXAS 78758

Continued...

For your ad to appear in The Macworld Shopper, please call 800.888.8622

Computer Systems

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: 305/321-0904
Fax: 305/321-0905

800-944-6227

Mac•In•Stock

CIRCLE 457 ON READER SERVICE CARD

WE WELCOME INTERNATIONAL & DEALERS

SYSTEMS

Preforma 200/400 Call
Preforma 600 Call
Mac II Vx W/CD ROM Call
Mac II Ci 5-120/420 2549/Call
Mac II Si 3-80/5-120 1545/1995
Quadra 700 4-425 4195
Quadra 700 4-120 3799
Quadra 950 Call
Powerbook 145 4-40/4-80 Call
Powerbook 160 4-40 In Stock
Powerbook 180 4-80 In Stock
PB DUO In Stock

MONITORS

Sony Trit. 1304/1604s
Radius Color Monitors
Supernac
E-Machine T16 MR
Rasterops
24 bit Acc. Card 849

PRINTERS

Appl. IIF/IIG/NTR ... Call/Best/1599
Nec Silentwr. 95 1399
QMS 410 Call
QMS 815/815MR 2689/3469
NewGen PS-410/840 1699/Call

STORAGE

SyQuest 44/88 465/Call
CD ROM ... Call FOR BEST PRICE

SCANNERS

UMAX UC 630/1200 1145/Call
Microtech 600Z/1850S Call

**COMPUTER POWER
HOUSE**

Tel (310) 474-6636
FAX (310) 474-4665
1880 Westwood Blvd., LA, CA 90025
Mon. - Fri. 8:30 To 6:30 Sat. 10:00 To 5:00

CIRCLE 423 ON READER SERVICE CARD

1-800-275-9924

Phone 510-244-5590
Fax 510-244-5594

**Computer
Revelations Inc.**

1461 Lakeland Ave. Suite #5
Bohemia, NY 11716

YOUR ONE STOP SHOP!

Macintosh Iivx 4/80 \$2599
LC II 4/80 \$1199
LC II 4/80 \$1299
LC II 4/160 \$1399
SI 3/40 \$1549
SI 5/80 \$1779
SI 5/160 \$1929
II Ci 5/80 \$2499

Printers

Hewlett Packard PS NTR \$1679
Laser IIF \$2229
HP Laser 4M \$2099
Deskwriter \$395
Deskwriter C \$549
Deskwriter 550C \$749
Paintjet XL300 \$3559

Scanners

HP IIP/IIC \$899/1399
Umax 630 \$1129
Umax 1200 \$Call
Mtek II \$929
Mtek IIXE \$1169

SuperMac

17" S-match \$1079
20" Color \$1459
20" Dual mode \$2399
Spectrum 8x24 \$839
Thunder 24 \$2295

Get Our One Year Warranty!

Prices are subject to change without notice.

**Call for hard to find parts!
NEW AND USED
BOUGHT AND SOLD
We also offer
E-MACHINES, GCC, RADIUS
SONY, UMAX, RASTEROPS,
SIGMA DESIGN**

CIRCLE 474 ON READER SERVICE CARD

ESTABLISHED 1981

MACINTOSH CPU'S

CLASSIC II CALL
LC II 4/80 1295
IISI 3/40 1495
IISI 5/80 1795

QUADRA'S

700 5/120 3795
700 8/240 4095
950 8/240 6295
950 24/520 7195
950 64/1.2GB 9395
950 128/1.2 11750

SUPERMAC

SuperMatch 17" 1045
SuperMatch 20" 1675
SuperMatch 21" 2475
APPLE/HP printers
Laser NTR 1675
Laser IF 2495
Lase IIG 3250

Hi-End printers

RasterOps CorrectPrint 300 6995
Newgen 1200 DPI 11x17 11,500
LaserMax Unity 1200XL 1200dpi Call
QMS ColorSript 100 Mod-30i 6795
QMS 815MR/825MR 3095/4095

SCANNERS

Umax UC-630 600dpi+Adobe 1125
Microtek ScanMaker II 600dpi 950
HP Scanjet IIC color scanner 1425

MONTHLY SPECIAL

SONY 19" w/ 8Bit \$2395.
Color Trinitron w/ 24Bit \$2695.

Sony 128MB MO Mag.optical \$1495
Sony 650MB MO Mag.optical \$2595
Toshiba 830MB 3.5" Dr. \$1395
PLI 1 GB Mini Array quick SCSI \$3495

DEALERS AND INTERNATIONAL SALES WELCOME.

Best Prices, Service, Delivery! Call or fax for best quotes

DATA COMPUTER

TEL: (310) 398-3300
FAX: (310) 391-2488
3847 Grand View Blvd. LA, CA 90066

CIRCLE 508 ON READER SERVICE CARD

1-800-334-KIWI

Classic II 4/120mb \$1199
Mac LC II 4/40mb with
14" color monitor \$1549
Mac LC II 4/120mb with
14" color monitor \$1749
Mac IISI 5/120mb with
14" color monitor and
MacPro keyboard \$2399
Mac IICI 5/120mb with
14" color monitor and
MacPro keyboard \$3099
Mac Iivx Call
Mac Powerbooks Call
All items new. 1 year warranty.
Most items in stock today.
Visa & Mastercard No Surcharge.
C.O.D. orders accepted.

Established 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-4:30pm PST

CIRCLE 404 ON READER SERVICE CARD

*"I saw it in the
MW Shopper"*

For your ad to appear in The Macworld Shopper, please call 800.888.8622

CATALOG

MACWORLD
MWShopper

Computer Systems

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

PowerBook

160 4/40 \$2295
160 8/80 \$2865
160 14/120 \$3679
180 4/80 \$3679
180 4/120 \$4019
180 14/120 \$4019
Due210, 4/80 \$2139
Due230, 4/80 \$2479
Due230, 4/120 \$2819

Classic II

4MB/80HD \$1125

LCII

4MB/40HD \$1145
6MB/160HD \$1599

Mac IICI

8MB/160HD \$2775
20MB/525HD \$3795
20MB/1gbHD \$4369

II Si

5MB/80HD \$1775
9MB/160HD \$2121
IIvx
4/80, 512ram \$2495
5/80, CD-Rom \$2895
4/230, 512ram \$3095

Quadra700

8MB/160HD \$3995
20MB/525HD \$4995
20MB/1gbHD \$5595

Quadra950

32MB/525HD \$7295
64MB/1gbHD \$8875

AppleMonitor

Color Display \$64
12" Color \$419
16" Color \$1295

SuperMac

Thunder 24 \$2295
ThunderStorm \$789
T Storm Pro \$2995
Spec 24 III \$829
Spec 24 pdq \$1579
Spectrum 8.24 \$828
20" Color \$1479
20T Color \$2445
Platinum 21" \$995

Sony

1320 Color \$385
1304s Color \$629
1604s \$1088

Radius

Pivot Mono \$729
Pivot Color \$1255
Pivot LE \$1255

LapisMonitor

All Models Call

Rasterops

20" Multiscan \$1339
PaintBoard LI \$825
24Stv \$770
Video Time \$1159

E-Machine

SX/MX \$489/799
Double color Lx \$635
T16 II MR \$1275

Apple Printer

StyleWriter \$345
Laser NTR \$1679
Laser IIF \$2225

Laser IIG

Laser IIG \$2795

NewGen

400P \$1639
660P \$2579
1200T 11X17 \$10895

TI Printer

PS17, 2.5MB \$1299
PS35, 2.5MB \$1399
Turbo, 4.5MB \$1640

LaserMaster

All Models Call

DatatProduct

LZR 960, 4MB \$1805

HP

DeskWriter \$395
DeskWriter 550C \$735

Microtek

ScanMaker II \$849
ScanMaker XE \$1095

UMAXScann.

UC 630 \$1095
UC 1200s \$2695

PLI Infinity

40 MB w/cart \$549
68 MB w/cart \$659
Optical 128M \$1499
4GB DAT Ext \$1699
21MB Floptical \$439

Asante

10BaseT Hub \$249
EN/SC 10BT \$249
EN/SC PB \$275

Tape Backup

Richo 650 \$2595

Kodak Diconix

180s \$365

SIMMs as low as

1MB/4MB \$33/120
16MB \$479
PwrBook Simm Call
PwrBook 2MB \$49

CIRCLE 420 ON READER SERVICE CARD

COMPU.D
INTERNATIONAL, INC.

IN BUSINESS SINCE 1983

6741 Van Nuys Blvd.,
Van Nuys, CA 91405

TEL: (818) 787-3282
FAX: (818) 787-2111

1-800-536-9999

NEW LINES OF POWERBOOKS 160, 180, DUO 210, 230, & VX IN STOCK ...CALL

QUADRA	MACINTOSH	POWERBOOK	MONITORS	PRINTERS & SCANNERS
950 8/0 \$5295	II Vx 4/80-512k \$2450	160 4/40 \$2270	Apple 12" clr \$425	HP DeskWriter \$395
950 8/105 \$5550	II Vx 5/80-CD \$2795	160 4/80 \$2550	Apple 13" clr \$495	550/500 CLR \$695/550
950 8/240 \$5895	II Vx 4/230-512k \$2750	160 4/120 \$2725	Apple 14" CLR \$558	HP ScanJet IIC R/W \$1295
950 8/200 \$5650	II Vx 5/425 \$3075	180 4/40 \$3450	Apple 16" clr \$1230	NTR \$1685
950 8/425 \$6050	II ci 5/0 \$2095	180 4/80 \$3595	RADIUD PIVOT \$730	IIG \$2695
950 8/640 \$6295	II ci 5/105 \$2325	180 4/120 \$3950	RADIUS L \$799	IIF \$2180
950 8/1.2GB \$6695	II ci 5/200 \$2425	DUO 210 4/80 \$2099	SEIKO 13" clr \$420	NEC 2 H.95 \$1467
950 64/1.2GB \$8150	II s1 3/40 \$1495	DUO 230 4/80 \$2425	SONY 1304 clr \$585	PLI 128 Opt. Dr. \$1499
900 4/0 \$3995	II s1 5/80 \$1699	DUO 230 4/120 \$2699	SuperMAC/K-Machine CALL	SEIKO Per Clr \$3550
700 4/0 \$3150	II s1 5/120 \$1799	145 4/40 \$1995	POWERBOOK ACCS.	UMAX UC-100 R/Adobe \$1099
700 4/105 \$3395	LCII 4/40 \$1175	145 2/80 \$2290	MAC DUO DOCK \$989	PARTS
700 8/200 \$3575	LCII 4/80 \$1250	170 2/80-4/40 \$2999	PBI FAX MODEM \$195	LOGIC BOARDS CALL
700 4/200 \$3499	CL II 4/40 \$1049	140 2/80-4/40 \$1940	40/80 H.D. \$195/399	Printer " " CALL
700 20/425 \$4465	CL II 4/80 \$1175	100 2/20, 4/40 CALL	2/4/8 MEM. \$79/159/225	COLOR PRINTERS CALL

* Above prices are subject to change without notice ! * DEMO COMPUTERS MONITORS & PRINTERS AVAILABLE FOR SALE CALL FOR PRICE

CIRCLE 434 ON READER SERVICE CARD

MAC • STUDIO COMPUTER SYSTEMS

FOR THE ART, DESIGN, & BUSINESS OF THE ARTS

PERSONALIZED SERVICE, CUSTOM ORDERS
LOWEST PRICES, LARGEST ARTS SELECTION
REAL WARRANTIES ON APPLE PRODUCTS

GRAPHICS • 3D IMAGING
DTP • VIDEO • ARCH.
MULTIMEDIA • MUSIC

MACINTOSH COMPUTERS • SOFTWARE • PERIPHERALS

800/743-9890 • FAX 215/668-2065 • 10-6 EST

CIRCLE 406 ON READER SERVICE CARD

CRA

700 So. University Park Drive
Suite 350
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, Si, 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, IIfx	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 4000pi 16GS DEMO	\$899
QMS Colorscript 100-10 DEMO	\$5500	Laserwriter Plus Upgrade Rom NEW	\$399
QMS PS Jet Plus 8ppm Postscript Laser	\$1799	Maxtor 650 meg SCSI NEW	\$1499
Supermac 19" Color New & Used	\$1999	Mirus & 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 IIs 550	\$2399
RasterOps Trinitron, 8 & 32bit	From \$2299	Mac II w/40 Accelerator	\$3499
Sony 1908 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

The Macintosh Herald

EXTRA! EXTRA! Read All About It!

The Incredible Shrinking Macintosh

Austin, Texas - Recent Macintosh sightings have revealed smaller units with fewer NuBus slots. Observers note that this trend has become a real problem with the rapidly increasing quantities of NuBus option boards available in the marketplace. A spokesman went on to say that power supplies were also becoming smaller, with less ability to provide power to these sophisticated NuBus

Second Wave Solves the Macintosh Slot Problem

Austin, Texas - A family of NuBus expansion chassis systems has solved the problem of NuBus slot shortages in your Macintosh, sources say. Four-slot and eight-slot expansion chassis for the Macintosh II, Performa, and Quadra models are now available.

Call Second Wave at 512-343-9661 or write to us at 9430 Research Blvd., Bldg. II, #260, Austin, TX 78759-6541 for the rest of the story...



Second Wave, Inc.
The Expansion Chassis Company

CIRCLE 446 ON READER SERVICE CARD

Continued...

For your ad to appear in The Macworld Shopper, please call 800.888.8622

Computer Systems

Great Prices on Used Macs

Big Savings
CPUs
Drives
Monitor
Modem
Much
More

Super Savings
Don't pay higher than actual
retail. Not charged outrageous prices
anymore.
Only \$395

Call 1-800-821-3221

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



CIRCLE 424 ON READER SERVICE CARD

Memory Upgrade



118 West Broadway
Albany, NY 12212
Fax: (405) 477-3780

*Your Memory
Connection!*

Quadra 700/900 VRam 30
Quadra 950 VRam 35
LC VRam 49
LC FPU 59
PowerBook Memory CALL

When it absolutely,
positively has to be there!

All major credit cards accepted

1 x 8 x 80	CALL
1 x 8 x 70	CALL
1 x 8 x 80 fx	CALL
2 x 8 x 80	CALL
4 x 8 x 80	CALL
4 x 8 x 70	CALL
4 x 8 x 80 fx	CALL
4 x 8 x 80 II	CALL
8 x 8 x 80	CALL
16 x 8 x 80	CALL

800-942-6227

CIRCLE 471 ON READER SERVICE CARD

Disk Drives

SATURAE

"BIG HARD DRIVES"

"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				HEWLETT PACKARD				ACADEMY				QUANTUM			
Model	Interface	Capacity	Seek/Effective	Internal	Internal	External		Model	Interface	Capacity	Seek/Effective	Internal	Internal	External	
220	234v	3.5"	12.6ms	14-20MBit	\$ 769	\$ 849		42	40v	1" 1/4	13ms	6-12MBit	\$ 209	\$ 289	
402	425v	3.5"	12.6ms	14-20MBit	\$ 1,039	\$ 1,099		85	82v	1" 1/4	17ms	6-12MBit	\$ 299	\$ 369	
1003	1.2as	3.5"	10.6ms	24-42MBit	\$ 2,049	\$ 2,129		127	120v	1" 1/4	17ms	8-12MBit	\$ 359	\$ 439	
1025	1.2as	3.5"	13.6ms	24-42MBit	\$ 1,929	\$ 2,049		170	160v	1" 1/4	17ms	8-12MBit	\$ 429	\$ 499	
1290	1.6as	3.5"	13.6ms	24-42MBit	\$ 2,279	\$ 2,399		240	234v	1" 1/4	15/10ms	15-30MBit	\$ 599	\$ 699	
1650	2.1as	3.5"	11.5ms	24-42MBit	\$ 2,979	\$ 3,099		502	525v	1" 1/4	13ms	18-30MBit	\$ 1,129	\$ 1,199	
1910	2.4as	3.5"	11.5ms	24-42MBit	\$ 3,379	\$ 3,499		1200	1225v	3.5"	10ms	18-30MBit	\$ 1,829	\$ 1,899	
ProLine				FUJITSU				ACADEMY II				NEW TOSHIBA			
500	520v	3.5"	12/9ms	18-24MBit	\$ 1,059	\$ 1,139		830	870v	3.5"	12.5ms	12-24MBit	\$ 1,199	\$ 1,279	
EDGE				RARE (DEC)				VISION				MAGNETO-OPTICAL			
1000	1.2as	3.5"	9.5ms	33MBit	\$ 1,999	\$ 2,079		1150	1230v	3.5"	12ms	15-30MBit	\$ 1,629	\$ 1,699	
SENTRY				TAPE BACKUP				NEW							
250	Sanyo	1/4"	Tape Drive		\$ 649			128	3.5"	35ms	MOST		\$ 1,289		
525	Sanyo	1/4"	Tape Drive		\$ 799			256	3.5"	35ms	MOST		\$ 1,699		
1000	Sanyo	1/4"	Tape Drive		\$ 999			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 two year warranty. Sanyo tape drives have a two year warranty. HP DAT and Vision MD Drives have a one year warranty. 30 day money back guarantee on all 3.5" hard drives. Prices subject to change. We offer full-time technical support from 9AM to 8PM Mon-Fri. All hard drives have a 40-hour burn-in time on warranty repair for the first year.							
2000	Hewlett Packard	DAT	Drive		\$ 1,449			ProLine and EDGE drives include CSG's COPYRIGHT™ SOFTWARE							
5000	Hewlett Packard	DAT	Drive		\$ 1,699										

CIRCLE 449 ON READER SERVICE CARD

MEMORY DIRECT
"Don't pay Retail... buy direct"



1 Meg Simms —\$28.

**Now Memory Upgrades
for the New Performa!**

44 meg Syquest w/crtge \$414.
88 meg Syquest w/crtge \$559.

See our 1 page ad in this section!

800-486-2447

CIRCLE 524 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-25 \$499

PB RAM 6Mb - \$239 Save w/ trade in

SIMM 1/4 - \$35/122

Portable Upgrade!

ADD 1-8 Mb reuse your RAM

Mac and PC service

M/C Visa COD P.O.

(800) 487-4655

CIRCLE 555 ON READER SERVICE CARD

The MW Shopper gives you results!

Call 800.888.8622

to place your ad today

For your ad to appear in The Macworld Shopper, please call 800.888.8622

Memory Upgrade

SIMPLY THE BEST

SERVICE • QUALITY • PRICES FROM THE LLB CO.

APPLIED ENGINEERING

QuickSilver IIsi	\$219
QuickSilver IIsi with FPU	259
Transwarp SE	525
Transwarp SE w/FPU	729
Transwarp LC 25mhz	449
Transwarp LC 33mhz	919
Transwarp LC 40mhz	1259
Transwarp LC 50mhz	1389
Transwarp 040	1759
Transwarp CI 50mhz	1069
FastMath LC	119
FastMath Classic II	109
QuadraLink	182
QuadraLink DMA	329
QuadraLink DMA/Lan	379

DAYSTAR

Universal PowerCache:	
33mhz	\$539
w/FPU	659
40mhz	749
w/FPU	909
50mhz	1079
w/FPU	1319
PowerCache Adapter	41
FastCache IIsi 64K	279
FastCache IIsi 64K w/FPU	349
Equalizer LC	169
Equalizer LC w/FPU	239
RAM Power Card 0 Meg	429
Combo Cache IIsi	209
Combo Cache IIsi w/FPU	299
Quadra Cache (128k)	269

REMOVABLE DRIVES

DPI Infinity 44 SyQuest	\$519
DPI Infinity 88 SyQuest	639
DPI 128Mb Optical Turbo	1279
DGR 256Mb Optical	1689
Pinnacle Micro 650Mb	
Optical (Fastest)	3119
AE Floptical (21Mb)	459
PLI Floptical (21Mb)	409

OPTICAL CARTRIDGES

Komag 128Mb	\$45
Verbatim 128Mb	49
DGR 256Mb	95
Floptical Disks (21Mb)	24

BERNOULLI DISKS

44MB Disk 3-pack	\$270
90MB Disk 3-pack	435

MODEMS

NEW! TelePort Bronze 24/96	\$208
NEW! TelePort Silver 96/96	375
NEW! TelePort Gold 14.4/96	438
Supra 5014FX 14.4/14.4 (W/Software)	\$359
Supra 50140 14.4/14.4	305
Supra 5024 (2400 Baud)	74
Quicktel Xeba 14.4/14.4 (W/Software)	\$329
Quicktel Xeba 96/96	299
Quicktel Xeba 24/96	169

FAX YOUR ORDER 24 HOURS A DAY

(206) 454-7302

ALL GOVERNMENT & EDUCATIONAL PO'S ACCEPTED UPON APPROVAL

Call Between 7AM and 6PM Pacific Time
Weekdays and 9AM to 4PM Saturdays

1-800-848-8967

The LLB Company, Inc. • 300 - 120th Ave NE, Bldg. 1, Suite 120
Bellevue, WA 98005 • Phone: (206) 454-7258

SIMMS

1x8x80 \$35 **2x8x80 \$61** **4x8x80 \$125**

1x8x70*	\$37	1x8x80FX*	\$37	8x8x80*	\$299
1x8x100*	33	1x8x70FX*	39	8x8x80FX*	299
4x8x70*	127	4x8x80FX*	127	16x8x80*	475
4x8x100*	123	4x8x70FX*	129	16x8x80FX*	499
4x8x80 II/IX*	150	*Life Time Warranty On SIMMS			

MAC PORTABLE SIMMS

Mac Portable 3Mb Simm	\$419	Mac Portable 4Mb Simm	\$449
-----------------------------	-------	-----------------------------	-------

POWERBOOK

PB100-2Mb	\$95	40Mb Internal Hard Drive	\$449
PB100-4MB	195	80Mb Internal Hard Drive	689
PB100-6Mb	249	120Mb Internal Hard Drive	729
PB145/170-2Mb	95	PowerPort Bronze	208
PB145/170-4Mb	195	PowerPort Silver	375
PB145/170-6Mb	239	PowerPort Gold	438
BookView (Video)	1069	PSI Powermodem 24/96	188
Battery Charger	149	PSI Powermodem III 96/96	375
Battery 140/170	79	PSI Powermodem IV 14.4/96	438

SYQUEST CARTRIDGES

\$63 44MB **\$99** 88MB

MISCELLANEOUS

Quadra Video RAM 256K \$31	Mac 101 Ext. Keyboard \$120
PMMU/MC6885	159
Maxima 2.0	44
Optima 32/Software	149
LC/Classic II 16MHz FPU ..	69
Kensington Turbo	
Mouse 4.0 (Trackball)	106
We Carry Networking Hardware	

COMPARE OUR LOW SHIPPING PRICES:

\$6 And up Overnight shipping by Airborne Express.	\$4 And up ground shipping by UPS.
• Orders received before 7:30 PM Eastern Time weekdays ship same day.	• Quantity pricing for dealers.
• We export to most countries in the world.	• Bank cards accepted. Your card is not charged until the order is shipped.
• Prices subject to change.	• All returns require approval and are subject to a restocking fee.

CIRCLE 525 ON READER SERVICE CARD

For your ad to appear in The Macworld Shopper, please call 800.888.8622

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

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	\$80	8x8 70 ns	\$289
1x8 70 ns	\$82	16x8 70 ci si	\$485
2x8 80 ns	\$56	16x8 70 ns fx	\$490
2x8 70 ns	\$81	16x8 low profile	\$835
4x8 80 ns	\$102	16 Radius Rocket	\$569
4x8 70 ns	\$106	Powerbook	
		140/170 6 meg	\$275

Because of recent price
fluctuations we can't list
price for simms.

SUPERMAC

Spect. 24 PDQ plus	\$1644		
Spect. 24	\$999	Series III	\$825
Spect. 8.24	\$575	PDQ	\$849
Spect 8	\$499		
Monochrome Card	\$349		

Supermatch

Platinum

21" 2 Pg	\$2725	21" 2 pg	\$999
20" Trin	\$2474	20" 1 f. pg	\$899
20" D.Trin	\$2449		
20"	\$1489		
17" Mult	\$1079		
17" Trin	\$1075		

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

MEMORY
UPGRADES FOR
THE NEW
PERFORMA

VASANTE

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

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



CIRCLE 516 ON READER SERVICE CARD

For your ad to appear in The Macworld Shopper, please call 800.888.8622



PERIPHERAL

SIMMs

PowerBook
Memory

Quadra
Memory

Video RAM

Cache Cards

Accelerators

SIMMs

1 Megabyte 70 ns
1 Megabyte 80 ns
1 Megabyte 100 ns
2 Megabyte 80 ns
4 Megabyte 80 ns
8 Megabyte 70 ns
16 Megabyte 70 ns

CALL
CALL
CALL
CALL
CALL
CALL
CALL

Video RAM

4 Bit to 8 Bit Upgrade 24.00
256K Quadra VRAM 29.00
512K Mac LC VRAM 59.00
Mac IIxv CALL

LIFETIME WARRANTY
ON MEMORY
PRODUCTS

ORDER BY 6:30 PM CST
FOR SAME DAY SHIPPING*

*some restrictions apply

TOLL-FREE
TECHNICAL SUPPORT

OVERNIGHT DELIVERY
from \$8.00

800/256-6581

SEE US AT
MACWORLD EXPO
SAN FRANCISCO
BOOTH 1823

POWERBOOK MEMORY

PowerBook 100
2 Megabyte Module \$ 89.00
4 Megabyte Module 189.00
6 Megabyte Module 289.00
PowerBook 140/170
2 Megabyte Module \$ 89.00
4 Megabyte Module 159.00
6 Megabyte Module 249.00
PowerBook 160/180
2, 4, 6, 8, and 10 Meg Modules
Call for latest prices.

QUADRA MEMORY

256K VRAM Quadra 700/900 \$29.00
256K VRAM Quadra 950 35.00
16 MB SIMMs Quadra 700 CALL
16 MB SIMMs Quadra 900/950 CALL

Prices subject to change and availability.

ImagePro 25 Mhz accelerator
and 19 inch monitor for SE

\$995

68882 FPU's

20 Mhz for Macintosh LC \$ 69.00
33 Mhz for Macintosh LC 149.00
50 Mhz for Macintosh LC 199.00
20 Mhz w/2 slots for Mac IIsi 119.00
20 Mhz for Mac Classic II 69.00
33 Mhz for Mac Classic II 149.00
50 Mhz for Mac Classic II 199.00

Cache Cards, Etc.

II si 64K Cache Card \$ 139.00
II ci 64K Cache Card 129.00
II si 2-slot Card and 68882 119.00

FPU's (chip only)

68882 16 Mhz \$ 55.00
68882 20 Mhz 59.00
68882 25 Mhz 109.00
68882 33 Mhz 135.00
68882 50 Mhz 175.00
68881 16 Mhz 45.00
68881 20 Mhz 49.00

Miscellaneous

T.I. Microlaser 1 MB \$ 39.00
Virtual 3.0 129.00
with accelerator 99.00
Mac Classic 1 MB Bd 55.00
Mac Classic 3 MB Bd 119.00
68851 16 Mhz PMMU 79.00
Mac Portable RAM/HeXT Memory CALL

68030 SUPER-FAST Accelerators

"Quik30" for Mac SE, Plus, 512Ke
•Speeds of up to 33MHz
•System 7/Virtual compatible
•Add up to 16 Megabytes of RAM
•Includes 68882 Math CoProcessor

only \$529.00 for 25MHz version

PERIPHERAL OUTLET

327 East 14th, PO Box 2329
Ada, Oklahoma 74820
International 405/332-6581
FAX 405/436-2245



CIRCLE 454 ON READER SERVICE CARD

For your ad to appear in The Macworld Shopper, please call 800.888.8622

Peripherals

Turn back.

Epson® now makes color scanners.

Call 1-800 BUY-EPSON

CIRCLE 422 ON READER SERVICE CARD

Plus radius radius radius

MONITORS

PrecisionColor/20S	\$2599
TPD 19"/TPD 21"	\$865/\$1113
Full Page Display	\$555

COLOR CARDS

Precision 8X/24X	\$719/\$1479
Color Pivot Interfaces	\$475
PowerView	\$479

ACCELERATORS

Rocket 25i/25/33	\$1190/\$1595/\$1980
------------------------	----------------------

NEW PRODUCTS

8XJ/24XP	\$469/\$475
VideoVision	\$1875

SPECIALS

24X & PrecisionColor/20S Bundle	\$3699
24-bit card & 14" Monitor	\$1059
Pivot/Color Pivot	\$669/\$1175
Color Pivot & Color Interface	\$1599

MACS, INC.

Interested in products not listed?
CALL US FOR THE BEST PRICES
AVAILABLE ANYWHERE!

VISA SAME DAY SHIPPING

(505)345-7112

24 Hour Fax Line (505) 345-7075

CIRCLE 437 ON READER SERVICE CARD

SUPER SCSI SOURCE

QUANTUM

ELS42S	\$189.00	LPS52S	\$205.00
ELS86S	\$279.00	LPS105S	\$305.00
ELS127S	\$329.00	LPS120S	\$339.00
ELS170S	\$379.00	LPS240S	\$569.00
PD425S	\$889.00	LPS52S	\$1099.00
PD700S	\$1499.00	GO40S	\$249.00
PD1050S	\$1649.00	GO80S	\$369.00
PD1225S	\$1799.00	GO120S	\$489.00

MEMORY

1MX8 70ns	\$32.00	2MX8 70 ns	\$72.00
4MX8 70ns	\$129.00	256X8 80 ns	\$10.00

CALL FOR MEMORY UPGRADES, CONNER, FUJITSU,

MAXTOR, MICROPOLIS, SEAGATE

COMPUTERS 4 LESS INC.

1-800-466-5782 OR FAX 1-714-634-0409

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

Call
800.888.8622

to reserve your space
in The MW Shopper
today!

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

Computer Revelations Inc.

1461 Lakeland Ave Suite #5
Bohemia, NY 11716

800-275-9924

Mac Compatible
Extended
Keyboard
\$99.00

CIRCLE 460 ON READER SERVICE CARD

Everything for your
Macintosh, and more!
The MW Shopper

Printers

Save BIG in printing costs!
Recycle your Jet & Dot Matrix Printer Cartridges

Jet-Master™



All Jet-Printers supported, single & multicolor with individual, re-usable Jet-Master kits. Each kit includes 1 ink bottle (4 for color kits). Then just buy ink as needed. Avg. ink cost per re-charge is 1-2 dollars.

- Apple Stylewriter (BJ1) ...29.95
- HP Deskjet (JM2) ...24.95
- HP Paintjet (JM1, 4 color) ...49.95
- HP Think-Jet (JM3) ...26.95

Other brilliant colors available. Call for detailed brochure. Resellers welcome.

Macinker™



Re-ink your Imagewriter cartridges for less than 5¢ and help extend printhead life with dark, cooling, lubricated ink. Over 200,000 sold since 1982. Re-ink multicolor cartridges too!

234im MacInker Imagewr. 1/11...48.00

M422 4-color Adapter40.00

Universal MacInker79.45

The Universal Macinker re-inks most cartridge types. Call for complete info.

Satisfaction or 30-day refund on all products. Major credit cards accepted.

Computer Friends, Inc. 14250 NW Science Park Drive, Portland OR 97229

Toll Free 1-800-547-3303 - fax (503) 643-5379

CIRCLE 563 ON READER SERVICE CARD

For your ad to appear in The Macworld Shopper, please call 800.888.8622

Printers

CRA Systems
600 x 600 dpi
LIQUIDATION
PostScript
\$2495

- 7 megs of Ram
 - Canon 8ppm Laser Printer Engine
 - Advanced AMD 29000 RISC Processor
 - Up to "10" times faster than the HINT
 - ISI (simultaneous PC or MAC Printing)
 - AppleTalk, RS232, SCSI Interface
 - Dual Page Processing
- 1-800-375-9000 1-817-754-2120
See our other ad under Computer Systems

CIRCLE 468 ON READER SERVICE CARD

Software Accounting

Business
Sense 1.6

Now you don't need to be an Accountant to do your own accounting on your Mac! Business Sense Takes Integrated Accounting into the next century. Includes AP, AR, GL, PAYROLL, Budgets, Imports and Exports.
- List price \$199 - For a FREE test drive call: 800-377-4954
FAX 800-377-5453
Business Sense, Inc. 6360 Moki Cr
West Jordan UT 84084

CIRCLE 567 ON READER SERVICE CARD

Bar Code

SOFTWARE for Macintosh
MAC-BARCODE
The Software that Enables Macintosh® Users to Design and Generate Bar Codes for Label Printing or Creating Worksheets.
Supports Code 128, UPC, Code 39, and 5 other symbologies. The New York Times says - "Mac-Barcode is both easy to use and versatile."
1-800-733-7592
\$149.95
Version 1.1 for Apple® Macintosh®
DATA CAPTURE INSTITUTE FAX 617-934-6233 PO 1625, Duxbury, MA 02331

CIRCLE 562 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



- 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

Astrology

INTRODUCING THE IO SERIES
An all new family of ASTROLOGY PROGRAMS For your MACINTOSH

To Edition
An advanced charting tool for professional astrologers and serious students. Features solar and lunar returns, progressions, transits, search tables, by wheels, by wheels, and much more!

To Horoscope
A popular chart interpreter that produces detailed Natal reports.

To Forecast
A powerful transit interpreter that yields amazingly accurate predictions for any time period.

To Composite
An editable interpreter for doing composite charts. Essential for evaluating joint undertakings such as business or marriage.

To Atlases
American and International Atlas modules. Automatically look up date-sensitive time for any city in the world using ACS Publications data.

Priced from \$195 to \$249.50

TIME CYCLES RESEARCH
27 Dimmock Rd. Waterford, CT 06385
203-444-6641

CIRCLE 411 ON READER SERVICE CARD

Bar Code Fonts



"...the people at Bear Rock are flat-out experts on the topic of bar codes and produce products of exceptionally high quality." — Personal Publishing Magazine, 6/91

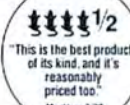
- Code 39 • UPC/EAN • ISBN • Interleaved 2 of 5 • POSTNET/FIM
- Compatible with almost any application • \$95-\$225
- CodeScan 3000 bar code readers • 5 year warranty • \$395

Sales
1-800-BEAROCK
916-622-4640
FAX
916-622-4775



Bear Rock
TECHNOLOGIES

6069 Enterprise Drive • Diamond Springs, CA 95619



Mystical Tarot INTERACTIVE™



One of the most powerful oracles created since the origin of the Tarot 600 years ago.

Fun & Exciting Way To Learn & Read Tarot
Gain Insight Into Yourself & Others
Layouts Include: Horoscope, Relationship, Chakra, Calendar, Affirmation & More
Interpretations For All 78 Cards & Layouts
Level I or Level II Advanced in Color or B/W

NEW ADVANCED VERSION FOR PROFESSIONAL PSYCHICS

800-322-1143 Level I \$39.95

Crowley or Waite Tarot Deck Available
Credit Cards Accepted
365 Brooks Ave. N.E., Atlanta, GA 30307

CIRCLE 412 ON READER SERVICE CARD

Grow with the market in the MW Shopper

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 92726
tel (714)669-9260 fax (714)669-1383
bbs (714)730-5785

CIRCLE 435 ON READER SERVICE CARD

For your ad to appear in The Macworld Shopper, please call 800.888.8622

Business

use your macintosh® to BUILD A PROFITABLE HOME BUSINESS

MONEY BACK GUARANTEE!

*The SunBear Technologies, Inc.
Entrepreneur's Kit*

Includes; ClarisWorks® integrated software, Quicken® home & business financial manager, 20 new business ideas, low-cost incorporating kit, and more!

A retail
value of
\$476 now
available for
\$288.

For all the
information you need
to make an informed
decision call Dave at
SunBear Technologies
(800)775-BEAR or Fax
(215) 698-7445

3625 Davisville Rd., Hatboro, PA 19040

CIRCLE 447 ON READER SERVICE CARD

Clip Art

NEW Introducing a New Concept
in Font Format 520 Original Images

Vol. 1: Ornaments ♦ Vol. 2: Corners
Vol. 3: Art Deco ♦ Vol. 4: Images

PolyType

Use in any program that supports font menus
Scalable to any size your program allows
Open/modify outlines in Freehand or Illustrator

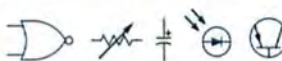
Call for Brochure or Send
\$10.00 for Sample Disk
P.O. Box 25976, Los Angeles, CA 90025 310-444-9934 FAX 310-444-7897

800 998-9934

CIRCLE 448 ON READER SERVICE CARD

CAD/CAM

TROPIC SYSTEMS



The Electronic Symbol Library

In Canvas™, Claris CAD™, MacDraw II™, or MacDraw Pro™ format. This library contains over 1500 symbols. Includes symbols for fundamental items, resistors, capacitors, relays, switches, transformers, semiconductor devices and basic logic symbols. All symbols created to conform to the IEEE standards 315 & 315A.

Tropic Systems

12319 SW 132 Ct., 2nd Flr. Miami, FL 33186
For info call (305) 251-7644 Fax (305) 251-9931

CIRCLE 462 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.

1910 Stepienowich Blvd., P.O. Box 3131
Evergreen, Colorado 80439

(303) 674-2222 to Order

(Specify DataCAD, MacDraw II, PowerDraw or Canvas™)

Compatible with
Claris CAD™,
MacDraw II™,
PowerDraw™ and
Canvas™

CIRCLE 409 ON READER SERVICE CARD

CLASSIC SERIES CLIP-ART
Original Images from the "Turn of the Century"

Borders, Corners, Bullets, Flourishes. Everything you need to accent your Documents.

Vol. 1, 2 or 3 \$49.00 each All Three Vol. \$125.00 1-800-829-8918

CIRCLE 440 ON READER SERVICE CARD

NEW! (in color!) **ART&CATS**
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
ART&CATS, Box 1287, Myrtle Creek, OR 97137

Use the Reader
Service Card to
request free
information
about the
products you
see in
The Macworld
MW Shopper.

CD ROM

Great Shareware on CD!

- Info-Mac CD-ROM: \$39.95
3384 apps, utils, sounds, games, graphics, stacks and more!
 - Educational Gameland CD: \$39.95
Array of fun learning games!
 - Digital Book Museum CD: \$39.95
Classic works/great literature!
 - Sony disc caddies: \$4.95
 - Other PC/Mac titles available
 - S/H: \$5 US, \$9 int'l each order
- Pacific HiTech, Inc.
4760 Highland Dr., Ste. 204
Salt Lake City, Utah 84117-5009
800/765-8369
801/278-2666 Fax

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

NetDraw Clip Art for Building Networks™

**Call 800-643-4668 To
Order Today!**

CIRCLE 461 ON READER SERVICE CARD

For your ad to appear in The Macworld Shopper, please call 800.888.8622

Clip Art

THE SANTA FE COLLECTION
Native American & Southwest
Clip Art for Mac & PC
500 Images & 125 Borders!

EPS Now Available!
Sampler Disk - \$15
Orders & Information
(505) 891-1600
1-800-245-7824

RT GRAPHICS
602 San Juan de Rio, Rio Rancho, NM 87124

CIRCLE 458 ON READER SERVICE CARD

AdArt
Encapsulated Postscript Images
ALSO AVAILABLE ON CD-ROM

Logos & Trademarks, 1 - 10
Int'l Symbols & Icons, 1 & 2
Flags of the World
Vinyl Cutters Collection
Business Symbols Collection
Recycled Art
Safety & Packaging Collection
Attention Getters Collection
Real Estate Collection

FAX 802-875-1768 • INFO 802-875-1164
800 255-0562
Innovation Advertising & Design
41 Mansfield Ave • Essex Jct., VT 05452

CIRCLE 463 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



NOW WITH IND\$FILE

CIRCLE 513 ON READER SERVICE CARD

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

Logo Design Software \$119

Create world-class logos like these in minutes. **Logo SuperPower™** is a graphic database of 660+ design elements which you can modify in an infinite number of ways. Available for FreeHand, Illustrator and PC. For information call (513) 421-1938.

Order line - call toll-free
800 648-5646

CIRCLE 533 ON READER SERVICE CARD

For all
your
Macintosh
needs, look
to the
MACWORLD
MWShopper

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 unlit 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). See us at SF Macworld Expo! TeleTypesetting Co. /Books-On-Disk 311 Harvard Street Brookline, MA 02146 **800/800-3333 MacConnection** **617/734-9700 Direct** **617/734-3974 Fax**

MAPS
FOR GRAPHIC DESIGN

MapArt Vol 1: USA & International
• 4 World Maps
• 34 Regions of Europe
• Africa, SE Asia, etc. with city borders, names, & major cities
• 20 Countries with state or province borders, names & major cities
Over 500000 points on 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
28 views of the globe. EPS or PICT

MapArt Vol 4: Metro Areas - USA
All US metro areas with interstates, roads, 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 8 South Main Street, PO Box 737
Lumberville, NJ 08850 • Voice: 609-297-5611 • 24 hr FAX: 609-297-5724
FOR PROMPT RESPONSE PLEASE CALL OR FAX US DIRECTLY

CIRCLE 417 ON READER SERVICE CARD

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

Custom Development

THE **d.i.d.CIRCLE** ORGANIZATION

Custom development with 4th Dimension®

Solid experience. World wide intervention.

U.S.A. JAPAN: FRANCE GREAT BRITAIN
(1-703)869.8709 * (81-3-)5562.9042 * (33-) 93.18.90.47 (44-71-)410.0930 *

* Wait for connection (automatic machines 30 sec. pauses), then enter 524 8724 ## (two ##)

CIRCLE 472 ON READER SERVICE CARD

For your ad to appear in The Macworld Shopper, please call 800.888.8622

Educational

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



Interactive MIDI Tutor
800-824-4788

\$119

EduACTIVE (603) 668-4788

• Full function Sequencer • Built-in Glossary • Student Notebook records your progress • Lesson Planner and Quiz Pages for the classroom

CIRCLE 465 ON READER SERVICE CARD

THE ABSOLUTE BEST IN TESTING!

LXR-TEST™ 4.1 is the most advanced and complete testing system available for your Mac!

- Item banking
- Test generation
- Scoring & analysis
- Paper & interactive
- Mark reader support
- Commercial banks

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

Macの日本語はクオリタスにお任せ下さい。 Qualitas is your Japanese Resource!

マック
広辞苑

CD-ROM版
\$499.00

三省堂ワードハンター

国語・英和・和英・ことわざ等、三省堂の12冊の辞書が1枚のCD-ROMに入りました。 **\$599.00**

JapanEaso

Vol.1 Katakana
Vol.2 Hiragana
Grammar

\$99.95 Each Vol.

QuarkXPress-J
Aldus PageMaker-J
EGWord and EGBBook Bundle
Aldus Freehand-J
Adobe Illustrator-J
SOLO Writer (NISUS Japanese)
EGWord 4.2 / Classic v.1.1
Adobe Type Manager - J

Excel-J
Japanese PostScript Fonts
rSTONE E-J and J-E Dictionaries
The Translator - (English to Japanese)
The Translator - Mini (for 2 MB Macs)
Mode Nihongo (Japanese System 7.0 simulation)
SweetJAM v. 7.0 (Engl. Sys. 7.0 compatible)
NihongoWare CD-ROM

IBM PC related inquiries also welcome

Qualitas Trading Company

2029 Durant Avenue, Berkeley, CA 94704
Phone: (510) 848-8080 Fax: (510) 848-8009



日本語で
お問合わせ
下さい。

CIRCLE 414 ON READER SERVICE CARD



Misty City Software
10921 129th Place NE
Kirkland, WA 98033
(800) 795-0049

Rated ★★★★★ by Macworld, December 1992 (p.263)
GRADING MADE EASY!
The best Mac gradebook just got better.
New Version 5.0 adds student graphs, narrative comments, multiple grading scales, user-defined special scores, password protection and much more. System 7 and network compatible.
No copy-protected. **Affordable** site licenses available.
\$79 (Still only \$99 bundled with new Attendance Option)
+ \$5 S&H **MONEY-BACK GUARANTEE!**

CIRCLE 413 ON READER SERVICE CARD

Engineering

CIVIL • STRUCTURAL • SURVEYING •

NEW! LANDview™ for CONTOURING & TERRAIN MODELING

LANDesign™
COGO/Surveying
• Data Collector and Export Modules available
• From US\$595 + shipping

FRAME mac™
Structural Analysis
• Frames, trusses, beams
• Full graphics
• US\$595 + shipping

Money-back guarantee. Free support.

Other programs and products:
• Deed plotting • Beam sizing • Structural design
• Road design • Section tables • Structural properties

For free catalog or info: **tel: (416) 738-4601**
COMPUnearing™ fax: (416) 738-5207

113 McCabe Crescent
Thornhill, Ontario L4J 2S6
CANADA

CIRCLE 503 ON READER SERVICE CARD

Fonts

Font Reference Guide

The Precision Type Reference Guide 150+ pages of displays, information and pricing for thousands of fonts, font software tools and CD's. **\$6.95**
Prices discounted up to 40% off list. The \$6.95 cost is refunded with your first order.

Precision Type
The Complete Font Software Resource
800.248.3668
47 Mall Drive
Commack NY 11725
516.864.0167

Use Visa, MasterCard, AMEX or Discover for your Reference Guide order.

CIRCLE 405 ON READER SERVICE CARD

Entertainment

College Basketball Pool

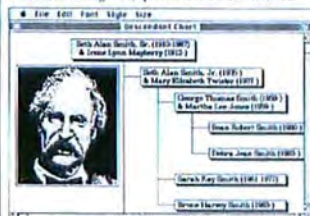
"March Madness" made easy. Manage the office pool on your Mac. Saves hours, errors and it's FUN! Automatic update of scores, rankings, best & worst possible finish, and who each player can or cannot defeat. "What if..." look-ahead feature. Point & click entry of predictions. Up to 100 players can participate. Send \$19.95 + \$3.00 S&H, or call for free brochure. Visa/MC.

Arlington-Boyd
201 W. Genesee Street #211
Fayetteville, NY 13066
800-382-7671 or 518/793-6618

Genealogy

REUNION the family tree software

Reunion quickly organizes your family information and images, links and displays pictures, identifies relationships, creates graphic tree charts, family group records, mailing lists, questionnaires, and more.



To order call MacConnection 1-800-334-4444, Mac's Place 1-800-367-4222, or MacZone 1-800-248-0800. For a free brochure & sample printouts, contact...

Leister Productions
P.O. Box 289, Mechanicsburg, PA 17055
phone 717-697-1378 — fax 717-697-4373

For your ad to appear in The Macworld Shopper, please call **800.888.8622**

Genealogy

Family Roots™

Do it YOUR way! Huge variety and capacity for your family history. Make pedigree charts, descendants charts, person sheets, group sheets, indexes and much more. Customize to your own preferences. Standard Mac interface. Call for FREE information. Satisfaction guaranteed. MC/Visa/AE.
Quinsept
Box 216
Lexington MA 02173
617/641-2930
800/637-ROOT

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 special Holiday 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

Graphics 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.

**JOIN US IN SAN FRANCISCO
FOR THE MACWORLD EXPO
HALL "D", # 3584**



KANDU
software corporation
703.532.0213

CIRCLE 549 ON READER SERVICE CARD

Human Resources

Frazzzzzled by HR Record Keeping?

Abra 2000 for Employees

- For 10 to 10,000 employees
- Top selling HR system, Mac & PC
- Over 100 Reports + Report Writer
- Starting at \$595 for up to 75 employees

AbraTrak for Applicants

- Find the right candidate—Fast
- Auto letter generator
- 80+ reports, includes EEO & Costs
- From \$995 for Single User

Evaluation System with Manual: \$25 / product

FREE Demo Disk • 408-737-9454



CIRCLE 450 ON READER SERVICE CARD

HyperCard Stacks

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

Languages

FORTTRAN 77 • System 7

Language Systems FORTTRAN is an ANSI/ISO standard FORTTRAN 77 compiler with System 7 features. Supports extensions from VAX and Cray FORTTRAN, built-in debugging, background execution, MPW integration, and optimized code generation for all Macintoshes. The complete solution to your FORTTRAN programming needs. Language Systems Corp.
44T Carlisle Dr.
Herndon, VA 22070-4802
703/478-0181
703/689-9593 Fax
800/252-6479 Expo Booth 1129

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 & 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 FORTTRAN 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 FORTTRAN 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

Lottery

"Hitting the MacJackpot!!!"

MacLotto® NOW in its 3rd year! With over \$8.2 Million already won... MacLotto® the most successful Lotto wagering system avail. Over 1500 built-in, expert system rules increase YOUR chances of Winning Millions More! Numbers up to 604% MORE likely to be selected. Patented Odds Improvement Engine works with all Lottos, All Keno's & All Macs! MC/VISA \$99. U.S. Math Labs (YES! System 7.0) 18 Main Street Concord, MA 01742
800/PLAY-SIX - All Lottos
508/653-9193 Fax
617/431-5922 Direct

Mathematics

Real World Math!
Problem-Solving Toolbox for Scientists and Engineers

***** MacWeek, 9/24/92: "The most complete set of math functions available." "Rapid and accurate solutions." "A new approach...exceptionally easy to learn."

***** MACWORLD, 10/92: "The right choice for serious engineering." "Amazingly fast." "Dazzling graphics." "The most powerful numerical software for the Mac."

***** "Can do matrix problems that make MATLAB hang up or report system errors."

BYTE, 9/92: "A scientific Swiss Army knife." "More than 600 built-in functions, interactive 2-D and 3-D graphics, and its own 4GL."

"Create, solve and present in a single environment." Bimillennium 101 Alhambra Way, Los Gatos, CA 95030, Ph: (408) 856-2010, FAX (408) 856-7335

HIQ

\$695

For Overnight Delivery
(800) 488-8662

CIRCLE 469 ON READER SERVICE CARD

For your ad to appear in The Macworld Shopper, please call 800.888.8622

Lottery

Sports Junkies!

Play RCT Sports Select. Bet on your favorite major league teams. Make 3-6 picks per parlay and win up to 15,000 to 1 on the right selection. Fax your name and fax number to 416/940-0572 for full details or write to the address below.

RCT Sports Select
34 Forbes Cr.
Markham, Ontario L3R 6S5
Canada
416/940-0572 Fax

Medical

Care4th™ for Clinicians

- Electronic Medical Records featuring fully customizable templates and prompts, "intelligent" problem lists and reports
- Clinical Database of unmatched power
- Decision Support, literature database
- Alert generator including allergies, interactions, analysis of overdue tests according to your rules, intuitive interface ...and much more. Under \$1000.

Exclusively Macintosh® - Solo or Group

Med4th Systems, Ltd.
716 East Carlisle Avenue
Milwaukee, WI 53217
(414) 963-1985 Voice/Fax



New! Medicine Monitor

Track your prescription and over-the-counter medicines. Avoid possible health problems caused by food/drug interactions. Discover the best time to take medicines based on your own eating and sleeping routines. Learn how various drugs affect your nutrition. Features a 640 drug database, medicine chart, messages and Food Frequency Analysis.

\$125 incl. shp.
DINE Systems, Inc.
586 N. French Rd., Suite 2
Amherst, NY 14228
716/688-2492
716/688-2505 fax

MacAnatomy™ MacSurgery™

...an electronic atlas of Anatomy in 4 vol. on disk in MacPaint™ format. Easily altered & copied to any program via the clipboard. Ideal for students of Anatomy in all the health & legal professions. ...is a HyperCard™ stack w/multi-choice quest & ans. Detailed discussions & documentations are provided. Ideal for continuing education & board prep.

MacMedic Publications
5177 Richmond, #1040
Houston, TX 77056
713/960-1858
800/477-0717
713/621-2408 Fax

CODE SEARCH™

ICD9 Medical Diagnosis Coding program allows rapid access, cutting and pasting of the most specific ICD9 Codes. Package includes 1993 ICD9 Codes and directory of over 6,000 Insurance companies. UPIN modules are available for any state. Works with most Mac billing systems and is System 6/7 compatible. Call to place your order or call for free demo disk and literature.

Diagnostic Data, Inc.
20 Balfour Drive
West Hartford, CT 06117
800/999-6405

TessSystem™: Ins/Billing

Wabash's state-of-the-art software for medical office mgmt. is competitively priced and outperforms any other on the market! Expandable line to grow with your needs. 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
317/579-5901 Fax

Movies

"Useful; fast; easy to use ... an incredible bargain."

MACWORLD March '92

VIDEO COMPANION™

Relational movie database by:

- title •director •topic keywords
- stars •year from list of over
- academy awards 1,300 topics

- Extensive plot information
- Print lists to take to video store
- Enter your own comments
- Updated quarterly

Current version over 8,000 titles

If you like movies ... this is the product you've been waiting for!

Sold by subscription: \$45/year (4 issues). (+ \$3.71 tax CA residents) VISA MC Check MO

1-800-759-4802

Electronic Movie Guide, Inc.
PO Box 3509, Redwood City, CA 94061

CIRCLE 459 ON READER SERVICE CARD

Call The Macworld Catalog and see why.



800.888.8622

Music/MIDI



Call Now!

DIGITAL

Hard Disk Recording, DAT, Macintosh, MIDI Instruments, Coda, Mark of the Unicorn, Passport, Dr.T's, Opcode, Digidesign, Roland, J.L. Cooper and more...

800-MAC-BEAT
505-473-4929

Mac BEAT

CIRCLE 433 ON READER SERVICE CARD



Interactive Learning Software

Compose yourself \$99.

Complete "How To" Composing Package
8 Track Sequencer • Chord Computer • Composer Strategies HyperCard Stack • Cassette Tape • Complete Composition Manual • Call for Details!

800-MAC-BEAT
505-473-4929 FAX 505-473-4647

Mac BEAT

CIRCLE 438 ON READER SERVICE CARD

The Macworld Shopper DELIVERS!

For your ad to appear in The Macworld Shopper, please call **800.888.8622**

Programming Tools

SoftPolish™ ver. 1.1

Quality Assurance for Macintosh developers

- avoid embarrassing errors
- spell check resources
- detect interface problems

This stand-alone application works with any programming language. It is a tool for anyone who cares about software quality. Macworld Expo Booth #1129. Language Systems Corp.
441 Carlisle Dr.
Herndon, VA 22070-4802
800/252-6479
703/689-9593 Fax

Property Management

Mac Landlord

Easiest-to-use property management software for only \$399. Designed by property managers for all kinds of rental properties. Includes recurring income and expenses, check writing, account balancing, transaction ledgers, maintenance records, printing tenant notices, full menu of management reports. Password protection. Free telephone support. Demo available for \$25, credited to purchase.
Labana Management Company
P.O. Box 2037
Dearborn, MI 48123
313/562-6247

Real Estate

Save Time, Make More \$\$\$

REAL ESTATE EDGE, Tracks clients, sends letters, envelopes, \$395.

PROANALYSIS, produces comprehensive reports for clients, banks, and investors. \$295.

PROPERTY MANAGER, keeps books, prints reports & checks, notices... \$495/995. Call for free literature, Demos \$25.
Transoft Corporation
31 Parker Way
Santa Barbara, CA 93101
800/949-6463

Religion

Round Out Your Hard Drive... Round Out Your Life!

We all have times when we can use a lift! What better way to make this happen than to read the Bible. The Thompson Chain HyperBible™ is the most complete Bible Study package available with:

- Atlas & Journey Maps
- Archaeological Studies
- Character Studies
- 7,000 Topical References
- Over 100,000 Marginal Notes
- NIV or KJV
- Thompson Chain-Reference® Study Bible



Special \$99

Call Today

800/428-4385

302

CIRCLE 466 ON READER SERVICE CARD

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 \$50

By The Numbers • 55117 Homer Avenue
Elkhart, IN 46517-3207 • 219-293-4893



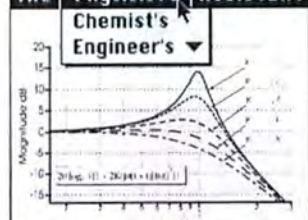
Sales/Marketing

Automate Your Sales Force

Market Master solves the problem of incomplete follow-up. Sell more and work less using AUTOMATIC, aggressive sales strategies. Keep up-to-date on the road with two-way remote data transfer. Don't just computerize - AUTOMATE with Market Master - the most persistent, ambitious, relentless sales assistant available. 30-day money-back guarantee. Demo disk \$10.
Breakthrough Productions
210 Park Avenue
Nevada City, CA 95959
916/265-0911
916/265-8036 Fax

Scientific

The Physicist's Assistant



Igor Graphing and Data Analysis

- Unlimited data length
- Incredibly fast
- High resolution printing
- Extensive analysis
- \$295, VISA & MC
- 30 day guarantee

WaveMetrics (503) 620-3201
P.O. Box 2088 • Lake Oswego, OR 97035

CIRCLE 432 ON READER SERVICE CARD

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 595
Wheat Ridge, CO 80033
(303) 423-5645 • FAX (303) 423-6171

Shareware

GREAT COLLECTIONS for Macintosh

- Games
- Education
- Religion
- Hypercard
- Business
- and more!



PAY ONLY \$9.95
PER COLLECTION
(Including Shipping & Handling)
for 6 disks full of software
Foreign add \$5.00 per collection.
Credit Cards Only.

Satisfaction guaranteed since 1985

SMC SOFTWARE PUBLISHERS
619-931-8111
Ext. 511

CIRCLE 487 ON READER SERVICE CARD

Mail order
can save
you time—
and money!

Continued...

For your ad to appear in The Macworld Shopper, please call 800.888.8622

Shareware

Computer Repair

Desk Top Publishing

FREE MAC & IBM SOFTWARE CATALOG

32 Pages! ASP Member

SOFTSHOPPE, INC.

P.O. BOX 19069
IRVINE, CA. 92714
Tel: (714) 261-0114
FAX: (714) 261-0116



Toll-Free—24 Hrs.
1-800-851-8089

CIRCLE 421 ON READER SERVICE CARD

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

COMPUTERINSURANCE 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

COMPUTERINSURANCE
Agency, Inc.
6150 Old Millersport Road, NE
Pleasantville, OH 43148

1-800-722-0385

CIRCLE 523 ON READER SERVICE CARD

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

\$19.00!!!

For all repairs plus parts and shipping. Maximum price guaranteed. Super fast turn-around. 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. 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. 8 800-765-9292 407-586-0011 Ph
Hypoluxo, FL 33462 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

WORLD WIDE SERVICE BUREAU

World Wide Press, Inc. • 801 River Dr. S. • Great Falls, MT 59405-4059

24-Hour BBS 1-800-438-3869 8-5 Mountain Voice # 1-800-548-9888

V.32bis Modem #

Agfa SelectSet 5000 Imagesetter

Agfa TabScript C500 Color Laser

Agfa Focus Scanner

Agfa/rool System

Located in Montana's FedEx hub city. Our shipping deadline is 8 AM. Rushes in by noon, out same day!

CIRCLE 405 ON READER SERVICE CARD

High Res Lino

TOLL FREE 24 HR. BBS

1-800-262-0368

NY Metro Area/Long Island: 516-821-8454

L330 with RIP 40 XMO TurboPix

Daily Densitometer Calibrations

Up to 3386 dpi • Paper/Film Quantity Discounts

Color Laser Proofs

Including 11 x 17 with Full Bleed

PM Imagesetters, Ltd.

ROCKY POINT, NY • TEL: 516-821-8451

CIRCLE 402 ON READER SERVICE CARD

Education

B.S. & M.S. Degree in CS

The American Institute for CS offers an in depth correspondence program to earn your B.S. & M.S. degrees in Computer Science at home. B.S. subj. covered are: MS/DOS, Basic, Pascal, C, File Processing, Data Structures & Operating Systems. M.S. program incl. subjects in Software Engineering and AI.

American Institute for Computer Sciences

2101-MW Magnolia Ave. Ste. 200
Birmingham, AL 35205

800-767-2427
205-323-6191

MACWORLD
MWShopper

**Your
direct
connection
to the
Macintosh
market!**

For your ad to appear in The Macworld Shopper, please call 800.888.8622

Laser Recharge

reconditioned **TONER** cartridges!
for laser printers & Canon PC Copiers

BETTER THAN NEW!

- 20% MORE TONER
- DARKER PRINT
- 100% GUARANTEED

From **\$44.95**

We buy empties
call for brochure
800-426-8196

Willow Products Corp.
3857 Willow Ave., Pgh, PA 15234

WILLOW

CIRCLE 445 ON READER SERVICE CARD

Slides

Digital Imaging
on photographic media

Slides from \$3, copies less

Prints from \$7, copies \$4

Overheads from \$8

best quality color to 12" X18"

Elegant Graphics
750 Princeton Ave., Box 774607
Steamboat Springs, CO 80477
(303) 879-4334, FAX (303) 879-5206
Modem/BBS (303) 879-5210 / 8484

CIRCLE 527 ON READER SERVICE CARD

Experts in
Macintosh Slide Imaging

Nextwave Productions
NYC, NY

NY State Call: 212 989 2727
Outside NY State Call: 800.445.9002

Matrix Forte & Chromascript
24/72 hr service - \$5/\$3
24 hr BBS
Color prints & overheads
High volume slide duplication
Scanning & production services
Volume discounts
Rush service available

AMERICAN EXPRESS VISA MASTERCARD

CIRCLE 488 ON READER SERVICE CARD

Only
The
Macworld
Shopper
gives you
the results
you've been
dreaming
about.

SlideImagers®
PostScript™ Imaging

Overnight \$4.95
Digital Output

- Slides
- Overheads
- Canon Flery Color Lasers

24-hour turnaround standard.
We support all major software
packages with fast, efficient
service and unbeatable quality.
See how easy imaging can be...
CALL TODAY!

(800) 232-5411
(404) 874-6740

NOW AVAILABLE:
Scanning Services
(Rates based on system time)

**QUALITY SO GOOD-IT
SHOULD COST MORE!**

CIRCLE 456 ON READER SERVICE CARD

Accessories

Cases



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

Covers

Our Cover Story.



Our cover story is simple—ABCOM dust covers protect your equipment from dust, spills and downtime. Custom-fitted using anti-static, waterproof nylon packcloth.

ABCOM

CALL FOR FREE BROCHURE: 619-872-1946

CIRCLE 408 ON READER SERVICE CARD

FOR ULTIMATE PRODUCT PROTECTION!
Buy Reusable A.T.A.* Cases

*STAR CASES exceed testing criteria, simulating 100 airline trips, as established by the A.T.A. (Air Transport Association of America)

"FREE" Case Catalog

THE ULTIMATE PRODUCT PROTECTION

When transporting anything valuable or fragile, insist on the Ultimate Product Protection.

★ STAR CASE
(800) 822-STAR
(800) 782-CASE

CALL FOR PRICING
All major credit cards accepted

CIRCLE 558 ON READER SERVICE CARD

For your ad to
appear, call
800.888.8622

MACWORLD
MWShopper

Continued...

For your ad to appear in The Macworld Shopper, please call 800.888.8622

Covers

Diskettes

PowerBook

DUST COVERS

(Please Call
With Any
Questions!)

ALL FABRIC

• Heat Ventilation, will not become stiff or crack with age! • Easy to Use • Machine Wash & Dry! • Highest Quality, Custom-Fit! • 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	11-30 Mac SE or SE Keyboard.....	3.95
10-74 Mac SE & SE Keyboard.....	24.95	11-34 AppleColor 12" Hi-Mir Monitor.....	24.95
10-75 Mac SE & SE Keyboard.....	24.95	11-23 Radius Pivot Monitor.....	24.95
11-35 Mac IIx Computer Only.....	15.95	10-95 Radius TPD - 19".....	24.95
11-36 Mac IIx 13" Hi-Mir Cr. & Keyboard.....	29.95	11-22 Super Mac 19" Cr. Mirr.....	29.95
11-37 Mac IIx 12" Mir & Keyboard.....	29.95	10-57 IntegreView II.....	15.95
10-73 Mac II, Cr Mir & Ext Keyboard.....	29.95	10-90 LaserWriter II.....	24.95
11-02 Mac IIx Ultra CPU.....	19.95	11-25 Personal LaserWriter.....	24.95
11-01 Mac IICx Computer Only.....	15.95	11-32 StyleWriter.....	16.95
10-88 Mac IICx, Cr Mir & Keyboard.....	29.95	91-221-Pi Desktop.....	19.95
11-33 Mac LC, 13" Hi-Mir & Keyboard.....	29.95	11-40 T.I. microLaser PS.....	19.95
11-32 Mac LC, 13" Mir & Keyboard.....	29.95	SKIN Keyboard Skins.....	21.95*

CO-DU-CO Computer Dust Covers
800-735-1584 414-476-1584 • 476-9329 FAX

CIRCLE 455 ON READER SERVICE CARD

FORMATTED DISKETTES BASF, VERBATIM, SONY

WITH FORMAT	QTY 250 MIX & MATCH	WITHOUT FORMAT
\$1.41	5.25" DS/DD	\$1.36
\$1.62	5.25" DS/HD	\$1.54
\$1.63	3.50" DS/DD	\$1.53
\$1.99	3.50" DS/HD	\$1.89

- **FREE FORMATTING** on First Order
- **TYVEC SLEEVES** & Labels Included
- **COLORED MEDIA** Please Add \$.05
- **VOLUME DISCOUNTS** Available
- **SAME DAY** Shipping
- **MONEY BACK GUARANTEE**

800-255-3142

Diversified Systems Group, Inc.
PO Box 1114, Issaquah WA 98027

CIRCLE 496 ON READER SERVICE CARD



Use your PowerBook
in the case!

Accessory Pockets

Fully Padded

Free Lost & Found

Registry Listing

MagentaCase™

Models for

PowerBooks &

PowerBook Duos

Magenta Seven

(800) 284-3957

Call now... protect your investment!

CIRCLE 442 ON READER SERVICE CARD

Pack your
Powerbook
in seconds!

Holds LC or SE
with 12" monitor

**WEST RIDGE
DESIGNS**

1236 N.W. Flanders, Portland, OR 97209
(503) 248-0053 FAX (503) 274-7685
CALL TOLL FREE! 1-800-548-0053
(9-5 Pacific Time)

CIRCLE 444 ON READER SERVICE CARD

Wherever the
market goes,
Macworld is
there first!

DUST COVERS 100%
COTTON CANVAS

ComputerWear

MAC, SE, II, & PRINTERS
Beige w/ Grey Trim Breathable! Static-Free!

NEW! Seal-Skins
For Keyboards

1-(800) 826-5761
Int'l: (415) 587-3002 Fax: (415) 587-2229
Contemporary ComputerWear
201 Chester Ave. San Francisco, CA 94132

CIRCLE 507 ON READER SERVICE CARD

For your ad to
appear, call
800.888.8622

MACWORLD
MWShopper

**POWERHOUSE COMPUTER
PRODUCTS**

KEYBOARD SKINS
CUSTOM LOGO PADS
WRIST PROTECTORS
MOUSEPADS/DISKS
LASER PRODUCTS
RIBBON/PAPER
AND MUCH MORE!

CALL FOR CATALOGUE
1-800-221-4892

CIRCLE 591 ON READER SERVICE CARD

The Bottom Line:

There's no easier, faster, or more economical
way to get your message in front of 500,000
Macintosh buyers than to advertise in

The Macworld Catalog.

Call 800/888-8622
to reserve your space today!

For your ad to appear in The Macworld Shopper, please call 800.888.8622

THREE GOOD REASONS WHY YOUR CD-ROM DRIVE WAS INVENTED:

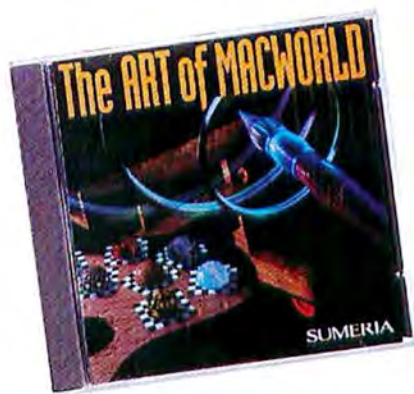
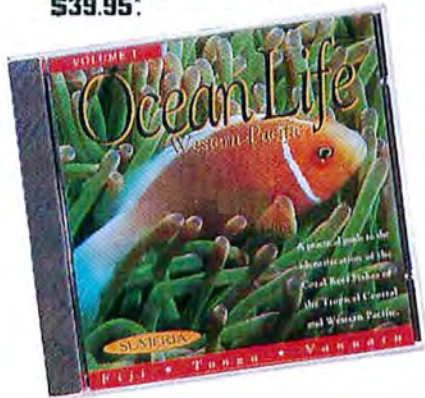


1 QuickTime™: The CD™

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 6-8 weeks for delivery.

BAR CODES OR LABELS?

MacBARCODA



NOW WITH COLOR CAPABILITY!

THE BIG COST SAVER IN THE PRINT, PACKAGING & PUBLISHING INDUSTRY

- Used in 35 countries, MacBARCODA is a suite of easy-to-use DA's producing bar codes in EPSF
- Compatible with all the popular page-makeup packages (Freehand®, Xpress®, Illustrator®, PageMaker® etc...)
- UPC, Code39, ITF, EAN, ISSN and ISBN
- Full control over magnification, truncation and bar width reduction
- Automatic check digit verification
- No messing with fonts or film
- All the vital features necessary for quality bar code production.

and NOW, the COMPLETE labeling solution



NOTHING COMPARES...

LABEL DESIGNER GIVES YOU:

- Mailing labels • Shipping labels
- BRCs • Inventory labels
- Product labels • Bar Code labels



Multi-variational text



Serial No.
100001

ComputaLabel

ComputaLabel Inc., 28 Green St. Newbury MA 01951
Tel 800-289-0993 Fax 508-462-9198

Circle 116 on reader service card

TRY BEFORE YOU BUY

Making the right purchase decision is always difficult — without the facts it can be impossible. Now you can "kick the tires" before you buy with *The Macworld Resource CD™*.



The Resource is a high-tech consumer toolkit with trial software, product demos and printable information from top Macintosh® hardware and software companies.

The Resource Features:

- **Tech Report:** The first QuickTime™ "TV Program" — a 30 minute interactive show on the latest technology trends.
- **Productworld:** Your interactive consumer toolkit. Get detailed product literature; run interactive demos; get "hands-on" with trial software.
- **The Directory:** An up-to-date, comprehensive database of thousands of Macintosh products.

If you buy Macintosh products, *The Macworld Resource CD* is a must-have. Take advantage of the charter subscription offer and save.

MW1192

Special Charter Subscription Offer

- ☐ YES! Please send me a one-year (4 quarterly CDs) *Macworld Resource CD* subscription for only \$49.95.
- ☐ YES! Please send me the Fall '92 edition of *The Macworld Resource CD* for only \$19.95.

Name _____

Company _____

Address _____

City/State/Zip _____

Telephone _____

☐ Payment Enclosed ☐ M/C ☐ Visa

Card Number _____ Exp. Date _____

Signature _____

TO SUBSCRIBE

Call 1-800-631-1700 X102 or clip coupon and return to:

Macworld CD Ventures,
501 Second Street, San Francisco, CA 94107.

GA, NJ, CA and IL residents add applicable sales tax. Special shipping and handling: Mexican residents add \$5 for single issue order and \$20 for one-year subscription. Canadian residents add \$5 plus \$1.75 GST for single issue order and \$20 plus \$4.90 GST for one-year subscription. Foreign residents add \$12.50 for single issue order and \$50 for one-year subscription.

Circle 283 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 re-launches. 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

MACINTOSH SECURITY PRODUCTS

COMPLETE LINE OF PROVEN AND EASY TO INSTALL SECURITY PRODUCTS FOR MACINTOSH COMPUTERS.

PREVENT COMPUTER THEFT!



MacKabli™ Security System

This system allows you to secure all your computer components: CPU, monitor, keyboard, printer. *Internal component security:* Kabli 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.

World's First Dual Capacity –
256MB/128MB Rewritable
3.5" Magneto-Optical Drive
Introductory Offer – only **\$1,748**



VISTA V256

- ♦ **Full compatibility** – Vista V256 reads & writes to ISO Standard 128 MB format cartridges, and a true, non-compressed 256MB to GZ format cartridges
- ♦ **Reliable** – features the acclaimed M.O.S.T. mechanism as used in the award-winning Vista V128 3.5" MO drive
- ♦ **Fast** – transfer rate up to 1.2 MB per second
- ♦ **Economical** – additional 256 MB cartridges only \$89
- ♦ **Versatile** – Mac and IBM compatibility

Order Direct **800.944.6232**

OCEAN



O·C·E·A·N Microsystems, Inc.
246 Hacienda Avenue
Campbell CA 95008 USA

Circle 62 on reader service card

NEW! **PORTABLE** DATA STORAGE

Battery, PS, Charger, & Parallel port inside.
Mac or IBM No cards needed!

WORLD'S SMALLEST New Low Prices.

 60-120MB HD Use alone or with base below as a removable.	 340MB-10Gig HD	 128/256MB 3.5" Cart. Read/write Optical. State of art.
 60-120MB HD w/battery	 2-8 Gig DAT compression, 600MB Tape, or 160MB Tape	 44MB or 88MB Syquest Cart. Drive
 Optical 20MB cart. 3 hr. Battery optional	 Sony CD-ROM NEW High Performance	 Single 2Gig. or Dual Bernoulli, Syquest, CD, r/w Optical or any combination.
 52-240MB HD, 155 Tape, Battery optional.	 90MB Bernoulli Cart. Drive 1/3 size of regular.	 1000MB very fast Maxtor r/w Optical Cartridge Drive Solid State 64-384MB available in same size as above.

Liberty Systems

(408) 983-1127
Fax (408) 243-2885

You're ready to work anywhere there's a computer. Send large documents and graphics between locations. Create a multimedia show and take it on the road. There's no end to the uses you will find for these small wonders. *Microscopic! MACWORLD

Circle 45 on reader service card

Quantum Leap CD SOFTWARE PRESENTS

AESOPOLIS™

Everyone loves Mr. Bits, your host and guide through the Greek temples of **Aesopolis**, a new multi-media CD-ROM. Featuring state-of-the-art graphics and sounds, Aesopolis teaches critical thinking skills. For ages 3-83.

Starring The Ant & The Grasshopper, The Tortoise & The Hare, The Wolf in Sheep's Clothing, many more.

Quantum Leap CD SOFTWARE
Call 1-800-762-2877
305-885-9985 • Fax 305-885-9986

Join me on an interactive journey through the world of Aesop's Fables.

Circle 101 on reader service card



Hard disk expansion just got easier...

...with eDisk, the new hard disk driver enhancement that multiplies the effective capacity of your drive.

Expansion, not File Compression

Instead of making files smaller, eDisk makes your hard disk larger. With eDisk, you simply double the effective capacity of any drive or partition. Turn your 80MB drive into a 160MB giant. Or make a partition as large as your whole hard disk is now!

Driver-Level Enhancement

eDisk works with your existing hard disk driver. That means it avoids the incompatibilities of "invisible" file compressors. eDisk also supports

partitions and takes advantage of your current driver's performance advantages. And once your drive is expanded, it works anywhere, with or without eDisk!

Economical

For a limited time you can get eDisk for only \$49.95.* Call now at 800 8ALYSIS (800 825 9747) to take advantage of this special offer. Your satisfaction is unconditionally guaranteed.

	Disk Dimension	Times Two
Driver-level operation	•	•
High-speed operation	•	
Supports partitions	•	
Does not replace hard disk driver	•	
Can triple drive capacity	•	
Shows actual space used	•	
Doesn't create invisible files	•	

ALYSIS

Software Corporation
1231 31st Avenue
San Francisco, CA 94122
tel: 415 566 2263
fax: 415 566 9692

* Regular price is \$149.95. Offer good until Jan 31, 1993. 30-Day, money-back satisfaction guarantee on all Alysis products.

eDisk is a trademark of Alysis Software Corporation. Times Two is a trademark of Golden Triangle Computers, Inc. Macintosh is a registered trademark of Apple Computer, Inc.

SEE US AT MACWORLD EXPO BOOTH 4090

Never again worry about computer theft or damage

What could be better than full replacement?

By now, you've probably heard or read about SAFEWARE® Insurance for microcomputers. But you may still wonder just what it protects, or whether it's really worth the investment. If you've never lost any part of your computer system or software, you probably don't yet realize the limitations of most standard insurance coverages. Or the agonies you could face in trying to recover even the simplest piece of peripheral equipment.

What do you mean it's not covered?!

Operating your computer system without SAFEWARE protection is fine as long as you don't have to worry about an accident or loss. But what if you came to your office one morning to find you'd been robbed? Or your home had been ransacked? Or that a pipe had burst and caused water damage? Or that your system, too, had fallen victim to a leading destroyer of micro-systems—a power surge? All events beyond your control. If something like this should happen to you, you're likely to find out the hard way just how limited your standard insurance policy's protection really is. And no matter how little or how much you have invested in your computer system, discovering that it's not covered can be an expensive lesson.

Now you can be sure

SAFEWARE was developed by an insurance professional who was shocked to learn that his very own personal computer was at risk. Can you imagine? What he discovered was that his homeowners insurance policy excluded coverage as soon as he began operating his first business program. Even his simplest spreadsheet voided coverage. Because most homeowners policies won't cover any equipment used for business, no matter how infrequently. Out of this need was born SAFEWARE. A simple, easy-to-understand coverage you can count on. Full replacement coverage of hardware, media and purchased software, after a low \$50 deductible.

With SAFEWARE there's no need for you to schedule equipment or software as you do with the "rider" type of policies. So your coverage can grow with your system, providing protection for its full value rather than for each individual item. This will be especially impor-

tant to you if you're ever planning to buy additional equipment or software. Even just one peripheral.

What the editors reported

Publication editors have discovered the news about SAFEWARE and have reported to their readers.

Computer Decisions: ... "Your personal computer might not be safe at home. If it is not insured, then you're running the risk of losing the thousands of dollars you've invested..."

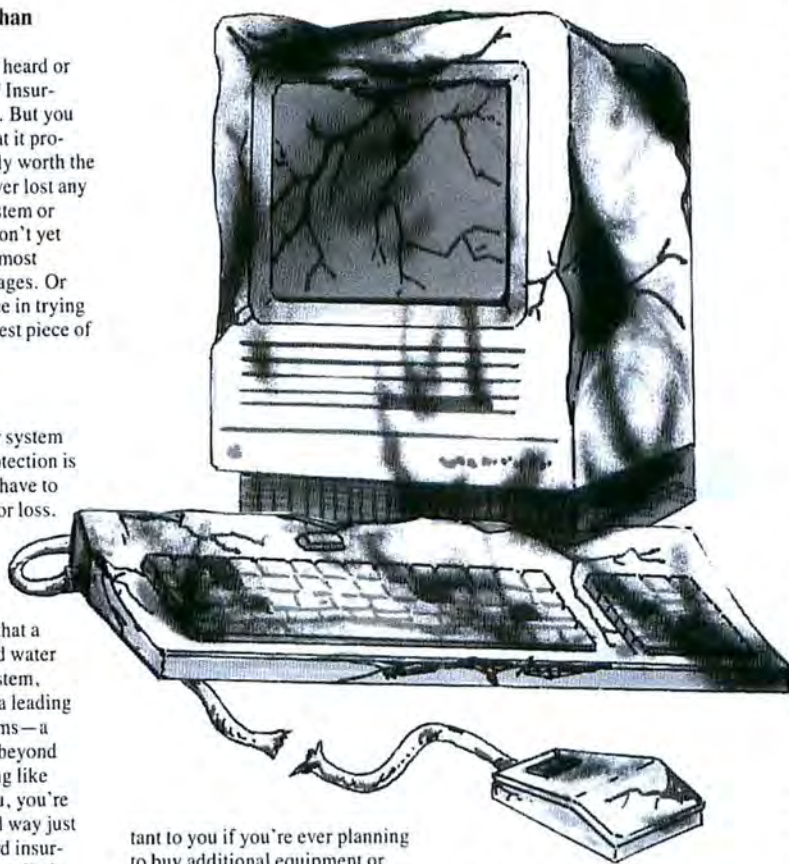
Personal Computing: ... "Replacing hardware may be more of a problem than you thought it would be... That's why (a computer consultant) suggests that you get the computer insured."

Wall Street Journal: ...

"[SAFEWARE] introduces coverage that insures home computers regardless of use. The usual premium: about \$75 a year."

No risk offer

SAFEWARE is a comprehensive plan of insurance, which means that it covers *all* hardware, *all* purchased software, and *all* media. Your complete system is protected against theft, fire, accidental damage. SAFEWARE even covers damage caused by power surges... the leading destroyer of microcomputers.



Easy to order

Choose from three simple ways to pay for your complete SAFEWARE protection: Call the toll-free phone number listed and we'll charge your premium to your VISA or MasterCard. Or, you can mail us the coupon below along with your check. Or, send us the coupon and charge to your credit card.

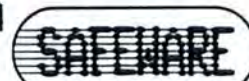
Total Hardware, Media & Software System Value	Annual Premium
Up to \$ 2,000	\$ 49
\$ 2,001-\$ 5,000	\$ 69
\$ 5,001-\$ 8,000	\$ 89
\$ 8,001-\$11,000	\$109
\$11,001-\$14,000	\$129

Call toll-free for rates on higher coverages

It is an underwriting requirement that you insure your system for full replacement cost.

800-848-3469

Phones open 8 a.m. to 10 p.m. Eastern Time Monday through Friday
9 a.m. to 5 p.m. Saturday



SAFEWARE, The Insurance Agency Inc.
2929 N. High St.
P.O. Box 02211
Columbus, OH 43202

With SAFEWARE you get...

- Full replacement coverage.
- Freedom from worries of fire, theft or accident.
- Ultimate in power surge protection.
- Costs as low as \$49 a year.

Yes, my computer needs immediate protection. Please issue my SAFEWARE Insurance Policy.

Name _____

Street _____

City _____

State _____ Zip _____

Phone _____

Total System Value \$ _____

☐ Check Enclosed ☐ VISA ☐ MasterCard

Card # _____

Exp. Date _____

Sign here _____

No risk. You may return contract for full refund within 10 days. Coverages and limits are subject to the terms, conditions and exclusions in the policy. Offer differs in Texas and Kansas. Void where prohibited.

Mail to: SAFEWARE:
2929 N. High St.
P.O. Box 02211
Columbus, OH 43202

T-MW

120 Top Quality Fonts... for \$100

Never before have you been offered so much for so little. Casady & Greene offers top quality, *handcrafted* typefaces at an unbeatable price. Choose between either **PostScript® Type 1** or **TrueType®** format, or choose both formats for \$179⁹⁵. All three libraries are available for the Macintosh or IBM PC compatible. Contact your favorite software dealer or call 1-800-359-4920.

"If I could buy only one postscript font package, this would be it."—WordPerfect



Fluent Laser
Fonts Library 2

120 typefaces. A wide variety of text, display, script, and headline fonts.

ABILENE

Alexandria Regular
 Alexandria Italic
 Alexandria Bold
 Alexandria Bold Italic
 Black Knight
 Bodoni Roman
 Bodoni Italic
 Bodoni Bold
 Bodoni Bold Italic
 Bodoni Ultra
 Bodoni Ultra Italic
 Bodoni Ultra Condensed
 Bodoni Ultra Condensed Italic
 Bonnard

Calligraphy
Canaille

COLLEGIATE OUTLINE
COLLEGIATE BLACK
COLLEGIATE BORDER
COLLEGIATE
COLLEGIATE INSIDE
Coventry Script
Cut Outs
DESPERADO
Dorovar Carolus
Dorovar Italic
DRY GULTCH
EQUOC

FATTI PATTI
FATTI PATTI BOLD

Fletcher Gothic
Galileo Roman
Galileo Italic
Galileo Bold
Galileo Bold
Gatsby
Gatsby Italic
Gatsby Bold
Gatsby Bold Italic
Gazelle
Gazelle Regular
Glen Bold
Gregorian
Harlequin Regular
Harlequin Bold
Harlequin Extra Bold
Highland Gothic Light
Highland Gothic
Highland Bold
Jott Casual
Jott Italic
Jott Bold

Jott Bold Italic
Kasse

Kasse Bold
Kasse Ultra
Ketten
La Peruta Regular
La Peruta Bold
La Peruta Ultra
Death
MICHELE
MICHELE BOLD
Micro
Micro *Italic*
Micro Bold
Micro Bold *Italic*
Micro Extended
Micro Extended
Italic
Micro Bold Extended
Micro Extended
Bold Italic
MONTEREY
MONTEREY *Italic*
MONTEREY Medium

MONTEREY Bold
MONTEREY Bold Italic

Moulin Rouge
Nouveau
Paladin
Pendragon
Phoenix Script
Prelude
Prelude Italic
Prelude Bold
Prelude Bold Italic
Regency Script
RIGHT FAX
Fitz Regular
Fitz Italic
Fitz Condensed
Rocko Regular
Rocko Bold
Rocko Ultra
Rocko Ultra Bold
Sans Serif Regular
Sans Serif Italic
Sans Serif Bold

Sans Serif Book Italic
Sans Serif Demi-Bold
Sans Serif Demi-Bold Italic
Sans Serif Bold
Sans Serif Bold Italic
Sans Serif Extra Bold
Sans Serif Extra Bold
Italic

Sans Serif Bold Condensed
Sans Serif Bold Cond Italic
Sans Serif Extra Bold Condensed
Sans Serif Extra Bold Cond Italic

Sedona Script
Slender gold

Vertigo
Vertigo Bold
Vertigo Plus
Vertigo Plus Bold

**Zephyr Script
Check Box**

Chicago

GLASNOST CYRILLIC
LIBRARY 2

17 typefaces-supporting Russian, Bulgarian, Byelorussian, Macedonian, Serbian, Ukrainian and English. Includes Keyboard Drivers, Language Module Support, & Keymapping.
Sug. retail price \$200

[illegible]

Glasnost Light
Glasnost Demibold
Glasnost Extrabold
Odessa Script
MURMANSK
Bodoni Cyrillic

Bodoni Cyrillic Bold
Bodoni Cyrillic Italic
Bodoni Cyrillic
Bold Italic
Svoboda
Svoboda Oblique

Svoboda Bold
Svoboda Bold Oblique
Vremya
Vremya Italic
Vremya Bold
Vremya Bold Italic

EASTERN EUROPEAN
LIBRARY

26 fonts. Supports Albanian, Croatian, Czech, German, Hungarian, Polish, Romanian, Slovenian, Slovak, and English. Set supports IBM code page 1250. Includes keyboard drivers. PC version includes Language Module support for Windows™. **Sug. retail price \$200**

Alexandria
 Alexandria Italic
 Alexandria Bold
 Alexandria Bold Italic
 Calligraphy
 Twenty Script
 Dorovar Carolus
 Dorovar Italic
 Heliodor

Heliodor Oblique
Heliodor Bold
Heliodor Bold Oblique
Jott Casual
Jott Bold
Prelude
Prelude Bold
Regency Script

Sans Serif
Sans Serif *Italic*
Sans Serif Bold
Sans Serif Extrabold

Topaz Roman
Topaz Italic
Topaz Bold
Topaz Bold Italic



**CASADY &
GREENE**

22734 PORTOLA DRIVE •
SALINAS, CA 93908-1119

1-800-359-4920
FAX 408-484-9218

SOFTWARE FOR BUSINESS AND PLEASURE

MISSION:**THUNDERBOLT™**

*Macworld Game Hall of
Fame Award 1992
Best in Role-Playing Division*

Brand new role-playing adventure game! Make your way through underground corridors in search of a deadly anti-matter bomb before it is used against mankind. A true thinker's challenge - 5 years in the making. Its never the same game twice! 7+ megabytes of pure challenge and late-night fun.

**\$59.95**

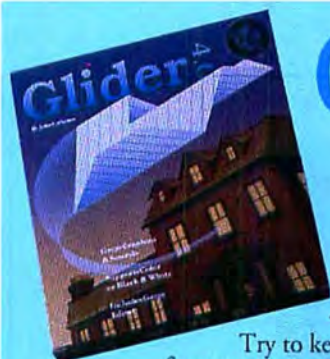
Expect to spend 40-80 hours playing one game.

PARARENA™ 20

Vintage John Calhoun! Calhoun, author of Glider 4.0 (Mac World Hall of Fame Winner), has done it again. Pararena is steeped in Calhoun's tradition of attention to detail, from the unique sounds (the player's armor clinking, the roar of the crowd, stadium vendors hawking peanuts) to the physics of the hoverboards gliding over the stadium dish. Still the greatest of the Calhoun tradition, is ENDLESS FUN!

\$59.95

**NETWORKABLE
CHALLENGING
FUTURISTIC**

NEW**GLIDER
4.0™**

*Macworld Game
Hall of Fame Award*

Try to keep the paper airplane flying from room to room without being blitzed by the wildest set of obstacles ever. Room editor included.

"The bottom line is that this game is a blast"

The Apple Source-RIMUG

MORE GLIDER!

Loved Glider 4.0 and want more? John Calhoun has built another house! All the fun, frenzy and madness that made Glider so much fun have been put into this brand new house. 64 new rooms form a convoluted maze!

Available directly
only from
Casady & Greene.

Requires Glider 4.0 to play.

\$49.95**NEW****\$20.00****FUN
BUNDLE:
THREE
GAME
PACK
OF
SOLID
FUN**

14 Mice (collectively) - Mac User Magazine
One Eddy Award Winner

Two Macworld Game Hall of Fame
Winners

- ☐ Sky Shadow
- ☐ Mission Starlight
- ☐ Crystal Quest
w/Critter Editor

\$99.95

**CASADY
& GREENE**

22734 PORTOLA DRIVE •
SALINAS, CA 93908-1119

1-800-359-4920
FAX 408-484-9218



Which desktop fax/modem is right for you?

When quality and compatibility are important, turn to the Global Village TelePort™ desktop fax/modem series. MacWEEK says, "...the TelePort is at the top of the list of Mac combined fax and data modems today."

The questions is, which TelePort fax/modem is best for you?

Are you a high-volume user?

Then go for the Gold. The TelePort/Gold™ fax/modem sends and receives data and faxes at a blazing 14,400 bps. That's the fastest speed you can get today.

Are you a moderate user?

Choose the Silver. At a fast 9600 bps, the TelePort/Silver™ fax/modem offers fast data and fax transmission and reception at a lower price.

Are you an occasional user?

The Bronze is ideal. The TelePort/Bronze™ fax/modem sends data at 2400 bps. It sends faxes at 9600 bps and receives them at 4800 bps. It even wakes up your Mac II series computer when someone calls.

Superior fax software

Sending a fax is as easy as printing. When you buy any Global Village fax/modem you get GlobalFax™ software. It is exceptionally powerful, yet easy to use.

Choose the TelePort fax/modem that's right for you. They're available from leading computer suppliers everywhere. For more information or for a reseller near you, please call 1-800-736-4821.



GLOBAL VILLAGE
COMMUNICATION

© 1993 Global Village Communication Inc. Global Village Communication, TelePort, Gold, Silver, Bronze, and GlobalFax are trademarks of Global Village Communication Inc. All other brand names are trademarks or registered trademarks of their respective holders.

Circle 248 on reader service card

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

Circle 168 on reader service card



Invest in something with growth potential.

America's economic future depends on a motivated, educated work force. At a Boys & Girls Club, kids learn the life skills and job skills they need to grow into productive members of our American economy, as well as our society.

Please make a contribution to the Boys and Girls Clubs. You'll be investing in the growth of America.



BOYS & GIRLS CLUB

SUPPORT THE CLUB THAT BEATS THE STREETS



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 spot-lights, apply a textured glass distortion, marbleize and more. Type 1 and TrueType™ fonts can be imported.

Fractal Design

Painter 2.0®



SO COOL

SO HOT



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.



**FRACTAL
DESIGN
CORPORATION**

© 1992 Fractal Design Corporation. All rights reserved. Fractal Design Painter is a registered trademark and Painter 2.0 is a trademark of Fractal Design Corporation. All other trademarks are the property of their respective holders. Fractal Design Corporation, P.O. Box 22800, Austin, CA 78720 • 408 688-8800

SEE US AT MACWORLD EXPO BOOTH #3478

Circle 190 on reader service card

Join the CD-ROM Revolution!

CD-ROM Drives All drives come complete and ready to run on Macintosh computers. Your choice of cable. Specify #981 MAC to SCSI or #982 SCSI to SCSI. \$50 off the EDUCORP Shareware CD with purchase of any drive.

CD-ROM Drives	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-37	450ms	64K	Dip Switch	Dial	Music Box DA	1	Not Included	Internal Termination	No	120 Volts	150K/Seconds	10,000	2 Year	\$449	1969
NEC CDR-74	280ms	64K	Dip Switch	Dial	Music Box DA	2	Included	Not Terminated	Yes	220 Volts	300K/Seconds	25,000	2 Year	\$639	1970
CD Tech CDR-T3301*	325ms	64K	Push Button	Dial	CD Remote DA	2	Not Included	Not Terminated	Yes	250 Volts	150K/Seconds	50,000	2 Year	\$579	1981
Toshiba XM-3301**	325ms	64K	Dial	Dial	Play CD Stack	2	Included	Not Terminated	Yes	230 Volts	150K/Seconds	25,000	1 Year	\$599	1937
Textel DM5024	265ms	64K	Dial	Dial	Music Box DA	2	Not Included	Not Terminated	Yes	240 Volts	300K/Seconds	25,000	1 Year	\$579	1815

2 FREE CDs: America Alive and Multimedia HANDisc * 1 FREE CD: AGFA Type (Includes 1 font: Garth Graphic)

CD-ROM Drive Bundles

Get the new, **FAST** Textel CD-ROM Drive with 8 CDs, speakers and headphones \$699

Includes drive, Labtec speakers with A/C adapter, stereo headphones, cable, driver software, power supply and 8 titles: Color It! • Desert Storm • Multimedia Encyclopedia • Orchestra • Publish It! • Sherlock Holmes Consulting Detective I • World Atlas • EDUCORP CD Sampler. #D1815

Award winning CD Tech T3301 Porta-Drive, 11 CDs, speakers, headphones \$699!

Includes drive, Labtec speakers with A/C adapter, stereo headphones, cable, driver software, power supply and World Atlas • Multimedia Encyclopedia • Publish It! • Desert Storm • Cosmic Osmo • Beethoven's String Quartet #14 • Color It! • EDUCORP CD Sampler • Boston Expo CD • PLUS coupons for 2 FREE multimedia titles: Multimedia HANDisc & America Alive. Just \$699 (retail value \$2399) #D1981

NEC Drive Bundles

Bundles include an NEC CD-ROM Drive, external amplified stereo speakers, batteries, driver software, cables and up to 11 CDs for as low as \$399!

NEC Multimedia Gallery \$799

Includes the NEC CDR-74 CD-ROM drive with 7 CD-ROM titles: • Grolier Multimedia Encyclopedia • Just Grandma and Me • Great Wonders of the World • Sherlock Holmes Consult. Detective I • U.S. Atlas • Color It! • EDUCORP CD Sampler • Headphones. You pay \$799! (value of \$1860) #M1970

NEC CD Express \$399

Includes the NEC CDR-25 CD-ROM drive with 11 CD-ROM titles: • Publish It! • World Atlas • Lucasfilm Favorites • Total Baseball • Interactive Storytime • The Family Doctor • Great Cities of the World v.2 • Aesop's Fables • Manhole • Best of the Bureau • EDUCORP CD Sampler. You pay only \$399! #C1964

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. Here's 29 titles on a variety of subjects for you to choose from.

CD-ROM Title Retail Value

B1. World Atlas.....	\$79.95
B2. Multimedia Encyclopedia.....	\$395.00
B3. Time Table of History.....	\$129.00
B4. Desert Storm.....	\$39.99
B5. Cosmic Osmo.....	\$9.95
B6. Beethoven's Quartet #14.....	\$66.00
B7. Multimedia World Fact Book.....	\$99.00
B8. US History.....	\$395.00
B9. The Orient.....	\$49.95
B10. Sherlock Holmes Consult. Det. I.....	\$69.95
B11. Environmental Data Disc.....	\$189.95
B12. Economic Data Disc.....	\$189.95
B13. US Atlas.....	\$79.95
B14. Lucas Game Pack..... (bundle only)	\$299.95
B15. Color It!.....	\$299.95

Choose from 29 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)

B16. Publish It!.....	\$199.95
B17. SportsROM.....	\$69.95
B18. FM Waves Artware.....	\$149.00
B19. DTPro.....	\$149.00
B20. Manhole.....	\$34.95
B21. Scenic & Nature III.....	\$69.95
B22. Scenic and Architecture.....	\$69.95
B23. 600 Days to Cocos Island.....	\$69.95
B24. Boston Expo CD.....	\$15.00
B25. Funny: A movie in QuickTime.....	\$39.99
B26. The Orchestra.....	\$79.98
B27. Sports Illustrated Almanac.....	\$59.95
B28. Word Tales.....	\$49.99
B29. The View from Earth.....	\$79.95

More CD-ROM drives and optional bundles available, call.

Over 275 CD-ROM titles in stock

We'll meet or beat any advertised price on CD-ROM products

Stock Photos

Each CD has 100 (most have 200) digital stock photos saved in 24-bit color.

1735 People in Business*	\$129.95
1736 People at Leisure*	\$129.95
1686 Kids*	\$129.95

1863 African Wildlife.....	\$129.95
1813 World Travel v.1.....	\$129.95
1814 World Travel v.2.....	\$129.95
1696 Nature's Way.....	\$79.95

1334 Prof. Photo Collection*	\$69.95
1581 Int'l Graphics Library.....	\$199.00
1698 Donatelli Lingerie v.3*	\$99.00
1822 Ocean Magic.....	\$89.95
1625 Aquatic Art*	\$99.95
1585 Ocean Imagery*	\$69.95
1865 Antique Toys*	\$49.95
1595 Swimsuit v.1*	\$199.00
1788 Swimsuit v.2.....	\$199.00

Published by Gazelle Technologies, Inc.

Movie Clips

1677 ClipTime v.1.....\$169.95
Add a new dimension to your applications with 250 movie clips.

1919 ClipTime v.2.....\$199.00



American Media. 350 movie clips, photos, sounds, slingers.
Published by Alpha Technologies, Inc.

1701 Digital VideoLibrary.....\$129.95

Get their attention with over 180 diverse quality video clips.
Published by Gazelle Technologies, Inc.

1659 WraptureReels One.....\$179.95



Broadcast quality digital video w/animated textures and looping video clips. 550 MB of material.
Published by Form & Function

Editable EPS

Shatter previous EPS, PICT and TIFF design restrictions with professional art lettering, images, cartoons, and backgrounds from these 4 CDs. All the graphics are editable, stretchable, rotatable, and infinitely resizable. Most are available in EPS, Illustrator and Freehand formats.

1857 BackIMPACT! Pro ..\$79.95

150 color & b/w EPS images, backgrounds.

1856 SlickART Plus ..\$99.95

Art lettering, images and backgrounds in Marble, Chrome and Neon.

Published by Art Sector One

1819 Funny Business ..\$129.95

Boost readership and increase sales with world class business humor created by internationally acclaimed cartoonists.

1680 GraphTec Graphic Designs.....\$49.95

450+ EPS images on a variety of subjects in color & b/w.

Published by Gazelle Technologies, Inc.

1653 Wraptures One \$95

Imagine over 120 seamless tileable textures at your fingertips! Map to 3D objects, or tile to create multimedia and presentation backgrounds. From shrubbery to stars, sunrises to a school of piranha. Saved in PICT and MacRender-Man optimized. Browser utility.

1990 Wraptures Two\$95

NEW! 130+ more 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. Children can select an animation, QuickTime video, or narrated sentence based on the chosen letter.

Published by REMedia

1924 ABC Songbook.....\$29.95

Sing along with Ramblin' Rico as you learn your ABC's. Entertaining from A to Z as you hear a story related to each letter of the alphabet. Rockin' tunes and funny stories.

Published by Gazelle Technologies, Inc.

Marble background from #1913 PhotoDisc v.3 Full Page Backgrounds \$299.95

Circle 157 on reader service card



CD-ROM Showcase

1405 7th Wonder.....\$59.95



Increase your productivity with this unbelievable collection of essential tools and utilities. Over 100 megs of the most up-to-date System 7-specific public domain/Shareware available today!

2067 A Thousand Fonts.....\$39.95



A huge collection of fonts. Everything from Klingon to Hebrew, and from swirly letters to traditional typefaces. Fonts formats include TrueType, Type 1, Type 3, and Screen fonts.

Published by Gazelle Technologies, Inc.

2047 Putt-Putt Joins the Parade.....\$49.95

Wax your car and buff your bumpers — it's time for the Annual CarTown Pet Parade! Help Putt-Putt tackle the local car wash, rescue a lost puppy, put out a fire and more. All this before he takes his place in the parade! Over 30 different locations for your child to explore, along with captivating activities and logic puzzles. 100s of secret Click-Points explode with sound/animation. Designed to challenge 3-7 year old minds. Includes a handbook filled with activities.



Published by Humongous Entertainment

2084 The Iron Helix.....\$69.95



The CD-ROM you have been waiting for! A 3D virtual reality style adventure game. Marked by seamless motion through a photo-realistic 3D environment, The Iron Helix is more like a movie than a game. Unlike any other CD-ROM, this fast paced 3D action experience is this years' hottest science fiction thriller!

Published by Drew Pictures

1786 Boris Vallejo.....\$199.00

200 incredible fantasy art pictures in 24-bit color.

1787 LaFemme Venus.....\$99.95

Featuring samples from The International Salon of Photographic Art 'Venus Studies And Portraits'.

1327 ExoticaROM 3.0.....\$199.00

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.

We'll meet or beat any advertised price on CD-ROM products!

2032 Total Distortion.....\$69.95



NEW from the co-developer of Spaceship Warlock-A totally insane multimedia experience! You are an adventurous music video producer. Travel to the planes of existence to the Plane of Distortion in search of fresh material for your music videos. You'll find a detailed 3D world of sound and animation. Meet a crew of rock heads, visit strange locations, and rock out to wild 3D animation, psychedelic visions, and mad metal video!

Published by Pop Rocket

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

Give your presentation a facelift! 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. Perfect with all presentation packages.

Published by REMedia

1762 SpaceTime & Art.....\$149.95

An exploration of discovery into outer space. QuickTime movies and animations illustrate some recent theories of creation in the universe. You'll also find original space images in 24-bit color, a database of astronomy organizations, illustrated reference stacks and graphic tutorials.



2049 Font Pro v.1: The Essentials.....\$59.95

125 fonts with complete character sets including international characters. All the fonts are in TrueType and Type One PostScript formats and are fully usable. Contains all the popular styles. Perfect for the graphic designer, or anyone who loves fonts!

Published by Wayzata Technology, Inc.

FREE Catalog!

If you don't see the CD-ROM title you want in this ad, chances are we have it! EDUCORP stocks the largest selection. Call for your free catalog. (Foreign customers send \$4 postage & handling).

2068 The Journeyman Project.....\$79.95
You walk hesitantly down the poorly lit corridor. "This could be the end of me," you think, "it could all end right here, and humanity would suffer for a 1,000 lifetimes because of my failure." You are faced with a weighty decision: risk your life in defense of that man has achieved in the past several 100 years, or turn safely back to a future marred in ways that only you will ever know. You turn, and suddenly you are caught frozen in the steely gaze of a 7' tall gleaming alloy beast. And you are standing in its way! An interactive future awaits you.



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! You'll also get an easy-to-use HyperCard Browser. \$50 off with CD-ROM drive purchase from EDUCORP.

Published by EDUCORP



abcdefghijklmnopqrstuvwxyz
ABCDEFGHIJKLMNOPQRSTUVWXYZ
0123456789
!@#\$%^&*~



1909 So You Want to be a Rock and Roll Star v.1.....\$79.95



Perform in 6 Rock and Roll classics - (Sitting on) The Dock of the Bay, Stand by Me, Twist and Shout, Crazy, Runaway, and In the Midnight Hour. Each song is accompanied by its own full-length animation.

You can delete the singer, guitar, or keyboard player from both the animation and the soundtrack, allowing you to sing or play along yourself! Dynamic music sheets let you click on each measure, so you can hear how each instrument should sound. Also included are in-depth analysis lessons, QuickTime Rockumentaries, and on-screen teachers.

Published by Interactive Records

2069 QuickLaffs v.1.....\$79.95



See the classics on your computer! The QuickLaffs Series of CD-ROM features QuickTime movies of classic films starring Charlie Chaplin, Buster Keaton, W.C. Fields and many others. On this volume you'll see The Tramp, and Twenty Minutes of Love with Charlie Chaplin, and Love, Speed and Thrills w/ the Keystone Cops. Volume 2 coming soon.

2071 QuickToons v.1.....\$79.95

This series features QuickTime movies of classic cartoons like Bugs Bunny, Superman, Betty Boop, and others.

Published by Gazelle Technologies, Inc.



Prices subject to change w/out notice
Dealer Inquiries Welcome



Order toll-free
in U.S. &
Canada



W10

EDUCORP 1-800-843-9497

Your CD-ROM Specialist

EDUCORP • 7434 Trade Street • San Diego, CA 92121 • Info 619-536-9999 • Fax 619-536-2111

Best-Sellers

FEBRUARY 1993

Months on chart
▼ Last month
▼ This month

Business Software

15	3	1	Microsoft Office <i>Microsoft Corporation</i>
84	1	2	Microsoft Excel <i>Microsoft Corporation</i>
93	2	3	Microsoft Word <i>Microsoft Corporation</i>
45	4	4	FileMaker Pro <i>Claris Corporation</i>
7	11	5	ClarisWorks <i>Claris Corporation</i>
14	5	6	MacDraw Pro <i>Claris Corporation</i>
31	9	7	Quicken <i>Intuit</i>
70	10	8	Microsoft Works <i>Microsoft Corporation</i>
45	7	9	WordPerfect for the Macintosh <i>WordPerfect Corporation</i>
68	6	10	MacDraw II <i>Claris Corporation</i>
8	14	11	1-2-3 for the Macintosh <i>Lotus Development</i>
80	13	12	Aldus PageMaker <i>Aldus Corporation</i>
33	—	13	QuarkXPress <i>Quark</i>
23	12	14	MacProject <i>Claris Corporation</i>
69	8	15	MacWrite II <i>Claris Corporation</i>

Education Software

59	4	1	Reader Rabbit <i>The Learning Company</i>
4	—	2	The Playroom <i>Broderbund Software</i>
69	—	3	Math Blaster <i>Davidson & Associates</i>
1	—	4	The Oregon Trail <i>MECC</i>
29	—	5	Where in the USA Is Carmen Sandiego? <i>Broderbund Software</i>

Months on chart
▼ Last month
▼ This month

Entertainment Software

32	—	1	Tetris <i>Spectrum HoloByte</i>
58	1	2	Microsoft Flight Simulator <i>Microsoft Corporation</i>
19	—	3	Beyond Dark Castle <i>Aldus Corporation</i>
4	—	4	Kling's Quest IV <i>Sierra On-Line</i>
4	5	5	Space Quest III <i>Sierra On-Line</i>

Network/Data Communications

39	1	1	PhoneNet <i>Farallon Computing</i>
62	3	2	AppleShare <i>Apple Computer</i>
8	2	3	AppleTalk Remote Access <i>Apple Computer</i>
17	4	4	Netware for Macintosh <i>Novell</i>
24	5	5	MacTerminal <i>Apple Computer</i>

Add-In Boards

22	1	1	Macintosh IIsx NuBus Adapter Card <i>Apple Computer</i>
26	2	2	Macintosh Display Card 8•24 <i>Apple Computer</i>
23	4	3	Pivot <i>Radius</i>
6	3	4	Macintosh II FDHD Upgrade <i>Apple Computer</i>
7	5	5	Spectrum/8 Series <i>SuperMac</i>

Months on chart
▼ Last month
▼ This month

Utility Software

21	2	1	After Dark <i>Berkeley Systems</i>
27	4	2	Norton Utilities for Macintosh <i>Symantec Corporation</i>
32	1	3	SAM <i>Symantec Corporation</i>
11	3	4	More After Dark <i>Berkeley Systems</i>
20	—	5	SUM II <i>Symantec Corporation</i>

The AmCoEx Index of Used Mac Prices

Machine/RAM/ Hard Drive	Average Sale Price	Monthly Change
Mac SE/2MB/20MB	\$675	-\$100
Mac Portable/1MB/40MB	\$600	\$0
PowerBook 100/4MB/40MB	\$775	+\$25
PowerBook 140/4MB/40MB	\$1350	-\$50
Mac Classic/2MB/40MB	\$600	-\$100
Mac SE/30/2MB/40MB	\$1500	-\$200
Mac LC/2MB/40MB	\$800	-\$50
Mac II/4MB/40MB	\$1400	+\$50
Mac IIsx/3MB/40MB	\$1275	-\$200
Mac IIcx/4MB/80MB	\$1775	-\$25
Mac IIci/4MB/80MB	\$2100	-\$200
Mac IIfx/4MB/80MB	\$2900	-\$100
Apple 12-inch B&W display/board	\$150	-\$50
Apple 13-inch RGB display/board	\$475	-\$50
LaserWriter Plus	\$850	-\$100
LaserWriter IINT	\$1450	-\$50

Index provided by the American Computer Exchange of Atlanta, Georgia (800/786-0717). It reflects sales during week of November 20. 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 October 1992.

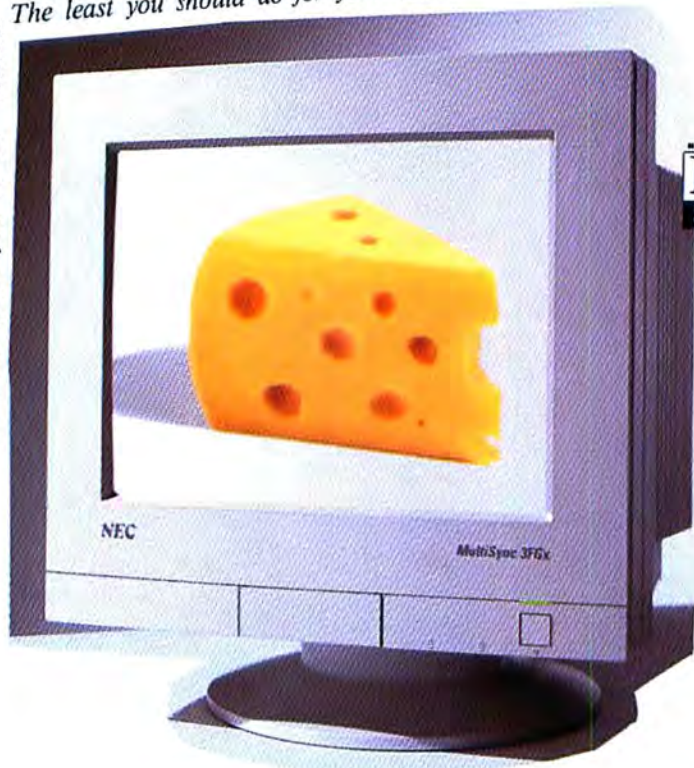


Announcing a better mousetrap.

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 640x480 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™ 400, Performa 600, 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, 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.

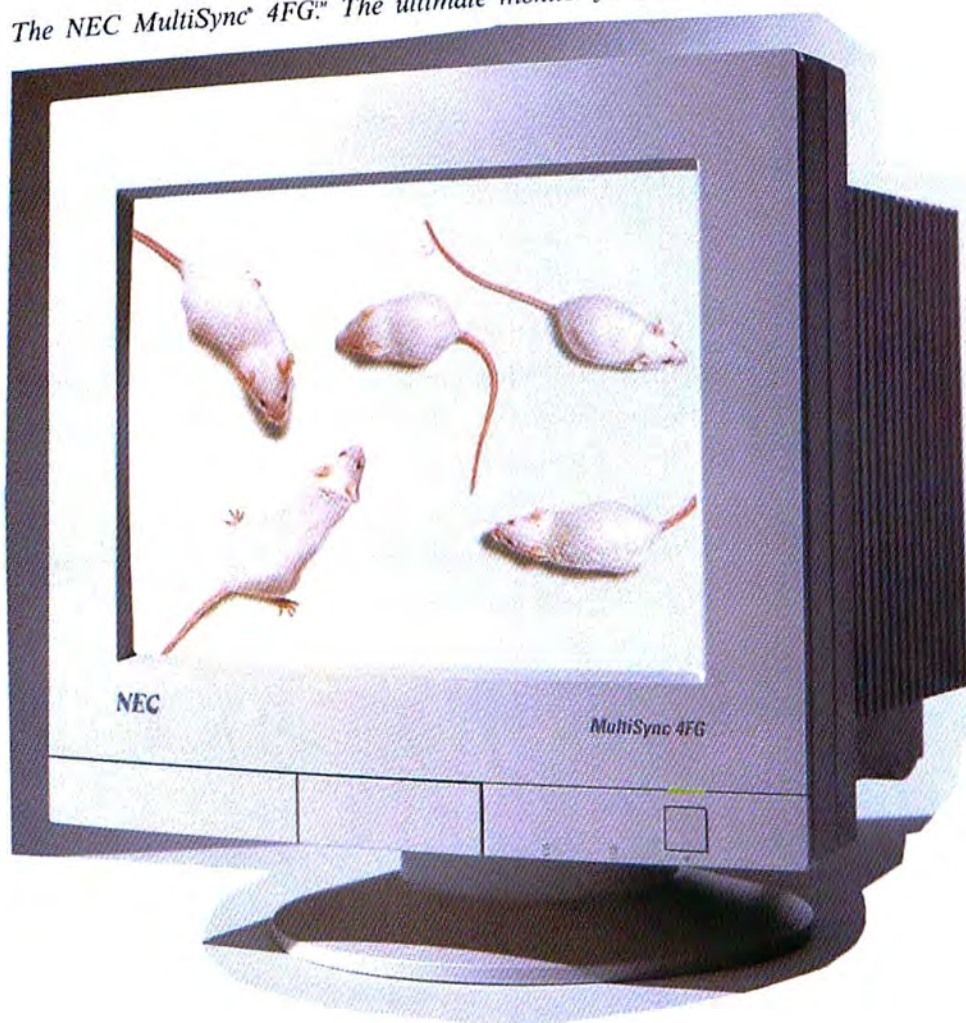
*15" CRT yields 13.8" active display area. All quotes reprinted from MacWorld magazine, August 1992. ©1992, Z/N Communications Company. MacUser and Service logos are registered trademarks of Z/N Communications Company. MultiSync is a registered trademark and AccuColor, FastFacts, FG, FullScan, Reduced Magnetic Field and MiniDock are trademarks of NEC Technologies, Inc. The swivel icon 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**

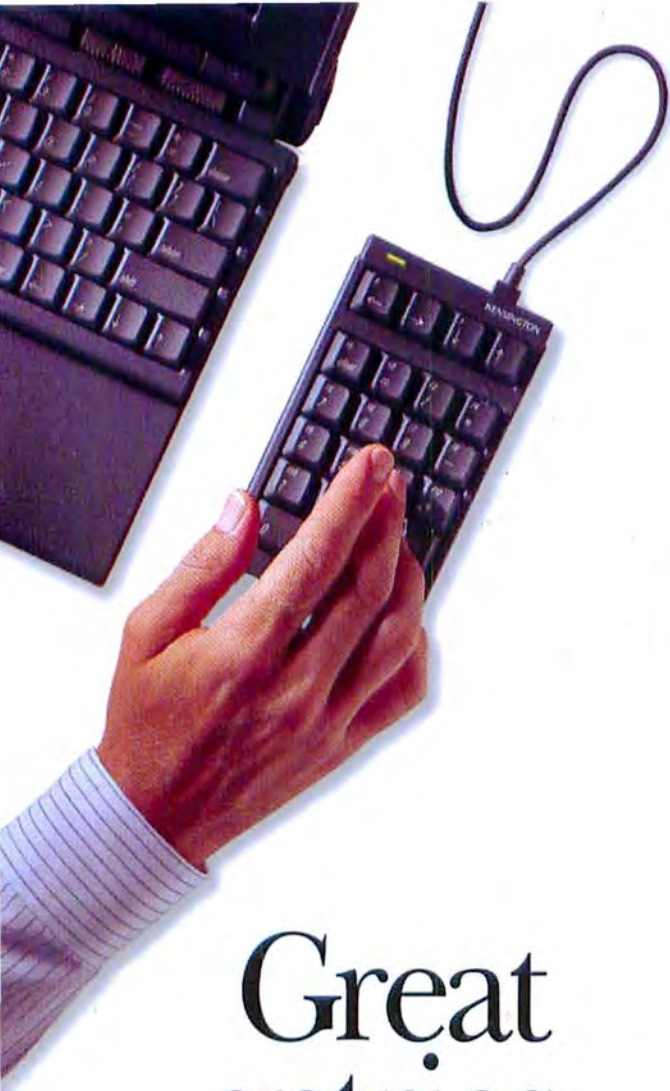
Circle 16 on reader service card

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*



Great entries.

Kensington introduces two new products for PowerBook® computers.

Kensington NoteBook KeyPad

Want to add full keyboard performance to your PowerBook? Want to enter numbers fast and accurately?

The Kensington NoteBook KeyPad is the answer.

Features include a calculator-style layout, mathematical function keys and an oversized Enter key. All keys are full-size. We even added the "5 Dot Home Key" for touch users.

What's more, 15 additional Function keys help reduce keystrokes and enable VAX/mainframe communication.

The Kensington NoteBook KeyPad has a small footprint, weighs just under 9 oz., plugs into any ADB port and is System 7 compatible.

Kensington NoteBook Traveler™

Now there's a traveling case designed just for PowerBook computers. It's rugged,



Great exits.

yet lightweight. Stylish, yet functional. And it comes in three convenient sizes—the full featured *Executive* version, the ever popular *Deluxe* and the streamlined *Compact*.

All versions include an impact-resistant computer compartment with high density padding, numerous zippered compartments and handy utility pouches.

Our new Executive version features three separate compartments for maximum storage, handy elastic straps for securing accessories, an accordion-style compartment for files and an outside pocket for quick access.

Every case has a durable, water-resistant fabric shell, a removable shoulder strap, reinforced webbing and self-repairing zippers. What's more, our unique easy-carry handle combines the strength of rivet-reinforced nylon with the comfort of foam rubber.

For more information, call 800-535-4242. Outside the US, 415-572-2700. For information by fax, call 800-535-4242 and enter 82.

NEW EXECUTIVE CASE



See us at MacWorld Expo, Booth #1041.

KENSINGTON®

NoteBook Traveler is a trademark and Kensington is a registered trademark of Kensington Microwave Limited. Apple, Macintosh and PowerBook are registered trademarks of Apple Computer Inc. © 1992 Kensington Microwave Limited. 12/92