70 NEW PRODUCTS: PAGE 233 44 PRODUCT REVIEWS: PAGE 184

MACWORLD

THE MACINTOSH® MAGAZINE

June 1992 $3.95 Canada $4.95

Accelerators

PRESERVING YOUR INVESTMENT

MW LAB 28 Products Tested

Integrated Software

MICROSOFT vs. 5 OTHERS
WHICH ONE IS BEST?

Input Alternatives

28 PRODUCTS TO EASE
YOUR WORK

Imaging Software

10 RENDERING PROGRAMS
COMPARED

WE LISTENED TO THOUSANDS OF
MAC® USERS, LIKE GUNNAR, TODD AND CHARLYN.
YOU CAN TAKE OUR WORD FOR IT.

*OFFER GOOD FOR CURRENT LICENSEES OF MICROSOFT WORD FOR APPLE® MACINTOSH® VERSION 4.0 OR EARLIER. USERS WILL NEED TO PROVIDE A MAC WORD DISK OR MANUAL COVER AS PROOF OF OWNERSHIP. PLEASE ALLOW 2-4 WEEKS FOR DELIVERY UPON RECEIPT OF ORDER BY MICROSOFT. OFFER EXPIRES 12/31/92. LIMIT ONE PER CUSTOMER. RESELLER PRICES MAY VARY. OFFER GOOD

Introducing new Microsoft Word. Of the people. By the people. And for the people.

NEW WORD 5.0

When it came to designing new Microsoft® Word 5.0, we listened to you. After all, you know what you want.

And you told us. In your letters. Your faxes. Your post cards. To sum things up: you want a Word that will make doing your everyday work even easier.

So we came up with the Ribbon—think of it as easy access to powerful features. With it you can create columns, access fonts, change the format and use Word's new drawing tool. All with a single mouse click. You'll even be able to move text with a drag and drop. Then there's our kinder, gentler print merge. It reduces a complicated process down to a few simple steps.

EASY ACCESS TO FEATURES YOU USE EVERY DAY.

We are also introducing word processing's first built-in grammar checker. A find file feature that can locate documents based on dates, keywords or the author. An auto-save reminder. And lots of other useful additions, like full System 7.0 support and Publish and Subscribe. Mac Word users can upgrade for $129.* So see your nearest reseller, or call (800) 645-WORD, Department X04. Call soon. We can't wait to hear from you.

Microsoft

ONLY IN THE 50 UNITED STATES. ©1991 MICROSOFT CORPORATION. ALL RIGHTS RESERVED. PRINTED IN THE U.S.A. FOR INFORMATION ONLY. IN CANADA, CALL (800) 563-9048; OUTSIDE THE U.S. AND CANADA, CALL (206) 936-8661. MICROSOFT IS A REGISTERED TRADEMARK OF MICROSOFT CORPORATION. APPLE, MACINTOSH AND MAC ARE REGISTERED TRADEMARKS OF APPLE COMPUTER, INC.

Contents

MACWORLD THE MACINTOSH® MAGAZINE JUNE 1992

FEATURES

MW LAB

The Need for Speed 146

BY MATTHEW LEEDS How do you get a faster Mac without buying a new one? Get an accelerator board. We tested 28 accelerators for a wide range of Macs—from the Classic to the Quadra 700—to help you decide whether to replace or accelerate.

Input Alternatives 154

BY FRANKLIN N. TESSLER Are you looking for an alternative to the mouse that came with your Mac? We tested a variety of input devices to find the best in innovation and ergonomics.

All-in-One Programs 160

BY TOM NEGRINO Integrated software packs a lot of functions in a low-cost package. We compared 6 programs to see how well each handles word processing, page layout, telecommunications, graphics, database management, and spreadsheets.

MW LAB

Hubs: Connecting to Ethernet 166

BY LON POOLE Thinking of upgrading your network from LocalTalk to Ethernet? Macworld Lab tested 11 10BaseT hubs to find the winners in speed and reliability.

Mathematics Analysis 172

BY CHARLES SEITER Five Mac programs offer scientists and engineers powerful computational tools they need for solving mathematical problems in research and design.

Rendering: Making Realistic 3-D Graphics ... 176

BY DAVID POOLE Choosing the right software—and hardware—to make realistic-looking 3-D images can be almost as difficult as creating the images themselves. We review 10 packages that offer widely varying photo-realistic rendering capabilities.

On the Cover

YOUR MAC JUST ISN'T AS FAST AS IT USED TO BE. BUT BEFORE YOU OPT FOR A TRADE-IN, CHECK OUT OUR COMPREHENSIVE REVIEW OF THE LATEST 030 AND 040 ACCELERATORS, PAGE 146. (ILLUSTRATION BY RON CHAN.)

Page 129

Page 184

Page 160

REVIEWS

184 **Macintosh 16" Color Display**
Color monitor

185 **Showplace 1.1**
Rendering program

188 **Gofer 2.0, On Location 2.0.1**
File-finding utilities

188 **MouseMan, TrackMan, A³ Mouse**
Input devices

190 **Muse 1.0**
Data-analysis software

192 **Number Munchers 1.1, Super Munchers 1.0, Word Munchers 1.0**
Educational games

194 **Wordscan 1.0, Wordscan Plus 1.0**
OCR programs

197 **Dycam Model 1, Canon RC250**
Still-video cameras

199 **ArchiCAD 4.02**
Architectural CAD software

201 **Bose RoomMate, MacSpeaker**
Shielded stereo speakers

202 **Nobunaga's Ambition**
Historical strategy game

202 **Aldus FreeHand 3.1**
Draw program

204 **Prograph 2.5**
Object-oriented development environment

204 **StudyWare for the SAT 3.7N**
SAT training program

206 **SICOS Cordless Rechargeable Mouse, SICOS Cordless Trackball**
Cordless input devices

206 **PageBrush Professional**
Gray-scale hand-held scanner

207 **Minitab 8.2**
Statistical software

207 **Pro-Cite 2.0**
Bibliographic database manager

208 **FolderBolt 1.02**
Folder-protection utility

208 **Patton Strikes Back: The Battle of the Bulge**
Historical simulation game

210 **Wordtris 1.0**
Arcade word game

210 **Expert Color Paint 1.0**
Color painting program

213 **Animation Clips**
Animated clip art

213 **Notify 1.0**
Wireless message transmitter

215 **WordPerfect for the Macintosh 2.1**
Word processor

215 **PowerPort/V.32**
9600-bps PowerBook data/fax modem

224 **LightningScan Pro 256**
Hand-held gray-scale scanner

224 **RateFinder 1.5**
Shipping-cost tables

225 **ComStation 2, ComStation 4**
Fax and data modem for networks

225 **Citadel with Shredder**
System-security tools

226 **The Complete Annotated Alice**
HyperCard-based book

226 **NetWorks 1.0.1**
Network-management and paging utility

227 **Creepy Castle**
Arcade-style game

227 **Aspects 1.01**
Collaborative software

Page 206

Page 166

Page 131

DEPARTMENTS

16 How to Contact Macworld

19 MacBulletin

23 Commentary/ Jerry Borrell
Curling up with an electronic magazine

35 Letters

71 Art Beat
BY CATHY ABES

75 The Iconoclast
BY STEVEN LEVY
Another look at Claris

83 Conspicuous Consumer
BY DEBORAH BRANSCUM
Specialized magazines for Mac fans

97 Updates

105 Lab Notes
BY MARK HURLOW

121 News
BY DAN LITTMAN AND TOM MORAN

229 The Desktop Critic
BY DAVID POGUE

233 New Products

241 How To/Quick Tips
BY LON POOLE

247 How To/Getting Started
BY JIM HEID
Customizing word processors

255 How To/Insights
BY DAVID POGUE
Canvas 3.0

259 Where to Buy

332 Best-Sellers

June 1992, Volume 9, Number 6 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 80328-4529. Editorial and business offices: 501 Second St., San Francisco, CA 94107, 415/243-0505.

AnthroCart®

The best furniture you can buy for your equipment. Incredibly strong. Mobile. Flexible. Space saving. Lifetime warranty.

Choose different sizes and colors. Add the accessories you want. Discover Anthro's exceptional service.

Call us for our new catalog.

Free Catalog:
800-325-3841
6:30 AM to 5:00 PM PST

ANTHRO®
Technology Furniture®
3221 N.W. Yeon St.
Portland, OR 97210
(503)241-7113
Fax: (503)241-1619

GSA contract No. GS-00F-5040A
Available for OEM applications
Made in USA
Prices start from $159
We ship in 48 hours

Anthro, AnthroCart and *Technology Furniture* are registered trademarks of Anthro.

MACWORLD

PRESIDENT AND CHIEF EXECUTIVE OFFICER/ MACWORLD COMMUNICATIONS, INC.	James E. Martin
EXECUTIVE VICE-PRESIDENT	Jerry Borrell
VICE PRESIDENT/BUSINESS DEVELOPMENT	Lindsay Davidson
PRESIDENT/CEO A+ PUBLISHING DIVISION	Paul Boulé
PRESIDENT/COO MACWORLD CD ROM PUBLISHING VENTURES	Dan Orum

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 150 computer publications in more than 50 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, Computerworld Southeast Asia, Computerworld Malaysia; AUSTRALIA'S Computerworld Australia, Australian PC World, Australian Macworld, Profit, Information Decisions, Reseller; AUSTRIA'S Computerwelt Oesterreich; BRAZIL'S DataNews, PC Mundo, Mundo IBM, Mundo Unix, Automacao & Industria, Publish; BULGARIA'S Computerworld Bulgaria; CANADA'S ComputerData, Direct Access, Graduate Computerworld; CHILE'S Informatica; COLOMBIA'S Computerworld Colombia; CZECHOSLOVAKIA'S Computerworld Czechoslovakia, PC World Czechoslovakia, Neural Network World; DENMARK'S CAD/CAM World, Computerworld Danmark, PC World Danmark, Macworld Danmark, Computerworld Focus, Lotus World, Macintosh Produktkatalog, Unix World, PC/LAN World; EGYPT'S PC World Middle East; FINLAND'S Mikro PC, Tietoviikko, Tietotekniikka, Tietoverkko; FRANCE'S Le Monde Informatique, Distributique, Compu Search, Golden, Computer Direct, InfoPC, Telecoms International, Le Guide du Monde Informatique; GERMANY'S Computerwoche, Computerwoche Focus, Computerwoche Extra, Computerwoche Karriere, Information Management, Macwelt, Netzwelt, OS/2 Welt, PC Woche, PC Welt, Unix Welt, Unit, Lotus Welt; GREECE'S PC World; HUNGARY'S Computerworld SZT, Mikrovilag Magazin, PC Vilag; INDIA'S Computers & Communications; ISRAEL'S People & Computers; ITALY'S Computerworld Italia, PC World Italia, Macworld Italia, Network World Italia; JAPAN'S Computerworld Japan, Macworld Japan; KOREA'S Computerworld Korea, PC World Korea; MEXICO'S Computerworld Mexico, PC Journal; THE NETHERLANDS' Computerworld Netherlands, LAN Magazine, Mac Magazine, Computer! Totaal; NEW ZEALAND'S Computerworld, PC World; NIGERIA'S PC World Africa; NORWAY'S Computerworld Norge, C World, PC World Norge, PC World Ekspress, IDG Direct Response, Multimedia and Desktop, Lotus World, PC World's Product Guide, Student's DP-Guide, Publish! World, Macworld Norge; PERS PC World; PEOPLE'S REPUBLIC OF CHINA'S China Computerworld, PC World China; IDG HIGH TECH Newproductworld; PHILIPPINES' Computerworld, PC World; POLAND'S Computerworld Poland; ROMANIA'S Infoclub; RUSSIA'S CADWorld, Computerworld, Networks, PC World; SPAIN'S CIMWorld, Communicaciones World, Computerworld Espana, PC World Espana, Macworld, PC World Autoedicion, Amiga World, Publish; SWEDEN'S ComputerSweden, Mikrodatorn, Macworld, CAD/CAM World, Lotus, Windows, Svenska PC World, Lokala Natverk/LAN, Affarsekonomi Management, Attack, CAP, Datalngenjoren, Data & Telekommunikation, Maxi Data, Digital/Varlden, Unix; SWITZERLAND'S Computerworld Schweiz, Macworld Schweiz; TAIWAN'S Computerworld Taiwan, PC World Taiwan; THAILAND'S Thai Computerworld; TURKEY'S Computerworld, PC World; UNITED KINGDOM'S Lotus, Macworld; UNITED STATES' Amiga World, C10, Computerworld, Computer Buyers World, Digital News, Electronic News, Federal Computer Week, GamePro, inCider/A+, IDG Books, InfoWorld, Lotus, Macworld, MPC World, NeXTWORLD, Network World, PC Games, PC World, Portable Office, PC Letter, Publish!, Run, SunWorld; VENEZUELA'S Computerworld Venezuela, MicroComputerworld Venezuela; YUGOSLAVIA'S Moj Mikro.

CANVAS™ 3.

EVERYTHING ELSE THIS GOOD IS BAD FOR YOU.

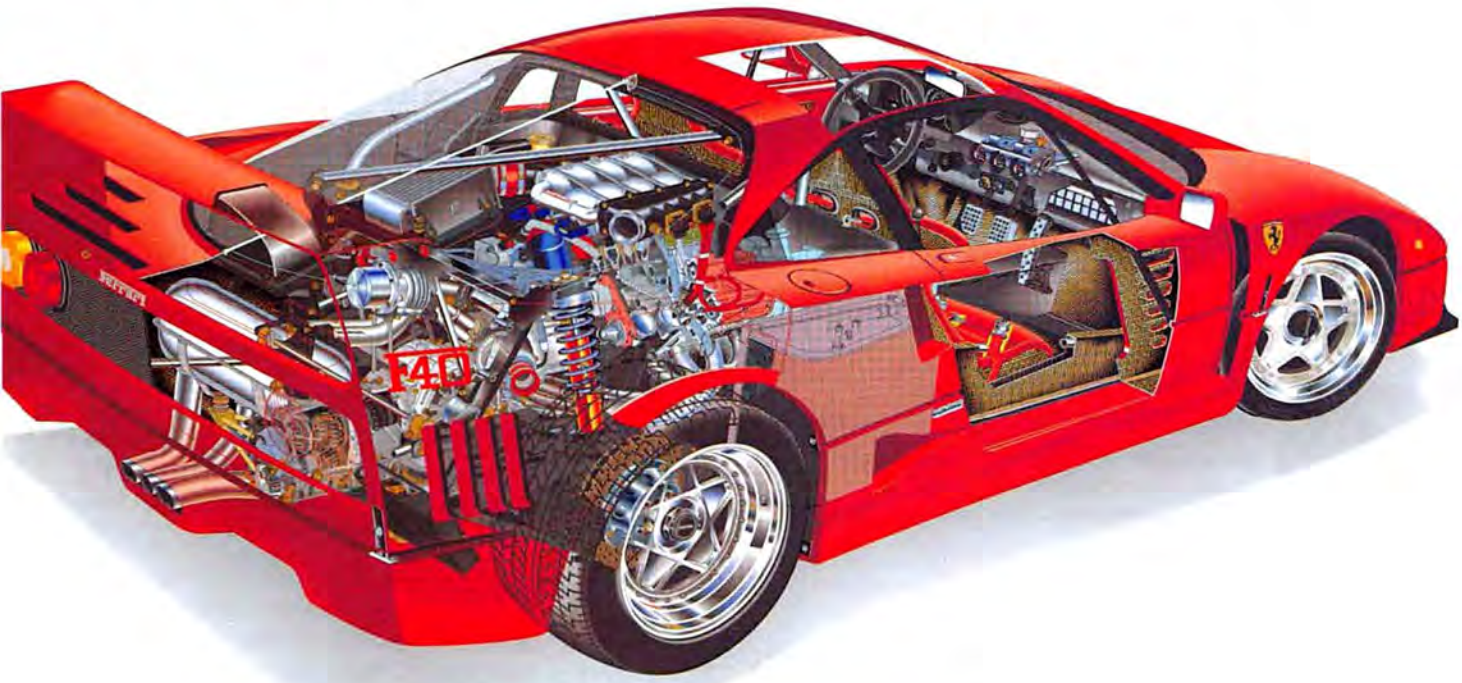
Fast cars. Bungee jumping. Triple chocolate cheesecake. Seems like all of life's really satisfying stuff comes laced with danger. Or at least cholesterol. • Our drawing program on the other hand, is an exception to the rule. • A peak experience that's actually good for you. • Good how? • Good by souping 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 revues 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.

MacUser Editors' Choice 1991 Winner

MacWeek Target 1991 Winner

JAN, 1992

Buyers Assurance Seal InfoWorld DEC, 1991



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 9/30/92. 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

INTRODUCING THE RAS

THE ONLY 32-BIT CMYK TECHNOLOGY FOR THE MACINTOSH

Revolutionary 32-bit color display technology offers unprecedented performance for graphic arts applications.

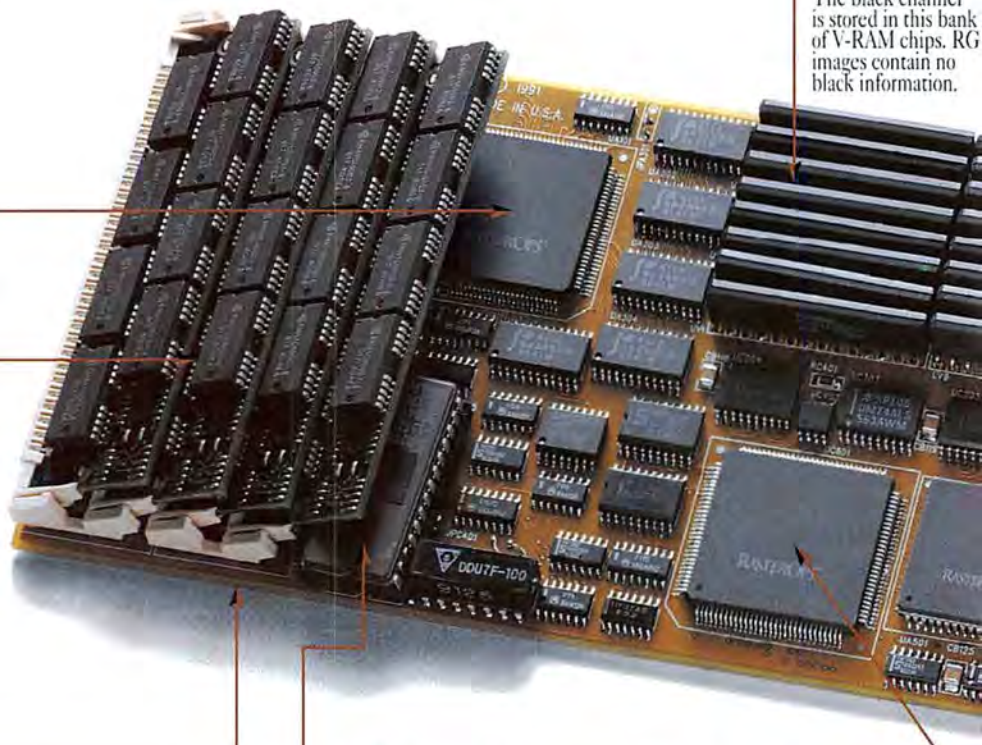
The ProColor 32 is a single-slot display adapter that provides everything color professionals need for increased productivity when working with large color images: unsurpassed speed of CMYK-to-RGB conversion, improved on-screen color, reduced storage requirements, QuickDraw acceleration, RAM-disk support and a connector for add-on enhancement boards.

ProColor 32. The new standard in color technology. And it's available today.
Call 1 800 SAY COLOR for details.

The black channel is stored in this bank of V-RAM chips. RG images contain no black information.

QUICKDRAW ACCELERATOR

Custom ASIC QuickDraw accelerator improves by as much as 600% certain on-screen drawing functions such as scrolling and screen redraw.



GWORLD ACCELERATION

Ordinary 1 or 4 MB SIMM chips may be added to create up to 8MB of GWorld-RAM for quick handling of large images.

SMOBC

High quality solder-mask-over-bare-copper board construction (SMOBC) is the ultimate in durability and reliability.

HARDWARE PAN & ZOOM

Smooth panning and 1X, 2X, 3X...up to 16X zoom functionality provides the perfect tool for detailed image retouching.

GAMMA CORRECTION & DIRECT SET ENTRIES

Sets monitor gamma and provides multiple display default settings for QuickDraw.

RISC

INTERFACE FOR OPTIONAL RISC ACCELERATOR

The ImagePro daughterboard is a programmable 40MHz RISC accelerator for use with the ProColor 32. The ImagePro also provides real-time JPEG compression and decompression.

TERAOPS PROCOLOR 32

HARDWARE SOLUTION FOR CMYK-TO-RGB CONVERSION

The ProColor 32 dramatically reduces the time and memory required to convert images from CMYK to RGB format by eliminating the need for time-consuming software conversions. Images in cyan, magenta, yellow and black (CMYK), the color space used for color separations and printing, are converted to red, green and blue (RGB) for display on your monitor using VLSI chip technology. By performing the CMYK-to-RGB conversions on-board, the ProColor 32 accelerates the conversion and eliminates the need for software to store both CMYK and RGB data in system or hard-disk memory.

In a CMYK image, the magenta channel is stored here. When working with an RGB image, the blue data is stored here.

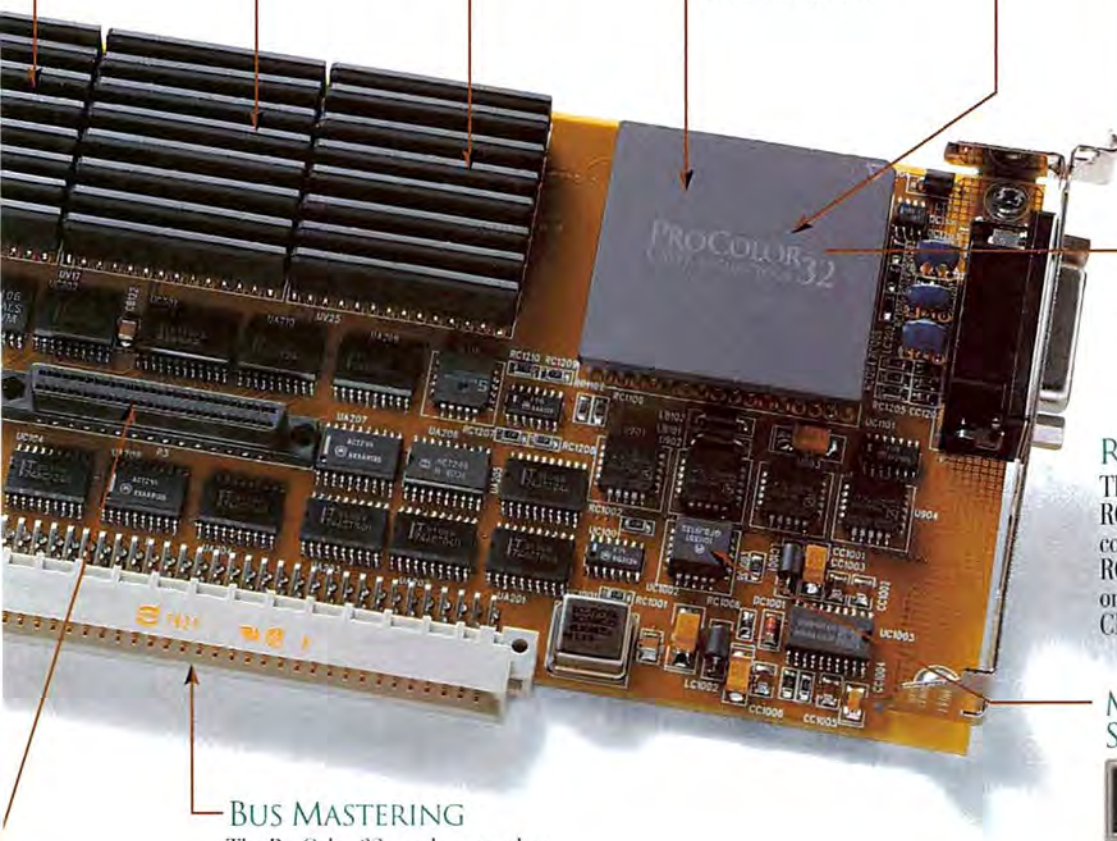
In a CMYK image, the yellow channel is stored here. When working with an RGB image, the green data is stored here.

In a CMYK image, the cyan channel is stored here. When working with an RGB image, the red data is stored here.

The custom ASIC chip instantly converts CMYK data to RGB for screen display, bypassing time-consuming software conversions.

ADVANCED 9-BIT DAC

The 9-bit digital-to-analog converter (DAC) allows for gamma correction to be made without any on-screen color degradation.



RGB MODE

The ProColor 32 supports both RGB and CMYK modes, providing complete compatibility with existing RGB software as well as simultaneous on-screen display of both RGB and CMYK information.

MULTIPLE MONITOR SUPPORT

Variable Clock Generator provides support for monitors ranging in size from 13" to 21".

BUS MASTERING

The ProColor 32 accelerates other boards you may have in your system.

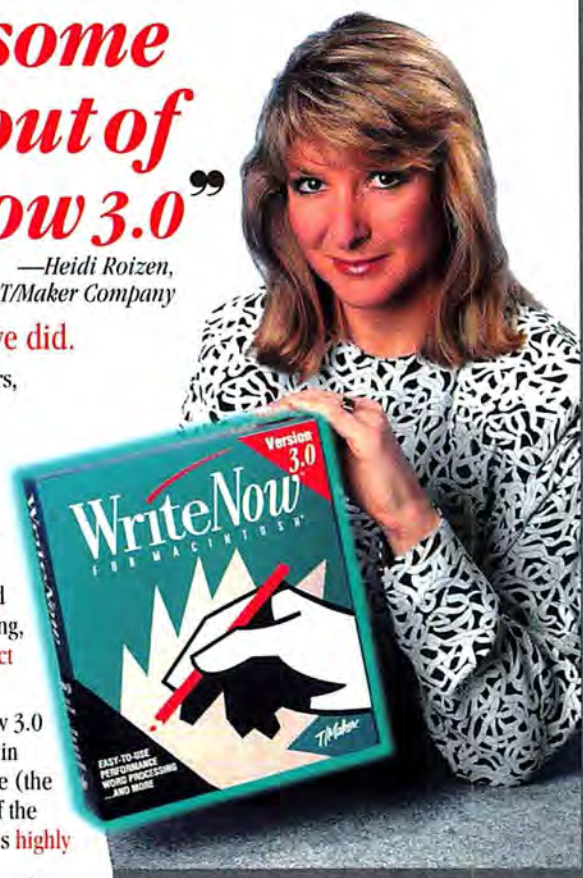
RASTEROPS®

THE ART & SCIENCE OF COLOR™

© 1992 RASTEROPS CORPORATION 2500 WALSH AVENUE. SANTA CLARA. CA 95051 ALL BRAND NAMES AND PRODUCTS ARE TRADEMARKS OR REGISTERED TRADEMARKS OF THEIR RESPECTIVE HOLDERS.

"We left some things out of WriteNow 3.0"

—Heidi Roizen, CEO, T/Maker Company



And you'll be happy we did.

Why? Because our competitors, in trying to make their word processors do *absolutely everything*, have created software that is too big, too slow, and too hard to use.

WriteNow® 3.0 is different. It has all the features you need to do powerful word processing, yet it's easy, extremely compact & blazingly fast.

Two-time "Best New Word Processor" MacUser Magazine

You see, WriteNow 3.0 is written entirely in assembly language (the native language of the Macintosh), so it's highly optimized.

"Editors' Choice for Word Processing" Computer Pointer Week Magazine

But don't let its small size fool you–it's packed with the features that are important for professional word processing *(and at half the price of the competition!)*.

	WriteNow 3.0	Word 5.0
Default Memory Setting	490K	2,048K
Application Size	220K	852K
Comfortable with System 7 & 2 MB	Yes	No
Spell Checker (words)	135,000	88,000
Thesaurus (words)	1.4 Million	191,000
Paragraph Styles	Yes	Yes
Character Styles	Yes	No
Suggested Price	$249	$495

All in all, we've added over sixty improvements while still retaining the speed and compactness that has made WriteNow the award-winning word processor of choice.

WriteNow 3.0...

The fastest, easiest way to write on the Macintosh.

T/Maker

T/Maker Company
1390 Villa St., Mtn. View, CA, 94041
415/962-0195 Fax: 415/962-0201

The following are trademarks or registered trademarks of their respective companies: T/Maker, WriteNow, T/Maker Company; Microsoft, MS, Microsoft Corp.; Mac, Apple, Macintosh, Apple Computer, Inc.; MacWrite, Claris Corp.; WordPerfect, WordPerfect Corp.

WriteNow 3.0

New Version–Features Include:

- Easy & Powerful Paragraph and Character Style Sheets.
- System 7 Savvy (32-Bit Addressing, Virtual Memory, etc.).
- Microsoft® Word Compatibility (Fast & Full-Saved). Also PC WordPerfect® & MacWrite® II Compatibility.
- Robust Print Preview.
- Color Text & Graphics · Column Breaks · Triple-click Selections · Variety of New Underline Styles · Lightning-fast Scrolling Option · One-button Setting of Document Defaults · Auto-Finding & Auto-Guessing in Spell Checker · Horizontal Line Graphics · Unlimited Paragraph Sizes · Largest Dictionary/Thesaurus Combination Available · Online Help · Virus Detection · New Documentation

Over 60 New Features & Improvements!

Microsoft Word Compatible!

...and much more!

100% MONEY-BACK GUARANTEE!

If you are not happy with WriteNow 3.0 for any reason, simply return it to your dealer within 60 days for a full refund. Satisfaction is guaranteed.

If you are a WriteNow user, upgrade to WriteNow 3.0 for

$49.95

($69.95 after June 30, 1992)

To upgrade, call

1-800/688-2850

Call for special $69.95 upgrade from MS® Word, MS Works, MacWrite, or WordPerfect.

TM578

Circle 174 on reader service card

MACWORLD

EDITOR-IN-CHIEF — Jerry Borrell

EDITORIAL

EXECUTIVE EDITOR — Adrian Mello
SENIOR EDITOR/FEATURES — Cheryl England
SENIOR EDITOR/REVIEWS — Carol Person
SENIOR ASSOCIATE EDITOR/DEPARTMENTS — Deborah Branscum
SENIOR ASSOCIATE EDITOR/LAB MANAGER — Chip Carman
SENIOR ASSOCIATE EDITOR/FEATURES — Liza Weiman
ASSOCIATE EDITOR/DEPARTMENTS — Cathy E. Abes
ASSOCIATE EDITOR/FEATURES — Galen Gruman
ASSOCIATE EDITOR/LAB — Mark Hurlow
ASSOCIATE EDITORS/NEWS — Dan Littman, Tom Moran
ASSOCIATE EDITOR/FEATURES — Charles Piller
ASSISTANT EDITOR/REVIEWS — Marjorie Baer
ASSISTANT EDITOR/NEW PRODUCTS — Evan Cooper
ASSISTANT EDITOR/FEATURES — Suzanne Courteau
ASSISTANT EDITOR/LAB — Tim Warner
EDITORIAL ASSISTANTS — Carolyn Bickford, Jim Feeley, Danny Lee
ASSISTANT TO THE EDITOR-IN-CHIEF — Sue Grant
CONTRIBUTING EDITORS — Robert C. Eckhardt, Erfert Fenton, Rob Hahn, Jim Heid, Dave Kosiur, Steven Levy, Joe Matazzoni, Tom Negrino, David Pogue, Lon Poole, Steve Roth, Charles Seiter, Franklin N. Tessler, Bruce F. Webster
INTERNATIONAL EDITORS — Alan Jones, Australia, 011 61 2 439-5133; Carsten Levin, Denmark, 011 45 36 44 28 00; Jean Cassagne, France, 011 33 1 49 04 79 00; Stefan Frevel, Germany, 011 49 89 3 60860; Giulio Ferrari, Italy, 011 39 2 58 011660; Osamu Honma, Japan, 011 81 03 5276-0541; Shin Cho, Korea, 011 82 2 579-8031; Paul Molenaar, Netherlands, 011 31 23 354554; Bernhard Steen, Norway, 011 47 2 647 725; Alvaro Ibariez, Spain, 011 34 1 319 4014; Fredrick Landergren, Sweden, 011 46 8667-9180; Roger Bataillard, Switzerland, 011 41 1 55 1077; Cemal Balci, Turkey; Peter Worlock, United Kingdom, 011 4471 831-9252

COPY EDIT AND EDITORIAL PRODUCTION

MANAGING EDITOR — Charles Barrett
ASSISTANT MANAGING EDITORS — Luis A. Camus, Ruth Henrich
SENIOR COPY EDITOR — Katherine L. Ulrich
SENIOR PRODUCTION EDITOR — Jo Ann Villalobos
COPY EDITORS — Doreen J. Kan, Paul King, Felicity O'Meara
ASSISTANT PRODUCTION EDITOR — Lisa Brazieal

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
DESIGNER — Hae Yuon Kim
ASSOCIATE DESIGNER — Matthew C. Nielsen
SENIOR DESIGN ASSOCIATE — Tim Johnson
DESIGN ASSOCIATE — Martha Katt

EVENTS AND CONFERENCES

EVENTS MANAGER — Sandy Butler
EVENTS ADMINISTRATIVE ASSISTANT — Donna Deuell

EDITORIAL ADMINISTRATION

EDITORIAL MANAGER — Jane Lagas
EDITORIAL ADMINISTRATIVE ASSISTANTS — Wendy Sharp, Lyn Taylor

PRESIDENT/CEO AND PUBLISHER, MACWORLD COMMUNICATIONS, INC. — James E. Martin
ASSISTANT TO THE PRESIDENT — Terri Edelman

Images scanned on a
anMaker 1850S 35mm Slide Scanner

New Low Prices

ScanMaker 1850	$1,999
ScanMaker 1850S	$2,199

Microtek removes the biggest barrier to owning a Slide Scanner

If price has been the barrier separating you from high quality color scanning, take a look at the ScanMaker 1850.

Another stunning price breakthrough from Microtek, the leader in affordable color scanning solutions.

The ScanMaker 1850 sports a formidable set of specs. 35 x 35mm scanning area. 24-bit color. 8-bit gray-scale. 1850 dpi resolution.

Best of all, it's so easy to use. Just drop in any slide and you're ready to start scanning.

The ScanMaker 1850 gives you everything you need to go from comps to final color separations. It even comes bundled with PhotoStyler for the PC or Adobe Photoshop for the Mac.

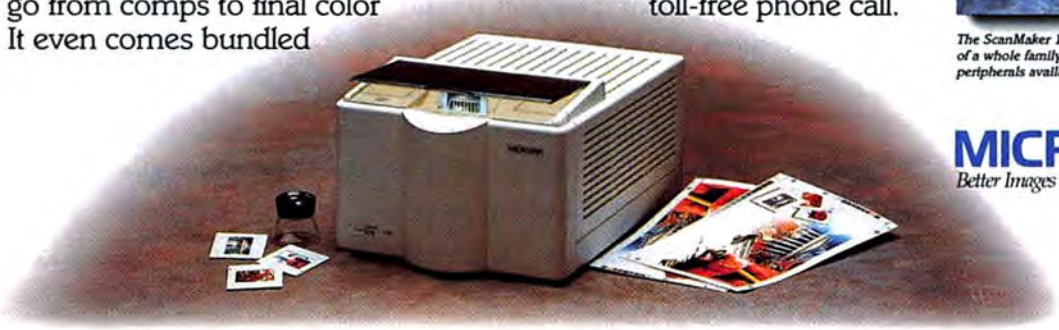
But wait, it looks even better when you see the price. Just $1,999 for the ScanMaker 1850 on the PC. And only $2,199 for the Mac compatible ScanMaker 1850S.

24 bit Color 1850 DPI

Call 1-800-654-4160 or 213-321-2121 in California for the name of the Microtek authorized dealer nearest you.

Because the only barrier between you and a 35mm color scanner now is a toll-free phone call.

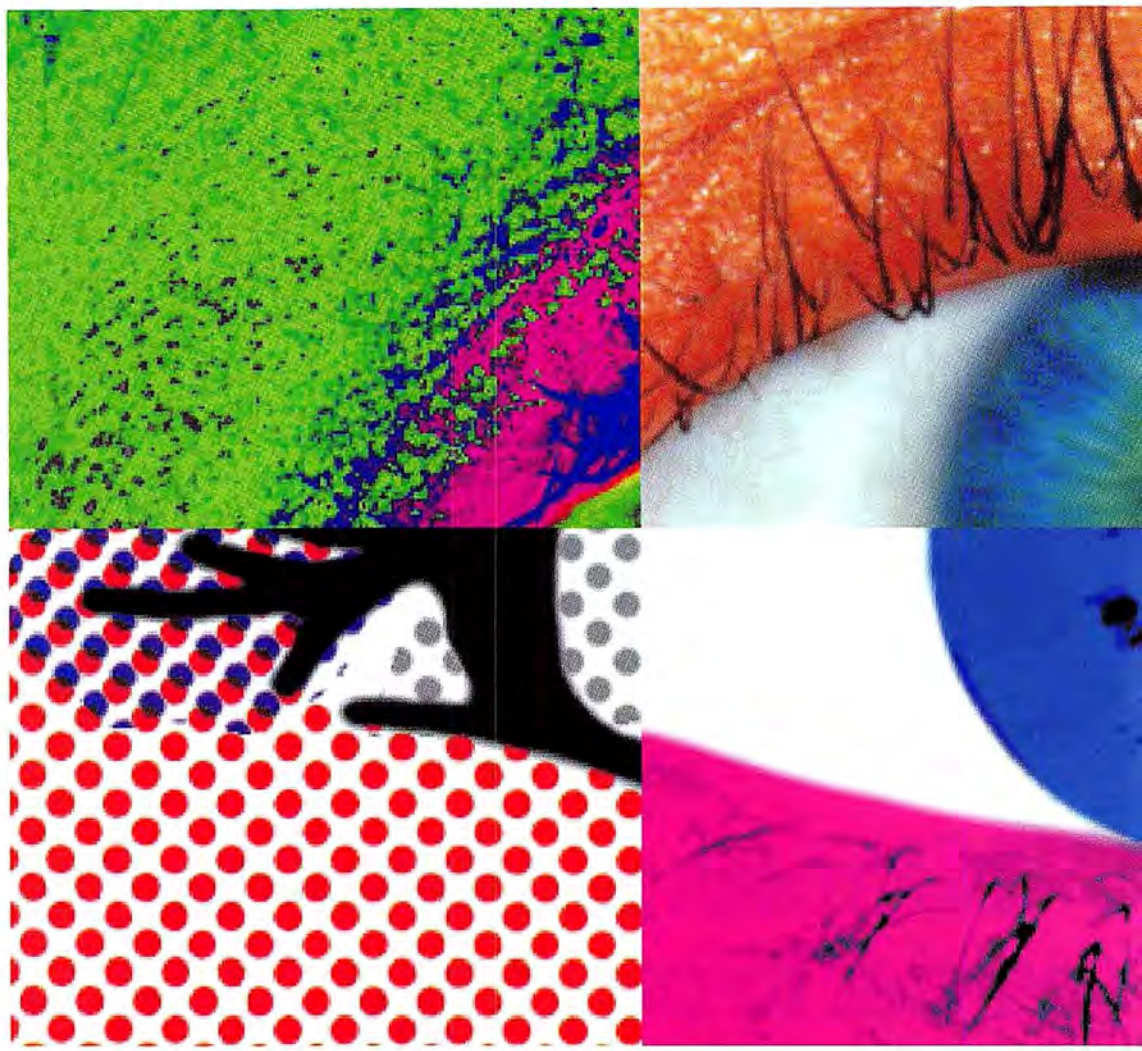
The ScanMaker 1850 is just one member of a whole family of affordable desktop peripherals available from Microtek.



MICROTEK
Better Images Through Innovation.

•Microtek Lab, Inc., 680 Knox Street, Torrance, CA 90502, (213) 321-2121 (800) 654-4160 •Microtek International, Inc., No. 6 Industry East Road 3, Science-Based Industrial Park, Hsinchu Taiwan, 30077, R.O.C., 886-35-772155 •Microtek Electronics Europe, GmbH., Schless-Straße 72, D-4000 Düsseldorf 11, F.R. Germany, 49-211-526070 • ©1991 Microtek Lab, Inc. All rights reserved. ScanMaker 1850 and ScanMaker 1850S are trademarks of Microtek International, Inc. PhotoStyler is a trademark of U-Lead Systems, Inc. Adobe Photoshop is a trademark of Adobe Systems, Inc. Macintosh is a registered trademark of Apple Computer, Inc. All other trademarks or registered trademarks are the property of their respective holders.

Circle 63 on reader service card



Made for Macs.
Not only are the new FG series of monitors made specifically for Apple Computers, we also make many other Apple compatible peripherals, from CD-ROM devices to a full line of printers.

NEC and Radius have designed a display

Presenting display systems that will be the apple of Macintosh™ users' eyes.

NEC's 15″, 17″ and 21″ MultiSync® FG™ display systems.*

A combination of NEC's award-winning monitor technology, and a display interface card specially designed for NEC FG monitors by Radius™, these display systems give you the flexibility you've never had before.

By providing you with multiple viewing modes. Which allow you to use all sorts of different applications more effectively. Whether it's a business program, desktop publishing or any other type of software.

For instance, condensed modes let you increase your resolution and desktop size. So you can display more on-screen information and do everything from putting two documents side by side, for easy cutting and pasting, to displaying more cells in your spread sheets.

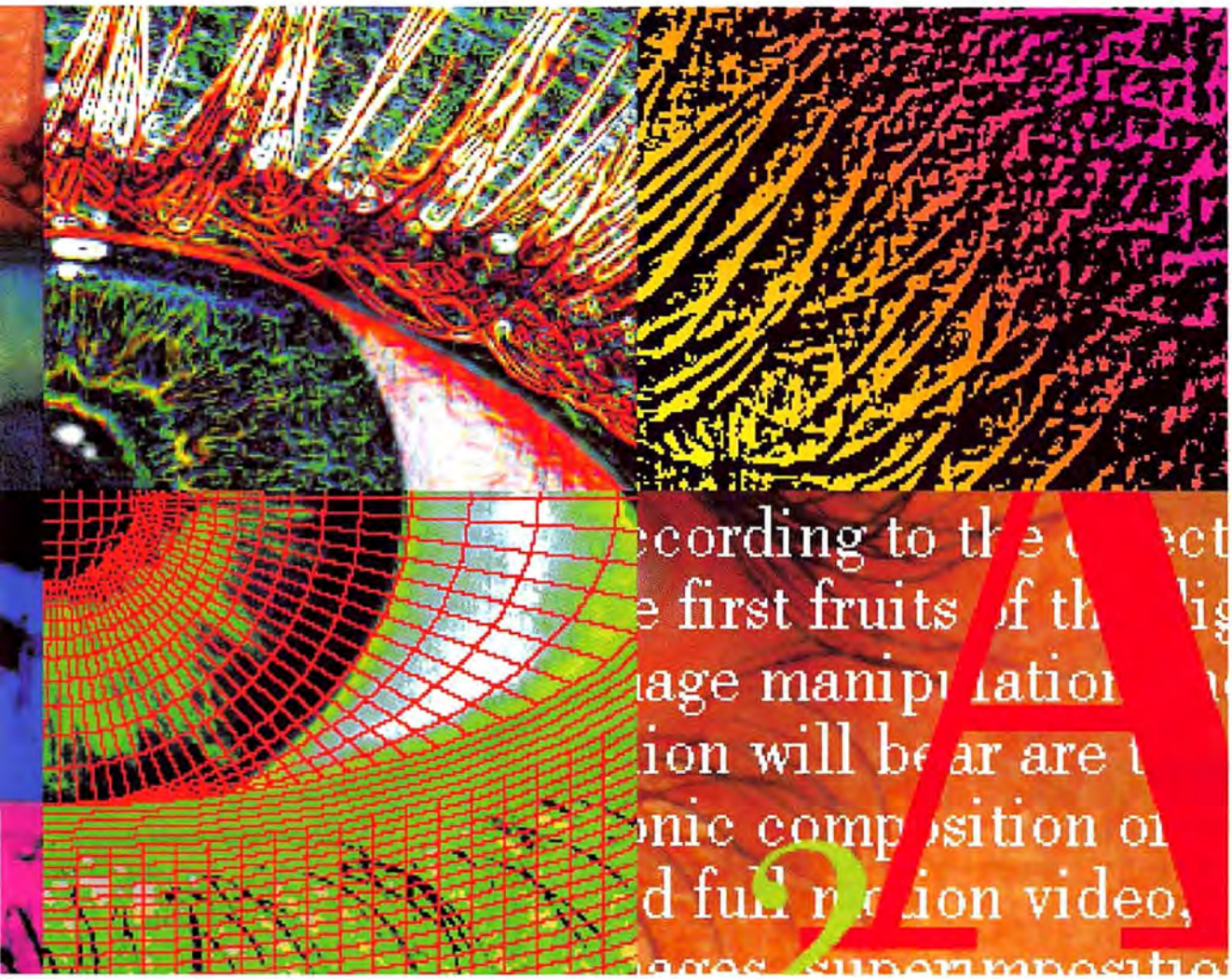
There's also a 72 DPI mode which gives you a WYSIWYG view of your final output.

And expanded modes that let you enlarge images and get a closer look at your work.

C&C
Computers and Communications

*15″, 17″ and 21″ CRTs yield 13.8″, 15.6″ and 19.7″ active display areas.

MultiSync is a registered trademark and MacFG, FG, FullScan and AccuColor are trademarks of NEC Technologies, Inc. Macintosh is a registered trademark and QuickDraw is a trademark of Apple Computer, Inc. Radius is a trademark of Radius, Inc. NuBus is a trademark of Texas Instruments, Inc. ©1992 NEC Techn



system that will make you open wide and say ahhh.

But the best part is, as you change applications, you can switch to any of these modes on the fly. Right from the control panel. You don't even have to restart the computer.

There's more. Our MultiSync FG monitors feature FullScan™ capability, for edge-to-edge images. And our exclusive AccuColor™ Control System lets you adjust your on-screen color to match your printed output. The MacFG™ Board is NuBus™ compatible and includes QuickDraw™ acceleration. And it's available in two versions. The MacFG 8X supports 8-bit color and the MacFG 24X supports 24-bit color.

MW EDITORS' CHOICE 15" MultiSync 3FGx Monitor MacWorld Magazine, March 1992

If they don't make your eyes pop out of your head, nothing will.

For a listing of all available DPI/viewing modes and other neat stuff we didn't have room to include, call 1-800-NEC-INFO. In Canada, 1-800-343-4418. For immediate information via fax, call 1-800-366-0476, request # 62234.

Once you take a look at these display systems, we're sure you'll see things our way.

Because ↑ is the way you want to go. NEC

Circle 68 on reader service card

FORD: $7,250.00 PROFIT IN 5 MONTHS WITH OUR STOCK PROGRAM

Symbol	Pos	Buy Date	Shares	Buy Price	Original Cost	Sell Date	Sell Price	Sell Value	P/L
F	Short	08/30/91	500	$31.13	$15,562.50	12/11/91	$24.13	$12,062.50	$3,500.00
F	Buy	12/06/91	500	$25.25	$12,625.00	01/20/92	$32.75	$16,375.00	$3,750.00

COMPUTERIZED TRADING FOR THE REST OF US.

The Right Time™ computerized trading system was developed by an expert portfolio manager for his own personal use. Over the last 10 years of in-market use the software has been perfected and made easy to use. Now it's available for any smart trader who wants to make big profits from quick decisions.

Not only is The Right Time™ 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.

AMAZINGLY PRECISE.

The Right Time™ programs run on IBM (and compatible), Apple II 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, Warner, Signal, DBC, Bonneville or the Radio Exchange 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 or Stock Program/Long Term
- Index Program or Index Program/LT
- Futures Program
- Mutual Funds Program
- Day Trading Program/Index, Futures or Stock

FOR MORE INFORMATION OR TO PLACE AN ORDER.

Call (800) 755-TBSP or write today for our free twenty-four page brochure or to place your order. Each of our end-of-day programs costs $599 (combination prices are available) plus shipping and handling (S&H).

We also have demonstration programs for just $59 (each) plus S&H. Each demo includes our complete manual.

Our Right Time–Day Trading Programs (Index, Futures or Stock) are priced at $999 each.

T.B.S.P. INC.
The Better Software People
610 Newport Center Dr., Suite 1120
Newport Beach, CA 92660
(714) 721-8603 Fax: (714)721-8635

©T.B.S.P. Inc 1991

Future results may vary.

All programs not available on all computers.

Circle 25 on reader service card

MACWORLD

ADVERTISING SALES

VICE PRESIDENT/DIRECTOR OF ADVERTISING SALES	Shannon Dolan (415/243-0505)
ASSOCIATE ADVERTISING DIRECTOR	William P. Peck (415/243-0505)
NO. CALIFORNIA (SAN JOSE, SOUTH)	Cherie La France (415/243-0505)
SALES ASSOCIATE	Shannon Smith
NO. CALIFORNIA (WEST BAY), WASHINGTON, WYOMING, WESTERN CANADA	Regina T. Salaices (415/978-3155)
SALES ASSOCIATE	Edward Ramirez
NO. CALIFORNIA (EAST BAY, MARIN), IDAHO, MONTANA, OREGON	Suzanne Young Saluti (415/978-3262)
SALES ASSOCIATE	Jill Nightingale
SO. CALIFORNIA	Cathi T. Bledsoe (714/250-1307)
	Nancy Coy (714/250-1307)
SALES ASSOCIATE	Marsha Bowers (714/250-1307)
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 (201/967-1350)
SALES ASSOCIATE	Cathy Langhaar
NEW ENGLAND/FLORIDA	Joan Flynn (508/879-0700)
SALES ASSOCIATE	Susan Cardoza
MANAGER OF TELEMARKETING SALES	Beverly Schneider (415/978-3138)
MACWORLD CATALOG	Carol Johnstone, Wendi A. Smith (415/978-3152, 415/978-3117)
MACWORLD BILLBOARD	Niki Stranz (415/978-3105)
ASSISTANT TO THE DIRECTOR OF ADVERTISING SALES	Yuen Yeh (415/978-3258)

INTERNATIONAL SALES

SALES ASSOCIATE	Christine Wong

MARKET RESEARCH

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

VICE PRESIDENT/MARKETING AND CIRCULATION	Lindsay Davidson

MARKETING

MARKETING MANAGER	Kimberlee Luedee
MARKETING EVENTS/MERCHANDISING MANAGER	Lisa Espinoza
MARKETING COMMUNICATIONS ASSISTANT	Darien Werfhorst
MARKETING ASSOCIATE/EVENTS AND MERCHANDISING	Jayne Salinger

CIRCULATION

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

PRODUCTION

VICE PRESIDENT/DIRECTOR OF MANUFACTURING	Anne Foley
PRODUCTION MANAGER	Claudia Dawn Smukler
ADVERTISING BILLING COORDINATOR	So Fong Yip
ADVERTISING TRAFFIC COORDINATOR	Arlette Crosland

ADMINISTRATION

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

ANTICIPATION. THE LAST THING YOU WANT IN A MAC.

If your Mac freezes to a standstill when you try to perform even the simplest task, it's time to make it sizzle with a super fast accelerator card from Applied Engineering. Our high-performance TransWarp accelerators put zing in even the slowest of Macs. At prices so affordable they won't leave you cold. Our accelerators boost the Macintosh SE, Classic, LC, II, IIx, IIsi, IIcx and IIci to lightning speeds. We've designed them around high-performance Motorola 68030 and 68040 processors. So you get speed plus guaranteed compatibility with all Macintosh hardware and software, including System 7. And at clock speeds from 16 to 50 MHz, our cards will make sure your Mac won't keep you waiting with baited breath next time your projects are hot. We back all our cards with a 30-day money back guarantee*, full one-year warranty and free 24-hour bulletin board support. So you get a product you can rely on, not just a product you can afford. If you've been fishing for the right accelerator for your Mac, don't wait any longer. Hook up with any of our authorized dealers today – we have over 2,000 nationwide. Or call toll-free for a complete product catalog. And find out how to turn up the heat with a fast, reliable accelerator card from Applied Engineering.

With our super fast accelerator cards, like the TransWarp 040, your Mac will never keep you waiting again.

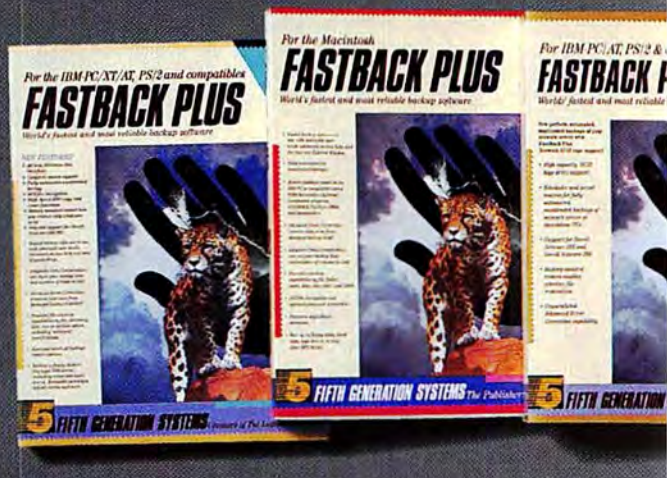
APPLIED ENGINEERING®
The Apple enhancement experts

1-800-554-MACS Ext.210
1-800-554-6227 Ext. 210

©1992 Applied Engineering, 3210 Beltline Road, Dallas, TX 75234, (214) 241-6060, Fax (214) 484-1365. All product names are the trademarks of their respective holders. *Through participating dealers.*

Circle 167 on reader service card

Backup. For people who don't.



Everyone who uses a Macintosh® ought to back up regularly. But most people don't back up at all.

In fact, if the people in your company are like those at most other companies, about the only way you're going to get regular backups out of them is to do it without them.

Guess what?

Now you can.

Now you can set up fully automatic, unattended backups for every Mac in the house.

Not to mention every DOS® and Windows®-based PC and Novell® network server.

What's more, you can easily customize the nature and timing of each one to

suit *your* requirements.

And transform a simple, effective company-wide backup policy from fantasy into fact.

All you need is Fastback Plus.

The Macintosh version of the world's most popular backup software is also the Mac world's most flexible backup software.

If automated, unattended backups aren't your style, you can still enjoy unprecedented convenience with our Express Menu, which lets you perform a full backup with a couple of clicks of your mouse.

Along with being System 7 savvy—which means you get to enjoy Balloon Help and other wonderful things—Version 2.6 lets you back up to just about anything you can think of, from floppies and hard disks to direct access and streaming tape drives and any HFS device.

It also lets you back up in the background while you're using an application or two in the foreground.

It even formats floppies on the fly, so you don't have to bother.

And it comes complete with our unique Macro Editor.

What, you ask, makes our Macro Editor unique?

It uses plain English commands. Which means you can actually use it.

Using the Mac version of Fastback Plus is a lot like using the DOS version, the Windows version and the Network version—same look, same functionality.

Same backups, even.

That's right. You can actually restore a Mac file directly onto a PC, and vice versa.

Nobody else can do that.

But then, nobody else can back up 1MB per minute on a Mac.

No other DOS, Windows or Network backup program can run fast enough to see our tail lights.

And no other backup software is backed up by our

In addition to floppies, hard disks and other HFS devices, Fastback Plus for the Macintosh lets you back up to direct access and streaming tape drives.

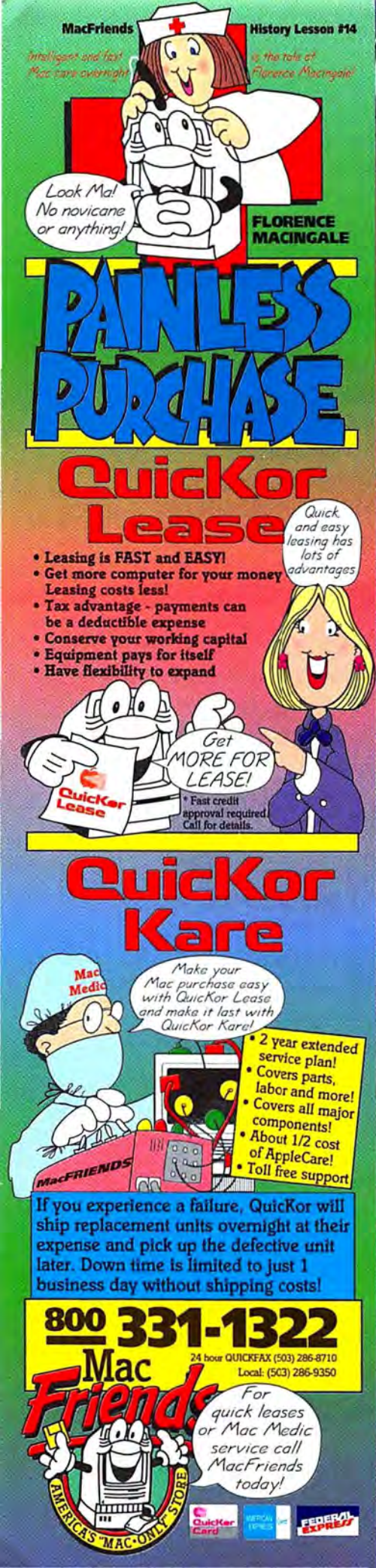
vaunted 24-hour toll-free technical support. And our one-year money-back guarantee.

There's more. So pick up the phone. Dial 1-800-477-8212.

And tell everyone to stand back.

FIFTH GENERATION SYSTEMS, INC

Circle 135 on reader service card



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.
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 Submit suggestions by mail (write Bug Report or Turkey Shoot on the envelope) or electronically (indicate Bug Report or Turkey Shoot in subject field). Please include your phone number.
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* is a registered trademark of IDG Communications, Inc. APPLE, the APPLE LOGO, MAC, and MACINTOSH are registered trademarks and MACLETTER is a trademark of Apple Computer, Inc. Printed in the United States of America. Copyright © 1992 Macworld Communications, Inc. All rights reserved. *Macworld* is a member of IDG Communications, the world's largest publisher of computer-related information. IDG Communications publishes over 150 computer publications in more than 50 major countries. Thirty million people read one or more IDG Communications publications each month.

Consumer Audit BPA

IDG INTERNATIONAL DATA GROUP

Subscribe today!

MACWORLD

DISCOUNT COUPON

☐ 1 Year (12 issues) for $24.
That's a savings of 49% off the annual newsstand price of $47.40.
With this coupon I'll save a total of $23.40.

☐ 2 Years (24 issues) for $39.97.

☐ Bill Me later!

NAME

COMPANY

ADDRESS

CITY, STATE, ZIP

Save 49%

Allow 4 to 6 weeks for delivery. Basic subscription price is $30 for 12 issues. The annual cover price is $3.95 per issue, $47.40 annually. For Mexican subscriptions, please add $18 per year for shipping. For Canadian subscriptions, add $18 plus $1.40 (7% GST). Add $70 annually for all other foreign countries. CA residents add applicable sales tax.

4A9F2

NO POSTAGE
NECESSARY
IF MAILED IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 1167 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

MACWORLD
Subscription Department
P.O. Box 51666
Boulder, CO 80321-1666

Macworl
Discount
Coupon

See reverse side for details

FrameMaker.

The most comfortable seat in document publishing.

FrameMaker's table editor lets you create detailed tables with straddled cells, graphics, unlimited paragraphs, and rotated text.

FrameMaker automatically reformats multichapter documents, updating page and paragraph numbers as well as cross-references.

To experience a whole new comfort level in document publishing, have a seat in front of a Macintosh® running FrameMaker.®

▶ FrameMaker integrates the entire publishing process into one easy-to-use application: Authoring, editing, graphics, page layout, production, even hypertext. Whether you create short, simple documents or long, structured documentation, you'll feel right at home with FrameMaker.

▶ You'll find our new version, FrameMaker 3.0, even more inviting. You can create your own intricate, multipage tables with its sophisticated table editor. And generate and maintain multiple versions of a single document with its conditional text capabilities. You can even import full-color images and produce four-color output of DCS images.

▶ That's the kind of innovation that earned FrameMaker an Editor's Choice award from MacWEEK and accolades from MacUser.

▶ And of course, it's compatible with System 7.0.

▶ So call 1-800-U4-FRAME ext. 955 for more information on FrameMaker 3.0 and the name of your nearest reseller. And feel how comfortable a position in publishing can be.

Frame™

Copyright © 1991 Frame Technology Corporation. International customers please call (408) 433-3311. FrameMaker and Frame Technology are registered trademarks, Frame and the Frame logo are trademarks of Frame Technology Corporation. Macintosh is a registered trademark of Apple Computer, Inc. All other trademarks or registered trademarks are the property of their respective holders.

Circle 60 on reader service card

Performance that blows you away!

The experts agree: Thunder/24 is the industry's fastest color graphics card.

"For those who want the best-performing, accelerated video card...the SuperMac Thunder/24 proved itself *far and away the leader* — sometimes more than twice as fast as the accelerators from the other companies."
MACUSER

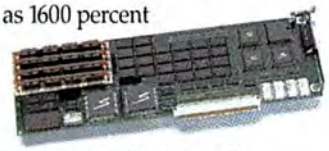
"*Editors' Choice:* Get a SuperMac 21" SuperMatch™ Two-Page Color Display with the super-fast Thunder/24. The color on this system is beautiful, the text is crisp."
MACWORLD

"New pricing...superior technology...five-year warranty... *the undisputed champ*...overall rating is excellent."
MACWEEK

"Thunder offers the *best Macintosh® graphics performance,* and that's essential to serious color-publishing customers."
TYPEWORLD

"*Best Products of 1991* Award of Merit to Thunder/24."
BYTE

In the world of professional color publishing and prepress, Thunder/24™ has left the competition in the dust! Its record-shattering power provides the industry's fastest QuickDraw™ acceleration for color graphics on large-screen displays up to 21 inches. Speed that's as much as 1600 percent greater than the nearest rival! Thunder gives you unprecedented *split-second response* from key applications like QuarkXPress, Adobe Photoshop,™ and Aldus PageMaker and FreeHand. And with its breath-taking superiority in speeding screen redraw, text and layout manipulation, color retouching, preparing proofs and separations — you can spend your time *creating*, not waiting. Plus, the feature-packed Thunder/24 provides pan and zoom in hardware, a Virtual Desktop™ of up to eight square feet for poster-size projects, and as much as 8 MB of on-board GWorld memory for faster manipulation of large color images. See Thunder/24 in action today at your Authorized SuperMac Reseller. **To find the reseller nearest you, just call 1-800-334-3005. For immediate information via fax, call SuperFacts:℠ 1-800-541-7680. (In 408 area, call 524-4797.)**



SUPERMAC™
The SuperSource for Color

© 1992 SuperMac Technology. All rights reserved. SuperMac, SuperMac Technology, SuperMatch, Thunder, Thunder/24, and Virtual Desktop are trademarks and SuperFacts is a service mark of SuperMac Technology. Macintosh is a registered trademark and QuickDraw is a trademark of Apple Computer, Inc. Photoshop is a trademark of Adobe Systems Incorporated. All other brand and product names are trademarks of their respective holders. This ad was produced using SuperMac color displays and graphics cards on Macintosh computers.

Circle 132 on reader service card

MacBulletin

LATE-BREAKING NEWS

Fire danger has prompted Apple to offer free battery cases for spare PowerBook batteries. When the rechargeable batteries are outside the computer and unshielded, there is a small possibility of grounding causing a discharge or fire, Apple said. Call 800/377-4127.

Two Big Mergers: MacroMind Paracomp and Authorware are merging. The company's new name was not set at press time. MacroMind Paracomp (415/442-0200) will take over sales and tech support. Microsoft intends to acquire Fox Software, subject to government approval; sales and tech support will remain at Fox (419/874-0162).

Radius blasts its Rocket 68040 accelerator to 33MHz—an increase over the speed of the company's existing NuBus accelerator of about 30 percent. The Radius Rocket 33 lists for $2499 and is shipping from Radius (408/434-1010).

Who's There? Nok Nok is a utility that tells you who is accessing your Mac under System 7's file-sharing. It can be set to open the file-sharing window when someone logs on; then it can disconnect after a specified time. Nok Nok is $49.95 from Trik, 617/933-8810.

The ComboCache IIsi from DayStar Digital (404/967-2077) adds 32K of RAM cache, a socket for an optional math coprocessor, and two PDS slots to the IIsi. (The board fills the IIsi's PDS slot.) The $349 ComboCache is available now.

QMS cut prices on its QMS-PS 410, QMS-PS 2210, and QMS-PS 2220 laser printers. The 4-ppm 410 went from $2395 to $1995, while the 2210 and 2220, both 22-ppm network printers, went from $9995 to $8995 and from $12,495 to $9995, respectively. QMS is at 205/633-4300.

TrueForm Options: For owners of the orphaned Adobe TrueForm, Shana Corporation (403/463-3330) has published the $149 Informed TrueForm Conversion Kit to move TrueForm forms into Shana's Informed format. Shana says almost all aspects of TrueForm forms are converted correctly, and a log of any problems is created.

Net Management News: The AG Group (510/937-7900) has upgraded Net Watchman to version 1.2. It supports Ex Machina's Notify pager and can monitor a class of network devices (for example, all laser printers) across an internet. Version 1.2 lists for $295. AG Group's $795 EtherPeek now works with all Ethernet devices based on the Sonic chip set, which includes the Quadra and most Mac IIsi and LC boards.

New Vectors: Sign-making system vendor ScanVec (508/694-9488) is entering the Macintosh market with raster-to-vector software. ScanVec's $1495 RVC/Mac has automatic smoothing that closes all objects. The company says it arranges polygons so they can be filled when a file is imported into Illustrator or FreeHand.

Ray Dream Revs: In version 2.0 of Ray Dream Designer, the LightForge modeling module has real-time preview and supports PostScript Type 1 and TrueType fonts. The new, $895 version's SceneBuilder assembly and rendering module incorporates DreamNet, which can divide up a rendering job for several Macs on a network. Ray Dream, 415/960-0765. m

Video Training Becoming Most Popular, Least Expensive Way to Learn Macintosh Programs

Macintosh Programs Can Now Be Learned in a Few Hours With A Unique MacAcademy Video Speed Learning System

Over the past five years I've been associated with over 100,000 people attempting to learn the Macintosh computer. I've watched as each one waged their own personal, private battle trying to master the Mac and the most popular Macintosh programs.

I've felt their frustration, have empathized with their confusion and have understood their computer fears. I've talked to employees who had new computers and new programs dropped on their desk with the directive to "learn this." I've listened to people who struggled night after night trying to read and understand a computer manual. It's amazing how a computer manual can make a fairly bright person feel totally inept.

You'd be surprised at the number of people who have confided in me the fact they've given up trying to learn some of the programs. They've put the box on the shelf and simply written the expenditure off as a bad investment.

Hard Earned Money Wasted

Can you imagine how much money has been wasted on programs and computers that are sitting abandoned? Right now think of the people working on Macs in your office. Do they really understand the computer? How many programs are each of your people using? Have they really mastered the programs? Do they know the shortcuts and valuable techniques that will save you time, money and increase your professionalism?

An Excellent, Low Cost Training Answer

Five years ago I founded MacAcademy. My purpose was to create a training organization that provided training similar in nature to the Macintosh itself - simple, easy to use and effective.

Now, five years later the concept has proven to be a great success. Right now people are benefiting from MacAcademy training in over 100 cities in the U.S., in Canada, Great Britain, Australia, Japan, Hong Kong and 22 additional countries throughout the world.

MacAcademy training is successful for one reason - it works!

The Video Answer

Three years ago we introduced the MacAcademy Video Training Library. This library now includes over 80 different titles. Each video is 2 hours long and offers clear, concise, effective training. In some cases you can receive up to 8 hours of training for one program.

MacAcademy has resisted the temptation to follow competitive training programs who have recently implemented large price increases. Our videos started out at $49 each and are still only $49. This low cost training alternative has proven to be the Macintosh training choice of over 10,000 companies.

Guaranteed Results

The MacAcademy reputation is excellent. Our guarantee is simple: If you're not happy we'll refund your money. No hassles or problems.

To Order

Here is a partial list of over 80 MacAcademy Video training tapes now available. To order, simply send check, credit card information, or purchase order to MacAcademy Videos Dept. MW692 477 S. Nova Rd. Ormond Beach, FL 32174 or call the numbers listed below. Now is the time to start training. Thank you for allowing MacAcademy to help you in that effort.

- ☐ Adobe Illustrator 3.2 Part 1
- ☐ Adobe Illustrator 3.2 Part 2
- ☐ Adobe Illustrator 3.2 Part 3
- ☐ Adobe Photoshop Part 1
- ☐ Adobe Photoshop Part 2
- ☐ Adobe Photoshop Part 3
- ☐ Adobe Photoshop Part 4
- ☐ Canvas 3.0 Part 1
- ☐ Canvas 3.0 Part 2
- ☐ Canvas 3.0 Part 3
- ☐ Claris Resolve Part 1
- ☐ Claris Resolve Part 2
- ☐ Claris Resolve Part 3
- ☐ ClarisWorks Database
- ☐ ClarisWorks Graphics
- ☐ ClarisWorks Spreadsheet
- ☐ ClarisWorks W. Processing
- ☐ Design & Layout Techniques
- ☐ Excel 3.0 Part 1
- ☐ Excel 3.0 Part 2
- ☐ Excel 3.0 Part 3
- ☐ Excel 3.0 Part 4
- ☐ FileMaker Pro Part 1
- ☐ FileMaker Pro Part 2
- ☐ FileMaker Pro Part 3
- ☐ Freehand 3.0 Part 1
- ☐ Freehand 3.0 Part 2
- ☐ Freehand 3.0 Part 3
- ☐ Font Management
- ☐ HyperCard Basics Part 1
- ☐ HyperCard HyperTalk Part 2
- ☐ HyperCard HyperTalk Part 3
- ☐ Lotus 1-2-3 Part 1
- ☐ Lotus 1-2-3 Part 2
- ☐ Lotus 1-2-3 Part 3
- ☐ Lotus 1-2-3 Part 4
- ☐ MacDraw Pro Part 1
- ☐ MacDraw Pro Part 2
- ☐ Macintosh Networks
- ☐ MacProject II Part 1
- ☐ MacProject II Part 2
- ☐ MacWrite II Part 1
- ☐ MacWrite II Part 2
- ☐ Microsoft Word 5.0 Part 1
- ☐ Microsoft Word 5,0 Part 2
- ☐ Microsoft Word 5.0 Part 3
- ☐ Microsoft Word 5.0 Part 4
- ☐ PageMaker 4.2 Part 1
- ☐ PageMaker 4.2 Part 2
- ☐ PageMaker 4.2 Part 3
- ☐ PageMaker 4.2 Part 4
- ☐ Paints & Draws
- ☐ Persuasion Part 1
- ☐ Persuasion Part 2
- ☐ PowerPoint
- ☐ QuarkXPress 3.1 Part 1
- ☐ QuarkXPress 3.1 Part 2
- ☐ QuarkXPress 3.1 Part 3
- ☐ Quicken 3.0
- ☐ SuperPaint Part 1
- ☐ SuperPaint Part 2
- ☐ SuperPaint Part 3
- ☐ The Macintosh Part 1 (6.0+)
- ☐ The Macintosh Part 2 (6.0+)
- ☐ The Macintosh Part 3 (6.0+)
- ☐ The Macintosh Part 1 (7.0)
- ☐ The Macintosh Part 2 (7.0)
- ☐ The Macintosh Part 3 (7.0)
- ☐ Using System 7

To Order: Call Toll Free

1-800-527-1914

FAX Orders Call

1-904-677-6717

48 Hour Shipments

National Strength With Personal Understanding

© 1992 Florida Marketing International, Inc.

Circle 106 on reader service card

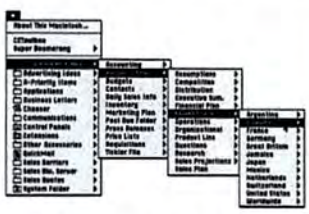
MacWeek & MacUser's 1991 Utility Product of the Year!

What did it take to get the editors at *MacWeek* and *MacUser* to agree on the best Macintosh utility product?

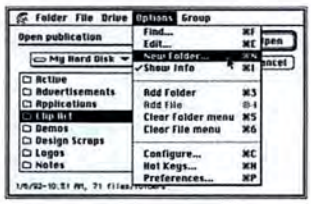
Unprecedented performance, compatibility, and value. In this case, a collection of 10 utilities that does for System 7 what products like SUM and Norton do for hard disks — only more so. As *MacUser* put it, "Now Utilities will make your Macintosh faster, easier, and more fun to use." For example:

- ***StartUp Manager™*** provides complete extension management
- ***Super Boomerang™*** finds files and folders instantly
- ***WYSIWYG Menus™*** groups fonts in their own typefaces
- ***NowMenus™*** makes the Apple Menu hierarchical
- ***AlarmsClock™*** displays the time & reminders in the menubar
- ***NowSave™*** automatically saves files to prevent data loss
- ***Screen Locker™*** keeps confidential information confidential
- ***MultiMaster™*** launches applications and files
- ***Profiler™*** analyzes system configurations
- ***DeskPicture™*** puts color and B&W pictures on the Desktop

In fact, every utility in the collection is the best of its kind. All of the utilities in the collection are also designed, tested, and guaranteed to work together — and with anything else your customers may have...even System 6. No wonder *MacUser* gave it a perfect five mouse rating and called it "a must-have for experienced users and novices alike."

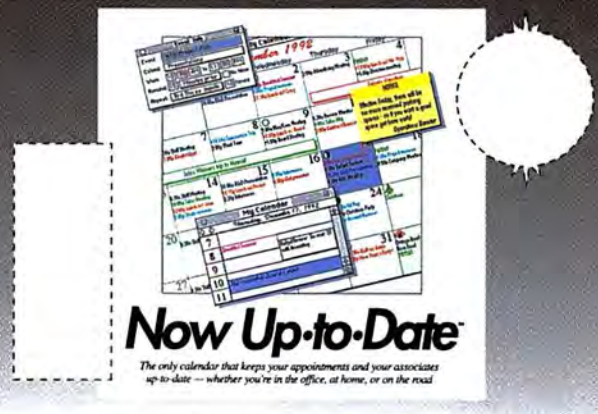


NowMenus saves you a lot of mousing around by creating submenus up to 5 levels deep for anything you put in your Apple Menu items folder — even aliases and other folders. It also pops up the menubar wherever you click your mouse



Super Boomerang lists your most frequently used files and folders in all Open and Save dialog boxes and in the Apple menu. It also lets you find files by name or content...even if they've been compressed (a file name search on a 100MB hard disk can take only 3 seconds — without requiring an index)

MacWeek & MacUser's 1992 Network Product of the Year?



What will it take to get the editors at *MacWeek* and *MacUser* to agree on the best Macintosh network product?

Perhaps Now Up-to-Date™: the only Macintosh application that keeps your appointments and your associates up-to-date — whether you're in the office, at home, or on the road.

Organize Your Appointments Now Up-to-Date can schedule a meeting to occur at 9:00AM on the first Tuesday of every month and have it automatically appear on your associates' calendars. Scheduled events can be private, shared, or restricted (i.e., only available to people with the correct password.)

Remember Your Meetings Now Up-to-Date keeps track of of all of your meetings and appointments, so you don't have to. It can also provide advance warning of upcoming events to ensure everyone shows up on time.

Mobilize Your Office Now Up-to-Date's versatile printing options include support for all major appointment books, so you can take your calendar on the road. If you own a PowerBook you'll appreciate the fact that Now Up-to-Date doesn't require you to be connected to a network to see your schedule. For that matter, you don't even need to own a network: Now Up-to-Date makes a great single user product, too.

Isn't it time you got up-to-date?

Now Up-to-Date's unique 'Public Calendars' coordinate your schedule with your associates' automatically, so your left hand knows what your right is doing

Now Up-to-Date can repeat events (and their reminders) with whatever frequency you may desire

With all this attention from the press it's not surprising that Now Utilities is already one of the best-selling products on the Macintosh. Now Up-to-Date looks to be just as popular. Call Now at **1-800-237-3611** to learn more about both of these great products, and how they can help you get more out of your Macintosh.

Now Software

Now Software, Inc. 520 S.W. Harrison Street, Suite 435 Portland, Oregon 97201 Telephone: (503) 274-2800 Toll-Free: (800) 237-3611 Facsimile: (503) 274-0670

Circle 13 on reader service card

This is not your average mouse...

ADB Version for Macintosh® SE/II.

Meet MVP Mouse™ from Curtis.

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 pin-point 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.

Actual size

#MVP-1 Retail $149.95

Take MVP Mouse for a spin. Visit your nearest Curtis dealer for a hands-on demonstration.

For the Curtis dealer nearest you call (603) 532-4123, Ext. 42

Manufacturing Company, Inc.
CURTIS
30 Fitzgerald Drive, Jaffrey, NH 03452
An Insilco Company

© 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

Electronic Magazines: Will You Read One?

BY JERRY BORRELL

Will you spend your evenings looking at a computer screen, reading the future's version of a magazine?

I will. Despite loving late nights reading a *New Yorker* article about the next elections in Bolivia, I'll have to get used to electronic magazines because the economics of publishing make it ever more expensive and inefficient to work with paper. The U.S. Postal Service adds to all publishers' burdens in terms of costs and speed of distribution. And paper will eventually become too expensive to waste on the millions of pages that are being printed today. Inks are improving, but there are still questions about the toxicity of ink that leaches into soil from paper in garbage dumps. And timeliness is an issue. Electronic publications can deliver information faster than paper ones can. Magazines as we know them today are becoming ever less possible, despite our love of them; cost, shrinking resources, and new technology will all contribute to their demise.

Can You Wrap a Fish in Them?

THAT WAS THE RESPONSE OF NEWSpaper publishers a decade ago when they first began to encounter the concept of electronic delivery of information to the home. Back then electronic magazines were going to be called videotex. And the publishers had a point, even if they should have had greater aspirations for their publications than having them serve as wrapping. Their point was that you couldn't curl up on a sofa with a computer or read from one while standing on a subway train.

Developments in several technologies will change that. Flat-panel devices will be suitable for home viewing from a sofa or dining room table. And transportability is not an issue with existing true laptops, which provide sufficient display space for reading.

Electronic magazines will offer more sex appeal than paper magazines, with the use of multiple languages, stereo sound, video, new interaction techniques, search-and-retrieval capability, and better ways of navigating massive amounts of information. Wall-size flat-panel displays for the home (with efficient controllers) should start appearing before the year 2000 and ensure that viewing electronic magazines will be both enticing and practical. Small-format CD ROM players will appear this year, making reading while traveling practical. Already the phenomenon of portable electronic books is important. The Voyager Company's version of Michael Crichton's *Jurassic Park* and other titles modified for the Mac PowerBook, called Expanded Books, are arousing much interest.

Communications Technology

SO HOW WILL YOU OBTAIN AN ELECtronic magazine? Certainly you'll buy them as CD ROMs. We published Macworld Interactive nearly two years ago and will publish more issues this year. But CD ROMs are, to me, a transitory distribution medium, suited for the current period. I think they will become antiquated with the introduction of better communications technologies.

After we've spent years of suffering with telephone-line–based 300-, 1200-, 2400- and 4800-bps connections to text-based online services, 9600-bps communications speeds have now become feasible. The slow improvement of modem speeds should have addressed the interminable delays experienced by online users, but every time a modem manufacturer makes another advance in technology, such as a 9600-bps modem, while dropping its prices, users demand greater performance.

Will readers curl up with a good laptop late at night?

Take 9600-bps service, for example. It's difficult (given the notoriously bad quality of phone connections) when an editor at one of the international *Macworld* magazines attempts to download a story from our San Francisco–based server. Downloading, or retrieving, 1MB-to-3MB PageMaker article files is fraught with problems like phone-line interruptions. The length of time required to download articles increases the likelihood that such problems will occur.

But ISDN and Switched Digital Services (SDS) at 64,000 and 56,000 bps, respectively, herald a new era. For the first time these high-speed services are available to users via standard telephone wires. We still have to pay a fee of around $500 to have these lines installed. Another $1500 worth of data communications equipment is required to connect a personal computer to them, but these prices will fall by half over the next year. And with ISDN and SDS, transmission of *Macworld*'s editorial copy and images has finally become practical.

There are even more advantages to ISDN and SDS. Services are becoming available on a cost-per-use basis rather than on a lease-line basis, which drops prices to about $20 per minute rather than close to $2000 per month. Foreign editions working with *Macworld* are paying about $200 per month in costs now. And connection reliability is a powerful hidden benefit. After an initial painful period of establishing a connection with ISDN, we have experienced only occasional problems with our telephone lines—typically related to a new version of software installed on the server.

Most important, however, is the fact that during 1992 ISDN and SDS are being introduced to large segments of the U.S. population. One of the primary limits on these two services has been that you've had to be physically close (within one mile) to the digital switching equipment needed to use the services. And there have been only a few switches in the United States capable of allowing end user connection. Now several of the Regional Bell Operating Companies, the "Baby Bells," are introducing ISDN/SDS-

continues

LIVE RECKLESSLY.

With Symantec Anti-Virus for the Macintosh keeping watch, you can leap from disk to disk and file to file, fully protected.

Life on the Mac is a breeze when you use the best-selling, highest-rated virus detection, protection, and repair program. That's because SAM 3.0 does more than stop every single Macintosh virus known today. It also seeks out anything even resembling virus-like behavior—and stops it cold—before it has a chance to corrupt your data.

All, without lifting a finger. That's because once installed, SAM keeps constant watch over your system. Giving you the freedom to dive into your work with reckless abandon. All for just $99.* Call now, **1-800-343-4714, x 606 G** for complete details.

SYMANTEC.™

In Europe, call 31-71-353111. In Australia, call 612-879-6577.
**Suggested retail price—only in U.S.A. SAM 3.0 is a registered trademark of Symantec Corporation. ©1992 Symantec Corporation.*

Circle 166 on reader service card

capable switching equipment in their areas of service. That allows people to use the service from within a 9-mile radius from a digital switch. The result is that most Americans should be able to connect to such services in the near term. Most won't due to today's cost. Businesses will, and in large numbers. I believe that some ordinary mortals will connect to ISDN/SDS services this year, but only early adopters.

A near-future benefit of ISDN/SDS-type services is in their certain performance improvements. Speeds up to 128,000 bps are possible today by dedicating two pairs of phone lines to the service. Next year or in 1994, as connection equipment improves, these speeds may become possible over one line. So those of us working with the technology today can look forward to a significant performance improvement.

Defining a New Kind of Publishing

STILL, SPEED IMPROVEMENT ALONE isn't enough. Tens of thousands of our readers could connect via high-speed digital links to the central server where we store *Macworld* electronically, but not many of you would want to read our stories from PageMaker files. True, we already serve thousands of readers by placing the text of reviews, new products, and other segments of the magazine online in Macworld Online. But we don't serve these readers with feature articles because of the tables, graphics, and photography. Our sister publications throughout the world download our files, but they have a specialized need for the information in our stories. We need to provide readers with more than high-speed access to *Macworld* text or DTP files. Otherwise, we're disseminating a publication electronically, not offering access to an electronic magazine.

What we do today only hints tantalizingly at what we must accomplish this year to attract you to an electronic version of the magazine. For example, we will need to make available a preview version of the magazine that will allow you to quickly browse the stories and information that we can provide. Once you've looked at the latest stories, you may want to download a particular story as a compressed file to read at your leisure from your home or office computer. Or you may want to print out a copy to take with you. At current ISDN or SDS delivery rates, reading a story from a server accessed via phone lines is possible, but still a little too slow to be attractive. At 128,000 bps, you won't mind reading our stories. And when networks can deliver 1-megabit-per-second transmission speeds, you'll no longer notice that you're online. You'll actually want to read and browse online because by then the technology and what constitutes a magazine will be dramatically different from what I'm proposing for 1992.

What About Cable?

IN FACT, AT 1-MEGABIT-PER-SECOND speeds, magazines could be provided over existing cable networks. This should strike a resonant note because most of America is wired for cable television today, so potentially we could deliver an electronic magazine in that way, or deliver it in a pay-per-view model, in the fashion of movies or special sporting events that you can already receive through cable. The real problem with existing cable is viewers' inability to interact with magazine content. Phone-based systems will allow data and instructions to be exchanged at high speed at both ends. Cable, in its present form, is a much more passive, receive-only model.

That's another part of electronic magazines of the future. Publishers will be able to lure you with high-quality content, but the real key to these new technologies is much more than simply creating wizzy files incorporating several languages and QuickTime movies. The key lies in how you'll be able to interact with, modify, store, retrieve, and select information in electronic magazines.

What Will They Look Like?

IN THE FUTURE, WILL A FEATURE be a feature? Articles will still be text and images combined on a page, but the page will have to shrink (or expand) to fit a screen. For small displays, text will have to be larger, the fonts carefully selected for legibility on a screen. Images will be active—that is, the static images that now appear in the magazine will actually be QuickTime movies that can be played. These movies will be PICT files, animations, and video.

As a reader, you should have some rudimentary control over your viewing environment—say, a choice of text size, bits per pixel (8 or 24), language, voice narration (or lack thereof), and the size of the viewing window for images, graphics, and video.

Electronic magazines will be essentially different from what you read on paper today, but not entirely dissimilar. One difference will be in the fashion that we publish stories. You'll be able to read about new products and other stories shortly after we write them, not weeks later. Another difference is in how you'll be able to search through the massive

continues

Choose Your Standard

Infinity Turbo 88 Drive

The demands for high-capacity data storage have been steadily increasing. The most efficient way to increase data storage as your needs grow is with removable media and the Infinity Turbo 88.

- 80MB+ removable cartridge SCSI drive
- Faster access times and transfer rates
- 60,000 hours MTBF
- Lower cost-per-megabyte
- External switches for termination and SCSI address
- 5 year warranty on cartridge

Infinity Optical 3.5" Drive

The PLI Infinity Optical 3.5" optical cartridge drive is the latest in data storage technology! Each single-sided cartridge holds approximately 128MB of data. The new cartridges have all the reliability of their big brothers and offer one great advantage — the cartridges fit into your shirt pocket.

- 120MB+
- Faster access times and transfer rates
- ISO/ANSI standard
- Rewritable magneto-optical SCSI drive

Infinity Floptical 21MB Drive

This drive combines the familiarity and ease-of-use of floppy drives with the reliability of modern hard drives and opticals. What you get is the ability to read, write and format 720K, 1.44MB and 21MB floppy diskettes. Infinity Floptical 21MB is perfect for backups, archiving or transferring small to medium amounts of data across the office or — the world.

- Floptical diskettes have 21MB capacity
- Reads and writes 720K and 1.44MB floppies
- 80ms access time — much faster than standard floppies
- Optical tracking and ECC for high reliability
- External switches for termination and SCSI address
- Compatible with all Macintosh computers

800-288-8754

Peripheral Land Incorporated
47421 Bayside Parkway • Fremont, CA 94538
Phone 510-657-2211 or Fax 510-683-9713

Circle 208 on reader service card

PLI

MWLD AD-04

MacTable®

"The only workcenter I'd ever consider for my Mac."
Larry Pina
The Macintosh Bible

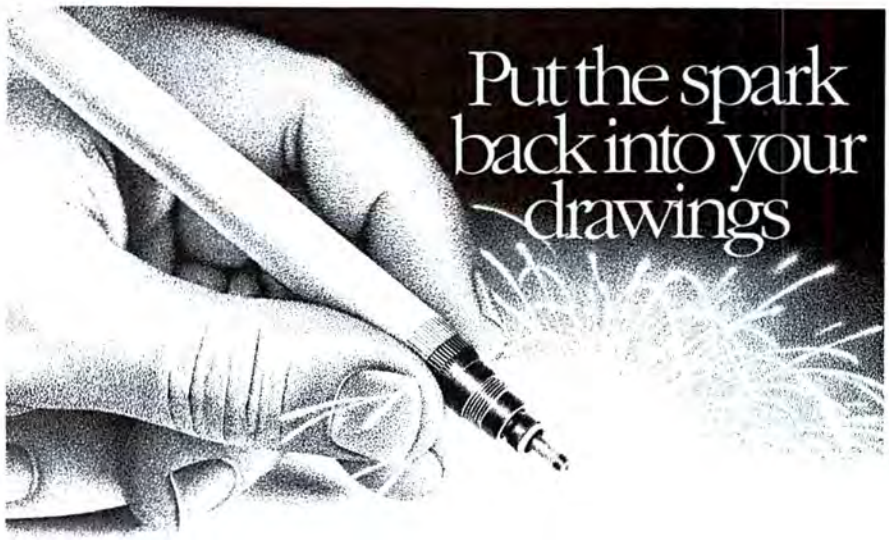
MacUser, June '90
"MacTable is the best designed and built and the best value. You win on all counts."
Steven Bobker
MacUser

Designed for space, comfort and productivity

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

Call for Free Catalogue and Computer Ergonomic Checklist
800-722-6263
or 206-481-5434 in WA state

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



with PowerDraw, accepted worldwide as the professional 2D CAD standard for the Macintosh. Fast. Intuitive. Elegant.

PowerDraw™
By Engineered Software

For free brochure, call Engineered Software. 1-919-299-4843.
In Canada, call Evoy & Associates. 1-204-453-8111.

Circle 12 on reader service card.

number of stories that we've published. And you'll be able to cut and paste portions of our work for your own use. (And pretty soon not only the Software Publishers Association will be voicing copyright concerns—traditional publishers will join it.) Some stories will be written (or rewritten in the case of articles like hard drive reviews) more frequently or have updates appended to them.

The entire realm of how we shape information in today's magazines—and how you use information—will change. All based upon instant access to new electronic magazines via phone lines. Which brings up an interesting topic, the threat that traditional publishers feel from electronic publishing.

Antitrust Fears

ONE OF THE RECENT CHANGES IN our society has been the regulation of public telephone networks. The federal courts decided some years ago to disallow quasipublic utilities, such as phone companies, from providing information services. In 1991, however, the courts reversed that decision and moved to allow the Bell companies and others to do just that. Shortly thereafter, newspapers, broadcasters, and other publishing companies began a noisy debate over whether the courts' decision should be countermanded through legislation. Newspaper publishers have been particularly outspoken in their criticism of the idea of allowing companies to combine phone services and information dissemination, saying that it will create a new oligarchy capable of controlling the public's access to information.

But some of us believe that the implementation of future information technologies will require that the Bell companies become participants. I happen to believe that smaller publishers will become more powerful, not less powerful, as a result of their ability to leverage resources from the phone companies' connections to every home in America. And, just as public access to cable systems is required through regulation, I believe that phone companies should be required to give all responsible parties access to phone-based information-distribution channels.

Get Ready, Get Set

SO WHAT WILL ELECTRONIC MAGAzines look like? When will they be available? How will they improve our lives?

They'll look like Macworld Interactive, which we'll be publishing again this summer. They'll be available in 1992. And they will definitely change how we access and use information. **m**

We're proud of our reputation.

"...The Good Housekeeping Seal. I'm now taking the safer course of buying from corporate-owned companies such as Quantum-backed La Cie..."
MacWeek, February 1991

"Between the good sales support and tech support that go the extra mile, La Cie is tops in my book!"
Bill Ringle, Philadelphia, PA

"La Cie offers the leading combination of software and performance."
Macworld, March 1990

The La Cie tradition of pride.

Pride in our products. Pride in our commitment to customers. Pride in who we are. At La Cie, "pride" has fueled each and every step in our success. Since our very first product, La Cie has earned an unsurpassed reputation for excellence. Top-rated performance. Award-winning design. From our sleek mass storage solutions to our Silverlining software, no other company in our industry has earned greater acclaim. Or appreciated it more.

LACIE LIMITED
A QUANTUM COMPANY

To order or for more information, call toll-free
800-999-0143
6 a.m.-6 p.m.PST Mon.-Fri.
International 503-691-0771 Fax 503-691-5590

We're proud

La Cie PocketDrive

When size really counts.

As a Quantum Company, La Cie offers customers the advantages of $489 million in assets. Deep-pockets R&D. State-of-the-art technology. Superior value. And, the assurance of long-term support. Yet for all our size, La Cie's smallest achievements still make our biggest headlines.

Introducing the PocketDrive.™ Portability in the palm of your hand.

Pack it in your pocket, purse or briefcase. La Cie's new 40MB and 80MB power-packed PocketDrives offer ounces of convenience, not pounds. Using Quantum's new 2½" drive, the PocketDrive offers 19ms seek time, whisper-quiet operation and La Cie's exclusive switchable termination and SCSI ID.

La Cie 40MB PocketDrive

$499

Desktop docking.

La Cie's PocketDrive eliminates the hassle of fumbling with cables at the back of your Macintosh every time you connect or disconnect the drive. Instead, the PocketDrive comes with a unique PocketDock™ desktop docking cable that lets you plug in the PocketDrive in seconds. With a second PocketDock (only $99), you can have fast and easy connection at work and at home. There's even a miniature T-connector (only $59) for connecting to other Macintosh systems.

Pocket Silverlining and an extendible 2-Year warranty.

Every PocketDrive comes complete with one PocketDock, our award-winning Silverlining hard disk management software and our extendible 2-Year Limited Warranty. For only $1 per MB, you can enjoy 72-hour warranty service for up to 5 years.

Price does not include shipping. Add 5% surcharge for American Express. Add sales tax where applicable. La Cie is a trademark of La Cie, Ltd., a Quantum Company. All other trademarks are the property of their respective companies. All specifications, terms, descriptions, products and services herein are subject to change without notice or recourse. La Cie, Ltd., all rights reserved, printed in U.S.A.. © Copyright 1991. 19552 SW 90th Court, Tualatin, OR 97062. Phone: (503) 691-0771, Fax: (503) 691-5590.

# of our size.

La Cie CirrusOptical Drive

Set your sites on a CirrusOptical™ magneto optical drive.

Introducing CirrusOptical. La Cie's remarkable new 3 1/2" magneto optical drive that offers massive storage capacity, superb reliability and high-speed performance in a compact case.

Space consciousness.

Smaller, faster and less expensive than conventional optical drives, La Cie's CirrusOptical uses cartridges that are the same size as 3.5" floppies, but store eighty-eight times more data than high-density floppy disks. Engineered to fit within our space-saving, award-winning Cirrus case, the CirrusOptical offers the reliability of optical media, 30ms seek times and the economy of removable cartridges.

La Cie MicroOptical Drive

$1699

Lose Weight. Lose Wait.

Until now, optical technology had a reputation for being slow. CirrusOptical drives at 45ms are faster than the conventional opticals. La Cie's CirrusOptical leaves the others in the dust.

Try one on for size.

When you need major-league performance in a pint-sized package, call us. We offer surprisingly small prices and a huge commitment to service and support.

I'm now taking the safer course of buying from corporate-owned companies such as Quantum-backed La Cie..."
MacWeek

LACIE LIMITED
A QUANTUM COMPANY

To order or for more information, call toll-free

800-999-0143

6 a.m.-6 p.m.PST Mon.-Fri.
International 503-691-0771 Fax 503-691-5590

We're proud

The drive to satisfy.

At La Cie customer satisfaction is the driving force behind everything we do. From our innovative product design to our capable, courteous customer support, La Cie goes the extra mile to assure you quality, service and value.

La Cie award winning chassis. Quantum power under the hood.

Sleek. Streamlined. Easy handling. Economical. La Cie drives deliver the advantages of award-winning design and state-of-the-art technology. Inside and out. For high-speed performance you can depend on, all La Cie hard drives up to 400MB incorporate the world's most respected and most trusted drive mechanisms–Quantum!

La Cie hard drives from

$299

Internals. Space savers. Portables.

La Cie offers customers a complete line of hard disk drives featuring state-of-the-art components, whisper-quiet half-speed fans, access times as low as 15ms, wide-range power supplies and La Cie's exclusive switchable termination and SCSI ID.

- 50MB-1.6GB Internal
- 50MB-1.6GB ZFP
- 50MB-400MB Cirrus
- 50MB-400MB Tsunami
- 50MB & 100MB Bacster™
- 40MB & 80MB PocketDrive

Drive the La Cie Express.™

We love all our drives, but take a look at our newest arrival. La Cie's new ExpressDrive™. Perfect for sensitive installations, the ExpressDrive is empowered with the performance of a Quantum fixed drive and the security and convenience of a removable drive, yet none of the risks of open-air media.

ExpressDrive from

$Call

Price does not include shipping. Add 5% surcharge for American Express. Add sales tax where applicable. La Cie is a trademark of La Cie, Ltd., a Quantum Company. All other trademarks are the property of their respective companies. All specifications, terms, descriptions, products and services herein are subject to change without notice or recourse. La Cie, Ltd., all rights reserved, printed in U.S.A. © Copyright 1991. 19552 SW 90th Court, Tualatin, OR 97062. Phone: (503) 691-0771, Fax: (503) 691-5590.

# of our drive.

Readable. Writable. Removable.

Economical, versatile, ideal for archival backup, La Cie's comprehensive line of removable media options includes:

- Removable cartridge drives
- ExpressDrive
- 3 1/2" & 5 1/4" magneto opticals
- CD ROM

Every drive has a Silverlining.

Acclaimed the most powerful hard disk manager available, La Cie's Silverlining is included free with every hard drive!

Tape backup with Retrospect.

Tape drives from

$649

Tucked neatly inside our Cirrus case, La Cie's 155MB or 600MB tape drives and 1.2GB or 2.0 GB DAT drives come with Retrospect software offering easy, economical data protection.

Up to 5-year warranty.

Ask about our generous warranties. La Cie offers up to a 5-Year Limited Warranty on Quantum drives and a speedy 72 hour turn-around on all warranty service!

Ready for a drive.

Don't let the quest for the right mass storage solution drive you wild. Call us. Our friendly, highly qualified staff will gladly help you select the perfect device to suit your needs and budget.

"Silverlining has bailed me out of so many tough situations, I've lost count."
Bobker's Dozen Best, MacUser, December, 1990

"La Cie hard disks are the most reliable and convenient disks I've ever had..."
James J. Haf, Lansing, MI

LACIE LIMITED
A QUANTUM COMPANY

To order or for more information, call toll-free

800-999-0143

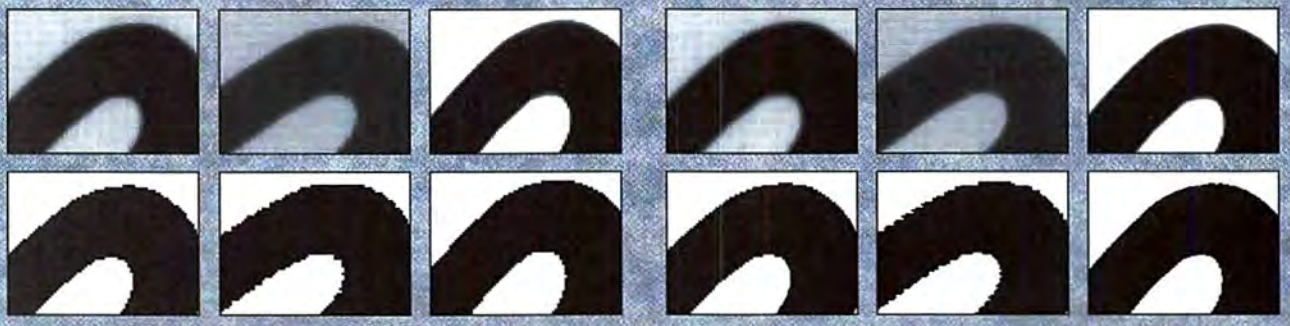
6 a.m.-6 p.m.PST Mon.-Fri.
International 503-691-0771 Fax 503-691-5590

We're proud

Microtek 600ZS $2,195*

Howtek Scanmaster 3 $8195**

La Cie Silverscanner $1,399



Microtek 600ZS 300 dpi at 1600%

Howtek Scanmaster 3 300 dpi at 1600%

La Cie Silverscanner 300 dpi at 1600%

Microtek 600ZS 600 dpi at 800%

Howtek Scanmaster 3 400 dpi at 1200%

La Cie Silverscanner 600 dpi at800%

Image is everything.

We believe quality is a priority. Our image as a company that produces quality products is well known. We're so confident in the quality of our scanner image that we are willing to compare it to other scanners right here. Compare for yourself.

Great color the first time.

Just look at the difference in the color scans. The single-pass Silverscanner has three separate noble gas-filled lamps for red, blue and green that are balanced so you get great scans the first time. With Silverscanner's built-in gamma correction, you get clean, bright scans with excellent detail in those hard-to-get areas that don't require difficult adjustment like other scanners. This can mean substantial time savings when every second counts.

The shadow knows.

Do you want good shadow detail? Then compare the black and white scans. The Silverscanner can give you production quality gray-scale scans for magazines, newspapers and brochures.

Lay it on the line.

When comparing line art, the Silverscanner really shines! At 1200 dpi you get what amounts to an ***electronic stat***. The comparison is incomplete, however, because some scanners don't have hi-res capability (too bad). But even if you compare at 400 or 600 dpi, it's clear how much better the Silverscanner is, especially bundled with Color It!

La Cie Silverscanner with Color It

$1399

Price does not include shipping. Add 5% surcharge for American Express. Add sales tax where applicable. La Cie is a trademark of La Cie, Ltd., a Quantum Company. All other trademarks are the property of their respective companies. *Price advertised in Macworld, Sept. 91. **From Howtek price list, effective 3-1-91. All specifications, terms, descriptions, products and services herein are subject to change without notice or recourse. Bundles in U.S.A. only. Ad design and production by Graphic Witness. Subject photos by Dennis Carney. © Copyright 1991 La Cie, Ltd., 19552 SW 90th Court, Tualatin, OR 97062. Phone: (503) 691-0771, Fax: (503) 691-5590). All rights reserved. Printed in U.S.A.

# of our image.

Microtek 600ZS $2,195*

Howtek Scanmaster 3 $8195**

La Cie Silverscanner $1,399

All scans were done at default settings with no corrections. The color images were separated using Adobe Photoshop. The logo was scanned as grayscale and as line art. This entire ad was done on the Macintosh using Silverscanner, Photoshop, Quark XPress and a PostScript Imagesetter. The entire production cost was $145.

Microtek 600ZS
1200 dpi at 400%—n/a

Howtek Scanmaster 3
1200 dpi at 400%—n/a

La Cie Silverscanner
1200 dpi at 400%

La Cie Silverscanner
1200 dpi at 100%

Software to die for!

We're proud of our image when it comes to quality software, too. La Cie has always had a reputation for powerful, well-written software. La Cie's exclusive plug-in modules for Photoshop, ColorStudio, Digital Darkroom, Enhance, ImageStudio and RagTime have been hailed as some of the best software ever written for flat-bed scanners. Enjoy features like fast dynamic ***color*** previews, independent color/brightness controls, nine scan modes, savable scan settings, color dropout, magnified previews, proof scans, 25% to 400% scaling in 1% steps, and 25 dpi to 1200 dpi in 1 dpi steps.

Silverscanner is OCR and Apple System 7 compatible and can be purchased with full versions of Adobe Photoshop ***and*** Letraset's ColorStudio— a $2139 value for only $1899!

La Cie Silverscanner with
Photoshop and ColorStudio

$1899

Who ya gonna call?

La Cie offers you toll-free expert technical support. We know scanning inside and out. We can help you. And we'll be here for you tomorrow because La Cie is a Quantum Company.

Seeing is believing.

La Cie is so proud of the Silverscanner, we used it to produce this ad. Not just the comparisons, ***everything.*** Call and order yours today.

"The choice is clear . . . buy the La Cie Silverscanner."
Macworld, June 1991

LA CIE
LIMITED
A QUANTUM COMPANY

To order or for more information, call toll-free

800-999-0143

6 a.m.-6 p.m.PST Mon.-Fri.
International 503-691-0771 Fax 503-691-5590

We're proud of our value.

50MB Quantum $299*

50MB	$299 Int.	$339 Ext.	155MB Tape Drive	$649
100MB	$429 Int.	$479 Ext.	600MB Tape Drive	$999 ~~$1199~~
120MB	$529 Int.	$579 Ext.	1.2-2.0GB DAT Drive	$1499 ~~$1799~~
240MB	$729 Int.	$789 Ext.	128MB CirrusOptical	$1699
400MB	$1399 Int.	$1499 Ext.	ExpressDrive	$Call
1.2GB	$2009 ~~$2749~~ Int.	$2099 ~~$2899~~ Ext.	Silverscanner	$1399
80MB PocketDrive	$649		Silverlining	$149

Call for products not listed.

You'll be delighted at La Cie's competitive prices. Especially when you consider what you get absolutely free. Like our acclaimed Silverlining software. Five megabytes of public domain software. A 2-Year Limited Warranty on Quantum mechanisms (extendible to 5 years). 72-hour turn-around on warranty service. Prompt, courteous, competent service.

At La Cie, we take pride in the unsurpassed value we offer customers. From our state-of-the-art technology to our award-winning design, La Cie never stops working to bring you better products and services than ever before. And because we're a Quantum Company, you can be assured La Cie will continue to provide you service and support for years to come.

LA CIE LIMITED
A QUANTUM COMPANY

To order or for more information, call toll-free

800-999-0143

6 a.m.-6 p.m.PST Mon.-Fri.
International 503-691-0771 Fax 503-691-5590

*Prices subject to change. Please call for lowest current prices and volume discounts.

Letters

JUNE 1992

Kept Wishing

I JUST FINISHED READING JERRY Borrell's March column (*Commentary*), and I can't agree with him more. Apple is just not keeping up with the Joneses, or the Borrells or the Stevenses for that matter. Hardware capability has fallen way behind the capabilities of many leading-edge applications. I'm not sure how much longer I can remain a loyal Macintosh user as long as my needs keep outdistancing the hardware Apple is developing.

Larry Stevens
Atlanta, Georgia

LET'S SEE IF I GOT THIS RIGHT. IBM got Apple's system code and Apple got the IBM dress code. Since the 5th of July, Apple stock is up 50 percent and IBM's is down 25 percent. I don't know what the dress code has to do with anything, but either IBM did not get much or it doesn't know how to use what it did get!

And about that PrintMonitor. The first System 7 problem I encountered was with PrintMonitor. After I spent 90 days with the System 7 answer line, my problem continued but the assistance didn't. Now, some six months later, I have found that if I turn off the background printer in the Chooser the machine starts every time and I have far fewer printing problems.

Am I the only one who has this problem? Nevertheless, I have no plans to trade in System 7 or my Apple stock.

Larry Hacker
Mabelvale, Arkansas

Forgotten CAD

I READ WITH INTEREST DAVID Peltz's response to the December 1991 *Commentary* by Jerry Borrell regarding the state of Macintosh CAD (*Letters*, March 1992). I think both missed the point. Borrell is correct: Macintosh CAD is in a sad state. Unless you include as CAD nontraditional activities such as photo-realistic visualization, the Mac is woefully short of its competitors in market share.

I do agree with Peltz that the Mac's market share in this area is growing, but given the basic graphical nature of the Mac and the performance of the Mac II line, Apple should have been able to grab a major portion of the routine day-in, day-out 2-D design and drafting market several years ago. This market is significantly larger than the visualization market *Macintosh Engineering & Scientific Report* and *Macworld* write about. And to date, Apple is simply ignoring it.

Gary Shellenberger
Clearwater, Florida

Modem Rambos

STEVEN LEVY, YOU EGOTISTICAL %#$@head. Heh, just kidding. Levy has hit the nail precisely on the head (*The Iconoclast*, March 1992). People love to appoint themselves King o' the Net. Usually it's when people are on new virtual turf, away from their normal stomping grounds, that they take an aggressive stance on some issue. They figure that they'll never visit there again and it's usually 500 miles away from their desktop.

Although computer communications have been around for a few decades now, it's surely an eighties, oops, nineties Rambo-complex kind of thing.

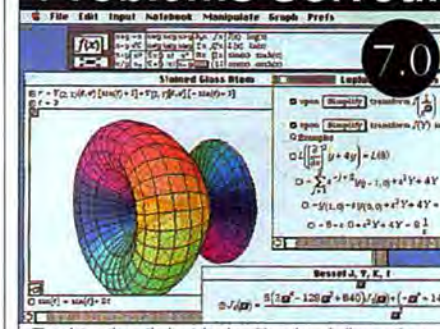
Steven Mills
Iowa City, Iowa

FREEDOM OF EXPRESSION IS ONE of the most important issues in our nation, and in the budding electronics area we need to be aware of the power of our own expressions. I think people will always need a vent; the idea that volume and livid fervor might become an acceptable substitute for thoughtful discourse is worrisome at best.

Brian Wanamaker
Capitola, California

continues

Mathematics Visualized. Problems Solved.



Theorist mathematical notebooks with real symbolic equations.

Theorist® is an interactive symbolic math and graphing program with a graphical user interface that makes mathematics easy-to-use. It is powerful enough for the advanced scientist, engineer, and educator, yet intuitive enough for the beginning student.

"[Theorist] is without question the easiest symbolic math program to use. ... In terms of interface design, Theorist is the best Macintosh symbolic math program... For mainstream science and engineering practice, Theorist will likely be the program that finally brings the advantages of symbolic computation to the average Macintosh user."
– MacWorld *magazine, May 1990.*

– *Five mice review*, MacUser *magazine, June 1990.* ★★★★★

"Theorist... surpasses the highly rated Mathematica... in interface and execution."
– MacUser *magazine, Editor's Choice Award, Best Math Program of 1989.*

Equations Made Easy.

$$\delta I_M = \frac{1}{2}\sum_n m_n \int_{-\infty}^{\infty} dp \left[-g_{\mu\nu}(x_n(p)) \frac{dx_n^{\mu}(p)}{dp} \frac{dx_n^{\nu}(p)}{dp} \right]^{-1/2}$$

To incorporate typeset quality equations into your technical documents quickly and easily, get ***Expressionist***®, the leading equation editor for the Macintosh.

"An excellent toolkit that all technical people should have at their disposal."
– *Jean-Louis Gassée, former Apple Computer Inc. executive.*

Call 1-800-UC-R-MATH
for demo disks, a video, and more info.

Prescience
939 Howard St. #102, San Francisco, CA 94103, FAX: (415) 882-0530

Circle 179 on reader service card.

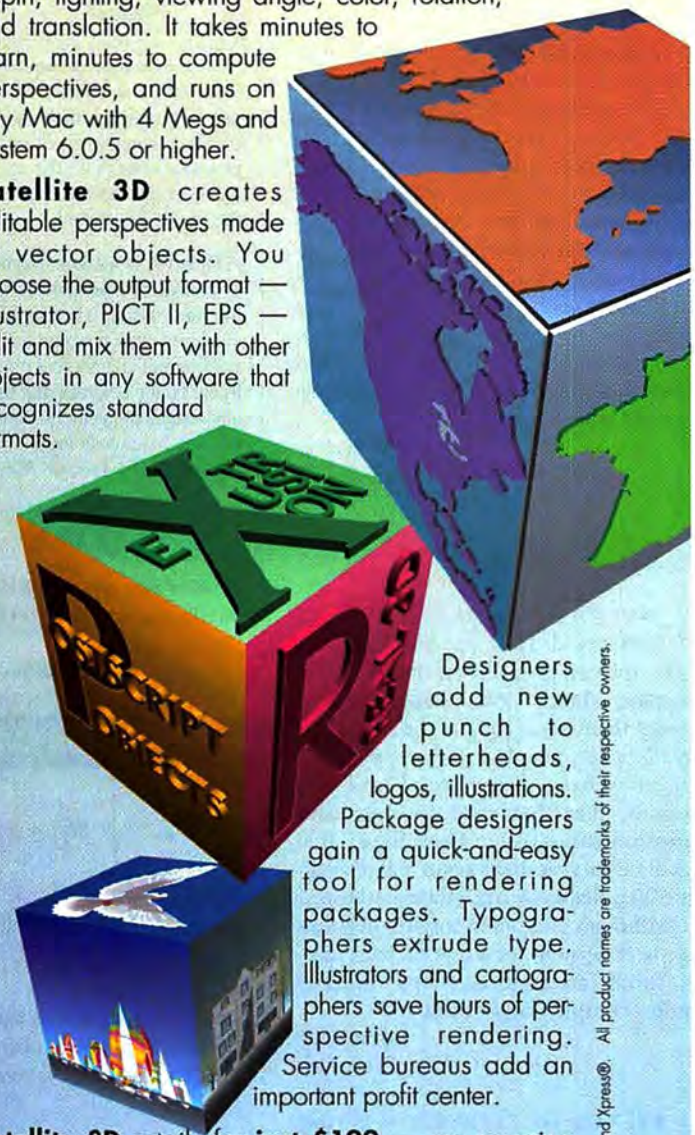
Illustrator® and Freehand® artists:

Add 3D impact to your art!

Today's competitive business environment demands fresh, new desktop graphic ideas to keep your clients — or boss! — interested.

Satellite 3D™ is an inexpensive, easy-to-use Macintosh® program that adds an exciting new dimension to your FreeHand or Illustrator graphics, putting them into **true 3D perspectives** — specifying depth, lighting, viewing angle, color, rotation, and translation. It takes minutes to learn, minutes to compute perspectives, and runs on any Mac with 4 Megs and System 6.0.5 or higher.

Satellite 3D creates editable perspectives made of vector objects. You choose the output format — Illustrator, PICT II, EPS — edit and mix them with other objects in any software that recognizes standard formats.



Designers add new punch to letterheads, logos, illustrations. Package designers gain a quick-and-easy tool for rendering packages. Typographers extrude type. Illustrators and cartographers save hours of perspective rendering. Service bureaus add an important profit center.

Satellite 3D retails for **just $199** — an amazing price/performance breakthrough for true 3D.

To order, call **1-800-645-8550**. Have your VISA or MasterCard handy for fastest service. And don't hesitate to call for more technical information.

CALLISCOPE™

Mountain View, California.
Tel. 415-964-8550 / Fax 415-964-8336
In Europe, call France:
(33) 67225555 / Fax (33) 67225487

Call 1-800-645-8550 today

This ad was created with FreeHand, Satellite 3D and Xpress®. All product names are trademarks of their respective owners.

CORRECTIONS

Ron Chan created the illustration in the photo on our April 1992 cover.

*The correct fax number for Deneba Software is 305/477-5794 (*Where to Buy, *April 1992). Deneba does not have a toll-free sales line.*

PLI's drives support A/UX partitions; PLI offers toll-free and on-line technical support, two-day repair turnaround, and free data recovery on request ("Seeking Midrange Hard Drives," February 1992).

*Our review of Carbon Copy Mac 2.0 refers to Timbuktu, not Timbuktu Remote (*Reviews, *April 1992).*

*Electronics Plus's toll-free number outside of California is 800/548-7135 (*Quick Tips, *April 1992).*

APS drives reviewed in "High-Capacity Hard Drives" (May 1992) do not contain contradictory information about termination.

MACWORLD HAS RESORTED TO printing hit pieces on readers who dare to bring to the attention of the publication the errors and misinformation that are in its pages. Anybody can make mistakes. What sets a professional apart from an amateur is that the professional is able to recognize, admit, and correct mistakes. The amateur justifies, covers up, and hides mistakes—condemning anyone who dares to bring a mistake to light. Your reviewer had the integrity to admit some of his mistakes on a public bulletin board service, according to Levy. But what has *Macworld* done in its pages? Ignored the issue and attacked those who brought the issue to light.

Brent Duncan
La Selva Beach, California

IN RESPONSE TO *THE ICONOCLAST* and in defense of the reviewers who write for your magazine, I would also feel angry, hurt, and frustrated if the program I just bought had a serious flaw that the reviewer of the product did not mention because he or she was worried about upsetting people.

Jonathan Dennerlein
Cincinnati, Ohio

Automating E-Mail

THE DAY YOUR ARTICLE APPEARED (*Lab Notes*, February 1992), our users starting calling us to say they use Tempo II Plus to automate their E-mail in much the same way you described needing to.

A Tempo macro can proceed in different ways, based on the presence of an alert dialog box, the message in the alert box, or even an image on the screen. And when you add conditional repeats to that conditional branching ability, a Tempo macro can perform the exact number of steps you need.

Richard Barron
President
Affinity Microsystems
Boulder, Colorado

Hard Drives: On or Off?

WHAT ARE THE ADVANTAGES TO leaving a hard drive on all the time, even when not in use (*Conspicuous Consumer*, March 1992)? Some people say leaving your equipment on saves wear and tear on the hard drives' disk mechanism. Others claim that leaving your equipment on only wastes electricity. I am confused.

Jeff Liss
Minneapolis, Minnesota

Drives built today have much higher mean-time-between-failure ratings, and turning a drive on and off should not have any noticeable effect on the life of the drive. With the dropping price of hard drives and the rising cost of electricity, the money you save by turning your hard drive off when it's not in use could possibly be enough to buy a larger, new drive when you need it.—Ed.

Tips for Monitors and Memory

I HAD TO THANK YOU FOR THE ARticle "Color Display Bargains" (March 1992). I'd just put in an order for a IIci and had very little money left when my mail arrived, bringing with it the latest issue of *Macworld*. This is the first time any magazine has given me the information I desperately needed just when I needed it most. Is Galen Gruman a mind reader?

Lon Poole in *Quick Tips* (January 1992) mentions some Macs that either work well or don't work well with the two-chip 1MB SIMMs. However, he didn't mention which category the IIcx or the IIfx fall into. The new Macs weren't mentioned either, but I assume these SIMMs work well with them.

Traci Espinet-Marquez
via America Online

Lon Poole's source of information, an Apple Service Note, didn't report on compatibility with any Macs other than the ones he mentioned. Other sources haven't noted any incompatibilities with the two-chip 1MB SIMMs and the IIcx, IIfx, and newer machines. However, those upgrading memory would be well advised to check with their dealer for updated news on compatibility, or to use only eight-chip 1MB SIMMs.—Ed.

Decompressing to DOS

DAVID POGUE'S REVIEW OF FILEcompression software for the Macintosh (*The Desktop Critic*, March 1992) was like taking the subway in New York: crowded, bumpy, and it missed my stop.

While he did mention that several of the Macintosh files can decompress text files compressed on the DOS side, there is precious little support for the DOS user who wants to decompress a text file archived by any of the Macintosh programs covered.

As it stands, StuffIt Deluxe (I'm told by Aladdin support) allows a Mac to compress a file into the old StuffIt 1.5.1 shareware format. Once in that format there are several DOS utilities that let a PC unzip those files; but none work with the new and improved commercial Macintosh versions.

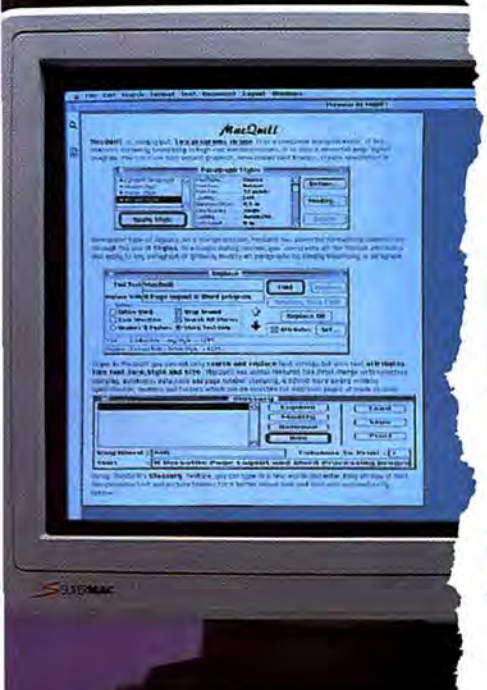
Bill Gram-Reefer
Concord, California

continues

MACQUILL IS A COMMON SENSE FULL FEATURED WORD PROCESSOR, AND WITH A CLICK OF THE MOUSE CAN CONVERT WORD PROCESSING TO PAGE LAYOUT, OR BACK TO WORD PROCESSING.

MacQuill
WORD PROCESSING AND PAGE LAYOUT IN ONE.

MACQUILL IS SO EASY TO USE YOU CAN BE DOING PAGE LAYOUTS, CREATIVE FLYERS, STORIES WITH TEXT FRAME LINKING ABILITIES, NEWSLETTERS, LOGOS, ADS, GRAPHIC IMPORTING IN MINUTES.



Introducing MacQuill.
The Word Processing / Page Layout program in **one**, that's simple to use.
Sug. Retail **$149.**
Introductory Price
$99.

Mail us your MacQuill registration card and a disk containing a MacQuill document you created, and we will send you a certificate to be our guest for 4 days at a fabulous resort, *your choice*
Palm Springs Ca.; Orlando Fl.;
Ft. Lauderdale Fl.; Las Vegas Nv.;
Hilton Head Island Sc.

1 800 524 3315

NEST SOFTWARE
Where ideas are born, take off and fly.

Circle 177 on reader service card

More on the New Look

SINCERE CONGRATULATIONS ON your new layout design. In this day and age when computer publishing allows publications to change their format as often as changing socks, I hope that *Macworld* will stick with this design. The February issue was a pleasure to read.

The biggest improvement overall was, by far, the *Macworld News* section with its free-flowing style. I usually found this section quite lackluster, and it ended up being the part of the magazine that I read during porcelain library visits.

Christopher Hyatt
Pittsburgh, Pennsylvania

WHAT ON EARTH HAVE YOU done to your magazine? *MacBulletin* looks like an advertisement; I almost passed it by. Jerry Borrell's and Steven Levy's departments look positively cramped—whoever put the layout together must feel that leaving white space is the eighth deadly sin. On top of that, the pages of those two departments are strikingly uninteresting visually: no color, precious little variation in typeface, and black-and-white photos of the authors.

The *News* section is just the opposite taken to an extreme. Four skinny little columns; two different heading and body text fonts for the items; some sidebar items on a color background, others with a color box around them; some sidebars one column wide, others two; pictures scattered hither and yon. If the departments were visually uninteresting, the *News* section was a cacophony of fonts, boxes, and colors.

I have no quarrel with your writers and editors. Just stand back and look at the layout again, okay? I don't think my eyes can take too many more issues like February's.

Eric Rountree
Halifax, Nova Scotia, Canada

I HATE YOUR NEW PAGE-LAYOUT style. I have no desire to look through the magazine, much less browse or enjoy. The one improvement you've made is with the *Contents* page. After that it is a trip backward. I never minded the ads as long as the articles stood out more than the ads. That day seems to be gone. Now its hard to find or distinguish the feature articles quickly first before settling back with the ads later. I'm hoping this is just a transition period on the way back to a good look.

Betty Horner
Milpitas, California

Retail or Mail Order?

I AM A BIG FAN AND USER OF CREDIT card–based mail-order merchants, but my most recent CPU shopping led me to a big surprise. The nearest mail-order competitor charged at least $100 more for a CPU than the walk-in retailer did, even including the tax. It seems the walk-in store paid attention to Apple's price reductions, while the mail-order companies think their CPUs are extra special.

Thomas Burke
Austin, Texas

I JUST BOUGHT MY FIRST MAC through the mail. The mail-order vendors know more about the hardware than the dealers do. They were willing to work with me and answer my questions. On the other hand, when I told the local Apple-authorized reseller I was more interested in processor speeds of the LaserWriter IIg and the IINTX, he failed to see why. Does Apple really expect me to pay full list price to a company that doesn't even know what it's selling?The key to successful mail ordering lies in knowing what you want. Being an informed consumer is essential.

Paul Saccone
Paoli, Pennsylvania

continues

INTELLIGENT ACCESSORIES. VERY SMART PRICES.

Whether you're using a PowerBook, networking Classics, or organizing a single workstation, there's a full line of MediaMate accessories to help you get more out of your Mac. More convenience. More performance. More comfort.

MediaMate. Intelligent accessories. Very smart prices. In stores nationwide.

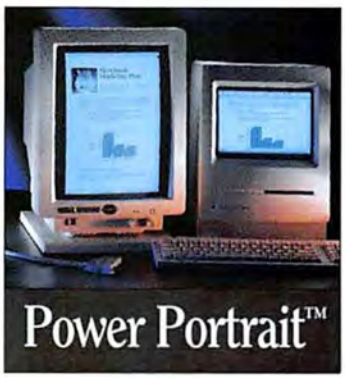
MediaMate

©1992 Hunt Manufacturing Co.

PowerBook, LaserWriter and Mac are registered trademarks of Apple Computer, Inc.

Circle 199 on reader service card

Just Plug It In!



Plugs directly into the SCSI port of any Mac Plus, Classic, Classic II, SE, SE/30 or PowerBook. Connects anywhere on the SCSI chain. Complete with cable.

Full Page Power at Its Best.

Full-page power has never been easier to install or more affordable. Our 15" full-page Power Portrait™ display plugs directly into the SCSI port of your Mac. No cards to buy or install. No loss of slots. No external box. With **Power Portrait**, it's so easy!

Built-in QuickDraw acceleration lets you race through graphic displays and minimize scrolling time. Select 72, 80, or 88 dpi to view your work at its best resolution. Hardware pan lets you create a virtual two-page desktop to power through multi-page tasks. And **Power Portrait** meets the latest Swedish guidelines for reduced VLF/ELF magnetic field emission. **Power Portrait** comes in two coordinated colors, granite or platinum, for a sleek, well-matched look.

Call **(800) 845-8086 EXT 100** for details. You're just a plug away from full-page power!

SIGMA DESIGNS

47900 Bayside Parkway • Fremont, CA 94538
Tel: (510) 770-0100 • Fax: (510) 770-2640

© 1992 Sigma Designs, Inc. Power Portrait and Low-Emission are trademarks of Sigma Designs, Inc. All other brand names, trademarks, and registered trademarks are the property of their respective owners.

Circle 176 on reader service card

Loving the System 7 Finder

IN RESPONSE TO THE LETTER BY Lawrence C. Stedman (*Letters*, March 1992), I want to say I find the enhanced Finder in System 7 the best thing going. It makes for the easiest computer interface on the market today and therefore should be the most productive. Of course there are basic concepts to learn to master its use, and there always will be. There is no such thing as a computer that is set up for every user right out of the box. If computer manufacturers tried to put everything everyone would like into their operating system, you wouldn't like it.

Mark Esposito
Houston, Texas

Power Psychology

JUST WHAT DOES EVERYONE WANT from a Mac or any computer? What we want, admit it or not, is power. Power to manipulate information, to understand, to journey to new lands in cyberspace. If there were a Motorola 68090 that could manipulate the space-time continuum, we would all want it too. Perhaps the greatest needs of all are to understand and to create, and that is what drives us toward increased speed, productivity, performance, and potential.

The Macintosh graphical user interface is a most elegant extension of human learning psychology. Pundits in Macland worry about gifts to IBM and the unfriendly monoliths of corporate America. If Apple can only give this gift to IBM, then what a wonderful gift it will be.

Roger Fuller
Sabattus, Maine

Curious about ELF

I AM WONDERING IF MORE SPECIFIC research results on the VLF/ELF emissions issue have been published since July 1990, and if so, is it possible to obtain reprints.

Laurie Hoey
Point San Quentin, California

Macworld Lab tested the extremely-low-frequency magnetic emissions of 32 color monitors in "Seeking ELF Relief," October 1991. Macworld Lab also tested seven color monitors for "Color Display Bargains," March 1992, including model M1297, Apple's new low-emission 13-inch color monitor. Back issues are available for $6 each from Snyder Newell, Inc., P.O. Box 7046, San Francisco, CA 94120-9727.—Ed.

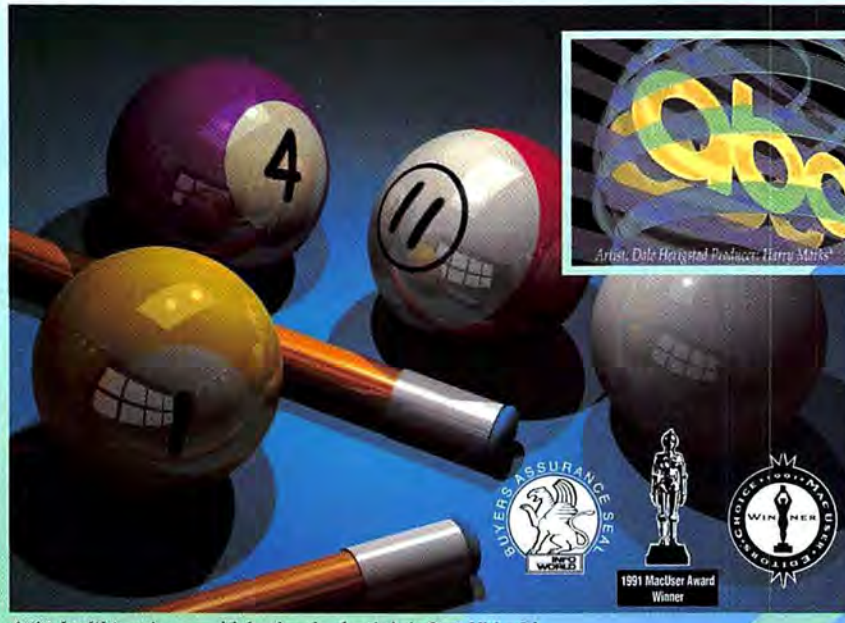
Adapt to Gray-Scale

YOUR JANUARY 1992 ARTICLE "GETting Started with Choosing a Mac" said some unflattering things about the SE/30's video capabilities. It says the monochrome screen can't display shades of gray. The problem lies not in the screen, but in the monochrome video circuitry. Micron Technology (208/368-2100, 800/642-7661) offers a gray-scale adapter that rectifies the problem. Also, the SE/30 has 32-bit color QuickDraw resident in ROM and can access gray and color external monitors. This ability for video expansion was one of the reasons I chose the SE/30. I have no desire to downgrade to the Classic II.

Charles Albrecht
Arvada, Colorado

Letters should be mailed to *Letters, Macworld*, 501 Second St., San Francisco, CA 94107, or sent electronically to CompuServe (70370,702), MCI Mail (294-8078), America Online (Macworld), or AppleLink (Macworld1). Include a return address and a daytime telephone number. We regret that, due to the high volume of mail received, we are unable to respond personally to each letter. We reserve the right to edit all letters. All published letters become the property of *Macworld*. **m**

PHOTOREALISM



Artist: Jon Watson; image modeled and rendered entirely in StrataVision 3d.

StrataVision 3d is realistically the best 3D program on the Mac. ● Already donned with top industry awards, there's even greater power with version 2.5. New modeling features give you more control over objects. Apply realistic textures, set reflectivity and soften shadows with improved ease. Animations of flexable objects offer stunning results. StrataVision 3d 2.5 still has a realistic price: $995. ● Whether you're an illustrator, a designer or an architect, we have the realistic solution. Call toll-free 1-800-869-6855 today.

STRATA
The Virtual Studio™ Company.
Strata, Inc. / 2 West St. George Blvd., Suite 2100 / St. George, UT 84770
1-800-869-6855 ext. 400

*StrataVision 3d created the ABC image for animation storyboards. StrataVision and StrataVision 3d are trademarks of Strata, Inc.

Circle 293 on reader service card

Which Comes First...

DUAL PAGE MONOCHROME DISPLAY WITH VIDEO CARD
Screen size (flat) — 19 inch diagonal
Resolution — 74 DPI WYSIWYG (same as Apple Two Page)
Vertical Refresh Rate — 75 Hz

FULL PAGE MONOCHROME DISPLAY WITH VIDEO CARD
Screen size (rounded) — 15 inch diagonal
Resolution — 80 DPI WYSIWYG (same as Apple Portrait)
Vertical Refresh Rate — 75 Hz (same as Apple Portrait)

FULL PAGE GRAY-SCALE DISPLAY (256 SHADES) WITH VIDEO CARD
Screen size (flat) — 15 inch diagonal
Resolution — 80 DPI WYSIWYG (same as Apple Portrait)
Vertical Refresh Rate — 75 Hz (same as Apple Portrait)

The Display Card or the Display?

Silly question. For Lapis owners that is. You won't have to spend another second debating which comes first, because at Lapis they both do. Take our cards, for instance. For those of you who already have a monitor, we've got the most comprehensive line of display cards to drive it, both monochrome and color. We also have display cards for every Macintosh computer. In fact, you'll never have to go anywhere else for a display card. We've got all the bases covered. And when you turn to Lapis for a display solution, whether dual page mono-chrome, full page gray scale or full page monochrome, you'll get more than just a monitor, you'll get an entire system, Lapis card and all. You see, sometimes it's okay to put all of your eggs in one basket. So whether you're in the market for a display card or a complete display solution, Lapis makes sure that you'll always come out first. Of course that also goes for our service and support. We'll answer every question you ever wanted to ask when you call our technical support line. (Just don't try that chicken and egg one, it gets 'em every time.) Just call us at **1-800-43-LAPIS** for the location of the nearest Lapis dealer. Any more questions?

Lapis has a full line of Apple-compatible, fixed and programmable, display cards.

Lapis™

Unparalleled Service and Technical Support • One-Year Warranty • Dealer Inquiries Welcome

©1991 Lapis Technologies, Inc. All rights reserved. Lapis and the Lapis logo are trademarks of Lapis Technologies, Inc. Apple and Macintosh are trademarks of Apple Computer, Inc.

End users circle 202 on reader service card

Dealers circle 204 on reader service card

PowerBook.

"One of the best-designed products of the year."
–*Time*

"One of the best products of the year."
–*Fortune*

"Hardware product of the year."
–*InfoWorld*

"One of the best new products of the year."
–*Business Week*

The power to be your best.

PowerBook.

The PowerBook 170 lets you take the awesome power of a Macintosh IIci in your briefcase with room to spare.

The new PowerBook™ computer from Apple is more than the lightest, smallest Macintosh® computer ever.

It's a whole new standard of mobile computing.

It's light. It's small. And it boasts the kind of bright, backlit, high-resolution screen required for Macintosh-quality graphics.

It's expandable. It's affordable. And its unique design makes it extraordinarily comfortable to use even in the most uncomfortable coach seat.

System 7 is standard equipment. So is a rechargeable battery that runs for up to three hours.

It even includes a remarkable new program called AppleTalk® Remote Access. This allows a modem-equipped PowerBook to tap the power of your desktop Macintosh – and any office network that supports AppleTalk – from just about anywhere there is a telephone.

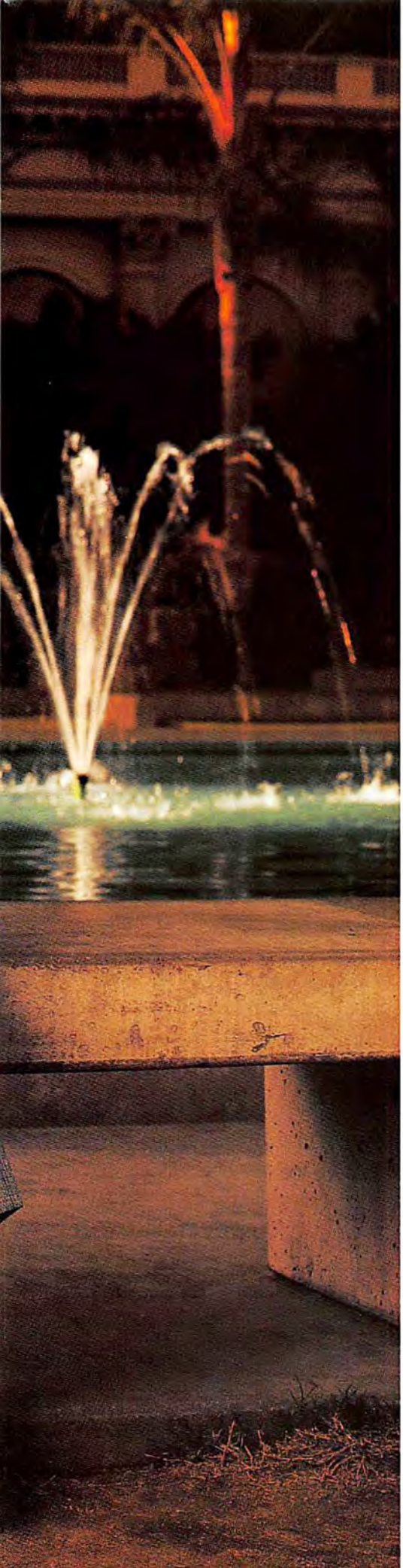
You can retrieve files from the Macintosh in your den without leaving your hotel room. Or print an order form on a printer in your office without leaving your client's office. Or send e-mail from wherever you happen to be to anyone on your network.

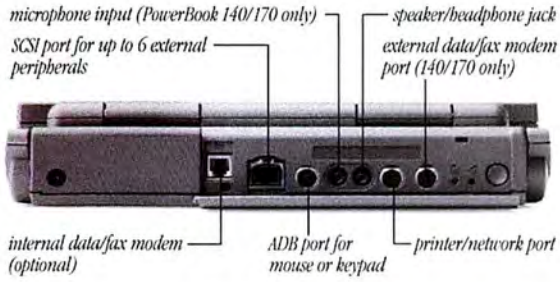
With an internal data/fax modem, you can even send your work directly to fax machines.

It's the power to work anywhere you want, anytime you want, in whatever way works best for you. The power to be your best.®

The power to be your best.

Computer, Inc. Apple, the Apple logo, AppleTalk, Macintosh and "The power to be your best" are registered trademarks, and PowerBook and SuperDrive are poration. SoftPC is a registered trademark of Insignia Solutions Inc. InfoWorld is a trademark of InfoWorld. This ad was created using Macintosh computers.





The extremely affordable PowerBook 100 offers twice the performance of a Macintosh Classic.

The PowerBook 140. The performance of a Macintosh IIcx engineered to fit into a mere 6.8-pound package.

The AppleTalk Remote Access software (included) gives you access to the Macintosh on your desk via phone – so you can use your files, e-mail or network resources from almost anywhere.

An integrated trackball and palm rests make the PowerBook keyboard extraordinarily comfortable for both left- and right-handed people to use.

Every PowerBook can run thousands of Macintosh business and education programs. And with the built-in Apple® SuperDrive™ (an external option on the PowerBook 100), it can read from or write to MS-DOS formatted disks, too.

PowerBook	Weight	Memory	Hard Disk	SuperDrive	Processor	Internal Modem
100	5.1 lb.	2/4MB	20/40MB	Optional ext.	16 MHz 68000	Optional
140	6.8 lb.	2/4MB	40/80MB	Internal	16 MHz 68030	Optional
170	6.8 lb.	4MB	40/80MB	Internal	25 MHz 68030/ 68882 coprocessor	Optional

All PowerBook models expandable to 8MB RAM.

For the name of your nearest authorized Apple reseller, call 800-446-3000, ext. 700. To run MS-DOS software, simply install a program like SoftPC. *© 1992 Apple trademarks of Apple Computer, Inc. Classic is a registered trademark used under license by Apple Computer, Inc. MS-DOS is a registered trademark of Microsoft Co*

A true culinary adventure

Get this coupon free with your order 'til 6/30/92.

The one-and-only *Marlows' Cafe.*

Every town has one – if it's lucky. A place where the locals come to chew the fat (so to speak), drink their coffee, digest the local gossip, and talk politics for hours on end. In our hometown that place is *Marlows' Cafe.* No spelling error here: you see, the locals call themselves "Marlows." And this place definitely belongs to them.

It's been a diner of sorts for years – at one time it was a Harley-Davidson shop. But when Darlene and Ray bought it early last year they really turned it into something special. Not only did they do extensive renovations – Ray's a contractor when he's not running the grill – they also transformed it into what Darlene proudly calls "the greatest conversation place ever. Even flatlanders are made to feel right at home."

You'll never go hungry buying from us.

Because we'll always give you everything you need: the best information, the best service, the best support, and now, even the best food. You see, we figured it would give you a nice feeling to know that, no matter what, there's always a free home-cooked meal waiting for

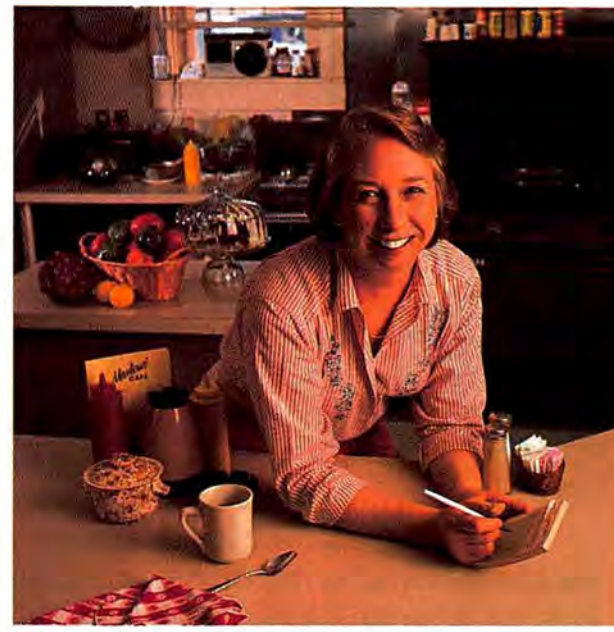
awaits you in Marlow, NH.

you here in Marlow. That's why we're enclosing the coupon pictured above in every order we ship until June 30, 1992.

Keep it in your wallet or pin it on the wall. Either way, you can rest assured that next time you get a hankering for homemade chicken vegetable soup, or a Cheeseburger Deluxe (Thursday's special), or some raisin/cinnamon bread pudding, you can just hop on a plane, train, or car and point yourself in our direction.

You want atmosphere?

Marlows' Cafe takes the cake. There are great old photos of Marlow on the walls and even a letter from the White House thanking Darlene for her invitation to the president to visit during the primary. Outside, a big sign offers the daily special and/or a tasteful greeting like



Darlene is all ready to take your order at Marlows' Cafe.

"Buy American, eat here!" or (during hunting season) "Stop here or we'll shoot." And if you can't clean your plate, don't worry. All the leftovers are recycled by the neighborhood hogs.

As waitress and songwriter Diane puts it: "Yes everything tastes finer/'Cause you see it being made. Come to Darlene's Marlow Diner/ So we can get paid."

© 1992 PC Connection, Inc. MacConnection is a division and registered trademark of PC Connection, Inc., Marlow, NH. All other trademarks remain the property of their respective companies.

We're first in more

Non-stop innovation sinc

1. Overnight Shipping 'til 3:15 a.m. $3.

What we'd *really* like is to be able to deliver your order a couple of seconds after you call. Unfortunately, the old space-time continuum makes that a bit difficult, but we have taken some quantum leaps in that direction. We were the first Mac company to offer $3 overnight shipping. And with our distribution center at Airborne Express, we can keep taking orders for "overnight" delivery of in-stock items 'til 3:15 a.m. Eastern Time.

2. Order Weekends. Get it Monday. $3.

Working on the weekend? Call us Friday (or 'til 3:15 a.m. Saturday) and we'll deliver by Saturday. *Ordering* on the weekend? Call by noon Sunday, and we'll deliver on Monday—which makes a whole lot more sense than having to wait 'til Tuesday. This service is for in-stock items and isn't available to all areas, but it is in most places. The cost? Still just $3.

3. Toll-Free Technical Support.

Some people don't want to call our toll-free tech support line because they think it's just for real complex questions. Well, even though we enjoy a good challenge now and then, we like the easy questions, too. After all, they're easier to answer. So whether you're using a product you just bought or discovering some strange wrinkle a few years down the road, give us a call. And find out why we were a 1991 *Macworld* World Class Award Nominee for Best Customer Support!

4. 30-60 Day Money-Back Guarantees.

Accept no substitutes! This is the only true money-back guarantee program, covering both opened and unopened boxes. If a product doesn't work out, call for a return authorization and send it back with all the original packaging. Just check the line listing to see if (and for how long) the product you want is covered. (Note: in rare cases we've had to limit the number of returns.)

ways than one.
984. And counting.

5. No Foam Peanuts.

Instead, we use a packing paper that's made from recycled magazines. And we print our catalogs on recycled paper. And we have an in-house recycling program that has reduced waste by 75%. And we make a concerted effort to encourage our vendors to minimize packaging. All of which puts us and our hometown of Marlow, NH (pop. 600 or thereabouts) at the forefront of Mac environmental politics. A position we're happy to share. Any ideas?

6. One-Minute Mail Order.

This little breakthrough is as much about ease as it is about speed. We use Caller ID* to access your previous ordering information instantly. Which means you don't have to rattle off all your vital statistics for the umpteenth time. So if you know what you want, including product numbers, we can take your order in record time. It's convenient, fast, and another way we keep our costs and your prices as low as possible.

*We can block at your request.

7. A Free Lunch!

We don't want our customers to ever go away hungry. So from now through June 30, 1992 we're including a coupon for a free meal at Marlows' Cafe with every order. Just stop by next time you happen to be driving through Marlow on your way to Goshen, Gilsum, Stoddard, or Alstead. What's that? You don't have any plans to visit rural New Hampshire in the near future? Why not make a little detour next time you go to Boston? (Or a really big detour next time you go to Tokyo?) Don't worry, the coupon's good as long as Darlene and the crew are still really cookin'. And, until you make it up here to Marlow, the coupon is certainly suitable for framing.

Removable drives.

Endless storage possibilities.
Removable cartridge drives are the answer for anyone archiving or transporting multi-megabytes of data—in other words, anyone trying to deal with today's sophisticated applications. And now we're selling MDS drives at a super-low price to make this essential technology available to more users. **MDS Drives** feature the acclaimed SyQuest mechanism and are designed specifically for use with a Mac. Choose the mild-mannered **MDS 44** or the heavy-duty **MDS 88**. Each drive includes one cartridge and all necessary cables.

Both drives have a 20ms average seek time—fast enough to use as your everyday drive as well as for backup—and 60,000-hour MTBF (mean time between failure). Other features include a push-button SCSI ID selector (so you can change the SCSI ID without special tools) and two switched power outlets (to power the drive and two other devices from a single switch). MDS drives are also easy to daisy chain because they have dual 50-pin SCSI connectors and an external terminator.

Remarkable prices.

And software to boot!

MDS drives come with all the software you need for low level formatting of cartridges, selecting interleaves for fastest data access, defining partitions, and initializing partitions in either Mac or A/UX formats. There's also disk caching and volume password protection. You'll also get your choice of either *Salient's AutoDoubler* or *Symantec's Norton Utilities for the Mac* with each drive you purchase at no extra charge.

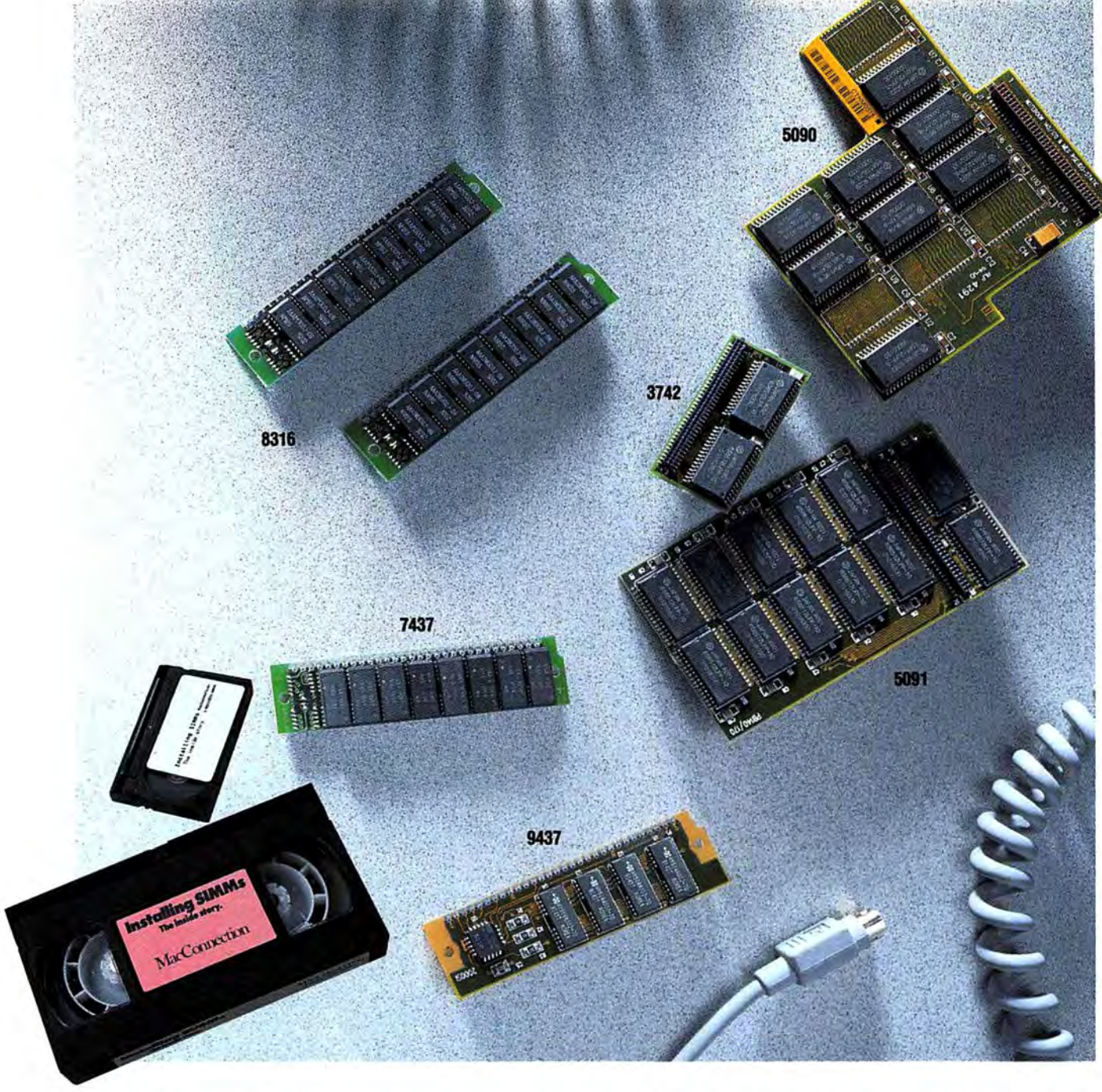
It's quite a package: a dependable SyQuest drive mechanism, cartridge, formatting and operating software, and either AutoDoubler or Norton Utilities, all backed by a rock-solid 2-year warranty and our toll-free technical support. Ready to get removable? Give us a call.

MDS Drives ... 60 day MBG

5533	MDS 44 SyQuest w/AutoDoubler.	**$499.**			
5532	MDS 44 SyQuest w/Norton Utilities	**499.**			
5534	MDS 88 SyQuest w/AutoDoubler..	**599.**			
5535	MDS 88 SyQuest w/Norton Utilities	**599.**			
6592	44 MB Cart. *(single)*	**69.**	5529 *(3)*	**199.**	
5528	44 MB Cart. *(5 pak)*	**329.**	9728 *(10)*	**649.**	
5531	88 MB Cart. *(3 pak)*	**312.**	5530 *(5)*	**512.**	

1-800/800-3333

MacConnection®



Not enough RAM?

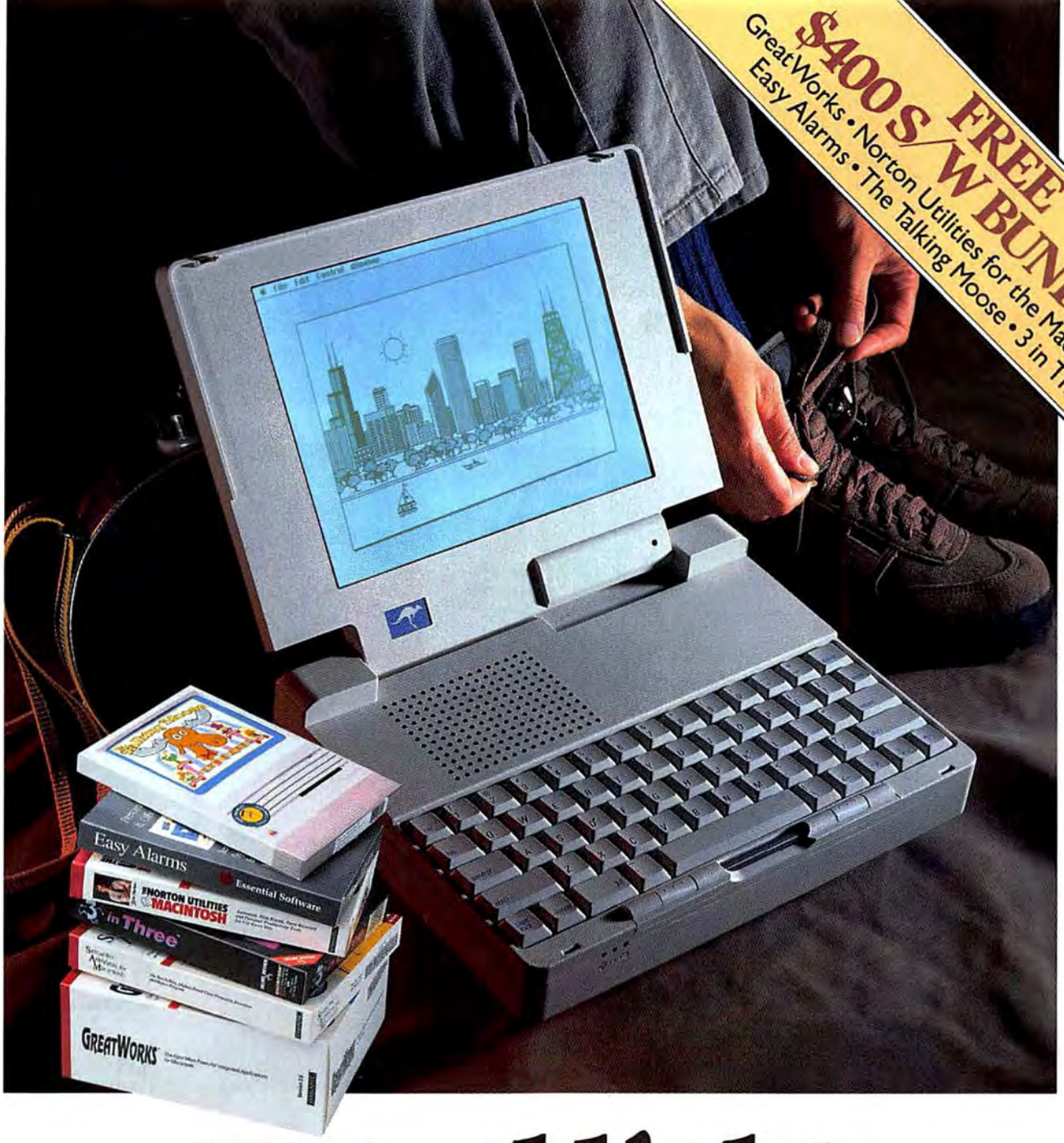
Get relief fast.

Do we have SIMMs! And at the lowest prices around. All SIMMs come with a full 2-year warranty as well as a free instruction manual, and installation video from PCTV. And all orders are shipped overnight. So when you need more RAM, call MacConnection right away and see how fast we can improve your memory.

We also carry 2 MB, 4 MB, and 6 MB PowerBook modules. We recommend the installation of the modules be done by an authorized Apple Service Center.

Note: prices and availability of SIMMs and PowerBook modules can be somewhat like the weather, and are subject to change without notice.

8316	1 MB SIMMs *(80ns, set of 2)*	**$69.**
9437	2 MB SIMM for IIsi or LC	**69.**
7437	4 MB SIMM *(80ns)*	**129.**
7600	4 MB SIMMs *(80ns, set of 4)*	**499.**
5478	16 MB SIMMs Quadra 700 *(4)*	**2799.**
5482	16 MB SIMMs Quadra 900 *(4)*	**2799.**
3742	2 MB PowerBook Module	**149.**
5090	4 MB... **269.**	5091 6 MB... **399.**



Travel light.

Enjoy Mac compatibility.
With System 6.0.7 *and* 7. Plus the CPU and hard disk are upgradable. The **Outbound 2030E** compares favorably to Apple's PowerBook 140. It has a 25 MHz processor (vs. 16 MB) and up to 14 MB of RAM (vs. 8 MB). The **Outbound 2030S** races past the PowerBook 170 with a faster processor (33 MHz vs. 25 MHz) and more potential RAM (14 MB vs. 8 MB). Plus you get a full-size keyboard, 17% more displayable screen area, and a battery-backed silicon memory option in a lighter and smaller package. (Outbounds weigh just 6.25 lbs.) And we include over $400 of free software. By the way, MacConnection is the exclusive mail-order reseller for **Outbound Notebook Systems**.

2161	2030E/440 *(68ec030, 4 MB, 40 HD)*	**$2799.**
2147	2030E/442 *(same w/math copro.)*	**2899.**
2655	2030E/880 *(68ec030, 8 MB, 80 HD)*	**3399.**
2653	2030E/882 *(same w/math copro.)*	**3499.**
2106	2030S/460 *(68030, 4 MB, 60 HD)*	**3399.**
2105	2030S/462 *(same w/math copro.)*	**3499.**
2673	2030S/880 *(68030, 8 MB, 80 HD)*	**3859.**
2669	2030S/882 *(same w/math copro.)*	**3999.**

1-800/800-3333
MacConnection®

Visual delights.

From typefaces to movies.
Adobe has the graphic world covered. Their new **Adobe Premiere** uses QuickTime technology to create high-quality digital movies. Use **Adobe Illustrator** for professional designs from simple drawings to elegant artwork and then do the pre-press on **Adobe Photoshop**. And **Adobe Streamline** lets you convert bitmapped images into PostScript language files. We also have the entire **Adobe Type Library** and **Adobe Type Sets for Business**.

Adobe Systems

4145	❼Adobe Premiere 1.0	**$305.**
8171	❼Adobe Illustrator 3.2 *(with ATM)*.	**368.**
6644	❼Adobe Photoshop 2.01	**548.**
5001	❼Adobe Streamline 2.0	**$122.**
5750	❼Adobe Type Manager 2.0.3	**59.**
6098	❼Adobe TypeAlign for ATM 1.0.4..	**62.**
	Adobe Type Sets for Business:	
2221	❼Letters, Memos & Faxes	**95.**
2223	❼Invitations & Awards	**95.**
2219	❼Spreadsheets & Graphs.....	**95.**
2222	❼Overheads & Slides.....	**95.**

Fast and safe.

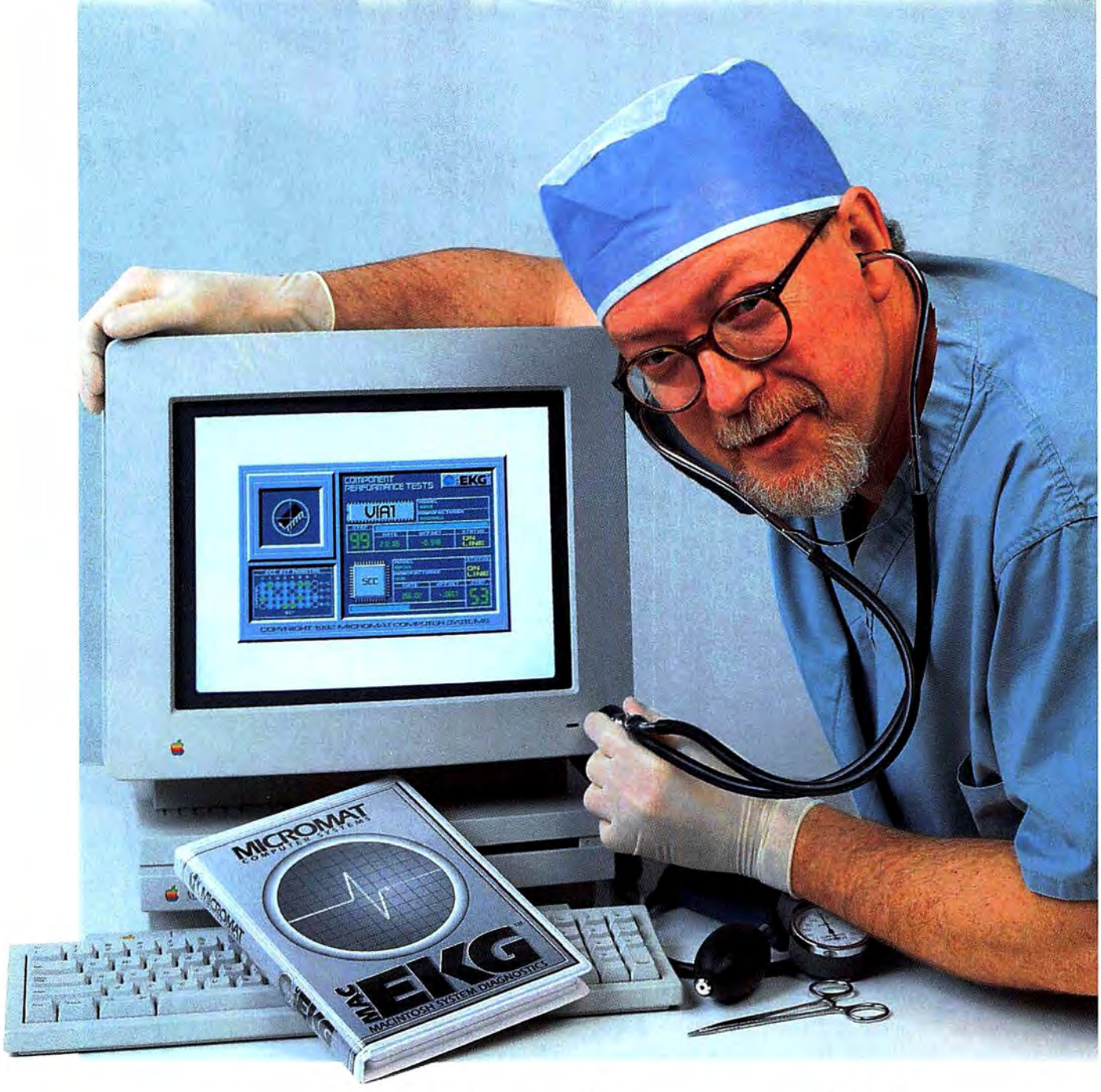
Electronic access control for the Mac.
The **MaccessCard Reader** is a very convenient new high-tech security add-on for your Mac. Forget about passwords. Working with **FileGuard** 2.5 or higher software, it controls access to your Mac using magnetically-stripped cards and an (optional) access key. You get two cards with the system, but you can quickly train it to recognize *any* ID card, such as your credit card, company or student ID card.

After an authorized user has turned on your system with MaccessCard Reader, FileGuard can continue to control access to all or any part of it (specific hard disk partitions, folders, files, applications, etc.). *MacUser* (5/91) gave both the hardware and software a 5 Mice rating and wrote: "It's sleek, fast and safe. I highly recommend it."

ASD Software ... 30 day MBG

9440	MaccessCard Reader *(requires FileGuard)*	**$299.**
7085	❼ FileGuard 2.7 *(1 user)*	**138.**
9439	❼ MaccessCard/FileGuard (1) Bundle	**399.**

1-800/800-3333 MacConnection®



Heal thyself.

Get to the heart of your Mac.
Uncover the mysteries, intricacies, and idiosyncracies of your Mac with **MacEKG II**, the complete diagnostic utility for user and specialist alike. Now with advanced chip-level diagnostics previously available only to Authorized Apple Technicians. This intrepid program looks at your entire system, including the effects of applications loaded and accessories attached, and tells you how your resources are being used. Any processor hogs eating up performance? Any unnecessary INITs gumming up the works? MacEKG II will find them.

Responsible for multiple Macs? MacEKG II will really help speed diagnosis by revealing, for example, the extensions no one mentioned they were running. And you can use the Reactivator to repeatedly reboot while MacEKG II observes and maintains a log to point you in the direction of the problem. So make sure your Mac keeps on ticking with MacEKG II.

MicroMat Computer Systems
3732 ❼ MacEKG II *(Apr. '92)* ..... **$110.**

Just imagine...

Master multimedia and 3D.

The merger of MacroMind and Paracomp has brought together an extraordinary collection of design tools. Assemble text, graphics, animations, music, and sound effects into multimedia presentations or instructional tools with **Paracomp Magic**, or the even-more-sophisticated **MacroMind Director**. **MacroMind Three-D** lets you professionally animate and render imported 3D models and export them into MacroMind Director. For 3D architectural modeling there's 1991 Eddy Award winner **ModelShop II**. And **SwivelMan** combines *Swivel 3D Professional, MacRenderMan* and *QuickPics*, the industry standards for Mac 3D modeling and rendering.

MacroMind•Paracomp ... 30 day MBG

3148	❼Paracomp Magic	**$275.**
5087	❼MacroMind Director 3.1	**799.**
2246	❼MacroMind Three-D 1.0	**999.**
5028	❼ModelShop II	**619.**
3450	❼SwivelMan 1.0	**619.**
7441	❼Swivel 3D Professional 2.0	**479.**
3440	❼QuickPics	**103.**

1-800/800-3333

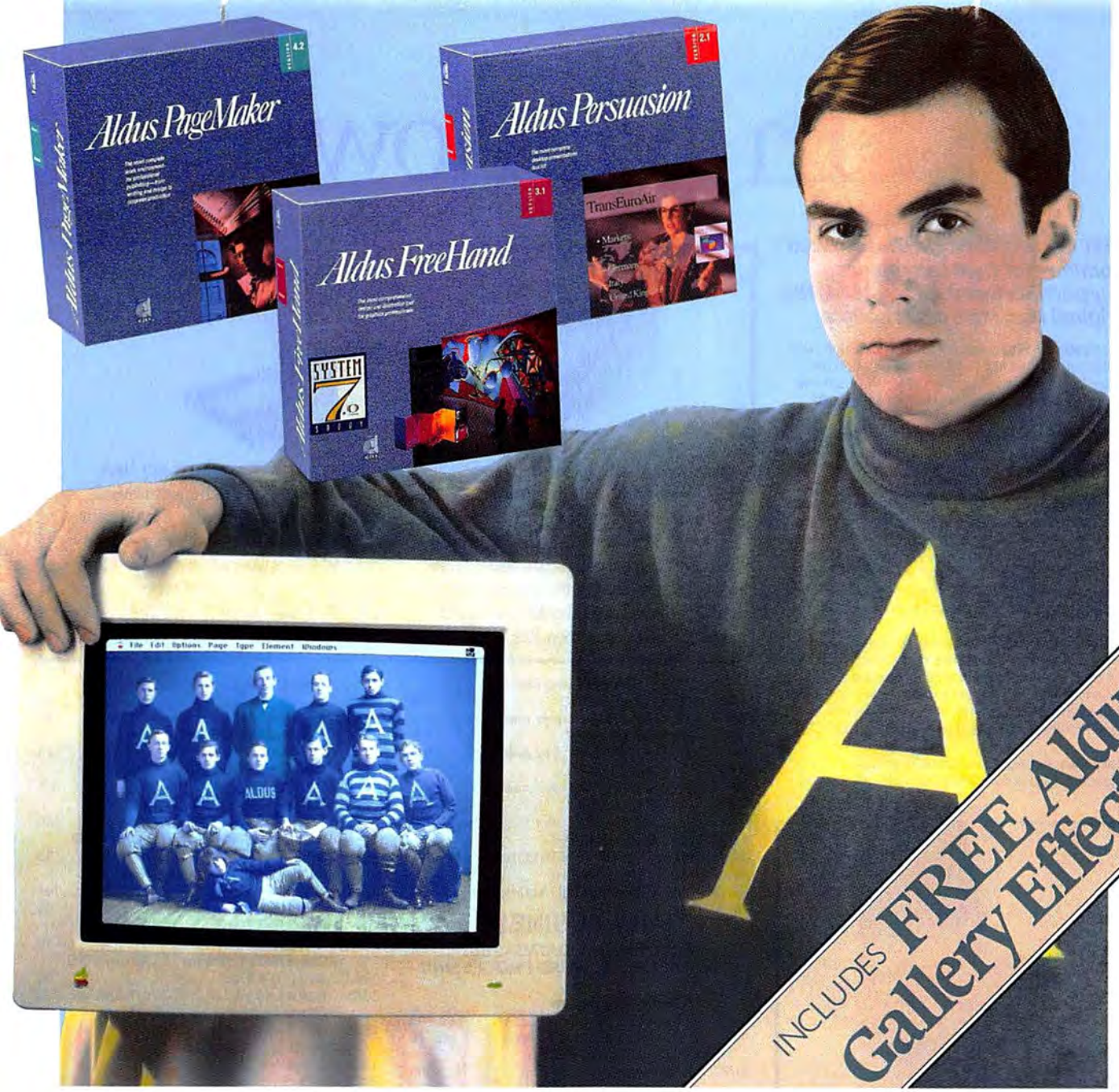
MacConnection®

Run DOS on Macs.

Your next PC could be a Mac.
Insignia Solutions has a wide range of options for running virtually any DOS program on your Mac. **Universal SoftPC** emulates a basic PC/AT and is recommended for text-based apps. For heavy-duty graphics and number crunching, **SoftAT** adds EGA graphics, a math coprocessor, expanded memory, and CD-ROM support. Add **SoftNode** to either one to share DOS applications over a Novell network. **Entry Level SoftPC** is designed for the occasional user who doesn't need SoftNode compatibility or CD-ROM support. And **AccessPC** lets you mount, view, and manage DOS files on floppies, cartridges, and magneto-optical drives directly from your Mac.

Insignia Solutions

4089	❼ Universal SoftPC 2.5	**$195.**
3229	❼ SoftAT 2.5	**299.**
3441	❼ SoftNode 1.0	**105.**
3454	❼ SoftNode 1.0 *(10 user)*	**699.**
9726	❼ Entry Level SoftPC 2.5	**125.**
7557	❼ Access PC 1.1	**60.**



Join the A Team.

Top-of-the-line design.

For desktop publishing, presentations, and design, put the Aldus Team on your side. **Aldus PageMaker** is an extremely flexible and intuitive environment for writing, designing, and producing professional-quality pages. And it now includes *Aldus PrePrint* 1.5 for preparing spot- and process-color separations on your Mac. **Aldus FreeHand** is ideal for designing anything: simple logos, signs, and forms; marketing and advertising collateral; and even technical illustrations, fine art, and textile designs. **Aldus Persuasion** streamlines the creation of quality presentations. Use the integrated outliner to get your ideas in order and then generate professional transparencies or 35mm slides, speaker notes, and audience handouts. And now you get a free copy of *Aldus Gallery Effects* with the purchase of any of these products.

Aldus ... 30 day MBG

7088	❼ Aldus PageMaker 4.2	**$494.**
1330	❼ Aldus FreeHand 3.1.....	**394.**
4751	❼ Aldus Persuasion 2.1	**325.**

1-800/800-3333
MacConnection®

In Marlow

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

Our **System 7 Video** featuring *Macworld* Contributing Editor Lon Poole is just $9 (2244) or *free* when you order Apple's System 7 for $99 (1074). We also have Lon's *Macworld Guide to System 7* for $19 (2238).

Products preceded by ❼ are compatible with **System 7**. For *specific features* of System 7, please ask your salesperson when placing your order.

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.

We have over 3,500 items to choose from, and we carry only the very **latest versions** of each product. For products or versions not yet released at press time we've indicated the expected availability dates as supplied to us by the manufacturers. Also, all software is not copy-protected, unless indicated otherwise by *(CP)*.

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

Outbound Systems, Inc.

❼ *Outbound Notebook Systems*–Includes 25 MHz or 33 MHz 68ec030, 4-14 MB of memory, a 40, 60, or 80 MB hard drive and math coprocessor option. Limited time offer: receive free software bundle (over $400) with each unit... see listing.

COMPUTERS

Outbound Systems, Inc.

A MacConnection exclusive! Each Outbound Notebook includes a 1.4 Floppy Drive, slip case, power supply & a limited time special software bundle offer valued over $400.

❼2030E Series *(25 MHz 68ec030)*

2161	440: 4 MB, 40 MB HD	2799.
2147	442: 4 MB, 40 MB HD *(incl. math copro.)*	2899.
2110	460: 4 MB, 60 MB HD	2899.
2109	462: 4 MB, 60 MB HD *(incl. math copro.)*	2999.
2660	860: 8 MB, 60 MB HD	3139.
2659	862: 8 MB, 60 MB HD *(incl. math copro.)*	3249.
2655	880: 8 MB, 80 MB HD	3399.
2653	882: 8 MB, 80 MB HD *(incl. math copro.)*	3499.
2651	1660: 16 MB, 60 MB HD	3639.
2730	1662: 16 MB, 60 MB HD *(incl. math copro.)*	3759.
2714	1680: 16 MB, 80 MB HD)	3859.
2712	1682: 16 MB, 80 MB HD *(incl. math copro.)*	3999.

★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 partitions in either Mac or A/UX formats. There's also disk caching and volume password protection. Plus, get a free copy of Salient's *AutoDoubler* or Symantec's *Norton Utilities for the Mac* with each drive purchased. Quite a package; and backed by a 2-yr. warranty.

5533 *MDS 44 SyQuest w/AutoDoubler* .... $499.
5532 *MDS 44 SyQuest w/Norton Utilities* ... 499.
5534 *MDS 88 SyQuest w/AutoDoubler* ..... 599.
5535 *MDS 88 SyQuest w/Norton Utilities* ... 599.
44 MB & 88 MB SyQuest Cart... see line listing.

❼2030S Series *(33 MHz 68ec030)*

2108	440: 4 MB, 40 MB HD	3199.
2107	442: 4 MB, 40 MB HD *(incl. math copro.)*	3299.
2106	460: 4 MB, 60 MB HD	3399.
2105	462: 4 MB, 60 MB HD *(incl. math copro.)*	3499.
2711	860: 8 MB, 60 MB HD	3639.
2684	862: 8 MB, 60 MB HD *(incl. math copro.)*	3759.
2673	880: 8 MB, 80 MB HD	3859.
2669	882: 8 MB, 80 MB HD *(incl. math copro.)*	3999.
2668	1660: 16 MB, 60 MB HD	4099.
2665	1662: 16 MB, 60 MB HD *(incl. math copro.)*	4229.
2664	1680: 16 MB, 80 MB HD	4349.
2661	1682: 16 MB, 80 MB HD *(incl. math copro.)*	4499.

DAILY BUSINESS

ACCOUNTING, DATABASES, SPREADSHEETS, WORD PROCESSING

A Lasting Impression

	❼ResumExpert or Cover Letters	*ea.* 48.
	❼Other ResumExpert Editions	*ea.* 48.

★**Aatrix ... 30 day MBG**

3976	❼Payroll 4.0	109.

Abacus Concepts

4482	❼StatView SE+Graphics 1.04	219.
4481	❼StatView II 1.04	309.

★**Acius ... 30 day MBG**

5618	❼4th Dimension 2.2.3	519.

★Expert Software ... 30 day MBG

5234 ❼ *Expert Writer 1.0*–Quick, easy, efficient word processor plus address book, spell checker and envelope printer (with postal bar codes). Always available, uses less than 50K of RAM! Professional looking letters, faxes, memos **$29.**

Amaze, Inc.

4989	❼CATHY Daily Planner	39.
3582	❼The Far Side Computer Calendar	45.

Ashton-Tate/Borland

1324	FullWrite Professional 1.0	25.

★**Avery ... 60 day MBG**

7446	❼MacLabel Pro 1.5	48.

★**Banner Blue ... 30 day MBG**

3548	❼Org Plus Advanced 1.0	125.

★**Baseline Publishing ... 30 day MBG**

8881	❼Thunder 7 1.0.5	55.

★**Beagle Bros. ... 30 day MBG**

3119	❼BeagleWorks	184.
3563	❼BeagleWorks Competitive Upgrade	95.

★**Checkfree Corp. ... 30 day MBG**

6928	❼Checkfree Mac 1.5	19.

★**CheckMark Software ... 60 day MBG**

5862	❼Payroll 4.6	169.
5863	❼MultiLedger 2.0 225. 3767 MultiUser	359.

★**Chena Software ... 30 day MBG**

1594	❼Fair Witness 1.1	315.

★**Claris ... 30 day MBG**

1129	❼MacWrite II 1.1V2	89.
3903	❼ClarisWorks 1.0 call 3743 ❼Upgrade	95.
3531	❼Claris Resolve 169. 3745 ❼Upgrade	95.
8216	❼FileMaker Pro 1.0V2	199.
1125	❼MacProject II 2.5V1	345.

★**Essential Software ... 30 day MBG**

4086	❼Easy Alarms 2.0 *(May '92)*	31.

★**Expert Software ... 30 day MBG**

5234	❼Expert Writer 1.0	29.

Fox Software

5572	❼FoxBASE+/Mac 2.01	289.

★**Franklin Software ... 30 day MBG**

7070	Language Master 2.0	45.

★**Good Software ... 30 day MBG**

2527	❼REMS Property Manager 3.01	399.

★**Intuit ... 30 day MBG**

2507	❼Quicken 3.0	42.

★**JAM Software USA ... 30 day MBG**

6089	❼Smart Alarms Plus	63.

★**Kaetron Software ... 30 day MBG**

1091	❼Flow Chart Express	93.
8941	❼TopDown 3.1	199.

★**Lotus Development ... 60 day MBG**

3606	❼1-2-3 for Mac	329.
3604	❼1-2-3 for Mac Competitive Upgrade	89.

★**Mainstay ... 30 day MBG**

7718	❼MacFlow 3.55	185.

★**MECA ... 60 day MBG**

2796	❼Managing Your Money 4.0	49.

★**Microlytics ... 60 day MBG**

9729	❼Strunk & White's Elements of Style	34.
7820	❼Random House Encyclopedia 1.0	68.

there stands a cafe,

★**Microsoft ... 30 day MBG**

3669 ❼ *Excel 4.0*–Excel has led in ease-of-use and design innovation since 1985. It's powerful, and remarkably feature-rich–just the way an award-winning spreadsheet should be . . **$295.**

5237 ❼ *Excel 4.0 Upgrade* . . . . . 99.

★**Microsoft ... 30 day MBG**

2884 ❼Works 2.00E . . . . . 155.
3669 ❼Excel 4.0 *(May '92)* 295. 5237 Upgrade 99.
4902 ❼Word 5.0. . 295. 1503 ❼Upgrade. . 125.
5454 ❼The Microsoft Office 2.5 *(May '92)*. . . . 475.

★**Niles & Associates ... 30 day MBG**

5048 ❼EndLink 1.1.3 58. 4602 ❼EndNote 1.4 85.
8010 ❼EndNote Plus 1.2 *(Apr. '92)*. . . . . 145.

★**Nolo Press ... 30 day MBG**

4228 ❼For the Record 2.0 . . . . . 30.
2981 ❼WillMaker 4.0 *(not valid in LA.)* . . . . . 35.
1204 ❼Living Trust 1.0 . . . . . 45.

OCCAM Research Corporation

3697 ❼MUSE 1.0. . . . . 469.

Paragon Concepts

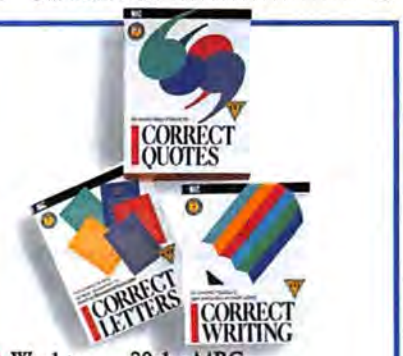
5683 ❼Nisus 3.06. 238. 1612 ❼Compact 3.3. 93.

★**Pastel Development ... 30 day MBG**

1785 ❼DayMaker 1.01 . . . . . 61.

PC Globe, Inc.

3608 ❼Mac USA . . . . . 35.
3356 ❼MacGlobe 1.0 . . . . . 46.



★**Wordstar ... 30 day MBG**

5281 ❼ *Correct Writing, Quotes, and Letters*–Express your thoughts more fluently with these three programs designed to help you analyze & enhance your writing, compose better business letters, & enable you to quote notables . . . **$75.**

★**Portfolio Systems ... 30 day MBG**

7992 ❼DynoPage 1.7 or 6916 ❼Dynodex *ea.* $72.

★**PowerUp ... 30 day MBG**

7696 ❼Calendar Creator 1.01 . . . . . 44.
7694 ❼Address Book Plus 2.01 . . . . . 63.

★**Provue ... 60 day MBG**

4582 ❼Panorama II 2.0.5. . . . . 239.

★**Que Corp. ... 30 day MBG**

7482 ❼RightWriter for the Mac 3.1. . . . . 54.

★**Reality Technologies ... 30 day MBG**

6929 ❼WealthBuilder 1.02. . . . . 95.

★**Reference Software ... 30 day MBG**

6268 ❼Grammatik Mac 2.0 . . . . . 58.

Round Lake Publishing

9946 ❼LetterWorks, 9945 ❼SALES LetterWorks, or 9947 ❼LEGAL LetterWorks . . . . . *ea.* 45.
5473 ❼Professional LetterWorks . . . . . 51.

★**Shana ... 30 day MBG**

8810 ❼Informed Mgr. 99. 7692 ❼Designer. 159.

★**SoftSync, Inc. ... 30 day MBG**

7129 ❼Accountant, Inc. 335. 3828 MultiUser 569.

Software Toolworks

8366 ❼Dollars & Sense 5.0 . . . . . 59.

★**Spyglass ... 60 day MBG**

2027 ❼Transform 2.1 or 2028 ❼Dicer 1.1 *ea.* 399.

★**Survivor Software ... 30 day MBG**

3289 ❼MacMoney 3.52. . . . . 58.

★**Symantec ... 60 day MBG**

2237 ❼GreatWorks 2.0. 199. 2278 Upgrade. 99.
3422 ❼More 3.1. . . . . 265.

★**Symmetry ... 30 day MBG**

3131 ❼Acta 7 1.0. . . . . 75.

★**Synergy ... 30 day MBG**

6617 ❼KaleidaGraph 2.1.3 . . . . . 150.

★**Teleware ... 30 day MBG**

7616 ❼M.Y.O.B. 3.0 *(Apr. '92)* . . . . . 138.

★**TIMESLIPS ... 30 day MBG**

2986 ❼Timeslips III 2.1. . . . . 194.

★**T/Maker ... 30 day MBG**

3639 ❼WriteNow 3.0 *(May '92)*. . . . . 149.
5259 ❼WriteNow 3.0 Upgrade. . . . . 49.
5253 ❼WriteNow 3.0 Competitive Upgrade . . . 69.
3508 ❼The PowerBundle *(with carry case)* . . . 159.

★**Williams & Macias ... 30 day MBG**

4976 ❼StickyBusiness 1.5 . . . . . 51.
6926 ❼myDiskLabeler III 3.1 . . . . . 42.

★**WordPerfect ... 60 day MBG**

3800 ❼WordPerfect Mac 2.1 . . . . . 279.
3090 ❼WordPerfect Office 3.0 *(single)* . . . . . 89.
3092 ❼WP Office *(5 pack)* 295. 3088 *(20 pack)* 895.

★**Wordstar ... 30 day MBG**

3554 ❼American Heritage Dictionary . . . . . 55.
6984 ❼Correct Grammar 3.01 . . . . . 55.
5281 ❼Correct Writing, Quotes, & Letters. . . . . 75.

★**Wyoming Software ... 30 day MBG**

3555 ❼Business Sense 1.5 . . . . . 124.

GRAPHICS & DESIGN
PUBLISHING, PRESENTATIONS

★**Abracadata, Ltd. ... 30 day MBG**

9995 ❼Instant Decorator 1.1 . . . . . 29.
9990 ❼Design Your Home - Architecture, 9992 Interiors, or 9994 Landscape . . *ea.* 63.

Adobe Systems

❼Adobe Type Library *(Vol. 1-260)* . . . . . call
8794 ❼Adobe Type On Call *(CD-ROM)*. . . . . 56.
6957 ❼Adobe Type Reunion 1.0.2 . . . . . 41.
5750 ❼Adobe Type Manager 2.0.3 . . . . . 59.
6053 ❼Adobe Plus Pack 2.0. . . . . 118.
6156 ❼Adobe Plus Pack/ATM . . . . . 175.

★**SoftSync, Inc. ... 30 day MBG**

7129 ❼ *Accountant, Inc. 3.0*–1991 MacUser Editors' Choice Award for *Best Accounting Package.* "The most complete integrated accounting and financial mgmt. package," *MacUser* (3/91). **$335.**

3828 ❼ *Accountant, Inc./MultiUser 1.0* . . . . . 569.

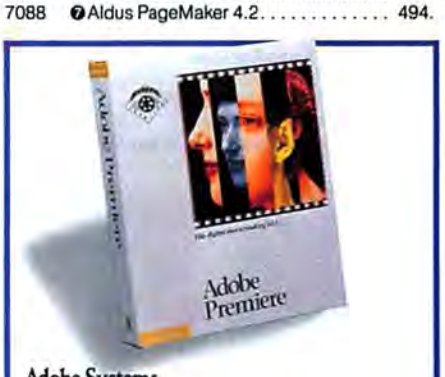
6098 ❼TypeAlign for ATM 1.0.4 . . . . . 61.
5001 ❼Streamline 2.0. . . . . 122.
4145 ❼Adobe Premiere 1.0 . . . . . 305.
8171 ❼Adobe Illustrator 3.2 *(with ATM)* . . . . . 368.
6644 ❼Adobe Photoshop 2.01. . . . . 548.
6671 ❼Adobe Type Set 1 or 6677 ❼Type Set 2 62.
7587 ❼Adobe Type Set 3 . . . . . 125.

Adobe Type Sets for Business:

2221 ❼Letters, Memos & Faxes . . . . . 95.
2223 ❼Invitations & Awards . . . . . 95.
2219 ❼Spreadsheets & Graphs . . . . . 95.
2222 ❼Overheads & Slides . . . . . 95.

★**Aldus ... 30 day MBG**

6674 ❼Aldus Personal Press 1.01 . . . . . 109.
2461 ❼Aldus Gallery Effects 1.0. . . . . 128.
3506 ❼Aldus SuperPaint 3.0 . . . . . 132.
3980 ❼Aldus Digital Darkroom 2.0. . . . . 259.
3507 ❼Aldus Super 3D 2.5 . . . . . 325.
4751 ❼Aldus Persuasion 2.1 . . . . . 325.
1330 ❼Aldus FreeHand 3.1 . . . . . 394.
7088 ❼Aldus PageMaker 4.2. . . . . 494.



Adobe Systems

4145 ❼ *Adobe Premiere 1.0*–Easily combines video footage, audio recordings, animation, still images and graphics to create high-quality digital movies. Takes advantage of Apple's QuickTime media-integration technology. . . . . **$305.**

410C

MMC

1-800/800-3333 MacConnection®

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

With a cook who's

★**Expert Software ... 30 day MBG**
4870 ❼ *Expert Color Paint 1.0*–New! The latest in painting tools at an incredible price. You get hot 32-bit color, image editing, and tools that may be customized, anti-aliasing, virtual memory and System 7 support ..... $29.

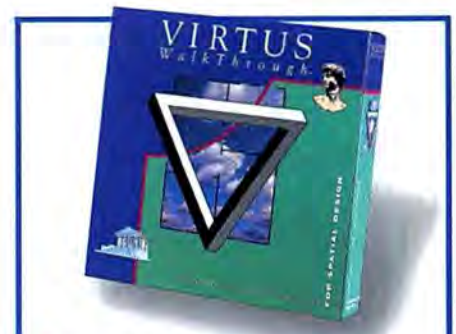
Altsys
9806 ❼Metamorphosis Pro 2.03 ..... 89.
1983 ❼EPS Exchange 2.0 ..... 89.
1195 ❼Fontographer 3.5 ..... 262.
★**Ares Software ... 30 day MBG**
8878 ❼FontMonger 1.05 ..... 62.
★**Baseline Publishing ... 30 day MBG**
8055 ❼Screenshot 1.2 ..... 34.
Bitstream
2249 ❼Type Treasury CD *(Type 1 & True Type Fonts)* 45.
❼Type Essentials *(coordinated collections)* call
Broderbund Software
3572 ❼Kid Pix 1.2 ..... 34.
1427 ❼The Print Shop 1.3.2. ..... 35.
6281 ❼TypeStyler 2.0 *(with ATM)* ..... 126.
★**Casady & Greene ... 30 day MBG**
8879 ❼Fluent Font Library 4.05 ..... 99.
1945 ❼True Type Starter Set ..... 57.
★**Claris ... 30 day MBG**
1123 ❼MacPaint 2.0 ..... 86.
2518 ❼MacDraw Pro 1.01 ..... 275.
8007 ❼Claris CAD 2.0 ..... 599.
Custom Applications
8037 ❼Freedom of Press Light 3.03 *(17 fonts)* . 84.
★**DeltaPoint ... 60 day MBG**
3558 ❼DeltaGraph Pro 2.0. ..... 199.
★**Deneba Software ... 30 day MBG**
3227 ❼Canvas 3.02 ..... 248.

★Casa Blanca Works ... 30 day MBG
1593 ❼ *Drive 7 2.0*–The most versatile & affordable formatter available. Incls. Drive7Rem for SyQuest, Bernoulli, Optical, & CD-ROMs!. $49.
1573 ❼ *DriveShare*–Share removable drives under 6.0x or 7.0x! Max your hardware investment. 89.

★**Expert Software ... 30 day MBG**
4870 ❼Expert Color Paint 1.0 ..... $29.
★**Foundation Publishing ... 60 day MBG**
9438 ❼Comic Strip/People & Kid Stuff ..... 71.
Fractal Design
5425 ❼Painter 1.2 ..... 235.
IDD/Innovative Data Design
2417 ❼MacDraft 2.1 ..... 279.
★**Letraset ... 30 day MBG**
4709 ❼LetraStudio 2.0 *(Apr. '92)* ..... 139.
FONTEK Typeface Collection ..... *ea.* 30.
Light Source
3733 ❼Ofoto 1.1.1 ..... 279.
★**Linguist's Software ... 60 day MBG**
Over 100 language fonts ..... call
★**MacroMind•Paracomp ... 30 day MBG**
3148 ❼Magic . 275. 5028 ❼ModelShop II . 619.
7441 ❼Swivel 3D Professional 2.0 ..... 479.
3450 ❼SwivelMan 1.0 ..... 619.
★**Mainstay ... 30 day MBG**
9798 ❼Capture 4.0 ..... 82.
★**MicroFrontier ... 30 day MBG**
3013 ❼Color It! 2.0 *(May '92)* ..... 73.
★**MicroMaps ... 30 day MBG**
7556 ❼MapArt *(PICT)* or 7555 *(EPS)* ..... *ea.* 89.
2791 ❼Global Perspectives ..... 25.

★ASD Software ... 30 day MBG
5313 ❼ *Active Memory 2.0*–Personal Info. Mgr. for network usage, sharing reminders, etc. $125.
2552 ❼ *WindoWatch*–A window tracking utility that generates a time sheet in the background over a LAN ..... 93.

★**Microsoft ... 30 day MBG**
2878 ❼PowerPoint 2.01E ..... 245.
★**Monotype Typography ... 30 day MBG**
❼Monotype Imprints-TrueType ..... *ea.* 22.
Classic Fonts *(full line available)* ..... call
Postcraft International
2210 ❼Effects Specialist 1.04 ..... 89.
2200 ❼Layouts PageMaker or 2414 QuarkXPress 69.
Quark
7612 ❼QuarkXPress 3.1 ..... 569.
★**Specular International ... 30 day MBG**
4962 ❼Infini-D 1.1 ..... 647.
3543 ❼Replicas *(vol. 1)* or 3675 *(vol. 2)* .. *ea.* 189.
★**Spinnaker ... 30 day MBG**
3530 Certificate Maker 2.02 ..... 22.
Strata
7773 ❼Stratavision 3D 2.5 ..... 629.
★**SuperMac Technology ... 60 day MBG**
3380 ❼PixelPaint 2.1.. 149. 5625 ❼Pro.. 459.
3G Graphics
6379 ❼Accents & Borders 1. ..... 63.
4583 ❼Business 1 .. 63. 2003 ❼People 1 .. 94.
★**Timeworks ... 30 day MBG**
7115 ❼Publish It! *Easy* 2.1 with File-It! ..... 145.
★**T/Maker ... 30 day MBG**
❼ClickArt *(7 bitmapped)*. ..... *ea.* 38.
❼ClickArt *(5 EPS formats)*. ..... *ea.* 82.
1858 ❼FaxMania *(birthdays to bulletins)* ..... 29.



★Virtus Corporation ... 30 day MBG
4488 ❼ *WalkThrough 1.03*–Award-winning 3D drawing program. Includes real-time 3D presentations, QuickTime and PICS animation movies, and perspective pictures as well as data exchange capabilities ..... $309.

★**Virtus Corporation ... 30 day MBG**
4488 ❼WalkThrough 1.03 ..... 309.

PROGRAMMING
UTILITIES, HYPERCARD, SECURITY

★**Abbott Systems ... 30 day MBG**
2515 ❼Calc+ 1.0 39. 5236 ❼CanOpener 2.0 62.
★**Advanced Software ... 30 day MBG**
8051 ❼Intouch 1.1 39. 9986 Network *(3-Pak)* 112.
After Hours Software
1352 ❼TouchBASE 2.0.1 ..... 79.
3314 ❼DateBook *(Apr. '92)* ..... 79.
★**Aladdin Systems ... 30 day MBG**
6740 ❼StuffIt Deluxe 3.0 *(May '92)*..... 55.
★**Aldus ... 30 day MBG**
5100 ❼Aldus SuperCard 1.6 ..... 195.
★**ALSoft ... 30 day MBG**
9808 ❼MasterJuggler 1.57 ..... 25.
9807 ❼DiskExpress II 2.11..... 49.
5204 ❼ALSoft Power Utilities 1.0 ..... 69.
★**Alysis Software ... 30 day MBG**
2687 ❼SuperDisk! ..... 49.
1608 ❼More Disk Space..... *special* 42.
Apple Computer
1074 ❼System 7 *(with free PCTV video)*..... 99.
★**ASD Software ... 30 day MBG**
5 & 10 users packs available.
7085 ❼FileGuard 2.7 *(1 user)*..... 138.
5313 ❼Active Memory 2.0 *(1 user)*..... 125.
2552 ❼WindoWatch *(1 user)* ..... 93.
★**Baseline Publishing ... 30 day MBG**
7783 ❼INIT Manager 1.1..... 33.
3114 ❼INIT Info Pro ..... 39.
★**Berkeley Systems ... 30 day MBG**
5737 ❼After Dark 2.0V..... 28.
2198 ❼More After Dark *(M.A.D)*..... 23.
2196 ❼After Dark & M.A.D. Bundle ..... 40.
★**Casa Blanca Works ... 30 day MBG**
1593 ❼Drive 7 2.0..... 49.
1573 ❼DriveShare *(Apr. '92)* ..... 89.
★**Casady & Greene ... 30 day MBG**
2269 ❼QuickDEX 2.3... 22. 2528 *(5 Pak)*... 99.
★**CE Software ... 60 day MBG**
1727 ❼CalendarMaker 3.0.1 ..... 31.
6278 ❼DiskTop 4.01 or 3376 ❼Tiles 1.01 .... 63.
7518 ❼Alarming Events 1.03 ..... 84.
8024 ❼QuicKeys^2 2.11..... 93.
1565 ❼QuicKeys^2 *(10 user)*. 749. 1561 *(50)*. 2799.
★**Central Point ... 30 day MBG**
5041 ❼Mac Tools Deluxe 1.2 ..... 79.
★**Claris ... 30 day MBG**
8734 ❼HyperCard Development Kit 2.1..... 139.

there every day.

After Hours Software
1352 ❼ *TouchBASE 2.0.1*–Multi-user database designed to keep track of personal and business contacts. It's a handy desk accessory that can print envelopes, labels, address books, fax cover sheets, reports and much more. . . . . $79.

★Connectix ... 30 day MBG
7830 ❼Maxima 2.0.1 . . . . . 45.
6647 ❼HandOff II 2.2.1 . . . . . 55.
★Dantz Development ... 30 day MBG
3393 ❼DiskFit Pro 1.0 . . . . . 74.
5255 ❼Retrospect 147. 7945 ❼Remote 1.3 264.
7946 ❼Remote *(10 Pak)* 147. 3112 ❼*(50 Pak)* 649.
Dubl-Click Software
6653 ❼MenuFonts 4.0 . . . . . 44.
7974 ❼ClickChange 1.05.2 . . . . . 56.
★ElseWare Corp. ... 30 day MBG
4871 ❼Checklist 2.0 . . . . . 89.
★Fifth Generation ... 30 day MBG
4287 ❼PYRO! 4.01 . . . . . 27.
3955 ❼Suitcase II 2.0 . . . . . 53.
8286 ❼SuperLaserSpool 3.0 . . . . . 99.
5178 ❼FastBack Plus or 5725 ❼DiskLock *ea.* 125.
★FWB, Inc. ... 30 day MBG
2999 ❼Hard Disk Toolkit 1.1 . . . . . 125.
★ICOM Simulations ... 30 day MBG
3731 ❼OnCue II 2.0 . . . . . 56.
★Insight Development ... 30 day MBG
6171 ❼MacPrint 1.3 . . . . . 92.
★Kensington ... 30 day MBG
9301 ❼PassProof *(right)* 65. 9300 ❼*(left)* *ea.* 65.
2011 ❼PP Classic or 1632 ❼PP IIsi . . . . . *ea.* 65.
★Kent Marsh Ltd. ... 30 day MBG
9513 ❼FolderBolt 1.02 . . . . . 73.
1839 ❼The NightWatch II *(Apr. '92)* . . . . . 89.
★Kiwi Software ... 60 day MBG
6267 ❼KiwiENVELOPES! 3.1.5 . . . . . 32.
3518 ❼Kiwi POWER WINDOWS . . . . . 50.
★Magic Software ... 30 day MBG
7267 ❼AutoSave II or 7268 ❼POWERicons. . . 26.
7270 ❼Backmatic 2.01 . . . . . 50.
★Microcom ... 30 day MBG
4803 ❼Virex/Mac . . 57. 5885 ❼*(10 user)* . . 399.
8561 ❼911 Utilities . . . . . 89.
2462 ❼Citadel with Shredder . . . . . 89.
MicroMat Computer Systems
3732 ❼MacEKG II *(Apr. '92)* . . . . . 110.
★Microseeds Pub. ... 60 day MBG
7068 ❼INITPicker 2.02 . . . . . 34.
2913 ❼Redux 1.63 or 2936 ❼HAM . . . . . 49.
★Microsoft ... 30 day MBG
4471 QuickBasic 1.0 . . . . . 64.
★Nine to Five Software ... 30 day MBG
9767 ❼Reports 2.1 . . . . . $94.
2832 ❼Attributes 2.0 50. 2835 ❼Search 2.0 62.
★Now Software ... 30 day MBG
1793 ❼Now Up-To-Date 1.0 . . . . . 65.
2371 *(5 user)* . . . . 265. 2366 *(10 user)* . . . . 395.
6925 ❼Now Utilities 3.01 . . . . . 83.
★ON Technology ... 1 year MBG
6385 ❼On Location 2.0 . . . . . 75.
1566 ❼STATUS•Mac 2.0.2 *(unlimited)* . . . . . 749.
Palomar Software
8210 ❼PLOTTERgeist 2.0 . . . . . 249.
★Salient Software ... 30 day MBG
7404 ❼DiskDoubler 3.7.5 . . . . . 45.
4838 ❼AutoDoubler 1.05 . . . . . 45.
★Symantec ... 60 day MBG
5176 ❼Symantec AntiVirus for Mac *(SAM)* . . . . 64.
5724 ❼Symantec Utilities for Mac *(SUM II)* . . . . 96.
6748 ❼Norton Utilities for Mac 2.0 . . . . . 95.
3421 ❼THINK Pascal 165. 2688 ❼THINK C 199.
9957 ❼THINK Reference 1.0 . . . . . 68.
Teknosys
5203 ❼HELP! 1.0.1 . . . . . 89.
★TGS Systems ... 60 day MBG
6667 ❼Prograph 2.5 . . . . . 309.

MicroMat Computer Systems
3732 ❼ *MacEKG II*–Get to the heart of your Mac. The complete diagnostic utility for all users. It looks at your entire System as a whole and shows you how your System's resources are being used–or abused . . . . . $110.

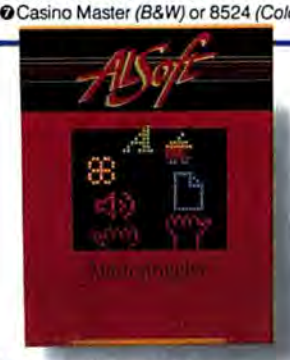
★Thought I Could ... 30 day MBG
4843 ❼Wallpaper 1.0.1 . . . . . 37.
UserLand Software
4753 ❼Frontier . . . . . 189.
★Utilitron, Inc. ... 30 day MBG
1340 ❼TrashMaster 1.0 . . . . . 39.
★Visionary Software ... 30 day MBG
3888 ❼Synchronicity 3.0 . . . . . 35.
3887 ❼First Things First 2.1 . . . . . 41.

LEARN & PLAY
FOREIGN LANGUAGES, TRAINING, GAMES

Accolade
1423 Hard Ball II . . . . . 31.
8220 ❼Jack Nicklaus Golf . . . . . 34.
★Aldus ... 30 day MBG
3503 ❼Dark Castle 1.1 . . . . . 34.
3502 ❼Beyond Dark Castle 1.0 . . . . . 34.
★Baseline Publishing ... 30 day MBG
7785 ❼Talking Moose 4.0.2 . . . . . 22.

★Symantec ... 60 day MBG
6748 ❼ *Norton Utilities for Mac 2.0*–New version combines & enhances Norton Utilities & SUM II. Offers fully integrated advanced disk repair and recovery, automatic backup, data security, productivity tools & system enhancements. . $95.

★Beacon Technology ... 30 day MBG
4967 ❼HyperBible *(KJV)* or 4968 *(NIV)* . . *ea.* 125.
Broderbund Software
4314 ❼Type! 1.0 . . . . . 18.
6516 ❼The Playroom 2.0 *(CP) (color)* . . . . . 29.
❼Carmen Sandiego Series *(CP)* . . . . *ea.* 29.
5317 ❼Spelunx and the Caves of Mr. Suedo . . 29.
9804 ❼RoboSport or 8195 ❼BannerMania *ea.* 35.
3559 ❼SimAnt or 5318 ❼Nigel's World. . . *ea.* 35.
8266 ❼SimEarth 1.1 . . . . . 40.
4966 SimCity *(CP)* . . 29. 5871 ❼Supreme . . 47.
★Carina Software ... 30 day MBG
5726 ❼Voyager 1.2 . . . . . 87.
★Casady & Greene ... 30 day MBG
4119 ❼Crystal Quest with Critter Editor 2.2x. . . 29.
3343 ❼Aqua Blooper Piper or 3342 ❼Glider . . 29.
4960 ❼Fun Bundle *(includes Crystal Quest w/CE, Sky Shadow & Mission Starlight)* . . . . . 59.
★Centron Software ... 30 day MBG
2707 ❼Puzzle Master . . . . . 26.
8525 ❼Casino Master *(B&W)* or 8524 *(Color)* . . 45.



★ALSoft ... 30 day MBG
9808 ❼ *MasterJuggler 1.57*–The indispensable font suitcase and application manager. Quickly access hundreds of TrueType and PostScript fonts, plus easily open applications and their documents from a convenient pop-up menu . $25.

410C

MMC

1-800/800-3333

MacConnection®

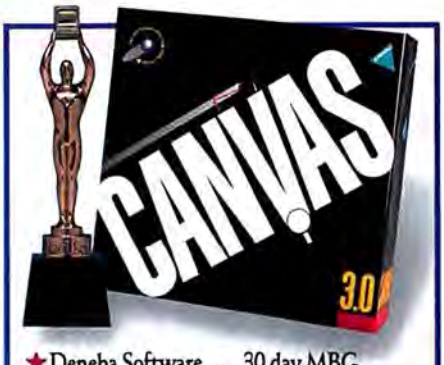
14 Mill Street, Marlow, NH 03456 603/446-3333 FAX 603/446-7791

So please come to eat,

★**Davidson & Associates ... 30 day MBG**
3922 ❼Talking Spell It Plus . . . . . $29.
6128 ❼Math Blaster Mystery . . . . . 28.
2574 ❼New Math Blaster Plus . . . . . 34.
8278 ❼Alge-Blaster Plus . . . . . 34.
3923 ❼Personal Trainer SAT . . . . . 34.
★**Deadly Games ... 30 day MBG**
2811 ❼Bomber2 or 3460 ❼Battle of Britain II *ea.* 31.
EARTHQUEST
3118 ❼EARTHQUEST Ecology 1.0 . . . . . 34.
8050 ❼EARTHQUEST 2.0 . . . . . 34.
5294 ❼Time Treks 1.0 *(May '92)* . . . . . 34.
Electronic Arts
1303 ❼Loom 1.0 . . . . . 29.
8194 Armor Alley 1.1 . . . . . 32.
1907 ❼PGA Golf or 2963 ❼Starflight II 1.0 *ea.* 39.
3385 ❼Secret of the Silver Blades . . . . . 39.
8643 ❼Harpoon 39. 2962 ❼Challenger Pak 59.
FTL/Software Heaven
1555 OIDS 1.2 . . . . . 24.
Graphic Simulations
4756 ❼Hellcats Over the Pacific 1.0 . . . . . 39.
★**Great Wave ... 30 day MBG**
2276 ❼Kid's Time 1.3 or 5642 ❼Kid's Math 1.1 25.
1517 ❼ReadingMaze . 25. 1513 ❼*(Color)* . 35.
4334 ❼NumberMaze. . 25. 8527 ❼*(Color)*. . 35.
8044 ❼NM Decimals & Fractions *(Color)* . . . . . 35.

★**Lotus Development ... 60 day MBG**
3606 ❼ *1-2-3 for the Mac*—Takes full advantage of the Mac. Directly manipulate & format all data, text, & graphics. Offers true 3D worksheets & Excel & 1-2-3 file compatibility **$329.**
3604 ❼ *1-2-3 Competitive Upgrade* . . . . . 89.

★**HyperGlot Software ... 30 day MBG**
❼Word Torture 4.0-Beginner to Advanced *(Span., Fren., Germ., Ital. & Rus.)* . . . *ea.* 34.
❼Pronunciation Tutor - Beginner *(Span., Fren.)* . *ea.* 35. *(Germ., Chin.)*. . 38.
❼Tense Tutor 2.0 *(Spanish, French, German, Italian)* . . *ea.* 38.
❼Survival Manual *(Span., Fren., Germ., Ital., Chin. & Rus.)* *ea.* 38.
★**Inline Design ... 30 day MBG**
1562 ❼3 in Three or 1944 Swamp Gas . . . . . 31.
8809 ❼Tesserae . 31. 3414 ❼Mutant Beach . 43.
7622 ❼Darwin's Dilemma 2.0 *(Apr. '92)* . . . . . 31.
Interplay Productions
1894 ❼BattleChess *(3D animation)* . . . . . 29.
3520 ❼Dvorak on Typing *(Apr. '92)*. . . . . 29.
1893 ❼CheckMate *(infinite play levels)* . . . . . 31.
3534 ❼Castles 1.0 *(May '92)* . . . . . 34.
★**Learning Company ... 30 day MBG**
2670 ❼Reader Rabbit 3.0 *(CP) (ages 4-7)* . . . . 34.
3272 ❼Super Solvers: OutNumbered! 1.0 . . . . 34.
3687 ❼Super Solvers: Midnight Rescue! . . . . . 34.
3281 ❼The Writing Center 1.0 . . . . . 51.
★**Leister Productions ... 30 day MBG**
7126 ❼Reunion 3.0 . . . . . 115.
Mallard Software
❼Scenery Disks 1-4 Flight Simulator. *ea.* 25.



★**Deneba Software ... 30 day MBG**
3227 ❼ *Canvas 3.02*—1991 MacUser Editors' Choice Award for *Best Drawing Program*. Features Bezier font outlines, professional word-processor-like text capabilities, object blending, a freehand Bezier curve tool, and more . . . . . **$248.**

★**MECC ... 30 day MBG**
3963 ❼Oregon Trail 1.0 . . . . . 28.
❼Number, Word, or Super Munchers *ea.* 28.
★**MicroMaps ... 30 day MBG**
2784 ❼KidMaps 1.0 . . . . . 16.
★**Microsoft ... 30 day MBG**
2868 ❼Flight Simulator 4.0 *(CP)* . . . . . 42.
★**Nordic Software ... 30 day MBG**
8258 ❼Turbo Math Facts 2.0 . . . . . 24.
8260 ❼Word Quest 2.1 . . . . . 30.
8257 ❼PreSchool Pack - Color 1.0. . . . . 34.
2716 ❼Word Search Deluxe 1.04. . . . . 34.
★**Penton Overseas ... 30 day MBG**
❼VocabuLearn/ce Levels I & II *(Span., Fren., Germ., Ital., Rus., Japan., & Heb.)*. . . *ea.* 35.
❼VocabuLearn/ce Level III *(Span., Fren., Germ., Ital., Rus., & Japan.)* . . . . . *ea.* 35.
❼PICTURE-IT! *(Spanish, French, German, & Italian)* . . . . . *ea.* 40.
★**Personal Training Sys. ... 60 day MBG**
Limited time special—Buy an entire PTS series & pay only $39 for each module in the series.
❼Basic Macintosh *(modules 1-4)* . . . *ea.* 59.
❼Converting 6.0 to 7.0 *(modules 1-2)* *ea.* 59.
❼Excel 2.2, 3.0 *(modules 1-9)* . . . . . *ea.* 59.
❼FileMaker Pro *(modules 1-5)* . . . . . *ea.* 59.
❼FreeHand 3.0 *(modules 1-5)* . . . . . *ea.* 59.
❼HyperCard 1.0, 2.0 *(modules 1-4)*. *ea.* 59.

★**Microsoft ... 30 day MBG**
4902 ❼ *Word 5.0*—New features include an integrated grammar checker, Drag-and-Drop text, and a new Print Merge Helper. Offers all the tools you need to make every day easier. **$295.**
1503 ❼ *Word 5.0 Upgrade*. . . . . 125.

❼PageMaker 4.0 *(modules 1-6)* . . . *ea.* $59.
❼Persuasion 2.0 *(modules 1-4)* . . . . *ea.* 59.
❼QuarkXPress 3.0 *(modules 1-4)*. . . *ea.* 59.
❼System 7 *(new users) (modules 1-3)* *ea.* 59.
❼Word 4.0 *(modules 1-4)* . . . . . *ea.* 59.
❼Works 2.0 *(modules 1-4)* . . . . . *ea.* 59.
Sierra On-Line
9733 Hoyle's Book of Games II . . . . . 20.
2412 Rise of the Dragon . . . . . 34.
7367 Space Quest III 34. 2522 ❼Space Quest IV 39.
3545 ❼EcoQuest *(May '92)* . . . . . 35.
2523 ❼King's Quest V . . . . . 39.
3549 ❼Police Quest III *(May '92)* . . . . . 39.
3552 ❼Leisure Suit Larry V. . . . . 39.
Sir-Tech Software
8229 ❼Bane of Cosmic Forge . . . . . 35.
★**SoftStream ... 30 day MBG**
4489 ❼Galactic Frontiers . . . . . 38.
3501 ❼Classic Trilogy *(Cribbage, Whist, Hearts)* 49.
3472 ❼Family Cards *(Solitaire, Rummy, War)* . . 49.
Software Toolworks
4619 ❼Mavis Beacon Typing 1.3 *(CP)* . . . . . 32.
1908 ❼World Atlas 1.0 . . . . . 52.
★**Spectrum Holobyte ... 30 day MBG**
3464 ❼Tetris 1.3 or 6112 ❼Welltris 1.1. . . . *ea.* 22.
3017 ❼Wordtris 1.0 . . . . . 27.
3459 ❼Falcon 2.2.1 or 8181 ❼Vette 1.0 . . *ea.* 33.

★**Teleware ... 30 day MBG**
7616 ❼ *M.Y.O.B. 3.0*—Powerful and easy to use. Command Centers are arranged in a flowchart form making the program unique. Impressive new features include importing back-order tracking, increased password protection, etc. . **$138.**

★**Spinnaker ... 30 day MBG**
2328 Sargon IV 1.03 *(CP) (chess)* . . . . . 28.
★**Strategic Studies ... 30 day MBG**
2685 ❼American Civil War 1.0 . . . . . 29.
3287 ❼Warlords *(empires at war)* . . . . . 34.
StudyWare
❼ACT, GMAT, GRE, or SAT Prep. . . . *ea.* 29.
Terrace Software
9970 ❼Mum's The Word Plus 1.01 *(color)* . . . 107.
★**Toyogo ... 30 day MBG**
7624 ❼NEMESIS Go Master 5.0 . . . . . 39.
7623 ❼NEMESIS Go Master Deluxe 5.0 . . . . . 99.
★**TeleTypesetting ... 30 day MBG**
5537 ❼Digital Gourmet 1.0 . . . . . 44.
★**Voyager ... 30 day MBG**
2809 ❼The Annotated Alice, 2836 ❼Hitch Hiker's Guide to Galaxy, 2820 ❼Jurassic Park *ea.* 15.
★**XOR ... 30 day MBG**
6040 MacGolf Classic 1.1 . . . . . 52.

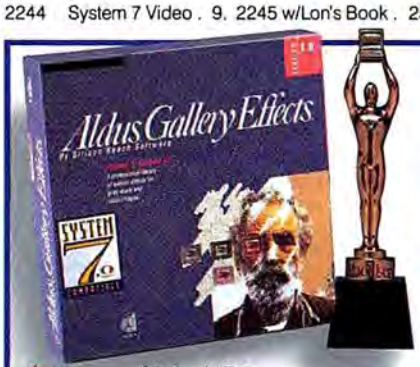
VIDEO & SOUND
MONITORS, MUSIC, MULTIMEDIA

★**Ars Nova ... 30 day MBG**
1215 ❼Practica Musica 2.3 . . . . . 66.
Coda Music Systems
8188 ❼MusicProse 189. 5604 ❼Finale 2.6.1 549.

we'll make it our treat.

★MacroMind•Paracomp ... 30 day MBG
4598 ❼ *MacRecorder Sound System PRO*–Includes MacRecorder and Sound Edit PRO. Complete sound capture and editing system. Record and edit voice, music and special effects .... $239.
5486 *Sound Edit PRO*..... 207.

★MacroMind•Paracomp ... 30 day MBG
4598 ❼MacRecorder Sound System PRO... 239.
5486 ❼Sound Edit PRO..... 207.
6159 ❼MacroMind Accelerator 3.0..... 135.
5087 ❼MacroMind Director 3.1 *(Apr. '92)*... 799.
2246 ❼MacroMind Three-D 1.0..... 999.
MASS Microsystems
2592 QuickImage 24..... 249.
Rival Monochrome Systems..... *ea.* 1199.
NEC
5009 MacFG 8-bit Card 799. 5018 24-bit 1699.
5021 Multisync 6FG..... 2899.
★Nutmeg Systems ... 30 day MBG
❼19" for SE, SE/30, II, IIsi..... *ea.* 995.
❼19" for GrayScale SE/30, II, IIsi . *ea.* 1295.
❼20" Color System: SE/30, II, IIsi. *ea.* 2595.
Passport Designs
3117 ❼Master Tracks PRO 5 5.0..... 339.
8250 ❼Encore 2.51..... 399.
PCTV
2244 System 7 Video . 9. 2245 w/Lon's Book . 25.



★Aldus ... 30 day MBG
2461 ❼ *Aldus Gallery Effects 1.0*–1991 MacUser Editors' Choice Award for *Best Visual Resource*. Transforms images into works of art. Whether scanned or original art, you can apply professional-looking effects easily & in minutes $128.

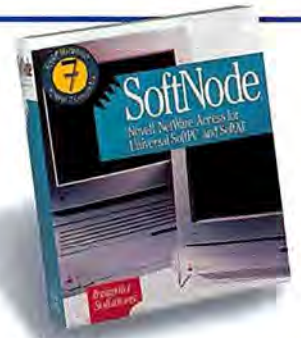
RasterOps
9784 RasterOps 24SX. $649. 8944 24STV. $829.
5378 Image Pro *(Accelerator for 24STV)*..... 829.
Software Toolworks
5201 The Miracle *(piano teacher) (Apr. '92)*.... call
Sound Source
3547 ❼Star Trek: The Logical Collection..... 29.
3607 ❼Star Trek: The Final Frontier..... 29.
4920 ❼Star Trek: The Bundle *(I gotta have both!)* 49.
★SuperMac Technology ... 30 day MBG
4122 VideoSpigot LC or 4114 IIsi.... *special* 349.
4164 VideoSpigot *(for NuBus)*..... *special* 399.
4134 19" Gray-Scale/Mono Display..... 999.
1805 19" SuperMatch Color Display..... 1799.
5000 20" Dual-Mode Trinitron..... 2699.
4720 21" Platinum Two-Display..... 1099.
1877 Spectrum/8LC or 2026 S/8si..... *ea.* 536.
1844 Spectrum/8 Series III..... 536.
1851 Spectrum/24 Series III..... 1525.
2330 Spectrum/8-24 PDQ or 2231 PDQsi.... 899.
★Voyager ... 30 day MBG
3921 ❼Mozart "Dissonant" Quartet CD..... 39.
3924 ❼Shubert: "The Trout" Quintet CD..... 39.
9322 ❼Voyager Videostack CD 2.2..... 65.

CD-ROM

Adobe Systems
8794 ❼Adobe Type On Call *(CD-ROM)*..... 56.
Broderbund
3730 ❼Just Grandma and Me *(CD-ROM)*.... 34.
CD Technology
2321 CD-ROM Caddy.. 11. 2533 *(5 Pack)*.. 49.
8057 Porta Drive CD-ROM..... 599.
4140 ❼Multimedia HANDisc..... 75.
★Cyan ... 30 day MBG
2717 ❼Cosmic Osmo 1.1 *(CD-ROM)*..... 37.
★Discovery Systems ... 60 day MBG
9967 ❼Nautilus *(subscription, CD-ROM)*..... 20.
9965 ❼Sherlock Holmes *(CD-ROM)*..... 20.
9968 ❼Birds of N. America *(CD-ROM)*..... 32.
1874 ❼Mammals of No. America *(CD-ROM)*.. 32.
3683 ❼Backpac Set 1 or 3679 ❼Set 2... *ea.* 45.
★Highlighted Data ... 30 day MBG
7771 ❼Webster's Dictionary *(CD-ROM)*..... 159.
★HyperGlot ... 30 day MBG
7473 ❼Learn To Speak French *(CD-ROM)*.... 62.
7829 ❼Learn To Speak Spanish *(CD-ROM)*... 62.
★ICOM Simulations ... 30 day MBG
3717 ❼Sherlock Holmes Consulting Detective 39.
NEC
6636 Image Gallery *(1400 line art)*..... 246.
9441 CDR-36M CD-ROM Portable Drive.... 399.
2595 General Reference CD-ROM Bundle *(includes CDR36, kit & 7 titles)*..... 529.
5161 CDR-73M CD-ROM Drive..... 599.
Software Toolworks
3915 Grolier Encyclopedia *(CD-ROM)*..... 249.
★Voyager ... 30 day MBG
3918 ❼Baseball's Greatest Hits CD..... 39.
3917 ❼A Silly, Noisy House CD..... 39.
3919 ❼AmandaStories CD..... 39.

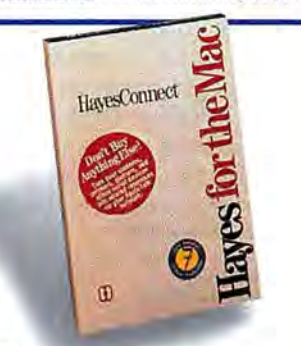
COMMUNICATIONS
MODEMS, MAIL, NETWORKS

★Abaton ... 30 day MBG
6266 InterFax 24/96 Modem..... 289.
★Applied Engineering ... 30 day MBG
8362 ❼QuadraLink *(with AE Shadow)*..... 205.



Insignia Solutions
3441 ❼ *SoftNode 1.0*–Add SoftNode to SoftPC, and your Mac not only can run MS-DOS applications, it can also share programs over a Novell PC Network! Your next PC could be a Macintosh ..... $105.

★Argosy Software ... 30 day MBG
7872 ❼Software Bridge/Mac 2.0.1..... 99.
2447 ❼RunPC/Remote 139. 2448 ❼/Network 279.
★CE Software ... 60 day MBG
8066 ❼QuickMail *(5 user)* . 249. 8067 *(10)* . 375.
1589 ❼QuickMail *(50)* . 1549. 3489 *(100)* . 2899.
★CompuServe ... 60 day MBG
1676 ❼Macintosh Membership Kit 1.6..... 25.
1673 ❼CompuServe Navigator 3.1..... 49.
1674 ❼Membership Kit/Navigator Bundle.... 72.
★DataViz ... 60 day MBG
1823 ❼MacLink Plus/PC 6.0..... 129.
4842 ❼MacLink Plus/Translators 6.0..... 109.
★Dayna ... 60 day MBG
DaynaPORT TRX: *(BNC or 10BASE-T)* *ea.* 87.
DaynaPORT E: *(10BASE-T)*..... *ea.* 164.
DaynaPORT E: SE, SE/30, II, IIsi, LC ... 183.
8719 EtherPrint... 345. 9888 *(10BASE-T)*... 345.
3665 DaynaSTAR MiniHub..... 309.
DaynaPORT SCSI/Link: *(BNC or 10BASE-T)* 279.
3664 NetMounter..... 57.



Hayes
5101 *HayesConnect 3.0*–Share modems or other serial devices over an AppleTalk network. Includes password security, activity logging, unlimited client support, as well as System 7, and Multifinder Toolbox compatibility .. $75.

410C

1-800/800-3333

MacConnection®

MMC

©Copyright 1992 PC Connection, Inc. MacConnection is a division and registered trademark of PC Connection, Inc., Marlow, NH. All other trademarks remain the property of their respective companies.

Who knows?

Dove Computer

6758 ❼DoveFax 2.0 . $199. 3352 NuBus . $229.
9634 ❼DoveFax Plus . . 265. 4111 NuBus . . 299.
4110 ❼DoveFax LAN-5 329. 4109 NuBus-5 365.
4796 ❼DoveFax LE . . . . . 365.
5383 ❼DoveFax PB *(May '92)* . . . . . 199.

★**Farallon Computing ... 30 day MBG**

Full line available. Partial listing.

9805 ❼Timbuktu 4.0.2 . . . . . 129.
4866 ❼Timbuktu/Remote 3.0 . . . . . 129.
6273 PhoneNET StarConnector 10-Pack . . . . 129.
4869 PhoneNET Connector 10-Pk *(DIN8)* . . . . 198.
2206 PhoneNET StarController 307 . . . . . 899.
4802 PhoneNET StarController 357 . . . . . 1025.
4814 PhoneNET StarController 377 . . . . . 1299.
9961 PhoneNET Card PC. . . . . 209.
PhoneNET Ethernet Card *(SE/30, II, si)* ea. 173.

★**FreeSoft ... 30 day MBG**

6115 ❼White Knight 11 . . . . . 85.

★**Global Village ... 30 day MBG**

8946 ❼TelePort A300 1.06 . . . . . 129.
8945 ❼TelePort/FAX 1.06 . . . . . 169.
5327 ❼TelePort/Full FAX 2.02 . . . . . 219.
5321 ❼PowerPort/V.32 2.0 . . . . . 489.

Hayes

5101 HayesConnect 3.0 *(modem sharing)* . . . . 75.
2300 ❼Smartcom II for the Mac 3.3B . . . . . 84.
1345 OPTIMA 24 Modem . . . . . 155.
3522 OPTIMA 96 Modem . . . . . 389.
7391 ULTRA 96 Modem . . . . . 669.
5024 ULTRA 144 Modem . . . . . 799.

★**FreeSoft ... 30 day MBG**

6115 ❼ *White Knight 11*–11 award winning communications program that supports XMODEM, YMODEM, ZMODEM, Kermit, and CompuServe Error Correcting protocols. Includes Okyto 1.0 and a free subscription to GEnie **$85.**

★**IBS ... 30 day MBG**

8581 DataClub Classic *(3)* . 265. 8580 *(10)* . 539.
1495 DataClub Elite . . . . . 939.

Insignia Solutions

7557 ❼Access PC 1.1 . . . . . 60.
9726 ❼Entry Level SoftPC 2.5 . . . . . 125.
4089 ❼Universal SoftPC 2.5. . . . . 195.
3229 ❼SoftAT 2.5. . . . . 299.
3441 ❼SoftNode 1.0. . 105. 3454 *(10 Pak)*. . 699.

Logicode Technology

5522 Quicktel Xeba M2400X . . . . . 99.
5525 Quicktel Xeba M9624XV . . . . . 199.
5524 Quicktel Xeba M9696XV . . . . . 399.
5523 Quicktel Xeba M1414XV. . . . . 459.

MASS Microsystems

3655 MASS FM24/96 . . . . . 185.

★**Microcom ... 30 day MBG**

7459 ❼CarbonCopy Mac 2.0 *(single)*. . . . . 59.
1556 ❼CarbonCopy Mac 2.0 *(unlimited)* . . . . 179.

★**Microsoft ... 30 day MBG**

9444 ❼Microsoft Mail 3.0 *(1-5 user)* . . . . . 269.

★**Orange Micro ... 30 day MBG**

2392 ❼Orange386 *(20 MHz)* . . . . . 1799.

★**Prometheus ... 30 day MBG**

8990 ❼ *ProModem Ultima Home Office*–V.32bis Ultima with voice feature added at an even lower price, turns your Mac into an answering machine. 14,400 bps data modem with V.42bis/MNP 5 & 9600 bps S/R fax & full voice capability! . **$489.**

★**Practical Peripherals ... 30 day MBG**

8994 2400 V.42 bis Modem . . . . . 125.
7934 PM9600SA Modem 1.26 . . . . . 289.
9849 ❼SmartPack 9600 *(with Smartcom II)* . . 349.

★**Prometheus ... 30 day MBG**

2590 ❼ProModem 2400 Mini Plus . . . . . 129.
3832 ❼ProModem Remote Plus . . . . . 225.
4724 ❼ProModem Home Office . . . . . 259.
8990 ❼ProModem Ultima Home Office . . . . . 489.

★**PSI Integration, Inc. ... 30 day MBG**

5320 ❼PowerModem *(for PowerBook)* . . . . . 206.
3143 ❼COMstation ONE 195. 3142 ❼TWO 299.
5340 ❼COMstation FOUR . . . . . 369.
5339 ❼TravelCOM *(pocket modem)* . . . . . 489.

★**Shiva ... 30 day MBG**

3444 ❼NetSerial 1.35. . . . . 275.
4347 NetBridge or 4942 ❼TeleBridge . . . . . 409.
NetModem/E *(thick, thin, 10BASE-T)* ea. 1679.

Sitka/TOPS

4188 Teleconnector *(DIN8)*. . 23. 2230 *(10)*. . 189.
6264 ❼TOPS Network 3.1 187. 2419 *(3 pack)* 249.

★**Software Ventures ... 30 day MBG**

3455 ❼MicroPhone II 4.0 . . . . . *special* 179.

★**Synergy ... 30 day MBG**

6618 ❼VersaTerm 4.6. 90. 6619 ❼PRO 3.6. 177.

★**TechWorks ... 30 day MBG**

1582 ❼GraceLAN . . . . . 285.
1584 ❼GraceLAN Corporate . . . . . 689.

★**Berkeley Systems ... 30 day MBG**

2198 ❼ *More After Dark (M.A.D.)*–*Honorable Mention*–1991 MacUser Editors' Choice Award for *Best Desktop Diversion*. 25 new displays. . **$23.**
5737 ❼ *After Dark 2.0V*–Stops screen burn-in. 28.
2196 ❼ *After Dark & M.A.D. Bundle*. . . . . 40.

1781 ❼GraceLAN Update Mgr. Single Zone $169.
1782 ❼GraceLAN Update Mgr. Multiple Zone 285.
1767 ❼GraceLAN Asset Manager . . . . . 499.
1763 ❼Hubworks-8 . . . . . 289.
Ethernet Cards. . . . . call

★**White Pine Software ... 30 day MBG**

3535 ❼Mac 240 . 139. 3541 ❼Mac 241 . . . 199.
2404 ❼Mac 320 . . 99. 2403 ❼Mac 330 . . . 169.
2400 ❼Mac 340 . 239. 3544 ❼Exodus 3.0. 199.

★**Zoom Telephonics ... 30 day MBG**

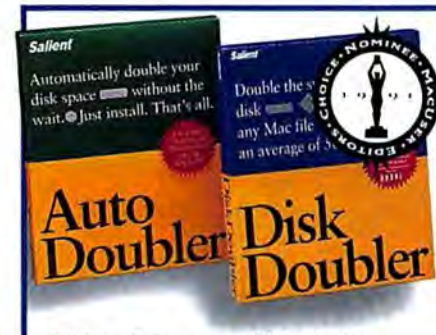
1168 ❼MX2400R Modem *(w/❼QuickLink II)* . . 69.
1176 ❼MX2400S Modem *(with SendFax 9600)* 79.
2310 ❼FX9624 Send/receive Fax/Modem . . . 119.
3576 ❼FX9624V Send/receive V.42 Fax/Modem 145.
1179 ❼V.42bis Modem *(with MacPack)* . . . . . 125.
2311 ❼V.32 Turbo Modem *(with MacPack)* . . 339.
3553 ❼Fax/Modem VFX V.32bis . . . . . 299.

INPUT/OUTPUT

KEYBOARDS, MICE, TRACKBALLS, PRINTERS & SCANNERS

★**Abaton ... 30 day MBG**

7432 ❼Scan 300/GS *(reqs. Scan Kit)* . . . . . 829.
2742 Scan 300/Color *(reqs. installation kit)* . . . 989.
1496 Inst. Kit for 300/Color with Photoshop. . . 479.
1537 LaserScript LX . . . . . 1729.



★**Salient Software ... 30 day MBG**

4838 ❼ *AutoDoubler 1.05*–New! Automatically double the space on your drive . . . . . **$45.**
7404 ❼ *DiskDoubler 3.7.5*–Award winner. Compress files for telecommunication, backups, or transfer to floppies. Can use w/AutoDoubler 45.

★**Advanced Gravis ... 30 day MBG**

9963 ❼Gravis Mouse Stick. . . . . 62.
9964 ❼Gravis Super Mouse. . . . . 79.

American Power

5895 UPS 110SE . . 209. 6686 UPS 370ci . . 339.
3447 SurgeArrest Plus . . . . . 39.

★**Appoint ... 30 day MBG**

2760 Thumbelina Mac *(mini 3 button mouse)* . . 65.
2769 MousePen Pro Mac . . . . . 65.

Caere

8124 ❼Typist Plus Graphics . . . . . 459.
4476 ❼OmniPage 3.0 . . . . . 459.
4930 ❼OmniPage Professional 2.0 . . . . . 649.

CoStar

1418 AddressWriter. . . . . 479.
❼Stingray ADB *(platinum or black)*. . ea. 79.

★**Curtis Manufacturing ... 30 day MBG**

8046 MVP Mouse *(MVP-1)* . . . . . 89.

★**Datadesk ... 30 day MBG**

9830 ❼MAC101E . 129. 2384 w/QuicKeys . 149.
6901 Switchboard *(modular keyboard)* . . . . . 159.

★**Everex ... 30 day MBG**

1144 ❼Silhouette Trackball 1.0 *(ADB Macs)* . . . 78.

★**GDT Softworks ... 30 day MBG**

3429 ❼BetterWriters 1.0 *(software drivers)* . . . . 39.
2499 ❼PowerPrint . . . . . 99.

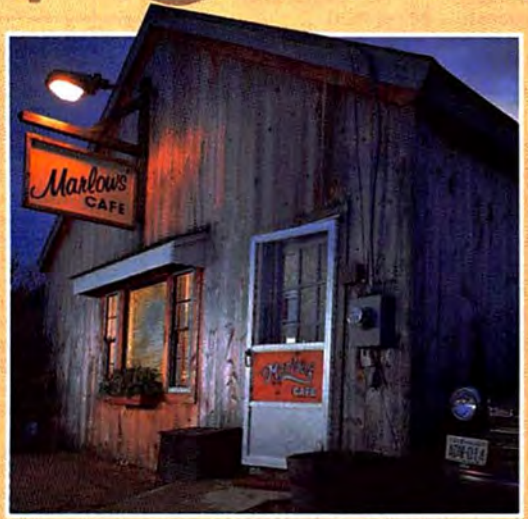
MacConnection®

TRUTH, JUSTICE, SOFTWARE, AND PERIPHERALS SINCE 1984.

WHO SAYS THERE'S NO SUCH THING AS A

FREE LUNCH

Need a break from fast food and pull-down menus? Find out about the free home-cooked meal waiting for you here in Marlow, NH.



CERTIFICATES FOR FREE MEAL ENCLOSED WITH ALL ORDERS PLACED BY JUNE 30, 1992.

800/800-3333.

Apple Computer
1074 ❼ *System 7*–Balloon help, File sharing, Publish & Subscribe, Aliasing, TrueType, Virtual memory, 32-bit addressing. Buy now & get a free PCTV® video (limit 1 per customer) with Lon Poole explaining all these new features **$99.**

★PSI Integration, Inc. ... 30 day MBG
3135 PSI MultiColor . . . . . 99.
3137 Crunch-It! LC . . . . . 113.
Sigma Designs
1501 DoubleUp with ❼DiskDoubler 3.7 . . . . . 179.
★Total Systems ... 30 day MBG
7817 16 MHz Mercury 030 *(for Mac SE)* . . . . . 359.
7816 20 MHz Gemini 030 . . . . . 799.
68882 Math Coprocessors . . . . . call

MEDIA

★Fuji ... 60 day MBG
2214 3½" DS Disks *(10)* . . . 9. 2242 *(50)* . . . 32.
2215 3½" HD Disks *(10)* . . 15. 2241 *(50)* . . . 59.
4863 3½" HD Disks *(20)* w/storage case . . . . . 26.
2243 3½" Color *(10)* DS . . . . . 10.
2239 3½" Color *(10)* HD . . . . . 18.
5348 DC2000 . . . . . 15. 5346 DC2120 . . . 21.
5345 DG60M . . . . . 16.
★Sony ... 60 day MBG
3297 3½" DS Disks *(10)* . . . 9. 6148 *(30)* . . . 25.
3298 3½" HD Disks *(10)* . . 15. 6375 *(30)* . . . 42.
1603 DG60M. . . . . 16. 2520 DG90M . . . 22.
8185 QD2040 . . . . . 14. 1895 QD2120 . . . 21.
★SyQuest ... 60 day MBG
6592 44 MB Cartridge *(1)* . 69. 5529 *(3)* . . . 199.
5528 44 MB Cartridge *(5)* 329. 9728 *(10)* . . 649.
3603 88 MB Cartridge *(1)* $107. 3600 *(3)* . . $312.
5530 88 MB Cartridge *(5)*. 512. 9728 *(10)* . . 999.
★3M ... 60 day MBG
3943 DC2000 . . . . . 17. 6065 DC2080 . . . . . 20.
1581 DC2120 . . . . . 23. 9931 DC2165 . . . . . 32.

★**SuperMac Technology ... 30 day MBG**
VideoSpigot–Digital-video frame grabber for making QuickTime movies. Includes VHS Video Input via RCA jack.
4164 *VideoSpigot (for NuBus)*. . . . . **special $399.**
4122 *VideoSpigot LC or 4114 VS IIsi* . . . . **ea. 349.**

ACCESSORIES
TONERS, CASES, DUST COVERS

Apple Computer
9773 StyleWriter Ink Cartridge. . . . . 22.
7748 Personal LaserWriter Toner Cartridge. . . . 87.
1115 LaserWriter II Toner Cartridge. . . . . 105.
★Avery ... 60 day MBG
7050 Avery 5660 *(1" x 2⅝" Clear Adrs.-Laser)* . 32.
4811 Avery 5182 *(8½" x 11" Trans.-Laser)* . . . . 22.
5392 Avery 5196 *(3½" Disk Labels-Laser)* . . . . 29.
4807 Avery 5160 *(1" x 2⅝" Address-Laser)* . . . 24.
★Basic Needs ... 60 day MBG
Full line of Dust Covers, etc. . . . . call
★Curtis Manufacturing ... 30 day MBG
8973 Apple Security Kit *(SL-2)*. . . . . 22.
Ergotron, Inc
Mac Tilt *(Classic, SE or SE/30)*. . . . . *ea.* 68.
★Goldstein & Blair ... 30 day MBG
8374 ❼The Macintosh Bible *(with disks)*. . . . . 25.

Ashton-Tate/Borland
1324 *FullWrite Professional 1.0*–Incredible deal! Version 1.0 can be upgraded to V 1.5S (System 7 compatible) for $49.95 + $5 shipping & handling. Simply dial 800/331-0877 (Borland sales) & have your disk serial number handy. . . **$25.**

★I/O Design ... 30 day MBG
Full line of Dust Covers *(teal green or navy)* call
3688 Ultimate StyleWriter Case . . . . . 49.
8812 Ultimate Classic Carrying Case . . . . . 64.
3362 Ultimate SL PowerBook Case. . . . . 64.
3371 Ultimate EX PowerBook Case . . . . . 75.
1941 Ultimate LC Carrying Case. . . . . 95.
★Kensington ... 30 day MBG
Full line available. Partial listing.
4973 Power Tree 20 . . . . . 27.
2559 Apple Security Kit. . . . . 33.
9303 Keyboard Shelf. . . . . 39.
6763 Mac SE Anti-Glare Filter . . . . . 52.
3623 Apple Color 12" Anti-Glare Filter . . . . . 63.
5064 Apple Color 13" Anti-Glare Filter . . . . . 63.
1118 Compact PowerBook Case . . . . . 49.
1092 Deluxe PowerBook Case . . . . . 79.
★MacConnection ... 60 day MBG
1505 Solid Oak Disk Case *(36)* 21. 4623 *(90)* 32.
★Moustrak ... 60 day MBG
2694 Moustrak Pad *(7"x9")* . . . . . 8.
2692 Moustrak Pad *(9"x11")* . . . . . 9.
2693 Moustrak Pad Low Friction *(9"x11")*. . . . . 10.
★Targus ... 60 day MBG
3617 Mac Classic/SE/Plus Case . . . . . 59.
1305 Universal Notebook *(for PowerBooks)* . . . 69.
4015 Mac SE & Ext. Keyboard Case . . . . . 75.

Hewlett-Packard
6754 *HP LaserJet III*–Exclusive Resolution Enhancement technology with 300 dpi sets a new standard. Prints up to 8 pages per minute as well as holding up to 5 MB of memory. (requires interface kit). . . . . **$1599.**

★T/Maker ... 30 day MBG
5316 The PowerBundle Carry Case *(only)*. . . . . 75.
★Tripp Lite ... 30 day MBG
3350 MacDirector. . . . . 72.

OUR POLICY

- 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 the shipment(s) that complete the order (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. $250 minimum. Manufacturer support and upgrade eligibility may be limited outside the U.S.A.
- Upon receipt and approval, personal and company checks clear the same day for immediate shipment of your order.
- Corporate P.O.s accepted subject to credit approval.
- COD max. $1000. Cash or certified check.
- 120 day limited warranty on all products. Defective software replaced immediately. Defective hardware repaired or replaced at our discretion. All items subject to availability. Prices and promotions subject to change without notice.
- Our order lines are open continuously from 8:00 a.m. Monday until 5:30 p.m. Sunday Eastern Time. You can call our business offices at 603/446-7711 Monday through Friday 9:00 a.m. to 5:30 p.m. Eastern Time.

SHIPPING

Continental US: 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. Some areas require an additional day delivery. The total freight charge on any order placed with MacConnection is only $3.

Hawaii, Alaska, Canada, Puerto Rico and the U.S. Virgin Islands: Call 800/800-3333 for information on shipping and charges.

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

You might want to stay.

Hewlett-Packard
6514 HP B&W DeskWriter *(w/cartridge)* .... $479.
2964 HP Color DeskWriter C *(w/color cart.)*... 849.
3596 HP ScanJet IIc *(color)*..... 1599.
6754 HP LaserJet III *(requires kit)*..... 1599.

★**Kensington ... 30 day MBG**
2547 ❼Turbo Mouse 3.0 ADB ..... 107.

Koala
2593 ❼MacVision (Serial) G-Scale Digitizer 4.1 259.
2879 ❼MacVision (SCSI) Color Digitizer 4.1.. 499.

Kraft Systems
6099 Trackball *(with footpedal)*..... 39.
7519 KM30 Trackball ..... 42.

★**Logitech ... 30 day MBG**
1671 ❼MouseMan . 77. 1672 ❼TrackMan . 89.
5082 ❼ScanMan Model 32 G-Scale Scanner. 299.
3339 ❼ScanMan & Catchword ..... 369.

★**MicroSpeed ... 30 day MBG**
2807 ❼MicroTRAC *(for SE & II family)*..... 75.
6621 ❼MacTRAC ADB 2.0 *(SE & II family)*.... 75.

★**Microtek ... 30 day MBG**
1981 ❼MS-II OCR Scanner ..... 849.
1978 ❼Scanmaker 600GS..... 849.
1985 ❼Scanmaker 600ZS ..... 1399.
4505 ❼TrueLaser *(with toner)*..... 1399.

Monster Design Group
1486 MacSpeakers *(two, stereo)*..... 169.

Applied Engineering
2532 QuickSilver Accelerator for the IIsi–Gives your Mac IIsi speed and expandability with an SE/30 slot extender, a cache card and a 68882 math co-processor chip on board. Comes with a 5 year warranty..... **$299.**

★**Mouse Systems ... 30 day MBG**
7520 ❼Little Mouse or 8001 Little Mouse Plus . 74.
3005 ❼A^3 Trackball *(ADB)*..... 79.

NEC
5377 SilentWriter Model 95..... 1599.

★**Orange Micro ... 30 day MBG**
3036 ❼Grappler 2.0... 92. 3692 ❼IIsp... 115.

★**Sophisticated Circuits ... 30 day MBG**
8009 ❼PowerKey 2.01..... 76.
8008 ❼PowerKey Remote ..... 32.

Thunderware
4994 ❼LightningScan 400..... 359.
3107 ❼LightningScan Pro 256..... 499.

UPGRADES & DRIVES

MEMORY, ACCELERATORS

SIMMs ... with free video & manual
8316 1 MB SIMMs *(80ns, set of 2)*..... 69.
9437 2 MB SIMMs for IIsi or II LC ..... 69.
7437 4 MB SIMMs *(80ns)*..... 129.
7600 4 MB SIMMs *(80ns, set of 2)*..... 499.
PowerBook modules ..... call

★**Applied Engineering ... 30 day MBG**
2532 QuickSilver Accelerator for the IIsi ..... 299.
1971 FastMath LC..... 139.

★**SIMMs ... with free video and manual**
RAM your Mac to System 7 specs and beyond. At the lowest prices around. All SIMMs come with a full 2-year warranty, plus free installation manual and video. We also carry SIMMs for the Quadra, and 2 MB, 4 MB, and 6 MB modules for Apple's PowerBooks. So kick your Mac into overdrive and create huge spreadsheets & complex graphics with power to spare.
1107 *1 MB SIMM (80ns)*..... 36.
8316 *1 MB SIMMs (80 ns, set of 2)*..... 69.
9437 *2 MB SIMMs (for IIsi or LC)*..... 69.
7437 *4 MB SIMMs (80 ns)*..... 129.
7600 *4 MB SIMMs (80 ns, set of 4)*..... 499.
16 MB SIMMs (for Quadra 700/900, set of 4) 2799.
PowerBook modules..... **call**

8361 ❼1.44 MB High Density Drive..... 229.
5290 ❼Plus Drive *(FDHD for Plus & SE)*..... 309.
3319 TransWarp SE *(25 MHz)*..... 799.
3317 TransWarp SE *(40 MHz)*..... 1479.
4147 TransWarp LC *(33 MHz)*..... 999.
4903 TransWarp LC *(40 MHz)*..... 1199.
2905 Floppy Drive to Mac II Cable ..... 15.

Computer Care
BookView Imperial *(memory and video card for Apple's PowerBooks)*..... call
BookRAM 2S, 4S, 6S, DRAM 4..... call

★**Dayna ... 60 day MBG**
8722 DaynaFile II 1.2 5¼" Drive ..... 429.

★**DayStar Digital ... 30 day MBG**
Does not include optional math chip.
8949 LT200 Connection *(PC)* 175. 8950 *(MC)* 279.
3584 DualPort IIsi with 20 MHz 68882..... 165.
8556 ❼FastCache for Mac IIci ..... 265.
3401 ❼FastCache IIsi 299. 3389 IIsi w/FPU 369.
1613 ❼FastCache 040 *(for Quadra)*..... 349.
PowerCache for SE/30, II, IIx, IIcx, IIci, IIsi, LC 40 MHz..... 859. 50 MHz..... 1349.
RAM PowerCard *(various memory config.)*. call

Envisio
1819 Notebook Display Adaptor *(1 MB)*..... 549.
1812 *(2 MB)*..... 699. 1842 *(4 MB)*..... 1099.
1848 Notebook Display Adaptor 030 *(1 MB)*.. 629.
1837 *(2 MB)*..... 939. 1835 *(4 MB)*..... 1249.

Logicode Technology
5523 Quicktel Xeba M1414XV–Send and receive faxes and data with Quicktel 14,400 bps V.32 compliant fax/modem. Distinctive styling, lighted icons, cables & lifetime warranty **$459.**

Dove Computer
Racer 030 Plus, SE, or SE/30..... *ea.* 399.
9789 Racer 030 for Mac II..... 739.

★**FWB, Inc. ... 30 day MBG**
2320 HammerDisk44 *(removable)*..... 739.
1802 HammerDisk88 *(removable)*..... 949.
2331 PocketHammer 50..... 569.
2329 PH 100..... 749. 2314 PH 200.. 1199.
1801 Hammer300.. 1899. 1803 PH 425 . 1999.
2333 Hammer Internal 100is 599. 2334 200is 999.
1795 300is..... 1699. 1794 425is ... 1799.

IOMEGA
2224 90 MB Transportable *(reqs. interface)*... 799.
2467 90 MB Gold Std. Rem. Cart. *(Qty. 3)*.... 439.
7789 ❼Mac 1B Interface *(w/Central Pt. Backup)* 39.
2466 ❼Mac 2B Interface *(w/Retrospect)*..... 99.

MASS Microsystems
2605 DataPak 45.. 649. 2599 DataPak 88.. 849.
2973 Diamond 120 MB Hard Drive..... 639.
2972 Diamond 210 MB Hard Drive..... 1049.
2969 Diamond 320 MB Hard Drive..... 1699.
2952 Diamond 510 MB Hard Drive..... 2149.
3677 2" Diamond 80 MB Portable Drive..... 689.
3678 2" Diamond 120 MB Portable Drive..... 569.
3663 2" Diamond 210 MB Portable Drive..... 979.
3662 2" Diamond 320 MB Portable Drive.... 1549.
3659 2" Diamond 510 MB Portable Drive.... 1999.
3657 HitchHiker Portable Drive *(40 MB)*..... 519.
3656 HitchHiker Portable Drive *(80 MB)*..... 689.

★**MDS Drives ... 60 day MBG**
5533 MDS 44 SyQuest w/AutoDoubler..... 499.
5532 MDS 44 SyQuest w/Norton Utilities .... 499.
5534 MDS 88 SyQuest w/AutoDoubler..... 599.
5535 MDS 88 SyQuest w/Norton Utilities .... 599.
5529 44 MB Cart. *(3 pak)*. 199. 5528 *(5 pak)*. 329.
5531 88 MB Cart. *(3 pak)*. 312. 5530 *(5 pak)*. 512.

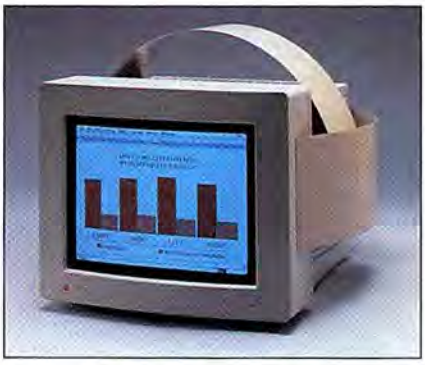
★**Micron ... 30 day MBG**
7149 ❼Xceed IIci-128K Cache Card ..... 239.
2262 Xceed Color 30 Card *(SE/30)*..... 279.
2260 Xceed Gray-Scale 30 Adapter Card ..... 75.
3668 Xceed Macro Color 30 24-bit Video Card 489.

Peripheral Land, Inc. (PLI)
1866 Quick SCSI Card *(requires cable)*..... 319.
8335 PLI TurboFloppy 1.4..... 295.
8327 PLI Infinity 40 Turbo *(removable)*..... 599.
9752 PLI Infinity 88 Turbo *(removable)*..... 779.
2325 PLI Infinity Optical Drive..... 3199.
4645 PLI Infinity MO 3.5" Optical Drive..... 1699.
2864 PLI Infinity Floptical Drive *(21 MB)*..... 559.
2865 Floptical Cart. *(21 MB)* 35. 2899 *(10 pak)* 299.
2644 Quantum 52 MB External Hard Drive... 479.
3682 Quantum 240 MB External Hard Drive.. 999.
8330 PLI 105 MB..... 619.
2327 PLI 2GB DAT Drive..... 1939.

ADVERTISEMENT

Monitor Radiation News

1-800-262-3260 Vol. 1



New Product Blocks ELF Magnetic Radiation

NoRad Corporation is now shipping ELF ProTech, the first externally mounted Extremely Low Frequency (ELF) magnetic field radiation suppressor for video display terminals (VDTs). Independently tested on popular monitors, ELF ProTech reduces ELF magnetic fields to well below the latest Swedish standards (SWEDAC, MPR II).

NoRad's proprietary technology (patent pending) safely absorbs ELF magnetic radiation by up to 70% *all around the display*—front, back, sides and top. And, the higher the field strength, the greater the reduction.

For the first time, you can upgrade your current monitor with external shielding rather than buy a new, low magnetic radiation monitor. Installed in minutes without special tools, ELF ProTech preserves image quality and *safeguards warranties and computer performance.*

ELF ProTech's universal design fits all monitors, and is color-matched to today's displays.

New Shield Delivers Brighter Image

The NoRad Shield, the industry-standard radiation and glare shield, is now even better. Advancements in manufacturing give NoRad Shield users High Light

Transmission (HLT), *which increases image brightness by a full 50%.*

Already the highest resolution shield available, NoRad has increased the Shield's resolution even more—to 260 lines per inch. This means a clearer image from your monitor.

Independent Tests Support NoRad Product Line

An independent, government-certified laboratory has tested the NoRad Shield and ELF ProTech to verify performance and shielding effectiveness.

Using U.S. Military Standard 285, the NoRad Shield was tested against the leading technologies which claim radiation protection. Only the NoRad Shield blocked 99.99% of virtually all electric field radiation—*not only ELF and VLF, but all the way up into the microwave range,* and greater than 50% of the total magnetic radiation above 30 KHz - *the broadest protection available.*

ELF ProTech was tested according to the most stringent Swedish standards (SWEDAC, MPR II) for its ability to suppress ELF magnetic radiation from popular, high-emission monitors. ELF ProTech brought magnetic fields at *all* of the required 48 test points below the 2.5 milliGauss benchmark, and a dramatic 37 of the 48 points were *below 2.0 milliGauss.*

Together They're Unbeatable!

It's a fact that monitors and VDTs emit electromagnetic radiation across a wide range of frequencies, in both electric and magnetic fields.

With the NoRad Shield *and* ELF ProTech you have the *best solution for monitor radiation.* To order or receive a *free* booklet on "The Myths and Facts of Anti-Radiation Screens" call:

1-800-262-3260

NoRad

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

Circle 133 on reader service card

Art Beat

Behind Macworld's Graphics

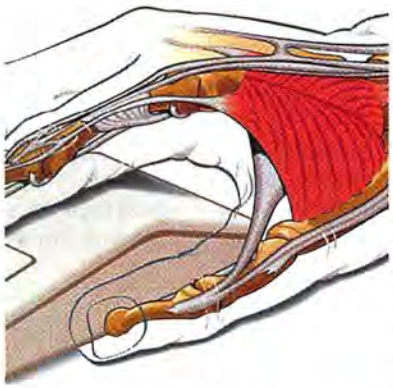
BY CATHY ABES

Artist: For the past three years, *Macworld* senior designer Arne Hurty has been creating the detailed, distinctive informational graphics that appear in *Macworld* feature articles and *How To* columns.

Hardware: Macintosh Quadra 700 with 8MB of RAM and 160MB internal hard drive; RasterOps 19-inch color monitor and 24-bit graphics board; Siemens gray-scale scanner; QMS color printer.

Software: FreeHand 3.1.

How It Was Done: For the illustration that opens our feature on alternative input devices, Hurty began by doing a pencil sketch, because he felt that an image as complex as a human hand showing muscles, tendons, and bones would be too difficult and time-consuming to draw freeform in a graphics program. Since it was a line drawing without any gray shades, Hurty scanned the sketch and placed it in FreeHand as a 1-bit TIFF rather than as a gray-scale file, so it would take up less memory.



Detail of the illustration that opens our feature on input devices, page 154.

Hurty first placed the original scanned image (on a layer he named Template) for use as a template from which to trace the different layers of the hand—skin, bones, muscles, and tendons. After saving the template, he created another layer for the skin, and with both the Template and Skin layers open, he began tracing the outline of the skin using the pen tool. Hurty used bright magenta for the line color so he could easily differentiate between the traced line and the original. Once the skin was traced and saved, Hurty turned off the Skin layer, and with the Template layer still on, created a new layer for the bones, where he repeated the same process (again using magenta for the line). Because there were so many tendons, he created two layers for them—one for the top layer of tendons and muscles and a second for the bottom layer.

Finally, he created a layer for the mouse. To draw the mouse in correct perspective, Hurty used a simple technique. He drew two sets of lines from two different vanishing points that originated far off the page. These he used as a guide for defining the boundaries of the mouse.

Next he created a set of colors for all the elements of the drawing—the bones, the tendons and muscles, the mouse, and the shadows. Then he applied the colors to the various elements using both solid and graduated fills.

To create the irregularly shaped lines that define most of the elements, Hurty first selected an element—for example, the shape of a bone—copied it to the Clipboard, and (using ⌘-shift-V) pasted it behind the original. Then he gave the pasted image a Basic fill of black, and with all the points of the element still selected, he pulled each point out the desired amount to create a line of irregular width. Because FreeHand's Snap to Point default setting makes it difficult to move points in slight increments and to place points very close to each other without allowing them to touch, Hurty turned it off before he began pulling out the individual points.

Hurty used this technique for all the outlines but varied it slightly for the skin. First he cloned the magenta outline of the skin, and then he slightly repositioned each point of the cloned line, except the end points. He joined the cloned and

continues

Out of Control?

Get IN CONTROL®

To-Do List Manager

We all make lists. But things still pile up. Or get lost. Important details forgotten.

Now there's IN CONTROL. Now you can track and manage all the details of your activities: due dates, priority, status and more. Organize, categorize and prioritize your lists instantly.

Order IN CONTROL today
only $129.95
Call now 617-776-1110
60 day money-back guarantee!

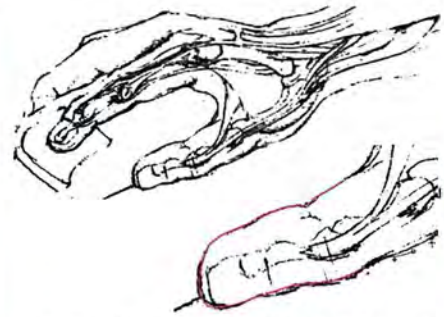
"Ideal for managing lists and tasks.... IN CONTROL is undeniably the product of choice." – MacWEEK 2/17/92

ATTAIN
Attain Corporation
48 Grove Street, Somerville, MA 02144
In Control is a trademark of Attain Corporation
FileMaker is a registered trademark of Claris Corp.

NEW from the creators of FileMaker®

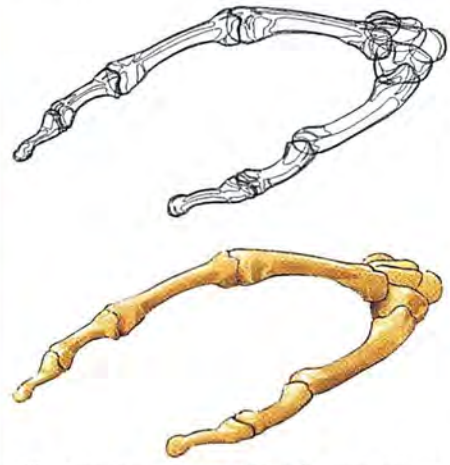
Magneto-Optical Storage
State-of-the-Art, Fast, Reliable, Versatile, Infinitely Expandable
...Now Affordable
128MB
REWRITABLE • REMOVABLE
3.5" MO
CARTRIDGE DRIVE
SPECIAL OFFER $1499
includes O·C·E·A·N VISTA V128 Subsystem & 128MB Cartridge

V128
Additional 128MB MO cartridges are just $55 each. Or save more – get a 3-pack (384MB) for only $150.
For massive storage needs, consider an OCEAN TIDALWAVE Rewritable MO drive featuring 600MB on each 5.25" cartridge.
Order Direct 1.800.262.3261
fax 408.374.8309
O·C·E·A·N
O·C·E·A·N Microsystems, Inc.
246 E. Hacienda Ave, Campbell, CA 95008
408.374.8300
Circle 131 on reader service card



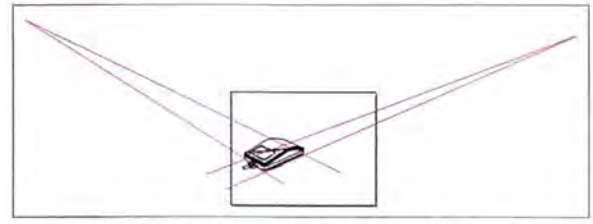
Hurty used his scanned pencil sketch as a template for tracing the various layers of the illustration (here, the Skin layer) in FreeHand 3.1, using a magenta line to differentiate between the template and the new layer.

Hurty created the irregular outlines around the bones (as well as other elements) by pasting a copy of the bone behind the original, giving the copy a black fill, and pulling out each of its points from the original just enough to create an irregular shape.



The Bone layer was created by the same process Hurty used to trace the skin. He then colorized the bones by applying a combination of solid and graduated fills.

For the skin, Hurty cloned the magenta line, pulled out all the clone's points except the end points, which he joined to the end points of the original, creating a closed shape. Deleting the line and giving the shape a gray fill resulted in the skin's irregular outline.



To enable him to draw the mouse in correct perspective, Hurty used as guidelines two sets of lines, each set originating from a vanishing point far outside the boundaries of the drawing.

original lines at the end points to create one continuous (closed) element. By deleting the stroke (the magenta outline) and giving the element a fill of gray, he was able to produce a line of irregular width for defining the skin.

Now it was time to create the shadows. Hurty had previously defined each of the shadow colors as tints of black. The colors he selected for all of the other elements were combinations of the other three process colors—cyan, magenta, and yellow. Hurty took this step because he wanted to make sure the shadows would reliably overprint the other elements. If the shadows shared a common color with the other elements, FreeHand would default to the percentage of common color present in the overprinted area (the shadow), and distort the image. If the shadow contained 20 percent black, for example, and another element contained 60 percent black, 20 percent black would appear in the overlap area—not a color made up of 80 percent black.

Another interesting effect was the one Hurty used to create the ridges in the muscle tissue. He first drew a thin crescent shape and cloned it. Then he pulled the clone's points inward to create an even thinner crescent in the middle of the original. After assigning a light pink to the original and a dark pink to the clone, he created a seven-step blend between the two. When he placed the element on a light pink background—the same color as the original crescent shape, its edges appeared to blend into the background, giving it a smooth, ridged effect. **m**

Unlimited connect time to access CompuServe basic services, now only $7.95 a month.

You can start with the basics at a flat monthly rate, with extended services available on a pay-as-you-go basis.

For more information about CompuServe's new basic services, just mail this card, or call 1 800 848-8199.

Name _____

Address _____

City, State, Zip _____

Telephone (_____) _____ **CompuServe®**

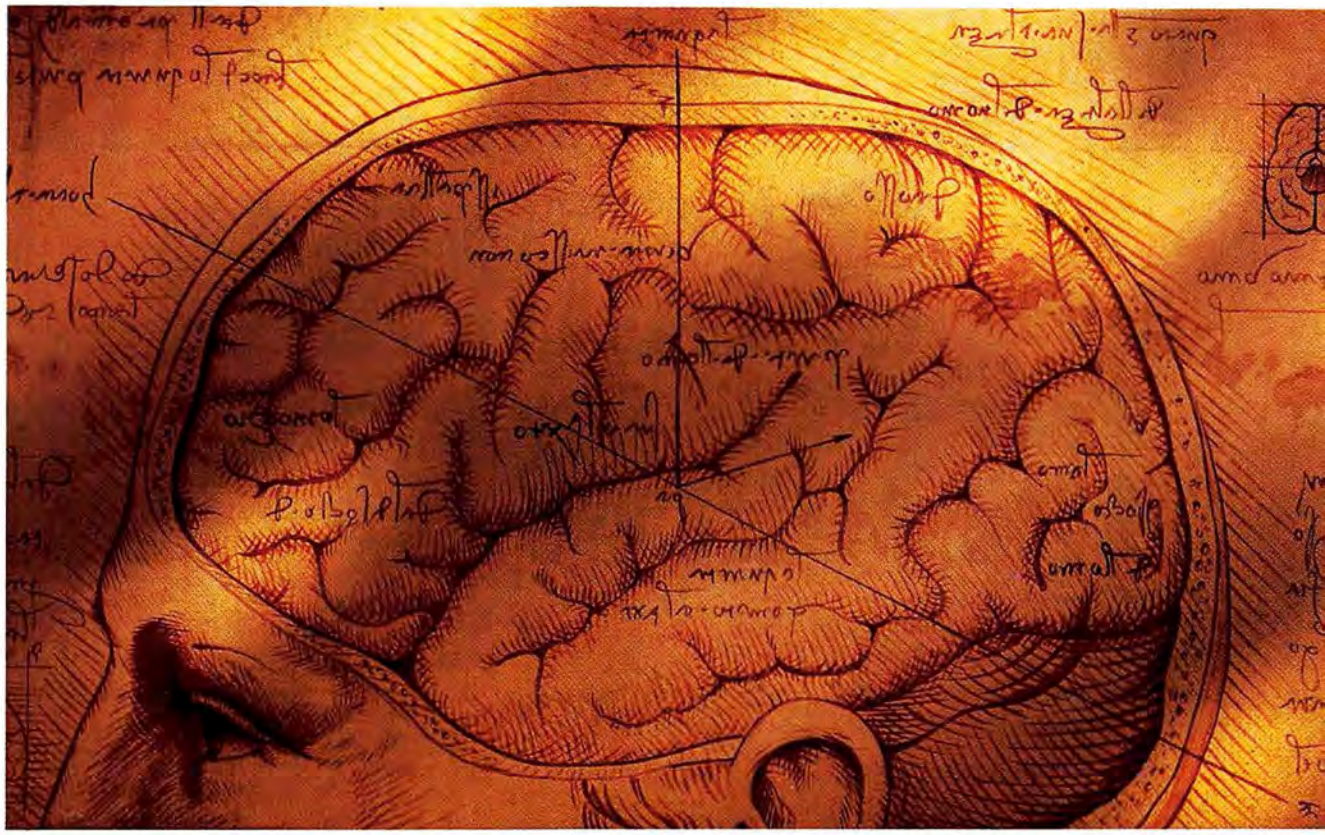
MacWorld/June

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 407 COLUMBUS, OHIO

POSTAGE WILL BE PAID BY ADDRESSEE

CompuServe
ADVERTISING DEPARTMENT
PO BOX 20212
COLUMBUS OH 43220-9988



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

NEW NORTON UTILITIES. GREATER THAN THE SUM OF ITS PARTS.

More than simply combining SUM and the Norton Utilities, we made it faster, more powerful, and easier to use.

Talk about a win-win proposition. Now you can get the most comprehensive data protection and recovery features for the Mac in a single box. Plus, some innovations that make Norton Utilities 2.0 the very best way to protect your data.

The ultimate in data protection.

Using simple menus and icons, Norton Utilities 2.0 combines the technologies from SUM and Norton Utilities to guide you through the best and worst of computing times.

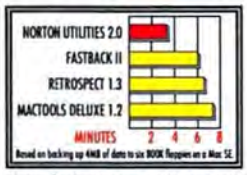
Now you can diagnose problems and restore data—with one product from the master of data recovery, Peter Norton.

To start, the Norton Disk Doctor® is in and it's more powerful than ever. It automatically diagnoses damaged hard drives and floppies, identifying and repairing both common and uncommon disk errors.

Say you've accidentally erased an important file, the enhanced UnErase® will dig deeper to recover it. The improved Volume Recover searches farther and wider to find lost or damaged data.

All this and fast backup, too.

Of course, the first line of defense against data loss is reliable backup. Our fast and flexible Norton Backup makes it easy. Use the scheduler to plan automatic backups from one or more volumes. Its data verification and error correction codes ensure the integrity of your files.



Norton Backup lets you quickly and easily make backups of single files, folders or large volumes.

To make the most of your Mac's performance, check out Speed Disk,™ the fast and safe way to defragment your files and optimize your hard drive.

Speed Disk™ accelerates your disk drive performance without risk.

Not just the best product, the best value.

The new Norton Utilities for Macintosh. It's everything you've come to expect from the top two Mac utilities. Plus, all the security, productivity, and system enhancements you'd expect from Peter Norton. In one box. Now what could be greater than that? To upgrade, or for the name of your nearest dealer, call **1-800-343-4714 ext. 754-G.**

Owners of SUM II and The Norton Utilities for Macintosh can upgrade for just $39*—before June 30, 1992.

© 1992 Symantec Corporation. *Offer expires 6/30/92; valid only in the U.S. and Canada. Price in U.S. dollars. International phone: Canada, 1-800-465-2266; Europe, 31-71-353111; Australia, 2-879-6577; others, 1-408-252-3570. All trademarks or registered trademarks are those of their respective holders.

SYMANTEC.

Circle 96 on reader service card

Claris Redux

BY STEVEN LEVY

DAN EILERS SEEMS TO BE having the time of his life. His face wears the expression of a weekend poker player, finally allowed into a high-stakes match, who just drew an inside straight. Try as he may to prevent it, a giddy smile breaks through. He knows the smile isn't politic, but he's too excited to worry about it.

At least that's the impression I got when we sat down to discuss his nascent reign as president and CEO of Claris, the wholly owned software subsidiary of Apple Computer. After years of toiling at weighty but relatively low-profile jobs at Apple—most notably as the chief purser of the company's strategic investments group, an in-house venture-capital program—Eilers now revels in his new role as software magnate.

When it comes to software written for graphical interfaces such as the Macintosh Operating System, and even Microsoft's Windows environment, nobody does it better than his team, says Eilers. "We're very good at it," he assures me. "The best in the industry at user-centric applications of software." Later, he returns to the subject. "Claris's strength derives from applications software," he says. "We do more on the Mac than any other major player. We are great at it."

If this were a movie, the sound track would be playing one of those stupid pop anthems. Dan and his executive team would be in a lush meadow, a group of business-suited white men tossing the familiar blue-and-white Claris boxes to each other in slow motion. Somewhere, in a dark tower, Bill Gates would be clutching his chest in pain.

At this point, such a movie would have to be rated as fantasy–science fiction. At least, that's the word from Eilers's competitors. Whereas once the name Claris sent software developers into apoplectic stuttering fits, something new has crept into their reactions: a relative ennui, or even dismissive laughter.

The overwhelming sentiment of the executives of the developers I spoke to—tellingly, a sentiment not expressed on the record—was that a competent Claris would indeed be a troublesome competitor, given that Apple's ownership gives the playing field an inevitable tilt. But—and here's the rub—they don't seem to regard Claris as competent.

On the contrary, they seem to think that Claris is a joke. "Why worry about Claris?" I was told. "It's doing such a good job of destroying itself!"

Claris and Hubris

APPLE STARTED CLARIS IN 1987, WHEN several executives, among them Dan Eilers, urged the company to set up a division specifically to create great applications for the Macintosh. To placate the fears of those third-party developers who had kept the Mac in business by already creating great applications for the Macintosh, Apple decreed that the new company would have its own identity, would receive no special favors, and would, at the soonest opportunity, be spun off as an independent entity in which Apple would hold but a minority share. A management team was appointed, led by Bill Campbell, a gung-ho marketing type who informed me early in his tenure that Claris was destined to become the number one software company in the Mac marketplace.

Most big software companies start by creating a great product, growing with it, and spending the rest of their lives trying desperately to repeat their first big success before they milk the last ounce of gold from it. Claris was different. It began with unheard-of resources, a list of solid if underexploited applications, and the clout of its parent company. It was a multimillion-dollar company without trying.

Eventually Campbell and company earned the respect if not the awe of the industry by setting up the workable infrastructure of a major software operation, as well as establishing an identity for Claris independent of Apple's. But though it proved capable of using its fat coffers to acquire products, Claris never did develop any killer applications in-house. And it never even came close to knocking off Microsoft as the leader in Mac software, which many still believe was Claris's mission. The initial gripes of some of the competitors faded as they realized that Claris, while formidable, was in no way destined to bulldoze its way to domination. Anyway, they assumed, soon the company would be independent and that whole sticky problem would go away.

But in June 1990 Apple dropped a bombshell. Claris was *not* going public. Apple decreed that Claris would hereafter be a permanent, wholly owned subsidiary—Apple's official software wing.

"It really was a rethinking of the entire situation," explains Al Eisenstat, Apple's chief legal officer and a board member of both companies. "Software operations played strategically into Apple's long-term plans. We realized that if we spun Claris out, we'd need to start a new Claris."

Two groups of people were unhappy with this. First were the Claris executives, potential shareholders in an independent company. No independent public offering meant that they would not be visiting the Ferrari dealerships quite yet. Apple, which has never had a problem with tossing small fortunes into the hands of its executives, tried to soothe the souls of Campbell and his top guns with millions of dollars in consolation prizes. But the disappointment stuck. Instead of being on their own, the Claris folks were wholly owned, permanently, by a company whose corporate credo was reorganization and confusion.

Within a year, the entire complement of top executives found reasons to leave. Few who witnessed it will forget the comical spectacle in the summer of 1991, when Claris held a press conference to introduce its new ClarisWorks integrated product. Before the demo, about a dozen members of the company's executive staff were introduced—and the most senior member of the group had been there only a few weeks. Not long after, in what current Claris vice president of product development Dick Mathews calls a ripple effect, the next level of management began trickling away, and months after that, some of

continues

Now and forever, this is Apple's software company

the programmers. Some projects were nearly gutted. For instance, the team creating the long-overdue MacWrite Pro lost its engineering manager, the program's chief architect, and its boss.

Profit Motive

THE OTHER UNHAPPY BUNCH CONsisted of companies competing with Claris. They were quick to note the flaw in Apple's logic: if it was necessary in 1987 to promise to spin off Claris to preserve fair competition, what had changed in 1990? What had changed was this: Apple was less beholden to its software developers. With the Macintosh a more proven success than ever, Apple figured the presence of its own software company would not keep potential developers away, and it certainly wouldn't force current developers to give up on the Mac. As long as Apple didn't give Claris egregious favors, it figured that people would pipe down.

Indeed, they did. Even Microsoft's executive vice president of worldwide products, Mike Maples, who says he watches out for those things, notes no special advantages doled out by Apple to its offspring. "Generally I've taken the position that it's not fair yelling 'Wolf!' until you see a wolf," says Maples. "To date, we haven't seen a wolf."

At least one competitor, however, says he's spotted one. Mark Simonsen, president of Beagle Bros, complains that Claris's assured access to Apple products is unfair to smaller developers. "We couldn't get a PowerBook to test our software on until the computers were already announced," he says.

But in my conversations with several other Claris competitors, I find such complaining rare these days. Instead, the gleeful word in the industry is that no one needs to worry about Claris, because Apple is screwing things up.

What evidence do these off-the-record bad-mouthers offer? First, Dan Eilers. They consider him a lightweight with little experience in the nuts and bolts of the software business. Then they note Apple's endemic propensity for destructive directional shifts—surely, they say, the presence of the Apple bureaucracy will hamper Claris's ability to respond to the twists and turns of the marketplace.

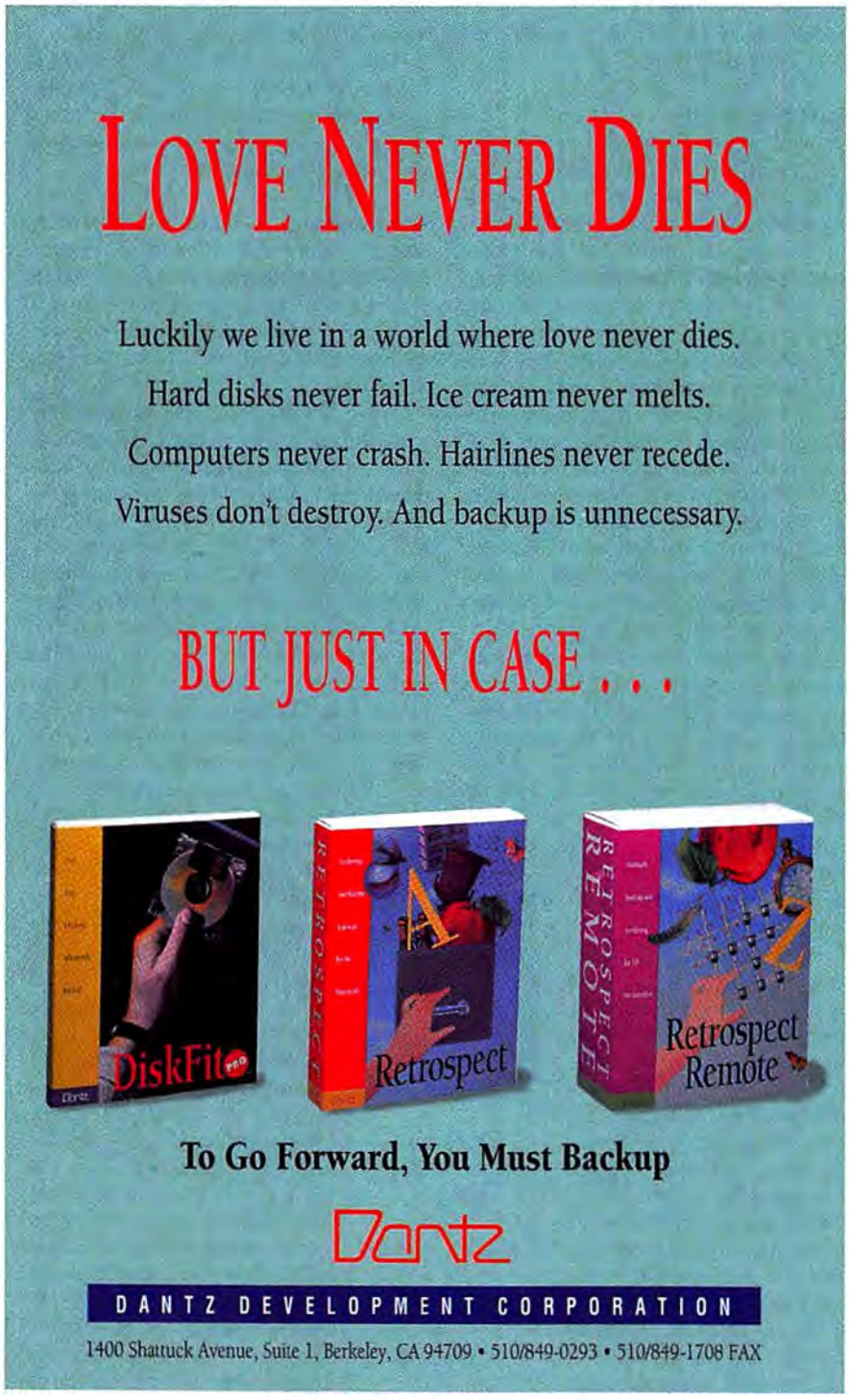
Finally, they howl with mirth at Claris's premiere in the Windows world with the presentations application called Hollywood, which is generally regarded as a dog. Anyway, why would Windows users buy their software from Apple? Would Macintosh devotees flock to IBM if the company started selling word processors for the Mac?

Give 'Em a Break

TO BE SURE, CLARIS-BASHING IS FUN. It's even more fun after hearing Eilers boast about the brilliance of his company's software, when in fact every one of the major Claris applications was inherited from Apple or purchased from outside developers. But I can only bash so far. Behind Eilers's bravado there's a lot of sense. Not to mention the multibillion-dollar company that makes the computer that runs the software.

For one thing, Apple has wisely decided that Claris should be run as a profit-making organization. Eilers says he has but one mandate: to turn a profit for his division. "There are only two profit centers at Apple," he explains. "One is run by Mike Spindler and has $7 billion in revenues, and the other is run by me and [reportedly] has $100 million in revenues." While the latter seems puny compared to the former, that Claris now lives by its

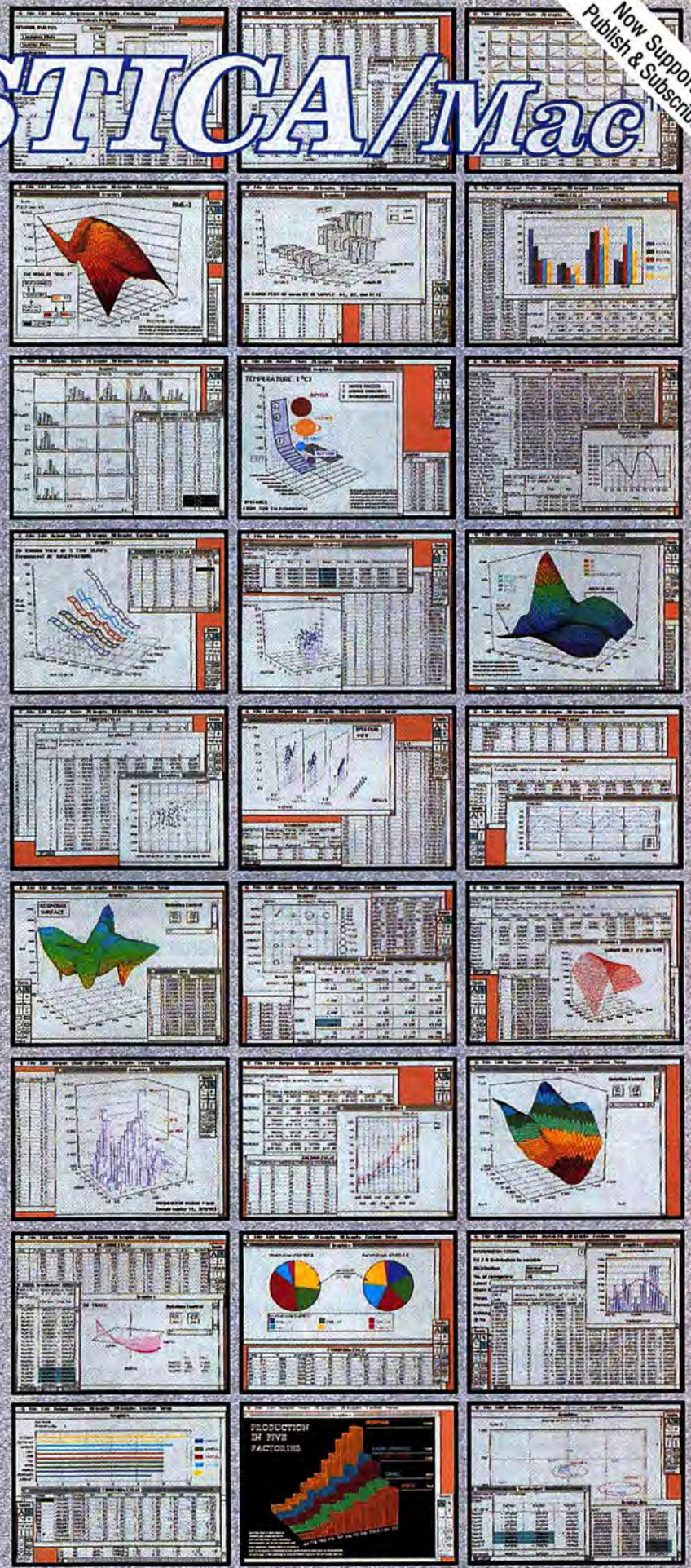
continues



Circle 26 on reader service card

STATISTICA/Mac

Now Supports Publish & Subscribe



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 nonlinear models and extended diagnostics; Logit/Probit transformations; General implementation of ANOVA/ANCOVA/MANOVA/MANCOVA (designs of practically unlimited complexity, repeated, nested, incomplete, random, changing covariates, contrast analyses, post-hoc tests, custom designs); Discriminant function analysis statistics; Canonical analysis statistics; Time series modeling techniques with forecasting; Factor analysis with rotations; Cluster analysis (incl. hierarchical, k-means, and 2-way joining); Distribution fitting (a large selection of continuous and discrete distributions); Curve and surface fitting and smoothing (incl. spline, DWLS, NEXP, and others);* and much more ■ Manual with comprehensive introductions to each method and step-by-step examples (Quick Start booklet explains all program conventions) ■ Extensive data management facilities: a super-fast spreadsheet of unlimited capacity; merge/split files; "double identity" of values (numeric/text); BASIC-like data transformations; Import/Export 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; click on a variable in the descriptive statistics table to produce a histogram; click on an interaction effect in the ANOVA table to see means, click on the graph option to produce 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, 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 scatterplot matrices (exploratory Draftsman plots) with histograms,* and many other specialized plots ■ Large selection of 3-dimensional graphs: *3D surface plots (with data smoothing procedures and color or grey-scale shading), 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.) and MacDraw-style tools with specialized "objects" ■ 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 as data files and used for input ■ 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 fx, 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) ■ Price: **$495**.

Quick STATISTICA/Mac™ A subset of STATISTICA/Mac ■ All basic statistical modules of STATISTICA/Mac (Basic and Descriptive Statistics, Frequency tables, Exploratory data analysis, Nonparametrics, Distribution Fitting, Stepwise multiple regression; ANOVA/ANCOVA) ■ STATISTICA/Mac manual with comprehensive introductions to each method and step-by-step examples (Quick Start booklet explains all program 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.

Circle 99 on reader service card

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: AkademiData 018-240035; Hungary: P&D Soft KFT 185-6868; Belgium: TEXMA 10 61 16 28; South Africa: Osiris 12 663-4500; Japan: SOFEL Co. 03-3251 1195.

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

bottom line can provide a necessary focus not present in all divisions of Apple.

Eilers also has a grand plan. First, Claris intends to rewrite all of its programs, tailoring them to fit on a single core of object-oriented coding that will allow for advanced scripting abilities between the applications. This will also translate to the Claris applications now being readied for other operating systems—in these post-IBM-Apple-agreement days, Claris can now develop software for Windows and no one raises an eyebrow. Eilers promises two more Windows applications by the end of the year, and also reveals that Claris is seeking budding new operating systems on which to write applications of the future. As Eilers puts it, "In 1992, we'll choose one new hardware paradigm on which to place applications software."

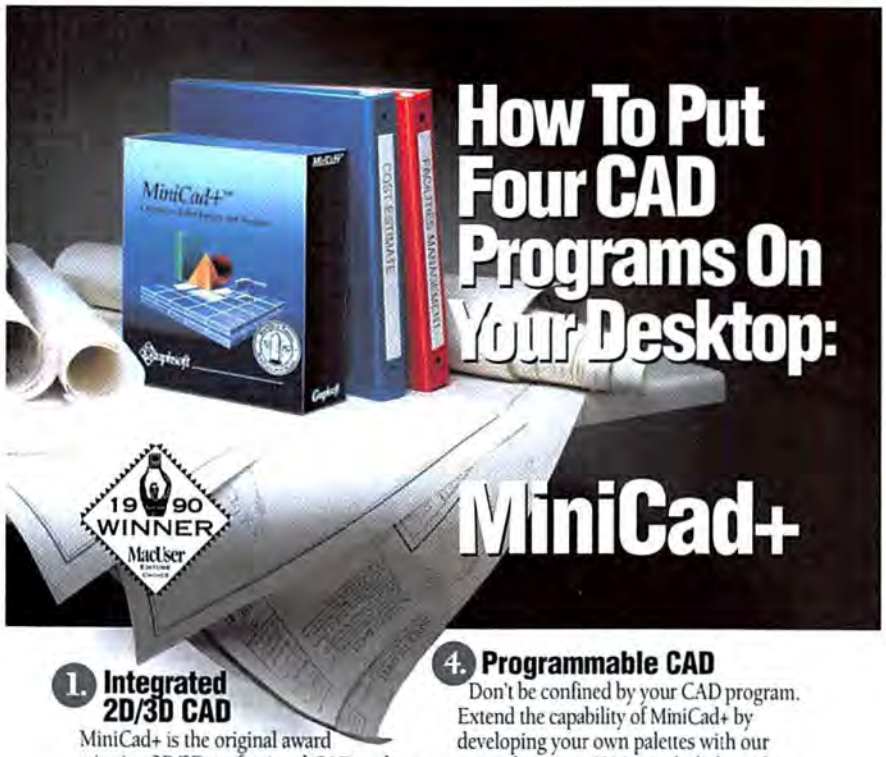
One of those "paradigms" (also known as computers) is bound to come from inside Apple, and here is where Claris has a true advantage over its competitors. As the official software arm of Apple, Claris sends its engineers all over Cupertino to participate in the big projects. This includes the Apple-IBM collaboration Taligent, Apple's rumored notebook project (called Newton), and even a top-secret General Magic project, in which Apple has a minority stake, and which reportedly will result in a low-cost product sold through consumer channels. Claris's ability to track the development of these systems, and even to affect them so that they will accommodate Claris's specific needs, are valuable assets to the company.

As far as Eilers's leadership is concerned, it's much too soon to dismiss him. He may not have run a software company before, but he knows the back channels and intrigues of Apple politics—and for the leader of Claris, that may be more important than grokking distribution channels. Eilers also has the luxury of learning his job without the pressures of most of his recession-beleaguered competitors—Claris is loaded with resources, has a full complement of existing applications, and has the insider track to the new systems that will drive the applications of the future. And no matter how bad things get, his company has a built-in fail-safe—the Bozo Factor. This assumes that a certain percentage of bozos will always prefer software written by the company that makes their hardware. Thus, even the lamest Claris application will find its way to users blissfully unaware of whizzy alternatives. And a truly competitive application like ClarisWorks will get an extra boost.

If Eilers is smart, he will use these edges. He won't beat Microsoft, but he will deliver a profit that will please his masters. If he doesn't, maybe the next person in charge will do so. Or the next.

When I talked to the guys who began Claris five years ago, I took note of their brash confidence and suggested that they rename the company Hubris. After meeting Dan Eilers, I still think my name fits better. But that doesn't mean that we could, or should, count Claris out, especially not because Apple Computer is bolted into the driver's seat. Apple may have its foibles, but somehow it managed to introduce and sustain something very near to our hearts and pocketbooks—the Macintosh. And, as Claris veep Dick Mathews notes, the Macintosh itself was not a hardware breakthrough, but a software coup. Would it be unreasonable to assume that some success might come from Apple's software arm? **m**

STEVEN LEVY's *Artificial Life* (Pantheon) will be published in June.



1. Integrated 2D/3D CAD

MiniCad+ is the original award winning 2D/3D professional CAD package. It continues to set the standard for price and performance on the desktops of engineers and architects.

2. Database CAD

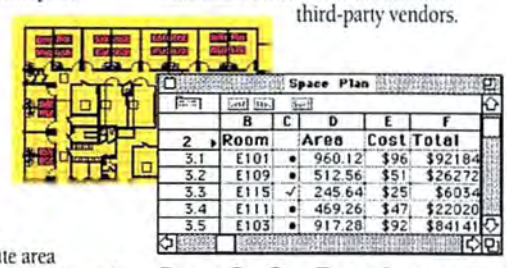
MiniCad+ has an integrated worksheet–literally, a spreadsheet and database in one–hot-linked to your drawings. Attach records such as type, cost or size and display at will. Compute area calculations, compile parts schedules and develop cost estimates.

3. Intelligent CAD

Our "Smart Cursor" automatically highlights, identifies and aligns relevant snaps, intersections, tangents and parallels. Snap to the precise point with more ease than you've experienced with any other program. We built the brains into MiniCad+ so you can think about more important things.

4. Programmable CAD

Don't be confined by your CAD program. Extend the capability of MiniCad+ by developing your own palettes with our macro language. We've included a wide variety of special-topic palettes with MiniCad+; others are available from third-party vendors.



Draw On Our Experience

Packed with features, the only thing small about MiniCad+ is the price. As a professional, you owe it to your desktop to ask your favorite distributor for the 1990 MacUser Editor's Choice winner in CAD, or call us for more information.

Graphsoft

8370 Court Ave., Suite 101 • Ellicott City, MD 21043 • (301) 461-9488 • FAX (301) 461-9345

Circle 46 on reader service card.

VideoSpigot

Now, pour video directly into your Macintosh for less than $500.

For the first time, getting digital video into your Macintosh® has become a reality. VideoSpigot™ from SuperMac™ makes it easy. Practical. And affordable.

VideoSpigot works with any Macintosh from the LC to the Quadra™ 900. As it pours footage from a TV, camcorder, laserdisc, or VCR into your hard disk, VideoSpigot turns each frame into digital data. And with the industry's best software video compression, VideoSpigot puts more video—of much higher image quality—on your disks than any other product.

"Spigoted" video, in QuickTime™ Movie file format, can be manipulated as easily as text and graphics. Import it into your applications—and it breathes visual drama into documents, newsletters, presentations, and sales materials. You can even create full-motion storyboards!

Prices start at under $500 for the entry-level VideoSpigot. There's also the VideoSpigot Pro for large-screen support, and the new Spigot & Sound™ for Macintosh computers without on-board audio. See them at your Authorized SuperMac Reseller today. To find the reseller nearest you, just call 1-800-334-3005.

For immediate information via fax, call SuperFacts℠ 1-800-541-7680. (In 408 area: 524-4797.)

"VideoSpigot is miles ahead of any product we have tested...we unhesitatingly recommend buying a VideoSpigot..."
MacWEEK

"An inexpensive QuickTime movie recorder that's worth every penny...quality images at astonishingly high frame rates...we were immensely impressed by VideoSpigot."
NewMedia

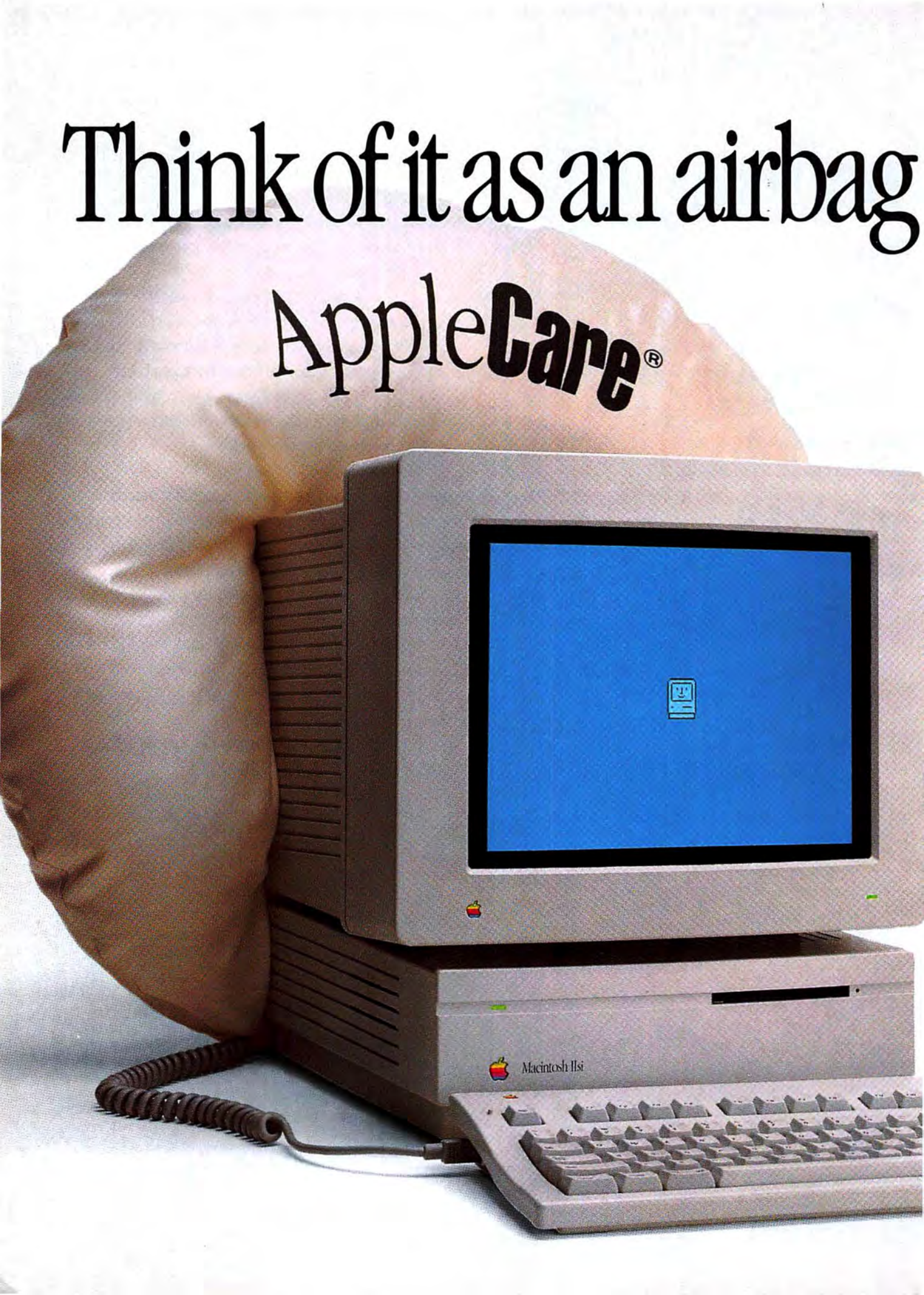
SUPERMAC™
The SuperSource for Video

© 1993 SuperMac Technology. All rights reserved. SuperMac, SuperFacts, Macintosh, Spigot, and Spigot & Sound are trademarks and SuperFacts is a service mark of SuperMac Technology. Macintosh is a registered trademark and QuickTime and Quadra are trademarks of Apple Computer, Inc. Adobe Premiere is a trademark of Adobe Systems Incorporated.

Circle 88 on reader service card

Think of it as an airbag

AppleCare®



for your Macintosh.

It's AppleCare®. The only extended service plan for Apple owners that's backed by Apple. And it's your best cushion against repair costs.

Should an unexpected problem develop, you know that your equipment will be repaired by the people who understand Apple products inside and out: Apple-trained professionals who use genuine Apple parts. So you'll be assured of the quality of the service.

AppleCare is the way to budget for computer repair and maintenance in advance. It's available for most Apple products, old and new models alike.

For all this peace of mind, you pay just a single annual fee — a reasonable one compared to the cost of typical computer system repairs. From then on, while AppleCare remains in effect, you won't pay a penny more for any covered repair. Not for parts. Not for labor.

With AppleCare, service is available from any authorized Apple reseller nationwide. And you're protected against virtually every type of computer problem arising under normal circumstances. Fixing a major hard disk problem for most computers typically can run as much as $600. But with AppleCare, it's taken care of. You can enjoy AppleCare protection for most of your Apple equipment, including CPUs, printers, monitors, external drives, and scanners.

Naturally, Apple builds everything to rigorous standards. And the way your computer system keeps going, day after day, is testimony to that. But if something should go wrong, we want to be the ones to set it right.

To receive more information about AppleCare, call the toll-free number below. Or just ask your Apple reseller.

If anything happens to your system, there's nothing like AppleCare to soften the blow. And protect the power that Apple has always given you. The power to be your best.®

Apple Care®

Call 1-800-365-3690, ext. 920.

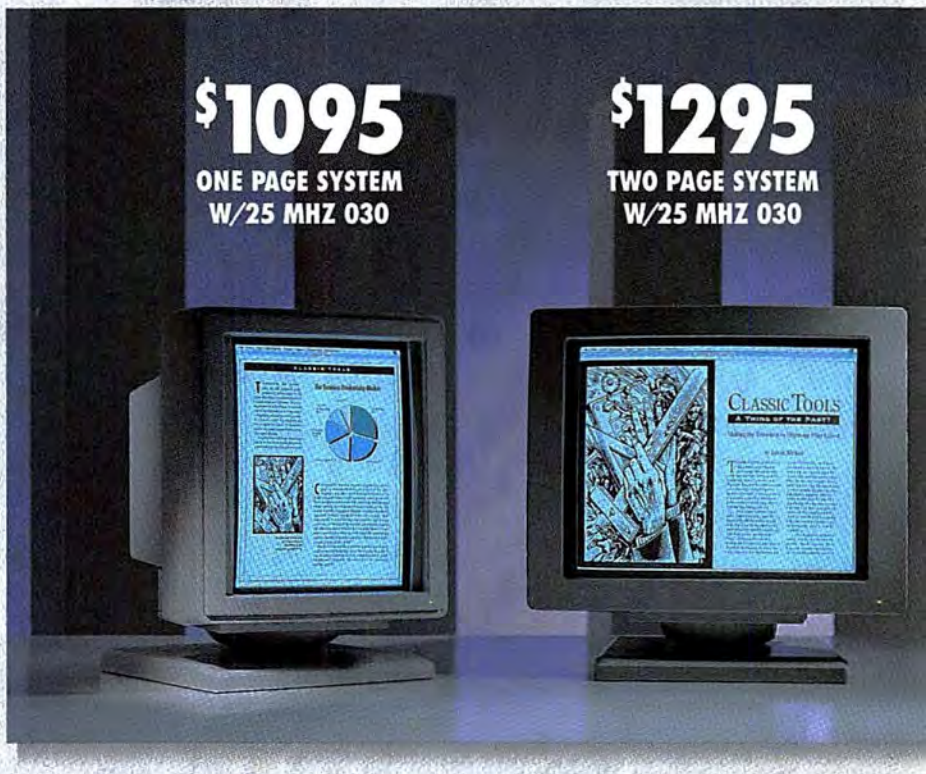
© 1992 Apple Computer, Inc. Apple, the Apple logo, and Macintosh are registered trademarks of Apple Computer, Inc. AppleCare is a registered service mark of Apple Computer, Inc.

ALSO AVAILABLE FOR THE MACINTOSH CLASSIC!

"THE BEST UPGRADE VALUE WE'VE SEEN YET FOR THE SE." –MacWEEK

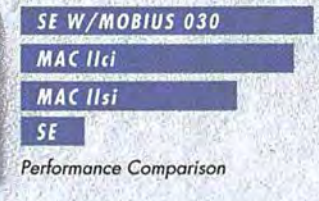
SAVE $2000 BY UPGRADING YOUR SE OR CLASSIC TO MAC IIci PERFORMANCE.

Upgrade to Mac IIci performance with the Mobius 030 Display System. The only *complete* 030 accelerator and display system available for the SE and Classic for one low package price.



TOP-RATED IMAGE QUALITY.

View a full page in Word™, an entire layout in PageMaker™, or a full year's budget in Excel™ on the razor-sharp, flicker-free Mobius One or Two Page Display. "The most visually appealing..." wrote *MacWorld*, "...very bright, very sharp, very easy on the eyes."



Performance Comparison

UNLIMITED TOLL-FREE SUPPORT.

At Mobius, we guarantee your satisfaction with unlimited, toll-free access to our Apple-trained support specialists, 30 Day Money Back Guarantee, One Year Warranty, and Free 48 Hour Warranty Express Service. Order now to see for yourself what the best upgrade value is for your SE or Classic.

RUN 6 TIMES FASTER AND INCREASE YOUR MEMORY UP TO 16MB.

With a 25 MHz 030 accelerator and video on one card, your *entire* Mac will run six times faster. Plus, on-board SIMM sockets allow memory expansion to 16 MB*, including virtual memory support.

ORDER DIRECT.

Mon-Fri. 8am-5pm PST.
Major Credit Cards Accepted.
Corporate Purchase Orders accepted upon credit approval.
Leasing Plan Available.

MOBIUS TECHNOLOGIES·INC

800-523-7933

In Canada: 416-886-2326

*With Memory Expansion Option ©1991 Mobius Technologies, Inc. Mobius 030 Display System is a trademark of Mobius Technologies, Inc. All other trademarks are property of their respective holders. Mobius Technologies, Inc., 1125 Atlantic Avenue, Alameda, CA 94501, 510-523-7900, fax 510-523-8452. Pricing subject to change without notice.

Circle 89 on reader service card

Special Interests

BY DEBORAH BRANSCUM

WE MAY BE NEARING the end of traditional publishing, but for now, words on paper continue to appeal to a broad audience. In columns past I've covered general-interest books and software helpful to Macintosh users. This time I'd like to steer readers toward selected special-interest publications of note. Some of these periodicals are sold on newsstands; the more expensive ones may be available in public and university libraries.

Computing

MACWEEK, WHICH IS PUBLISHED 44 times a year, is indispensable for following Mac industry news. People who buy (or, perhaps, claim to buy) lots of Macs for their place of employment can get the publication for free; the rest of us pay $99 for an annual subscription. Call 609/461-2100 for details.

HyperPub is a stylish quarterly for HyperCard developers from former *Dr. Dobb's Journal* editor Michael Swaine. This attractive, 40-page black-and-white newsletter offers a "script lab" and XCMD tutorials every issue and also covers related hypermedia issues. An accompanying floppy disk contains an electronic version of *HyperPub* and other goodies each issue. A four-issue subscription is $40; mail payment to The Prose Lab, 31 Patrick Rd., Santa Cruz, CA 95060.

Facts on File (212/683-2244) cranks out many useful compilations, including *Software Reviews On File*, which excerpts passages from reviews of microcomputer software printed in nearly 200 publications. An annual subscription is $215.

NSTL (800/328-2776 in the United States and Canada) publishes the monthly *Software Digest Macintosh Ratings Report*, a 16-page newsletter that compares a different category of business software—such as advanced word processors or spreadsheets—each issue. NSTL is an independent testing group that accepts no advertising in its publications. A 12-issue subscription costs $202.

The *PC Market Monitor* from Computer Economics (619/438-8100) is a detailed survey of the street prices, used prices, leasing rates, and relative performance of selected personal computers, monitors, hard drives, printers, and software. It's designed to help Fortune 1000 companies locate dealers with the best prices, but smaller companies will find the info useful as well. Subscribers pay $395 for a three-ring binder with monthly updates on computer systems and printers. Other hardware and software prices are updated quarterly, as are used computer prices. A dealer section includes mail-order companies and lists open hours, credit card acceptance, and other helpful info.

A less expensive and less detailed alternative to the publication above is *The PC Street Price Index*, a slim 12-page newsletter from Metro Computing. The monthly tracks street prices for a variety of computers, printers, monitors, and software. Contact information for retailers with the lowest prices are included. An annual subscription is $195; call 609/784-9814 for details.

Shop-till-you-drop types might enjoy *Computer Catalogs*. The $15.45 paperback from Todd Publications (914/358-6213 or 800/747-1056) describes more than 300 mail-order computer-related catalogs and tells you how to order them.

The MZ Group (415/543-8290, ext. 155) publishes the *Macintosh Services Directory* twice a year. It is a buyer's guide for services such as database programming, user training, user documentation, and technical support. The price is $21.45; some readers may qualify for a free issue.

DTP and Graphics

THEPAGE CALLS ITSELF "the visual guide to desktop publishing on the Macintosh." This 20-page black-and-white newsletter carries no advertising but lots of practical information for its readers, most of whom use PageMaker. (Generally one article per issue deals with QuarkXPress.) *The Page* offers advice on hardware as well as software issues and is one of the most useful publication I've seen for desktop publishers. "The Back Page" column by editor and publisher David Doty is especially entertaining. (In the May 1991 issue he gave readers a six-point plan for avoiding product-related stress. The points included refusing to upgrade applications, to buy more hardware equipment, or to install System 7. It was a great column, trust me.) A ten-issue subscription is $65 and includes a booklet called *Basics of Desktop Publishing on the Macintosh*.

Another excellent monthly newsletter, *Step-By-Step Electronic Design*, uses a color layout to offer desktop designers how-to information. A recent issue offered tips on using Adobe Illustrator; discussed making masks in Adobe Photoshop; and explored the additions to PageMaker in version 4.2. Some readers may be acquainted with its sister publication, *Step-By-Step Graphics*, a beautiful how-to magazine that covers both traditional and electronic graphic arts. The January/February 1992 issue, for example, followed one illustrator's work in crafting a digital collage with Adobe Photoshop. Another piece offered 18 techniques for creating digital backgrounds. Subscriptions are priced at $48 for 12 issues of *Electronic Design* and $42 for a 6-issue subscription of *Graphics*. Call 800/255-8800 for details.

MacPrePress (fax 203/454-4962) claims to cover "the news that matters on Mac-based off-the-shelf prepress technology." *Macworld*'s in-house DTP guru calls the black-and-white newsletter objective and insightful. Recent topics included the good news and bad news of DTP ("image recording is no longer a major issue," but "large-file movement is a real difficulty"; "color science is no longer an issue," while "trapping is still problematical"). *MacPrePress* is distributed by fax 48 times per year; subscriptions run $295.

Mesmerized by music? Dazzled by design? Whatever your interest, there's a magazine for you.

A specialized monthly newsletter tackles technology, journalism, and publishing. *The Cole Papers* follows the triumphs and pitfalls of technology in the newsroom, including new product developments. A one-year subscription runs $99; request a sample is-

continues

Service Hero

Reader David Atherton of San Diego was pleased by the service he received from APS. "I spend each year in three different locations—London, San Diego, and Hong Kong," he writes, "and during the past 12 months have ordered some 10 drives from APS on toll-free numbers. Unfortunately, three of the drives developed problems, but in each case a replacement was sent the day the company received my returned drive and, more importantly, they did the paperwork in such a way that there were no delays in customs."

sue from The Cole Group, 2590 Greenwich St., #9, San Francisco, CA 94123.

Education

EDUCATORS PROBABLY ALREADY know about *Syllabus*, but people outside of universities might also be interested in Macintosh development in higher education. The Apple-sponsored quarterly is published by Syllabus Press (408/773-0670). A recent issue traced the history of the Mac in higher education and profiled development projects at several universities. Subscriptions are free to some professionals (including faculty members and software developers); others pay $18.

The Computing Teacher, the journal of the International Society for Technology in Education, covers using personal computers in curricula and offers professional techniques. The March issue included one article on a day in the life of a computer specialist and another on using a single computer for instructing an entire class. Call 503/346-4414 or 800/336-5191 for ordering information.

The *Macintosh Education Software Collection* is a catalog, not a magazine, but it may be helpful to teachers who are looking for courseware, administrative software, and shareware to use in their classrooms. Chariot Software Group of San Diego sells software through this catalog, which can be ordered at no cost at 619/298-0202.

Music and Multimedia

READERS WHO WANT TECHNOLOGY with rhythm can find it in *Electronic Musician*. A recent issue examined why so much MIDI-based music sounds bad and included a glossary of electronic-music terms. Call 615/377-3322 or 800/888-5139 to subscribe. A 12-issue subscription is $19.95.

Seybold Publications (215/565-2480) has made a name for itself with newsletters on desktop publishing and publishing systems. A fairly recent addition is *Digital Media*, edited by Denise Caruso. It's cogent and lacking in hype, a refreshing change from the usual blather about that arena. Recent topics include electronic books and fractal compression. At $395, a 12-month subscription is not cheap; a sample issue is available on request.

NewMedia could be considered *Digital Media*'s juvenile counterpart—brash, loud, and not very good yet. Still, it has promise, and there's something endearing about its humor—a list of the top-selling CD ROMs in the year 2000, for example, included Whambi IV: Revenge of the Debauched Dwarf Lizards. Subscriptions run $36 for 12 issues. Call 609/764-1846 for subscription info.

Offbeat Fun

THE FOLLOWING TWO QUARTERLY glossies defy easy description but trendoids have been reading them for ages.

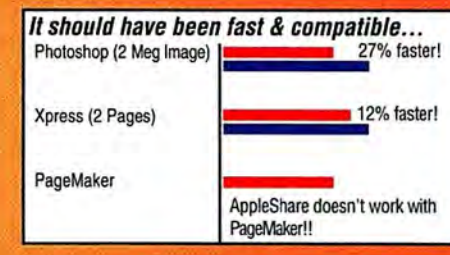
Verbum, The Journal of Personal Computer Aesthetics, tracks the so-called digi-

continues

Never Wait for a Busy Printer Again!

Print Central is the most flexible, complete network print server on the market today. Whether you share one laser printer or a series of PostScript devices, Print Central is the product for you. Print Central provides the means for defining up to eight Chooser selectable print queues. Queued jobs can quickly be prioritized or placed on hold, or sent to a different queue. Each queue can be sent to one or several printers on a first available basis. Print Central print queues are never busy, imagine never waiting for a printer again!

Print Central maintains an accurate record of each job processed; the report can be printed in a variety of sorted formats. Security is an important aspect in a network of any size. Print Central can 'hide' printers and the administrator can define an authorized 'user list'. Included is the ability to either status or control the server from any Mac on the network (remote control). Print Central works with all applications and PostScript equipment including laser and color printers, imagesetters and slide recorders. Print Central is available from your local dealer or directly from Compumation. Stop waiting for your printers, stop your printers from waiting for the next job. Call 1-800-SPOOLER for more information or to get your copy today!



It should have been full featured...

	Print Central	Apple PS
Runs on a Macintosh	✔	✔
Printer Load Balancing	✔	
Works with Large Graphics	✔	
Authorized User List	✔	
Remote Status & Control	✔	
Configures Printer	✔	
Works with AppleShare 3.0	✔	✔

Working with scanned or high resolution images? **Color Central** is the OPI/DCS Image Print Server, an enhanced version of Print Central. Color Central permits you to place a low resolution image in a page layout, while the high resolution or separated version is stored at the print server. When the Mac prints to Color Central it is freed in seconds rather than the hours associated with printing high resolution graphics. When the job is sent to the printer, Color Central automatically inserts the images on the fly!

1-800 SPOOLER

Print Central
what the AppleShare Print Server should have been!

Compumation Inc.
(814) 238-2120 fax 234-6864 AppleLink: COMPUMATION
All trademarks are the property of their respective owners.

Circle 198 on reader service card

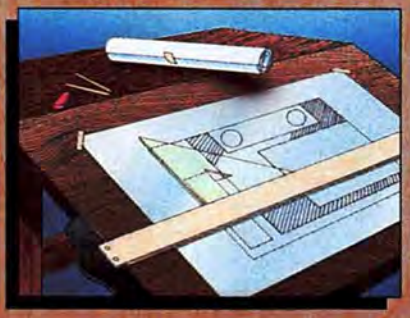
The Evolution of CAD

From the beginning of time, man has tried to express himself through graphics.

In the beginning man had to use primitive tools for creating graphic designs.

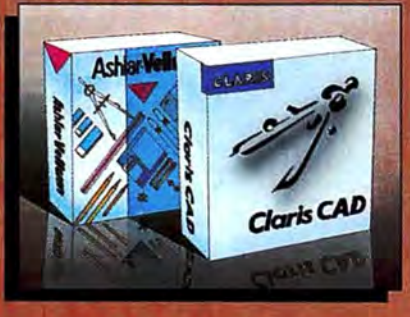
In the 15th Century design tools were quill ink pens and crude styles of paper.

By the 18th Century man had advanced to the drafting table with the T-squares, slide rules, precision ink pens and the dreaded eraser.



In the 20th Century the first CAD programs were very slow and extremely difficult to use, not to mention the expense of buying them.

As programs became easier to use, they thought they were radical and intelligent, but lacked real CAD power.



End users circle 336 on reader service card

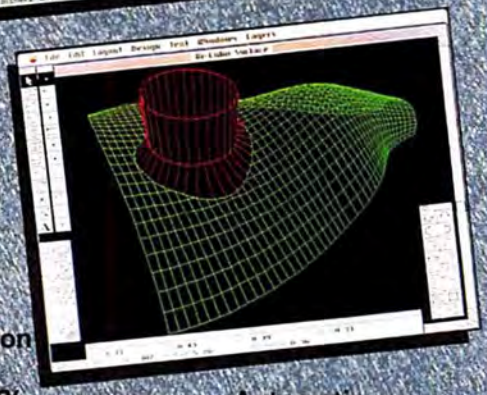
Now step into the 21st Century...

DesignCAD 2D/3D

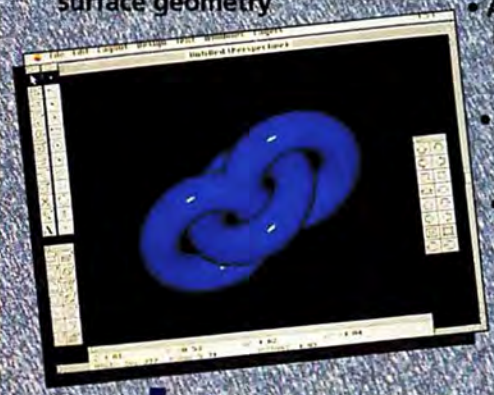
The power of intelligence!

New 3.0 Now Available

- Full 2D drafting
- Floating Point Precision
- Auto Isometric Viewing
- Associative Dimensioning
- Tolerance options
- Arrowhead choices
- 256 layers



- Related and Auto Update Windows
- Unlimited color Support
- Fast, Smooth 3D Shading in any view
- Specular Highlighting
- Real-Time Rotation
- Unified Bi-Cubic surface geometry



- Automatic Hidden Line Removal in any View
- Perspective or Orthographic calculations
- Import & Export DXF, IGES, XYZ Coordinates, & DesignCAD MS-DOS

for only... **$299**

MACRenderman Compatible

Call or write for FREE BROCHURE & DEMO DISK
Phone (918) 825-4848 FAX (918) 825-6359

DesignCAD, Inc.
One American Way • Pryor, OK 74361

Dealers circle 337 on reader service card

tal art life-style. A recent issue included articles on creating type effects in Photoshop; a gallery of art; and an interview with Mac-using musician Graham Nash and his partner. The magazine is $7 on the newsstand; call 619/233-9977 for a one-year subscription ($24). Issue number five of *Mondo 2000* included several seriously strange fashion layouts (including vinyl, plastic, and rubber clothing from a Dutch designer); computer game reviews; and many interviews with musicians. A five-issue subscription is $24; call 510/845-9018 for details.

User Groups

USER GROUP NEWSLETTERS OFTEN make for good reading. BMUG's is justly famous—the spring issue weighed in at 2¼ pounds and 467 pages. Several smaller publications are also worth perusing. My favorites include *The Apple COREspondent*, from the Lansing (Michigan) Area Mac and Lisa User Group; *FatBits*, from the Conejo-Ventura Macintosh User's Group; and *The Mac Street Journal*, from the New York Macintosh Users Group.

I read the ten-page *Apple COREspondent* largely for the opinionated writings of Andy Frederick, a sometimes caustic former user-group president. (It doesn't hurt that the group gave me a subscription until the year 3000.) LAMALUG can be reached at P.O. Box 27372, Lansing, MI 48909; membership is $20.

The more substantial *FatBits* (30 pages) has no table of contents but more than makes up for that lapse with "The Rumor Mill," a column by Johanna Michelle Grzywacz. One recent column covered computer chess champions, superstores, virtual reality, and the gender gap in earnings. CVMUG, the world's first Macintosh user group, can be reached at P.O. Box 1139-CVMUG, Simi Valley, CA 93062. Membership is $30.

> *The Mac Street Journal tracks NYMUG members' complaints or problems with specific companies*

The New York Macintosh Users Group is a large MUG with plenty of professional Macintosh users, so it's no surprise that *The Mac Street Journal* is so well done. Especially educational is the "Letters to the Vendor Liaison" section that follows members' complaints or problems with specific companies. NYMUG can be reached at 212/691-0496; membership costs $45 ($20 for students and seniors).

For additional resources, see *Conspicuous Consumer*, June 1990 and July 1991. Recent books are examined each month in the "Desktop Librarian" section of *News*. Let us know about other publications or resources that are particularly useful. **m**

Research assistance by CAROLYN BICKFORD.

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

We put a lot in so you can get a lot out.

Microcom Value Pak™ (MVP) gives you all these great utilities at one great price!

Microcom 911 Utilities™ Disk and File Recovery

Virex® Virus Prevention, Detection & Treatment

Complete Undelete™ Recovery of Files Thrown in the Trash

Microcom Citadel with Shredder™ Disk and File Security

Carbon Copy™ for the Mac Remote Control and File Transfer

Microcom Value Pak (MVP)

Great Value! That's what everyone is saying about the Microcom Value Pak (MVP). You get Microcom's complete family of essential utilities for the Macintosh at one great price. MVP includes Virex, Microcom 911 Utilities, Complete Undelete, Citadel and Carbon Copy for the Mac in one Package. See your favorite retailer for MVP today and you too will say GREAT VALUE!

Microcom®

© 1992 Microcom Systems Inc. Microcom and Virex are registered trademarks and Microcom 911 Utilities, Complete Undelete, Citadel with Shredder and Carbon Copy are trademarks of Microcom, Inc.

P.O. Box 51489
Durham, NC 27717
(919) 490-1277 ext. 310
FAX: (919) 490-6672
BBS: (919) 419-1602 (8,1,N)

GREAT VALUE MVP

Circle 41 on reader service card

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

1-800-248-0800 • ORDER TODAY • IN YOUR HANDS TOMORROW!

The Mac Zone
Established 1986

At the Mac Zone, we provide you with more than just great prices and the widest selection available—we have the service and support to earn your continued business.

Our Mac Advisors speak: French, German, Japanese, Korean, Spanish and Scandinavian languages.

Our commitment:
- *Knowledgeable sales advisors*
- *Personalized service*
- *Hassle-free ordering*
- *$3 overnight shipping*
- *Canadian customers' orders, in most cases, delivered in 24 hours*

System 7 Compatible

$298 Move up to Microsoft Excel 4.0 for the Apple Macintosh

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 Excel is designed to work the way you do, and provide you with all the tools you need. Just look at some of the new features Microsoft Excel version 4.0 offers:

- **Even easier to use:** Produce a spreadsheet in just 60 seconds using features like Drag and Drop to move information, or Autofill to intelligently project trends.
- **More power than before:** Create multiple "what if" scenarios and use the Scenario Manager to view them all at the same time. Plus, check out the extensive financial, statistical, engineering and scientific tools.
- **Unrivaled Presentation tools:** Now you can have one-step access to 16 professionally designed spreadsheet formats. And you can check the spelling of your spreadsheets, text boxes and graphs with just a single mouse click.

Microsoft Corp. #00227 ❼ ✓

LIVE UPGRADE

Microsoft Excel 4.0 Live Upgrade

Limited Time Offer $98

If you own an earlier version of Microsoft Excel, it's easy to move up to the unprecedented new power and ease of Microsoft Excel 4.0. Just Mail or fax us page 1 of your Microsoft Excel User's Guide or mail us disk 1 of Microsoft Excel for the Macintosh and you can upgrade to Microsoft Excel version 4.0 today! Then you'll see just how easy power can be.

Microsoft Corp. #04545 ❼ ✓

Place your order through CompuServe Just Type: Go MZ

Business Essentials

Acius
00411 4Th Dimension Calc ..... 224 ❼ ✓
03973 4Th Dimension Write ..... 229 ❼ ✓
02648 4Th Dimension 2.2 ..... 509 ❼ ✓

Aldus Corporation
02424 Aldus Persuasion 2.1 ..... 324 ❼ ✓
03492 Super Card 1.5 ..... 198 ❼ ✓

Banner Blue Software
04806 Org Plus for Mac 1.0 ..... 125 ❼ ✓

Beagle Brothers Inc.
04327 Beagleworks ..... 184 ❼ ✓
04583 Beagleworks Competitive Upgr. .... 94 ❼ ✓

Ceres
00588 Inspiration ..... 159 ❼ ✓

Claris
04306 Claris Resolve ..... 168 ❼ ✓
03478 Filemaker Pro ..... 204 ❼ ✓
04651 Claris Works Tradeup Program ..... 99 ❼ ✓
04466 Claris Works ..... 196 ❼ ✓
04140 Macproject II V2.5 ..... 342 ❼ ✓
04703 Macwrite II 1.1 ..... 88 ❼ ✓
04302 Hypercard 2.1 Development Kit ... 134 ❼ ✓
04814 Hypercard Upgrade 2.0 to 2.1 ..... 49 ❼ ✓

Delta Point
04805 Deltagraph Pro ..... 198 ❼ ✓

Digital Concepts
04560 4Th Right! Professional ..... 449 ❼ ✓

Fisher Idea Systems, Inc.
00897 Idea Fisher 2.0 ..... 387 ❼ ✓

Fox Software
02581 Foxbase+/Mac 2.01 ..... 264 ❼ ✓

Individual Software
00432 Individual's Resume Maker ..... 26 ❼ ✓
Training for Word or Pagemaker ... 54 ❼ ✓

International Business Software
00474 Data Club Elite ..... 1149 ❼ ✓
04746 Data Club Classic 3 user ..... 249 ❼ ✓

Jian Tools
04257 Biz Plan Builder ..... 88 ❼ ✓
01045 Employee Manual Maker ..... 98 ❼ ✓

Lotus Corp
00518 Lotus 123 - Mac Competitive Upgr. 89 ❼ ✓
00507 Lotus 123 Mac Prerelease Price .. 328 ❼ ✓

Microlytics
00438 Random House Encyclopedia Mac 67 ❼ ✓
01501 Wordfinder for Mac ..... 33 ❼ ✓
00416 Elements of Style 1.0 Mac ..... 34 ❼ ✓

Microsoft Corporation
00356 License Pak for Excel 3.0 Mac ..... 243 ❼ ✓
00227 Excel 4.0 - Mac ..... 298 ❼ ✓
04545 Excel 4.0 Live Upgrade Mac ..... 98 ❼ ✓
01220 Powerpoint 2.01 ..... 244 ❼ ✓
00427 Microsoft Office V2.0 ..... 474 ❼ ✓
00567 Microsoft Works 2.0C ..... 154 ❼ ✓
04161 Project for the Mac ..... 444 ❼ ✓
00596 Word 5.0 Mac Live Upgrade ..... 124 ❼ ✓
04898 Word 5.0 Mac ..... 294 ❼ ✓
00557 Microsoft File ..... 123 ❼ ✓
02054 Quick Basic 1.0 ..... 63 ❼ ✓

Nolo Press
00481 Will Maker 4.0 Mac ..... 31 ❼ ✓
03781 For The Record 2.0 Mac ..... 30 ❼ ✓

NorthCon Technologies
00609 Double Helix V3.5 ..... 428 ❼ ✓
02661 Double Helix 3.5 Multiuser Kit ..... 368 ❼ ✓

Now Software
00580 Now Up To Date ..... 64 ❼ ✓
00572 Now Up To Date 5 User ..... 264 ❼ ✓

Paragon Courseware
00999 Nisus Compact ..... 92 ❼ ✓
03479 Nisus 3.06 ..... 236 ❼ ✓

Palo Alto
03910 Business Plan Toolkit ..... 94 ❼ ✓

Continued Next Page

Increase Your Productivity Tomorrow
NOW! Order on Saturday — Receive on Monday

The Mac Zone Established 1986

Business Essentials

❼ = System 7 Compatible ✓ = Money Back Guarantee

PeCox
01036 Call Me! ..... 32 ❼ ✓

Personal Bibliographic
04532 Procite 2.0 ..... 195 ✓

Prentice Hall
04597 Rightwriter 3.1 - Macintosh ..... 53 ✓

Reference Software
03143 Grammatik Mac 2.0 ..... 57 ❼ ✓

Serius Corporation
00902 Serius Developer 3.0 ..... 408 ✓
00903 Serius Programmer 3.0 ..... 279 ✓
Serius Objects (each) ..... 64 ✓

Sensible Software
00483 Sensible Grammar ..... 54 ❼ ✓
00640 Bookends II ..... 68 ❼ ✓

Symantec
04464 More 3.1 ..... 264 ❼ ✓
00458 Great Works V.2.0 ..... 198 ❼ ✓
00582 Great Works V.2.0 Compet.Ugr. .... 86 ❼ ✓
04095 Think C V.5.0 ..... 199 ❼ ✓
04178 Think Pascal V4.0 ..... 164 ❼ ✓
04066 Think Reference ..... 69 ❼ ✓
02071 Just Enough Pascal ..... 51 ❼ ✓

T Maker
04465 WriteNow 3.0 ..... 158 ❼ ✓

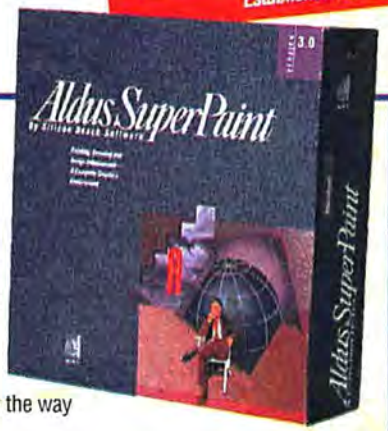
Technology Works
04029 GraceLAN v 2.0 50 Users ..... 289 ❼ ✓
04945 GraceLAN v 2.0 Unlimited Users . 698 ❼ ✓

TGS Systems
04253 TGS Prograph V2.5 ..... 298 ❼ ✓

The Open University
04671 The Desktop Lawyer Mac ..... 69 ❼

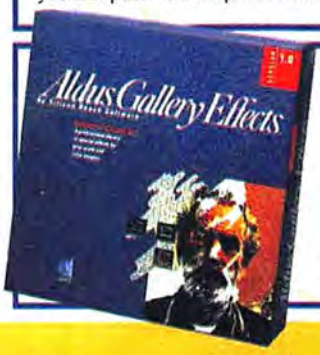
WordPerfect Corporation
04170 Wordperfect Office 3.01 ..... 89 ❼ ✓

Wordstar
00975 Bus.Power Bndl-Bus.Ltrs, Library of Quotes, Writing Guide ..... 59 ❼ ✓
03813 Correct Gramar 3.0 ..... 49 ❼ ✓



Aldus SuperPaint 3.0 $132

Aldus SuperPaint is the complete painting, drawing and image-enhancement tool—whether you're creating fine art, business illustrations, full color or black and white. It combines three fine art applications into one unified graphics environment that works exactly the way you'd expect—no surprises. Aldus #04190 ❼ ✓



Gallery Effects $128

Aldus Gallery Effects gives designers the power to transform color, grayscale or even bitmapped images into sophisticated art. With the library included, artists can produce vivid, dramatic art easily, reliably and with consistent results. It works as a stand-alone application or can be accessed from most leading applications supporting plug-in filters. Aldus #04121 ❼

FREE SHIPPING ON ORDERS PLACED BETWEEN 9 & 7 E.T.

ScanMan 32 ★★★½ w/ CatchWord Pro

$378 Some of the ScanMan Model 32's many features are: 32 gray scale and advanced halftone for superior image quality; true 400dpi scanning resolution; half-page scanning width; advanced output controls; tear-off tool palette; works with all applications, including HyperCard. With CatchWord OCR software you'll capture text with high-level accuracy. Logitech #00670 ❼ ✓

ADDMOTION PROMOTION

$248 PROmotion w/PrimeTime

With PROmotion's 24-bit-color paint, animation and sound editor you can make QuickTime Movies, storyboards and presentations, in a fraction of the time—even if you can't draw. It's the perfect choice for business and artistic professionals. Includes extensive System 7 support and Sony Print to Video. Motion Works #01039 ❼ ✓

PRIMETIME CD VOL. 1

$64 PrimeTime

PrimeTime CD is a collection of media & clips for use with PROmotion and ADDmotion II. The CD includes a Media Browser containing over 100 actors (in both b&w and color), background props, and over 120 sound clips covering business, education and entertainmentMotion Works #1038 ❼ ✓

ADDmotion II ★★★★

$94 This seamless multimedia extension for HyperCard brings 24-bit-color paint, animation and sound editing to HyperCard 2.1. ADDmotion II's ease of use and price make animation and multimedia available to Mac enthusiasts and HyperCard users. Exports QuickTime Movies. Includes HyperCard 2.1. Motion Works #00194 ❼ ✓

Cliptures Vol.4 World Flags $67

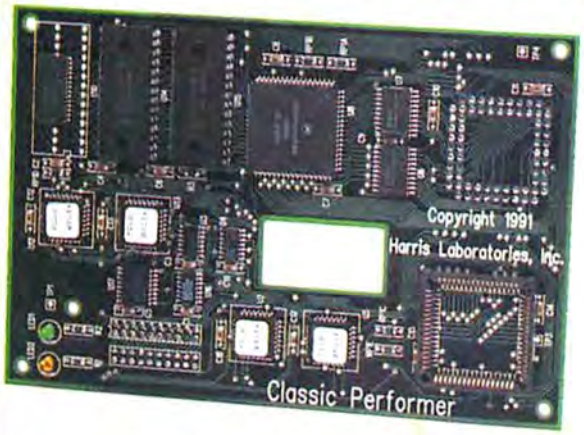
World Flags contains exquisitely detailed national and civil flag illustrations from all the independent and dependent countries of the world, plus various international, organization and code flags. Dream Maker Software #04282 ❼ ✓

The Mac Zone Established 1986

Accelerate Your Mac

Spend More Time Working, Less Time Waiting

Accelerate Your Classic



NEW PRODUCT

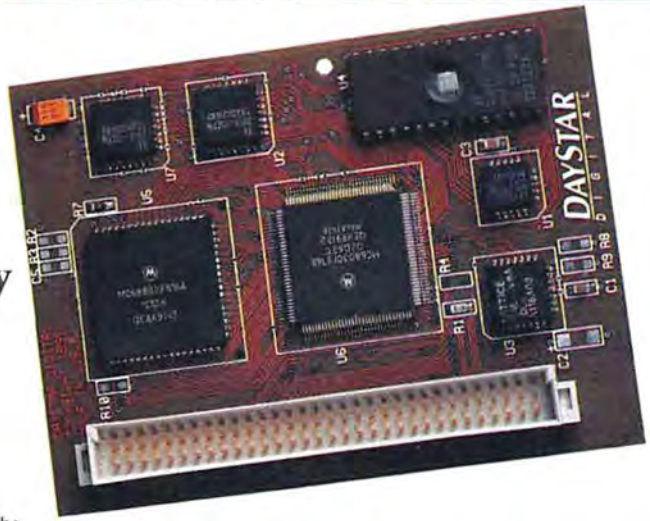
As reviewed in MacWEEK 2/17/92

Classic Performer $248

The Classic Performer is designed to turn your Mac Classic into a serious business tool. With its 16MHz architecture and 96K cache it doubles your processing power, accelerates program loading and increases file sorting speed. With it you can run your favorite applications such as PageMaker, MS Word, Excel and others. It installs in under 15 minutes and carries a manufacturer's lifetime warranty.Harris Laboratories #04646 ✓

Math Coprocessor Upgrade #04647 ..... $74

Get More from your Mac LC from DayStar



Equalizer LC Memory Upgrade w/FPU $336

This 68030 upgrade for your Mac LC gives you the virtual memory you need...10, 20, 100 Mb or more, all for one price! This 16MHz 68030-based processor (the LC comes stock with a 68020) gives you enough power to run Apple's System 7 virtual memory. The math chip is great for recalcs and math/science programs. PowerMath software adds even more of a boost to many other math functions. Buy today, and you can upgrade the PowerCache when your needs expand. DayStar Digital #00579 ✓

Equalizer LC Memory Upgrade w/o Math Coprocessor #00560 ..... $259

DAYSTAR DIGITAL

PowerMath LC $118

Run math, spreadsheet and science programs at speeds you didn't think were possible on an LC. The PowerMath LC package includes PowerMath software to provide even greater math performance. DayStar Digital #05003 ✓

Accelerators, Memory and Upgrades

Applied Engineering

00289	Cache-In (IIci Cache Card)	194	✓
00833	QuickSilver IIsi Cache Card	269	✓
00873	TransWarp 040	2189	✓
03673	Quadralink	208	✓
04072	Cache In 50 with FPU	1899	✓
04120	Fast Math LC	139	✓
04154	Quicksilver IIsi w/FPU	298	✓
04325	TransWarpSEAccel25MHz w/FPU	798	✓
04732	TransWarp LC 33MHz w/FPU	999	✓
04735	TransWarp SE 40 MHz w/FPU	1499	✓
04903	TransWarp LC 33MHz	799	✓
04904	Fastmath Classic II	169	✓
04732	TransWarp LC 33MHz	998	✓
04904	Fastmath Classic II	139	✓

DayStar Digital

00560	Equalizer LC Virtual Mem Upgr	259	✓
00561	Fast Cache 040 f/Quadra700/900	374	✓
00562	Fast Cache PDS CI/SI Fpu+ Adpt	394	
00579	Equalizer LC Mem Upgr w/Fpu	336	✓
02877	Fast Cache IIci 64K Ram	278	✓
03729	SCSI Powercard w/o Simms	1124	✓
03730	Ram Powercard w/o Simms	499	✓
04181	Fast Cache IIsi	309	
04182	Dual Port IIsi w/FPU	169	
04183	Dual Port IIsi nout FPU	104	
04319	Universal Powercache 40MHz	868	
04320	Univ.Powercache 40MHz w/FPU	1078	✓
04321	Universal Powercache 50 MHz	1348	✓
04322	Univ.Powercache 50MHz w/FPU	1638	✓
04323	Universal Powercache 33 MHz	643	✓
04634	Univ.Powercache 33MHz w/FPU	863	✓
04549	Cache Adapter LC	38	
04707	Cache Adapter IIsi	38	✓
04708	Cache Adapter PDS (SE/30)	38	✓
04709	Cache Adapter II	38	✓
04710	Cache Adapter IIx	38	✓
04711	Cache Adapter IIcx	38	✓
05003	Power Math LC	118	✓
05004	Combo Cache II si w/ FPU	334	✓
05005	Combo Cache IIsi	258	✓
05006	Fast Cache IIci (32k)	184	✓

Dove Computer

00964	Macsnap 524Xs 512Ke-1Mb w/SCSI	248	
01260	SCSI Port Adapter Macsnap	99	
03818	Macsnap 596Xs 512Ke-4Mb w/SCSI	455	

Harris Laboratories, Inc.

04646	Classic Performer	248	
04647	68881 Math Coprocessor Upgr.	74	

OVERNIGHT DELIVERY VIA AIRBORNE EXPRESS

#20602

Call Now for your FREE Spring Catalog
Over 2400 Products at Super Low Prices!

Hard Drive Utilities

❼ = System 7 Compatible ✓ = Money Back Guarantee

Aladdin Systems, Inc.
3458 Stuffit Deluxe ..... 59 ❼ ✓

Alsoft
2853 Diskexpress II 2.0 ..... 49 ❼ ✓

Casa Blanca Works, Inc
4962 Drive Share ..... 69 ❼ ✓
858 Drive 7 Universal Formatter 2.0 ..... 59 ❼ ✓

Dantz
4722 Disk Fit Pro ..... 69 ❼ ✓
4194 Retrospect Remote ..... 263 ❼ ✓
2586 Retrospect 1.3 ..... 146 ❼ ✓

Fifth Generation
4413 Disklock 2.1 ..... 117 ❼ ✓

FWB, Inc.
555 Hard Disk Toolkit ..... 124 ❼ ✓

Golden Triangle
4724 Disktwin 2.0 ..... 699 ❼ ✓
861 Twinit ..... 169 ❼ ✓

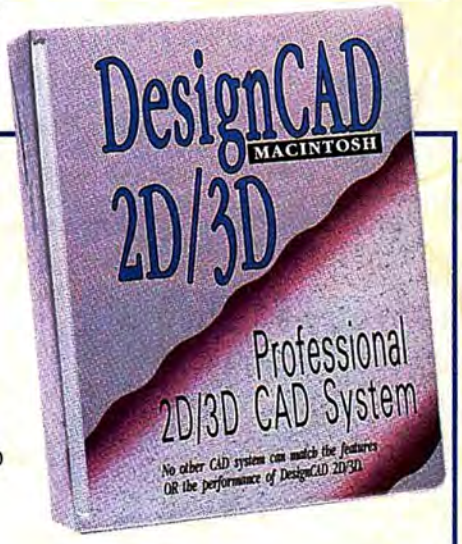
Handoff Corporation
855 Trashmaster 1.0 ..... 39 ❼ ✓

Microcom
2077 Virex 3.1 For Mac ..... 56 ❼ ✓

Salient
4955 Auto Doubler ..... 48 ❼ ✓
3515 Disk Doubler 3.7 ..... 46 ❼ ✓
3516 Partner 1.01 ..... 55 ❼ ✓

Symantec
4890 Norton Utilities 2.0 ..... 98 ❼ ✓
116 Sam 3.0 ..... 64 ❼ ✓

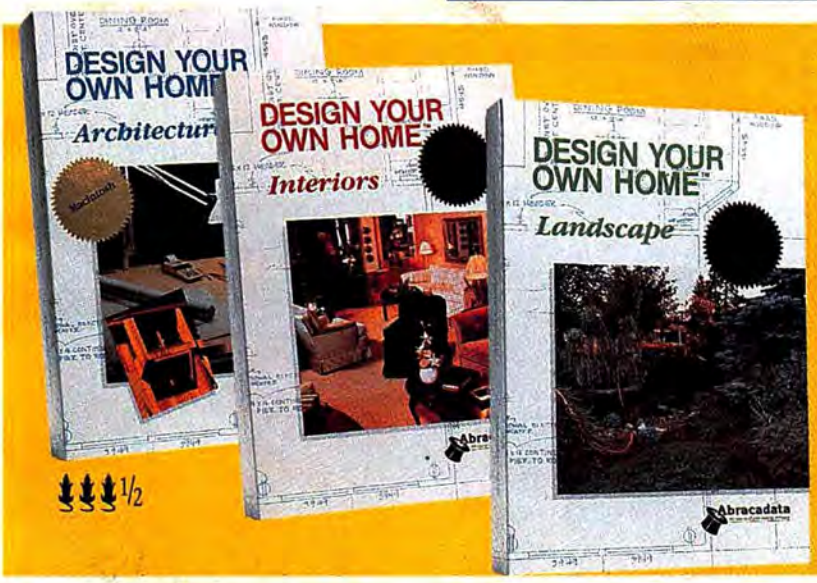
Terranetics
863 Autoback ..... 94 ❼ ✓



DesignCad 2D/3D V3.0

$159

DesignCAD 2D/3D provides the speed and accuracy necessary to manipulate complex two- and three-dimensional designs. It's designed for engineering, animation, desktop publishing and multimedia. Provides file support for DXF, IGES, XYZ, PICT, RIB. DesignCAD, Inc. #04180 ❼



Design Your Own Home:

$62 each

Architecture #03609
Interiors #03611
Landscape #03610

Whether you are a professional or a do-it-yourselfer, Design Your Own Home can make your planning time more productive. Each program includes sample plans and a try-out section to get you started, plus command cards to keep by your side as you work. There are 3 programs: Architecture (floor plans to structural details), Interiors (furnishings to color schemes), and Landscapes (trees to fences). Includes several sample plans. Abracadata❼ ✓

- All major credit cards accepted. No surcharge.
- Credit card is not charged until your order is shipped. If we must ship a partial order, freight is not charged on back order (USA only).
- Most personal and company checks received by mail will clear immediately. In order to be processed all checks or purchase orders must have a phone number and contact person listed.
- C.O.D. orders are accepted: Limit $1,000 per order. Cashier's check or money order only. Add $5.00 per C.O.D. order.
- Educational, government and corporate purchase orders are accepted.
- All U.S. shipments insured at no extra charge.
- No sales tax, except for Washington State residents (add 8.2%).
- Prices and product availability subject to change without notice. All specials and promotions are limited to available stock. Please call for current prices.
- All products covered by 120 day limited warranty.
- Shipping is $3 per order for delivery in the USA. We ship via Airborne Express Overnight service. (Some rural areas require an extra day for delivery).
- Orders placed 9pm to 7am ET are shipped free in USA via Airborne Express except monitors.
- Orders placed by 9pm ET (6pm PT) weekdays for "in stock" items will ship that day for overnight delivery (barring system failure, etc.).
- APO/FPO box orders are shipped first class U.S. Mail. Shipments to P.O. Boxes are via UPS.
- We will not be held responsible for typographical errors.
- **Defective software will be replaced immediately. Hardware will be repaired or replaced at our discretion.**
- **A Return Authorization Number must be obtained prior to returning any item. Please call Customer Service Hotline, 1-800-248-9948, weekdays from 6am to 6pm PT, 9am to 9pm ET.**

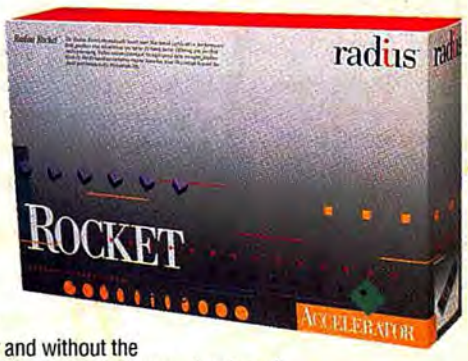
Mac Zone 18005 NE 68th St, Suite A110 • Redmond, WA 98052-9904

International: 206-883-3088 • FAX: 206-881-3421

Radius Rocket 25i/24X Card Bundle

$2498

1991 WINNER



The all new Radius Rocket 25i features Motorola's 68LC040, an '040 processor without the integrated math coprocessor and without the price tag. It's the ideal CPU upgrade for the Macintosh II user who doesn't need floating point instructions in a math coprocessor. If you use Quark XPress, Adobe Illustrator or Microsoft Word you won't miss this capability or the added expense. The new Radius PrecisionColor 24x offers 24-bit color with on-board QuickDraw acceleration, at just the fraction of the cost of the competition. You also get the added benefit of multiple resolutions with "on-the-fly" switchability. Radius #01004 ❼ ✓

FAX YOUR ORDER TO US ANY TIME • FAX #: 1-206-881-3421

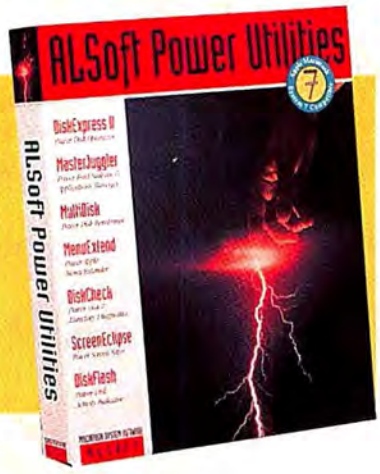
1-800-248-0800 • ORDER YOUR FREE SPRING CATALOG TODAY

The Mac Zone
Established 1986

All The Right Stuff
Utilities That Will Make Your Life Easier

AlSoft Power Utilities

$62 Enhance the performance of your Mac with Alsoft Power Utilities. The package includes seven helpful units: a disk space manager, a disk partitioner, a System 7 menu enhancer, a disk and directory diagnostic program, a screen saver, a disk activity indicator, a font suitcase and application manager. AlSoft, Inc. #00628 ? ✓



Screen Utilities

Baseline Publishing
3762 Talking Moose ..... 23 ? ✓

Berkeley Systems Design
4046 More After Dark Bundle V.2 ..... 40 ? ✓
4053 More After Dark Vol. 1 ..... 23 ? ✓
2785 After Dark 2.0U ..... 28 ? ✓

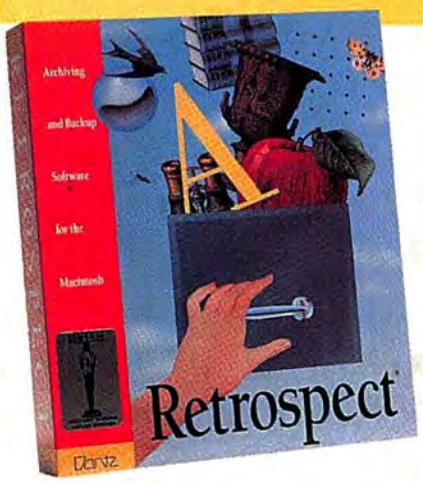
Bright Star
At Your Service Characters ..... 10 ? ✓
00415 At Your Service ..... 30 ? ✓

Dublclick Software
908 Menufonts 4.0 ..... 44 ? ✓
3616 Clickchange 1.04 ..... 55 ? ✓

Fifth Generation
04776 Suitcase II 2.0 ..... 49 ? ✓
2194 Pyro! 4.0 for Mac ..... 24 ? ✓

Preferred Publishers
3554 Screen Shot ..... 30 ✓

Thought I Could
4762 Wallpaper ..... 37 ? ✓



Retrospect 1.3 ★★★★½

$146 Retrospect provides automatic, unattended backup for any Macintosh to tape, cartridge or optical device. Set it up once, and the built-in calendar backs you up again and again. It also saves hard disk space by archiving seldom-used files to the backup media for future retrieval. Retrospect Remote brings the power of Retrospect to an entire AppleTalk network. Dantz #02586 ? ✓

Retrospect Remote #04194 ..... **$263**

OPEN 24 HOURS EVERY DAY

SNOOPER

LETS YOU FIND THE PROBLEM

$128

Snooper #05025 ? ✓

Snooper w/Nubus Card #05026 ? ✓ ... **$168**

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 a comprehensive suite of 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 time and money. If you already own Norton Utilities, complete your Mac utilities with SNOOPER hardware diagnostic.

VIDEO TESTS • BENCHMARKS • LOOPBACK CONNECTORS
RAM TEST • SYSTEM TESTING • SCSI TESTS • I/O TESTING
AUDIO TESTS • ERROR LOGGING

MAXA

#20602

Service, Selection and Price

We Have What It Takes To Earn Your Business

The Mac Zone Established 1986

FREE SHIPPING: ORDERS PLACED 9PM TO 7AM E.T. • 1-800-248-0800

VIRUSES: DON'T WAIT...INNOCULATE!

S.A.M. 3.0

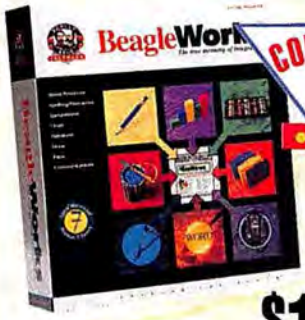
$64

SAM is the best-selling, highest-rated virus protection, detection and repair program for the Macintosh. It intercepts viruses, scans and repairs files, combats known and unknown viruses and more. Symantec #00116 ❼ ✓

Virex

$56

Protect your valuable data from the risk of invasion by computer viruses. The Virex 3 INIT repairs your damaged files instantly, before a virus finishes its destructive purpose. The program is user-configurable, so you can adjust it to knock out new viruses that may (will!) occur. Microcom #02077 ❼ ✓



BeagleWorks $184

BeagleWorks combines a full-function word processor, spreadsheet, charting program, database, painting program, drawing program and communications module into one package. This truly integrated program lets you combine data from all other modules and make changes (edit in context), all without leaving your document! Beagle Bros. #04327 ❼ ✓

$308 AE PlusDrive 1.44/800K FD

The new 1.44Mb floppy "plus drive" is one of the finest available for the Mac. It includes SuperDrive capability with the Mac Plus, SE and Mac II family; MS-DOS compatibility; two color read/write activity light; die cast Apple "platinum" case; and manufacturer's full one-year warranty. Applied Engineering #04956 ❼ ✓

NEW FOR YOUR POWERBOOK

Universal NoteBook Case

$74

The Universal NoteBook Case is made of a new material that is both stylish and durable. The computer compartment has an extra layer of foam padding and Velcro straps to secure the computer. The other has Velcro-adjustable dividers for supplies. Targus #07454 ❼ ✓

Envisio $548

The Eddy Award-winning Envisio Display Adaptor allows you to hook up your PowerBook to an external monitor. It supports all Apple and many VGA displays via a lightweight, internally mounted video interface. Envisio, Inc. #05165❼ ✓

1991 WINNER

NoteBook Display Adapter 030 1.0, 2Mb #05167❼ ✓.....$638

MODEMS AND FAXES

❼ = System 7 Compatible ✓ = Money Back Guarantee

Abaton Technology Corp

02154	Interfax 12/48 Faxmodem	264	✓
02987	24/96 Faxmodem 110V	338	✓
03186	24/96 Faxmodem 220V	338	✓

Applied Engineering

03666	Modem 2400 MNP 5 External	195	✓
03667	Modem 2400 MNP 5 SendFax Ext	235	❼ ✓
03668	Modem 2400 MNP 5 Internal	195	❼ ✓
03669	Modem 2400 MNP 5 SendFax Int	269	❼ ✓
03980	Mac LC 24/96 Sendfax Modem	245	❼ ✓
04579	Datalink LC V.42 Fax/Modem	259	✓

Best Data

00698	Smart One 2400 Mac Modem	110	

Cypress Research

04585	FaxPro with FaxPro Share V1.0	999	❼ ✓

Dove Computer Corp

03318	Dove Fax 24/96	268	❼
03514	Dove Fax Plus	370	❼
04756	Dove Fax Lan External	498	
04757	Dove Fax Lan Internal	529	

Global Village Communications

00395	Teleport Fax 24/96	184	❼ ✓
00949	Teleport FullFax	218	❼ ✓
03883	Teleport Adb 2400 MNP 5 Modem	128	❼ ✓

Hayes

00451	Personal Modem 2400+	148	❼ ✓
04796	Ultra9600 w/Smartcom IImac	698	❼ ✓
07829	Optima 24/SC EZ	158	

Logicode Technology

00852	Xeba 2400 Ext	99	
04644	Xeba 9600S/R Fax/V.42Bis Black	199	❼
04674	Xeba 9600S/R V42BisFaxPlatinum	199	

Mass Microsystems

00701	24/96 Fax Modem	179	

MacTurbo

00408	MacTurbo Plus Modem	89	✓
00977	MacTurbo 24/96 Fax Modem	149	

Prometheus

00062	Promodem Ultima	498	✓
00331	PowerBook Home Off.Int 24/96	269	✓
00877	Home Office Ultima Ext	498	
00907	Home Office 24/96 w/ Voice	269	
03312	Promodem 2400 Mini-M	118	✓
03313	Promodem Travel Modem	122	✓
03608	Promodem 9600M Plus	599	❼ ✓
04416	Prometheus 2400 Mini Plus	123	❼ ✓
04596	Promodem 24/96 S/R Mini Fax+	268	❼ ✓

PSI Integration, Inc.

04948	PowerModem 24/96SR Internal	215	❼ ✓

Relisys

00256	Relisys Tefax with Autofax	869	❼ ✓

Shiva

01615	Shiva Netmodem V2400	338	✓
03251	Shiva Netmodem V.32 9600	1149	❼ ✓
04129	Shiva Netmodem/E 10 BaSE T	1749	❼ ✓
04491	Shiva Netmodem E Thin/Bnc	1749	✓
04758	Shiva Netmodem/E Thick	1749	✓
04759	Shiva Netmodem/E AUI	1749	❼ ✓

Solectek

04753	Solectek Pocket Fax Modem	219	❼

Supra Corporation

00065	Modem 2400 Plus	148	
00413	Fax Modem V.32BIS wsft/cbl	379	
00414	Fax Modem V.32BIS w/o sft/cbl	319	
00424	Fax Modem V.32 w/o sft/cbl	259	
00426	Fax Modem V.32 wsft/cbl	329	
02003	Modem 2400 Baud	89	❼
03368	Modem 2400 Macpac	138	❼
04351	Fax Modem Plus	199	❼

Telebit

02554	T-2500 V.42 Rel 6.01 19000 Bps	628	❼

1-800-248-0800 • USA & CANADA • OPEN 24 HOURS EVERY DAY

The Mac Zone
Established 1986

Mac Zone Means Business

Call Our Knowledgeable Sales Advisors

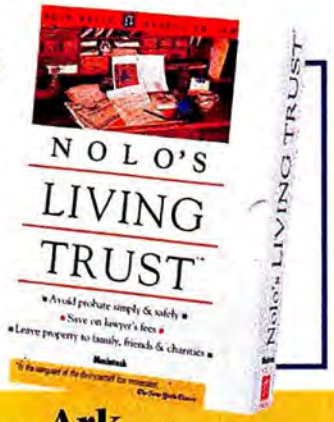
WINNER

Accountant Inc. 3.0 $329

Accountant, Inc. is the Eddy-award-winning fully-integrated accounting system that's perfect for any type of business—retail, manufacturing, service or professional. It provides reports and performs analysis like no other software, so you can do what you do best and stop worrying about the accounting chores.
Softsync, Inc. #00344 ❼ ✓

NOLO's Living Trust $43

Make sure that your wishes are followed. Write your own living trust! Easy-to-use question and answer format walks you through the process step by step. Use it for individually or jointly-owned property. Can be rewritten or modified any time you wish. NOLO Press #04720 ❼ ✓



Ark Workspace $78

Concentrate on your work, not on your computer. Workspace is a visual project organizer which keeps documents and applications for specific projects together in one place, where you can find them. Workspace also tracks time spent on projects—giving a daily, weekly or monthly accounting. Requires System 6.05 or later with MultiFinder.
Ark Interface #05024 ❼ ✓

Minotaur Labyrinths of Crete $39

In Minotaur, two players compete against on another from their own computers via modem or serial cable. You and your opponents (up to 8 can play) are thrown into a huge randomly-generated labyrinth where you'll battle to the death with a number of magical and enchanted items. Bungie Software #00639 ❼ ✓

Operation Desert Storm V1.5 $27

Join the forces in the gulf in this realistic full-color battle simulation! Experience full screen action on any monitor as you command your M1A1 Abrams tank on a series of missions against a hostile, well-equipped enemy. Bungie Software #04106 ❼ ✓

Accounting

❼ = System 7 Compatible ✓ = Money Back Guarantee

Aatrix
1875 Ultimate Payroll ..... 198 ❼ ✓
1871 Payroll 4.0 ..... 108 ❼ ✓

Checkmark Software
4536 Multiledger 2.0 ..... 228 ❼ ✓
2411 Payroll 4.5 ..... 171 ❼ ✓

Computer Associates
4533 Simply Accounting for the Mac .... 134 ❼ ✓

Dac Software
4312 Daceasy Lite Checkbook Acctg 2.0 19 ❼ ✓

Intuit
4230 Quicken 3.0 Mac ..... 42 ❼ ✓

Peachtree Software
2598 Insight Expert Series ..... 295 ❼ ✓
2594 At Once! ..... 189 ❼ ✓

Shopkeeper Publishing
0439 ShopKeeper Plus ..... 309 ❼ ✓
0428 Bill-It 4 ..... 114 ❼ ✓

Softsync, Inc.
4778 Accountant Inc. Multi User Pak ... 560 ❼ ✓
0344 Accountant Inc. 3.0 ..... 329 ❼ ✓

Survivor Software
1582 MacMoney 3.5 ..... 58 ❼ ✓

Teleware Incorporated
4712 M.Y.O.B. 2.1 ..... 138 ❼ ✓

Timeslips
1044 Timeslips III v2.1 ..... 194 ❼ ✓
0403 Timeslips III Network 5 User ..... 529 ❼ ✓

Personal Productivity

After Hours Software
3908 Touch Base 2.0 ..... 78 ❼ ✓

Attain
4949 In Control ..... 89 ❼ ✓

Casady and Greene
4810 Super Quick Dex ..... 58 ❼ ✓

CE Software
3624 Alarming Events ..... 83 ❼ ✓
1497 Calendar Maker 3.0 ..... 30 ❼ ✓

Disctech Corporation
4550 Facilitator ..... 219 ❼ ✓

NOLO Press
481 Will Maker 4.0 Mac ..... 31 ❼ ✓
3781 For The Record 2.0 Mac ..... 30 ❼ ✓
4720 Living Trust ..... 43 ❼ ✓

Now Software
580 Now Up To Date ..... 66 ❼ ✓

Pastel Development
4752 Daymaker ..... 64 ✓

Psybron
200 Contact 1.0 ..... 59 ✓
288 CalenDAr (DA) 1.1.3 ..... 39 ✓

Superoffice Corp
4966 Super Office Single User ..... 248 ✓
1001 Super Office Competitive Upgrade . 69 ✓

The Open University
4671 The Desktop Lawyer Mac ..... 69 ❼

#20602

TransWarp Accelerators

It's Like Getting A New, Faster Computer

The Mac Zone
Established 1986

High-Performance TransWarp Accelerators

TransWarp LC
33 Mhz w/ FPU

$988

Tired of waiting for your LC to catch up? TransWarp LC provides high speed performance for the Macintosh LC. This 68030 CPU/68882 FPU upgrade for the Mac LC helps eliminate the time you spend waiting on your computer. Desktop publishing, graphic design and CAD packages become fun again. Applied Engineering #04732 ✓

TransWarp SE
Accel 25Mhz w/FPU

$798

The TransWarp SE 030 gives you up to 10 times the speed of the standard SE. The board comes standard with a 68882 Floating Point Unit (FPU) math chip which greatly enhances the speed of any math functions, so your spreadsheets and CAD programs run faster than ever before. Applied Engineering #04325 ✓

Boost your Mac to Lightning Speeds with Æ Cards

QuickSilver IIsi CacheCard $269

The QuickSilver IIsi CacheCard is a 32K static RAM cache board for the Macintosh IIsi. QuickSilver provides a 40% performance increase over the standard IIsi. QuickSilver comes standard with an SE/30 slot extender, which allows SE/30 cards to be used in the IIsi, and an optional 68882-20MHz FPU for increased floating point equation performance. Applied Engineering #00833 ✓

Quadralink
w/ Shadow

$208

QuadraLink gives your Mac II four additional serial ports. No more reaching behind your computer to unplug one printer and plug in another. No more shorting-out serial devices by connecting them while your computer is on. QuadraLink works as an electronic switch box, allowing you to easily switch between any devices connected to one of its ports or your computer's printer and modem ports. Applied Engineering #03673 ✓

Fast Math LC

$139

Make your LC a math whiz with the FastMath LC card. Its 68882-16MHz FPU dramatically increases the speed of math intensive applications. FastMath LC plugs easily into the LC's processor direct slot (PDS) with no switches to flip or jumpers to move. Comes with a full five-year manufacturer's warranty. Applied Engineering #04120 ✓

Applied Engineering has a card to fit most Macintosh computers. Applied Engineering accelerators boost the Macintosh SE, Classic, LC, II, IIx, IIsi, IIcx and IIci to lightning speeds. All Applied Engineering cards are backed with a manufacturer's 30-day money back guarantee, and a full one-year warranty.

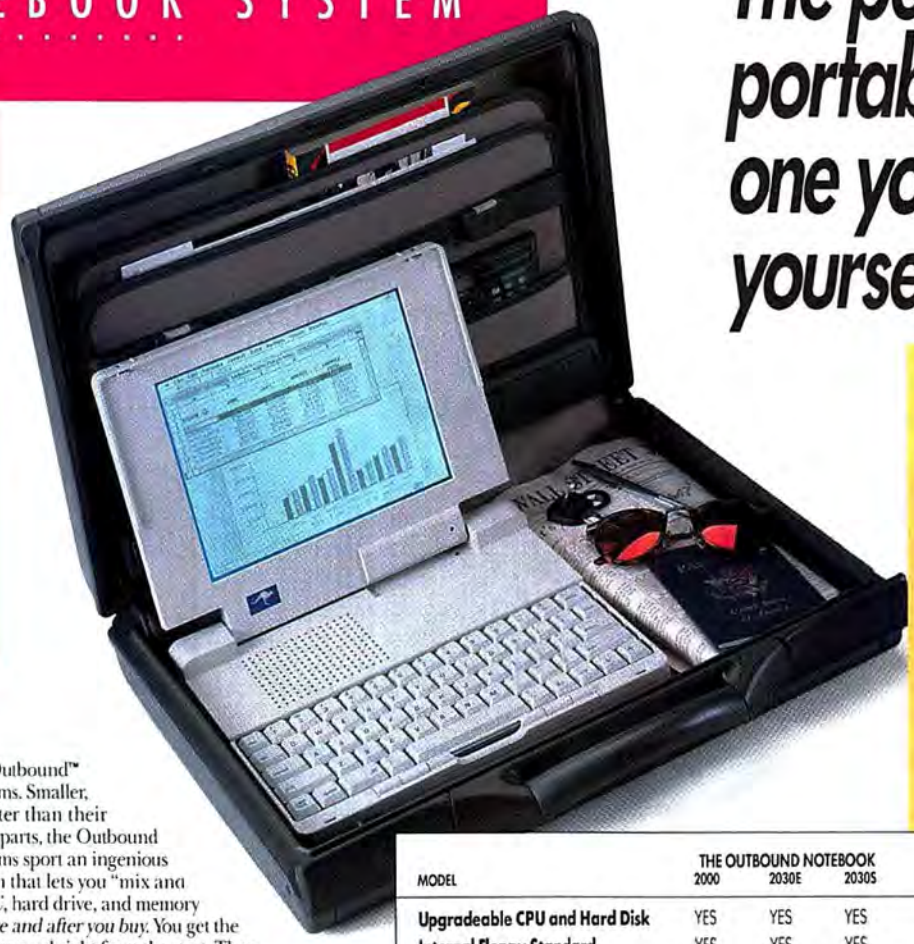
Æ APPLIED ENGINEERING®
A Division of AE Research Corporation

Circle 70 on reader service card

$3 OVERNIGHT DELIVERY VIA AIRBORNE EXPRESS • 1-800-248-0800

THE OUTBOUND NOTEBOOK SYSTEM

The perfect portable is the one you design yourself.



What the experts say:

"Outbound offers top-notch portable Mac."
MacWEEK Magazine

"Outbound's notebooks are solid machines and deserve serious consideration by anyone contemplating buying a Mac notebook."
Macworld Magazine

"Outbound's new Notebook System has the unique ability to grow along with your requirements–and your budget."
MacUser Magazine

"Innovative touches, a high degree of compatibility, and moderate pricing make the Outbound Notebooks strong competitors with Apple's portable Macs."
Portable Office Magazine

"For me, the Outbound Notebook is the better choice."
BYTE Magazine

Meet the new Outbound™ Notebook Systems. Smaller, lighter and faster than their Apple® counterparts, the Outbound Notebook Systems sport an ingenious modular design that lets you "mix and match" the CPU, hard drive, and memory you want, *before and after you buy.* You get the performance you need right from the start. Then, as your hunger for power grows, you can upgrade your Notebook simply and easily with standard low-cost modules.

Don't give up anything

Outbound's "mix and match" system lets you choose from two to 14 MB of RAM, a hard disk from 20 to 120 MB, and lightning speeds of 20 to 33 MHz. With any combination, you'll have all the power and memory you need for your demanding applications. Naturally, the Outbounds are equipped with all of the ports you'd expect in a Mac®: a standard SCSI, communications, sound, ADB and printer. There is even a built-in microphone and speaker.

Enjoy Mac compatibility

Your Outbound Notebook is ready for action the minute you unpack the box, because the Macintosh ROM is already installed for compatibility with the thousands of Macintosh applications. Systems come with the memory conscious System 6.0.7 installed, and are completely compatible with System 7. And of course, all models include an internal SuperDrive™-equivalent 3½" floppy disk drive for working with high and low density Mac and MS-DOS diskettes.

Perform big business in small places

Small enough to fit in most briefcases, all models measure 8.5 x 11 x 2.1 inches, weigh only 6.25 pounds, and boast a full-size, silent keyboard. In tight quarters, use the keyboard mounted TrackBar™ to point and click. Or, add a mouse or other ADB pointing device. The backlit LCD screen is large and easy to read, and provides 17% more displayable area than the Apple PowerBook™ screens.

MODEL	THE OUTBOUND NOTEBOOK 2000	2030E	2030S	MACINTOSH POWERBOOK 100	140	170
Upgradeable CPU and Hard Disk	YES	YES	YES	No	No	No
Internal Floppy Standard	YES	YES	YES	No	Yes	Yes
Processor Speed	20MHz	25MHz	33MHz	16MHz	16MHz	25MHz
Maximum Hard Drive Available	120MB	120MB	120MB	20MB	40MB	40MB
Full Size Silent Keyboard and True Notebook Size	YES	YES	YES	No	No	No
Maximum RAM Available	4MB	14MB	14MB	8MB	8MB	8MB
Math Coprocessor	No	Optional	Optional	No	No	Yes
Maximum Silicon Disk Memory (RAM) Available	12MB	50MB	50MB	6MB	6MB	6MB
Price	2000/220 $1999	2030E/220 $2499	2030S/440 $3899	100/220 Ext. Floppy $2199	140/220 $2899	170/440 $4599

ORDER DIRECT AND SAVE– PRICES START AS LOW AS $1999

You can order your Outbound Notebook System right from the folks who make it. Just call toll-free and use your credit card. And, when you call, be sure to ask about our low-cost financing.

Smaller, lighter, faster and available now!

There's no reason to wait. Start enjoying the Macintosh environment you know and love on the road now. Let us customize an Outbound Notebook for you today. There's no risk when you buy, because every Outbound Notebook System purchased direct comes with a FULL 10 DAY MONEY BACK GUARANTEE OF SATISFACTION, one year warranty, and toll-free customer support.

ORDER DIRECT TODAY AT:

1-800-444-4607

IN CANADA CALL 1-800-463-3257

or call Outbound for the dealer nearest you. 7 a.m. to 6 p.m. Mon-Fri. and 8 a.m. to 4 p.m. Saturdays MST. Visa, MasterCard and American Express accepted. Overnight shipping available.

Cost-effective upgrades are quick and simple thanks to Outbound's unique modular design.

OUTBOUND™

Outbound Systems, Inc. 4840 Pearl East Cir.
Boulder, Colorado 80301
Phone: 303.786.9200 Fax 303.786.8611

Notebook prices based on direct sales. PowerBook prices reflect published Apple retail pricing. Technical specifications and prices subject to change without notice. The Outbound name, logo and TrackBar are trademarks of Outbound Systems, Inc. Apple, Macintosh and Mac are registered trademarks of Apple Computer Inc. PowerBook and Apple SuperDrive are trademarks of Apple Computer Inc. All other brand and product names mentioned herein are trademarks or registered trademarks of their respective holders.

Circle 30 on reader service card

Updates

JUNE 1992

THIS SECTION LISTS THE LATEST VERSIONS OF SELECTED MAC APPLICATIONS THAT WERE SHIPPING BY THE TIME WE WENT TO PRESS.

PRODUCT	V.	REQ.	★	$
4TH DIMENSION	2.2	1MB/6.0		$99
A4	3.0	2MB/6.0.5		$395
AATRIX CHECKWRITER II	3.02	512K/4.1		*
ACCOUNTANT, INC. PROFESSIONAL	3.0	1MB/6.0.3		*
ACCUTEXT	3.0	4MB/6.0		$150
ACTA 7	7.0	512KE/6.0.5	2/92	$33.50
ADDMOTION	2.0	2MB/6.0.5		*
ADDRESS BOOK PLUS	2.0	1MB/6.0.2	2/92	$25
ADOBE ILLUSTRATOR	3.2	2MB/6.0.3		*
ADOBE PHOTOSHOP	2.0.1	2MB/6.0.2	9/91	$199
ADOBE TYPE MANAGER	2.0	1MB/6.0.2		FREE
AFTER DARK	2.0	512KE/4.1		*
AGENT DA	2.0	1MB/6.0.5		$30
AGFATYPE	3.0	2MB/6.0.2		FREE
AGFA TYPECHART	1.5	1MB/6.0.4	7/91	FREE
ALARMING EVENTS	1.0.3	1MB/6.0.2		$15
ALDUS DIGITAL DARKROOM	2.0	1MB/6.0	9/91	*
ALDUS FREEHAND	3.1	1MB/6.0.5	3/92	*
ALDUS PAGEMAKER	4.2	4MB/6.0.5	5/92	*
ALDUS PERSUASION	2.1	4MB/6.0.5		*
ALDUS SUPER 3D	2.5	2MB/6.0.5		*
ALDUS SUPERCARD	1.6	2MB/6.0.4		$50
ALDUS SUPERPAINT	3.0	1MB/6.0.5	3/92	$65
ALLIANCE POWER TOOLS	2	1MB/6.0.4		*
AMAZING PAINT	1.0.1	512KE/6.0.4		$15
AME	2.0	1MB/6.0.2		$49.95
ANTITOXIN	1.4	512K/3.2		$15
APPLESHARE FILE SERVER	2.0	512K/3.2		*
ARCHICAD	4.03	5MB/6.0	3/92	10% OF LIST
ASHLAR VELLUM	2.10	4MB/6.0.2		*
ASHLAR VELLUM 3D	2.10	4MB/6.0.2		*
ATONCE	1.2	1MB/6.0.5		*
AUDIOMEDIA	2.02	2MB/6.0.7		$29
AURACAD	3.01	1MB/4.0		$90
AUTHORWARE PRO	1.7	2MB/6.0.5		*
AUTOSAVE II	2.0	512KE/4.2		*
A/UX	2.0	4MB/6.0.5		*
AZIMUTH	2.1	1MB/6.0.2		$45
BACKFAX	2.0	1MB/6.0.3		$75
BACKMATIC	2.0	1MB/4.2	2/92	*
BILL-IT	2.6	1MB/6.0.3		*
BITSTREAM TYPEFACE LIBRARY	1.5	1MB/6.0		*
BUSINESS SENSE	1.5	1MB/6.0.7		$69
CA-CRICKET PRESENTS	2.0.1	1MB/6.0		*
CALENDAR	1.1.2	512KE/6.0		FREE
CANOPENER	2.0	512K/3.0		$29
CANVAS	3.0	1MB/6.0.2	1/92	*
CARBON COPY MAC	2.0	1MB/6.0.5	4/92	*
CAT III	1.1	1MB/6.0		*
CHECKLIST	2.0	1MB/6.0	2/92	*
CINEMATION	1.0	4MB/6.07		NA
CLARIS CAD	2.0.2	2MB/6.0		$79
CLARIS RESOLVE	1.0.1	1MB/6.0.5	1/92	NA
CLARISWORKS	1.0	1MB/6.0.5	3/92	NA
CLICKCHANGE	1.05.2	1MB/6.0.4		$5
CLICKPASTE	2.1	1MB/6.0		*
CMS UTILITIES	7.0	2MB/7.0		$25
COLOR MACCHEESE	2.07	1MB/6.0.5		$15
COLORSTUDIO	1.5	4MB/6.0.5	3/92	*
COMPUSERVE INFORMATION MANAGER	1.5	1MB/4.1		*
COMPUSERVE NAVIGATOR	3.1	512K/4.1		*
CONCERTWARE+	4.0	512KE/4.2		$15
CONNECTIONS	2.0	2MB/6.0.5	4/92	NA
CORRECT GRAMMAR	2.0	1MB/4.2		*
DATACLUB CLASSIC	2.0	2MB/6.0		*
DATA SHAPER	1.2	1MB/6.0		$40
DECK	1.03	2MB/6.0.7		FREE
DELTAGRAPH PRO	1.0	2MB/6.0.5	5/92	$75
DELUXEMUSIC CONSTRUCTION SET	2.5	512K/6.0.2		*
DESCARTES	1.04	2MB/6.0.3		FREE
D.E.S. DOCUMENT EXCHANGE SYSTEM	4.1	1MB/6.0		*
DESIGNCAD	3.0	2MB/6.0.5		*
DESIGNCAD 2D/3D	3.0	2MB/6.0.5		$50
DESIGNSTUDIO	2.0	1MB/6.0	11/91	*
DESKPAINT	3.07	1MB/6.0.5		$19.95
DIGITAL DARKROOM	2.0	1MB/6.0.4	9/91	$80
DISKDOUBLER	3.7	1MB/6.0.2		$15
DISKEXPRESS II	2.10	1MB/6.0		FREE
DISKFIT PRO	1.0	1MB/6.0	4/92	$32.50
DISKTOP	4.01	1MB/6.0		*
DISPLAY ADBUILDER	1.1	1MB/6.0.3		*

continues

V. = version #. **Req.** = min. RAM and system software required. ★ = last time (in the past year) this or an earlier version was reviewed. **$** = cost of update to registered owners. **NA** = first version, not applicable. * = contact your dealer for update policy. **Blue** = new version. **Yellow** = reviewed product.

OUTRIGGER MONITOR

THE OUTBOUND

Make your portable more productive.

Take your notebook on the road, then quickly turn it into a full-sized office system by adding the Outbound Outrigger™ Intelligent Monitor. Its razor-sharp, full-page portrait display is 200% larger than a Mac Classic and 100% compatible with an Outbound Notebook, Apple® PowerBook or any Macintosh computer. The Outrigger connects directly to your computer with just a SCSI cable – no expensive SCSI interface card required. The built-in 20MHz 68000 processor means fast redraw and an extra SCSI port gives you added versatility. Get more productivity with your notebook, add the Outrigger today.

Suggested Retail Price $949.

To order direct or for the dealer nearest you call:

1-800-444-4607

IN CANADA CALL 1-800-463-3257

OUTBOUND

Outbound Systems, Inc.
4840 Pearl East Cir.
Boulder, CO 80301
303.786.9200

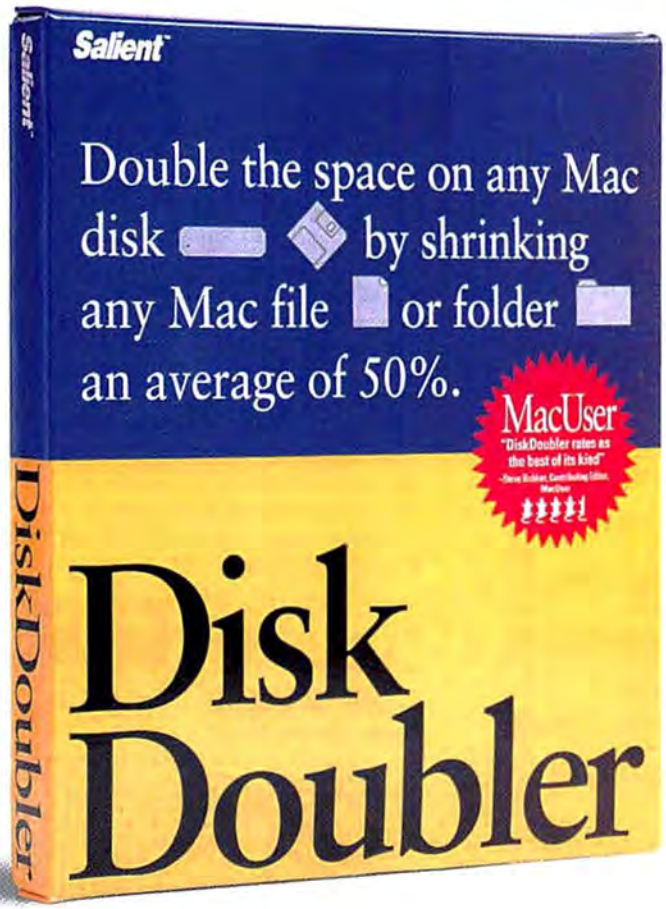
Technical specifications and price subject to change without notice. The Outbound name, logo and Outrigger are trademarks of Outbound Systems, Inc. Apple, Macintosh and Mac are registered trademarks and PowerBook is a trademark of Apple Computer, Inc. Classic is a trademark used under license to Apple Computer, Inc. All other brand and products mentioned herein are trademarks of their respective holders.

Circle 219 on reader service card

PRODUCT	V.	REQ.	★	$
DOLLARS & SENSE	5.0	512KE/3.2		*
DOUBLE HELIX	3.5	1MB/6.0		$99
DREAMS	1.1	1MB/6.0.2		*
DYNAPERSPECTIVE	2.3	2MB/6.0.5		$149
DYNODEX	2.0	1MB/6.0	2/92	$25
EASY COLOR PAINT	2.02	1MB/6.0.2		*
EHELP	2.0	1MB/4.1		$445
EMPOWER II	4.0.7	2MB/4.2		*
ENCORE	2.5	2MB/6.0.2		*
ENHANCE	2.0	2MB/6.0.3	11/91	$100
EVOLVE	1.1	2MB/5.3		$25
EZ VISION	1.0	1MB/6.0.3		NA
FASTBACK PLUS	2.6	1MB/6.0	4/92	*
FAST FORMS	2.0	1MB/6.0		$25
FASTLABEL	3.1	1MB/6.0		$10
FASTTRACK	1.5	512KE/5.5		$20
FAXGATE (MICROSOFT MAIL)	3.0	1MB/6.0.3		$9/WORKSTATION
FAXGATE (QUICKMAIL)	1.5	1MB/6.0.5		$9/WORKSTATION
FILEGUARD	2.7	1MB/4.2		$18
FILEMAKER PRO	1.02	1MB/4.2		FREE
FILEVISION V	1.1	1MB/6.0.2		*
FILMMAKER	2.5	5MB/6.0.3		*
FINALE	2.6	1MB/6.0.2		FREE
FLEXICAD	2.20	5MB/6.0.4		*
FONTMONGER	1.0.5	2MB/6.0.2	10/91	FREE
FONTOGRAPHER	3.5	1MB/4.2		*
FONTSHARE	2.2	1MB/6.0		FREE
FONTSTUDIO	2.0	1MB/6.0.5		*
FORM Z	2.0	2MB/6.0		*
FOXBASE+/MAC	2.01	1MB/6.0		FREE
FRAMEMAKER	3.0	1MB/6.0	3/92	*

PRODUCT	V.	REQ.	★	$
FREEDOM OF PRESS LIGHT	3.0.1	2MB/6.0.3		FREE
FREEDOM OF PRESS PROFESSIONAL	3.0.2A	4MB/6.0.3		$250
FULL IMPACT	2.0	1MB/6.0		$50
FULLWRITE PROFESSIONAL	1.5	2MB/6.0.2		*
GENERIC CADD	1.1	1MB/6.0.5		*
GEOQUERY	3.0	1MB/6.0		*
GOFER	2.0	1MB/4.1	3/92	$25
GRACELAN	2.0	1MB/6.0.5		*
GRACELAN UPDATE MANAGER	1.0	2MB/6.0.5		NA
GRAMMATIK MAC	2.05	1MB/6.0		$15
GREAT GANTT	1.4	1MB/6.0		*
GREAT PLAINS ACCOUNTING SERIES	6.0	1MB/4.2		*
GREATWORKS	1.0	1MB/6.0.2	1/92	NA
GUIDE	2.0	512K/4.1		$50
HAND-OFF II	2.2.1	1MB/6.0		FREE
HELP	1.0.1	1MB/6.0	2/92	FREE
HYPERCARD	2.1	1MB/6.0.3		$49
HYPERDA	2.0	512K/3.2		*
ICON-IT	2.1	1MB/6.0.2		*
IF:X FORMS DESIGNER	1.1	1MB/6.0		FREE
IGOR	1.2	2MB/4.1		$35
IMAGESTUDIO	1.7	1MB/6.0		$99
IMAGE GRABBER	3.0	1MB/6.0	2/92	$18
INFINI-D	1.1	4MB/6.0.4	9/91	FREE
INFOLOGIC ENVELOPE	1.1C	512KE/4.0		$5
INITPICKER	2.02	1MB/6.0		$10
INSIDE OUT	II	1MB/6.0.2		*
INSIGHT EXPERT ACCOUNTS PAYABLE	2.1.1	1MB/6.0		*

PRODUCT	V.	REQ.	★	$
INSIGHT EXPERT ACCOUNTS RECEIVABLE	2.2	1MB/6.0.2		*
INSIGHT EXPERT GENERAL LEDGER	2.2	1MB/4.2		$99
INSPIRATION	3.0	1MB/4.2	12/91	*
INSTANT-EXPERT PLUS	2.0	1MB/5.0		FREE
INTERFACE RAVE	2.0.5	2MB/6.0.4		FREE
INTOUCH	1.1.7	512KE/4.2	3/92	FREE
ITHINK	2.0	2MB/6.0.2		$149
KALEIDAGRAPH	2.1	2MB/6.0.5	9/91	$20
KIWIENVELOPES	3.1	512KE/4.1		*
LABVIEW	2.2	4MB/6.0.5	10/91	*
LANGUAGE SYSTEMS FORTRAN	3.0	2MB/6.0.4		$100
LAPLINK MAC III	3.2	512K/2.0		FREE
LAPLINK MAC PLUS III	3.0	512K/2.0		*
LASERPAINT COLOR II	1.02	1MB/6.0.3		FREE
LETRASTUDIO	2.0	2MB/6.0		*
LIGHTSPEED COLOR LAYOUT SYSTEM	2.5	1MB/6.0.5		*
MACANALYST	3.1	2MB/6.0		*
MACARCHITRION	5.5	2MB/6.0.3		*
MACBRAIN	3.0	1MB/6.0.5		$295
MACDRAFT	2.1	1MB/6.0.2		*
MACDRAW II	1.1	1MB/6.0		*
MACDRAW PRO	1.0.1	1MB/6.0.5	11/91	$99
MACENVELOPE	5.1	1MB/4.2		$29.95
MACENVELOPE PLUS	2.0	512KE/3.2		$50
MACFLOW	3.5.4	1MB/6.0		$30
MACFORTRAN II	3.1	4MB/6.0.3		$99
MACGLOBE	1.0	1MB/6.0.4	4/92	*
MACLABELPRO	1.5	1MB/6.0.3		$19.95



Visibly Superior.

Apple Macintosh System 7 Compatible

MACWORLD 1991 World Class Award Winner

EDITOR'S CHOICE MacWEEK 1991

EDITORS' CHOICE NOMINEE MACUSER 1991

For telecommunication, backups or floppies, use award winning DiskDoubler.™

PRODUCT	V.	REQ.	★	$
MACLINKPLUS/PC	6.0	1MB/6.0.3	3/92	*
MACMONEY	3.5	512KE/4.0		$12
MACPAINT	2.0	512KE/3.2		$25
MACPALETTE II	2.2	1MB/6.0.5		*
MACPHONEBOOK	3.0	1MB/6.0	9/91	*
MACPLOT PROFESSIONAL	3.7.4	1MB/6.0.5		*
MACPLOT STANDARD	3.7.4	1MB/6.0.5		*
MACPROJECT II	2.5	1MB/6.0		$99
MACRECORDER	2.03	512K/3.2		*
MACRENDERMAN	1.1	5MB/6.0.5		$75
MACROMIND DIRECTOR	3.0	2MB/6.0.5		$195
MACSCHEDULE	2.5	1MB/6.0		$30
MACSCHEDULE PLUS	1.0.5	1MB/6.0		FREE
MACSPIN	3.01	512K/4.3	3/92	*
MACTERMINAL	3.0	512K/3.2		$65
MACTOOLS DELUXE	1.2	1MB/6.0		*
MACTOPS	3.1	1MB/6.0.5		*
MACWRITE II	1.1	1MB/6.0		FREE
MANAGING YOUR MONEY	4.0	1MB/6.0.3		*
MANAPRO GENERAL LEDGER	3.1	1MB/6.0		NA
MAPGRAFIX	2.1.1	4MB/6.0.3		*
MAPLE V		2MB/6.0.7	5/92	*
MARCOPOLO	1.1	1MB/6.0		FREE
MARKET ANALYZER PLUS	2.0	2MB/6.0.2		$99
MARKETMASTER	3.5	1MB/6.0.3		*
MARKUP	1.03	1MB/6.0		FREE
MASTERFINDER	1.1	1MB/6.0.5		*
MASTERJUGGLER	1.57	512K/6.0		$15
MASTERPLAN	1.03	512K/6.0.5		FREE
MASTER TRACKS PRO	5.0	1MB/4.1		$45
MATHCAD	2.06	1MB/6.0.2		FREE

PRODUCT	V.	REQ.	★	$
MATHEMATICA	2.0	1MB/6.0		*
MATHTYPE	2.1.1	512K/6.0.2		*
MATHWRITER	2.0	2MB/6.0.5		*
MEDIATRACKS	1.01	1MB/6.0.2		FREE
MENUFONTS	4.01	1MB/6.0.5	5/92	$20
METAPICT	2.0	512KE/4.5		$69
META PRO	2.03	1MB/6.0		*
MICHAEL'S DRAW	1.0	1MB/6.0.5	12/91	NA
MICROPHONE II	3.0	512K/4.2		*
MICRO PLANNER MANAGER	1.0	2MB/6.0		*
MICROSOFT EXCEL	3.A	1MB/6.0.2	9/91	*
MICROSOFT FILE	2.0	512K/3.2		*
MICROSOFT MAIL	3.0	1MB/6.0.2	8/91	*
THE MICROSOFT OFFICE	1.5	1MB/6.0.2		$129
MICROSOFT POWERPOINT	2.01	1MB/6.0		FREE
MICROSOFT PROJECT	1.1	1MB/6.0.4	11/91	NA
MICROSOFT WORD	5.0	512KE/3.2	4/92	$129
MICROSOFT WORKS	2.0e	512K/6.0		*
MINDLINK	2.0	1MB/6.0		*
MINDWRITE	2.1	512KE/4.2		*
MINICAD+	3.1	1MB/6.0	7/91	*
MOCKPACKAGE PLUS UTILITIES	4.4	512KE/3.2		$15
MODELSHOP II	1.1	1MB/6.0.2	3/92	FREE
MORE	3.1	1MB/4.1		*
MR. FILE	1.1.1	1MB/4.2		FREE
MULTI-AD CREATOR	3.0	2MB/6.0.3		*
MULTILEDGER	1.1	512K/3.2		$75
MUSICPROSE	2.1	1MB/6.0		FREE
MUSIC PUBLISHER	2.5.2	1MB/6.0	12/91	$15
MYADVANCEDMAILLIST	3.0	512K/4.1		*
MYDISKLABELER III	3.0.4	1MB/6.0		*

PRODUCT	V.	REQ.	★	$
M.Y.O.B.	2.0	1MB/6.0	10/91	*
MYTIMEMANAGER	4.0	1MB/6.0.3		*
NETMINDER ETHERNET	2.0	2MB/6.0		*
NETWORK BUNDLE FOR THE MAC	3.0	512K/3.2		*
NETWORK SUPERVISOR	2.0	2.5MB/6.0.3		*
NISUS	3.06	1MB/6.0.2		*
THE NORTON UTILITIES FOR THE MACINTOSH	1.1	1MB/4.2		$19
NOW UTILITIES	3.0.1	1MB/6.0.4	2/92	$49
NUBASE FOR THE MAC	1.3	1MB/4.1	1/92	$75
OMNIPAGE	3.0	4MB/6.0		$25
OMNIPAGE PROFESSIONAL	1.0	5MB/7.0		*
OMNIS SEVEN		2MB/6.0		*
ONCUE II	2.0	512K/6.0.2		$34.95
ON LOCATION	2.0	1MB/6.0.5	3/92	$25
ON SCHEDULE	2.0	1MB/3.0		*
PANORAMA	2.03	1MB/6.0	5/92	*
PAYROLL	4.0	2MB/6.0.5		$89
PERFORMER	3.61	2MB/6.0.2		*
PERSONAL PRESS	1.01	1MB/6.0.2		FREE
PHONENET LIAISON	3.0	1MB/4.2		$75
PHOTOMAC	1.5	2MB/6.0.3		$75
THE PHRASE THESAURUS	2.0	1MB/6.0		FREE
PICKTURE	1.0	512K/6.0		NA
PICTUREBOOK+	1.0	1MB/6.0	2/92	*
PICTUREPRESS	2.0	2MB/6.0.4		*
PIXELPAINT	2.1	2MB/4.1		*
PIXELPAINT PROFESSIONAL	2.01	4MB/6.0.5	9/91	$125
PLAINS & SIMPLE	1.06	1MB/3.2		*

continues

Invisibly Superior.

Salient Software, developer of best-selling DiskDoubler, now brings you a clear choice for automatically saving disk space. Introducing AutoDoubler,™ the data compression program that's so fast, so safe, so automatic — it's virtually invisible. AutoDoubler's patent-pending technology can increase your disk space up to 100% or more. For 0% effort. And it's so fast, you'll hardly even notice your files are compressed! Put AutoDoubler in your Macintosh, and watch your disk space problems disappear.

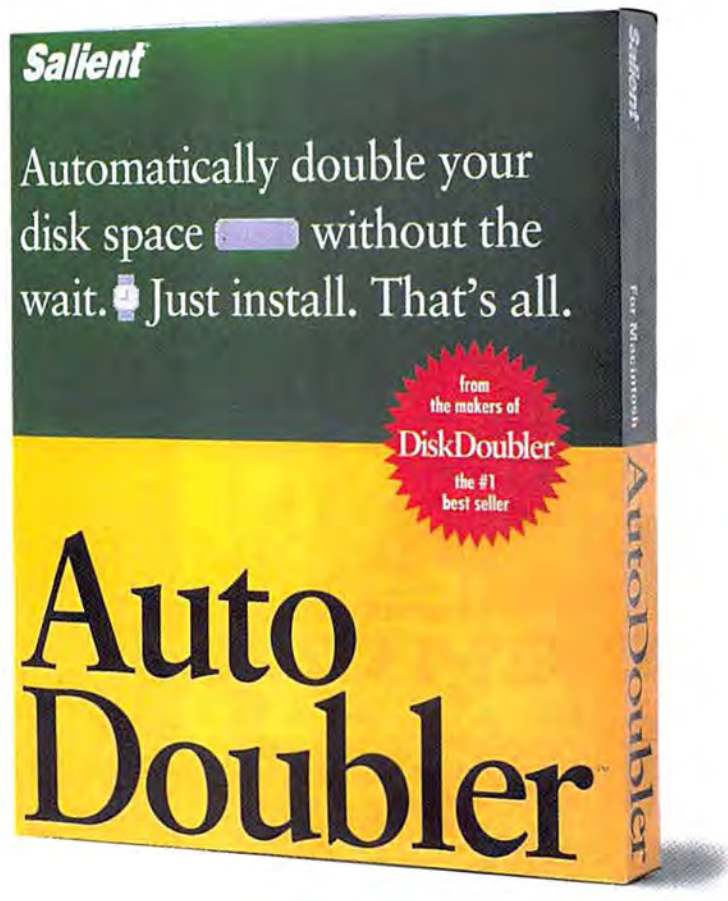
Both available at leading software stores.

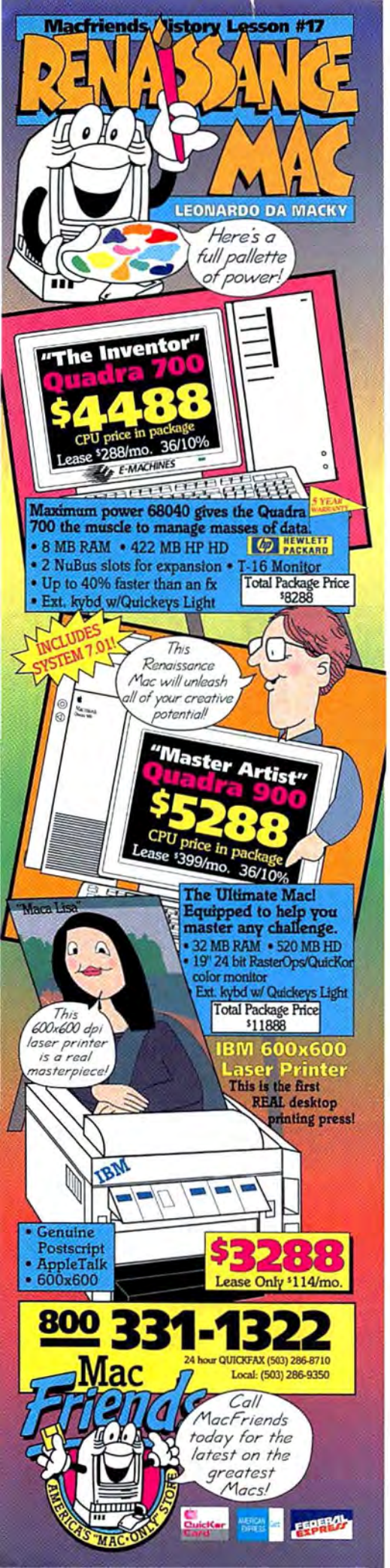
Salient® SOFTWARE INC

(415) 321-5375

Salient Software, Inc., 124 University Avenue, Palo Alto, CA 94301.
DiskDoubler and AutoDoubler are trademarks of Salient Software, Inc. © 1992.

Circle 39 on reader service card





UPDATES

PRODUCT	V.	REQ.	★	$
PLANISOFT	1.3	512K/4.2		$48
POSTERWORKS	2.1	2MB/6.0.3		*
POWERDRAW	3.0	1MB/6.0		*
POWERSTATION	2.5.5	512K/4.1		*
POWERTRAX	1.1	1MB/6.0.5		FREE
PRACTICA MUSICA	2.2	512K/3.2		*
PRESENTER PROFESSIONAL	1.0	5MB/6.0.5		NA
PRO-CITE	2.0	1MB/6.0.2	3/92	$95
PRODIGY	3.1	1MB/6.0		FREE
PROFESSIONAL COMPOSER	2.3	1MB/6.0.3		FREE
PROGRAPH	2.5	2MB/6.0	3/92	$49.99
PROPSFORMS	2.0	1MB/6.0.3		FREE
PROTOTYPER	3.0	1MB/4.1		$99
PUBLISH IT	1.2	512KE/5.0		*
PUBLISH IT EASY	2.5	1MB/4.2		$49.95
PYRO	4.0.1	512K/4.1		$15
QUARKXPRESS	3.1	2MB/6.0.5		*
QUICKDEX II	1.4D	1MB/6.0.5		*
QUICKEN	3.0	1MB/6.0.5	12/91	*
QUICKEYS²	2.1	1MB/6.0.2		*
QUICKLETTER	1.1.5	1MB/6.0		$25
QUICKMAIL	2.5	512KE/3.2		*
QUICKSHARE	2.0	512KE/3.2		*
QUICKSHOT	2.1	1MB/4.2		$5
RAGTIME 3	3.1	2MB/6.0		$150
RAY DREAM DESIGNER	1.1	4MB/6.0.5	9/91	*
READ-IT OCR PERSONAL	3.0.A	2MB/6.0.5		$49
READ-IT OCR PROFESSIONAL	3.0	2MB/6.0.3		*
READYSETGO	4.5	1MB/6.0		*
RETROSPECT REMOTE	1.3	1MB/6.0		*
RIGHTWRITER	3.1	512K/3.0		$29.90
RIVAL	1.1.9	2MB/6.0		FREE
RUNPC	3.1.2	512K/6.0.4		NA
SAM	3.0	1MB/6.0		$29
SCHEDULEMAKER	3.01	1MB/6.0		$25
SCULPT 3D	2.0.6	8MB/6.0.5		FREE
SCULPT 4D	2.0	8MB/6.0.5		$1000
SEND EXPRESS	2.1	1MB/6.0.2		*
SHADOWWRITER	1.1	2MB/6.0.2		FREE
SILVERLINING	5.31	1MB/6.0		*
SKETCH	1.0	5MB/6.0.5		NA
SMALL BUSINESS ACCOUNTING SYSTEM	2.1	512K/4.1		FREE
SMART ALARMS	3.07	1MB/6.0.2		$28
SMARTCOM II FOR THE MAC	3.3	1MB/6.0.5		*
SMARTFORM DESIGNER	1.1	1MB/6.0		FREE
SMARTSCRAP & THE CLIPPER	2.1	1MB/6.0.3		$40
SNAP	3.1.3	1MB/3.0	2/92	*
SOUND DESIGNER II	2.2	2MB/6.0.5		*
SPELLING COACH PROFESSIONAL	3.1	512KE/4.2		*
SPELLSWELL	2.2	512K/3.2		$20
SPINNAKER PLUS	2.0	2MB/6.0		$45
STATUS MAC	2.0	1MB/6.0	5/92	*
STEPPING OUT II	2.02	1MB/4.1		FREE
STICKYBUSINESS	1.4	512KE/6.0.3		*
STRATAVISION 3D	2.0	2MB/6.0.3		$99
STUDIO/8	2.0	2MB/6.0.5		$30
STUDIO/32	1.2	5MB/6.0.5		FREE
STUFFIT CLASSIC	1.6	1MB/6.0		*
STUFFIT DELUXE	2.0	1MB/6.0		FREE
SUITCASE II	2.0	512K/4.1		$25
SUM II	2.1	1MB/6.0		*
SUPER 3D	2.5	2MB/6.0.2		*
SUPERANOVA	1.1	1MB/6.0.2		FREE
SUPERCARD	1.5	1MB/6.0.5		$55
SUPERGLUE II WITH GLUENOTES	2.01	512K/6.0		$25
SUPERLASERSPOOL	3.0	2MB/6.0		$30
SUPEROFFICE	2.02	2MB/6.0.7		FREE
SUPERSPOOL	5.0	512K/4.1		$30
SWIVEL 3D	2.0	1MB/6.0.5		$75
SWIVEL 3D PRO	2.0	4MB/6.0.5		$150
SYSTAT	5.2	2MB/6.0		*
TASK MONITOR	4.0	1MB/6.0.3		FREE
TASTE	1.01A	2MB/6.0.2	5/92	FREE
TEMPO II PLUS	2.0.1	1MB/4.2		$39.95
TEXTPERT	3.01	1MB/6.0		FREE
TEXTSCAN	4.0	1MB/6.0		$75
THEORIST	1.1	1MB/6.0		*
THINK C	5.0	2MB/6.0		$89
THINK PASCAL	4.0	1MB/6.0		$69
THOUGHTPATTERN	1.2.2	1MB/6.0	6/91	FREE
THUNDERWORKS	1.2	1MB/6.0.2		*
TILES	1.0.1	2MB/6.0.4	5/92	NA
TIMBUKTU	4.0.1	1MB/4.1		*
TIMBUKTU/REMOTE	3.0	1MB/4.1		*
TIMESLIPS III	2.1	1MB/6.0.2		*
TOPDOWN	3.1	1MB/6.0.4	10/91	$99
TOPSCAN PLUS	1.0	2MB/6.0.5		NA
TOUCHBASE	2.0	1MB/6.0.5	9/91	*
TRAPEZE	2.1	1MB/6.0.2		FREE
TRUEFORM	2.1	1MB/6.0		FREE
TSCRIPT	3.0	1MB/6.0		$60
TYPEALIGN	1.04	1MB/6.0		FREE
TYPEREUNION	1.01	1MB/6.0		FREE
TYPESTYLER	2.0	2MB/4.0		$25
ULTRAPAINT	1.03	1MB/6.0.2		FREE
UNIVERSAL SOFTPC	2.5	2MB/6.0	11/91	$99
VENTURA PUBLISHER	3.2	2MB/6.0.5	6/91	$59
VERSACAD/ MACINTOSH EDITION	4.0	2MB/6.0.5		$295
VERSATERM	4.6	800K/4.2		$20
VERSATERM PRO	3.6	800K/4.2		$20
VIDEOPAINT	1.1	2MB/6.0.3		$35
VIREX	3.52	1MB/4.2		$15
VIRTUAL 2.0 FOR 030	2.04	1MB/4.2		FREE
VIRTUAL 2.0 FOR MAC II	2.04	1MB/4.2		FREE
VIRTUAL 2.0 FOR MAC PLUS	2.04	1MB/4.2		FREE
VISION	1.32	2MB/6.0.3		$29
WHITE KNIGHT II	1.12	1MB/6.0.2		*
WILLMAKER	4.0	512K/4.2		$18.50
WINGZ	1.1	1MB/6.0		FREE
WORD FINDER	2.0	512K/3.2		*
WORD FINDER PLUS	1.0	512KE/6.0		$19.95
WORDPERFECT FOR THE MACINTOSH	2.1	1MB/6.0.3	3/92	*
WORDPERFECT OFFICE	3.01	1MB/6.0.5	12/91	NA
WORDSCAN	1.0	4MB/6.0.5	3/92	NA
WORDSCAN PLUS	1.0	4MB/6.0.5	3/92	NA
WORKSPLUS SPELL	2.0	1MB/6.0.3		$35
WRITENOW	3.0	512K/4.2		$49.95

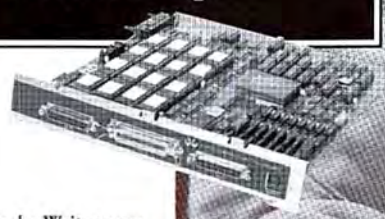
To have your products considered for this section, send a press release to *Updates, Macworld,* 501 Second St., San Francisco, CA 94107, or send a fax to 415/442-0766.

"Brilliant"

The user-installable Accel-a-Writer™ controller from Xante® is literally an art director's dream come true. This ground-breaking technological value installs in any Apple® LaserWriter® in minutes to deliver true **600 x 600 dpi typeset-quality text and 850 x 850 dpi gray scales.** That means you'll have 197 gray levels instead of the 25 you're limited to at 300 dpi! You'll enjoy clear, crisp graphics, scanned images and halftones that are simply the best available from any laser printer on the market today. What's more, the Accel-a-Writer's **RISC processor** delivers this superior output up to **12 times faster than your current laser printer!**

You'll enjoy other important advantages, too. Like **35 resident fonts.** Expanded connectivity for **simultaneous operation of Apple Macintosh®, IBM®/compatibles** and other popular workstations. **A SCSI port** to easily attach external hard drives for permanent storage of downloadable fonts. And Advanced Memory Management that automatically allocates the Accel-a-Writer's memory to increase resolution, virtual memory or font caching as needed.

What makes your LaserWriter 12 times faster, gives it 4 times the resolution and twice the connectivity?



Call Xante toll-free to order your Accel-a-Writer now, (there's one for every Apple LaserWriter & most HP® LaserJets®) and give your printer capabilities most art directors only dream about.

Accel-a-Writer I
Original LaserWriter & LaserWriter Plus

Accel-a-Writer II
LaserWriter IISC, LaserWriter IINT & LaserWriter II NTX

Accel-a-Writer III
Personal LaserWriter SC & Personal LaserWriter NT

Accel-a-Writer IX
Personal LaserWriter LS

1-800-926-8839
FAX 205-476-9421

XANTE
Innovations In Output

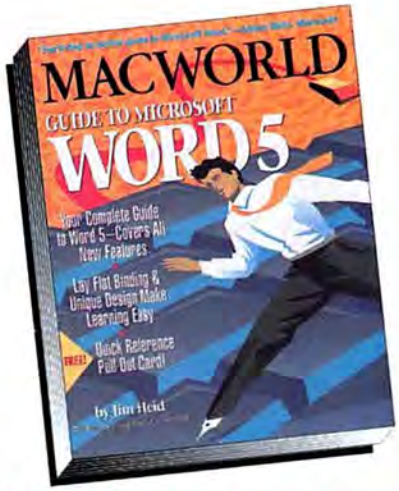
FEATURES	ALL APPLE LASERWRITERS without Accel-a-Writer	ALL APPLE LASERWRITERS with Accel-a-Writer
PostScript® Compatibility	✔	✔
True 600 x 600 dpi		✔
RISC Processor		✔
Standard 6MB RAM		✔
SCSI Connectivity	✔(Only on NTX, IIsi)	✔
Simultaneous Interfacing (AppleTalk®, serial, parallel)		✔
Dual Page Processing		✔
Advanced Memory Management		✔

Free Video Tape With Order!
"How to Install your Accel-a-Writer Fast and Easy."

© 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 119 on reader service card

Macworld Experts To Go



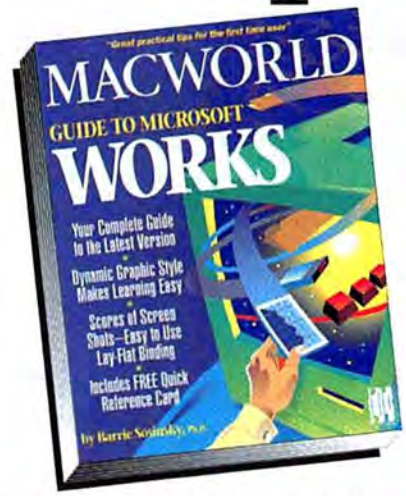
Macworld Guide to Microsoft Word 5

Jim Heid, *Macworld* magazine's "Getting Started" columnist, helps you master Microsoft Word 5 quickly and easily.

$22.95 US/$29.95 Canada, 448 pages, Available Now

Also by Jim Heid, the critically acclaimed *Macworld Complete Mac® Handbook.*

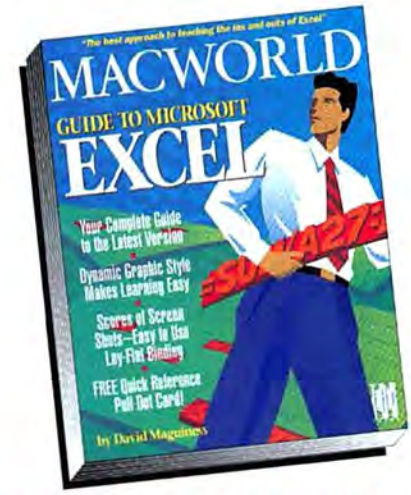
$28.95 US/$35.95 Canada, 578 pages, Available Now



Macworld Guide to Microsoft Works

Put Works to work for you with this complete guide to the latest version. Bestselling Mac author Barrie Sosinsky shows you the ins and outs of each Works module: word processing, database, spreadsheet, communications, and graphics.

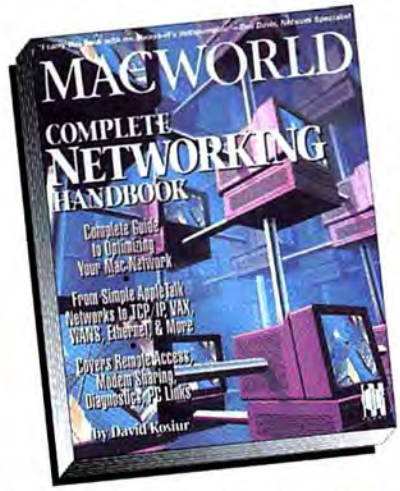
$22.95 US/$29.95 Canada, 336 pages, Available June



Macworld Guide to Microsoft Excel

David Maguiness, a bestselling computer book author who specializes in spreadsheet programs, helps you build spreadsheets fast with this indispensable guide to Excel. Step-by-step insights, tips, and tricks boost your number-crunching power instantly.

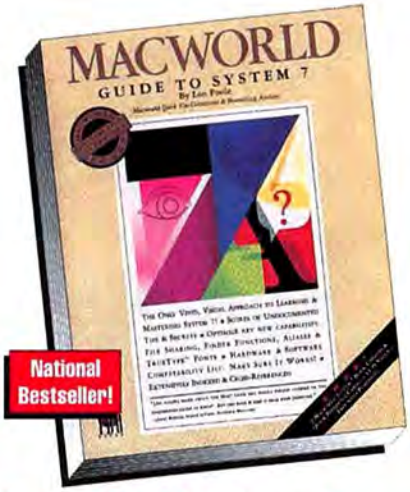
$22.95 US/$29.95 Canada, 336 pages, Available June



Macworld Networking Handbook

Networking expert and *Macworld* magazine Contributing Editor David Kosiur teaches you how to design, install, and manage AppleTalk networks in this easy-to-understand guide. Advanced sections cover more complex networking design, Ethernet, and connecting Macs to other platforms.

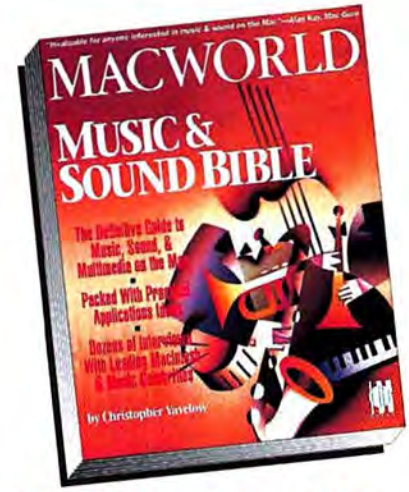
$29.95 US/$39.95 Canada, 600 pages, Available May



Macworld Guide to System 7

Optimize System 7 with this critically acclaimed guide by Lon Poole, bestselling Mac author and *Macworld* magazine's "Quick Tips" columnist. Scores of undocumented tips and secrets. Includes free Quick Reference Card and two free System 7 updates.

$24.95 US/$39.95 Canada, 384 pages, Available Now



Macworld Music & Sound Bible

Finally, the definitive guide to music, sound, and multimedia by renowned Mac music guru and *Macworld* magazine contributor Christopher Yavelow. Extensive coverage of the latest hardware, software, and techniques plus dozens of interviews with industry notables including Herbie Hancock, Craig Anderton, and more.

$37.95 US/$47.95 Canada, 1024 pgs, Available April

IDG BOOKS

Ask for Macworld Books by name at a bookstore near you. Or to order today, call 1-800-762-2974.

Macworld Books are authorized by *Macworld*—the world's leading Macintosh® magazine.

And Here's Where To Go To Find Them

Look for Official Macworld Books *nationwide* at:

B. Dalton
Barnes & Noble
Bookstop/Bookstar
Crown/SuperCrown
Encore
Software Etc.
Waldensoftware
Waldenbooks

Alaska

Book Cache
All locations

Baker and Baker Booksellers
Fairbanks

Big City Books
Juneau

Arizona

A.S.U. Bookstore
Tempe

University of Arizona Bookstore
Tucson

Northern California

A Clean Well Lighted Place
Cupertino
Larkspur
San Francisco

The Booksmith
San Francisco

Stacey's Bookstore
Cupertino
Modesto
Palo Alto
San Francisco
(2 locations)

Tower Books
Chico
Citrus Heights
Concord
Mountain View
Sacramento
(3 locations)
San Mateo

Whole Earth Access
Concord
San Francisco
San Jose
San Mateo
San Rafael

Cody's Books
Berkeley

Computer Literacy Bookshops
Cupertino
San Jose
Sunnyvale

Gayle's Books
Davis

UCD Bookstore
Davis

Stanford Bookstore
Palo Alto
Stanford

Aardvark Books
San Francisco

Franciscan Shops
San Francisco

Copperfield's Books
Santa Rosa

ASUC
Berkeley

Bookshops Santa Cruz
Santa Cruz

Booksellers
San Jose

Computer Learning Center
San Francisco

Computerware
Palo Alto

Kepler's
Menlo Park

Macadam
San Francisco

MacUniverse
Tarzan

Southern California

UCLA Bookstore
Los Angeles

USC Bookstore
Los Angeles

Opamp Technical Books
Los Angeles

Huntley Bookstore
Claremont

San Diego Technical Books
San Diego

Univ. Bookstore
San Diego

Chaucer's Bookstore
Santa Barbara

Irvine Sci-Tech Books
Irvine

UC Irvine Bookstore
Irvine

Colorado

Tattered Cover
Denver

BookTech
Denver

McKinzey-White Booksellers
Colorado Springs

Connecticut

Yale Co-Op
New Haven

Books Unlimited
Rocky Hill

U Conn Co-op
Storrs

Delaware

McMahon Books
Newark

District of Columbia

Reiter's Scientific & Professional Books
Washington

Hawaii

Honolulu Book Shops
Honolulu

Manoa Campus Bookstore
Honolulu

Illinois

Pages For All Ages
Champaign

Kroch's & Brentano's
Chicago

Univ. of Chicago Bookstore
Chicago

Readmore Bookworld
Rock Island

Bookworld III
Rockford

Book Center in Illini Union
Urbana

Dicken's Discount Books
Gurnee

Indiana

Horizon Books
Indianapolis

Book Corner
Bloomington

Book World
Mishawaka

Ball State University
Muncie

Iowa

University Bookstore
Ames

Kansas

Crossroads
Hutchinson

Maryland

Maryland Book Xchange
College Park

Massachusetts

Words Worth
Cambridge

Paperback Booksmith
Hanover
Woburn

BU Bookstore
Boston

Lauriat's
Greater New England

MIT Co-Op at Kendall
Cambridge

Quantum Books
Cambridge

Softpro
Burlington

Tatnuck Booksellers
Worcester

University of Massachusetts
Amherst

Baker Books
New Bedford

Waterstones
Boston

Michigan

Metro News Center
Birmingham
Bloomfield Hills

Book World
Grand Rapids

Little Professor Book Center
Dearborn

Young & Welshans Booksellers
Flint

Bookworm Eastbrook Mall
Grand Rapids

Stadium BookMark
Mt. Pleasant

James L. Lundberg Bookstore
Big Rapids

Fireside Bookshop
Rochester Hills

Jocundry's Books
East Lansing

Minnesota

Maverick Bookstore
Mankato

Odegard Books Saint Paul
St. Paul

Nebraska

Nebraska Bookstore
Lincoln

University Bookstore
Lincoln

New Hampshire

Dartmouth Bookstore
Hanover

New Jersey

McGraw Hill
Hightstown

Princeton Univ. Bookstore
Princeton

New York

Classic Bookshop
New York City

Coliseum Books
New York City

McGraw-Hill Bookstore
New York City

Papyrus Booksellers
New York City

Tower Books
New York City

Book Revue
Huntington

Barnes & Noble Bookstore
18th St. & 5th Ave,
New York City

Benjamin Books
New York City

GJ Books
New York City

New York University
New York City

The Paper Cutter
All Locations

North Carolina

Atticus Books
Greensboro

Ohio

Wilkies University Shoppes
Fairborn

Wit & Wisdom
Beachwood
Rocky River

Ohio State Univ.
Columbus

Books & Co.
Dayton

Wilkie's South
Dayton

MicroCenter
Columbus

Oregon

Oregon State Univ.
Corvallis

Book Mark
Eugene

University of Oregon
Eugene

Powell's Bookstore
Beaverton

Powell's Technical Bookstore
Portland

Reed College
Portland

Pennsylvania

Encore
Greater Philadelphia

Gene's Books
King of Prussia

The Book Center
Pittsburgh

Chester County Book Company
West Chester

Texas

Sam Houston Book Shop
Houston

Taylors Tech. Books
Dallas (4 locations)
Ft. Worth
Plano

J.A. Majors
Houston

Book Gallery
Lubbock

Allen Maxwell Books
Houston

Compu Books
Cedar Creek

Jeremy's Bookshelf
Houston

Majors Scientific Books
Houston

Washington

Tower Books
Bellevue
Seattle

Univ. Bookstore
Bellevue
Seattle

Elliott Bay Book
Seattle

Anderson Computer
Everett

Wisconsin

Harry W. Schwartz
Milwaukee
Brookfield

CANADA

Future Shops
Across Canada

W.H. Smith Stores
Across Canada

Classics
Across Canada

Alberta

Edmonton Computer Books
Edmonton

Westworld
All Locations

Manitoba

Tronica
All Locations

Nova Scotia

The Bookroom
Halifax

True North
Halifax

Ontario

Coles Bookstore
All Locations

World's Biggest Bookstore
Toronto

Arkon
Toronto

Canadian Software Source
All Locations

Classcom Computers
Toronto

Computerland Outlets
All Locations

Computer System Centre
Toronto

Computronix Data Center
Toronto

Elm Street Computers
Toronto

Micro Age
Peterborough

Micro Boutique
Toronto

Quebec

Adventure Electronique
All Locations

Coles 100
Montreal

Coop Concordia
Montreal

Jac & Gill
All Locations

Micro Boutique
All Locations

Micro Logique
All Locations

Microserv
All Locations

Ordinateurs
All Locations

IDG BOOKS

The World Of Computer Knowledge

IDG Books Worldwide
155 Bovet Road, Suite 610
San Mateo, CA 94402
(415) 312-0650
(800) 762-2974

Circle 19 on reader service card

The Typist Plus.

- Scans directly into word processing, spreadsheet or DTP applications.
- Available at a single touch of a button.
- Proven Caere® *Omnipage*® OCR technology from the industry leader.
- Fully integrated OCR and image scanning.
- Caere's Graphic Editor™ features advanced image processing tools.
- Caere's LaserGray™ technology for superb image output.

All other hand scanners.

- No direct input into any application.
- At least six tedious steps from scan to application input.
- Relies on third party OCR software. The result? Electronic alphabet soup.
- Zero integration of OCR and image editing software.
- Simple paint tools better suited for adding moustaches than photo retouching.
- When it comes to printing, what you see on screen is not always what you get. Not even close.

TYPIST™ PLUS GRAPHICS

Do the right thing.
Call 1-800-535-SCAN
for the dealer nearest you.

CAERE®

Caere, the Caere logo and OmniPage are ®registered trademarks of Caere Corporation. Typist, Graphic Editor and LaserGray are ™trademarks of Caere Corporation. ©1992 Caere Corporation.

Circle 73 on reader service card

Lab Notes

Accelerators: How Compatible Are They?

BY MARK HURLOW

FOR THIS YEAR'S ROUNDUP OF 68030 and 68040 accelerator boards, "The Need for Speed," Macworld Lab spent considerably more time on performance testing than for last year's batch. Aside from having many more accelerators and CPUs to test, incompatibility was the major problem. While we found a few accelerator boards to be compatible with all of our application tests, about 40 percent of the products had incompatibility problems in at least one of our testing categories, including software (such as Microsoft Word 4.0 and Excel 3.0); video boards; CPUs; and System 7 features, such as 32-bit addressing and virtual memory.

Hardware Incompatibilities

THE FIRST AND most important compatibility issue is whether an accelerator board can peacefully coexist with your hardware. For example, while Radius's multiprocessing board, the Saturn V, runs on the Mac IIfx, the Radius Rocket (on which the Saturn is based) doesn't. And although the Rocket and Impulse Technology's Performance/040 are advertised as Mac II, NuBus-based 68040 accelerators, they're not compatible with all NuBus-based CPUs. If you plan to upgrade a Mac II with either of these boards, make sure you have the Rev. B ROM set—a ROM upgrade obtainable from Apple dealers—which makes it possible to transfer 32-bit data over NuBus. The Rev. A ROM, which is incompatible with the Mac II, limits the CPU's addressing to 1MB on each NuBus slot, compared with 256MB with the Rev. B ROM. The Performance/040 also requires a Paged Memory Management Unit (PMMU) on the Mac's logic board.

Some 68040-based accelerators, including the Radius Rocket and the Performance/040, also had trouble working with some NuBus boards. We found Fusion Data Systems' TokaMac SX 25 (on the IIsi) was incompatible with the SuperMac Spectrum/24 PDQ display board; the Rocket wouldn't work with some RasterOps video-interface boards (especially the ones for 13-inch monitors); and the Truevison video board was incompatible with the Performance/040. Most video boards require a firmware revision to work with 68040 accelerators because to transfer data most video boards rely on an undocumented feature of the 68020 and 68030 processors called *byte smearing*, which the 68040 boards do not support. Make sure you check with the accelerator board vendor about hardware compatibility with your existing system.

The introduction of the Mac II made possible 32-bit addressing, which enables the CPU to access up to 1 gigabyte of RAM. However, the ROM that came with the Mac II—and subsequently the SE/30, IIx, and IIcx—is unable to access more than 8MB of physical memory. To take full advantage of 32-bit addressing on these machines requires Mode32 (available free from Connectix Corporation, Apple dealers, bulletin boards, and user groups). But not all accelerators support Mode32. For example, without RocketWare 1.3 (which should be available by the time you read this) the Radius Rocket cannot access more than 8MB on the accelerator board when installed on a Mac II, IIx, or IIcx. The TokaMac SX 25 (on the SE/30) is also incompatible with Mode32.

None of the Classic and SE accelerator boards support 32-bit addressing, since none of the compact Macs (the

continues

BETTER PRINTING ON OVER 900 PRINTERS!

GDT's printer drivers reveal the hidden capabilities of virtually any printer and make it fully compatible with your Mac.

GDT drivers have the most features; here are some of them:

- Text and graphics support along with access to multiple bins, color, internal fonts, custom paper sizes, etc. for most printers.
- Reduction and enlargement from 20% to 400% in 1% increments.
- Smooth 90° rotated text.
- Print on both sides of a page with Even/Odd pages feature.
- Smoother greyscale patterns.
- Fastest QuickDraw™ drivers you can select in the Chooser.
- Smarter and faster label and forms printing without jamming.
- Compatible with System 6 and 7, TrueType™, Adobe Type Manager™, SuperLaserSpool™, NetSerial™, etc.

PowerPrint ™

Enables Macs to print to over 850 non-Apple printers. Great for users who already have or want to use less expensive, better dot matrix, inkjet, and laser printers. Also ideal for PowerBook users who want access to high quality portable printers or just the ability to walk into any office and print to virtually any printer. PowerPrint comes complete with a high speed, easy to use cable.

BetterWriters™

Dramatically improves printing speed and provides LaserWriter-like features for serial Apple ImageWriter® I, II, and LQ.

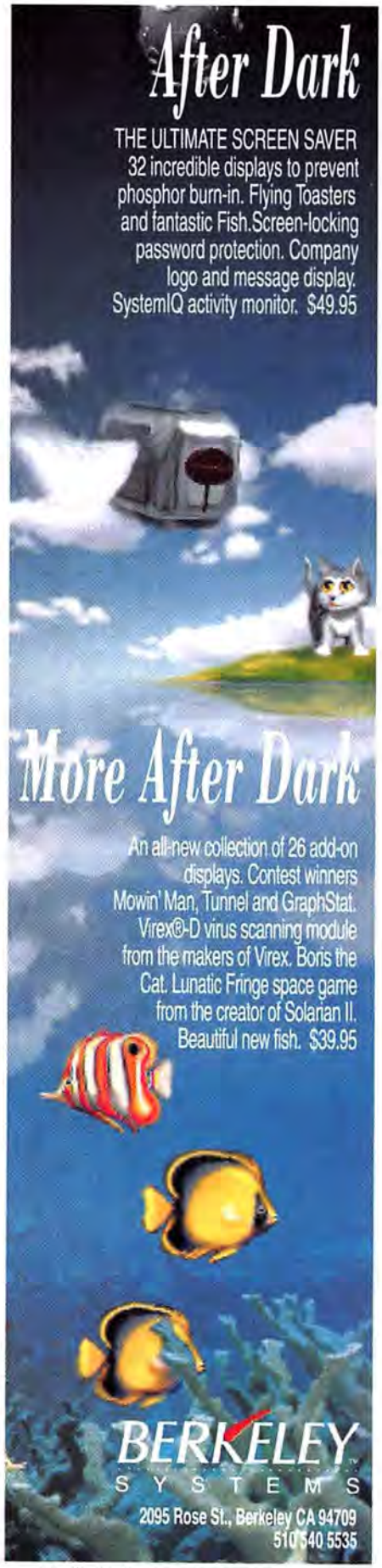
Also provides powerful enhancements for StyleWriter™ and DeskWriter™ users.

GDT Softworks Inc.

4664 Lougheed Highway, Suite #188
Burnaby, BC Canada V5C 6B7
604-291-9121 604-291-9689 (fax)
800-663-6222 (orders) AppleLink:GDT.MKT

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

Circle 42 on reader service card



Circle 218 on reader service card

512K, Plus, SE, and Classic) have 32-bit-clean ROMs to start with. To enable these 68000-based compact Macs to work with 32-bit addressing would require a major revision of the ROM, not a simple task.

To break the 4MB limit of the 68000-based machines—the Plus, the SE, and the Classic—some accelerator vendors are shipping their compact Mac 030 accelerator boards with Connectix's Compact Virtual. If you need to access more than 4MB of RAM on a 68000-based compact Mac, get an accelerator board that supports Compact Virtual 3.0, which should be released by the time you read this. Like System 7's virtual memory, Compact Virtual enables a CPU to use a SCSI storage device (such as a hard drive) as an extension of physical RAM. But unlike System 7's virtual memory (VM), Compact Virtual allows you to access up to 16MB of physical RAM from the accelerator board itself.

Due to ROM limitations, System 7's VM will not run on a 68000-based compact Mac, not even one equipped with a PMMU chip. The beta version of Compact Virtual 3.0 that we examined lets an accelerator board access up to 16MB of virtual or physical memory on a compact Mac and includes some nice features not provided by Apple's VM, such as Disk Saver and RAM Disk. Disk Saver is a disk-partitioning scheme that's more efficient than System 7's VM. For example, if you have an 8MB CPU and need to access 10MB, with Disk Saver you need to allocate only 2MB of disk space of VM; System 7's VM requires 10MB of disk space. RAM Disk shortens access time by using physical RAM as disk storage. Because it's nonvolatile, it will survive a restart.

Although our tests showed that Dove Computer's MaraThon Racer 030, DayStar Digital's PowerCache, and other 68030-based accelerators for modular Macs had no trouble running System 7's VM, the 040-based boards don't support it at all. Some vendors are trying to get virtual memory to run on their 040 accelerators. Impulse, for example, is talking with Connectix about creating a version of Virtual that will be compatible with the Impulse board. Fusion Data, meanwhile, promises virtual memory support in the near future, either by reengineering some of the board's start-up routine or through Virtual. Taking a different approach, Radius recommends its users purchase more RAM, since virtual memory is considerably slower than real memory.

A word of caution: If you think you'll need virtual memory, don't buy an accelerator with a 68EC030 or 68EC040 processor; these lack the PMMU required to run virtual memory.

While 030-based accelerators for modular Macs have no trouble running A/UX, Apple's implementation of the Unix operating system, 040 boards don't support A/UX at all. Fusion Data Systems is currently working with Apple A/UX engineers to determine the feasibility of running its PDS-based 040 accelerator boards with a Quadra-compatible version of A/UX, but neither Radius nor Impulse Technology has any plans to support A/UX in the near future. Because A/UX, like virtual memory, requires complete control of the 68040 processor's Memory Management Unit, and each of these NuBus-based boards implements its own memory management for its on-board memory with the 68040's MMU, supporting a radically different operating system would mean having to rewrite a lot of memory-management routines.

Software Incompatibilities

IN ADDITION TO HARDWARE AND SYSTEM incompatibilities, many accelerators had trouble running with certain applications. Some applications, like Excel 3.0, were incompatible with a few 68030-based accelerator boards. Others, like Word 4.0 and PageMaker 4.01, were unable to run with 68040 accelerators. Still other applications, like 4th Dimension, failed only on specific boards—in this case, the Impulse Performance/040.

The most common problem we found specific to 68030 boards was with Microsoft Excel running under System 7.0.1. At first we suspected the culprit was the SANE trap, which intercepts SANE calculations, translates them into floating-point calculations, and diverts these floating-point calculation instructions to the 68882 floating-point unit, or FPU (SANE, or Standard Apple Numerics Environment, is an extension to the Mac Operating System). However, the problem turned out to be HWPriv (Hardware Privilege), a system trap Excel 3.0 uses that Apple changed in System 7.0.1. This problem exists only on compact Macs that have an 020 or an 030 accelerator, and most vendors already have patches for it.

Another Microsoft product, Word 4.0, had compatibility problems, but only on 040-based accelerators. To run Word 4.0, you need to turn off the accelerator (through a control panel). To take full advantage of 040 processing power, you can upgrade to Word 5.0 or get Word 4.0e, the free maintenance version of 4.0.

Another problem was that most 040 accelerators couldn't open PageMaker 4.01 in copy-back mode, an instruction and data-caching scheme in which information written to the cache is updated in main memory only when there is a spe-

continues

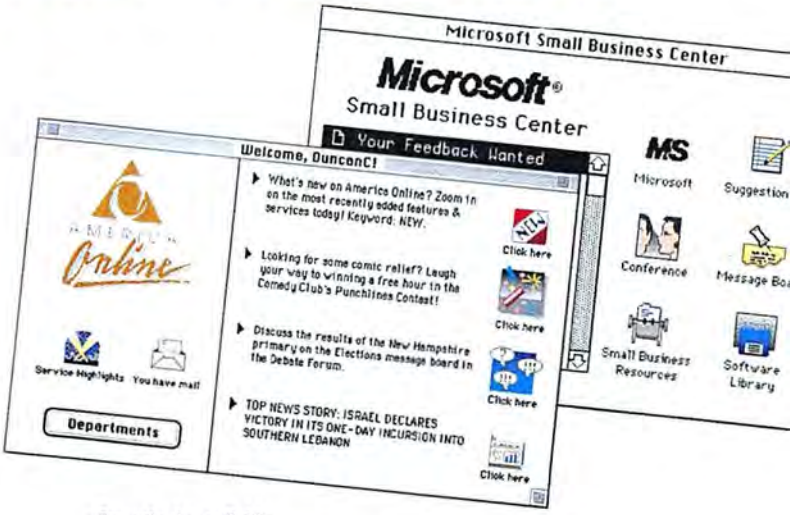
SERIOUS ABOUT COMPUTING? TRY AMERICA'S MOST EXCITING ONLINE SERVICE—FOR FREE!

AMERICA ONLINE UNLOCKS THE FULL POWER OF YOUR MAC®.

America Online is everything an online service was meant to be.

Need software? Download from a selection of more than 25,000 programs, all carefully reviewed for quality and thoroughly described. Finding exactly the software you need has never been easier, or more reliable.

Need advice? Get fast answers from Microsoft, Claris, and 75 other Macintosh® hardware and software developers. Scan for objective reviews on thousands of computing products. Participate in live conferences and message boards specializing in games, graphics, educational programs, utility programs, business and productivity applications, and much more. It's like having your own consultant on call, 24 hours a day.



See what's available, and get there, with just a point and a click.

NO OTHER ONLINE SERVICE IS EASIER TO USE.

The familiar Macintosh interface lets anyone—novice or pro—discover America Online's many services with a point and a click. There are no puzzling prompts or commands to get in the way.

Get resume advice and career counseling. Manage your investments. Get homework help for the kids and use a searchable, up-to-date encyclopedia. Get the latest news and weather. Join special interest groups and clubs. Save time and money shopping. Find and book the lowest airfares. Entertain yourself with multi-player games, quizzes, movie and book reviews, horoscopes, soap opera news, and much more.

Download from a selection of more than 25,000 programs and files!

WE'RE SERIOUS ABOUT THIS SPECIAL FREE OFFER!

Return this coupon for all the software you need to start using America Online—for free! We're so sure you'll love America Online, we'll even give you free software, and a free trial membership to try the service. Order today!

HURRY! RESPOND BY 7/31/92!

FREE TRIAL! FREE SOFTWARE!

☐ YES! 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

( )
HOME PHONE

You must have ☐ a Mac Plus or higher; and ☐ a modem to use America Online.

5806/Mac

How Many of These America Online Services Could You Use—Right Now?

- ☐ Stock Quotes and Portfolio Management
- ☐ 25,000 Software Files and Programs
- ☐ Fast, Easy Downloading
- ☐ Searchable Online Encyclopedia
- ☐ Powerful Electronic, Fax, and U.S. Mail Capabilities
- ☐ Microsoft® Small Business Center
- ☐ Support from more than 75 Leading Macintosh Software and Hardware Developers

- ☐ Access to Computer Industry Experts
- ☐ Special Interest Groups and Clubs
- ☐ Graphic Windowing Interface
- ☐ Nightly Event Programming
- ☐ Homework Help and Tutoring Sessions

Mail this coupon in today for your FREE trial of America Online!

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL
FIRST-CLASS MAIL PERMIT NO. 8567 VIENNA, VA

POSTAGE WILL BE PAID BY ADDRESSEE

America Online®
8619 Westwood Center Drive
Vienna, VA 22182-9806

Hurry! Respond By 7/31/92!

Free Trial! Free Software!

☐ YES! 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

( )
HOME PHONE

You must have ☐ a Mac Plus or higher; and ☐ a modem to use America Online.

Clip and mail to:
America Online
8619 Westwood Center Drive
Vienna, VA 22182

America Online is a registered service mark of America Online, Inc.
Macintosh and Mac are registered trademarks of Apple Computer Inc.
Microsoft is a registered trademark of Microsoft Corporation.

5806/Mac

cific instruction to do so. This can be avoided by removing most of the PageMaker filters from the System Folder. PageMaker 4.2, an $85 update, eliminates this problem.

A number of vendors we contacted told us that most 040-based accelerators have trouble with multisegmented cdevs (control panels in System 7), INITs, DAs, and filters compiled with older versions of Think C and Think Pascal, which used 68020/68030-specific instructions. Most software compiled with the older version of either Think C or Think Pascal should have updated versions available by now.

A few applications failed to run properly on only the Impulse Performance/040. We had to turn off copy-back mode to run 4th Dimension with the Impulse. The board's software reports the board as an 030, which makes 4D run under write-through mode, a scheme that runs more slowly than copy-back. Meanwhile the 040 board is running under copy-back mode. This mismatch causes 4D to quit. Other problems specific to the Performance/040 board include failure to perform calculations in Mathematica and freezing when quitting from MacDraw Pro. Impulse should have released a bug fix by the time you read this.

According to most of the accelerator vendors we contacted, many sound programs (such as SoundEdit) that avoid the Sound Manager by writing directly to the Mac's sound chip are likely to be incompatible with most 030 and 040 boards. Games with copy-protection schemes (which include self-modifying code) don't work with an 030 or 040 accelerator because the board's instruction cache prevents the modified code from being updated in RAM. Games that directly access logic board hardware, such as the video frame buffer or the sound chip, won't work either. Also, games that make assumptions about the environment of the CPU (for instance, assuming that if a 68030 is present it should have Color QuickDraw) might also fail.

Compatibility issues have existed since the introduction of the Mac II, and accelerators will continue to have such problems whenever they encounter new system software or new applications. While most accelerator vendors try to solve incompatibility problems, you can't expect them to find—or be able to solve—them all. So before you spend your hard-earned money (or your boss's smart-earned money) on an accelerator, you should first try out the board with your favorite applications, screen savers, and games to see if they run. If you can't do that, call the accelerator board vendor and ask for a compatibility list. **m**

Impressive any way you look at it.

Our Still Video Imaging Kits let you convert objects into digitized images, ready for use on Mac, PC and Windows programs like PageMaker,™ Ventura,™ Photoshop,™ Persuasion,™ MediaMaker™ and HyperCard.™

Impressed? Call 1-800-221-3333 ext. 313 for dealer locations and a free brochure.

Canon
STILL VIDEO

© 1991 Canon U.S.A., Inc.
One Canon Plaza, Lake Success, NY 11042

Brand and Product names are trademarks of their respective holders.

Circle 164 on reader service card

TIGERSOFTWARE

YOUR SOURCE FOR QUALITY MACINTOSH SOFTWARE AND PERIPHERALS

Call 1-800-666-2562, Mon.-Fri. 8AM-10PM, Sat. 8:30 AM-8:00PM & Sun. 11AM-5PM (EST). Or, use our 24-hour fax line: (305) 444-5010. Federal Express shipping just $3.00. A "7" symbol in the price box designates System 7 compatibility. Call for complete compatibility details.

© 1992 TigerSoftware, 800 Douglas Entrance, Suite 765, Coral Gables, Florida 33134

Thunderous Color!

REVIEWER'S NOTEBOOK: *The advanced new line of NEC monitors is designed specifically for Macintosh users. They are magnificent, introducing flat-square screen, razor sharp resolution and rich color to the world. Faster, brighter screens are a must — without loss of focus. These features are available today from the NEC team of display researchers. The FG Series of monitors are packed with features, enclosed in a sleek cabinet that actually gives you more image area than conventional monitors. Each pixel is defined with unmatched clarity and saturated with color. No wash-out, no blur. The amazing new 4FG provides microprocessor-controlled, digital color. The on-board AccuColor system allows you to match PANTONE and Trumatch colors on screen!*

An affordable technological leap? The NEC FG displays are actually less than any of the other pricey nameplates, and deliver more quality, advanced design and performance. How can you possibly beat that? Destined to become "Product of the Year."

The NEC MultiSync 3FGx. The designers and engineers went crazy on this one, packing unparalleled features and performance into this amazing new monitor. Like the new NEC FullScan capabilities and larger screen sizes, where you can see up to 36% more active screen display — without distortion. Its 15" screen is flat, and provides a high refresh rate. That means crisper images, brighter colors, richer tones and more contrast. You'll notice the difference immediately when looking at your desktop! In fact, the 3FGx has been fine tuned for flicker-free images demanded by end users.

The new flat-square screen design also enhances the display of single-pixel fonts on your Mac, so even your type will look better.

The NEC MultiSync 4FG. The 4FG revolutionizes monitors in one very important area: color accuracy. This new standard in video excellence is based on the concept of multiple-frequency engineering. And only NEC can do it. The award-winning 4FG is a 15" flat-square screen, digitally controlled monitor that features AccuColor. This revolution allows you to adjust colors to your preferences, or to match your printer's capabilities — even match Pantone and Trumatch colors! Like the 3FGx, the 4FG provides crisp images — 36% larger than conventional 14" monitors!

NEC MONITORS

BBP2708	**NEC MultiSync 2A** 13" w/Mac Connector Cable	$395.00
BBP2709	**NEC MultiSync 3FGx** 15" w/Mac Connector Cable	$660.00
BBP2710	**NEC MultiSync 4FG** 15" w/Mac Connector Cable	$780.00
BBP8515A	**NEC MultiSync 5D** 20"	$1899.00
BBP8516	**NEC MultiSync 5FG** 17"	$1489.00
BBP8517	**NEC MultiSync 6FG** 21"	$3109.00
BBP2715	**MacFG 8X Color Display Interface Card**	$799.00
BBP2716	**MacFG 24X Color Display Interface Card**	$1599.00

Sorry, no returns on these items. Shipping charges billed actual cost.

Just Released! The NEC Silentwriter 95 PostScript Power Made Perfect!

The laser-printed page just got a new standard: The NEC Silentwriter Model 95. The new Silentwriter 95 features advanced Sharp Edge technology, for exceptionally black images, without jagged edges. The secret is in the Microfine toner, that can be evenly spread across the entire image or text character. Microfine toner means consistent, pro-quality results for every page.

It's a speedster — the advanced controller benchmark tests at 68000 @ 16.7 Mhz — delivering 6 pages per minute with full support for PostScript Level 2 and Hewlett-Packard LaserJet III. Supports parallel, serial and Appletalk — with on-board intelligent switching. There's 2Mb of memory, expandable to 5Mb, 35 built-in Adobe fonts and 14 bitmapped and 8 scalable HP fonts. The Silentwriter includes 2 HP-compatible font slots for additional HP font cartridges.

Our tests matched features of the Silentwriter 95, the QMS 410 and the HP LaserJet III: PostScript standard, HP LaserJet emulation, Apple interface availability, number of hot ports, edge enhancement, fax upgradability and feeder features. The results? Surprising. The NEC Silentwriter 95 is over $500 less than the LaserJet III, $700 less than the Apple LaserWriterNT and over $1000 less than the QMS 410! Amazing! The Silentwriter 95 gives you more advanced technology, higher quality materials and workmanship — for up to $1000 less than the competition. We even dragged in an HP IIIP for Mac, a Texas Instruments Turbo and an Epson 7500 to battle feature for feature with the Silentwriter 95, but they proved to be no match.

The Silentwriter 95 is PostScript Level 2, with full HP III (PCL 5) emulation. Imagine, you can print PostScript and PCL — the Silentwriter 95 automatically switches emulations for you. One printer can handle your PCs and Macs. It's all here, built right in to the Silentwriter 95. We weren't able to find this combination of features anywhere else at any price. Full-featured PostScript laser technology at an affordable price! The print quality is absolutely perfect. Documents look typeset with the Silentwriter's Sharp Edge technology and Microfine toner.

NEC SILENTWRITER

BBP8522	**NEC Silentwriter Model 95**	$1545.00

Sorry, no returns on these items. Shipping charges billed actual cost.

HOW TO PLACE AN ORDER

- **Ordering:** Just call **1-800-666-2562** Monday-Friday 8:00 AM - 12:00 PM, Saturday 8:30 AM - 8:00 PM and Sunday 11:00 AM - 5:00 PM (eastern) and one of our representatives will be happy to take your order. Your order will be promptly processed.
- **Fax Orders:** For faster service, FAX your order form or P.O. to us on our TigerSoftware ExpressFAX Order Line — **(305) 444-5010.**
- **How to Pay:** Pay for your purchases with VISA, MasterCard, American Express, Discover Card, by check (personal checks held 10 days) or money order. We DO NOT charge your account UNTIL WE SHIP THE SOFTWARE! We accept purchase orders from Fortune 500 companies, educational, and government institutions (net 15 days).
- **Risk-Free Return Guarantee:** We proudly stand behind every product we sell with our ironclad, 30-day return guarantee. If for any reason, you're not 100% delighted with the product, just return it within 30 days. We only ask that you return ALL material in new, resalable condition (packing materials, registration cards, etc.) and the original invoice. We will then immediately exchange the program or issue a TigerSoftware credit, less shipping costs, for any future TigerSoftware purchase.
- **Customer Service:** If you order your new software product by 3:00 p.m. e.s.t., then Federal Express picks it up the same day for immediate shipment to you. If for any reason you are unhappy with your new software, simply call our Customer Service Department for a Return Authorization Number, and return it to us freight prepaid. We will gladly exchange it for any other product in our huge inventory.

LOWEST PRICES GUARANTEED!

We will match current, published prices on identical offers. ALL PRICES ARE SUBJECT TO CHANGE.

TigerSoftware is a registered trademark of TigerSoftware, Inc. This entire catalog, copy and unique method of showcasing products is copyright 1989, 1990, 1991 TigerSoftware, Inc. All trademarks appearing herein are acknowledged.

THE MAC PROS

PULVERIZING HIGH PRICES — DELIVERING EXCEPTIONAL VALUE.
Speak to fully trained Macintosh Professionals — Over 100 Years Combined Experience!
Over 11,000 products available! If it's not here, call us — we'll get it and ship it!
DON'T PAY ANYONE ELSE'S LISTED PRICE! CALL US AND WE'LL BEAT IT!

READ THIS BEFORE YOU BUY A CD-ROM FROM ANYONE ELSE!

You Get All This: CDR-36 or 73, Interface, 15 CDs and Stereo Speakers.

A NOTE FROM THE PRESIDENT OF TIGER-SOFTWARE: Frankly, I'm a little upset by the whole CD-ROM market right now. My competitors are selling CD-ROM readers for $20 less than I am. BUT — they shouldn't be! Although my price is $20 higher, I'm including over $1400 in FREE CD-ROM software! Look at their ads: you'll see The NEC CD Gallery advertised for $20 less — with 7 free CDs. For $20 more, I'll throw in the same 7 CDs—PLUS 8 FREE ADDITIONAL CDs: The popular CIA FactBook, The Orient, Learn To Speak Spanish, TimeTable of Science & Innovation, Sherlock Holmes, U.S. History, Family Doctor and Clip Art 3-D! That's over $1400 in FREE CDs for just $20 more! Don't be bamboozled by their lower price — you know that it's value that counts!

This one box is your ticket to the incredible world of CD-ROM. Everything you need to get started is inside — including seven of the hottest CD-ROM software titles in the industry. Your Koss SA/30 amplified stereo speakers pump out the sound as you explore full-interactive, multimedia computing. A complete package, perfect for home and business.

Hundreds of thousands of diskettes' worth of information, fun and productivity are packed onto just 8 speedy CD-ROMs! They include the amazing, full-length encyclopedia, complete with enhanced sound; a comprehensive world atlas, presented in full-color; the entertaining Cosmic Osmo; complete coverage of Operation Desert Storm with photos, sound and more; Ludwig Van Beethoven Symphony No. 9; the classic fairy tale, Cinderella in English and Spanish; and The Time Table of History. Without a doubt, it's the perfect introduction to CD-ROM, with everything included!

Desert Storm: The War in the Persian Gulf chronicles the war and the events that precipitated it, providing news reports, eyewitness accounts, photos, sound recordings, detailed maps and interviews.

The New Grolier Electronic Encyclopedia covers hundreds of topics in great detail. Many entries contain enhanced sound and vibrant color. It is the premier CD-ROM encyclopedia. 33,000 articles, 1,500 color graphics, numerous maps and stereo sound make learning exciting.

Switch to Ludwig Van Beethoven Symphony No. 9 and explore the entire work, as well as its historical setting... all while listening to the music itself.

Or, slip in the Time Table of History: Science and Innovations. More than 6,000 interrelated entries show the chronology of historical, scientific and technological events from the beginning of time to the present day.

From there, explore the earth's geography with The Toolworks World Atlas. This package contains the most extensive collection of full-color maps you'll find anywhere. There's also plenty of data about each country and region: population, industry and more.

For a little fun, try Cosmic Osmo — winner of the 1990 *MacUser* award for "Best Recreational Program." This fascinating adventure game follows Cosmic Osmo to the Worlds Beyond the Mackerel.

NEC CD GALLERY ⑦

BBP8372 **CD Gallery w/CDR-73 Reader** **$745.00**
BBP8336 **CD Gallery w/CDR-36** **$599.00**
FREE Clip Art 3-D with CDR-36 or 73 Gallery Pack!
Mac Plus, SE, SE/30, Classic, LC or II Series; minimum 2 MB RAM; hard drive with at least 10 MB available space; System 6.05 or above; Hypercard 2.0 required for Time Table and Ludwig Van Beethoven's Symphony No. 9.
$25.00 shipping charge on this item. *Call for more CD-ROM titles.*

The Finest Removable Hard Drives Made.

REVIEWER'S NOTEBOOK: *Highly acclaimed, 100% reliable and backed by a solid warranty, the PLI line of removable cartridge drives is the most respected in the industry. When your files and applications grow to monumental size, when you want to perform fast backups or when you want to take heavy megabytes on the road, nothing gives you the unlimited capabilities of the PLI Infinity 40 and 88mb drives. The PLI Cartridges carry a full 5-year warranty. Includes PLI's famous TurboWare utilities. One other note: The PLI drives and cartridges are thoroughly tested, far exceeding industry standards, so when you install a PLI, you're ready to go — with uninterrupted performance.*

With much of the design and layout work done at TigerSoftware on Macs, our PLI cartridge drives are critical to a smooth operation. Without their reliable service and unmatched speed, getting our hands on files would be nearly impossible. Our choice: the PLI Infinity 88 Turbo drive. This remarkable instrument carries a 60,000 hour MTBF rating. It features the highest level of filtration, quality-engineered circuitry and is virtually impossible to damage by incorrect cartridge insertion (one of the leading causes of drive failure). Designed and engineered for rugged use, the PLI Infinity 88 Turbo has the industry's highest tolerance to non-operating shock (our 88 Turbo once survived a four-foot fall onto a tile floor). The 88 Turbo also includes PLI's TurboCache, a disk drive accelerator program that dramatically increases the speed of all of your SCSI drives. TurboCache uses system memory to create the cache, boosting data throughput by a whopping 50% for many applications. Of course, you'll get all the features that have made PLI the name asked for most when it comes to removable cartridge drives including external switches for termination and SCSI address, UL-approved, individually tested power supplies, long-life 50-pin Centronics SCSI connectors, an external fuse and (unlike other drives) you get the complete kit, with all necessary cables and accessories. The Infinity 88 Turbo beats Bernoulli hands down when it comes to price, performance and value.

Another PLI advantage: your Infinity removable cartridge drive comes complete with useful, easy-to-use software hand-picked by the experts at the renowned Berkeley Macintosh User's Group — over 15 megabytes! It also includes PLI's own TurboCache and TurboOptimizer software, with a combined retail value of $200.00. These tools add to the performance and flexibility of your Infinity 88 Turbo system. And only PLI provides them.

PLI conducts 24-hour drive burn in, component level testing, self-diagnostic routines and a slew of other tests, many of which are proprietary to PLI.

PLI DRIVES & CARTRIDGES

BBP2460A **Infinity 88mb Removable Single External Drive** **$845.00**
BBP2460B **Infinity 40mb Removable Single External Drive** **$645.00**
BBP2465A **88mb Cartridge** (Unform., 1-yr. war.) . **$139.00**
BBP2465B **44mb Cartridge** (Unform., 1-yr. war.) . **$79.00**
BBP2465C **88mb Cartridge** (Format., 5-yr. war.) . . **$149.00**
BBP2465D **44mb Cartridge** (Format., 5-yr. war.) . . **$95.00**

Enhance And Modify Your Fonts With Amazing Results!

REVIEWER'S NOTEBOOK: *Now anyone can get typographic-quality effects and enhancements using their existing type, with FontMonger, the super fast, simple-to-use type customizer. Modify a wide range of your type's characteristics, including the ability to merge individual characters to create custom faces. Modify existing typefaces into all small caps and use characters you've never been able to access before.*

This easy-to-use utility can save you hundreds (or even thousands) of dollars by converting PostScript Type 1 (for use in Adobe Type Manager) and Type 3 fonts to the advanced new TrueType format.

Here's another fascinating FontMonger capability: you can actually merge characters from several font families, to create unique small caps, composite characters, customized faces and logotypes.

Combine typefaces, remap keyboard characters or convert between type formats.

FontMonger also offers support of Adobe Illustrator and Aldus Freehand files. You can create or modify characters within programs and build these modified characters back into a font. It's fast, easy and very handy when using multiple programs. FontMonger's type modification tools provide a vast assortment of intriguing capabilities including: access to unencoded characters, creation of oblique characters, generation of superscript and subscript characters along with generation of slash and bar fractions (some of which have been previously hidden, others you probably never knew you had).

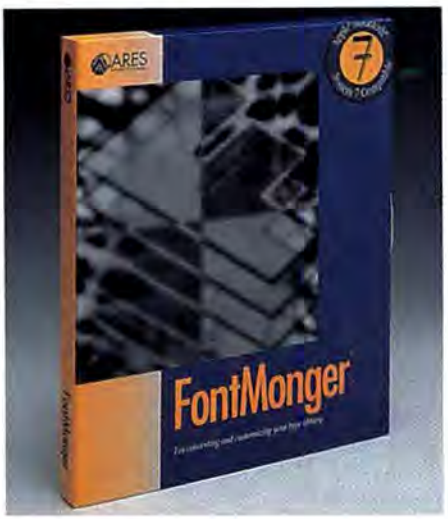
Using FontMonger, you can convert fonts one face at a time, as you need them, or in batches so your entire library is at your service. Just one step converts the batch. In addition, you can control the character widths of your fonts (the space between characters) the horizontal and vertical scaling, the slant and character width.

Outline Fonts. Outline fonts that describe the lines and curves which make up their characters. They can be used to draw characters at any size on any screen or printer. With the arrival of Adobe Type Manager (ATM) and Apple's System 7.0, you can now use outline fonts throughout your Macintosh system. Fonts you use this way must be in PostScript Type 1 format for ATM, and in TrueType format for System 7.0.

TrueType. The TrueType font format was developed by Apple for System 7.0. The format has been adopted by Microsoft for use with Windows.

Type 1. Before 1990, only Adobe could produce fonts in PostScript Type 1 format, so if you wanted to use ATM you had to buy Adobe fonts. Now, the Type 1 font specifications are publicly available, and you can buy Type 1 fonts from many vendors.

Type 3. Until the Type 1 format was made public, non-Adobe PostScript fonts were in the less-capable Type 3 format. Type 3 fonts are usually slower to print, produce lower-quality results and do not work with ATM. You may never need to convert any fonts to Type 3 format with FontMonger (although you can). Instead, you will probably want to convert Type 3 fonts to Type 1 and TrueType formats.



ARES FONTMONGER
BBP2415 **FontMonger** $59.95
Requires Macintosh Plus or newer; 1 MB of memory; two floppy drives or a hard disk; System 6.0.2 or later.

Upgrade Or Switch to Publish-It! Easy 2.1 For Only $99.

REVIEWER'S NOTEBOOK: *If you're about to enter the world of Macintosh desktop publishing, or if you're an experienced user who wants fast, pro-quality results without dredging through hundred-page-manuals, Publish-It! Easy is the award-winning, System-7 Savvy product that MacWorld magazine calls "...the Swiss Army Knife of desktop publishers". Now for a limited time, you'll be able to switch or upgrade to this 4-and-a-half mice rated package for only $99 — if you currently own a desktop publisher or word processing program. This is a $150 savings off the suggested retail price of $249.95. Simply send us the title page of the DTP or word processing manual you are currently using, and you'll own Publish-It! Easy Version 2.1 for only $99. Publish-It! Easy is also available in the new Corporate Network File Server Version.*

The printed page. It can be an adversary or a joy. If you've got new Publish-It! Easy loaded on your Mac, you'll enjoy the process of laying out a page — and produce handsome newsletters, brochures, catalogs, reports, bulletins, advertisements, flyers, coupons and more! With the toolbox of advanced, easy-to-use features such as The Slide Show (complete with dozens of features and effects, outperforming some stand alone packages!), instant thumbnails (view and edit up to 100 pages), built-in database and mail merge, spell checker and thesaurus, your ideas will look extraordinary on paper as well as on-screen. Draw, paint, edit text, add graphics instantly and use a host of other state-of-the-art publishing tools with sleek controls. In fact, this one program eliminates the need and expense of having separate drawing, painting, word processing mail merge and presentation software — that's how incredibly full featured this package is! And don't worry — Publish-It! Easy doesn't punish you for mistakes or experimentation — it provides 5 levels of Undo to get you right back to the beginning, so you can explore other creative avenues. Print your quality pages on any Chooser-selectable printer.

PUBLISH-IT! EASY 2.1
BBP2712 **Publish-It! Easy 2.1 (Upgrade or Switch Offer)** $99.00
BBP2470 **Publish-It! Easy 2.1** . . $135.95
BBP2720 **Publish-It! Easy 2.5** Promotional Pack (One Network Filer Server, One-Node Lan Pack, plus another One-Node Lan Pack FREE) . . . $399.00
Any Macintosh running System 6.0 or later with 1MB RAM.

Advanced Grayscale Image Enhancement.

If you've got a scanner, this product is for you. A professional-quality image manipulation product with scores of tools, filters, masks, retouching features and more. Supports TIFF, PICT and EPS. Features a customizable tool palette, advanced magnification features and input/output device calibration for best-possible reproduction. It is a true second-generation grayscale image enhancer, so you have complete control of your scanned images, not just two or three options. Create images that you simply couldn't before — clean, crisp halftones from imperfect originals. Grab just parts of a photograph, create a montage, filter images for reproduction with higher quality than you've ever seen before. In use today by graphic designers, scientists, publishers and professional retouchers.

ENHANCE
BBP2447 **ENHANCE** $230.00
Macintosh SE30, LC or Macintosh II family of computers with 2 MB RAM; 8 bit color video card with gray scale or color monitor recommended.

Create Full 3-D, Photorealistic Images!

MacRenderMan and Showplace (bundled together in this offer) represent the finest software available for 3-D image creation, viewing and manipulation. MacRenderMan allows you to create incredibly realistic images, while Showplace allows you to import those images and create scenes, with complete control of lighting, texture, backgrounds, vantage points and dozens of other effects. Altogether amazing, surprisingly easy and fast. In fact, RenderMan was used in creating the academy award winning film, Tin Toy. Impressive results can be achieved in a short time, but if you get the urge, you can get crazy with these products and never be seen or heard from again...

ALSO AVAILABLE IN CD-ROM VERSION
MacRenderMan and Showplace applications, complete online documentation for both products, a gallery of images created with Pixar products and a sample of Pixar animation all on one CD-ROM!

MACRENDERMAN & SHOWPLACE
BBP2410 Showplace & MacRenderMan Bundle $595.00
BBP2411 Showplace & MacRenderMan CD . . $315.00
Please call for system requirements.

The Art Of The SCAN

REVIEWER'S NOTEBOOK: *The Logitech series of advanced mice and scanners has won acclaim from the press — and thousands of loyal users. No other manufacturer engineers so much precision and innovation into their products. From an incredibly sharp hand scanner, to the all new breed of "programmable" mice, they're a pleasure to work with. We put the ScanMan 32 hand scanner through it's paces, performing over 50 scans of various black and white images — photos, line art, logos, type, illustrations — even poor-quality photos. The ScanMan 32 features 32 gray scale performance, with adjustable scanning resolutions from 100 dpi for quick scans; up to 400 dpi for magnificent finished images. Use scanned images in word processors, multi-media, desktop publishing, HyperCard, OCR and more. Hold a Logitech device in your hand and you'll notice the superior craftsmanship, the precise movement of the rollers and the extra large scanning window so you can see as you scan. Scan instead of re-keying data: capture text (with OCR software) with crisp, clean results.*

The Science of Scanning. Logitech technology destroys the old barriers of scanning, increasing the speed and accuracy of anything you scan. Superior image quality, with the ability to produce halftones for reproduction. The set of output controls provide the best possible results on any printer or monitor screen. Its 4" wide scanning area allows full-page scans with just two quick passes.

And Logitech's rugged construction and precision roller system allows straight, unwaivering scans. No curving, no skipping. The scanning speed indicator controls the movement for perfect scans every time. There are three settings for scanning photos and another for scanning line art. Its shape is perfect, its weight and components distributed equally for balance. All of which makes getting an image from paper—into your Mac, simple and easy.

The ScanMan 32 gives you a free set of software editing tools, including a 32 gray scale palette for detailed retouching. There's also a handy dimension box and tear off tool palette; use them alone or incorporate them as a desk accessory. Pop up real-time brightness and contrast controls, refine images with amazing flexibility, rotate, flop and invert images. Save your scans in a variety of formats, including MacPaint, TIFF and PICT).

Here's What You Get: The ScanMan 32 contains everything you need. The Model 32 Gray Scale scanner, SCSI interface box and cable, power supply adaptor, ScanMan software, version 2.0, CatchWord Pro OCR software and complete user guide. Fast, easy, compatible — and powerful — the ScanMan 32 is a superior hand scanner.

Actual unretouched scan.

Included with ScanMan 32 — CATCHWORD PRO: Powerful Optical Character Recognition (OCR) software that allows you to capture printed, hard-copy data by scanning it, rather than typing it. But, without quality software and a high quality scanner (like the ScanMan 32), scanning text won't work properly. "Dirty" scans produce unwanted characters and commands, requiring enormous cleanup — creating more work than rekeying.

CatchWord Pro delivers an amazing 99% accuracy in OCR testing, used in tandem with the ScanMan 32. CatchWord Pro is compatible with popular word processors, spreadsheets, databases and desktop publishers — so you can scan information directly into your application and use it immediately! Different typestyles and sizes are no problem, any printed characters, in any size of typestyle are instantly recognized. It will even automatically convert two scans into one, full-page image.

What about larger, memory-intensive photos and pages packed with small type — don't they slow my system to a crawl? The answer is "no" and only Logitech can say that. While other scanners are notorious for system slowdown, all of your ScanMan 32 scans zip along with Logitech's ingenious memory management features that automatically swap image data between your system's RAM and hard disk.

The instrument itself is a masterpiece. From the genius of the respected industrial design firm, Frogdesign — also responsible for the new line of NEC monitors and other distinctive hardware products, the ScanMan 32 is different from the ground up. First, you'll notice that it's heavier, with precision rollers that provide more "grip" along with a superior guidance system for light-touch control. All of which means you can scan quickly and accurately — once — and capture the image perfectly. While many other hand scanners rely on you to move in a straight line as you scan, the ScanMan 32 provides fully balanced, direct movement.

Using the ScanMan 32, you can create instant layouts, experiment with backgrounds and special effects. Add text and explore sizing and cropping options within seconds. That's why the hand scanner has caught fire in the design world: its ability to let you see many different visual combinations.

Businesses use scanners to capture text as described above and for keeping archival records of paper documents with instantaneous access. Logitech's advanced technology gives you more flexibility, creative tools and value than any other scanner.

Although there are two basic scanning modes in ScanMan, there are in fact three ways of scanning an image: Line art mode, Gray mode, or Mixed mode.

Line Art Mode. Line Art mode is useful for scanning black and white line drawings, diagrams, and text. This mode produces high-contrast images in black and white.

Gray Mode. Gray mode is useful for scanning photographs, color images, and drawings where the high-contrast black or white character of Line Art mode detracts from the quality of the image.

Desktop publishing programs enable you to combine your ScanMan images with text. Most of these programs accept either PICT or TIFF format files. PICT format enables you to work with compact files, although you won't be able to change the display format of the document or the grays.

TIGER SPECIAL

ScanMan 32 with CatchWord Pro & MouseMan MAC **ONLY $389**

LOGITECH

BBP2509 **ScanMan 32** with CatchWord Pro	$359.00
BBP5298 **ScanMan 32** w/CatchWord Pro and MouseMan MAC	$389.00
BBP2511 **TrackMan MAC**	$79.00
BBP2510 **MouseMan MAC Upgrade**	$49.95
BBP2220 **ScanMan 32** w/Digital Darkroom	$289.00

ScanMan 32: *Macintosh Plus or better running System 6.0 or later. Hard disk recommended.* ***TrackMan/MouseMan:*** *Any ADB Macintosh running Macintosh, A/UX or X-Windows Operating Systems.*

The Intelligent Desktop

REVIEWER'S NOTEBOOK: *Although OnCuell contains several individual features (each of which could be standalone products), one in particular caught our eye as an incredible time saver: KeyLauncher. It allows you to launch any application from the keyboard, without opening layers of folders — by simply typing all or part of its name! That one capability can save an incredible amount of time by eliminating time-consuming steps. It's worth the price of OnCuell alone — but there's much more...*

OnCuell satisfies the power-user in us as elegantly as it satisfies our need for easy-to-use utilities that perform as promised and increase productivity. So it's great for anyone. In seconds, you can personalize your menu configuration for maximum speed and efficiency. Just click to open an application, group documents together that will be used for a specific project, return to work on a recently-used document by retrieving a list of up to 100 files you've used, and launching any of them immediately. No other file and application manager gives you this degree of functionality. There's even a cure for the "missing application" message using OnCuell's unique MatchMaker feature. With it, you can launch files that have missing applications by assigning another application — any one you choose!

OnCuell also provides powerful, easy-to-use tools to help you instantly find seemingly lost files. You can conduct blistering fast searches by file name, file format (TIFF, PICT, etc.), creator application, dates created or modified, file size or any combination. With this powerful search feature on your side, you'll never misplace another file. Guaranteed. And with OnCuell's amazing file management capabilities, you'll be able to instantly find, get info, copy, move, delete, and rename files/folders from within any application — and without using the Finder. It doesn't get any more convenient than that.

And there's more! The On Startup feature gives you complete control of the programs that load when you turn on your Mac, like system extensions and control panels. You simply define the priority and groupings and OnCuell takes care of the rest.

All of which makes OnCuell one of the most important new products to come along in years, giving you capabilities you've probably wished for but never thought possible. And we've just scratched the surface of OnCuell's vast potential: it contains ten other time-saving features that users have screamed for. This is one product that does it all.

Eliminate time-consuming steps with the following versatile features:

Instant file management — from within any application! Find, get info, copy, move, delete, even rename files or folders without using the finder!

- **On Cue II.** Instantly launch any file or application, or simultaneously launch a group of files and applications — without opening layers of folders — all with a single mouse click.
- **MatchMaker.** Conveniently launch files that have missing applications by assigning another application of your choice.
- **File Search.** Quickly locate files by using the following search criteria: file name, file format, creator application, dates created or modified, file size, or any combination of these criteria.
- **On Startup.** Easily manage programs that load when you turn on your computer (e.g., system extensions) by defining the priority and groupings in which these programs are loaded.

...Plus 13 other time-saving features!

ONCUE II

BBP2400 **OnCuell** **$55.00**

Any Macintosh computer running System 6.0.4 or later with at least 1MB RAM.

Full-Motion, Interactive Sherlock Holmes Mysteries!

Over 90 Minutes Of Adventure On One CD!

REVIEWER'S NOTEBOOK: *An absolute must for electronic game fans, Sherlock aficionados and deductive-reasoners! Sherlock Holmes, Consulting Detective is the only game we've ever seen that features FULL MOTION VIDEO. You actually interact with the on-screen characters, embarking on three different cases with the super-sleuth himself, along with Watson and an intriguing collection of victims, suspects, generals, beautiful women and jealous sisters. It's a fascinating new technology. The sound is incredible, taking advantage of your MAC's full capabilities. Hours of fun and intrigue. The cases are well written adaptations of characters licensed from the Sir Arthur Conan Doyle estate. You interact with the characters. Your interrogations lead to valuable information and the evidence you uncover leads to clues needed to help Scotland Yard nab the villainous murderer. Members of the Tiger staff first saw this disc at the CD-ROM Expo in San Jose last summer. We knew then that this one was destined to become a classic. If you've got a CD-ROM reader, you'll love it. This multimedia, full-motion blockbuster is worth it!*

For the first time ever, over 90 minutes of full-motion video brings Sherlock Holmes to life. This revolutionary CD gaming experience lets you match wits with the super-sleuth himself. Guide Sherlock and Watson through the streets of London to interrogate suspects and solve three intriguing murder mysteries! Just slip in the CD and go to work.

The Case of the Mystified Murderess.

Two sisters. One beautiful. The other quiet and plain. A single man. Tall, handsome... and dead. Who did it? Was it jealousy or was it greed? Could the murder be tied to a rash of burglaries causing panic in the upper-class communities of London?

The Case of the Mummy's Curse.

Four men found dead. Some say the murderer is a 4000 year old Mummy exhumed during an archeological dig in Katebet, Egypt. Were their murders simply coincidental or were these men cursed from the crypt? Great sets and effects. You — and Holmes — try to unravel one of the century's most bizarre murders.

The Case of the Tin Soldier.

Waterloo, 1815. Power and Passion. He was an officer but not a gentleman. Now, years later, the retired General has been murdered, a jewel stolen, and a king's ransom waits to be claimed. Who killed General Armstead and why? Holmes enters the scene. This case is a baffler, there are no solid clues.

MULTIMEDIA CD-ROM

BBP2703 **Sherlock Holmes, Consulting Detective CD-ROM** **$59.95**

Sherlock Holmes: *requires CD-ROM reader and will run on a MAC LC or greater.*

The Integrated Package That's Truly Integrated.

Work With All 7 Programs At Once! It's Seamless... It's BeagleWorks!

REVIEWER'S NOTEBOOK: *Beagle Bros. Software has consistently offered up some of the finest products we've seen for the Apple Computer. Each is clean, powerful and easy to use. Now, Beagle Bros. assembled a product that offers an integrated software program with seven modules. Beagle Bros. went back to the drawing board to create a new concept of integration, allowing users instant access to all information in the modules. Their efforts have produced In-Context Editing™, which links the word processor (with speller/thesaurus), spreadsheet, database, charting, drawing program, paint program and communications. This high level integration makes life very easy. Link documents and combine data from any of the individual modules into a single document and make changes without ever leaving that document.* ***Feature for feature, BeagleWorks beats ClarisWorks, GreatWorks and Microsoft Works in every area we tested.*** *It's the only one of the four that is System 7 SAVVY, so it takes full advantage of Publish & Subscribe, Balloon Help, TrueType, AppleEvents, Virtual Memory, 32-bit file addressing and color icons. An incredible value, ready-to-run for users of any expertise level. Great starter application that won't be quickly "outgrown."*

A new definition of integration. For example, you can actually combine information from any of the seven modules into a single document. Or create new information in another module without leaving the module in which you are currently working. And with the innovative In-Context Editing, when information is changed in one document, the information in the linked documents changes with it. Automatically.

Publish & Subscribe information from any of the modules. BeagleWorks includes some powerful desktop publishing features like wrapping text around objects, setting multiple columns on and off anywhere on the page, and reduction and magnification as well as page preview in any module.

You'll love the full-featured Spreadsheet that allows you to create up to 256 columns and 16,385 rows. A powerful tool bar and time-saving recalc automatic summation features. The charting modules creates robust, 256-color line, bar, column, area, scatter and exploded pie charts. The database module allows 16,000 records per file, 256 fields per record and easy mail-merge. Sixty-four built-in functions are all at your command and BeagleWorks provides 32 report formats for your data.

Wanna' draw? Just pop open BeagleWorks' draw module and choose from a palette of tools, colors, patterns and line widths and shapes. The streamlined, tear-off menus make it a pleasure to work with. While you're in a creative state, zip into the paint module and get crazy with a host of spectacular studio tools — and some nifty special effects as well. Airbrush, spray can, paint bucket, pencil, line and more. Provides 256 custom colors and 128 patterns.

When you're ready to connect your Mac to the world, BeagleWorks' communications module makes use of Apple's Communications toolbox to give you powerful connectibility! It stores commonly used phone numbers with a variety of convenient settings. Autodial, autoanswer, uses a modem or direct serial connection.

In-Context Editing™ *— Allows editing of one file from within another by simply double-clicking.*

Multiple Columns *— Can be turned on or off anywhere on the page.*

Automatic Irregular Text Wrap *— Text takes on shape of the graphic.*

Common Tool Bar *— Frequently used tools are easily accessible.*

Word Processor: Automatically wrap text around objects; format in multiple columns; graphic ruler with tool bar for quick formatting; multiple headers and footers, custom styles and more; Microlytics® spelling checker and thesaurus.

Spreadsheet: Apply a different type style to any cell; create up to 256 columns and 16,384 rows; tool bar allows easy access to formatting.

Chart: Chart types include Line, Bar, Column, Area, Scatter, Exploded Pie and more; 256 custom colors.

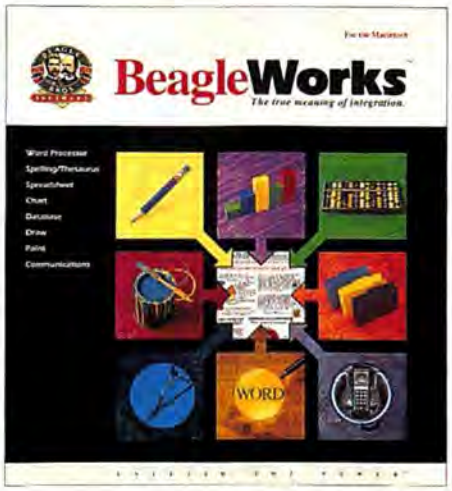
Database: Manage databases with more than 16,000 records per file and 256 fields per record; mail merge with word processor; 64 built-in functions; up to 32 report formats of your data; tool bar provides easy access to formatting and alignment.

Draw: Tear-off menus for tools, colors and patterns.

Integrated Software: Who Leads The Pack?

FEATURES	BeagleWorks	ClarisWorks	GreatWorks	Microsoft Works
System 7 Savvy	YES	NO	NO	NO
In-Context Editing™ (multiple documents)	YES	NO	NO	NO
Paint module	256 Colors	NO	Bk & Wht	NO
Common tool bar w/module-specific tools	YES	NO	NO	NO
Automatic irregular text wrap	YES	NO	NO	NO
Multiple Columns can be turned on/off anywhere on the page	YES	NO	NO	NO

BeagleWorks is the clear winner overall when it comes to true integration and powerful features.

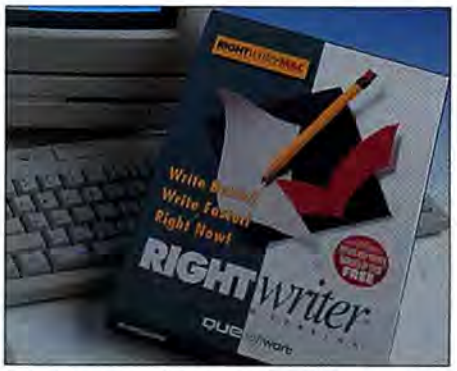


FREE! ONLY FROM TIGER

RightWriter for the Mac

FREE WHEN YOU BUY BEAGLEWORKS!

RightWriter for the Mac. One of the more popular categories in software is the grammar checker, arguably the most important word processing add-in. With



today's business climate, poorly written correspondence is separating success and failure. RightWriter's depth and attention to the details of written communication makes it the premier grammar checker for the Mac. Conclusive testing has established RightWriter as the most accurate, most flexible and easiest to use over any of its competitors.

RightWriter for the Mac is designed to flag errors in your writing from a rule base of over 4,500 — including rules of grammar, style, usage, punctuation, sentence structure, subject-verb agreement and more. RightWriter produces a copy of the document and performs its analysis. Then displays (or prints) your document with flagged errors and explanations. These explanations are your guide to better writing.

RightWriter Contains Over 4,500 Rules, Including:

Grammar Rules

- Noun-Verb Mismatch
- Sentence Fragment
- Run-On Sentence
- Misused Verb
- Misused Pronoun
- Misused Article
- Wrong Verb Form
- Misused Word
- Possessive Use
- Is This Correct?
- Repeated Word
- Capitalization

Style Rules

- Passive Voice
- Split Infinitive
- Long Sentence
- Sentence Length
- Difficult Sentence
- Use Verb Form
- Long Paragraph
- Start With But
- Conjunction Start
- Weak Sentence Start
- End With Preposition
- Negative Sentence
- Use Simpler Terms
- Use Simpler Word
- Consider Omitting
- Ambiguous Wording
- Cliche
- Overused Phrases
- Single Word Quote
- Contraction

Usage Rules

- Colloquial & Slang
- Archaic
- Sexist
- Legalese
- Computer Terms
- Vague
- Wordy
- Redundant
- Questionable Word

BEAGLEWORKS

BBP2700 **BeagleWorks** $184.00
BBP2701 **Competitive Upgrade** $95.00

Upgrade to 1-2-3: Just $69.95!

After Wire Transfer Rebate From CheckFree

REVIEWER'S NOTEBOOK: *The thoroughbred of Macintosh spreadsheets. Not a step-child of the original DOS product, Lotus 1-2-3 for the Mac has been designed from the ground up to exploit the power and flexibility of the Mac. Revolutionizing financial software with true 3-D worksheet capabilities: Excel doesn't have it, Claris Resolve doesn't have it. Fully featured, with System 7 support; completely customizable with desktop tear-off menus, most functions require just a mouse click. Excel users will be surprised at the power and grace engineered into Lotus 1-2-3 for the Mac.*

Lotus' deep understanding of advanced spreadsheet and financial modeling technology is present here. True 3-D worksheet management, incredibly nimble relational database power and easy-to-use formulas. Over 14 million people rely on the Lotus concept to create budgets, perform precise forecasting and instant analysis. Proposals and presentations ring with clarity with Lotus' financial graphs and tables. It's easy to edit cells, create graphs, and import data, using the same menus, tools and file formats across worksheets, graphs and macros.

Using 1-2-3 for the Mac is fast and simple. It embraces new System 7 and provides the classic 1-2-3 menu for complete keystroke compatibility. We love the use of floating toolboxes and palettes, allowing customization of your workspace. Moving around is silky and streamlined, allowing you to quickly select ranges (before or after starting commands). You get in-cell editing and the ability to directly manipulate chart elements. You also get 256 colors, 49 different fill patterns and 230 line styles and thicknesses for use in your spreadsheets.

Along with the brutal power of 3-D worksheets, you can easily customize database forms for automatics fill-in and printing, perform a host of advanced relational capabilities, including swift queries (a particularly useful feature), an ever-active macro recorder (an incredible time saver!), and automatic compression routines for any printer. By the way, Lotus throws in a free copy of Adobe Type Manager.

With 1-2-3 for the Mac, complicated tasks, like consolidations, don't require tedious linking or endless dialog box activity, just a couple of mouse clicks is all it takes. Easily bring remote data right into 1-2-3 through DataLens and the Apple Data Access Language. Read FoxBase and dBASE files directly.

Lotus 1-2-3 for the Mac towers over the capabilities of Excel in a host of areas. Its ability to perform true 3-D functions is an enormous advantage. And the spectacular range of colors and graphic devices available within the worksheet. Excel doesn't allow pop-up functions or range names, Excel doesn't allow you to directly manipulate elements in charts, or perform in-cell editing Lotus 1-2-3 for the Mac does. Excel doesn't include relational capabilities, floating toolboxes or palettes, you can't customize your workspace or have your macro recorder on all the time. 1-2-3 does.

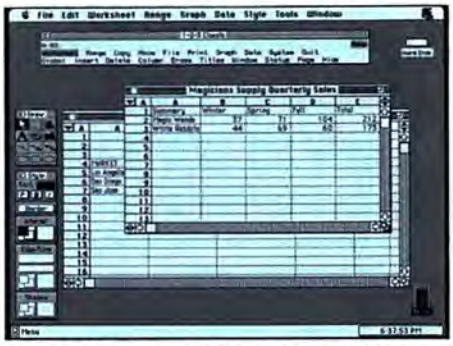
When it comes to spreadsheet features, no one even comes close to 1-2-3 for the Mac. That's because only Lotus has engineered true 3-D worksheet power into 1-2-3. Excel users are converting in droves to the newest, hottest spreadsheet product, finding features like relational joins and queries, the 1-2-3 Classic menu for 100% keystroke compatibility, vast color and graphics support and a dozen other advantages. In fact, we've compiled a feature-by-feature comparison for your review. But there's an intangible difference: The proven 1-2-3 approach to the worksheet. Just the feel of the in-cell editor, pop-up functions and macros display the refined Lotus functionality. John Sculley, CEO of Apple says "...This is a spectacular product." And MacWeek raves: "The most impressive aspect of the program is its implementation of the Macintosh interface. Mac aficionados will have no problems with the program — 1-2-3 Mac is a Mac application to the core." The numbers have never looked so good...

More Powerful Than A Locomotive. True 3-D worksheet management lets you tackle complex tasks, without complicated linking or dialog boxes. Bring remote data right into Lotus 1-2-3 through DataLens® and the Apple Data Access Language. Then work with it using full relational database power and custom database forms. No matter what you're doing, you'll see only one set of menus, tools and file formats. You'll get so much done with so little to learn.

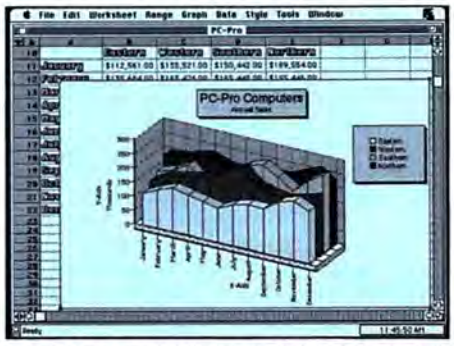
No Mac Is An Island. Share files, macros and applications with Excel users? With PC users? Yes. You heard right. 1-2-3 for Macintosh directly reads and writes Microsoft® Excel for Macintosh files. So you can make the switch to 1-2-3 and never look back. What's more, 1-2-3 for Macintosh is fully compatible with all 1-2-3 files and macros, including PC versions. More than fourteen million people already rely on Lotus 1-2-3 for accounting, budgeting, forecasting, analysis, proposals, presentations and much more. Now Mac lovers can, too.

See How The Newest Macintosh Spreadsheet Stacks Up.

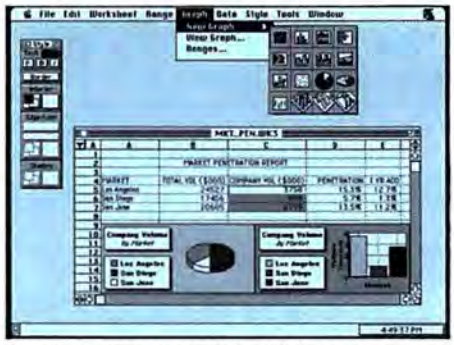
Features	Lotus 1-2-3 for Macintosh	Microsoft Excel 3.0
Optimized for Macintosh		
• Supports system 7 features	Yes	Yes
• Floating toolboxes and palettes for custom workspace	Yes	No
• Directly manipulate chart elements	Yes	No
• In-cell editing	Yes	No
• Context-sensitive, graphical help	Yes	No
• Select ranges before or after starting commands	Yes	No
• Supported colors/fill patterns/ line styles and thicknesses	256/49/230	16/18/32
Powerful Spreadsheet Features		
• True 3-D worksheets	Yes	No
• Pop-up functions and range names	Yes	No
• Menu promotion	Yes	No
• Same menus, tools, and file formats across worksheets, graphs, and macros	Yes	No
• Adobe Type Manager included	Yes	No
• Automatic compression on all printers	Yes	No
• Macro recorder always active	Yes	No
• Customizable database forms	Yes	No
• Relational joins and queries	Yes	No
• Directly reads FoxBase and dBASE files (.DBF)	Yes	No
Compatibility		
• **Reads and writes all 1-2-3 files**	Yes	Yes
• Runs all 1-2-3 macros without translation	Yes	No
• Reads and writes Excel files	Yes	Yes
• 1-2-3 Classic Menu provides keystroke compatibility	Yes	No



"Classic" 1-2-3 menus work the same as the 1-2-3 everyone knows and loves. (Or use the standard Mac menus — your choice.)



Only 1-2-3 has true 3D-Worksheets. Perfect for linking Profit Centers and multiple departments.



Fantastic charting including 2-D and 3-D charts in numerous styles and types — all available with the click of the mouse. And only 1-2-3 has floating toolboxes for ease-of-use.

FREE! ONLY FROM TIGER

CheckFree

When You Buy Lotus 1-2-3 for Macintosh

Now you can pay your bills electronically — via modem — regardless of which bank you use, or who's on your payment list. CheckFree uses its built-in telecommunications program to handle payments through the Federal Reserve System for 100% safety and reliability. And with CheckFree, you'll pay all of your bills in about ten minutes! That's it. No checks! CheckFree keeps an electronic check register for you and works seamlessly with financial management software like Quicken and Managing Your Money. ***A $29.95 value. Yours Free!***

ORDER YOUR COMPETITIVE UPGRADE TODAY!

If you are a current 1-2-3 user, you are automatically eligible. If you use Excel, Claris Resolve or another competitive spreadsheet, you too are eligible.

ALSO FREE WITH 1-2-3 — DYNOPAGE

LOTUS 1-2-3 MAC

BBP2485 **Lotus 1-2-3 Mac** $325.00
BBP2486 **Lotus 1-2-3 Mac Upgrade** $99.95

ADD SIX SERIAL PORTS – INSTANTLY!

Connect And Control Modems, Printers, Networks, Peripherals And Other Serial Devices. Hardware And Software Included.

REVIEWER'S NOTEBOOK: *One of the most useful new ideas in computing – Enables you to control – from a software interface – up to six serial devices. (Macs only come with 2 – Printer and Modem.) It's like adding six serial ports to your Mac (in fact, we found that it's almost like having TWO computers). Configure your equipment any way you like: One Mac to six devices; One Mac to five networks or four Macs to two devices. A snap to install, simple to operate and fully System 7 compatible. Full two-year warranty on everything.*

So forget changing cables, swimming through wires and fiddling with A-B switches (those things can actually cause system freeze-up!). Now you simply pop up the MultiPort screen, select the port you want to use from a graphical on-screen diagram – and you're done. Choose from six serial ports and five ADB ports – a total of eleven! The LED lights on the MultiPort unit indicate the port selected and your INIT installs setups for specific situations, each time the Mac is started. There are dozens of possibilities for the MultiPort, like using it "inside out" to allow up to 4 Macs to share two non-LocalTalk devices. You can even have more than one mouse connected to your Mac; your standard Mac mouse for normal use, and a trackball-type mouse for graphics and publishing work.

Performs beautifully with all Mac add-on equipment – we tested every Mac serial device we could find and saw 100% compatibility!

MultiPorts
Four serial ports located on the back of the enclosure can be characterized as either "Printer" or "Modem". Connect up to six non-LocalTalk printers!

System Ports
Two more serial parts on the back are software defaults as startup and cannot be re-characterized. Always either "Printer" or "Modem".

ADB Ports
Four additional ADB ports and the connection for an optional ADB power supply are conveniently located on the side of the MP-91 enclosure.

A must for the Mac user performing multiple tasks and working with assorted equipment. Everything you need to get going is included: controller box, detailed user's guide and accompanying software. Runs off of ADB power, no power supply is needed to operate the MP-91.

Software-Controlled Ports.

This compact little device – about the size of a paperback book – is the answer to connecting extra serial ports and controlling them on your Mac screen. Simple controls allow you to just click to select a port – or to invert the Port in-out lines, or port character-printer or modem. The MultiPort MP-91 is the ideal Desk Accessory that's guaranteed to save you hours of time switching cables, running and re-running wires. It's the easiest system available for multiple port switching.

Here Are The Installation Instructions:

The MultiPort MP-91 simply plugs into the printer, modem and ADB sockets on the back of your Mac. Your add-on equipment (printers, modems, scanners, etc.) are plugged into the MP-91. A software Desk Accessory goes into the System. That's it.

That Was Fast...

And using the MP-91 is even faster! All the selections you make are handled by the software, so there's really no need to touch the MP-91 again. Just tuck it away and enjoy its ingenious functionality. Our "Printer Sharing Test" saw connections of: Four Macs to one ImageWriter; Two Macs to two LaserWriters and two ImageWriters – and a modem; even One Mac connected to two LaserWriters, 1 ImageWriter on LocalTalk, a modem and a scanner. We connected, re-connected and re-routed as many different serial devices we could find – with easy connections and reliable performance – every time.

What's The MP-91 Secret?

The magic of Apple's ADB (Apple Desktop Bus). The MP-91 and its proprietary software combine to create a lightning fast data highway, similar to Ethernet, between the serial device – and your Mac.

Printer Drivers & The Chooser

All Mac printers are controlled by software programs called "drivers". These driver programs are represented by icons that appear in the selection panel of the Chooser. You select these drivers by clicking on them in the Chooser. MP-91 Control allows you to switch to an MP-91 serial port which may have **any** type of printer attached. BUT – you must first select the appropriate printer driver with the Chooser before initiating printing in your application if the printer type is different than the one already selected in the Chooser.

You have a LaserWriter attached to the "Printer" port and an ImageWriter attached to MultiPort #2. You have been using the LaserWriter, and now want to use MP-91 Control to select MultiPort #2 to use the ImageWriter.

It's the smoothest way to connect your Mac to half a dozen printers, modems, networks, or any other serial device. Fully automatic and software controlled. Or turn it around and share expensive devices (like a high-speed modem) with multiple Macs!

Other Drivers

Modems use drivers, too. These, however, are usually part of the communication program (Such as MicroPhone II™ or AppleLink™). Therefore no driver selection is necessary using modems, just click to the port you want.

MP-91/2:6 Features

- Six Serial Ports – Software Controlled
- Five Full-Time ADB™ Ports
- Easy Port Selection With Software
- LEDs Indicate Port Selections
- ADB™ Interface – No power Supply Needed
- All Connections Easily At Hand
- Compatible With All Macintosh Serial Printers And The Chooser™
- Same Convenient Size As 3.5" Floppy
- Compatible With All BusRider™ Products Such As The BC-91™ Bar Code Reader

MULTIPORT

BBP2785 **Multiport MP-91** **$227.00**

Dimensions: 120 W x 172 L x 38 H mm, 4.75 W x 6.8 L x 1.5 H in.
Warranty: Two Years On Everything.

The Industry's Only Continuous Hard Disk Backup.

REVIEWER'S NOTEBOOK: *Ordinary backup systems make periodic backups of your data to a tape or floppy, and that's fine; but DiskTwin offers you automatic, continuous backup protection (great for workgroup servers, transparent while AppleShare runs). That means up-to-the-instant data backups (from primary disk to secondary disk) without any effort at all. Just install DiskTwin and never worry about it again. Another important advantage: DiskTwin features Automatic Cutover, which keeps your Mac on-line during a system crash, seamlessly switching you to the second drive. DiskTwin has the ability to rebuild bad blocks at up to 85mb/per minute. And with DiskTwin's parallel SCSI buses, you don't suffer any performance loss! DiskTwin includes PartitionTwin, a unique utility that allows you to use selected portions of your hand disk. DiskTwin was awarded an honorable mention as storage product of the year in the MacUser* Eddy *awards. It also receive four-and-a half mice in their November issue.* 4½

You can avoid the most horrifying scenes with an ounce of prevention. It's called DiskTwin, and it could save your life in the event of ... well, the unspeakable. Available either as a NuBus card or SE/30 version (and accompanying software), DiskTwin gives you a constantly updated backup, so there's no data loss between backups. It is automatic and completely transparent, so you'll never forget to use it. It is also AppleShare® compatible so it doesn't slow down your AppleShare users, and it preserves access privileges. And since DiskTwin uses any standard Macintosh SCSI drive, there's no reformatting or need to update drivers. In short, DiskTwin is a simple, powerful backup system for the Mac.

The automatic cutover feature actually keeps your computer running — right through a disk failure — without any loss of data! DiskTwin simply moves you to the twin disk, you (and your workgroup) continue to work without interruption. The failed disk can be repaired or replaced at any time. The speedy restore function takes control of the recovery process in the event of a primary disk failure, rebuilding data with lightning speed. Once it restores the data and your disk is operational, DiskTwin returns to its continuous backup duties. All DiskTwin error messages can sent via e-mail.

On servers, DiskTwin is the great protector, keeping them on-line through even the most serious interruptions. DiskTwin's mail notification is ideal for unattended or "headless" servers. And DiskTwin doesn't require server shutdown to archive continuously or for archival backup. It's compatible with all file sharing, e-mail, database and other workgroup software.

DiskTwin Scenario — AppleShare / E-Mail Server. Acme Widgets uses an SE/30 AppleShare server with an 80mb internal hard disk for a customer database and QuickMail. How can Acme's network administrator protect her company from losing all of its customer records when a disk crashes and eliminate downtime from a busy workday?

The DiskTwin Solution. Using DiskTwin with a removable cartridge drive, the administrator can keep both an archive of the entire 80mb server disk and an up-to-instant backup. Every evening, she removes the twin cartridge for safekeeping and replaces it with another. By exchanging cartridges daily, the administrator has both continuous server backup and an archive that's immediately usable, unlike a tape or floppy backup.

If Acme's server disk crashes, DiskTwin automatically cuts over and continues operation from the cartridge disk, preventing downtime and the loss of the day's work. Users continue working uninterrupted, unaffected by the disk crash. DiskTwin's QuickMail Notification sends an e-mail to the administrator and other designated users, warning them that a disk has failed. The crashed disk can be repaired or replaced at a convenient time.

Scenario #2 — Individual User. An illustrator uses a Macintosh IIci with a 330MB disk plus a 40 MB external to create large images for a daily newspaper. At any one time, he has about 40MB of current projects on his disk. From time to time he does a copy of key files from the 330MB disk to the 40MB disk. It takes a long time and he has to constantly remember to do it. The illustrator has learned to live with tight schedules, but his Mac has not. How can he ensure that he never misses a deadline?

The PartitionTwin Solution. Simply by adding the DiskTwin system to his existing configuration, the illustrator can keep a continuous backup of his current work. He can twin a 40MB partition from the larger disk to the 40MB disk, using PartitionTwin. He keeps all his current projects in the partition on the big disk and as he works on them, DiskTwin automatically maintains a complete backup. If his larger disk ever fails, he has a ready-to-use backup.

DiskTwin gives you:

- Continuous, Up-To-The-Instant Backup
- No Data Loss With Hard Disk Failures
- Background Operation/Totally Transparent
- Fully AppleShare Compatible
- Uses Any Standard Mac SCSI Disk Drive
- No Performance Loss or Slow Down
- Fits Any Mac II, SE/30 or Quadra

"A godsend for network managers concerned about downtime."

MacWorld Magazine

TwinIt — Backups On A Budget. TwinIt is the software only version of its illustrious bigger brother, DiskTwin. It provides the same fully automatic, continuous-backup abilities for individual users and compact servers. Since no hardware is required, it runs beautifully on all Mac versions. It also works with all SCSI disks, with no reformatting or disk driver replacement necessary. TwinIt also allows you to create archives, using removable cartridges or erasable optical disks. These archives are ready-to-use.

DiskMaker: New From The Makers Of DiskTwin. If you own a SCSI disk, why settle for the lightweight software that the manufacturer usually provides? DiskMaker is the universal SCSI disk formatter that works with any SCSI disk and eliminates disk software incompatibility. So if you have different types of disks, you won't have to scramble to learn the different software. And DiskMaker lets you do more — much more. It features full System 7 support, with 32-bit addressing and virtual memory support.

GOLDEN TRIANGLE	
BBP2430 **DiskTwin**	$599.00
BBP2431 **TwinIt**	$89.00
BBP2432 **DiskMaker**	$55.00

DiskTwin: *Macintosh SE/30 or II series but Apple NuBus or PDS adapters required for IIsi; System 6.0.4 or later; SCSI twin disk; no minimum memory requirement.* ***TwinIt and DiskMaker:*** *Macintosh Portable, Plus, SE series, or II series; System 6.0.4 or later; SCSI twin disk (TwinIt only); no minimum memory requirement.*

Bone-crushing Radius Rocket Speed!

Scientifically Engineered Performance For The Desktop Studio.

REVIEWER'S NOTEBOOK: *Radius has always been on the lips of art directors, designers and studio producers who use Macs. For years, the creative community has turned to Radius to speed their work and enhance their creativity. As an authorized Radius dealer, Tiger presents The Rockets: advanced Motorola 68040 processing power at a new lower price.*

The revolutionary Radius Color Pivot Display is the only monitor that works the way you do — in both portrait and landscape modes. See a full page without scrolling. A spectacular value!

One other note: For PowerBook users who want a clean, crisp connection to external color displays, the Radius PowerView is the perfect instrument. Lightweight, small and built to survive an airport cargo crew, the PowerView displays up to 256 colors andeasily plugs into your SCSI port.

Tiger is fully stocked with these magnificent new Radius products and ready to ship; but you must act fast, these are the most popular boards in the business right now.

ACCELERATORS: The Rocket 25i provides lightning quick speed for Mac page layout and publishing applications. The Rocket 25 straps on 25MHz processing capabilities and includes floating point instructions. Then there's the Rocket 33 — featuring the fiery rage of Motorola's 33MHz 68040 processor. The Rocket 33 clocks in at over 32% faster than the 25MHz "040" (COMPARE VALUE! The Rocket 33 is 30% faster than the Quadra 700 upgrade and is hundreds of dollars less!) The Rocket 33 is the right board for 3-D modeling, like Pixar's MacRenderman, popular animation applications, publishing and image processing programs and more.

THE RADIUS ROCKET 25i

This is hot new Motorola '040 speed technology at an unbelievably low price. Built to dramatically speed up QuarkXPress, Adobe Illustrator and Microsoft Word. Growling 25MHz '040 processing performance for the Mac II, IIx, IIcx and IIci. At just $1,395, the Rocket 25i is less than HALF THE PRICE of the Quadra 700 Upgrade (Apple charges you $3,495 for it — ouch!). One of the industry's hottest boards at a great price. Full support of System 7, Nu-Bus slot design for effortless installation. Great for speeding up RIPs! We were impressed with the software that is included with the Rockets. It allows your system to selectively enable or disable the '040 cache mode — actually making the Rocket more compatible with existing Macintosh software than the Quadras themselves!

Let's have some fun. We combined a Radius Rocket 25i with an 8x (and subsequently a 24x) and tore apart the SuperMac Thunder/24 — which, until then, we thought was a hot board.

Call one of our Mac specialists and ask about the specific capabilities of the Rocket 25i, the Rocket 25 and the amazing Rocket 33 — get the right power (and appropriate RAM SIMMS) for your needs.

Color Portrait And Landscape Display In One!

The immortal Radius Color Pivot. The only monitor in the world that can display a full page in color and pivot to display a full page landscape too! Ask a pro how much easier that makes his life. Now your Mac can have this freedom, along with resolution up to 640 x 870. And the Color Pivot can provide full 16 color support (4-bit color) from onboard video in the IIsi or IIci — so you don't need an interface card.

The Color Pivot is perfect for design professionals and advanced desktop publishers, but it's also an ideal upgrade for everyday use, especially if you're "in and out" of a variety of applications. Just pivot to see as much of the screen as you need. And it is an excellent value. Consider this — the only other way to see a full page in actual size without scrolling would be to buy a 19" or larger display — many hundreds of dollars more than the Color Pivot!

NEW! PowerView Links PowerBooks To Large Color Displays!

A must for PowerBook users on the run. PowerView is an external color display interface for 140 and 170 'Books. You install it — you don't have to send your PowerBook away. Just plug it into the PowerBook's SCSI and you're ready to go. Run the PowerBook's LCD as a second screen, or in presentation mode to see what your audience is seeing.

radius

RADIUS	
BBP2780 **Rocket 25i** (25 MHz no floating point)	$1395.00
BBP2781 **Rocket Accelerator** (25 MHz & floating point)	$1859.00
BBP2782 **Rocket 33 MHz**	$2299.00
BBP2783 **Powerview Interface**	$535.00
BBP2784 **ColorPivot**	$1425.00

(Please call for details on the interface for your ColorPivot)

The Perfect Presentation.

To express yourself — and truly communicate — MORE gives you the ultimate set of creative tools for organizing and presenting your ideas. From initial concept to creation of 35mm slides and audience handouts, your presentation takes shape quickly, flowing along with your ideas. Create reports and outlines or detailed tree charts from your presentation notes. When you want to communicate — really communicate — with style and impact, MORE is the only presentation program you'll ever need...

Everything begins with the sleek Outliner. Just enter your thoughts, numbers and proposals, pick a background — and you've got a presentation, or bullet charts — or tree charts. The Outliner is MORE's secret to quick organization.

Enter data — then automatically create dynamic slide presentations, detailed bullet charts, flexible tree charts and more. Adapt all or just parts of your outline into your presentation. The Outliner allows you to quickly crystalize your thoughts for maximum impact on your audience.

The spoken word becomes electrically charged when synchronized with meaningful slides or overheads. Because MORE is designed to organize your thoughts, your communication is crisper, more direct and more understandable. It's one of the great by-products of preparing your presentations with MORE. What ideas do you have? Funding for expansion. Marketing savvy. Reasons why a prospective client should sign on the dotted line.

SYMANTEC	
BBPY7013 **MORE 3.1**	$265.00
BBP2705 **SUM**	$96.00
BBP2706 **SAM**	$66.00

ORGANIZE TIME!

REVIEWER'S NOTEBOOK: *First Things First is an award-winning time management utility that has no learning curve — it's immediately useful right out of the box. It puts up a unique Floating Clock-Icon, which stays "on top" regardless of how crazy your desktop gets. It not only always tells you the time and date, but also provides instant access to ToDo lists, to check your schedule, or to set up a Reminder. Just double-click on it, or use the program's built-in hot key, and you are managing your time without wasting any of it.*

Perfect timing. It's either the result of incredible luck or determined effort. In business, however, you can't always depend on luck. That's where First Things First comes in. The premise is that even the most organized people have trouble keeping track of all the things they must (and want to) accomplish.

Sound familiar? Time-dependent tasks, appointments and deadlines simply don't care if you have enough time to organize them. And unless a time manager is fast and easy, it is of little use. First Things First is extremely easy to use, delivering instant access to your list of tasks and details. It allows you to organize your efforts by category or project, and keeps you in touch with the big picture even in the wake of interruptions, crises and priority shifts.

You'll quickly create categories, establish reminders and things to do, view and print your lists and have almost unlimited capabilities to customize First Things First to fit your personal style. That's important.

The Floating Deskclock is an access device unique to First Things First. In its 3-dimensional form, it actually decorates your screen. Or, if you like, you can park it in a reduced form in the menu bar. Either way, you just double-click on it any time you want to access your time management program. Nothing could make more sense from a user's point of view!

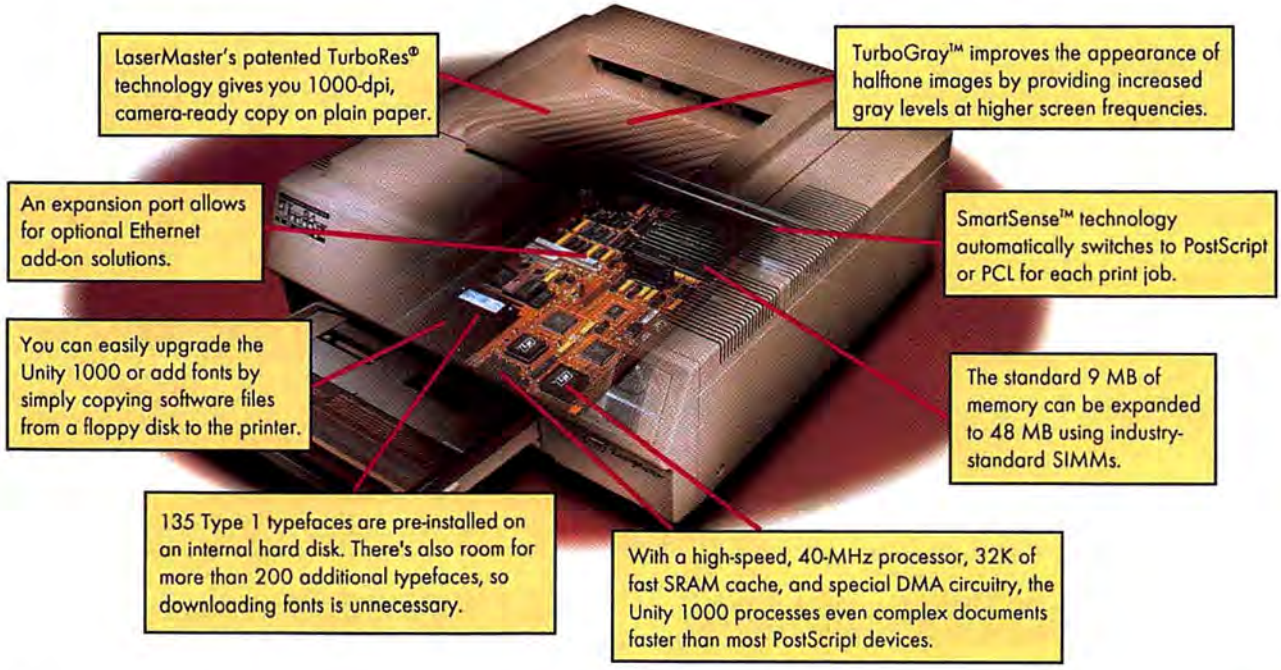
Printing is a snap. And First Things First gives you complete control of your output, with a variety of styles and fonts. Print just the items within a time range — or your entire weekly schedule. Creating Reminders is simple — just click on "New Reminder" and enter the text for your Reminder. You then choose a Category for your Reminder and set the time and date.

VISIONARY SOFTWARE	
BBP2403 **First Things First 2.0**	$49.00

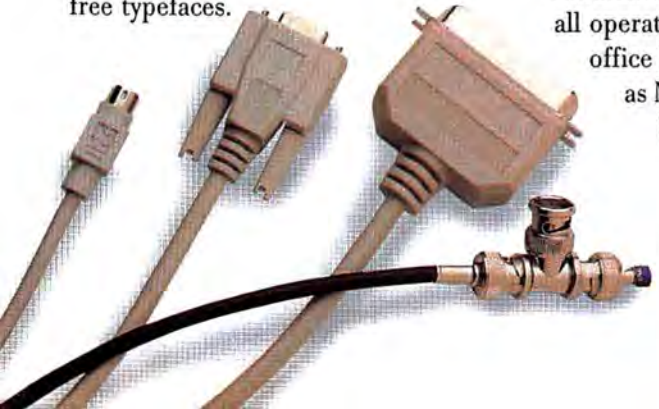
Any Macintosh with at least 1mb of RAM and System 6.0.4 or later.

TURBORES® FAST • LOW COST • RECYCLABLE TYPESETTING

If only you could design your own typesetter...

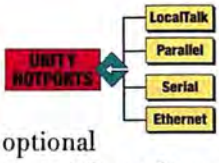


You'd make it fast. You'd have it print camera-ready copy on plain paper. You'd design it to store so many typefaces that you'd never waste time downloading another font. You'd make it easy to expand and upgrade, so it wouldn't become obsolete. And you'd make it capable of printing from just about any computer out there, just in case you ever need to print camera-ready copy from another computer. While you're at it, you'd probably throw in a hundred free typefaces.



Sounds just like our new Unity 1000 Plain-Paper Typesetter. It's fast. It prints at 1000 dpi. It's expandable and software upgradable. It handles fonts like no other printer can. And, it comes with 135 Type 1 typefaces—that's 100 more than other PostScript devices.

Combine these great features with multi-platform capabilities, and you have the kind of typesetter you've been waiting for. Unity provides simultaneous connectivity to virtually all operating environments, so if your office happens to use PCs as well as Macs, you're in luck. Unity's HotPorts feature automatically selects the LocalTalk, parallel, serial, or optional EtherTalk interface, and SmartSense automatically switches to PostScript or PCL.



Give us a call to find out more about the Unity 1000. We bet it's the typesetter you've been waiting for.

1-800-950-6868 **Dept. 09U**

1-612-944-9330, Fax: 1-612-944-0522

LM® LASERMASTER™ TYPESETTING DIVISION

Mac, Unix, PC TurboRes Typesetting–FAST!

©1992 LaserMaster Corporation, 6900 Shady Oak Road, Eden Prairie, MN 55344. The LM logo and TurboRes are registered trademarks, and LaserMaster, Unity, SmartSense, HotPorts, and TurboGray are trademarks of LaserMaster Corporation. PostScript is a trademark of Adobe Systems, Incorporated. All other product names or brand names are trademarks or registered trademarks of their respective holders. Specifications subject to change without notice. All camera-ready copy for this advertisement was produced by a LaserMaster Unity 1000.

Circle 182 on reader service card

MACWORLD NEWS

THIS MONTH: Apple's Color Matching • QuickMail Adds DOS Format • GCC's First Color Printer • Personal Information Managers

BY DAN LITTMAN AND TOM MORAN

Strata's New Skin

Stratavision 3d version 2.5 has a new feature called skin modeling that works by wrapping a surface around ribs. For example, you create a model as a series of two-dimensional cross-sectional ribs that define an object's contours; Stratavision then interpolates the surface between ribs. Skin modeling works with another new feature called Flex Objects, a way of changing the shape of each rib over time to produce moving or metamorphosing objects. Version 2.5 can also convert TrueType and PostScript Type 1 text into Bézier curves, which can be extruded into 3-D space, modified, and rendered. Version 2.5 lists for $995. Strata has also announced a network rendering package, but price and ship date were not set at press time. Strata, 801/628-5218.—D.L.

DICK MAXWELL

STRATAVISION'S SKIN MODELER CAN WRAP A SURFACE OVER MANY DIFFERENT-SHAPED RIBS.

TREND

Supra Fax Modems Break Price Barrier

Supra Corporation has introduced two fax modems that promise high performance at low price points. The two devices are among a number of fax modems that offer faster data transmission than was previously widely used. The SupraFaxModem V.32bis sends and receives faxes and data at 14,400 bps and lists for $399.95. The SupraFaxModem V.32 sends and receives faxes and data at 9600 bps and lists for $299.95.

JOHN WILLIAM LUND

THE U.S. ROBOTICS SUPRAFAXMODEM V.32BIS SENDS FAXES AND DATA AT UP TO 14,400 BPS.

Both fax modems are compatible with the Group III and earlier fax-transmission protocols, and as modems, both support the V.42bis, MNP Classes 2 through 5, and MNP Class 10 data-compression and error-correction standards. V.32bis can further increase data transmission speeds by a factor of four when communicating with another V.32bis-compatible modem. Both devices are available now. Supra, 503/967-2400.—T.M.

2700-DPI Slide Scanner

The Mira 35 from Santos Technology is a low-cost color slide scanner that offers 2700-dpi resolution and a robust Mac interface. The one-pass scanner permits preview scanning at a variety of resolutions and croppings, and it accepts any positive or negative film or slide. For a greater dynamic color range the Mira 35 captures 30 bits of color information, which is processed to 24 bits for display and manipulation on the Mac.

The slide scanner takes about three minutes to scan an entire slide in full color. The Mira 35 was slated to begin shipping in April. Its suggested list price is $2695. Santos Technology, 213/320-8888.—T.M.

ROBERT PERRY

SANTOS TECHNOLOGY'S MIRA 35 SLIDE SCANNER CAPTURES COLOR IMAGES AT UP TO 2700 DPI.

JENNIFER SAUER

HUMANS WANDER THROUGH A COMPUTER-GENERATED WORLD IN GEORGE COATES'S *INVISIBLE SITE*.

The Invisible Site

Silicon Valley companies, including Apple, can't seem to line up fast enough to support San Francisco multimedia performance artist George Coates. Coates has convinced them that productions like his *Invisible Site: A Virtual Sho* can create a more-than-virtual market for their products. *Invisible Site* features animated characters alongside real ones in what the audience, wearing 3-D glasses, is meant to see as a fully sensory online world. Its hero and heroine arrange to meet on Prospero's cyberspace island, but a Rimbaud-obsessed hacker keeps them apart during detours through visually exotic locales. Performance Works, 415/863-4130.—ANN GARRISON

ILLUSTRATORS, THE PRESSURE IS ON.

Using Aldus FreeHand and the pressure-sensitive Wacom stylus, you can create natural-looking pen and brush strokes, like the ones on the lead horse.

Illustration by Jeff Tull, Fearless Designs.

With the winning team of Aldus FreeHand® 3.1 for the Macintosh and Wacom's pressure-sensitive tablet, your illustrations will pull ahead of the pack. Aldus FreeHand, linked to the Wacom stylus, works and feels just like a pen or brush. Now you can easily create those graceful thick and thin strokes that you used to have to make tediously, click by click.

Aldus FreeHand is a productivity tool, too. It's also available for Windows 3.0, so you can freely exchange designs with PC users. You can take full advantage of Apple's System 7 features. And a new hotlink from Aldus PageMaker® lets you work on Aldus FreeHand graphics from within the page layout.

Aldus FreeHand is one of a suite of graphic-arts products we've designed to work together as intuitively–and creatively–as you do. For a free self-running demo or working model, call 1-800-685-3563.

ALDUS®

This ad was produced using Aldus FreeHand 3.1 and PageMaker 4.2. Aldus, the Aldus logo, Aldus FreeHand, and PageMaker are registered trademarks of Aldus Corporation. All other products are trademarks or registered trademarks of their respective companies.
©1991 Aldus Corporation. All rights reserved.

News

GCC's First Color Printer

GCC Technologies has announced its first color printer, a dye-sublimation device called the ColorTone. The company has also introduced a wide-carriage QuickDraw printer called the WideWriter 360.

The 300-dpi ColorTone printer will approach photo-realistic quality, according to GCC, and will come with 10MB of RAM and an internal 100MB hard drive that supports font caching, virtual memory, and easier updates to the printer's software. It includes PhoenixPage, a PostScript Level 1–compatible page-description language. The ColorTone has connectors for EtherTalk, AppleTalk, and serial and parallel ports, and all the ports can be connected simultaneously. The price and availability for the ColorTone were not set at press time, but the price was expected to be under $10,000 and shipping was tentatively scheduled for the second quarter.

The WideWriter 360 is a QuickDraw-based printer built around a 360-dpi Canon ink-jet engine that can also produce 180 dpi in draft mode. The single-color printer is intended for CAD, spreadsheets, and other applications that require wider paper. It comes standard with one sheet feeder; a second sheet feeder will cost about $149, although the price was not set at press time. The WideWriter includes an AppleTalk connector and an RS-422 serial port and will list for $1599. GCC hoped to begin shipping the WideWriter 360 on April 15. GCC, 617/890-0880.—T.M.

OUTPUT FROM THE GCC COLORTONE DYE-SUBLIMATION PRINTER APPROACHES PHOTO-REALISTIC QUALITY.

TREND

QuickMail and MHS

CE Software has announced plans for a version of QuickMail with support for Novell's MHS (Message Handling Service). MHS is the dominant environment for messaging in the DOS world. MHS is a rich platform for building E-mail, groupware, and other messaging-based applications, providing such features as message encryption, sender and contents authentication, and message routing. About 120 commercial DOS and Windows applications support MHS. QuickMail for MHS will be able to communicate with all of them, and is likely to build momentum for other Mac-based MHS products. Pricing was not set at press time. CE Software, 515/224-1995.—D.L.

Mail Stop

Lotus Development's cc:Mail is being revised to version 2.0, and another leading E-Mail package for DOS and Windows PCs called Da Vinci eMail is making its first foray into the Macintosh market.

By supporting multiple data types (graphics and sound, and color text-highlighting, for example) in one message, and enabling users to view attachments, play sounds, and run QuickTime movies from inside the message, cc:Mail 2.0 moves a little closer to the company's goal of a compound document architecture. Lotus Development's cc:Mail division, 415/961-8800.

Da Vinci is marketing MacAccess, developed by Action Technology, and working on a full-featured Macintosh version of Da Vinci eMail. MacAccess supports MHS (see "QuickMail and MHS" above), provides conversation threading, and can save a half-written message to be completed later. Da Vinci also plans to develop add-ons like its Assistant for Windows, which performs filing and mail forwarding, can send a stock reply to all incoming messages (for example, "Out of town until Friday"), and issues reminders. Prices for all products depend on number of users. Da Vinci, 919/881-4320.—D.L.

AFTER RUNNING PARO PAPER THROUGH A COLOR COPIER, YOU CAN TRANSFER THE COLOR IMAGE TO A T-SHIRT.

Mac to Fabric

Silk-screened T-shirts may soon go the way of vinyl recordings and rotary-dial telephones. Graffoto has come out with Paro, special paper for transferring images—even four-color, photo-realistic scans—from the Mac to fabrics. Users send images to a Canon Color Laser Copier equipped with a special Canon controller or an EFI Fiery CLC Controller, which in effect turns a color copier into a computer printer. The image is printed on Paro paper and then heat-pressed onto fabric, eliminating the cost of a silk-screening setup for tests and short runs. Graffoto is working on a similar transfer for the Xerox 5775 Digital Color Copier. Graffoto, 604/683-1232.—ANN GARRISON

KERNEDIT SHOWS THE PAIR BEING KERNED IN THE CONTEXT OF WHOLE WORDS THAT USE THE PAIR.

Agfa's Type Tools

Miles Agfa Division is marketing two utilities for people who are serious about typography. KernEdit allows the user to create or edit kerning-pair tables for PostScript Type 1 and TrueType fonts. It maintains a list of words to display as examples while altering the kerning of a letter pair. KernEdit lists for $149. Agfa is also selling KernData, $99 collections of predefined kerning tables for a wide selection of fonts. TypeChart is a $99 collection of type specimens for printing out as a type book. It includes a utility for resolving font ID conflicts, and it supports changing the text-block specimen. Agfa, 508/658-5600.—D.L.

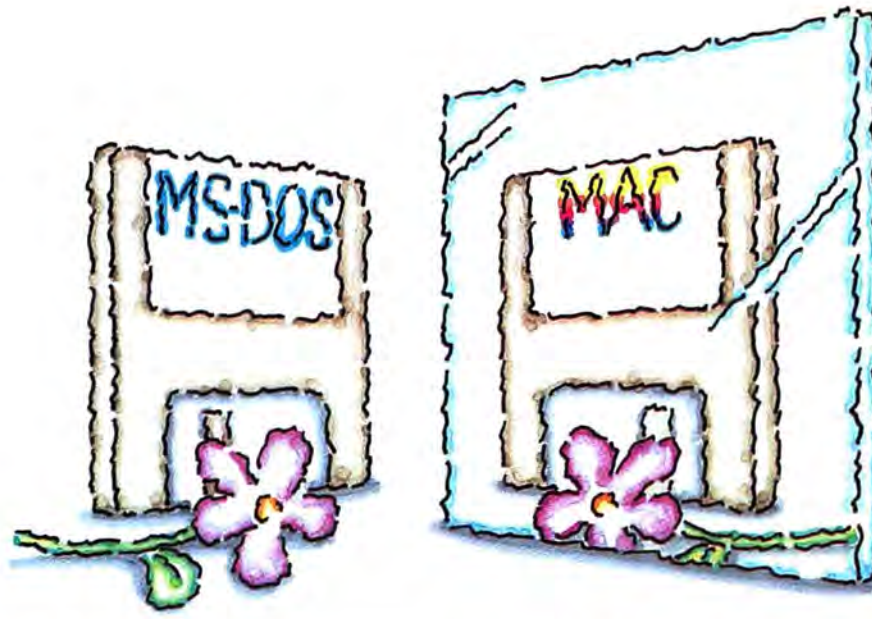
TURKEY SHOOT

DESIGN FLAWS NOTED

Macintosh LC and LC II Standards? *We* don't need no stinkin' standards! Who cares if your multisync monitor doesn't work with your LC? After all, *we* don't sell multisync monitors. (Fortunately, some monitor vendors sell an LC adapter; others build it in.)

Spelling Checkers and Ligatures Why is it that spelling checkers and related tools for virtually every product that has them—even desktop publishing software—can't interpret ligatures correctly? Maybe someone thinks Mac users don't care about typography?

Macworld will send you a Turkey Shoot T-shirt if we shoot your turkey in this column. See *How to Contact Macworld.*



Now, MS-DOS Files Can Look Just Like Mac Files.

AccessPC is System 7 savvy as well as completely compatible with Apple's System 6.

With AccessPC®, you just pop any DOS floppy in your drive, and in a couple of clicks, what you see on your desktop are Mac files.

And they not only look just like Mac files, they act just like Mac files in Mac applications.

You can edit, copy, save, print, play with the numbers, print again, and give the PC folks back their diskette.

AccessPC is so easy to use, it gives new meaning to the word *utility*.

Put MS-DOS disks in your SuperDrive, double-click on the DOS file, and open it in your Macintosh application.

Plus, it includes powerful Multi-Driver™ and Media Formatter™ utilities, *free*. You get instant compatibility even with DOS removable cartridges and optical drives. And you can get access up to ten times faster than with other utilities.

Pick it up today. You'll be amazed at how such an inexpensive little utility can make you look so good.

Insignia Solutions™
Bridging Worlds Of Software™

Insignia Solutions Inc., **800-848-7677**. 526 Clyde Avenue, Mountain View, CA 94043. FAX (415) 964-5434. Call (415) 694-7600.
Insignia Solutions Ltd., Bellfield House, Bellfield Road, High Wycombe, Buckinghamshire, HP13 5HP, UK. FAX +44 494-459720. Call +44 494-459426.

AccessPC and SoftPC are registered trademarks and Multi-Driver and Media Formatter are trademarks of Insignia Solutions Inc. All other product names are trademarks or registered trademarks of their respective owners.

Circle 235 on reader service card

News

Apple Standard for Color Matching

To reduce confusion and wasted motion in the field of color output, Apple Computer plans to add a color-matching extension for QuickDraw to its system software by the end of the year. Not yet officially announced, the Apple Color Matching System will be based on the CIE XYZ color space and will have the advantage of working with existing applications, because it will require only new device drivers instead of major rewrites of each application. If, as expected, the Apple method is adopted by vendors of color input and output devices, the vendors will not have to put as many resources into creating and pushing their various color-matching methods. That lowered overhead may ultimately mean that a complete color-matched Mac system will cost less.

The Apple color-matching software will include Color Systems Manager, an exact copy of the QuickTime Component Manager, which will keep track of the gamma curves, RGB values, and color temperature of the different hardware devices attached to a user's system. The Color Systems Manager will allow vendors of other color-matching methods to drop their algorithms into a folder and have them take precedence over the native Apple algorithms. The Apple algorithms, called Color Matching Utilities, are programs that translate between different color spaces.

At press time, Apple had not decided if it will charge for the Color Matching System, which will require System 7.—T.M.

DESKTOP LIBRARIAN

Books on Word 5

This month we crack open four books on Microsoft Word 5.0.

SCOTT PETERSON

FOUR OF THE LATEST BOOKS ON MICROSOFT WORD 5.0 TAKE DIFFERENT APPROACHES TO THE SUBJECT.

- *Word 5 Companion, Macintosh Edition*, by Gena B. Cobb, Allan McGuffey, Judy Mynhier, with Mark Nieker (1992, $27.95). This book starts by detailing the new features of Word 5. Sections cover what you need to know before using the program, working inside Word, formatting techniques, word processing utilities, and customizing your Word setup. Microsoft Press, 800/677-7377.
- *Macworld Guide to Microsoft Word 5*, by *Macworld* contributing editor Jim Heid (1992, $22.95). The book's four sections cover Word basics, editing and proofing, advanced formatting, and streamlining your work. Each of its 34 topics begins with an overview, moves to step-by-step examples, and finishes with quick tips. Includes a pull-out quick-reference card. IDG Books Worldwide, 415/358-1250.
- *Microsoft Word 5 for the Macintosh Made Easy*, by Paul Hoffman (1992, $19.95). Each chapter begins with a lesson and ends with exercises. The first section is a quick-start introduction; subsequent sections cover basic editing, using Word to format, and other Word features. Osborne McGraw-Hill, 800/227-0900.
- *Getting Started with Microsoft Word for the Apple Macintosh, Version 5*, by Michael Boom (1992, $19.95). This beginning-level book includes tutorials, examples, and tips on topics ranging from creating a business letter to producing special documents with headers, footers, tables, and other graphics. Microsoft Press, 800/677-7377.—T.M.

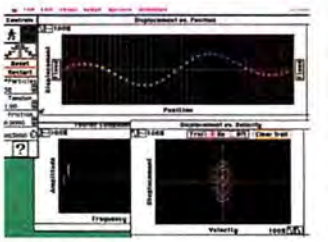
ALEX VIARNES

USING A SPECIAL ATTACHMENT (RIGHT), THE SPECTRA STAR MODEL 450 COLOR PRINTER CAN ALSO MAKE SLIDES.

Color Printer Makes Slides

General Parametrics has introduced the Spectra Star Model 450, a color thermal-wax transfer printer that includes a slide-making attachment. The PostScript device can also produce transparencies. It incorporates a 32MB hard drive that can store the images to be made into slides.

The Model 450 produces 300-dpi output. It is shipping at a list price of $14,990. General Parametrics is also offering the slide-making attachment as a $6995 upgrade to its Spectra Star Model 440 and its other printers. General Parametrics, 510/524-3950.—T.M.



WAVEMAKER TUTORIAL SOFTWARE SIMULATES VARIOUS WAVEFORMS.

New Wave

During the third semester of college, once they've taken the required math, serious physics students tackle the physics of vibrations. Now less-advanced students can learn the basics with Wavemaker, software that simulates the waves and oscillations of complex linear systems. Wavemaker's innovations include preset and user-definable graphs that show relationships among variables, and an introduction to Fourier analysis.

Pricing and distribution were not set at press time. For information, call Charles Whitney, Harvard-Smithsonian Center for Astrophysics, 617/495-9798.—ANN GARRISON

Air Time

Ham radio operators have been doing what BBS users do for years: sending messages or setting up radio conferences to talk about religion, sex, politics, car repair, and the latest movies. Now hams are using radio to send digital messages between computers, and the FCC has a license for digital ham operators that doesn't require knowing Morse code. The National Amateur Radio Association (NARA) has just released MacHam, a $34.95 coaching program for the license test. MacHam contains all 700 possible questions and generates practice exams. NARA, at 206/232-2579.—ANN GARRISON

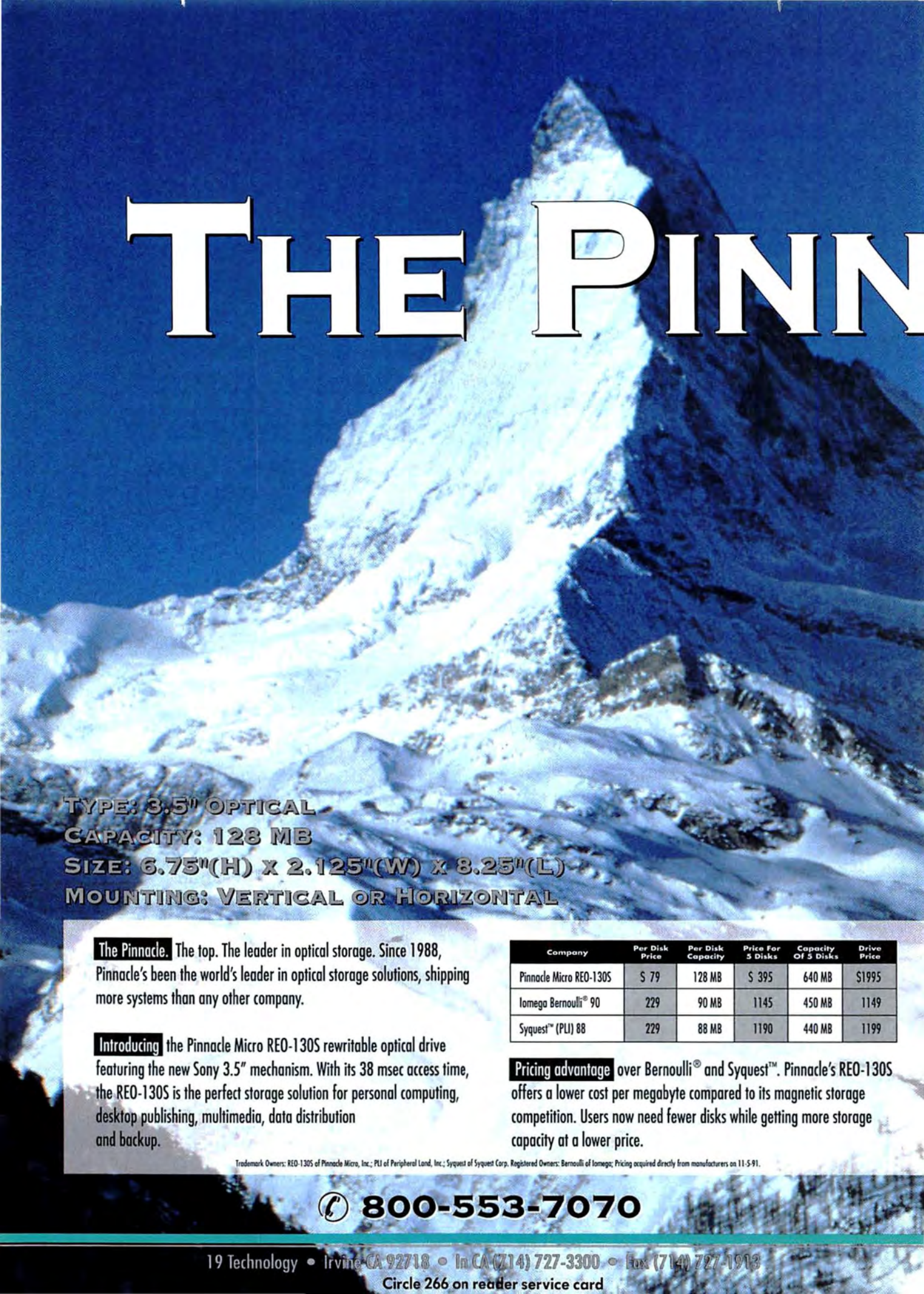
TREND

Saving Space

Software that compresses files to make more room available on a hard drive is nothing new. But the new generation of compression products have a key improvement: once installed, they can operate invisibly. The user does not have to create archive files, designate special folders, or modify file names.

WARD SCHUMAKER

Aladdin Systems' StuffIt SpaceSaver ($59.95), Alysis Software's More Disk Space ($99.95), and Salient Software's AutoDoubler ($79.95, and the only product shipping at press time) all do essentially the same thing, though Alysis says More Disk Space can incorporate a decompression engine inside an application that decompresses resources only as they are required. Aladdin Systems, 408/761-6200; Alysis, 415/566-2263; Salient, 415/321-5375.—D.L.



The Pinnacle. The top. The leader in optical storage. Since 1988, Pinnacle's been the world's leader in optical storage solutions, shipping more systems than any other company.

Introducing the Pinnacle Micro REO-130S rewritable optical drive featuring the new Sony 3.5" mechanism. With its 38 msec access time, the REO-130S is the perfect storage solution for personal computing, desktop publishing, multimedia, data distribution and backup.

Company	Per Disk Price	Per Disk Capacity	Price For 5 Disks	Capacity Of 5 Disks	Drive Price
Pinnacle Micro REO-130S	$ 79	128 MB	$ 395	640 MB	$1995
Iomega Bernoulli® 90	229	90 MB	1145	450 MB	1149
Syquest™ (PLI) 88	229	88 MB	1190	440 MB	1199

Pricing advantage over Bernoulli® and Syquest™. Pinnacle's REO-130S offers a lower cost per megabyte compared to its magnetic storage competition. Users now need fewer disks while getting more storage capacity at a lower price.

Trademark Owners: REO-130S of Pinnacle Micro, Inc.; PLI of Peripheral Land, Inc.; Syquest of Syquest Corp. Registered Owners: Bernoulli of Iomega; Pricing acquired directly from manufacturers on 11-5-91.

✆ 800-553-7070

19 Technology • Irvine CA 92718 • In CA (714) 727-3300 • Fax (714) 727-1913

Circle 266 on reader service card

ACLE.

Optical Technology has distinct advantages over the Bernoulli® and Syquest™ technology. Since optical drives use laser technology to store information there is no chance of head crashes. 3.5" optical has a much smaller footprint than 5.25" magnetic but holds 40% more data.

Reliability of optical media is 15 years (shelf life) - that's 3 times longer than Bernoulli® and Syquest™ magnetic disks. Since the 3.5" cartridges are removable, optical remains the most secure way of storing your data into the future.

Media Standards for 3.5" optical disks have both ISO and ANSI standards to support the technology, while Bernoulli® and Syquest™ have none. Each 3.5" disk can be recognized in any 3.5" ISO/ANSI standard optical drive.

The Pinnacle Advantage is clear. Pinnacle Micro dominates the optical storage industry by offering the largest selection of 3.5" and 5.25" optical drives and disk changers. Interface kits are available for MAC, SUN, DEC, IBM and compatibles. The Pinnacle. Your next storage system.

PINNACLE MICRO

THE OPTICAL STORAGE COMPANY

DOES THE POWERBOOK HAVE ITS LIMITS? NOT ANYMORE.

The Envisio Display Adaptor 030 enables you to use color applications and view 256 colors on displays like the Apple 13" RGB and VGA monitors.

Envisio NoteBook Display Adaptors work with most Apple and VGA compatible LCD projection panels, as well as Barco and Electrohome projectors.

You've got to love the PowerBook. Its innovations can take your work to the cutting edge, But with Envisio's NoteBook Display Adaptors, you can go further still. Now you've got the power to drive a range of external monitors and projectors. Suddenly, you've got a powerful desktop computer. A persuasive presentation tool. Connect to a full or two-page display, and you can view one or two 8.5" x 11" pages at once. And by connecting to an LCD overhead or RGB projector, you can share your work with an audience. Use NoteBook Display Adaptor 030 and you can view or project 256 brilliant colors on Apple's RGB Display or VGA monitor. And fast? It's the obvious choice for animation and QuickTime. The PowerBook means freedom, so of course Envisio NoteBook Display Adaptors reside *inside* the unit. No external hardware, no hassle.

An Envisio Authorized Dealer can help you take your PowerBook to the limit. We suggest you visit one today.

E N V I S I O

510 1ST AVENUE NORTH • SUITE 303 • MINNEAPOLIS, MINNESOTA 55403
PHONE (612) 339-1008 • FAX (612) 339-1369

©1991 ENVISIO INC. NoteBook Display Adaptors is a trademark of ENVISIO INC. Apple, Macintosh, Barco and Electrohome are trademarks of their respective companies.

End users circle 222 on reader service card

Dealers circle 224 on reader service card

News

JENNIFER CHEUNG

RICK SAVAGE USES SURFACEVIEW TO ANALYZE THE RESULTS OF LASER EXPERIMENTS AT UCLA.

On the Surface

National Instruments' LabView has an open architecture for adding modules called virtual instruments (VIs). One of the most interesting VIs is Metric Systems' SurfaceView, which plots three-dimensional wire-frames inside LabView from data from instruments or generated by LabView.

SurfaceView provides background grids, user-definable axes, and tools for rotating the plot or changing point of view. SurfaceView's VIs can be incorporated into the interface of a custom LabView application. SurfaceView lists for $250; LabView lists for $1995. Metric Systems, 512/388-4458; National Instruments, 512/794-0100.—D.L.

Xante Printer Does 600 DPI

Xante Corporation, maker of printer accelerators, has introduced its first complete printer, the 600-dpi Accel-a-Writer 8000. The 8-ppm printer includes a fast RISC processor, 6MB of RAM, and Xante's new Virtual Disk Technology, which uses optional Flash EPROM, instead of a hard drive, to store fonts. Flash EPROM is ROM that can be erased and rewritten many times as fonts are downloaded from the Mac. The EPROM stores the fonts until they are written over when other fonts are desired.

Enough EPROM to store 15 additional fonts lists for $100, while enough to store 30 additional fonts lists for $200. The printer comes standard with 35 resident fonts without using the Virtual Disk Technology. The Accel-a-Writer 8000 also has a SCSI port for attaching a hard drive. Now shipping, the printer lists for $4495. Xante, 205/476-8189.—T.M.

Upfront and Close

Alias Research's Style division is preparing version 2 of Upfront, its 3-D architectural and conceptual solid-modeling package. New features in Upfront include Virtual Graffiti, which allows patterns or graphics mapped onto surfaces to retain their proper perspective when the point of view changes—this is especially useful for adding signage to a model without using 3-D letters—and Spider Vision, a refined method of controlling fly-through animations. Version 2 adds a true double-wall tool that eliminates the need to substitute vertical boxes for walls when constructing buildings, and that can import 3-D DXF files and export QuickTime movies. It will probably list for $895. Alias, 416/362-9181.—D.L.

ALIAS UPFRONT 2.0 WITH SPIDER VISION—A SERIES OF LINES DESCRIBING THE PATH OF A FLY-THROUGH.

Signs of the Times

How can taxi companies, department stores, and universities generate the hundreds of signs they need? They could turn to Amiable Technologies' FlexiSign. Unlike proprietary sign-making systems, FlexiSign uses standard fonts and can import illustrations from other graphics programs. It can drive machines that rout and emboss hard surfaces, or that cut colored adhesive vinyl or rubber sand-blasting stencils (it supports most makes of machining tools). Cutting signs requires some special techniques, which FlexiSign can apply. For example, colors must be separated into layers with the biggest (usually the sign's background color) on the bottom and the smallest (usually the letters) on the top. FlexiSign also has tools designed for drawing, layout, and alignment, and for distorting type.

FlexiSign lists for $1995; the $599 FlexiCut can cut illustrations created in other Macintosh software but lacks FlexiSign's high-end features. Amiable Technologies, 215/222-9066.—D.L.

USING FLEXISIGN TO PREPARE A SIGN WITH MULTIPLE LAYERS OF ADHESIVE VINYL.

ANALYSIS

Managing Personal What?

What blend of calendar keeper, contact manager, and miscellaneous-junk repository qualifies as a personal information manager, or PIM? There are many PIMs for the Mac, all of them different. For example, After Hours Software's TouchBase ($125) is an electronic address book; Attain's In Control ($129.95) is a malleable to-do list; Bananafish Software's Thought-Pattern ($149.95) is an unstructured database; and Chena Software's Fair Witness ($495) is almost a full-fledged project-management package.

Pastel's DayMaker ($99) provides the best blend of calendar, reminders, and miscellaneous storage, and—here's the personal in PIM—DayMaker provides great flexibility in categorizing, selecting, and viewing information. But it may face a serious challenge in features, if not in price, from After Hours' DateBook ($125), when combined with TouchBase, which provides access to contact info from inside a calendar and can display a to-do list side by side with a schedule. After Hours, 818/780-2220; Attain, 617/547-2188; Bananafish, 415/929-8135; Chena, 215/770-1210; Pastel, 212/941-7500.—D.L.

WARD SCHUMAKER

VIRUS WATCH

CURRENT VIRUSES, TROJAN HORSES, AND WORMS

MBDF

TYPE: Virus
FIRST LISTED IN VIRUS WATCH: 6/92
INFO: Initially distributed via trojan horse program called Tetricycle, but can spread like other viruses
IMPACT: Does not destroy data; may disable applications

Zuc C

TYPE: Virus
FIRST LISTED IN VIRUS WATCH: 10/91
INFO: A Zuc clone
IMPACT: Nondestructive; infects applications and system files; renders cursor inoperable

HC

TYPE: Data Virus
FIRST LISTED IN VIRUS WATCH: 6/91
INFO: Infects HyperCard stacks
IMPACT: Causes the Mac to hum oddly

Quick, Who's Number One In E-mail?

(If you guessed QuickMail™, you're right.)

PC WEEK ANALYST'S CHOICE That's easy. According to the experts at PC Week (1992 Analyst's Choice) and Macworld (1992 Editors' Choice Award), the #1 Multiplatform E-mail system is QuickMail. They agreed that, for ease-of-use, flexibility and connectivity, no E-mail communicates better across the most sophisticated environments—Macintosh®, DOS and Windows™ 3.x. And once you start using QuickMail, you'll agree—no other E-mail system works so well for your entire organization. Here are some more numbers you should know: call 1-800-523-7638 and ask for **Dept. CE31** to receive more information on QuickMail, or for the name of a dealer near you. For more information on the QuickMail International Distributor network, call 515-224-1995, or fax us at 515-224-4534.

MW EDITORS' CHOICE

Improving your environment is our business.℠

CE SOFTWARE™

© 1992 CE Software, Inc P.O. Box 65580, West Des Moines, IA 50265, U.S.A. QuickMail is a trademark of CE Software, Inc. All other registered and unregistered trademarks are the sole property of their respective companies.

News

Back in Form

The much-heralded, never-arrived Mac-based electronic forms market suffered from a confused identity. Would electronic forms be a front end for databases? Or would office workers design forms, laser print them, and fill them out with a pen?

Neither, says Purup Electronics, which sells dedicated forms-design workstations. Its recently unbundled Mac software, FormsExpert, is aimed at skilled forms designers who create business forms for traditional printing methods.

To that end, FormsExpert's high-end features include support for tear-off stubs; designing in perforations, glue lines, and crop marks; making every edge of a box a different line weight; and pantographs (a repeated background pattern, commonly seen on checks). FormsExpert can rotate text to .01 of a degree, and choke and trap color separations.

FORMSEXPERT FORMS CAN HAVE SPROCKET HOLES AND BOXES WITH DIFFERENT TOP AND BOTTOM CORNERS.

FormsExpert costs $750 and is available only through service bureaus that own Purup imagesetters. Purup Electronics, 612/646-3388.—D.L.

STEVEN BLOCH

THE TEKTRONIX PHASER II PXE COLOR PRINTER CREATES POSTSCRIPT LEVEL 2 OUTPUT AT 300 DPI.

Low-Cost PostScript 2 Color Printer

Tektronix has broken new ground with its Phaser II PXe, a 300-dpi thermal-wax transfer printer that incorporates Adobe PostScript Level 2 and lists for $4995. It also includes Tek's TekColor PS version 2 color-matching software.

The networkable printer contains a parallel port, a serial port, and an AppleTalk port and works with Tektronix's new 4511A Ethernet adapter for TCP/IP networks. The Ethernet adapter lists for $1495 and is available now. The Phaser II PXe printer is also currently shipping. Tektronix, 503/682-7377.—T.M.

U.S. Robotics Enters Mac Market

Modem vendor U.S. Robotics has brought out its first Mac-specific products: a 2400-bps fax modem and a 14.4Kbps fax modem. Called the Sportster 2400 Mac&Fax and the Sportster 14,400 Mac&Fax, both support the 9600-bps Group III fax standard.

The Sportster 14,400 includes V.32bis at 14,400 bps, while the Sportster 2400 offers the same standard at 2400 bps. Both fax modems support delayed transmission and group broadcasting of faxes. The two devices come with a Mac-compatible cable, an RJ-11 phone cord, and FAXSTF software from STF Technologies. The $549 Sportster 14,400 and $329 Sportster 2400 fax modems should both begin shipping in the second quarter. U.S. Robotics, 708/982-5010.—T.M.

TOM GIBSON

THE SPORTSTER 14,400 MAC&FAX SUPPORTS DELAYED TRANSMISSION AND GROUP SENDING OF FAXES.

Darwin on a Disk

"We cannot speculate on man's position in . . . nature . . . while we keep his highest faculties out of our sight. Strip him of these faculties and he becomes entirely bestial." So said the outraged Reverend Adam Sedgwick in his review of Charles Darwin's *The Origin of Species*. Sedgwick's review can be found in Darwin, a $29.95 HyperCard stack, along with the reviews of Darwin's adherents and other critics. The stack includes Darwin's theories; the history of his life; the social, religious, and scientific context of his work in early nineteenth-century England; and an assessment of his works' impact in the twentieth century. Chariot Software, 619/298-0202.—ANN GARRISON

BUG REPORT

PowerBooks The PowerBook does not function correctly with MIDI instruments. Apple and other sources disagree over the cause—it may be a hardware problem affecting the serial port or a software problem.

AutoDoubler 1.0 through 1.03 Problems occur during background printing and with DiskExpress, AppleShare, and MPW (Macintosh Programmer's Workshop). Salient Software says patches for upgrading to 1.04 or 1.05 were sent to all registered owners and are available on request or from the online services.

Alarming Events 1.03 Incompatible with System 7 Tune-Up. Version 1.1 will be available free online or for $15 to owners who request it from CE Software.

Now Menus This module of Now Utilities 3.01 crashes when accessing an alias whose original file has been moved or deleted. Version 3.02 will be available free online or for $5 to owners who request it from Now Software.

MacInTax 1991 Problems with installation and crashes in some complex situations will be fixed in an upgrade that ChipSoft will send to all registered users at no charge. Version number not set at press time.

Symantec AntiVirus for Macintosh Versions 3.0 through 3.06 crash with QuickTime installed if file-sharing is enabled. Symantec is working on a free bug fix. Version number not set at press time.

MACWORLD WILL SEND YOU A BUG REPORT T-SHIRT IF YOU ARE THE FIRST PERSON TO INFORM US OF A SERIOUS, REPRODUCIBLE BUG THAT WE REPORT IN THIS COLUMN. SEE *HOW TO CONTACT MACWORLD*.

TREND

PSI Adds OCR to Fax Modems

PSI Integration has announced a pair of internal fax modems for the PowerBooks, and software that adds OCR capability to its own and other fax modems for Macs. The Group III–compatible fax modems are the PowerModem 96/96, which sends and receives data or faxes at 9600 bps, and the PowerModem 10/42, which sends and receives faxes at 9600 bps and data at 2400 bps. The $699 PowerModem 96/96 supports the V.42 and MNP Class 5 protocols; the $399 PowerModem 10/24 offers V.42, V.23, and MNP Class 10 support. The V.42bis protocol allows both the fax modems to effectively quadruple their data-transmission speed. The PowerModem 10/24 is shipping, while the PowerModem 96/96 should ship in May.

The OCR software, called FaxOCR, senses if text is received at 200 dpi by 200 dpi or at 200 dpi by 100 dpi. It converts the fax into a Mac file. FaxOCR requires an 030-based Mac running System 7. The list price for FaxOCR was not expected to exceed $199. It should ship in the second quarter. PSI, 408/559-8544.—T.M.

TelePort/FullFax

Think of it as the Macintosh of fax.

Everything you imagined a fax modem could be
From the hardware to the human interface, everything about TelePort/FullFax™ is as easy to use and productive as your Macintosh. Our powerful GlobalFax™ software adds FAX to the menu bar of all your applications, so sending a fax is a snap. TelePort/FullFax plugs into an ADB port like the mouse, freeing up your serial port. And there are no batteries or power supplies. It also doubles as an MNP5 error-correcting data modem.

Wake up your Macintosh
On an incoming fax call, TelePort/FullFax powers up your Macintosh II family computer to receive a fax. And your icon flashes to inform you that a fax has been received. You can forward a fax to other destinations, and even have all incoming faxes automatically printed.

One line for voice and fax
TelePort/FullFax eliminates the hassle and expense of separate phone lines. A built-in phone/fax switch lets you share a single line for both voice and fax calls.

Sophisticated software that makes life simple
GlobalFax software lets you schedule a fax for an optimum time, reschedule or change a destination, and send to multiple or group destinations. Create custom cover sheets and let the Macintosh complete them for you each time you fax. You can even "envelope" documents from multiple applications and send them in one fax.

Welcome to the Global Village
We brought you TelePort, MacUser's "Best Communications Product of the Year." The tradition continues with TelePort/FullFax and GlobalFax software. For the name of your local TelePort dealer, call **1-800-736-4821** today, Pacific time.

GLOBAL VILLAGE
COMMUNICATION

Circle 9 on reader service card

All product names are trademarks of their respective manufacturers.

This ad isn't big enough to show the whole Image Club Typeface Library. To see 200 more fonts, call for a free catalog

Why *you* should try *our* fonts.

Price!

Because with our ***"Buy one, get one free!"*** special, you won't find a better font value anywhere.

Quality!

Because we design our fonts to meet the high standards our customers need & expect. And of course, our fonts are all ***Type 1 PostScript®*** format, completely compatible with Adobe Type Manager.™ Using system 7.0 or ***Windows™ 3.1?*** Many of our fonts are available in ***TrueType™*** format as well.

Selection!

Because as PC Magazine (09/91) said, "If there's a typeface you haven't been able to find, chances are you didn't look in the Image Club Typeface Library." We have ***over 635 typefaces,*** and even more on the way. Whether you need fonts for your ***Macintosh® or IBM® PC*** system or even on CD ROM, you're sure to find them at Image Club.

Service!

Because we do anything to keep your business. And that means before, during & ***especially*** after you place your order.

Guarantee!

Because ***satisfaction is guaranteed,*** or your money back.

Order it today! Use it tomorrow!

1. To order, carefully select all the fonts you want. Complete font families only. Minimum order on this special offer is $100.*
2. Select the same value of ***fonts for free.**** Again, complete font families only.
3. Call our nation wide toll free order desk.

Call 1-(800)-661-9410

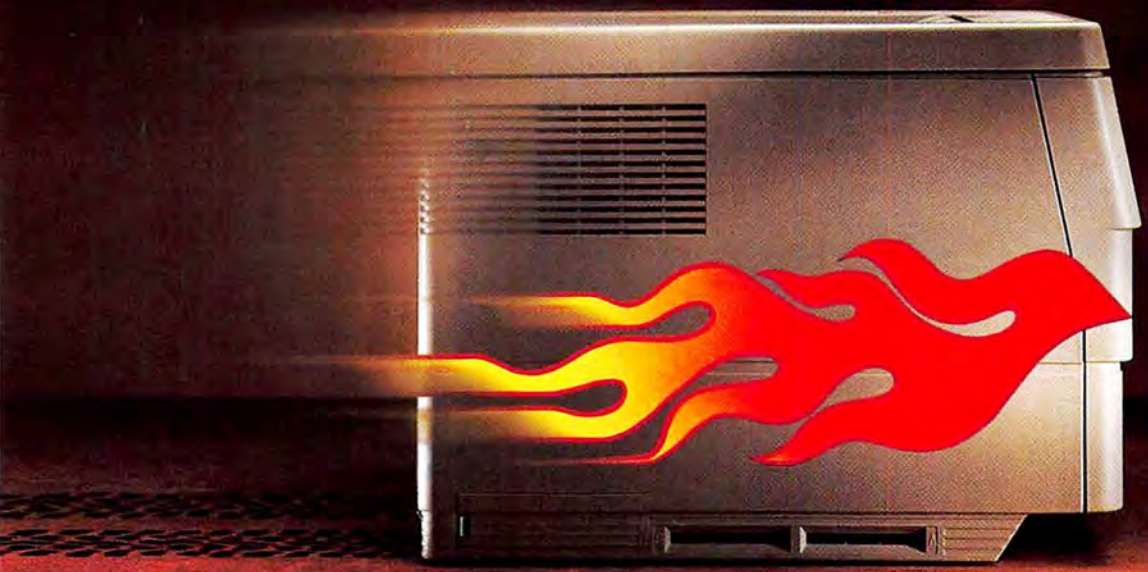
**Regular font orders have a minimum purchase of $50. Please add $9 for shipping and handling. The "Buy one, get one free" offer expires June 30, 1992.*

Act Now! LetterPress™ CD ROM Special!

The LetterPress is the ***entire*** Image Club Typeface Library. 635 fonts! And now, until May 31, 1992, you can purchase the LetterPress CD ROM System ***for only $1999.*** That's $2000 off the regular price! A mere $3 per font! Order the LetterPress today and have a type store on your desktop tommorrow.

Image Club Graphics, Inc.
Suite 5 - 1902 Eleventh Street Southeast
Calgary, Alberta, Canada T2G 3G2
Phone (403) 262 8008 / Fax (403) 261 7013
Applelink CDA0573 / Compuserve 72560,2323

Get Turbo-Charged



and get your chance to win!

Register for hot prizes in the Get Turbo-Charged Value Sweepstakes.

The Grand Prize includes the incredible new TI microLaser™ Turbo. PLUS...

Grand Prize winner also gets a choice between the TI TravelMate™ 3000 WinSX™ or Apple Macintosh IIsi® PLUS...

Over $2,000 worth of publishing software: Adobe® Illustrator™, Corel Draw® and Aldus® PageMaker®!

Now between April 1, and June 30, 1992, when you see your TI dealer for a demo of the new microLaser Turbo or microLaser XL Turbo, you can register in the Get Turbo-Charged Value Sweepstakes. There's no purchase necessary.

The lucky Grand Prize winner drives off with a TI microLaser Turbo printer and a choice of the hottest computers on the market – the award-winning TI TravelMate 3000 WinSX or the Apple Macintosh IIsi – together with three of the most popular desktop publishing software packages, Aldus PageMaker, Adobe Illustrator and Corel Draw.

Coming in second looks pretty hot, too. The Second Prize winner can choose between the TI TravelMate 3000 WinSX or the Apple Macintosh IIsi.

After your test drive, if you buy a TI microLaser Turbo or microLaser XL Turbo loaded with PostScript® software from Adobe, you'll get a coupon for a free copy of Adobe Type Manager™ (ATM) software and Adobe Garamond Font Package! That's a total retail value of $346 – you pay just a $7.50 shipping and handling charge. Proving that you're always a winner when you choose TI.

Your dealer has all the details on the Get Turbo-Charged Value Sweepstakes. So sprint in today to see the best value in super-fast PostScript printing race through graphics software faster than other printers. And get your chance to win.

For the name of your nearest TI dealer, dial:

1-800-527-3500

TEXAS INSTRUMENTS

POSTSCRIPT

The Grand Prize has an approximate retail value of $8,350. Second Prize has an approximate retail value of $4,000. Promotion will be supported by all participating dealers in the U.S. and Canada. Void in Quebec. Canadian residents must correctly answer a skill-testing question to win. In Ohio or Michigan, you may also call 1-800-527-3500 for an entry form. microLaser, TravelMate and WinSX are trademarks of Texas Instruments Incorporated. Apple Macintosh IIsi is a registered trademark of Apple Computer, Inc. Adobe, PostScript and the PostScript logo are registered trademarks and Adobe Type Manager and Adobe Illustrator are trademarks of Adobe Systems Incorporated. Aldus and PageMaker are registered trademarks of Aldus Corporation. Corel Draw is a property of Corel Systems Corporation.

© 1992 TI

71888

Circle 313 on reader service card

Robot Reader

TypeReader is a new omnifont optical character recognition package that publisher ExperVision claims is accurate enough for reading faxes, photocopies, and newspapers because it was developed to read 7000 kanji characters. The first version is for Latin-alphabet languages, with a kanji version to ship later.

TypeReader can scan, compress, and save a stack of pages and then perform recognition unattended or in the background (multiple documents are saved as separate files if a blank sheet is inserted between them during scanning). TypeReader recognizes tables as tables, not as columns, and saves them in tab-delimited format. TypeReader can differentiate between serif and sans serif fonts, and saves text in the correct size and style. It will list for $895. ExperVision, 408/428-9444.—D.L.

Patching Genes

Molecular biologists are piling up more and longer DNA sequences that create special database problems. A new Mac program called Sequencher looks like a convenient desktop solution to most of them.

One problem is linking the fragments of sequences found into genetically meaningful longer sequences. Sequencher can examine large sets of fragments to find overlapping regions, creating an on-screen genetic map of ways to stitch the fragments together to make a larger gene.

Sequencher also inspects sequences downloaded from GenBank and other large databases for contamination with the special small sequences that are used in the sequencing experiment. The program performs standard types of sequence manipulation with graphical views of gene maps and produces publication-ready output. Gene Codes, 313/769-7249.
—CHARLES SEITER

A SERIES OF DNA FRAGMENTS ALIGNED IN SEQUENCHER. RED INDICATES WHERE A BASE HAS BEEN CHANGED.

Copyright Database

How will copyright law apply when music, print, video, photos, and art are all mass-marketed in multimedia products? New York University's Interactive Telecommunications Program (ITP) has established a Copyright Division, headed by writer and lawyer Donna Demac, to follow these issues as they evolve. One project will be Rightsbase, a multimedia database of information about U.S. copyright law, case studies, and current developments. Samples of creative work in question will be included to clarify the issues. The database will be accessible via modem, and callers will be able to share information. Professor Demac is at 212/998-1882.—ANN GARRISON

JUST FOR FUN

Mister X

The angst-ridden underground comic book hero Mister X has escaped the confines of the printed page to find himself standing high above the city on a ledge of a building, with the wind blowing his tie, and with eerie voice-over narration and a voice of his own. On this CD ROM disk, every page of one Mister X issue has become a set of animated frames, scanned in from the original comic book artwork, and with stereo sound added. If you prefer your Mister X in Japanese, you can start up the CD ROM so that it shows Japanese subtitles. The software requires a Mac II, a CD ROM player, System 6.0, and 4MB of RAM. $29.95 from Educorp, 619/536-9999.
—CAROLYN BICKFORD

WARD SCHUMAKER

TREND

Low-Cost Landslide

As Apple expands its selection of less-expensive Macs, software vendors are pricing products to match. Softsync has announced a line of under-$50 products (see *MacBulletin*, April 1992); Claris dropped the price on MacWrite II to $129 from $249 (Claris has not decided if MacWrite II will survive after MacWrite Pro ships); and Paragon Concepts shipped the powerful Nisus Compact for $150 (see *Macworld News*, May 1991). Now WordPerfect Corporation is releasing the $199 LetterPerfect, which is much like WordPerfect without macros, drawing tools, and a few other pieces; and newcomer Nest Software is developing the $149 MacQuill, which combines a word processor mode with a page-layout mode. Claris, 408/727-8227; Nest Software, 408/441-1944; Paragon Concepts, 619/481-1477; Softsync, 305/444-0080; WordPerfect, 801/222-1000.—D.L.

Intelligent Vision

If you need to find a needle in a haystack, the Adaptive Learning Image Analysis System (ALIAS —no relation to the 3-D vendor Alias Research) might be able to find it. ALIAS is a shell for developing image-analysis applications for such tasks as making change machines able to distinguish photocopied bills, analyzing print jobs as they come off a press to look for smeared ink, and detecting vehicles in aerial photos of a desert. Once you train a system, its database and knowledge can be moved to other devices.

News

CAN YOU DISTINGUISH TANKS FROM ROCKS IN THIS AERIAL PHOTO? HINT: THE TANKS ARE ON THE ROADS.

ALIAS runs on Pacific Parallel's coprocessor boards (see *Macworld News*, March 1992). Source code is available for other platforms. Cost depends on application. Alias, 703/313-9520.—D.L.

Technology Tepee

Does TV compel us to shop? Are we trapped by technology beyond our control? Recent visitors to San Francisco's Anon Salon discussed these questions on TPTV, a QuickTime video bulletin board set up inside a tepee. In TPTV's main window they saw text and animations based on Jerry Mander's new book, *In the Absence of the Sacred*, and a camera recorded their comments as QuickTime movies for later users. The bulletin board was created by multimedia artists and producers Abbe Don, Mark Petrakis, and Nick West, and interface designer Mitch Yawitz, a member of Apple's QuickTime team. Nick West is at 415/775-7089.
—ANN GARRISON

TPTV WATCHERS' COMMENTS ARE STORED AS QUICKTIME MOVIES; JUST CLICK TO HEAR WHAT THEY SAID.

If there were a printer that could give you this kind of color, would you still make your presentations in black and white?

Do your business presentations go in one eye and out the other? The Colormate™ PS can easily and affordably give them the impact they deserve. Enhancing your work with truly amazing color, from brilliant primaries to soft pastels. All Pantone® approved.

The Colormate PS integrates readily with any network, PC or Mac. And it's compatible with most popular business presentation and graphics software. Of course, Adobe® PostScript® is standard. The Colormate PS comes in two models—the economical Model 40 with 4MB of memory and 17 resident fonts, and the fully featured Model 80 with 8MB of memory and 35 resident fonts. Both feature reliable 300 DPI thermal transfer technology.

For your free Color Presentations Guide and more information, call 1-800-NEC-INFO. Or call NEC FastFacts, 1-800-366-0476, document #26567, for info via fax.

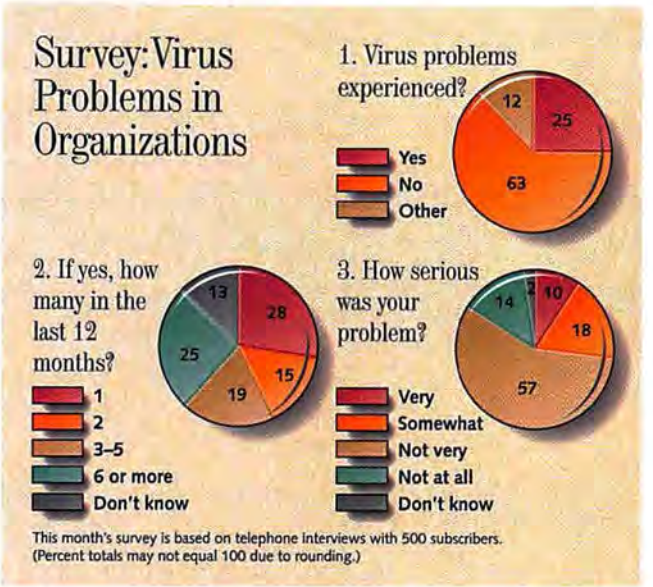
After all, the world isn't black and white, why should your presentations be?

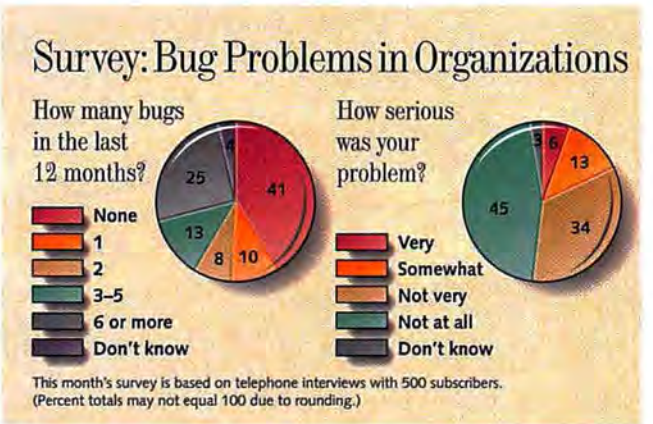
© 1992 NEC Technologies, Inc. Colormate is a trademark of NEC Corporation.
Adobe and PostScript are registered trademarks of Adobe Systems, Inc.
Macintosh is a registered trademark of Apple Computer Inc.
Pantone is a registered trademark of Pantone, Inc.

C&C Computers and Communications

NEC

Circle 180 on reader service card

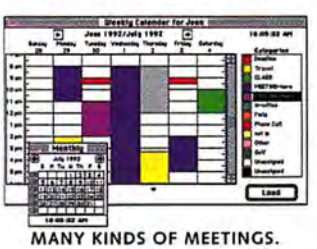




Office Talk

Cornice Software's Officemaster adds a new twist to contact management and work planning. A user can link a contact history with a reminder to call someone, or link a scheduled meeting with notes on previous meetings. Using the program's built-in messaging, someone in a networked group sharing an Officemaster system could send out a meeting reminder linked with minutes from previous meetings on the same topic.

Officemaster lacks gateways to full-featured E-mail packages, which Cornice expects Apple's Open Collaboration Environment to provide. Future plans also call for a project-management add-on, proxy support (that is, letting an assistant manage someone's schedule), and remote-access capability. Officemaster lists for $179 for one user, $1299 for five, and $1799 for ten. Cornice Software, 714/985-8323.—D.L.



MANY KINDS OF MEETINGS. OFFICEMASTER CAN DISPLAY A MONTH VIEW AND A WEEK VIEW SIDE BY SIDE.

Cartridge Adds PostScript Level 2 to LaserJets

Hewlett-Packard has begun shipping the HP LaserJet PostScript Cartridge Plus, which adds Adobe PostScript Level 2 to HP's popular LaserJet III, LaserJet IIIP, and LaserJet IIID printers. The cartridge supports automatic language switching between PostScript and HP's PCL 5, the widespread printer language for DOS machines. PostScript Level 2 also provides compression for faster data transmission, and other speed improvements.

The HP LaserJet PostScript Cartridge Plus has a suggested list price of $695. It requires at least 2MB of RAM in the printer. HP has also cut the price of its existing PostScript Level 1 cartridge from $695 to $495. Hewlett-Packard, 800/752-0900, 503/750-5856 for upgrades.—T.M.

ROBERT HOLMGREN

HIGH TECH CENTER INSTRUCTOR ALICE ROSE (TOP) WITH STUDENTS JENNIE SILVA AND CHARLES WILSON.

High-Tech Help

Angela Horne entered college never having written an essay, because of a learning disability which had her struggling just to arrange words on paper. An otherwise apt 18-year-old, Horne wrote her first essay on a Mac using grammar and spelling checkers—and with help from Alice Rose, an instructor at the High Tech Center at De Anza College in Cupertino, California. The center uses computers to assist disabled students, but its main mission is to train faculty from California's community colleges to do the same. With their help, the visually impaired learn to use software that makes visual interfaces audible, students with reading difficulties learn to use software that isolates text into comprehensible units, and students with physical disabilities learn to enter data with Morse code—faster than touch typists. The High Tech Center is at 408/996-4636.

—ANN GARRISON

News

BETA WAIT

Long-awaited products

Acius's 4D Server
Shown publicly January 1991. Current ship date projected: spring 1992 in France, three months later in United States.

FoxPro/Mac
Discussed publicly winter 1990/91; Fox says will go to beta soon, no ship date projected.

Interleaf 5
Discussed publicly October 1990. Current ship date projected: summer 1992.

Claris's MacWrite Pro
Announced spring 1991. Current ship date projected: late summer 1992.

AEC's FilePower
Announced August 1991; planned to ship winter 1991/92. Current ship date projected: summer 1992.

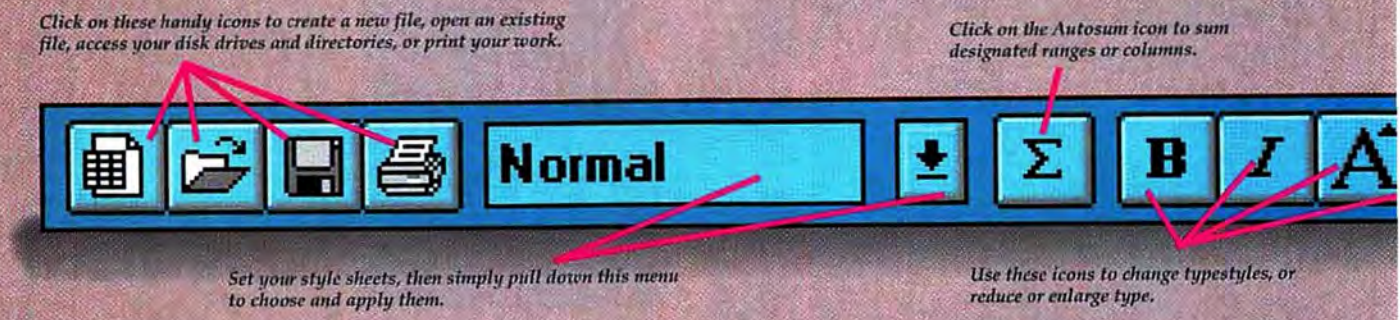
Alysis's SuperDisk 2.0
Original ship date: September 1991. Current ship date projected: early spring 1992.

Atto Ships SCSI-2 Board

Atto Technology is now offering the SiliconExpress II, a NuBus board that supports data transfers up to 10MB per second when used with SCSI-2 storage devices. Acting as a bus master, the SiliconExpress II gets around the NuBus/CPU bottleneck, freeing the CPU. The Silicon Express II also supports Block Transfer Mode on the Quadras for faster, burst data transmission. The board links to seven SCSI drives in addition to the Mac's support for seven SCSI devices. More than one SiliconExpress II can be used to support many drives.

The SiliconExpress II has a list price of $1295. Atto, 716/688-4259.—T.M.

Microsoft Excel 4.0 – See

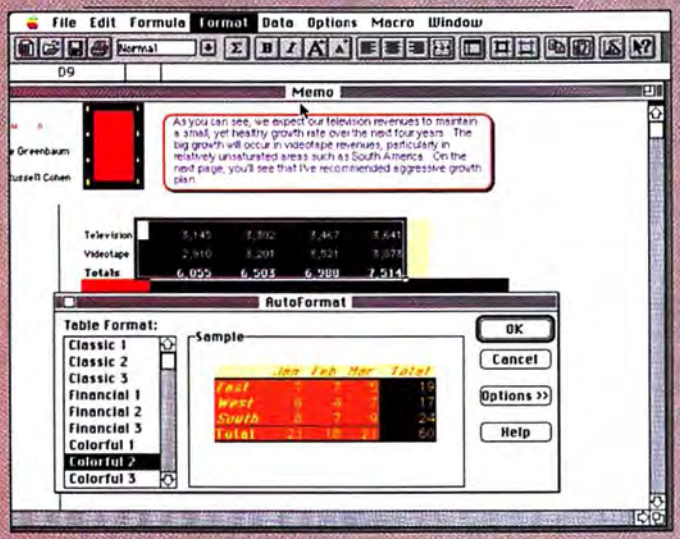


Microsoft Excel for the Macintosh just got even better. The new version 4.0 adds to this already incredible program by giving you more powerful features that make everyday spreadsheet tasks easier than ever. Even more important, Excel 4.0 offers a whole new wealth of built-in intelligence features. So Excel can actually anticipate the kind of information you'll want, and then present it to you. And Excel 4.0 is designed to share information with other kinds of documents, and even across platforms. And that's just for starters!

A whole new level of easy.

Believe it or not, you can actually create a spreadsheet in just about 60 seconds with Microsoft Excel 4.0. New intuitive features replace the long, steep learning curve with quick and powerful commands that have you up and running in a flash!

- *Use Excel's customizable* ***Toolbar*** *for one-step, on-screen access to the commands you most frequently use.*
- ***Autosum*** *lets you sum designated ranges or columns with a simple double-click.*
- ***Autofill*** *recognizes trends in your data, and extends them as far as you'd like.*
- ***Shortcut menus*** *pop up to give you instant access to common, context-sensitive commands.*
- ***Best Fit*** *automatically resizes columns to accommodate the widest entry.*
- *And the incredible new* ***Wizards*** *are always watching and waiting in the background, ready to guide you step-by-step through any complex task.*



Autoformat lets you choose from 16 attractive, professionally-designed formats. Then apply the format you select to your worksheet with just a single mouse click.

Powerful analytical tools put you in touch with your data.

Microsoft has added a host of new analysis tools to Excel 4.0, giving you entirely new ways to view and analyze your data.

- *Use the* ***Crosstabs*** *feature to create crosstab tables based on database entries that you can sort by any criteria.*
- *Store related worksheets together in a single file with* ***Workbooks****.*
- ***Consolidate*** *data from multiple worksheets, regardless of formatting, file type, or file location.*
- *The* ***Analysis ToolPak*** *includes the most extensive set of financial, statistical, engineering, and scientific tools that you will find in any spreadsheet.*
- ***Outlining*** *lets you expand or collapse your worksheet to view the desired level of detail.*
- *Plus the extraordinary* ***Scenario Manager****, which lets you create and save multiple "what if" scenarios and create a summary of these scenarios in just minutes.*

Improved graphics tools and presentation support

Excel 4.0 gives you even greater control over how your finished documents will look. It provides everything you need to create dazzling reports, complete with charts, graphs, and notes or annotations.

- ***Autoformat*** *gives you one-step access to 16 professionally designed spreadsheet formats.*
- ***Report Manager*** *lets you merge different sections of different spreadsheets to produce customized reports that you design.*

how easy power can be!

Your choice of alignment options — left, right or centered — are only a mouse-click away.

Click on this icon and your selected data will be copied right to the Windows clipboard.

Choose this icon, and you'll have a whole range of charting features at your disposal.

These formatting tools make it easy to add bars, outlines, underlines or borders anywhere on your spreadsheet.

Switch back and forth between spreadsheets with a simple mouse click here.

To access Excel's context-sensitive, on-line help, just double-click on this icon from wherever you are in the program.

Discover for yourself how easy spreadsheet power can be. Order Microsoft Excel 4.0 today!

Microsoft Excel 4.0

BUS0223
Publisher: Microsoft
Suggested Retail: ~~$495~~ **$295**

System requirements: 1 MB RAM (2 MB for System 7.0); hard disk drive; Finder 6.1 or later; System 6.0.2 or later.

- ***Charting** lets you choose from over 90 chart options, including 3-D surface charts, wire charts, and radar charts.*
- ***Drawing** tools make it easy to highlight and annotate your spreadsheets and graphs with arrows, ovals, arcs, or rectangles, — all in one easy step.*
- *Use the built-in **Spelling Checker** to ensure that all your presentations and reports are letter perfect.*

Smooth transition from Lotus 1-2-3

Excel's Custom Help for Lotus 1-2-3 lets you use your familiar 1-2-3 commands right within Excel. Excel will demonstrate its equivalent command, so you can learn as you work. Lotus files and macros can be imported right into Excel, and the program supports all Lotus file formats, so it's easy to convert your documents. Plus, there's a helpful, on-line tutorial for 1-2-3 users who want to switch without a fight.

Microsoft Excel 4.0 Upgrade for only $99!

Upgrade and SAVE!

If you're using a previous version of Excel, you can upgrade to Excel 4.0 at substantial savings off the regular price! To qualify, just mail or fax us the title page of your user manual, or the original program disk.

Microsoft Excel Live Upgrade

Qualifying products are any previous versions of Microsoft Excel. Offer expires 9/30/92. Note: if you purchased Microsoft Excel 3.0 after 2/15/92, the upgrade to version 4.0 is free, direct from Microsoft.

UPG0010 ..... **$99**

To order, call MacWarehouse at 1-800-255-6227

MWF2E

Mac WAREHOUSE

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.

OVERNIGHT DELIVERY ONLY $3.00

NEW VERSION!

The Norton Utilities for Macintosh 2.0

❼ The Norton Utilities for Macintosh 2.0 combines and enhances the features from two award winning products: SUM II and Norton Utilities. The combination of these two products results in the first Macintosh utility software package to offer fully integrated advanced disk repair & recovery, automatic backup, data security, productivity tools and system enhancements in one informative, easy-to-use product. This unbeatable combination allows you to protect valuable data and make day-to-day functions a breeze. Whether working on your Macintosh at home or while networked into a corporate-wide system..if you own a hard drive, the Norton Utilities for Macintosh 2.0 is the product for you. **Publisher: Symantec UTI0151**

$99

FileGuard 2.7

★★★★★

❼ "It's sleek, fast, and safe. I highly recommend it." MacUser April 1991. Protect your Hard Drives and Partitions from unauthorized access (including security bypass with a system diskette), copying and erasure; Applications and File/Folders (including system folder) from unauthorized access, deletion, and/or illegal copying; Desktop (including system folder) from alterations by unauthorized user; Keep an eye on System Usage with the system users log which continuously tracks user/group activity. System 7 compatible.
Publisher: ASD Software

Single User **UTI0135** **$139**

Lotus 1-2-3 For Macintosh

❼ At last, a 1-2-3 spreadsheet that is designed exclusively for the Macintosh computer. 1-2-3 for Macintosh takes full advantage of the rich graphical environment of Macintosh while delivering significant new spreadsheet features. And of course it's compatible with other new versions of 1-2-3 and Excel. A whole new kind of 1-2-3 created expressly for Macintosh. The result is a rich design that makes even the most complex spreadsheet tasks easy. 1-2-3 for Macintosh sets a new standard for what a Macintosh spreadsheet should be. System requirements, any Macintosh with a hard disk. 2MB RAM under System 6 or later. 3 MB RAM under 7. **Publisher: Lotus Development BUS0188**

$349

Init Manager 1.1 or Thunder 7 1.0.5

Init Manager 1.1
❼ Full featured INIT control utility permits auto-disabling of crashing INITs, scanning and detection, on/off selection, ordering, grouping functions and more. Also shipped with a powerful system analyzer design to generate detailed diagnostic system reports. (CDEV) **UTI0187 $34.**

Thunder 7 1.0.5 ❼ Interactive spelling checker and thesaurus designed to provide a single dictionary to reduce disk space for all your applications and desk accessories. Complete with auto-correction glossary, search and replace, look-up thesaurus and readability analysis capabilities. (CDEV)
Publisher: Baseline SPL0029

$56

WristSaver/ WristSaver MousePad

The WristSaver cradles your wrist with a contoured neoprene rubber pad and a nylon covering. It's ergonomically designed to support your wrist at the proper angle to help avoid the pain associated with Carpal Tunnel Syndrome. The WristSaver MousePad provides a comfortable rest for your wrist, plus a conventional mouse pad. Simple finger movements replace sliding the entire arm or hand.
Manufacturer: LB Innovators
WristSaverMousePad **ACC0635 $15.**
WristSaver **ACC0560 $15.**
Bundle **BND0033**
(Available in Gray, Black, Red or Navy)

$25

Software Bridge/Mac 2.0.1

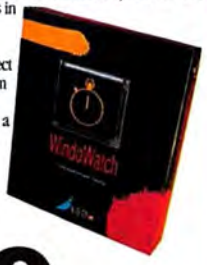
❼ Macintosh users translate between over 30 different Mac and PC word processing formats for over 800 possible translation paths. DOS to Mac translation is invisible: simply insert a DOS disk into a Mac SuperDrive, double-click on a DOS document, and Software Bridge automatically loads identifies, translates and launches it into your Mac format, ready to edit! Uses the Document Manager for one-step Mac to DOS, Mac to Mac, and DOS to DOS translation. Also translate files located on external DOS disk drives or file servers. "It's strongest in the field of reliable DOS-to-Mac conversions of complex documents" (MacWeek 11/6/90). Includes MountPC to access DOS disks from the Mac's Superdrive as if they were Mac disks.
Publisher: Argosy Software, Inc. COM0099

$99

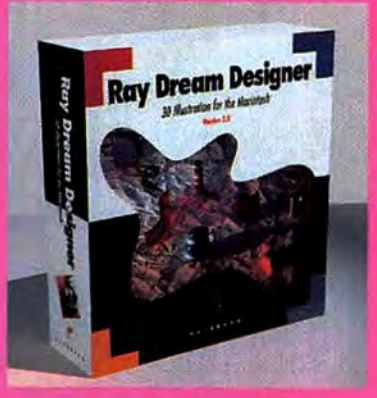
NEW

WindoWatch 1.52

❼ Track the hours you spend on a project with WindoWatch. It's a must for professionals who bill their services by the hour (or minute). WindoWatch operates in the background, automatically generating a timesheet as you work. Use WindoWatch to collect and merge timesheets from team members over the network or export timesheet information to a spreadsheet. Don't miss any opportunity to accurately bill your clients. After all, time is money. **Publisher: ASD Software UTI0264**



Single User **$89**



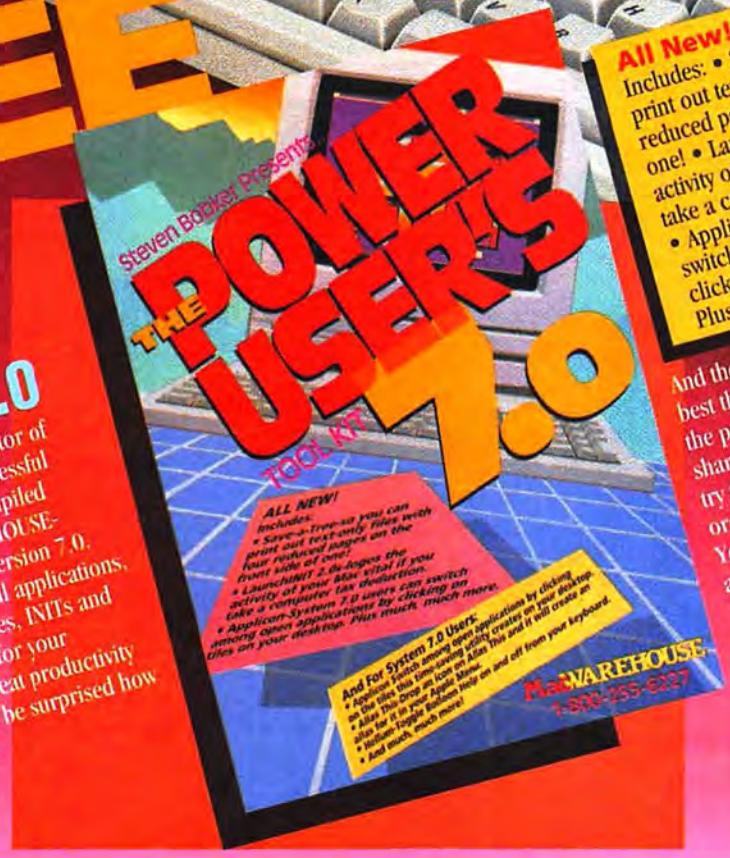
Ray Dream Designer 2.0

❼ You don't have to settle for flat illustrations and designs any longer. Ray Dream Designer's drawing and text tools, for creating lines, circles, ellipses, polygons, Beziers, colors and shadings, are virtually the same as those in most 2D illustration programs. The only difference is, now your objects have the realistic look of three dimensions. Wrap them around an object or text for instant dimension. Comes with a library of 3D solid textures you can use as-is or customize. Lightning, shadows, transparency, reflections and, best of all, perspective are all handled automatically. Requires: Mac II family with coprocessor, 32-bit QuickDraw; 4MB RAM and hard drive. **Publisher: Ray Dream GRA0292**

$589

FREE POWER USERS TOOL KIT 7.0

If you're not already a collector of Steven Bobker's highly successful Power User's Tool Kit -compiled exclusively for MacWAREHOUSE- you'll want to start with version 7.0. It's stuffed with ten useful applications, utilities, desk accessories, INITs and System 7.0 extensions for your Macintosh. They're great productivity enhancers and you'll be surprised how easy they are to use.



All New! Includes: • Save-a-Tree- so you can print out text-only files with four reduced pages on the front side of one! • LaunchINIT 2.0s - logs the activity of your Mac - vital if you take a computer tax deduction. • Applicon - System 7.0 users can switch among open applications by clicking on tiles on your desktop. Plus much, much more.

And the best thing is, the programs are shareware so you can try them FREE when you order from MacWAREHOUSE. You pay only $1.50 shipping and handling if you want the disk. If you wish to continue using the software, some authors ask that you pay a small fee ($5-$25). All the details are explained on the disk, which is yours to keep. Please remember to ask for item # AAA 0013 when you order.

White Knight V.11

❼ The perfect low-cost solution to almost any Mac telecommunicator's needs. Offers the kind of power associated with products costing hundreds of dollars more, but is easier to learn and more flexible. 270+ page user manual is geared to all levels of experience. Winner of 11 awards including MacWorld's World Class Software Award 1987-1991.
Publisher: FreeSoft
COM0060

$85

RésumExpert

❼ Create job-winning résumés quickly with RésumExpert. Ten editions available by profession. Each edition features 40+ professionally written and fully-formatted Microsoft Word résumé templates. Simple to use- just select a template and substitute your personal information. MacUser 10/89 awarded RésumExpert 4 mice and raved about its "excellent" manual and writing tips. Also rated a top 200 software program by MacUser 12/89. Requires MS Word. System 7 compatible.
Publisher: A Lasting Impression
BUS0087

$49ea.

Aldus SuperPaint or Aldus Gallery Effects*

Aldus SuperPaint 3.0
❼ Five time winner of MacWorld magazine's World Class Award, new Aldus SuperPaint combines painting, drawing, and image enhancement, and includes 1 thru 24 bit color, textures, gradients, and EPS graphics. **GRA0112 $133.**
Aldus Gallery Effects **❼ 1991 MacUser's Editors' Choice Award for Best Visual Resource.** Aldus Gallery Effects automatically transforms grayscale and color bitmap images into stunning, sophisticated art, with 16 master effects including Graphic Pen, Watercolor, and Charcoal. Works directly within programs like SuperPaint and PhotoShop, or as an application or DA.
Publisher: Aldus
GRA0279

$129*

NEW

FaxMania Business Fax Cover Sheets

❼ FaxMania Business Fax Cover Sheets is an imaginative collection of 80 fax cover sheets designed for business, home, and fun. Send a Birthday fax and much more. The categories include: Meetings, Finances, Announcements, Ecology, International, Reminders, Invitations, Sports, Travel and more. The fax cover sheets are provided in word processing formats. The formats for the Macintosh include: WriteNow, MacPaint, MacWrite and MS Word. They can be edited, sent electronically or printed and used as paper faxes. **Publisher: T/Maker GRA0317**

$29

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 MWF2
Free MacWAREHOUSE Catalog Subscription
1690 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)

OVERNIGHT DELIVERY ONLY $3.00
1-800-255-6227

Mac WAREHOUSE

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.

Tiles•the Intelligent Desktop™

Nominated for MacUser's Editors Choice Award for Utility of the Year, Tiles puts everything you need at your fingertips! Whether you work with one file at a time or with several programs at once, you'll love Tiles. Set Tiles to create a single Tile for the project you're on. Later, when you need to get back to work, just click the Tile. Tiles automatically tracks and organizes what you need, from your favorite files and programs to entire projects. You can even use Tiles to launch your QuicKeys with a single click! **UTI0213**

$69

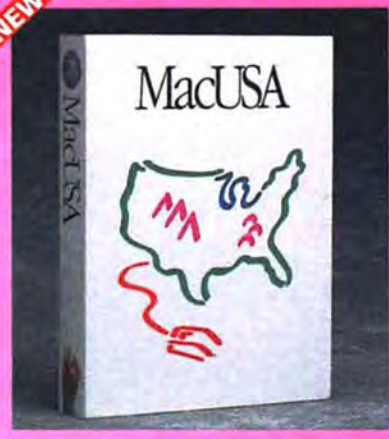
From QuicKeys™ and DiskTop™ adding power to your desktop, to QuickMail™, helping you to communicate regardless of platform. We can help you do whatever you do, *better.* How do we know this? Simple.

Improving your environment is our business™.

Publisher:

CE SOFTWARE INC

NEW



MacUSA

Every Mac user who wants fast, accurate information on the 50 states and Puerto Rico, coupled with superb maps and graphics, will love MacUSA. Provides you with an instant profile of each state that includes: city locations, elevations and natural features; demographic, economic, political, climate and health data; state history, tourist attractions, and time zones; state flags and entire state songs; simple print and export capabilities. For students, travelers, business people, and those who just want to know more about the United States. MacPlus or later model computers with System 6.0.4 or later.
Publisher: PC Globe GRA0246

$39

SEPTEMBER 17, 1991 SCORE CARD MacWEEK POWERCACHE "EXCELLENT" OVERALL VALUE

WINNER MacWEEK 1991

Universal PowerCache

When you feel the need for speed, the award-winning PowerCache gives you the best combination of blazing-fast speeds (up to three times faster) and cost-effective prices. More important, it's guaranteed 100% compatible with ALL your software and hardware, while running at full speed. The same board fits seven different Macs (adapter required for non-IIci installations). **Manufacturer: DayStar Digital**
40MHz w/out 68882

$949

Run PC/Network

Connect any one of 10 Macs to a PC via modem or AppleTalk network to control virtually any DOS program. Run programs at full speed, access VGA graphics, extended/expanded memory and PC peripherals. Copy and paste text or graphics between programs, print DOS files onto your Mac printer. Transfer files, translate documents in either direction and mount DOS disks using included Software Bridge/Mac.
Publisher: Argosy Software, Inc.
COM0098

$279

Puzzle Master

Solve crossword puzzles, or create your own. Includes 250 of The New York Times® classic puzzles, 200 daily puzzles and 50 Sunday puzzles. Built-in timer and scoring system. **ENT0383 $29.**

Canis

A new educational/reference program for current and prospective dog owners. Includes breed selection, health care, nutrition, and dazzling color pictures. **ENT0384 $25.**

Casino Master

Offers all the fun of playing the odds in Las Vegas without the risks. Simulates the five most popular casino games: Blackjack, Craps, Roulette, Poker, and Baccarat. **Publisher: Centron Software**
Deluxe Color Version
ENT0289 $45
Standard Version **ENT0277**

$39

DiskFit Pro

For Finder-readable backup to floppies, cartridge or other hard disks, get DiskFit Pro. DiskFit Pro copies files from a hard disk to a "SmartSet" of floppies, and then updates the "SmartSet" with each subsequent backup. By replacing only the obsolete files in the backup set, DiskFit Pro keeps your SmartSet from growing every time you backup. Backups stay fast and backup sets compact. And since files are stored in Finder format, a click and drag is all it takes to restore files directly from the backup. System 6 compatible, System 7 sawy. Don't leave your data at risk, backup with DiskFit Pro. **Publisher: Dantz Development UTI0246**

$74

NEW

ExpertColor Paint™

ExpertColor Paint is a simple to use yet powerful color paint program with many extras including 32-bit color, image editing and multiple undo's. By using a vast array of painting tools, you can create great looking art. You won't believe how easy the customizable tools make painting. There are multiple adjustable paint brushes, spray paint, paint cans and more to help create sophisticated art or touch up existing pictures. It's like having a fully equipped art studio at your disposal. Offers advanced image editing features like blur and sharpening filters and includes a free bonus clip art disk ($24.95 value). **Publisher: Softsync, Inc. GRA0318**

$29

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.

ORDER UNTIL MIDNIGHT(EST) FOR OVERNIGHT DELIVERY

MacPrint 1.3

Use a Macintosh with non-Apple printers. Print Mac applications on HP Laserjet, Deskjet or compatible printers including all Series IIs, IIIs and the Deskjet 500. Prints text and graphics at the printer's maximum resolution. Does not require PostScript. Cable is included. **Publisher: Insight Development UTI0098**

$95

BeagleWorks

With the introduction of BeagleWorks, the true meaning of integrated software has finally been defined. BeagleWorks includes seven modules so fully integrated you can easily access the Word Processor, Database, Spreadsheet, Chart, Paint, Draw and Communications modules from anywhere in the program. Exclusive to BeagleWorks is a revolutionary technology called In-Context Editing™. This gives you the ability to access or create an item from one file without having to leave the module in which you are currently working. The word processor features irregular text wrap, multiple columns anywhere on the page. The spreadsheet boasts an automatic sum tool, as well as in-cell editing. And 256 custom colors are featured in all the modules except communications. **Publisher: Beagle Brothers BUS0189**

$185

Active Memory 2.0

Turn your PowerBook into a power organizer with Active Memory! When traveling, manage info like sales leads, field results or travel expenses. Enter data your way in a free-form Info field. Once back at headquarters, remind networked co-workers about upcoming deadlines. Import contact lists and setup reminders to call them. For daytimers, use Active Memory to print your things-to-do list or travel itinerary. Make it easier to manage your data in the office or on the road. **Publisher: ASD Software BUS0207**

$125

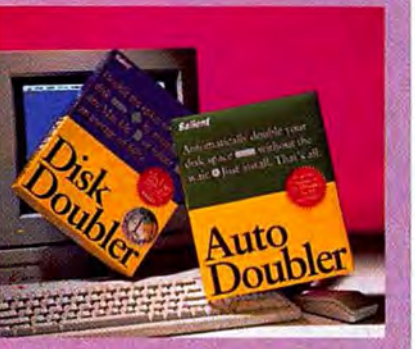
Star Trek Sound Clips

Enliven your next presentation with these official digital Star Trek Sound Clips. Both volumes include sound effects, music cues, and dialog from Star Trek the Original Television Series. Now, you can slyly slip in the Transporter sound effect for a slide dissolve, or zap the Klingon competition with a phaser blast. They work with most desktop presentation and multimedia applications. The clips also work with SoundMaster (included) to replace those boring Mac System beeps with your favorite Star Trek sounds. **Publisher: Sound Source**

Unlimited Vol.1: The logical Collection **ENT0418 $29.**

Vol. II: The Final Frontier **ENT0419**

$29



AutoDoubler

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. **UTI0254 $49.**

DiskDoubler 3.7

DiskDoubler 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: Salient UTI0179**

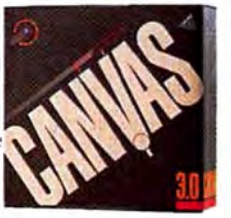
$49

ULTRA 9600 Bundle

Hayes top Performer... The Hayes ULTRA 96 comes with the award winning Smartcom II for the Macintosh software, RS232 cables, and HayesConnect software. ULTRA 96 practically operates without you! Automatic Feature Negotiation creates the best combination of speed, error-control, and data compression whenever you use your ULTRA modem. It achieves 100% error-control using both the V.42 standard and MNP 2-5 protocols, and 4 to 1 data compression for 38,400 bps throughput with V.42bis. HayesConnect allows users to share modems or other serial devices such as plotters or printers across and AppleTalk network. **Manufacturer: Hayes MOD0065**

$749

Canvas 3



Canvas 3 is fast, powerful, easy to learn and provides all the tools you'll need to create and print professional quality color or monochrome graphics. Use in a wide range of design projects including desktop publishing, technical illustration, design graphics, architectural rendering, engineering drawing, presentations, multimedia and general business graphics. Canvas 3 offers unparalleled productivity. Create illustrations from scratch with our new freehand tool, or scan existing artwork and let Canvas auto trace its outlines for you. System 7 Savvy! ***1991 MacUser Editor's Choice Award.*** **Publisher: Deneba Software GRA0280**

$249

Accountant, Inc. 3.0

"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. You only have to enter information once. 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

Mac WAREHOUSE

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

Fuji
BND0077 MF2DD 100PK ..... 59.
BND0076 MF2HD 50PK ..... 59.
I/O Design, Inc.
ACC0528 Ultimate Classic SE Carrying Case ..... 65.
ACC0665 Notebook EX Carrying Case ..... 75.
LB Innovators
BND0033 WristSaver/MousePad Bundle-Red ..... 25.
Targus, Ltd.
ACC0252 MacPlus/SE Carry Case (black) ..... 59.
ACC0675 Universal Notebook Case ..... 69.

BUSINESS & PRESENTATION

Amaze!nc
❶BUS0221 Cathy Daily Planner ..... 39.
Ark Interface
❶BUS0220 WorkSpace ..... 89.
ASD
❶BUS0207 Active Memory 2.0 ..... 125.
After Hours Software
❶DAT0076 TouchBASE 2.0 ..... 79.
A Lasting Impression
❶ResumExpert: Word 30/4.0 version, Cover Letters, Manager, Sales & Marketing, Students, Computer Science & Engineering, Financing & Banking ..... ea.49.
Aldus
❶BUS0066 Persuasion 2.1 ..... 325.
Attain
❶BUS0211 IN CONTROL 1.0 ..... 95.
Beagle Brothers
❶BUS0189 BeagleWorks ..... 185.
❶SID0006 BeagleWorks Competitive Upgrade ..... 95.
CE Software
❶GRA0070 CalendarMaker 3.0 ..... 31.
Chena Software
❶BUS0208 Fair Witness 1.1 ..... 315.
Claris
❶BUS0201 ClarisWorks ..... 209.
❶SID0002 ClarisWorks Trade-up ..... 99.
❶DAT0064 FileMaker Pro ..... 205.
❶UPG0005 FileMaker Pro Upgrade ..... 99.
❶BUS0058 MacProject II 2.5 ..... 345.
❶BUS0178 Resolve ..... SPECIAL 175.
❶SID0003 Resolve Trade-up ..... 99.
❶BUS0065 SmartForm Designer ..... 289.
Data Description
❶STA0012 Data Desk 3.0 ..... 459.
JAM Software
❶DAC0033 Smart Alarms 3.1(1-4 users) ..... 125.
Kaetron
BUS0218 FlowChart Express ..... 93.
Lotus Development Corporation
❶BUS0188 Lotus 1-2-3 for Macintosh ..... 349.
❶SID0004 Lotus 1-2-3 Competitive Upgrade ..... 89.
Meca
❶FIN0039 A. Tobias' Managing Your Money 4.0 ... Call
Microsoft
❶BUS0223 Microsoft Excel 4.0 ..... 295.
❶UPG0010 Microsoft Excel 4.0 Upgrade ..... 99.
❶BUS0008 Microsoft PowerPoint 2.01 ..... 245.
❶BUS0181 Microsoft Project 1.1 ..... 445.
❶BUS0186 Microsoft Schedule+ 5 Pack ..... 125.
❶BUS0014 Microsoft Works 2.0 ..... 155.
❶BUS0088 The Microsoft Office 2.0 ..... 475.
Now Software
❶BUS0212 Now Up to Date-single ..... 65.
Pastel Development
❶BUS0199 DayMaker ..... 65.
Power Up
❶BUS0153 Address Book Plus 2.0 ..... 63.
❶BUS0073 Calendar Creator ..... 44.
Reality Technologies
❶FIN0068 WealthBuilder (Mac) ..... 95.
Round Lake Publishing
❶Legal LetterWorks or Sales ..... ea. 45.
❶BOK0007 LetterWorks ..... 45.
Softsync Publishing
❶FIN0048 Accountant, Inc. 3.0 ..... 335.
Symantec Corporation
❶BUS0217 GreatWorks 2.0 ..... 199.
❶SID0001 GreatWorks Sidegrade 2.0 ..... 85.
❶BUS0055 More 3.1 ..... 265.
Synergy
STA0018 Kaleidagraph 2.1 ..... 149.
Teleware, Inc.
❶FIN0087 M.Y.O.B. 3.0 ..... 139.
Timeslips
❶BUS0043 Timeslips III 2.1 ..... 195.
T/Maker
❶BUS0193 The PowerBundle ..... 159.
Visionary Software
❶BUS0190 First Things First 2.0 ..... 45.
Wyoming Software
❶FIN0013 Business Sense 1.5 ..... 129.

COMMUNICATIONS & NETWORKING

Argosy
❶COM0098 RunPC/Network ..... 279.
❶COM0103 RunPC/Remote ..... 139.
❶COM0099 Software Bridge/Mac 2.0.1 ..... 99.
CE Software
❶COM0101 QuickMail 2.5.1 (1-5 users) ..... 249.
❶COM0100 QuickMail 2.5.1 (1 - 10 users) ..... 375.
Dayna
❶NET0125 DaynaPORT E/2 ..... 275.
❶NET0076 DaynaPORT E/SE ..... 179.
Ex Machina
❶COM0111 Notify! 1.1 Personal Edition ..... 109.
Farallon™ Computing
❶NET0210 EtherMac II/10T card Mac II ..... 165.
❶NET0211 EtherMac 30i/10T card SE/30 ..... 199.
❶NET0212 EtherMac II Thinnet/card Mac II ..... 165.
❶NET0213 EtherMac 30i/10T card Mac IIsi ..... 299.
❶NET0214 EtherMac 30i/Thinnet SE/30 ..... 199.
❶NET0215 EtherMac 30i Thinnet card IIsi ..... 299.
❶NET0007 PhoneNET® Plus, SE & II ..... 31.
❶NET0019 PhoneNET StarController® ..... 879.
❶NET0122 Timbuktu® 4.0 ..... 129.
❶NET0034 Timbuktu/Remote® 3.0 ..... 129.
FreeSoft
❶COM0060 White Knight V.11 ..... 85.
Insignia (Full line available)
❶COM0107 Soft PC Universal 2.5 ..... 195.
Hayes
❶COM0095 HayesConnect 3.0 ..... 89.
❶COM0015 Smartcom II 3.3 ..... 84.
Synergy
❶COM0003 VersaTerm Pro 3.6 ..... 177.
❶COM0002 VersaTerm 4.6 ..... 90.
TechWorks
❶NET0133 GraceLAN 2.0 50-user ..... 289.

DESKTOP PUBLISHING

Aldus
❶DTP0072 PageMaker 4.2 ..... 495.
❶UPG0003 PageMaker 4.2 Upgrade ..... 150.
❶DTP0040 Personal Press 1.01 ..... 99.
Quark, Inc.
❶DTP0071 XPress 3.1 ..... 569.

DISK DRIVES & BOARDS

Computer Care
❶DRI0336 Mac Rescue w/SCSI Port ..... 195.
❶DRI0479 BockRAM 2S for Powerbook ..... 249.
Mass MicroSystems
❶DRI0253 DataPak 45 Removable ..... 649.
❶DRI0254 DataPak IIC ..... 735.
❶DRI0354 DataPak 88 Classic ..... 849.
❶DRI0451 DiamondDrive 120 MB Fixed Drive ..... 649.
❶DRI0452 DiamondDrive 210 MB Fixed Drive ..... 1049.
❶DRI0453 DiamondDrive 320 MB Fixed Drive ..... 1699.
❶DRI0454 DiamondDrive 510 MB Fixed Drive ..... 2149.
Micron Technology
DRI0412 Xceed MacroColor II 24-Bit Video Card 469.
Peripheral Land, Inc.
❶DRI0375 Infinity 88 Removable single ..... 849.
❶DRI0115 Infinity Turbo 40 Meg Removable ..... 649.
PowerUser®
❶BND0094 44 Meg Removable+cartridge ..... 579.
❶BND0095 88 Meg Removable+cartridge ..... 799.
❶DRI0203 40 Meg External Hard Drive ..... 349.
❶DRI0204 60 Meg External Hard Drive ..... 399.
❶DRI0205 80 Meg External Hard Drive ..... 449.
❶DRI0326 100 Meg External Hard Drive ..... 499.
❶DRI0502 PowerUser Pro DAT 44mm ..... 1799.
SuperMac
❶DRI0437 Spectrum/8 24 PDQ ..... 899.
❶DRI0516 Spectrum/24 Video Mac II Card ..... 1099.
❶DRI0517 Spectrum Series III Accelerator Card ..... 449.
❶Spectrum/8si or Series III ..... 539.

EDUCATIONAL & ENTERTAINMENT

Amaze!nc
❶ENT0400 The Far Side Computer Calendar ..... 45.
Baseline
❶ENT0403 Talking Moose/Cartoon Carnival 4.0 ..... 23.
Broderbund
❶CDR0042 Just Grandma and Me-CD-ROM ..... 39.
❶GRA0268 Kid Pix 1.2 ..... 35.
Where is Carmen Sandiego? ..... ea. 29.
❶EDU0291 The Playroom-Color 2.0 ..... 29.
Centron Software, Inc.
❶ENT0329 BlackJack Strategy Tester/ BlackJack Ace 65.
❶ENT0384 Canis ..... 25.
❶ENT0277 Casino Master Standard Version ..... 39.
❶ENT0289 Casino Master Deluxe Color Version ..... 45.
❶ENT0383 PuzzleMaster ..... 29.
HyperGlot
❶Word Torture: Spanish, French, German, Russian ea 35.
MECC
❶ENT0381 The Oregon Trail ..... 29.
❶Number Munchers or Word Munchers ..... ea. 29.
Nordic Software
❶EDU0276 Word Search Deluxe ..... 35.
❶EDU0142 Preschool Pack ..... 35.
Penton Overseas (Full line available)
❶Picture It! Level I: Spanish, German, French, Italian ... ea. 42.
❶VocabuLearn Level I, II or III: French,German, Hebrew, Italian, Japanese, Russian or Spanish ..... ea. 35.
Personal Training Sys.(Full line Avail)
❶Macintosh, HyperCard, FileMaker Pro, Microsoft Excel, Microsoft Word, Aldus PageMaker 4.0, Aldus FreeHand, Aldus Persuasion, Quark XPress 3.0 ..... ea. 59.
Software ToolWorks
❶MUS0092 Miracle Piano ..... 399.
Sound Source
❶Star Trek Vol. 1 or II ..... SPECIAL ea.29.
Zondervan Publishing House
❶MacBible-Greek or NIV ..... ea.79.
❶BOK0021 MacBible - King James Version ..... 79.
❶BOK0033 MacBible NRS w/Apocrypha ..... 79.

FONTS & APPLICATIONS

Adobe Systems, Inc.
❶DAC0028 Adobe TypeAlign ..... 62.
❶FON0264 Adobe Type Manager 2.03 ..... 59.
❶FON0351 Adobe Type On Call 2.0 ..... 59.
❶FON0295 Adobe Type Reunion ..... 41.
Altsys
❶FON0014 Fontographer 3.5 ..... 265.
❶FON0284 Metamorphosis Pro 2.03 ..... 89.
Ares Software
❶FON0361 FontMonger ..... 62.

GRAPHICS & MULTIMEDIA

Abracadata
CAD0032 Design Your Own Home-Architecture ... ea 65.
Adobe Systems, Inc.
❶GRA0304 Adobe Premiere ..... 305.
❶DTP0054 Illustrator 3.2 (w/ ATM 2.0) ..... 369.
❶GRA0125 Streamline 2.0 ..... 122.
❶GRA0191 PhotoShop 2.0 ..... 549.
Aldus
❶GRA0092 Digital Darkroom 2.0 ..... 259.
❶GRA0305 FreeHand 3.1 ..... 395.
❶GRA0279 Gallery Effects Vol. I ..... 129.
❶GRA0131 Super 3D 2.5 ..... 325.
❶HYP0027 SuperCard 1.6 ..... 195.
❶GRA0112 SuperPaint 3.0 ..... 133.
Claris
❶CAD0029 ClarisCAD 2.0 ..... 625.
❶GRA0271 MacDraw Pro ..... 275.
❶UPG0004 MacDraw Pro Upgrade ..... 99.
Deneba
❶GRA0280 Canvas 3 ..... 249.
Dream Maker
❶GRA0105 Cliptures Vol. 1 Business Images ..... 69.
Graphsoft
❶CAD0024 Blueprint 2.1 ..... 219.
PC Globe
❶GRA0246 MacUSA ..... 39.
Metro Image Base (Full line available)
❶GRA0277 Metro-ImageEasics ..... 35.
Pixar
❶GRA0288 MacRenderMan & Showplace Bundle ... 619.
Ray Dream
❶GRA0292 Ray Dream Designer 2.0 ..... 589.
Softsync
❶GRA0318 ExpertColor Paint ..... 29.
T/Maker
❶GRA0317 FaxMania, Business Fax Cover Sheets ... 29.
Thought I Could
❶GRA0302 Wallpaper ..... 39.
Virtus
❶GRA0278 Virtus WalkThrough ..... 309.

INPUT & OUTPUT

Appoint, Inc.
INP0219 Mouse Pen Pro Mac ADB ..... 65.
INP0220 Thumbelina Mac ..... 65.
Articulate Systems
❶INP0160 Voice Navigator II ..... 599.
❶INP0206 Voice Impact Pro ..... 199.
❶INP0207 Voice Impact ..... 79.
❶INP0208 Voice Record 2.1 ..... 59.
Caere
❶INP0205 Typist Plus Graphics ..... 475.
Canon
❶INP0184 Still Video Camera Computer Imaging Kit Color ..... 899.
❶INP0186 Still Video Black Standalone Camera ..... 499.
CoStar
❶INP0195 AddressWriter Envelope Printer ..... 479.
❶INP0194 Stringray Platinum ..... 89.
Datadesk International
INP0174 Mac 101E Keyboard Platinum ..... 129.
Kensington
INP0060 Turbo Mouse ADB (SE or II) ..... 109.
Key Tronic
❶INP0156 MacPro Plus Keyboard ..... 145.
Microtek
❶INP0180 Microtek ScanMaker 600ZS ..... 1449.
Mouse Systems
❶INP0132 Little Mouse ADB ..... 74.
❶INP0163 A3 Mouse ..... 85.
❶INP0199 A3 Trackball ..... 75.
Sharp (Full line available)
COMP023 Wizard Oz 8200 (128KRam) ..... 399.
Sophisticated Circuits
❶ACC0535 Power Key w/Quickeys Lite 2.0 ..... 75.
SuperMac
MON0224 20" SuperMatch Color Display ..... 1799.
ThunderWare
INP0116 LightningScan 400 ..... 369.
INP0189 LightningScan Pro 256 ..... 499.
Wacom
❶INP0179 Digitizing Tablet 6" x 9" ..... 589.

UPGRADES & ACCELERATORS

DayStar Digital
❶PowerCache 33 MHz ..... 749.
❶PowerCache 33 MHz w/882 ..... 979.
❶PowerCache 40 MHz ..... 949.
❶PowerCache 40 MHz w/882 ..... 1199.
❶PowerCache 50 MHz ..... 1459.
❶PowerCache 50 MHz w/882 ..... 1799.
❶DRI0224 FastCache IIci ..... 269.
❶DRI0421 FastCache IIsi ..... 319.
❶DRI0500 FastCache 040 for Quadra 700/900 ..... 379.
PowerUser®
❶CHP0066 2MB PowerBook 100/140/170 Upgrade 259.
❶CHP0067 4MB PowerBook 140/170 Upgrade Kit .. 399.
❶CHP0068 6MB PowerBook 140/170 Upgrade Kit .. 499.

MODEMS & FAX

Dove
❶MOD0053 Dove Fax Plus w/ VOICE Mail ..... 269.
Global Village
❶MOD0087 Powerport V. 32 ..... 499.
❶MOD0086 TelePort/Full FAX 2.0 ..... 219.
Hayes
❶MOD0065 Bundle 9600 ULTRA SmartModem ..... 749.
PowerUser®
❶MOD0062 24/96 Mini Send/ Receive Fax Modem .... 199.
❶MOD0043 2400 Mini Modem ..... 99.
❶MOD0047 Mini Send Fax 2400/9600 ..... 149.
❶MOD0071 9600 bps/ V.32&V.42bis Modem ..... 399.
❶MOD0070 2400 bps/V.42bis Mini Modem ..... 149.
Prometheus
❶MOD0084 Home Office 24/96 ..... 269.
❶MOD0085 Ultimate Home Office 24/96 ..... 499.

UTILITIES & PROGRAMMING

Abbott Systems, Inc.
❶UTI0236 Calc+ ..... 39.
❶UTI0113 CanOpener 2 ..... 59.
Alsoft
❶UTI0269 Alsoft Power Utilities Bundle ..... 85.
Altsys
UTI0224 EPS Exchange 2.0 ..... 89.
Alysis
❶UTI0232 SuperDisk! 2.0 ..... 49.
ASD Software, Inc.
❶UTI0135 FileGuard 2.7 ..... 139.
❶UTI0130 FileGuard 2.7 - Office Pack 5 ..... 479.
❶UTI0264 WindoWatch 1.52-Single ..... 89.
Baseline Publishing
❶UTI0187 Init Manager 1.1 ..... 34.
❶UTI0183 ScreenShot 1.2 ..... 34.
Berkeley System Design
❶UTI0119 After Dark 2.0 ..... 29.
❶UTI0231 More After Dark/ After Dark 2.0 Bundle ... 45.
Casa Blanca Works, Inc.
❶UTI0273 Drive 7 ..... 49.
CE Software
❶UTI0188 Quickeys 2 v2.1 ..... 94.
❶UTI0213 Tiles ..... 69.
Dantz
❶UTI0246 Diskfit Pro ..... 74.
❶UTI0227 Retrospect 1.3 ..... 147.
Insight Developement
❶UTI0098 MacPrint 1.3 ..... 95.
Kensington
PassProof ..... ea 65.
Salient
❶AutoDoubler or DiskDoubler 3.7 ..... ea.49.
Symantec Corporation
❶UTI0151 Norton Utilities for the Mac 2.0 ..... 99.
❶UTI0214 Symantec Antivirus for Mac 3.0 (SAM) ... 65.
❶UTI0241 Symantec Utilities for Mac 2.1 (SUM) ..... 99.
❶LNG0051 THINK C 5.0 ..... 199.

WORD PROCESSING

Baseline
❶SPL0029 Thunder 7 1.0.5 ..... 56.
Caere
❶UTI0237 OmniPage 3.0 ..... 475.
❶UTI0202 OmniPage Professional ..... 669.
Calera
❶UTI0215 WordScan ..... 249.
Claris
❶WRD0026 MacWrite II 1.1 ..... 89.
Microsoft
❶WRD0050 Word 5.0 ..... 295.
❶UPG0001 Word 5.0 Upgrade ..... 125.
Sensible Software
❶SPL0018 Sensible Grammar 2.0 ..... 55.
TGS
❶LNG0053 Prograph 2.5 Compiler Ver. ..... 309.
T/Maker Co.
❶WRD0051 WriteNow 3.0 ..... 159.
❶SID0008 WriteNow 3.0 Competitive Upgrade ..... 69.
❶UPG0007 WriteNow 3.0 Upgrade ..... 49.
WordPerfect
❶WRD0041 WordPerfect 2.1 ..... 295.
❶SID0007 WordPerfect 2.1 Competitive Upgrade ... 139.
❶UPG0006 WordPerfect 2.1 Upgrade ..... 89.
WordStar
❶SPL0030 American Heritage Electronic Dictionary .. 55.
❶SPL0028 Correct Grammar 3.0 ..... 49.
❶WRD0053 Correct Letters ..... 32.
❶WRD0054 Correct Quotes ..... 32.
❶WRD0052 Correct Writing ..... 39.

- All major credit cards accepted. No surcharge. **MWF2**
- 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.

SHIPPING
- 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 by12:00 MIDNIGHT (EST) (weekdays) for "in stock" items ship same day (barring system failure, ect.) 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 tyographical errors."

I'm Kerry, call me at:

Mac WAREHOUSE®

1-800-255-6227

(1-800-ALL-MACS) Now works in Canada.

Inquiries: 908-367-0440 **FAX:** 908-905-9279 **(NOTE NJ AREA CODE)**
1690 Oak Street, P.O. Box 3031
Lakewood, NJ 08701

NEW! Express Customer Service Number:
1-800-445-9677

For faster service for existing customers our computers recognize incoming calls by the telephone number and instantly locate your records.

©Copyright 1992 MicroWarehouse, Inc. MacWAREHOUSE® is a division of MicroWarehouse, Inc. MacWAREHOUSE™ and MacroWarehouse® are registered servicemarks of MicroWarehouse, Inc. Item availability and price subject to change without notice. Apple, the Apple logo, Mac and Macintosh are registered trademarks of Apple Computer, In

POWERUSER® PRO SERIES

Hard Disk Drives and Tape Backup Systems

INDUSTRY-RENOWNED FOR RELIABILITY AND PERFORMANCE!

PowerUser Hard Drives have gained industry acclaim for their top quality, high performance and reliability. The Pro Series carries on this tradition of excellence, bringing you the latest drive technology in a newly-streamlined, compact design. The PowerUser Pro Series drives are shock mounted, so they're safe and convenient solutions for Mac fanatics on the go, and each drive features high-quality components from the most recognized manufacturers in the industry, including Quantum, Archive and TEAC. And with PowerUser Pro, you get everything you need to be up and running in no time — plus lots of extras, too!

POWERUSER PRO HARD DISK DRIVES: CONVENIENT SIZES MEAN AFFORDABLE SOLUTIONS! Choose just the amount of storage you need, 52, 105 or a whopping 240 Megabytes! Each incorporates a top-rated Quantum drive mechanism, providing incredibly fast access times - 17 ms or less - or even faster when you use the handy disk caching software we've included. Every PowerUser Pro drive is preformatted, and comes with everything you need to be up in running in a flash, including dual 50-pin SCSI connectors, SCSI System cable, and an external terminator. We've even included a disk full of indispensable utilities, to help you keep your new Pro running at peak performance. Manufacturer's 2-year warranty.

POWERUSER PRO 52 MB
DRI 0493 ..... **$399**

POWERUSER PRO 105 MB
DRI 0494 ..... **$599**

POWERUSER PRO 240 MB
DRI 0495 ..... **$999**

POWERUSER PRO SERIES CARRYING CASE
This sturdy case is custom made for the PowerUser Pro 52, 105 and 240 MB drives, and also fits the PowerUser Pro Tape Drives (DAT and Personal).
ACC 0693 ..... **$29**

POWERUSER PRO TAPE BACKUP SYSTEMS: STORE IT, TRANSPORT IT, OR BACK IT UP - FOR ONLY PENNIES PER MEGABYTE! Whether you need gargantuan Gigabytes or merely Megabytes, put a Pro on your Mac and you'll have an economical solution for archiving, transporting or backing up your valuable data!

- **For Gigabytes, you want DAT - The PowerUser Pro Digital Audio Tape Drive. This incredible tape drive incorporates the renowned Archive mechanism, and uses the latest high speed technology, called "helical-scan," allowing you to store from 1.3 up to an incredible 2.0 Gigabytes!**
- **For Megabytes, choose the PowerUser Pro Personal Tape Drive. Its state-of-the-art TEAC mechanism will back up a monstrous 160 MB of data - all on one low-cost data cartridge that's easy to store and a breeze to transport.**
- **PLUS - To make your backups even faster and easier, we've included a full copy of Retrospect, the highly-acclaimed backup software from Dantz Development, with both our new PowerUser Pro Tape Drives. And, of course, your first backup tape cartridge is included - on us!**

POWERUSER PRO DAT (4MM)
Manufacturer's one-year warranty.
DRI 0502 ..... **$1799**

MED 0066: Extra 4mm Data Cartridge (60 Meter, 1.3 GB, Fuji) $15

MED 0073: Extra 4mm Data Cartridge (90 Meter, 2.0 GB, Fuji) $19

POWERUSER PRO PERSONAL TAPE DRIVE (160 MB)
Manufacturer's one-year warranty.
DRI 0503 ..... **$799**

MED 0072: Extra 160 MB Data Cartridge $29

POWERUSER REMOVABLE HARD DISK DRIVES: FOR THE ULTIMATE IN "TRANSPORTABILITY" The ideal solution for Mac users who want their data "to go," PowerUser Removables offer both the traditional 44 MB or the new 88 MB capacity. If you're a traveler, just pop out the removable cartridge and take it with you. If you're stationery, but need your data to travel (even if it's just back and forth out of your Mac), then these drives are definitely for you. PowerUser Removables feature industry-standard Syquest mechanisms, with a space-saving design that compliments all compact Macs. And you get your first 44 or 88 MB cartridge FREE! Manufacturer's 2-year warranty.

POWERUSER 44 MB REMOVABLE
BND 0094 ..... **$579**

MED 0035: Extra 44 MB Removable Cartridge $75

POWERUSER 88 MB REMOVABLE
BND 0095 ..... **$799**

MED 0071: Extra 88 MB Removable Cartridge $139

MacWAREHOUSE®
1-800-255-6227
Overnight Delivery Only $3.00!
Call 24 hours a day, 7 days a week.
©1992 Micro Warehouse Inc.

MWF2N

Circle 270 on reader service card

The Need for Speed

The latest generation of accelerators provide brisk performance and add life to older machines

by Matthew Leeds

IT'S AN OLD STORY and a common one: your Mac doesn't seem to perform like it used to. Maybe you're using a new application whose operations take too long. Or maybe you have added a 24-bit display board or a large-screen monitor. Perhaps you have switched to System 7 and are using all the Finder options. Or you may want to take advantage of such System 7 functions as 32-bit addressing and virtual memory, but your Mac's logic board isn't designed to do so.

Any or all of these may lead you to consider trading in your current Mac for a faster one. One of the best and most popular ways to get a faster Mac without buying a new machine is to buy an accelerator board, a board that replaces your machine's processor and memory with faster versions.

Macworld Lab tested 28 accelerators for a range of Macs, from the Classic to the Quadra 700. (Accelerators that shipped after our testing deadline are listed in "Accelerator Details.") We did not test accelerators for the Mac Plus or earlier machines because it is more cost-effective to simply replace them with a faster Mac. You also get better components with a new Mac. But we found it makes sense for owners of most of the newer Macs to buy an accelerator board instead of a new machine or an Apple upgrade.

Most accelerators use either the Motorola 68030 processor found in the Mac IIx, IIcx, IIci, IIsi, and IIfx, or the 68040 found in the Quadras. We did not test accelerators that are based on the 68000 processor used in earlier Macs. The 68000 doesn't support some of System 7's functions, and vendors are phasing out boards based on this processor. (We did test the 68000-based Harris Laboratories Classic Performer to show the kind of speedup such boards can provide to users who aren't interested in System 7 features.)

Whether to get a 68030-based or 68040-based accelerator is the toughest decision for most Mac owners. The 030 and 040 accelerators use different technologies to implement their functions. These differences may seem arcane at first, but they can actually be crucial for some applications.

68030 Technology

OWNERS OF A 68000-BASED SYSTEM WILL SEE MORE ADVANTAGES than just speedup by getting a 68030-based accelerator, since the 68030 processor has many more built-in capabilities than does a 68000. But owners of 68030-based Macs, too, should consider getting a 68030-based accelerator board with a faster processor.

Not all 68030 processors are the same. Some 68030-based accelerators (such as one version of the Mobius Technologies' One Page 030 Display) use Motorola's 68EC030 chip, which does not include a Paged Memory Management Unit (PMMU), a component required to run System 7's virtual memory. Vendors use the 68EC030 because it costs less than the full 68030, resulting in less expensive accelerators for consumers. Those who don't work with large files or lots of applications simultaneously may not need virtual memory.

Even if they use the full 030 processor, many accelerators do not support System 7's virtual memory, and require Connectix Corporation's Compact Virtual 3.0 to implement this feature. (This product does not work with modular Macs like the II and IIsi.) Com-

1½ XW

panies whose boards do support Apple System 7's virtual memory include DayStar Digital, Newer Technology, and Sigma Designs.

Owners of 68000-based Macs like the Classic and SE should note that Apple does not certify System 7's virtual memory to work with 68030-based accelerators installed in these older Macs, which were not designed for such memory. However, Compact Virtual 3.0 does work in many such environments. Several accelerator vendors bundle it with their accelerators (see "Accelerator Details").

The 68000 also does not support a floating-point unit (FPU) math processor; the 68030 supports the 68882 FPU, an improved and faster version of the 68881 used with the 68020. An FPU can dramatically speed up certain applications—such as spreadsheets, ray tracing, and rendering programs—that take advantage of an FPU's specialized calculation abilities. Accelerators using 68030 chips usually include a socket for an FPU. The FPU can operate at a different speed than the processor can, since each chip's speed is controlled independently. If you frequently use an application that uses floating-point math, you can improve that application's performance by getting an accelerator with a moderate processor speed, say 25MHz, and a fast FPU speed, say 33MHz—at a lower cost than buying a board with both the processor and FPU clocked at the higher speed, 33MHz. Companies that let you select the FPU speed include Mobius Technologies, MacProducts USA, and Novy Systems.

68040 Technology

THE 68040 PROCESSOR IS THE LATEST version of the 68000 family. It essentially combines the 68030 processor and 68882 FPU, adds larger instruction and data caches (which store frequently used commands and data to speed processing), and speeds processing by improving the *pipelining* (how tasks are divided internally in the chip). These changes improve performance, but they also reveal compatibility problems with some software (see *Lab Notes*, this issue, and "The Quadra Quandary," *Macworld*, March 1992). When the 040 was introduced, for example, popular programs like Microsoft Excel and Aldus PageMaker were incompatible with it; software fixes to make them compatible are now available.

The data caches on the 68040 use a new mode of operation called *copy back*. On the 68030, commonly used data and instructions are stored in main memory and are always available. The copy-back mode of the 68040's data caches writes such instructions to main memory only when requested, saving time by not having the CPU write every instruction to memory. But not all applications handle this mode correctly, resulting in errors.

Accelerators that use the 68040 include software to turn off the copy-back mode so the 68040 will work with all applications. But this fix has a price: turning off the 68040's copy-back mode can slow the 040 down significantly. Macworld Lab tests show that having copy-back mode turned on can increase application speed by 200 to 450 percent, with math-oriented applications benefiting the most.

Some boards come with software to detect 040-incompatible programs and automatically switch to running with the 040's caches turned off, but this software does not reenable the 040's caches unless you quit the 040-incompatible application. This means that if you are running more than one application, the caches remain off even when you switch to 040-compatible applications. However, an INIT called Compatibility from Alysis Corporation corrects this problem.

The 68040 has a built-in FPU, so you do not need to buy one separately. The built-in FPU is faster than the 68882 that works with the 030 processor. But to fit the FPU onto the 68040, Motorola removed some functions such as sine, cosine, and tangent (now supported via software). This means that the maximum FPU performance gains will be seen only when vendors start to develop 68040-specific applications, most likely in the areas of CAD/CAM and rendering.

The 68040's PMMU is less flexible than the 68030's, making it more sensitive to how software manages memory. Although this should not affect applications, it requires vendors to rewrite their virtual memory applications. Apple does not guarantee that System 7's virtual memory will work with third-party accelerators. Unless you can purchase a compatible third-party virtual memory solution, you may be stuck doing without.

At press time, no such product was available for 040-based accelerators running under System 7, though the new Virtual 3.0 being developed by Connectix may solve the problem when released.

Some older display boards—including Apple's Mac II Video Card and early versions of its Macintosh Display Card 4•8 and 8•24—do not work on machines using the 68040 and require a change in the boards' ROM chips.

As with the 68030, there are lower-cost versions of the 68040: the 68LC040 and the 68ELC040. The 68LC040 has its FPU portion disabled; the 68ELC040 has both its FPU and PMMU portions disabled. Using these processors means vendors can offer lower prices, and the loss of the FPU makes sense for many users, since most applications do not use the FPU. The Radius Rocket 25i uses the 68LC040 with the FPU disabled. Likewise, the loss of the PMMU makes sense for many users who don't use virtual memory capabilities.

Until recently the 68040 was available only as a 25MHz chip, but 33MHz versions are now available in small quantities. Some accelerator manufacturers have been waiting for the 33MHz version before introducing a 68040-based accelerator board. Our tests show that this has been a wise move, since the fastest 68030 accelerators (which run at 50MHz) performed as well as the 68040 accelerators (which run at 25MHz), and they often cost $1000 to $1500 less. Impulse Technology and Radius have begun shipping 33MHz 040-based accelerators and Fusion Data Systems has announced one.

Memory Considerations

MACS BASED ON THE 68000 CAN USE only 4MB of system memory because 68000-based Macs can't take advantage of the 32-bit address mode in System 7. With 32-bit addressing, Macs based on the 68020, 030, and 040 processors can address up to 128MB of memory (the IIsi is limited to 65MB, while the Quadra 900 can address 256MB).

For most Macs, the faster speeds of accelerators require faster RAM. The ac-

JEANNE STACK

Rather than create a different board for each type of Mac Processor Direct Slot, DayStar Digital uses one common board (upper left) and offers adapters to connect it to each type of Mac PDS.

MW LAB Accelerator Performance

Times are in seconds.
Shorter bars are better.

Time taken by processor to perform tasks the accelerator could not handle.

Graphics

Four scroll tests—in Resolve, Excel, MacWrite II, and Word—represent overall graphics-handling performance, since scrolling is the Mac's most common graphics task.

FPU Math

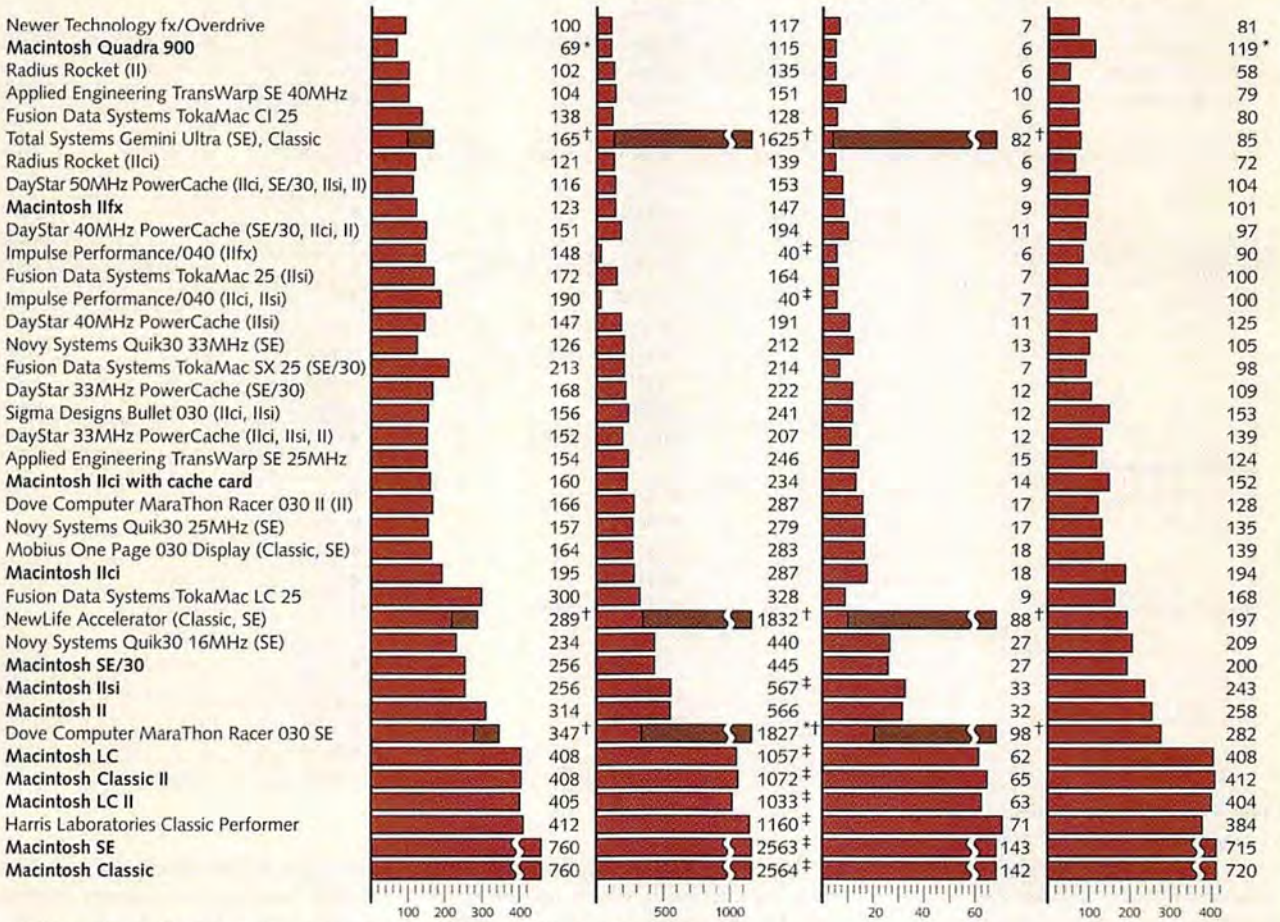
Four tests—function evaluation in Mathematica, scientific simulation in Extend, and scientific recalculations in Excel and Resolve—show a floating-point-unit math processor's performance.

Non-FPU Math

Two tests—business recalculations in Excel and Resolve—show the performance of math functions by the processor and Standard Apple Numerics Environment math-handling routines.

Processor

Six tests—a FileMaker II sort, MacDraw Pro graphics flip, PageMaker font change, FreeHand preview, and replace in MacWrite II and Word—measure the speed of the processor by itself.



* Couldn't run Word 4. † Couldn't run Excel; patch now available. ‡ Couldn't run Mathematica.

Products are listed in order of fastest to slowest overall performance, based on results from 36 tests that measure all aspects of performance. Times are reported in total seconds for each set of tests. Several boards are relabeled versions of another company's board, and results were identical. Results for the MacProducts USA RailGun boards are the same as for the Novy Systems Quick30, and the results for the Total Systems Magellan boards are the same as for the Fusion Data Systems TokaMacs. Boards appear twice if speeds on different Macs vary by more than 5 percent.

Top Five Performers by User Specialty

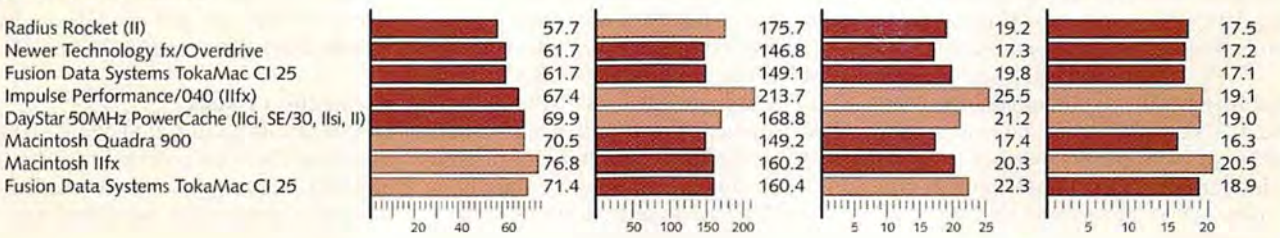
Times are in seconds.
Shorter bars are better.
Top five performers

Infini-D render, for CAD/CAM users

4-D sort, for large database users

Think C compilation, for developers and programmers

Photoshop resample, for image editors and publishers



ACCELERATOR DETAILS

Company	Product	Processor Speed (in MHz)/ Price (excluding RAM)	FPU Included	Macs Supported	Maximum RAM on Board
68030-BASED BOARDS					
Applied Engineering	TransWarp LC	25/$1199; 33/$1499; 40/$1990; 50/$2195	●	LC	[1]
	TransWarp SE	25/$1189[2]; 40/$2195[2];	●	SE	4MB[3]
DayStar Digital	PowerCache	33/$998[5]; 40/$1298[5]; 50/$2299[5]	optional	SE/30, LC, II, IIx, IIcx, IIci, IIsi	[1]
Dove Computer Corporation	MaraThon Racer 030 II	32/$1099	optional	II	[1]
	MaraThon Racer 030 Classic	16/$599	optional	Classic	[1]
	MaraThon Racer 030 SE	16/$599	optional	SE	[1]
MacProducts USA	030 RailGun	16/$399; 25/$599; 33/$849	optional	Plus, SE, Classic	64MB
Mobius Technologies	Mobius One Page 030 Display	25/$1095	optional	SE, Classic	16MB
Newer Technology	fx/Overdrive	50/$1995	●	IIfx	[1]
	fx/Overdrive-II	50/$850	○[6]	IIfx	[1]
NewLife Computer Corporation	NewLife 25	25/$689 (SE); 25/$719 (Plus)	optional	Plus, SE	16MB
	NewLife 33 SE	33/$1895	●	SE	4MB
	NewLife Accelerator Classic	16/$599	●	Classic	16MB
	NewLife Accelerator SE	16/$499	●	SE	16MB
Novy Systems	Quik30	16/$495; 25/$595; 33/$795	●[7]	Plus, SE, Classic	64MB
Sigma Designs	Bullet 030	50/$1995	●	IIci, IIsi	[1]
Total Systems	Gemini Classic	20/$716; 33/$903; 50/$997	optional	Classic	64MB
	Gemini Ultra	20/$716; 33/$903; 50/$997	optional	Plus, SE	64MB
	Mercury 030/SE	16/$325	optional	Plus, SE	64MB
	Mercury Classic	16/$495	optional	Classic	64MB
	Voyager 030	33/$1032; 50/$1435	●[8]	II, IIx	[1]
68040-BASED BOARDS					
Applied Engineering	TransWarp 040	25/$2599	●	II, IIx, IIcx, IIfx, IIci	128MB
Fusion Data Systems	TokaMac CI 25	25/$2595	●	IIci	[1]
	TokaMac LC 25	25/$2495	●	LC	[1]
	TokaMac SX 25	25/$2595	●	SE/30, IIsi	[1]
Impulse Technology	Performance/040	25/$2195; 33/$3295	●	II, IIx, IIcx, IIfx, IIci, IIsi	129MB
Radius	Radius Rocket	25/$1999	●	II, IIx, IIcx, IIci	128MB[1]
	Rocket 25i	25/$1499	○	II, IIx, IIcx, IIci	128MB[1]
Total Systems	Magellan 040 CI	25/$1397	optional	IIci	[1]
	Magellan 040 LC	25/$1187	optional	LC	[1]
	Magellan 040 SI	25/$1397	optional	SE/30, IIsi	[1]

● = yes; ○= no; AS = Apple's System 7; CV = Connectix's Compact Virtual 3.0. [1] Uses system RAM. [2] Also available with slower FPU. [3] Will support 16MB with pending software bundle. [4] Included. [5] Price includes $49 for required adapter. No adapter required for IIci. [6] Speeds logic board's FPU if installed. [7] FPU is optional on 25MHz board. [8] Also available with faster FPU. [9] Supports virtual memory under System 6.0.X via Connectix's Virtual 2.03.

celerators' processors communicate faster than do the memory chips on the Mac's logic board. The mismatch in communication speed between these components results in either the memory chips missing data or the processor slowing down while waiting for the memory chips.

To get the same level of performance that Macworld Lab did for compact Macs like the SE and Classic, you may need to add new, faster memory chips for the accelerator board (see "Accelerator Performance"). You'll need 80ns or 70ns RAM in most cases.

If you use slow RAM, the accelerator must use *wait states*, which are pauses inserted in the processor's requests for data from the memory chips, to let the memory catch up to the processor. Macworld Lab tests show that each extra wait state can degrade an accelerator's performance by about 12 percent.

Boards for 68000-based Macs usually have slots for their own RAM, which they use instead of system RAM. In many cases, you can move the RAM already installed on your Mac to the accelerator's slots, but that RAM may not be fast enough to avoid extra wait states.

Some companies provide software that lets you leave the slower RAM on the logic board and use it as a RAM disk or RAM cache. (You'll still need to have RAM on the accelerator board to do this.)

The Dove Computer MaraThon Racer 030 Classic and the Harris Laboratories Classic Performer support only static cache RAM, which acts as an intermediary between the memory chips and the processor. This limits your ability to expand total system RAM to what your logic board can handle.

Some accelerators, such as the Mobius, MacProducts, and Novy boards, provide the option of copying the contents of a Mac's ROM chips into the RAM on the accelerator board. This improves performance, since the processor can access the contents of RAM faster than it can the contents of ROM. Because they use only static cache RAM, the MaraThon Racer 030 Classic and the Classic Performer don't give you this option.

Connection Issues

IN CREATING AN ACCELERATOR BOARD, designers start with a 68030 or 68040 chip and then must weigh a variety of other elements to create a fast, functional, and affordable device.

On-Board Cache	Virtual Memory Supported	Enable/Disable Options	Warranty Period (in months)	Toll-Free Technical Support
●	none	cache, SANE	12	○
●	CV[4]	cache, SANE	12	○
●	AS	cache, SANE	36	●
●	AS	cache, FPU	12	○
●	CV	FPU	12	○
●	CV	cache, FPU	12	○
○	CV	FPU	12	○
○	CV[4]	board, video	12	●
○	AS	board, FPU	60	●
○	AS	board, FPU	60	●
○	CV[4]	FPU	24	●
●	CV[4]	FPU	24	●
○	CV[4]	FPU	24	●
○	CV[4]	FPU	24	●
○	CV[4]	FPU	24	○
●	AS	cache	60	○
●	CV[4]	board, cache	12	○
●	CV[4]	board, cache	12	○
●	CV[4]	board, cache	12	○
●	CV[4]	board, cache	12	○
●	none	board, cache	12	○
○	none	board, cache	12	○
○	none	040 mode, board	12	○
○	none	040 mode, board	12	○
○	none	040 mode, board	12	○
○	none	040 mode, board	12	○
○	none	040 mode, board	24	○
○	none	040 mode, board	12	○
○	none	040 mode, board	12	○
○	none[9]	040 mode, board	12	○
○	none[9]	040 mode, board	12	○
○	none[9]	040 mode, board	12	○

The first consideration is where and how the accelerator attaches to its host. Some products, such as the MaraThon Racer 030 Classic and the Classic Performer, either replace or sit piggybacked on the original processor. Some accelerators clip to an existing chip—the only option for a Classic accelerator. Occasionally these clips come loose if the computer is moved, but they have the advantage of not requiring modifications to the logic board's components.

Another type of accelerator board replaces an existing processor by plugging into the processor's socket, but not all Macs have such a socket. To use such a board on a Mac with no processor socket—like most IIcx's—you need to have a socket added to the computer's logic board. To use a DayStar's PowerCache accelerator in a IIcx requires this modification (DayStar will modify your logic board at no additional cost).

Most accelerators are NuBus or Processor Direct Slot (PDS) boards, which can easily be installed in an empty slot. The PDS is the only slot on the SE, SE/30, IIsi, LC, and LC II. The IIfx and Quadras have NuBus slots and PDS's.

An accelerator installed in a PDS can give greater performance than an accelerator in a NuBus slot. The PDS connects directly to the processor, so instructions and data move between the accelerator board and the processor with no delay. NuBus slots do not connect directly to the processor; instead, the logic board referees traffic between the processor and all the NuBus slots, a process that can delay communication between the accelerator and the processor if several NuBus boards are vying for the processor's attention. Because almost every Mac has a different PDS design, accelerator makers produce only one kind of board with adapters for each type of PDS.

Accelerators based on the 68040 chip may include their own PDS or custom expansion slot—this slot connects to the accelerator's processor, not the processor on the Mac's logic board. Examples include the Radius Rocket, Impulse Technology Performance/040, and Applied Engineering TransWarp (a relabeled version of the Impulse accelerator). These slots often provide direct access to the 68040 chip and can themselves support a display accelerator, high-speed SCSI board, or other expansion device. This is especially useful on one-slot Macs like the IIsi. But beware: because there is no standard for the design of these slots, you will probably have to get any such expansion devices directly from the manufacturer of your accelerator. (Some manufacturers of 030-based accelerators, including DayStar Digital and Sigma Designs, provide a PDS adapter that provides two PDS connections for the IIsi. The accelerator occupies one, leaving the other available for other boards.)

The Apple Upgrade Option

RATHER THAN BUY AN ACCELERATOR, you might consider a logic board upgrade from Apple. Upgrades are available for the SE (to an SE/30), the Mac II and IIx (to a IIfx), the IIcx (to a IIci), the Classic (to a Classic II), the IIcx and IIci (to a Quadra 700), and soon the LC (to an LC II). A logic board upgrade gives you genuine Apple parts, with potentially fewer compatibility problems down the road. You might also find it easier to sell your system later, as not everyone is comfortable with modified systems.

In some cases, you gain new features beyond the speed increase. For example, with an upgrade from an SE to an SE/30, you get a new ROM that supports color; and with an upgrade from a IIx to a IIfx, you get a faster SCSI bus.

Upgrading a Mac II or IIx to a IIfx makes some sense. The performance increase is significant; you get hardware that a future version of the system software might take advantage of (for example, you would get the most recent SCSI chip, one that the forthcoming SCSI Manager will use to improve hard drive performance); and you can add an accelerator to your new IIfx later if you need more speed.

In some cases it may be cheaper to purchase a new Mac (remember, your old machine still has some resale value). Potential hidden costs to a logic board upgrade include buying additional or different-speed RAM, adding a SuperDrive, adding a better power supply, and paying a dealer to install the upgrade.

In all other cases, unless you've got a special consideration such as a PDS al-

MW EDITORS' CHOICE

For the Classic

Gemini Classic The 50MHz version of the Gemini board was the fastest, offering better performance than a IIfx. **Company:** Total Systems. **List price:** $997.

NewLife The 16MHz board offers better performance at a lower price than a Classic II upgrade. **Company:** NewLife Computer Corporation. **List price:** $499.

For the SE

Gemini Ultra 50 Although edged out by the TransWarp SE board in our speed tests, the 50MHz Gemini Ultra 50's lower price makes it a better buy. **Company:** Total Systems. **List price:** $997.

For the SE/30

PowerCache 40MHz This board brings performance up to Mac IIci levels. **Company:** DayStar Digital. **List price:** $1299.

For the Mac II

Radius Rocket Fastest for processor-related processing, the 68040-equipped Rocket is attractively priced. **Company:** Radius. **List price:** $1999.

For the IIsi

Magellan 040 SI

PowerCache 50MHz These two boards tied in performance and are close in price. **Company:** Magellan, Total Systems; PowerCache, DayStar Digital. **List price:** Magellan $2097; PowerCache $2299.

For the IIci

PowerCache 50MHz Although edged out in speed by the TokaMac CI 25, the PowerCache offers a better price. **Company:** DayStar Digital. **List price:** $2299.

ready occupied or a company restriction against third-party products, we recommend adding an accelerator board rather than a logic board upgrade. You'll get better performance at the same price or much better performance at a slightly higher price—and for all machines, accelerators are available that exceed the performance gain you can get from just an upgrade.

Performance: Compact Macs

THE SE HAS MORE ACCELERATOR OPTIONS than any other machine. This is mostly because of its age and the fact that it can benefit highly from acceleration. Adding an FPU can improve floating-point math by 25 times, according to Macworld Lab tests. An accelerator can also remarkably improve hard drive and display performance—in fact, the fastest accelerated SE outperformed a stock IIci and in many tests either outperformed or kept up with a stock IIfx, as "Accelerator Performance" shows.

The fastest SE board was the Applied Engineering TransWarp SE 40MHz. The Total Systems Gemini Ultra 50 was a close second, but it had some problems with Microsoft Excel that the TransWarp SE board did not. Excel was a problem for several 030-based boards, but each manufacturer was developing patches during our testing period; all should have them available by the time you read this. Impulse Technology recently announced a Classic accelerator.

Several of the accelerators look very similar, and in fact are the same. The Mobius and MacProducts boards are built by Novy Systems. These relabeled boards match the performance of the original manufacturers' versions, and they all offer the same options and software as the originals do. The only differences are the names on the packaging and the prices.

While you can speed up an SE by upgrading it to an SE/30, we recommend buying an accelerator board instead, since that will give you better performance.

Likewise, it makes more sense to accelerate a Classic than to upgrade to a Classic II. All the Classic accelerators we tested were faster than a Classic II—with the notable exception of the 68000-based Harris Laboratories Classic Performer, which we included to show differences between the older, 68000-based accelerators and the new crop of 68030-based boards. The fastest accelerator was the 50MHz Total Systems Gemini Classic, which ran faster than a stock IIfx. Dove Computer has recently begun shipping accelerators for the Classic and Impulse Technology has announced such accelerators.

For SE/30 acceleration, DayStar's PowerCache, which plugs into the PDS slot, was a runaway winner in speed. The combination of a static RAM cache and a high-speed processor–FPU pair ensured performance gains on all tests. Not surprisingly, considering their design, DayStar's products did well on other Mac systems also.

Performance: Modular Macs

ONLY TWO ACCELERATORS SPECIFICally designed for the LC were available for testing, and one (the Total Systems Magellan 040 LC) was simply a relabeled version of the other (the Fusion Data Systems TokaMac LC 25). Because they are the same product, these 040-based 25MHz boards performed the same. DayStar's 030-based PowerCache accelerators will also work with LCs, and Applied Engineering recently began shipping an 030-based LC accelerator, and Impulse Technology, which makes Applied Engineering's board, plans to ship its own version.

On modular Macs with NuBus slots (like the II, IIci, and IIsi), the 50MHz, 68030-based DayStar PowerCache boards and the 25MHz, 68040-based Radius Rocket traded off the lead on tests. The PowerCache performed better on disk-based tests, and the Rocket excelled on processor-based tests. The PowerCache's advantage in disk-based tests is mainly due to its large on-board static RAM cache. Fusion Data Systems' TokaMac 25 series and Total Systems' Magellan 040 series (which is a relabeled version of the TokaMac 25 series) closely trailed the PowerCache and Rocket. For IIci owners, Applied Engineering has announced a 50MHz, 68030-based accelerator.

The IIfx used to be the fastest Mac available. Then the Quadras came along. But with Newer Technology's 50MHz fx/Overdrive accelerator installed, a IIfx ran generally faster than a Quadra 900. Newer recently began shipping the fx/Overdrive-II, an upgrade that runs the IIfx's own processor faster rather than requiring it to be replaced. The fx/Overdrive-II costs only $850, compared with the original version's $1995. Newer has also announced the Quadra Overdrive, which runs the normally 25MHz Quadras at 33MHz.

Installation Notes

MACWORLD LAB FOUND THE BOARDS easy to install, with two exceptions.

First, the NewLife Accelerator SE did not fit in an older SE (Apple changed the SE's case a few years ago to give it more room, and NewLife apparently did not design its board with the previous cases in mind; NewLife says upcoming versions of its boards will correct the problem).

Second, installing Newer Technology's fx/Overdrive (but not the fx/Overdrive-II) requires removing the IIfx's processor and FPU chips. Although Newer supplies a chip puller, you run the risk of damaging these chips, making them unusable if you need to reinstall them later.

In both cases, let an experienced dealer install the boards.

Making a Choice

WHILE PERFORMANCE AND PRICE COMmand the most attention in evaluating accelerators, there are other areas to consider: ease of installation, warranty, compatibility, cost of peripherals, bundled software, and expected longevity of the technology used. All the accelerator ven-

dors offer tech support via bulletin boards or online services except for Dove, Newer, and NewLife.

Owners of Mac II–series computers will no doubt be eyeing the 040-based accelerators, since they use the newest technology. Although an 040 may have more cachet, Macworld Lab tests show that a 50MHz 030-based accelerator is generally as fast as an 040-based accelerator. For some users, an 030-based board is a better option because of incompatibilities some applications have with 040-based Macs (see *Lab Notes*, this issue).

Price is another issue: the higher cost of an 040 accelerator coupled with the cost of upgrading to 040-compatible versions of your software may be too high.

But the 030-based accelerators will not be able to keep up with newly released 33MHz 040s. And incompatibility problems should disappear as vendors upgrade their software.

However, compatibility questions should not be ignored. Not all vendors rigorously test a wide range of applications to ensure that their accelerators—whether based on an 030 or 040—are compatible with them. During our testing period, several vendors shipped us software upgrades to fix incompatibilities they had not detected before shipping their product. That means some dealers may sell a version of the board with the earlier software, which will require the user to encounter the bug, call technical support, and find out about the needed software upgrade. The company with the most incompatibilities was Impulse Technology, which shipped us three upgrades in a two-week period to fix incompatibilities with programs like MacDraw Pro. Impulse's accelerator also had several problems with ACIUS's 4th Dimension caused by the 68040's new cache modes. However, other 040-based accelerators did not have these problems or their makers had already detected and fixed them.

Before spending a couple thousand dollars on an accelerator, consider how much improvement you need. Adding a cache card instead of an accelerator to a IIci or IIsi can improve the speed of some applications (like Excel) by 25 percent, according to Macworld Lab tests; general improvement ranges from 15 to 30 percent. Cache card prices start around $125.

A cache card works like a RAM cache, except that it is faster because the cache card uses static RAM chips. The static RAM is fast enough to keep up with the processor, eliminating the wait states that are normally inserted to keep the processor and memory in sync. Cache cards come in different memory sizes, but you'll see about the same performance gain no matter what the size, since you quickly reach a point of diminishing returns.

Adding an FPU makes a big difference in the performance of applications that use floating-point arithmetic (as do some spreadsheet calculations, some ray-tracing and rendering tasks, and most CAD/CAM programs). For more standard math-oriented applications like simple spreadsheets, a SANE (Standard Apple Numerics Environment) trap is more effective. A SANE trap intercepts common mathematical calculations—from simple addition to complex trigonometric and logarithmic functions—built into the Apple ROM and substitutes less-precise but faster calculations. (In almost all cases, the very small changes in accuracy will go unnoticed.) Apple has included its own SANE traps, called Omega SANE, in System 7.0.1. But neither an FPU nor a SANE trap will speed all your operations. If you find all your applications are sluggish, you'll want a more comprehensive solution like getting an accelerator or a faster Mac.

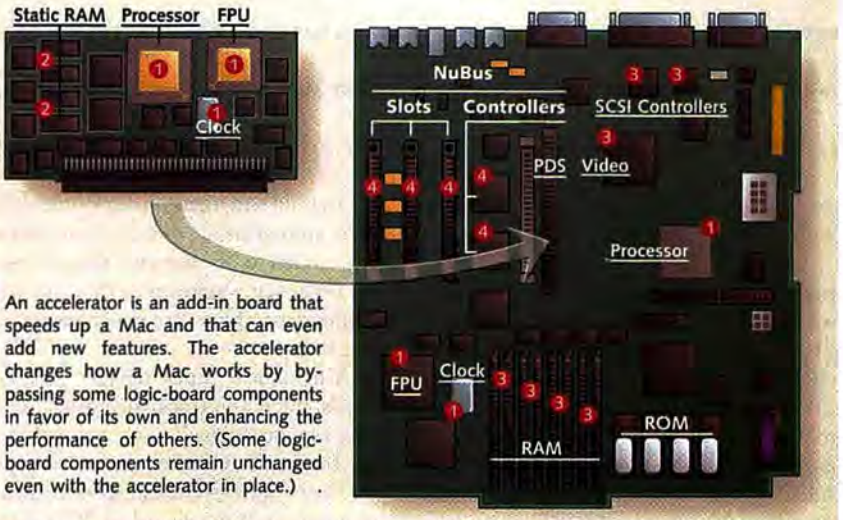
The final thing to consider when deciding how to speed your Mac is whether you are making a long-term investment or just trying to get your current machine through one more year. Remember, next year a new crop of accelerators (and Macs) will hit the street. ■

See *Where to Buy* under "Accelerators" for contact information.

MATTHEW LEEDS works for a major software developer as its technical services manager.

Macworld Lab testing supervised by MARK HURLOW, with assistance from JIM FEELEY.

What Can Accelerators Do?



An accelerator is an add-in board that speeds up a Mac and that can even add new features. The accelerator changes how a Mac works by bypassing some logic-board components in favor of its own and enhancing the performance of others. (Some logic-board components remain unchanged even with the accelerator in place.)

Options for Modular Macs

The DayStar Digital PowerCache (shown here with a Mac IIci logic board) is typical of accelerators for modular Macs; it plugs into the Mac's Processor Direct Slot. Some accelerators plug into NuBus slots.

1 *Replace components.* All accelerators replace the Mac's processor and its clock with a faster set. This processor substitution accounts for most of an accelerator's benefits. Many accelerators also replace the floating-point-unit (FPU) math processor; some offer an FPU replacement as an option.

2 *Add components.* Some accelerators, like the PowerCache, add a static-RAM cache, which acts as a buffer between the accelerator's processor and the logic board's memory. This speeds up RAM by making the commonly used data more accessible. Accelerators that don't offer a static-RAM cache usually use their own faster RAM, instead of the logic board's RAM.

3 *Enhance components.* An accelerator does not directly affect the SCSI controller and the built-in video circuitry (for Macs that have it), but the accelerator does speed the software that controls those components.

4 *Leave components unaffected.* Accelerators don't speed the NuBus slots and their controller; these can become a bottleneck for some tasks.

Options for Compact Macs

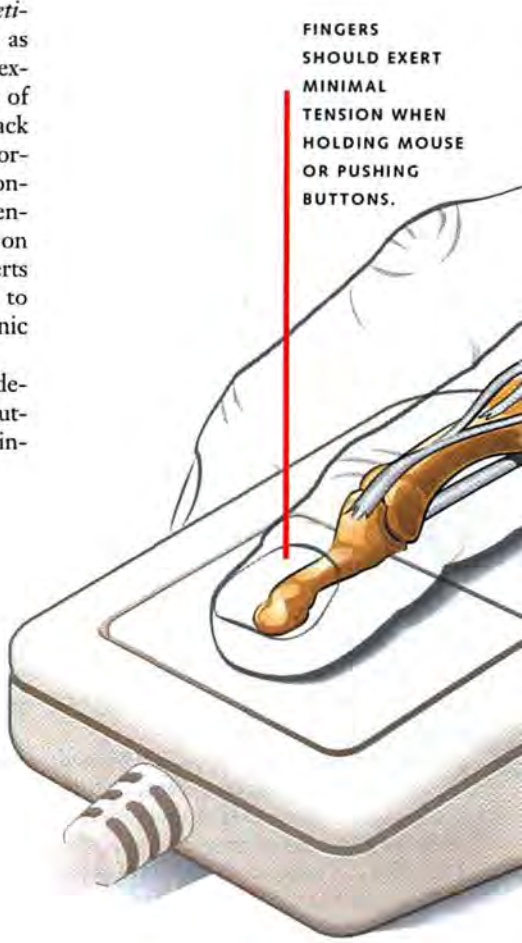
Many accelerators for compact Macs, such as the SE, offer an option to copy the contents of the Apple ROM into the RAM on the accelerator. (Most accelerators for compact Macs use their own RAM instead of the logic board's.) This speeds up performance because a processor can access RAM faster than ROM. Another option typically found on accelerators for compact Macs is virtual-memory support, usually through third-party software.

Input Alterna

How—and why—to choose a better pointing device

by Franklin N. Tessler

Illustration by **ARNE HURTY**



OF THE MANY INNOVATIONS POPULARIZED BY THE MACINTOSH, NONE HAS BECOME MORE INTIMATELY ASSOCIATED WITH THE MAC THAN THE MOUSE. THOUGH MICE HAD BEEN INVENTED NEARLY 20 YEARS EARLIER, THE MAC BROUGHT THE MOUSE INTO MAINSTREAM COMPUTING FOR THE FIRST TIME. AS *MACWORLD'S* JANUARY 1984 PREMIER ISSUE NOTED, "THE MOUSE MAY NOT BE THE ULTIMATE DEVICE FOR INTERFACING WITH COMPUTERS, BUT FOR THE TIME BEING IT'S THE BEST SYSTEM YET devised for making computers more compatible with the people who use them."

Now, more than 8 years, 20 Macintosh models, and numerous system software revisions later, Macintosh users face a bewildering spectrum of pointing-device choices. Despite the wide range of options, most users settle for the Apple mouse that comes with the Mac. Are users shortchanging themselves by not considering other pointing devices? To answer that question, I spent several months living and working with more than 25 products from Apple and third-party vendors. The results may surprise you.

Sorting through Claims

STANDING OUT IN A CROWDED MARketplace is never easy, so vendors make a variety of claims to convince users that a particular mouse, trackball, or other pointing device is better than the rest of the input-device pack.

For example, manufacturers often claim that their product is more comfortable to hold and manipulate. While differences among input devices have historically tended to be cosmetic, there is growing evidence suggesting that properly designed products are truly easier and safer to use.

Mechanical input devices like keyboards, mice, and trackballs force users to make repetitive, small movements that can take their toll over time and cause *repetitive strain injuries* (RSIs). Also known as cumulative trauma disorders, RSIs are exacerbated by unnatural applications of force and awkward body positions. Lack of rest or recovery time is another important contributing factor. But while concerns over RSIs are increasing, the scientific literature is far from unanimous on the subject of RSIs. Some medical experts contend that there is little evidence to support the relationship between chronic motion and injury.

Still, responding to the desire for devices that minimize the risk of RSI, input-device manufacturers say they are beginning to apply the science of *ergonomics*, the discipline devoted to the study of people interacting with their working environment. Altruistic motivations aside, vendors have discovered that claims of ergonomic design make good ad copy. Also, the trend toward legislative regulation of computers in the workplace at the federal, state, and municipal levels has spurred research in the relationship between input devices and RSIs.

Of the many factors contributing to RSIs, a product's design is most directly related to muscle tension. Minimizing muscle tension goes a long way toward making an input device less tiring to use. Ideally, the device should fit the cupped

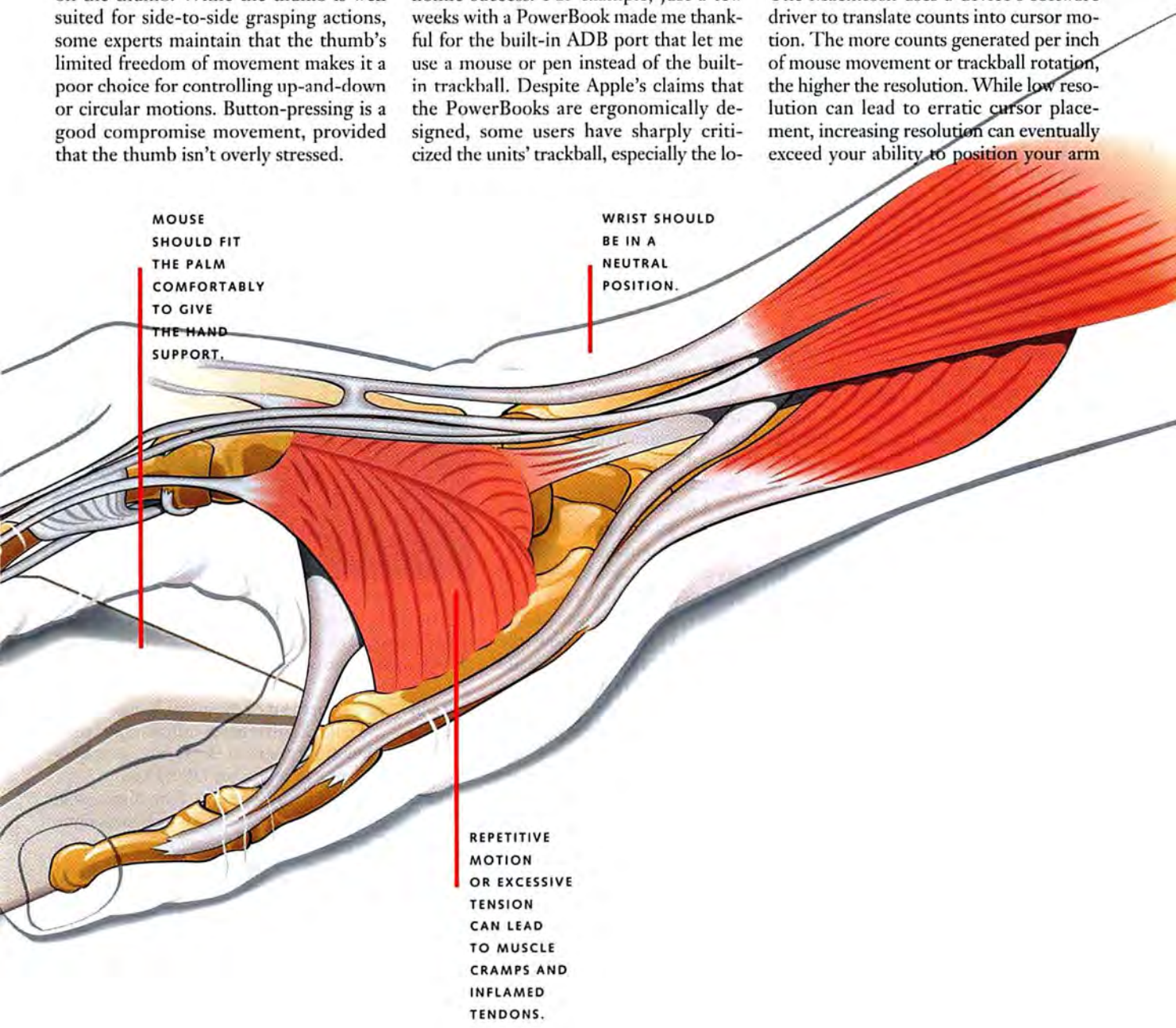
shape of the user's hand, not the other way around. The forearm, wrist, and hand shouldn't be forced into awkward positions, and the fingers should rest comfortably and naturally on the buttons.

In trackball design, the thumb's role is an especially important consideration. Most trackballs are designed to be controlled by the index finger, but some rely on the thumb. While the thumb is well suited for side-to-side grasping actions, some experts maintain that the thumb's limited freedom of movement makes it a poor choice for controlling up-and-down or circular motions. Button-pressing is a good compromise movement, provided that the thumb isn't overly stressed.

Although some companies maintain that their input devices have a better ergonomic design and are easier to use, those I contacted declined to discuss the results of the research underlying their claims, citing the competitive pressures of a crowded marketplace.

And even with technical resources like Apple's, there is no guarantee of ergonomic success. For example, just a few weeks with a PowerBook made me thankful for the built-in ADB port that let me use a mouse or pen instead of the built-in trackball. Despite Apple's claims that the PowerBooks are ergonomically designed, some users have sharply criticized the units' trackball, especially the location of the buttons and the central position of the ball. (This layout does have its fans.)

Another thorny issue is *resolution*, loosely defined as the precision with which the input device controls the cursor's motion. Rolling devices like mice and trackballs work by generating mechanical pulses, or *counts*, as they move. The Macintosh uses a device's software driver to translate counts into cursor motion. The more counts generated per inch of mouse movement or trackball rotation, the higher the resolution. While low resolution can lead to erratic cursor placement, increasing resolution can eventually exceed your ability to position your arm



t i v e s

or hand accurately. Most devices generate 75 to 150 counts per inch.

Resolution claims should be taken with a grain of salt because some vendors misleadingly advertise translated counts, not raw counts, as their device's resolution. A device that produces 200 counts to the inch may, for example, simply multiply that raw count by 4 and transmit 800 counts to the Mac. But the extra counts provide no finer control because the device itself still differentiates only 200 counts per inch. To further complicate matters, vendors sometimes describe resolution in terms of dots of cursor displacement per inch (dpi) of device movement, a meaningless number unless you know the resolution of the monitor.

Ideally, a pointing device should permit ultrafine control for precision work but also let the user move the cursor quickly over a wide area when necessary, an important consideration on large monitors. Most products provide this flexibility through a feature called *variable acceleration*, or *ballistics*. When you move the pointing device slowly, the cursor follows at the same speed; when you move your hand rapidly, the driver causes the cursor to travel even faster than the device, so it takes less time to traverse the screen. Despite some vendor claims to the contrary, my testing revealed that, for routine work, the default responsiveness of products differed only slightly for each type of device.

Responsiveness is most critical in tasks like CAD and graphics editing. Consequently, many vendors let users customize cursor responsiveness through control panel software. The various vendors' acceleration controls work pretty much the same, with none standing out.

A final consideration in choosing a pointing device is the amount of desk space needed. Mice typically require at least 6 square inches for comfortable operation, and most mouse pads are much larger than that. Trackballs are smaller than mouse pads but occupy about the same amount of space that most people use to move a mouse.

An ideal pointing device should allow both ultrafine positioning and the ability to jump across large areas quickly

Optical mice, which use a sensing system with no moving parts, impose special restrictions. Although inherently more reliable than their mechanical counterparts, optical mice like the A^3 Mouse from Mouse Systems Corporation need a special pad that incorporates a fine grid the mouse uses to sense direction of movement. If you rotate the pad slightly, horizontal motion of the mouse results in unwanted diagonal cursor movement on the screen.

I found that grading input devices is a lot like auditioning stereo equipment: audio experts can generate a slew of technical specifications for a particular loudspeaker, but in the long run, it's how the speaker sounds that really counts. With mice, trackballs, and other input devices, all the testing and measurements in the world can't substitute for real-life use.

To evaluate the products, I enlisted the help of several Macintosh users, including both novices and experts. Their impressions were supplemented by the opinions of several editors at *Macworld*. Users were asked to consider a number of characteristics—including appearance, construction and durability, ease of learning and setup, and functionality—in day-to-day work.

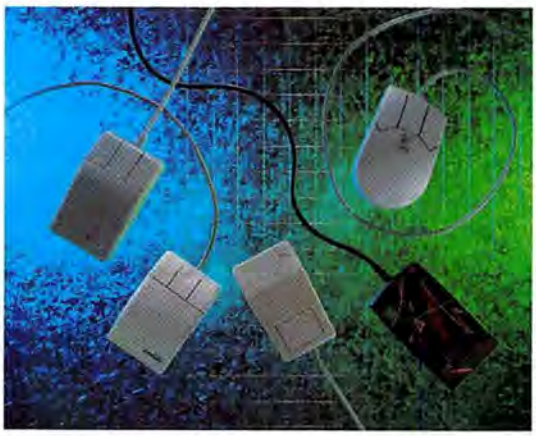
JEANNE STACK

Trackball designs vary widely, as these four devices show (clockwise from upper left): CoStar Stingray, Curtis MVP Mouse, Logitech TrackMan, and Kensington Turbo Mouse ADB.

Selecting the Right Mouse

IN CHOOSING A MOUSE, THE shape is even more important than internal construction. The boxy contour of the original Macintosh mouse made it tiring to hold for extended periods. By the time the Apple Desktop Bus Mouse debuted in 1987, Apple had improved its earlier design by giving the case a tapered profile front and back, making the mouse more comfortable to grasp. Logitech's MouseMan for the Macintosh, released in late 1990, took another step forward by sloping the mouse to one side to accommodate the palms of right-handed users. Most of the testers appreciated the contoured design.

Unfortunately, a contoured mouse for right-handed users leaves left-handed users—who make up about 8 percent of the general population and between 10 and 15 percent of computer users—out in the cold. Logitech may offer a contoured version for them in the future, as it does now in its version for DOS PCs.



JEANNE STACK

Most mice have a similar design, although their feel differs significantly. Examples are (from left) Advanced Gravis SuperMouse, Mouse Systems A^3 Mouse, Apple Desktop Bus Mouse, Logitech MouseMan, and Softcode SICOS Fancy Mouse.

Of all the features that distinguish Apple's mice from its competitors', none has been so sacrosanct as its single button, an approach long used as an argument in favor of the Mac's ease of use. But times are changing, and three of the seven mice I tested sport multiple buttons. In most cases, button operation can be configured via a control panel—for example, you can define any button to click-lock, eliminating the strain of holding it down for extended dragging operations; or to double-click, minimizing the rapid finger action users have to repeat so often. Some mice go even further by letting you assign keystrokes to buttons.

Unfortunately, of the multiple-button mice I tested, only the Advanced Gravis SuperMouse makes it easy to distinguish among the buttons by touch so that you're less likely to push the wrong button acci-

JEANNE STACK

Designed as a mainstream alternative, the Altra Felix (upper left) is an exception to the niche orientation of other alternative devices such as (lower left to right) the Appoint MousePenMac, Appoint Thumbelina, and Advanced Gravis MouseStick.

dentally. Buttons would benefit from a feature like the raised bars or dots on a keyboard's D and K keys (or the F and J keys on some keyboards) that help touch-typists identify their finger position without looking.

Trackballs: Squeezing into Tight Spaces

DESPITE THE OBVIOUS, IF superficial, similarity to upside-down mice, trackballs trace their lineage to the 1950s. Because they were sturdy and could be built into existing consoles, trackballs were often used in military hardware. Trackballs were later adapted for use in video games and computers.

Trackballs' limited clearance requirements make them ideal for setups where space is at a premium. Apple recognized this advantage and built trackballs into the Macintosh Portable and PowerBook computers. But Apple has never offered a stand-alone trackball, claiming that the market is sufficiently saturated by third-party products.

Compared with mice, trackballs come in a dizzying assortment of shapes and sizes. For this article, I looked at 11 trackballs, ranging from MicroSpeed's tiny MicroTrac at the low end to EMac's imposing Silhouette Trackball.

The perfect trackball would be mounted with the top of the device's housing flush with the work surface. Unfortunately, unless you're willing to cut a recess into your furniture, using a trackball demands that you elevate your forearm, wrist, or hand. Although some manufacturers try to incorporate a natural wrist rest into the casing, their success varies. Of the trackballs tested, the Curtis MVP Mouse, with its sloping, embossed case, is my favorite. The EMac Silhouette, although nicely contoured and striking in appearance, is a bit too high for my comfort. The design of the Turbo Mouse ADB trackball from Kensington Microware also pleased some editors.

Input on Keyboards

When buying a computer, most users give no more thought to the keyboard than to the pointing device, even though the keyboard is the part they have the most contact with. But a good keyboard can add comfort and efficiency to a well-thought-out work space. Ideally, the fingers should rest on the keys with arms parallel to the ground; the wrists should be relaxed, not flexed.

Things have come a long way since the days of Apple's original keyboard. Alternatives offer innovation with an eye toward user comfort. Available for most Mac models—the 128K, 512K, Plus, SE, SE/30, and Mac II family—many feature adjustable keyboard tilt angles to give fingers a boost reaching the third row of keys or the function keys, use dual-tone key shading to break up the visual monotony, and sport dual-legend function keys for split Mac–DOS PC use. Here's a sampler.

• Mac-101E, $195, Prometheus Products. Features include switchable control and caps-lock keys; lock for the period and comma keys; removable function-key template; and a clear, hard plastic cover with a three-year warranty. Buyers also get a discounted price ($49.95) on QuicKeys^2. I particularly liked the definite click you get when pressing keys, which is a great boon for audio-feedback typists.

• MacPro Plus, $179, Key Tronic. Similar to the Mac-101E, the MacPro Plus has switchable control and caps-lock keys and a lock for the period and comma keys, and is backed by a three-year warranty. With a $15 kit, you can customize key resistance and tension so the keys will respond exactly as you like them to. Buyers can get the Tempo II macro software and an RJ-11 cable (for use with the Mac 128K, 512K, and Plus models) at no cost. Although its click is less audible than the Mac-101E's, the MacPro Plus's customizable tactileness makes it a top pick. (See *Reviews, Macworld,* September 1991.)

• TrakPro, $249, Key Tronic. Essentially like the MacPro Plus with a built-in trackball and a System 7–compatible control panel device to assign keyboard commands to the trackball keys, the TrakPro needs Key Tronic's $19.95 cable kit to work on Mac 128K, 512K, or Plus. Covered by a lifetime warranty. Our test units froze on several Macs under System 7. We did get them to work under System 6.0.7, but performance was inconsistent. When used on an SE, the TrakPro had fairly smooth trackball action, but on an SE/30, cursor movement became hopelessly erratic. Key Tronic said it is working on resolving quality problems with the trackball module's manufacturer.

• Switchboard, $239.95, Prometheus Products. Designed for the multiplatform office, Switchboard also works with IBM PS/2 and standard DOS PCs via DIP-switch settings; all necessary cabling is included. It has separate modules for the text, numeric, and cursor key units so you can rearrange them to suit handedness and other layout preferences. An optional trackball ($149) and vertical function keypads ($49) are also available. The Switchboard comes with a three-year warranty. (See *Reviews,* February 1991.)

• Apple Keyboard II, $129. The standard keyboard for use with the Mac 128K, 512K, and Plus has an nonadjustable keyboard tilt, monochrome coloring, no function keys, no cursor or numeric keypads, and with its Mac-only key labeling, no recognition that anyone might use a non-Mac PC. It comes with a one-year warranty.

• Apple Extended Keyboard II, $229. This extended keyboard for Macs with ADB ports has the same monochrome coloring and permanent tilt as the regular Apple keyboard, but it adds function keys and numeric and cursor keypads. It has a one-year warranty.

Several alternatives to the standard typewriter keyboard have been designed, and their designers say they are working on Mac versions. They include

• Tony, Tony Hodges. Use it like a standard keyboard or crack it in half and rotate it like a drawbridge (see *Conspicuous Consumer, Macworld,* August 1991).

• Datahand, Industrial Innovations. A unique marriage of familiar typewriter key layout with radical, split keyboard hand rests. Instead of keystrokes, you move your fingers left, right, down, curled in, and flexed out—sort of like typewriter shorthand. This approach is meant to increase speed and accuracy of data entry while decreasing the risk of repetitive-motion stress to the hands and fingers (see *Conspicuous Consumer,* August 1991).

• The Bat, Infogrip. Another two-fisted data entry product, The Bat relies on chording (pressing several keys at once) to input data, much like a court reporter's machine. Infogrip touts The Bat's enhanced speed, reduced repetitive strain, and easy input for disabled users.—SUZANNE COURTEAU

Apart from overall size, trackballs differ most in the ball's diameter, mass, and position. From an ergonomics standpoint, the ball is the most important moving part because it controls the cursor. Ideally, the ball should be equally capable of slow, fine motion and rapid, coarse motion.

Although mice and trackballs are excellent pointing devices, they fall short for drawing and painting tasks

While easier to control, a larger ball may be too massive to move effortlessly. Only the Silhouette gives the user a measure of control over the ball's mass—the product comes with four balls, each a different mass and color, that you can pop in and out to suit your taste.

The ball's location also determines which fingers will generally be used to move it. In most designs—where the ball is centered in the housing—the index and middle fingers are the most natural to use. A symmetrical layout is preferable if the trackball will be used by both right- and left-handed people. Most trackballs are designed this way. But the Silhouette's design is more suited to right-handed use, and the Logitech TrackMan for the Macintosh is designed for use only by right-handed people.

Button placement is another important concern in selecting a trackball. Buttons should be within easy reach. You don't usually move the ball with the thumb, which means the thumb is a good choice for activating the main button, as on the Silhouette. The large, contoured buttons on the CoStar Stingray serve as ideal thumb rests for both right- and left-handed users. Because it's awkward to move the ball while pushing the button, a drag button is another essential trackball feature. Trackball button functions can be configured by control panels.

Kraft Systems, with its Trackball ADB, and Curtis, with the MVP Mouse, also offer foot switches to supplement buttons on the main units. Although I found it tiring to rest my foot on either company's pedal for long stretches, foot controls can be a welcome addition for some disabled users.

Alternative Pointing Devices

POINTING DEVICES THAT DEFY CLASSIfication are a testament to their inventors' ingenuity. Altra's Felix, for example, is a squat box about 6 inches on a side. In the center is a small plastic handle, which you grasp with your thumb and index finger, topped by a switch that works like a standard mouse button. The handle moves freely within an operating area of about 2 square inches (a slightly smaller area than typical for mouse users). The light touch makes zipping the cursor around the screen almost too effortless, although you can map handle motion to apply to a small segment of the display for precision work. But it's hard to control at the edge of the operating area, which can make pull-down menu selections difficult. Most users disliked the Felix's feel or control, but one loved it.

A unique feature called Window Manager lets you map the corners of the Felix's operating area to specific areas in the active window. For example, moving the handle along the left edge to the top-left corner automatically moves the cursor to the close box. Unfortunately, cursor motion tends to be jumpy, especially when you try to reach the extreme corners of the screen.

The MousePenMac, from Appoint, is another unusual mouse replacement. A cross between a pen and a mouse, it's designed to be used on soft surfaces such as fabric. (Slick mouse pads don't provide enough friction for this device.) Although I found the MousePenMac awkward for desktop use, it was great when used with a PowerBook notebook computer away from a desk. Sitting on a park bench with the PowerBook perched on my lap, I found the MousePenMac was often easier to use than the built-in trackball. As with the Felix and other unconventional pointing devices, you either love the MousePenMac or you hate it.

The Advanced Gravis MouseStick was the only joystick I received to test for this article. It performed well with arcade games and Microsoft Flight Simulator, although having to use a separate controller box was inconvenient. But a joystick makes a poor general-purpose input device. While it may be great for zapping aliens, a joystick is ill suited to more mundane tasks like word processing.

Two other input devices also deserve special mention: the AirMouse Remote Control and Appoint's Thumbelina are both designed for presentations. The AirMouse is a cordless mouse that communicates with a base unit (and the Mac) by infrared light. The AirMouse works well from across a room, as long as the Mac's display is large enough that you can see what you're doing. If you can't afford AirMouse's $595 price, Appoint's $99 handheld Thumbelina is fine for stand-up work at short range.

MW EDITORS' CHOICE

MouseMan for the Macintosh The contoured shape is an ideal fit for right-handed users. A good choice for first-time buyers or as a replacement mouse. **Company:** Logitech. **List price:** $129.

Gravis SuperMouse Our second choice comfortably fits the hands of most people—including, unlike the MouseMan, left-handed users. **Company:** Advanced Gravis. **List price:** $129.95.

Drawing Tablets: Electronic Paper

ALTHOUGH MICE AND TRACKBALLS are excellent pointing devices, they fall short for drawing and painting tasks, an area where digitizing tablets excel. Tablets cost much more than other input devices and can take up much desktop real estate. Fortunately, most manufacturers have versions as small as 6 inches by 9 inches. Still, if you factor in extra space for power supplies and outboard processor boxes needed by tablets like Wacom's, you might end up making a trip to a furniture store for a bigger desk.

A drawing tablet is designed to facilitate the actions of an artist or draftsperson. Most use a mouselike device (called a puck) or pen that is moved across the drawing surface, causing the cursor to follow on the screen. Getting used to a tablet takes a bit of practice, especially if you're used to a mouse. When you lift a mouse off the work surface and move it, the cursor stays put—with tablets, the cursor jumps to a new position. Two tablets—those from Summagraphics Corporation and Kurta Corporation—offer a mouse-emulation mode, but these emulations do not work when in drawing mode.

Some tablets, like Wacom's, can detect the amount of pressure being applied on the pen. Compatible Macintosh software can use this information to simulate the effect of a pen or brush on paper.

As a nonartist, I appreciated the ability to use the pens to trace drawings and photographs. I especially liked the segment of the Personal Writer PW10SL tablet devoted to mimicking mouse and keyboard operations. For example, a virtual keyboard at the tablets' top left lets you enter text without using the keyboard.

Once you get used to one, a pen-based tablet can be more natural to use

than a mouse. Several *Macworld* editors find that tablets produce less stress on their hands than do mice.

The Power of Speech

HAND-OPERATED POINTING DEVICES that directly steer the cursor are ideal for graphical user interfaces like the Mac's, but what about situations where hands-on control is inconvenient or impossible?

One approach to hands-free operation is voice control, a longtime staple of science fiction. Although true speech recognition is still years away, Articulate Systems' Voice Navigator II and MacSema's Voice Express bring limited voice control to the Macintosh. Both products let you associate brief voice commands with actions like key presses and menu selections by digitizing your voice and comparing it with recorded patterns. You train both devices by repeating three times the phrase you are associating with each action; because neither product truly understands speech, you can use almost any sound, as long as you're consistent. (You can have a lot of fun with this if you're inventive.) Still, neither product claims to replace a keyboard and pointing device.

The Pick of the Pointers

ALTHOUGH IT'S POSSIBLE TO ARGUE in favor of mice, trackballs, or other alternatives, experience with real Macintosh users has convinced me that choosing a pointing device is still largely a matter of personal preference. In fact, despite what some vendors claim, published research hasn't come up with a clear-cut winner, either—there is research that lauds and criticizes each type of device.

Among the mice, the Logitech MouseMan, with its contoured design, was a clear winner among our testers, with the Advanced Gravis SuperMouse (also made by Logitech) coming in second.

There was less consensus for the trackballs. I prefer the Curtis MVP Mouse and the EMac Silhouette, despite its low housing. Other testers also liked MicroSpeed's full-size MacTrac trackball.

While most users give little or no thought to choosing an input device, a poor decision—or no decision at all—can make using the Mac difficult, if not downright unhealthy. Fortunately, you don't have to be an expert in product design to apply ergonomics principles to your selection. Like buying a pair of shoes, finding a pointing device that works for you demands a critical eye and a generous helping of common sense. And just as you wouldn't walk out of the shoe store without a fitting, don't consider a mouse, trackball, or other alternative without a trial or money-back guarantee. You use them day in, day out, so don't settle for just any pointing device. **m**

See *Where to Buy* under "Input Devices" for contact information.

A *Macworld* contributing editor, FRANKLIN N. TESSLER is an M.D. who uses a variety of hand-held devices as a radiologist specializing in ultrasound.

EVALUATING INPUT DEVICES

Company	Product	List Price	Comments
MICE			
Advanced Gravis	Gravis SuperMouse	$129.95	Better-contoured than the Apple mouse. Multiple buttons. Our second-favorite mouse.
AirMouse Remote Controls	AirMouse Remote Control	$595.00	Cordless infrared mouse. Good for stand-up presentations.
Apple Computer	Apple Desktop Bus Mouse	$99.00	Sharp angles on side make it harder to hold than contoured mice.
Logitech	MouseMan for the Macintosh	$129.00	Multiple buttons. Excellent feel. Contoured to fit right-handed users. Our overall favorite mouse.
Mouse Systems Corporation	A³ Mouse	$149.95	Multiple buttons. Special optical pad can cause tracking problems.
	Little Mouse ADB	$134.95	Too narrow for most users' hands. Special optical pad can cause tracking problems.
Softcode Canada	SICOS Fancy Mouse	$89.00	Flatter shape than the Apple mouse. Hard to grip.
TRACKBALLS			
Asher Engineering	Lynx Trackball	$99.00	Buttons can be hard to press. Overall flimsy feel.
CH Products	RollerMouse	$119.95	Comfortable casing. Large ball's weight requires extra effort.
CoStar Corporation	Stingray	$129.00	Low-profile case with large, contoured buttons.
Curtis Manufacturing	MVP Mouse	$149.95	Contoured case with wrist rest. Foot switch optional.
EMac	Silhouette Trackball	$99.95	Includes four replaceable balls with different weights, so you can choose most comfortable one. Positioned higher than other trackballs.
Kensington Microware	Turbo Mouse ADB	$169.95	Excellent ball feel. Buttons easy to reach and press.
Kraft Systems	Trackball ADB	$119.95	Middle button hard to reach. Includes foot switch.
Logitech	TrackMan for the Macintosh	$149.00	Designed only for right-handed users. Ball controlled by thumb, which can be awkward.
MicroSpeed	MacTrac	$119.00	Tapered design. Comfortable hand position. Ball is a bit heavy.
	MicroTrac	$89.95	Smallest trackball. Can be attached to side of keyboard or portable.
Mouse Systems Corporation	A³ Trackball	$139.95	Wrist rest. Large buttons are easy to reach but can be hard to press.
DRAWING TABLETS*			
CalComp	DrawingBoard II	$495.00	Pressure-sensitive stylus available. Beta version evaluated was responsive. Cordless version $645.
Kurta Corporation	IS/ADB	$495.00	Easiest tablet to set up.
Personal Writer	PW10SL	$799.00	Includes special drawing area with a virtual keyboard.
Summagraphics Corporation	SummaSketch II ADB	$699.00	Mapping tablet to screen is difficult. Too many cables.
Wacom Technology Corporation	Wacom SD-421E	$1095.00	Pressure-sensitive stylus available. Easy to set up.
	Wacom SD-510C	$695.00	9-by-6-inch drawing area. Pressure-sensitive stylus available. Requires separate controller box (included). Easy to set up.
ALTERNATIVE DEVICES			
Advanced Gravis	Gravis MouseStick	$99.95	Joystick. Uses separate controller box (included). Not appropriate for day-to-day tasks.
Altra	Felix	$129.00	Finger-operated. Cursor can be difficult to control.
Appoint	MousePenMac	$99.00	Penlike device. Can be used on most surfaces. Works well with portables.
	Thumbelina	$99.00	Hand-held, thumb-operated trackball. Good for stand-up presentations.

** 12 by 12 inches unless noted otherwise. Tablets are available in larger sizes for dedicated uses like CAD.*

all-in-one prog

Six integrated programs that give you a lot of power for a small investment

ILLUSTRATIONS BY GORDON STUDER

rams

INTEGRATED SOFTWARE PROVIDES A wide variety of functions in a low-cost, compact package. Typically, an integrated package includes several different applications organized in cooperative modules: a word processor, a spreadsheet with charting capabilities, a database, a graphics program, and telecommunications software. Integrated programs are ideally suited to people on a budget and those who are running less-powerful Macs. Big jobs are best handled by dedicated software packages; none of the current crop of integrated programs are well suited to writing a book, maintaining a huge mailing list, or creating a complete set of complex financial projections. For people whose needs are more general, however, integrated programs can be a good value.

I evaluate six integrated software packages: Microsoft Corporation's Microsoft Works 2.0, Claris Corporation's ClarisWorks 1.0, Symantec Corporation's GreatWorks 2.0, MacVonk USA's HandiWorks 1.0, Zedcor's Desk 3.07, and Beagle Bros' BeagleWorks 1.0. For a quick look at how these packages compare, see "Integrated Overview."

In order to simulate how these programs are used in real-life situations, I invented Privacy Advocates of America (PAA), a small nonprofit organization working for personal privacy rights on the national and state level. In addition to standard business correspondence, PAA needs to keep a database of contributors, to whom the organization sends mail-merged letters. PAA also produces a graphically embellished newsletter of its activities, *Privacy News*, and sends it to members and news organizations. To track financial contributions, the organization uses a spreadsheet. And finally, PAA's executive director uses telecommunications software to log on to online services to do legal research.

The integrated packages I looked at use one of three methods to integrate their separate application modules. The simplest method, used by Microsoft Works and Desk, creates separate documents for each type of work (word processing, spreadsheet, and so on) and uses the standard Mac Clipboard to copy and paste information between modules.

The integration method used by ClarisWorks and HandiWorks lets you create compound documents by opening *frames*, areas in a document where you can do work from each of the modules. If you are writing a report and need to insert a table with a few calculations, you draw a spreadsheet frame right in your word processing document. When you click in the spreadsheet frame, the menu bar changes to reflect the spreadsheet functions. Clicking in the text brings you back to the word processor, and the menu bar changes back to word processing commands.

The newest path to integration is followed by BeagleWorks and GreatWorks. These programs use System 7's publish and subscribe capabilities to actively link information in one document to the same information in another document. This is similar to copying and pasting information, except that when you change the information in a publisher document, the corresponding information in the subscriber document changes automatically. In BeagleWorks, publish and subscribe is called In-Context editing, and the linking is mostly transparent; as with a frame-based system, when you click in the spreadsheet area of the word processing document, the menus change to spreadsheet mode and you can make changes. When you are done, you return to the word processor. But the publish-and-subscribe method of linking files differs from the frame-based method in that each kind of document (word processing, spreadsheet, and so on) exists as a separate document on the hard drive. GreatWorks uses the standard version of publish and subscribe, which requires you to open the publisher document and make your changes there; when you save changes, the subscriber document is updated.

When I sat down and tried to send a mail-merged letter, create a database, design a newsletter, maintain a simple chart of accounts, create a graphic, or go online, the packages' strengths and weaknesses became clear. Here's what I found.

BY TOM NEGRINO

Word Processing Tasks

MOST PEOPLE USE INTEGRATED PROGRAMS to do writing more than any other activity. All the programs I evaluated have adequate word processors, covering basic features like WYSIWYG editing, font and style control, tabs, justification, margins, and headers. All the programs have spelling checkers; BeagleWorks, ClarisWorks, and GreatWorks also provide a thesaurus.

There are a few differentiating features, though. BeagleWorks can automatically wrap text around irregularly shaped graphics and lets you change column structure anywhere on the page. The program also has custom character and paragraph styles, a word-count feature, and multiple columns. And BeagleWorks' tool palette gives you access to most of the basic features without your having to resort to the menus.

GreatWorks provides custom character styles, a print preview, multiple columns, and a draw layer. GreatWorks also has a terrific envelope-printing feature. ClarisWorks' word processor is reminiscent of a stripped-down MacWrite II. It has multiple columns and autonumbered footnotes but is otherwise quite simple. HandiWorks is the only program that comes with a Spanish dictionary, and 17 other language dictionaries are available. The program also does automatic hyphenation and kerning. DeskWrite's remarkable features include a word counter and the ability to change text case (for example from small letters to all capitals) and add graphic borders around paragraphs. Microsoft Works brings up the rear in the word processing department. It has virtually no features beyond the basics.

■ For word processing I'd recommend BeagleWorks.

Easy Mail Merge When creating mail merge fields in BeagleWorks, you simply pick the fields that you want to insert from a dialog box and double-click; the merge field then appears in your document with the double angle brackets already in place.

MEMORY APPETITES

Product	RAM Space [1]	Drive Space [2]
BeagleWorks	1024K	940K
ClarisWorks	900K	562K
Desk (Total)	4881K	920K
DeskCalc	1000K	263K
DeskCom	20K	30K
DeskDraw	384K	265K
DeskFile	1024K	146K
DeskPaint	1953K	113K
DeskWrite	500K	103K
GreatWorks	1024K	588K
HandiWorks	750K	616K
Microsoft Works	768K	591K

[1] *Suggested RAM in Get Info box.*

[2] *Program only, exclusive of dictionaries, translators, and so on.*

Creating Form Letters

MAIL MERGE LETS YOU CREATE PERsonalized form letters by melding a list of names (and other individualized items) from a database with a letter written in a word processor. To make the merge letter, I pasted the PAA logo into the header of a word processing document. In merge letters, field names from the database are placed into the document, usually in double angle brackets, like this: «Address». After you've written the letter and placed the merge field names where you want them, you tell the program to merge these fields from the database with the text of the letter. The program then adds the information you've specified from the database into the letter.

ClarisWorks, BeagleWorks, and GreatWorks all let you select from a dialog box the field names that you want to use, leaving a minimum of typing for you to do (see "Easy Mail Merge"). Mail merge in any of these programs is simple, but with ClarisWorks it's slightly easier than with the other programs. BeagleWorks has a feature that I like: the database can have up to 32 data layouts, with an associated selection criterion. So, if you set up a layout to select only certain records (say, all contributors who gave more than $5000 last year), you can choose that layout in the mail merge, and print letters only for the select few.

Desk's DeskWrite and DeskFile work together for mail merge using much the same procedures as ClarisWorks and GreatWorks, but you have to type the brackets and field names into the merge letter manually, instead of selecting them from a dialog box.

Microsoft Works doesn't use bracketed fields in the merge letter; instead, you select a menu choice called Prepare To Merge. You're then presented with a list of database fields to choose from. The annoying thing about this process is that you have to select Prepare To Merge for each merge field in your letter.

HandiWorks does not have a full-featured database module; instead, it has an address-book–like desk accessory called Address Manager. Address Manager has standard name and address fields, plus two user-customizable fields. Entering data into Address Manager is straightforward, but when you create a merge letter in HandiWorks, you must create spreadsheet frames for the Address Manager fields. The spreadsheet frames need to contain an equation that references the Address Manager fields, and the Address Manager fields cannot even be referenced by name, only by the number of the field. So, instead of typing in «Address», you type an equation in the spreadsheet frame that reads AMMailmerge (8). I found this needlessly difficult to master.

■ For the best mail-merge program, it is a close tie between ClarisWorks, BeagleWorks, and GreatWorks, in that order.

Laying Out the Newsletter

I CREATED THE FRONT PAGE OF PRIvacy Advocates of America's newsletter in each of the integrated programs (see "Newsletter Layout"). The newsletter is in a two-column format, with the *Privacy News* logo centered at the top. I drew the two horizontal rules using the graphics tools in each package, and the cartoon at the bottom of the page is a MacPaint-format graphic from a clip art collection.

Creating the newsletter in ClarisWorks was a breeze. Starting in the draw mode, I created the two text columns and linked them. I wrote the text, letting it flow between the two linked columns, then adjusted the height of the columns until I had the specific text I wanted in each column. I pasted in the *Privacy News* logo and the cartoon from the Scrapbook, dragging them directly to where I wanted them on the page. The headline and the masthead were each separate text blocks dragged into place. The "Inside This Issue" table of contents was another text block, and I drew the box around it with the rectangle tool. I then used the straight-line tool to make the two horizontal rules for the masthead. Finally, I wrote the text that went into the cartoon balloon and nudged it into place with the arrow keys on the keyboard.

Privacy News

Jan-Feb 1992 The Newsletter of Privacy Advocates of America Page 1

Congress Considers Privacy Act

The United States House of Representatives began debate in late January on the Privacy Act of 1992, a landmark piece of legislation that, if passed in its current form, will significantly expand citizen protection from intrusive government and corporate actions. The Privacy Act enumerates, at the federal level, a specific right to privacy. While many state constitutions specify a right to privacy, the United States Constitution has no such explicit provision. Over the past several decades, various Supreme Court decisions have derived a right to personal privacy from several of the Amendments in the Constitution. However, as the Court has shifted to the right during the past eight years, proponents of privacy rights have seen a series of decisions chipping away at the underpinnings of these derived rights.

This legislation could have far-reaching effects, from the highly contested arena of abortion rights, to possible new limitations on police agencies nationwide, and will affect the right of consumers to remove their names from corporate mailing lists.

The main sponsor of the Privacy Act is California Senator Robert Feinly (D). Asked what chances the bill has for passage, Senator Feinly remarked, "We

Inside This Issue

Congress Considers Privacy Act Page 1
CA Bulletin Board System Seized Page 2
Betty Pattengale Honored for Years of Service to Privacy Community Page 3
Letters From Our Readers Page 4

The main sponsor of the Privacy Act is California Senator Robert Feinly (D). Asked what chances the bill has for passage, Senator Feinly remarked, "We have some strong opposition, especially from the business groups and the anti-abortion organizations. We're not sure whether we'll be able to get the bill past such a powerful coalition of opponents in this session, especially in an election year. But if we do fail this time around, I will reintroduce the bill next year." (con't on page 3)

Don't forget to write your Congressperson urging passage of the Privacy Act!

Newsletter Layout This document contains many of the common formatting elements used to create simple newsletters. Notice the PICT logo, horizontal lines, MacPaint cartoon, dual columns, and the boxed paragraph used for the table of contents.

Getting Connected The BeagleWorks tool palette gives valuable information about the status of the telecommunications session in progress. The session has been going on for three minutes, the connection is at 2400 baud, the terminal emulation is TTY, and the currently selected file-transfer protocol is Xmodem. The other icons in the palette are to control file transfer, text capture, the Phone Book, dialing, and hanging up the phone.

Making newsletters in HandiWorks was almost as pleasant—because the program is completely frame-based, it is especially well suited to page-layout tasks. I simply drew frames, specified their type (text or picture), linked the text frames, pasted in the graphics from the Scrapbook, and added the extra text and graphic elements. HandiWorks has features normally found in more expensive, specialized programs, such as kerning, automatic hyphenation (in 17 languages), and good leading controls. A drawback to HandiWorks is that it has a sparse user interface that isn't as clear as that of some of the other programs. The program's tool palettes use some peculiar icons that require explanation, and learning to deal with HandiWorks' frame-based document structure takes a while.

Creating the newsletter in GreatWorks was quite different. I put the *Privacy News* logo and the cartoon into separate draw and paint documents, respectively, then linked them, using publish and subscribe, with the newsletter, created in the draw module. I wanted to use the write module for the newsletter because it has better text controls, but it doesn't let you flow text around graphics, so I had to use the draw module to accomplish that layout task. And you can't link text columns in the draw module; you have to cut and paste to move text between columns as you are laying out the page. If you're going to be doing a newsletter regularly, GreatWorks isn't a great choice.

BeagleWorks gave me a different series of problems. I linked the newsletter elements from several documents in the word processor. BeagleWorks lets text flow around graphics, so I placed the cartoon and table of contents, and the text repositioned itself. While BeagleWorks lets you mix different column structures on a page, it always balances the text evenly between multiple columns—if you have a two-column layout, BeagleWorks tries to make both columns the same height. In the *Privacy News* page, I wanted to have more text in the left column than in the right column; BeagleWorks took the text and made two even columns. To make the text flow correctly, I had to create the table of contents box as a draw graphic, then precisely position it in the second column until the text flowed the way I wanted it to.

Desk is the wrong package to use to create a newsletter. While I was able to create *Privacy News* in DeskDraw, it was a laborious process. There's no provision for creating and linking text columns. Each element must be pasted into the layout, then dragged into place. This is a job only for the patient.

Microsoft Works required me to create the whole newsletter in the draw mode of the word processor because you can't create columns in the word processing mode. And text created in the draw mode doesn't use tabs, so it was difficult to get the table of contents to format correctly. All the text was created with the draw mode's text tool and dragged into place. There was no way to link the two text columns, so I had to do a lot of tweaking of column heights to place the text properly. And text that needs to be moved from one column to the next must be cut and pasted. This resulted in a newsletter that took too much effort to create.

■ For newsletter layout I'd pick ClarisWorks, with HandiWorks as a close second.

Future Watch

The integrated software wars won't end with the products evaluated here. Two newer entries are expected to enter the fray by the time you read this.

Symantec plans to offer Q&A for the Macintosh, based on its best-selling package for DOS. Q&A is a flat-file database with an integrated word processor. The database portion is expected to be similar to Claris's FileMaker Pro, with the word processor much like MacWrite II. Users of the Q&A database will be able to share data over a network with DOS Q&A users. The word processor serves as a convenient way to do mail merges without switching to another program. Symantec hadn't set pricing for Q&A for the Mac at press time.

Microsoft will deliver the long-awaited Microsoft Works 3.0 by late spring, according to Microsoft spokespersons. Microsoft showed me a beta version of the program in March, and while some features were expected to change, Works 3.0 now includes a separate draw module and more draw tools. The word processor has revamped the dictionary and thesaurus functions, and the communications module has gained Kermit file transfers. The database module shows the most improvement; you can now have multiple layouts, and the draw tools are available to the database form designer. Microsoft Works 3.0 follows the same path to integration as does its predecessor: cut and paste; publish and subscribe is not supported.

Microsoft will be using DataViz's file translators in Works 3.0; this gives Works extensive file interchange options with dozens of other programs in both the Mac and DOS worlds. Microsoft Works 3.0 is expected to sell for the same $249 price as the current version.

Telecommunications

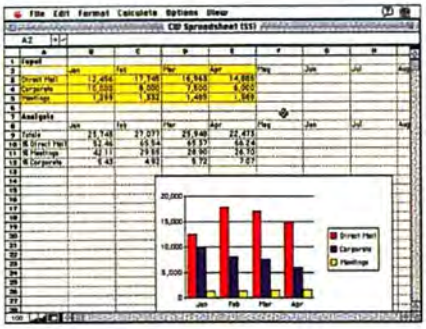
TELECOMMUNICATIONS IS THE WEAKest module in each of the packages, with the exception of HandiWorks, which lacks such a module altogether. I used

each of the other packages to log on to CompuServe, and I signed on to a local bulletin board system at both 2400 baud and 9600 baud and downloaded a file using the Xmodem protocol (a standard way to communicate between computers). While each of the programs works adequately, their lack of scripting and other tools designed to make routine communication easier make the process harder than it needs to be.

If you spend a lot of time using your modem, you are probably best served by buying a separate telecommunications program such as FreeSoft's White Knight or Software Venture's MicroPhone II. These programs feature scripting—which lets you automate log-on sequences and online actions—and can handle a variety of file-transfer protocols, such as Xmodem, Zmodem, and Kermit, that ensure that files transferred between two modems are sent error-free.

Zedcor's DeskCom is a simple desk accessory that handles connection, text capture to a file, basic Xmodem file transfers, and not much else. Microsoft Works adds VT102 emulation for those who need to communicate with mainframes, but it doesn't really add anything else to the basic features list. Both DeskCom and Microsoft Works let you save up to eight phone numbers in a communications document, so you don't have to retype frequently called numbers.

ClarisWorks, BeagleWorks, and GreatWorks build their communications modules around Apple's Communications Toolbox, a set of software tools that is built into System 7 and can be installed on machines running System 6. The ClarisWorks and GreatWorks communications modules are almost identical. They are functional but sparse.



Year-to-Date Charting To create a chart in ClarisWorks, all you need to do is select the range of cells that you want to chart, then pick Make Chart from the Options menu. ClarisWorks places the chart right into the spreadsheet, and can resize the chart as needed.

The best communications module is offered by BeagleWorks (see "Getting Connected"). Instead of saving each online service you call as a separate communications document, as do ClarisWorks and GreatWorks, BeagleWorks saves a Phone Book file in the System Folder. Each entry in the Phone Book file can have a set of parameters that include speed, terminal emulation, and other communications settings. Best of all, you can associate a simple log-on script with each Phone Book entry; BeagleWorks gives you four script commands—Wait For (text), Send (text), Password, and Pause—that let you handle most log-on sequences. After you create the script with the script editor, choosing the Phone Book entry and clicking on the Dial button calls the online service and logs you on automatically.

- For telecommunications I would choose BeagleWorks.

Spreadsheets

PAA'S SPREADSHEET NEEDS AREN'T complex; it uses spreadsheets to track contributions and do some simple financial projections. Although in the past the organization tried using a spreadsheet for day-to-day accounting, it found that an off-the-shelf personal finance package was better suited to its accounting needs.

At the end of each month, PAA's director takes the total amount of contributions and plugs it into a tracking worksheet. This worksheet has the months of the year across the top and the different sources of contribution (direct mail, corporate donations, meetings) down the side. The worksheet calculates the running totals and the percentage of total contributions that came from each source. PAA then generates year-to-date charts that show the state of contributions.

Making the spreadsheet is straightforward in all of the programs. It is charting where things get interesting. ClarisWorks lets you create a chart right in the spreadsheet, rather than as a separate document. ClarisWorks is also the smartest program, labeling the values and categories correctly and clearly without any tweaking (see "Year-to-Date Charting"). Other programs either group the catego-

INTEGRATED OVERVIEW

Company	Product	Modules	Retail Price	Advantages
Beagle Bros	BeagleWorks 1.0	word processing, draw, color paint, spreadsheet, chart, database, communications	$299.95	good integration via System 7's publish and subscribe, with ability to edit published data in the subscriber document; innovative user interface; deepest feature set; word processor supports multiple columns and irregular text wrap
Claris Corporation	ClarisWorks 1.0	word processing, draw, spreadsheet, chart, database, communications	$299.00	best balance of power and ease of use; interfaces similar to those of more powerful Claris products; easy, transparent integration between word processing, spreadsheet, and draw modules
Zedcor	Desk 3.07	word processing, draw, black-and-white paint, spreadsheet, chart, database, telecommunications	$399.95	individual applications are quite good; DeskPaint and DeskDraw are great for quick graphic tasks
Symantec Corporation	GreatWorks 2.0	word processing, draw, color paint, spreadsheet, chart, database, telecommunications, outliner	$299.00	only package with an outlining module; interface consistent across modules; easy to use
MacVonk USA	HandiWorks 1.0	word processing, draw [1], spreadsheet, chart, database [2], telecommunications	$175.00	inexpensive; very good at page-layout tasks; fine spreadsheet functions; multiple-language support for spelling and hyphenation
Microsoft Corporation	Microsoft Works 2.0	word processing, draw [3], spreadsheet, chart, database, telecommunications	$249.00	old reliable; inexpensive; doesn't shine, but gets the job done

[1] Limited to lines and boxes in the frame mode. [2] Address Manager DA only. [3] Draw tools available in word processor.

ries incorrectly (GreatWorks, Desk) or label them poorly (BeagleWorks, Microsoft Works).

- For spreadsheet users, I would recommend ClarisWorks.

Graphics

ALL OF THE PROGRAMS HAVE DRAWing modules with object-oriented drawing tools. DeskDraw gives you control over the transparency of objects. BeagleWorks has a nice object-duplication function. GreatWorks features a Bézier curve tool and gradient fills. None of these programs, however, are going to satisfy the professional artist, though they're all more than adequate for moderate drawing tasks. HandiWorks is the exception, since it has only rudimentary box and line tools.

- No package stands above the rest in graphics, yet all are fine for occasional use.

Databases

NONE OF THE PROGRAMS ESPECIALLY shine in the database department, either. They are all simple databases that lack lookups, data formatting, and other features that distinguish stand-alone programs like Claris's FileMaker Pro and ProVue's Panorama II.

GreatWorks and BeagleWorks have the strongest databases overall and are the only programs that let you have picture fields in a database. GreatWorks also lets you assign automatic serial numbers to fields. BeagleWorks has the best sorting and selection feature.

The programs with the weakest database modules are Microsoft Works, because it only lets you have one limited form view, and HandiWorks, because its Address Manager DA isn't a decent substitute for a real database.

- If you are going to keep track of people, places, or things with a database module, it's a tie between BeagleWorks and GreatWorks.

Disadvantages
steeper learning curve than the other programs; publish and subscribe can be cumbersome to set up
database and telecommunications modules could stand improvement
group of separate applications with minimal integration; poor memory management when modules are used simultaneously
average integration overall; publish and subscribe can be cumbersome to set up
Address Manager isn't as good as a real database module; no telecommunications module; better drawing tools needed; no paint tools
poor integration; clumsy draw layer in word processor; limited database; desperately seeking revision

Limited Storage and RAM

THESE INTEGRATED PACKAGES ARE being targeted for use with the Macintosh Classic, the Classic II, and the LC, all of which often have limited drive space and limited RAM. And owners of the portable Mac PowerBooks, which currently have small hard drives and expensive RAM add-on costs, also need compact, efficient programs. To evaluate how the integrated packages cope with limited resources, I ran all of them on a 2MB Mac Classic running System 6.0.7 and on a 2MB PowerBook 140 running System 7.0.1 (see "Memory Appetites").

On the Classic running System 6.0.7, which gives you the option of turning MultiFinder off, thereby dedicating most of the machine's RAM to the running application, all the programs opened and ran well. It was a different matter on the PowerBook 140, however. Running System 7.0.1 with all extensions off, there was only 1049K of RAM available for a program to use. In this tight environment, GreatWorks and BeagleWorks were at a disadvantage (see "Memory Appetites"). GreatWorks started up fine, but ran sluggishly with more than one document window open. BeagleWorks, which requires a minimum memory allocation of 1024K and prefers 1500K, ran slowly on the low-memory PowerBook. At press time, Beagle Bros was readying an update, due in April, that lowered the memory requirement to 900K, and stated that all registered users would get the update for free. The only two Desk applications I could open simultaneously were DeskWrite and DeskDraw. Attempting to open other Desk programs resulted in out-of-memory messages.

The best performers on the PowerBook were HandiWorks, Microsoft Works, and ClarisWorks, all of which handled the various documents I tried with no problems. Although you can get by with the minimum 2MB configuration, you're much better off bumping RAM up to 4MB for the Classic, and to either 4MB, 6MB, or 8MB on the PowerBooks, which require System 7.

MW EDITORS' CHOICE

ClarisWorks With an excellent combination of power and ease of use, ClarisWorks nudges its way to the front of the integrated software pack. The program's easy, no-hassle integration of word processing, drawing, and spreadsheets makes it the winner in this suddenly crowded field. **Company:** Claris Corporation. **List price:** $299.

Choosing the Right Package

MICROSOFT WORKS HAS LONG BEEN the leader in integrated software, partly by being the lone contender. The newer packages clearly show that Microsoft Works is long in the tooth, and long overdue for a complete overhaul. Zedcor's Desk isn't really an integrated package, although some of the applications work together well.

HandiWorks is attractive for people who are looking mainly for word processing and page-layout tasks, but its weak Address Manager makes it a poor choice for users who need to keep track of lists of people.

BeagleWorks is full of whiz-bang features, but it is a bit more difficult to learn than the other packages I evaluated. With its many modules and unique version of publish and subscribe, it is also more powerful in creating compound documents that combine many disparate elements. For anyone willing to spend the time to master it, BeagleWorks gives ClarisWorks serious competition.

Symantec's GreatWorks 2.0 is a big improvement over the original version. Integration via System 7's publish and subscribe works well, although I still feel that the frame-based programs provide easier integration overall. GreatWorks gets high marks for including an outline module and a color paint module. GreatWorks is a solid program, and it's worth a close look.

That leaves ClarisWorks with the best all-around combination of ease of use and integration. While ClarisWorks isn't perfect—I 'd like to see a better database module, in particular—it is more than enough for most beginning users. **m**

See *Where to Buy* for contact information.

TOM NEGRINO is a *Macworld* contributing editor and a contributor to the *Macworld Read Me First Book* (IDG Books Worldwide, 1991).

Hubs: Connecting to Ethernet

Macworld Lab finds that hubs—the devices that control transmission of data on 10BaseT networks—are highly reliable

BY LON POOLE

IF YOU ARE CURRENTLY UPgrading your network from LocalTalk to Ethernet, you are probably installing the most popular type of wiring: 10BaseT, or unshielded twisted-pair wiring. It is inexpensive, easy to install, and reliable. With twisted-pair you use standard telephone wire to connect computers in a star layout. At the center of the star is a *multiport repeater*, or *hub*—an important piece of hardware that can make or break a network's reliability. The hub receives signals from any device connected to it and repeats them as full-strength, clear signals to all other devices. Without these high-quality signals, the network would slow down. For instance, if a signal fades away or becomes garbled before arriving at its destination, the sender must retransmit the signal.

The star configuration makes 10BaseT more reliable than forms of Ethernet that use a bus layout (where information is passed in a straight line from one device to another) because if one device in a bus layout is improperly terminated, breaks down, or becomes disconnected, the whole network may stop working. In contrast, if one branch of a 10BaseT star has trouble, the hub shuts down that branch, and the rest of the network continues working normally.

The number of 10BaseT hubs you can choose from may surprise you (see "Twisted-Pair Hubs Compared"); such a variety exists because hubs appeal to a number of markets. Twisted-pair wiring works with a wide variety of computer networks, including Novell NetWare and other networks on DOS computers, TCP/IP networks on Unix computers, DECnet networks on Digital Equipment Corporation computers, and AppleTalk networks on Macs. To help you decide which 10BaseT hub to get, Macworld Lab evaluated 11 of them (see "Testing 10BaseT Hubs").

Hub Connections

A 10BASET HUB HAS MULTIPLE PORTS; you can connect only one network device to each port. You don't daisy-chain multiple devices as you do with other forms of Ethernet, LocalTalk, or PhoneNet. Thus, the hub you buy needs enough ports for every device in the network, plus extra ports to accommodate growth. You can get 10BaseT hubs with a range of ports—common configurations are 8, 12, and 24—and you can interconnect a limited number of hubs. A special type of hub called a *concentrator* consists of a chassis to which you add *modules*, boards containing a number of ports. Concentrators make it easy to expand the number of ports.

You connect computers and other network devices to a 10BaseT hub using standard telephone wires and connectors. A 10BaseT cable consists of ordinary unshielded twisted-pair wires like the telephone wires installed in most buildings. If your building was wired in the past ten years, you may be able to use spare telephone wires to connect a 10BaseT network. 10BaseT uses two pairs of wires; one pair sends data and the other receives. A single twisted-pair segment—from hub to computer—can be up to 100 meters (328 feet) long.

Twisted-pair cables connect to most hubs with 8-pin RJ-45 modular connectors similar to the 4-pin modular connectors you use to plug a phone into a wall jack. The RJ-45 connectors make 10BaseT network hookup a snap, but can create a serious snarl of cables. For a neater, more permanent, and more expensive installation, you can use a hub with

SCOTT PETERSON

one or two 50-pin RJ-21 connectors. Each RJ-21 socket replaces up to 12 RJ-45 jacks. A single thick cable, composed of twisted-pair wires, carries 12 ports from the RJ-21 to another standard piece of telephone equipment called a punchdown block. Anyone with telephone-wiring skills and tools can easily connect the twisted-pair wires from the thick cable to the individual 10BaseT cables running to computers or other networked devices.

Of the hubs tested, only Asanté Technologies' 10T Hub/12 comes with interchangeable connector panels, one with RJ-45 jacks and the other with an RJ-21 socket. Du Pont's LAN One Concentrator, Farallon Computing's PhoneNet StarController EN, and Network Resources Corporation (NRC)'s MultiGate Hub come with RJ-21 sockets only, but you can buy a separate RJ-45 connection panel, called a patch panel, for these hubs. Some hubs that have only RJ-21s come with an RJ-21–to–RJ-45 converter that looks like a large harmonica, hence its name, harmonica block.

No matter which 10BaseT hub you choose, each device you want to connect to it must have Ethernet capability with a 10BaseT port (RJ-45 jack). Most Macs require an Ethernet adapter board or an Ethernet SCSI adapter box (see "Moving Up to Ethernet," *Macworld*, May 1992). The Quadra computers and the LaserWriter IIf and IIg printers have a special AAUI (Apple Attachment Unit Interface) Ethernet port built-in. For these Macs, you purchase a special transceiver that connects the AAUI to twisted-pair wiring.

Since there are two versions of AppleTalk—Phase 1 and Phase 2—keep in mind that a Mac using one version cannot communicate through a 10BaseT hub with a Mac using the other version. In order to communicate, all computers connected to the same hub must have the same AppleTalk version. Phase 2 is standard with System 7, and all new Macs will support only Phase 2. You can tell which version is installed on a Macintosh running EtherTalk by opening the Network control panel. Single arrowheads in the EtherTalk icon indicate that AppleTalk Phase 1 is installed, and double arrowheads indicate Phase 2 is installed.

SCOTT PETERSON

Top to bottom, 12-port hubs include Sonic Systems' StarBase T, Farallon's PhoneNet StarController EN, and Du Pont's LAN One Hub.

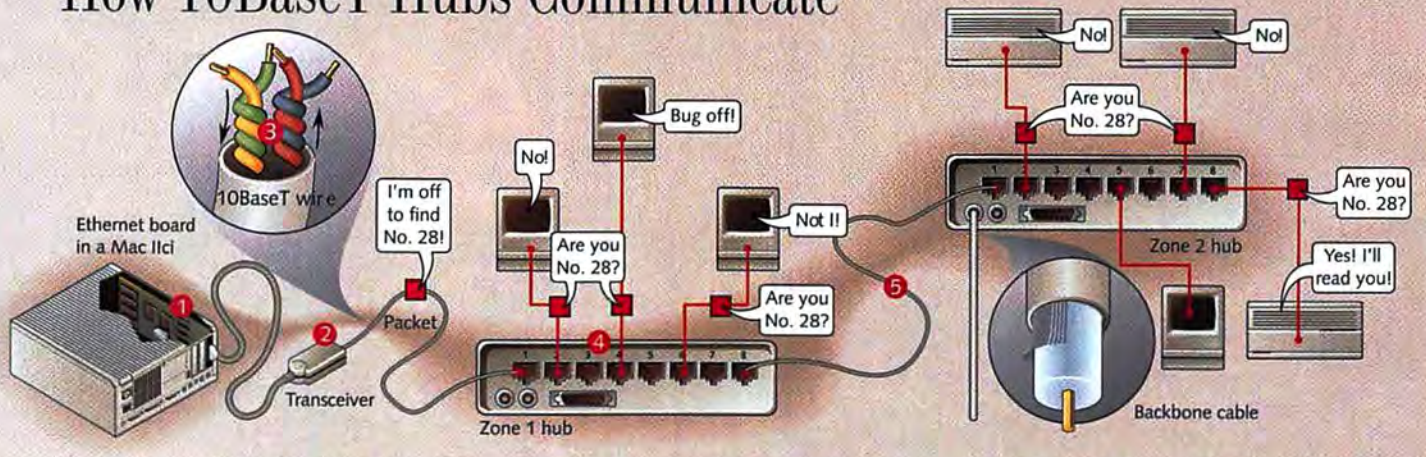
Adding More Ports

WHEN A HUB RUNS OUT OF PORTS, you can connect another hub to it. A method called *cascading* involves running a twisted-pair cable from one hub's 10BaseT port to another hub's 10BaseT port. The cable's send and receive lines are crossed so that the send line hooks into the receive portion of each port and vice versa. You can use a regular 10BaseT cable instead of the crossover cable if one of the interconnected hubs has a switch that crosses the send and receive lines on one port. The Asanté 10T Hub/12 and TechWorks' HubWorks-8 have crossover switches for one port, and Sonic Systems' StarBase T has internal jumpers for crossing one port.

Some 10BaseT hubs have an additional port to connect two hubs, thereby conserving a 10BaseT port for connecting a computer or other networked device. This port may have one or more standard Ethernet connectors—AUI, BNC, or fiber-optic. You attach a transceiver that converts one of the available connectors to 10BaseT, and run a regular 10BaseT cable from the transceiver's 10BaseT port to a 10BaseT port on another hub. Sonic's StarBase T hub lets you connect to its AUI port and its BNC port at the same time, but most hubs with a combination of AUI, BNC, and fiber-optic connectors let you use only one at a time.

Cascading creates a hierarchy of hubs. For example, you might have a central hub with other hubs branching out from it in a star layout and computers branching out from the peripheral hubs. (You

How 10BaseT Hubs Communicate



Ethernet boards and EtherTalk system software prepare AppleTalk data packets for transmission on Ethernet cables by adding Ethernet addressing information **(1)**. Ethernet boards also receive data packets, remove the Ethernet addressing, and forward the packets to AppleTalk system software. Transceivers convert an Ethernet adapter's AUI (Attachment Unit Interface) or AAUI (Apple Attachment Unit Interface) port to a 10BaseT port **(2)**. Unshielded twisted-pair (UTP) wiring is attached to the 10-BaseT port; one pair of UTP wires carries data packets from a networked device to the hub, and another pair carries them back **(3)**.

The hub receives the data packets and transmits them to its connected ports **(4)**. Only the networked device to which a packet is addressed processes the packet; all other devices ignore it. Hubs can be connected with UTP cables so that networked devices in one zone can communicate with devices in another zone **(5)**.

Backbone cable—thick Ethernet coax, thin Ethernet coax, or fiber optic—carries data packets longer distances than UTP wiring does. Networked devices can be attached directly to the backbone.

could also connect computers to the central hub at 10BaseT ports not used for cascading.) In this scenario, data from a computer connected to one peripheral hub must go through three hubs to reach a computer connected to a different peripheral hub. The IEEE's Ethernet standard limits the hub hierarchy, specifying a maximum of four hubs between any two networked devices. In other words, data can hop through at most four hubs from the data source to the destination.

Instead of subjecting your network to the four-hop limit and using up 10BaseT ports to cascade hubs, you can connect multiple hubs to an Ethernet backbone cable. The hubs all need an AUI, BNC, or fiber-optic port. The type of connector determines the type of backbone cable you use. A BNC connector hooks up to thin Ethernet cable, and fiber-optic connectors hook up to fiber-optic cable. An AUI connector requires a transceiver to match the type of backbone cable—thin Ethernet, fiber-optic, or thick Ethernet.

Several manufacturers let you add alternate backbone connectors by plugging modules into the hub. Sonic has an unusual provision for increasing the number of ports in its StarBase T hub. The basic hub has 12 RJ-45 jacks, but only 6 work. You activate the others one pair at a time by installing SIMM-like hub modules.

For large networks, Cabletron, David Systems, Du Pont, and other companies offer concentrators. Their capacities range up to 228 10BaseT ports distributed among 3 to 20 modules. One module handles multiport repeater functions, and the other modules provide 10BaseT ports. You can use modules that work with different kinds of cabling and in some cases different sorts of networks. You can't mix and match modules made for different concentrators, however. Some hubs, such as David Systems' 13-port ExpressNet Hub, can be converted to concentrator modules to enlarge a network.

MW LAB Testing 10BaseT Hubs

Macworld Lab tested the error handling of eleven 10BaseT hubs—the Asanté 10T Hub/12, the Asanté 10T Hub/8, the Cabletron MRXI, the Cabletron MMAC-3 FNB Concentrator, the Dayna Communications DaynaStar MiniHub, the Du Pont LAN One Hub, the Du Pont LAN One Concentrator, the Farallon PhoneNet StarController EN, the Network Resources Corporation (NRC) MultiGate Hub, the Sonic Systems StarBase T, and the TechWorks HubWorks-8.

We ran each hub through a series of tests to determine how well it handled various network errors. In short, we found that hubs are highly reliable. That's good news, since a hub that cannot correct errors (or at least detect them) cannot be expected to send out correct data. Some of the most interesting tests are outlined below.

The IEEE specification says a hub must automatically *partition* (shut down) a port after 30 or more short collisions or after 1 long collision lasting 0.1 to 3.0 milliseconds. In the Macworld Lab, we transmitted packets on 2 ports to create a series of .08ms collisions, and all hubs partitioned both ports after 30 to 37 of these short collisions. Four hubs partitioned both ports after a single long (1ms) collision—Asanté's 10T Hub/12, Du Pont's LAN One Hub, Farallon's PhoneNet StarController EN, and Sonic's StarBase T. Five other hubs—Asanté's 10T Hub/8, Cabletron's MMAC and MRXI, the DaynaStar MiniHub, and the TechWorks HubWorks-8—treated these long collisions the same as short collisions, waiting for 32 or 33 of them before partitioning the ports. The remaining two hubs—Du Pont's LAN One Concentrator and NRC's MultiGate Hub—partitioned after a variable number (1 to 23) of long collisions. However, this doesn't mean these hubs are less reliable—a 1ms collision borders on being a short collision (the IEEE specification is not very strict on defining the borders for short and long collisions). All hubs automatically reconnected a partitioned port after receiving good packets from it.

Several manufacturers claim their hubs automatically detect and correct reversed polarity in twisted-pair cables—that is, they correct cases where the negative and positive receive wires are accidentally crossed. We found that all hubs except Cabletron's MRXI successfully established link integrity with reversed polarity. Polarity correction is a minor benefit because hubs have only a 50 percent chance of correcting a random wiring mistake. They can fix polarity on receive lines, but not on transmit lines. Besides, uncorrected polarity shows up through the status lights as a bad link, and checking cable condition is standard procedure if a bad link occurs.

Our tests indicate that all 11 hubs behave as they should. There are slight differences, but they are well within the IEEE's 10BaseT specification.

Hubs in Action

ALL HUBS THAT CONFORM TO THE IEEE 10BaseT specification perform certain tasks. In its role as a network repeater, a 10BaseT hub receives a packet of data from a port, removes minor irregularities, and transmits the packet to all its working ports. The hub knows which ports are working by performing tests and monitoring error conditions.

A 10BaseT hub tests the integrity of the link between each port and the device connected to that port by sending a special pulse to the device. If the device doesn't respond to the pulse, the hub shuts down the port. This integrity test doesn't indicate how well the link is working, only whether it is working well enough for the connected device to receive and respond to the hub's pulses. Most hubs have status lights that show which ports have passed the link test. Many hubs let you disable the link test for individual ports so you can use old Ethernet adapters, which do not respond to 10BaseT hub pulses.

SCOTT PETERSON

From top to bottom, compact 8-port hubs include Asanté Technologies' 10T Hub/8, Dayna's DaynaStar MiniHub, and TechWorks' HubWorks-8.

Besides detecting faulty links, all 10BaseT hubs recognize and handle collisions that occur when two or more networked devices transmit data at the same time. A hub stops forwarding packets to or from a port, an action termed *partitioning*, when it detects too many consecutive collisions or too long a collision at that port. The hub continues to monitor port traffic and resumes normal packet forwarding when it sees the first valid packet to or from a partitioned port. Status lights on many hubs identify partitioned ports.

10BaseT hubs ignore continuous data transmissions that exceed the maximum Ethernet data-packet size. This excessive data-transmission condition, known as *jabber*, usually results in too many collisions and causes the hub to partition the jabbering port. Some hubs have a jabber indicator light that you can use along with partition status lights to diagnose the source of persistent jabber.

The NRC MultiGate Hub has a handy feature for reducing network traffic—the MultiGate can serve as a *bridge* between an Ethernet backbone and the hub's 10BaseT ports. A bridge reduces traffic by filtering data packets according to their destinations. Hubs that do not offer bridge functions route data packets to all working ports. The NRC MultiGate's bridge feature lets the hub filter data packets according to their network type, including AppleTalk, DECnet, Novell NetWare, and TCP/IP. Besides filtering network traffic, a bridge overcomes the IEEE limit of four hubs between sender and receiver by dividing the backbone and the 10BaseT ports into separate networks, each of which can have four hubs. Similarly, some concentrators, such as the David Systems ExpressNet Concentrator, support bridge modules.

Hub Management

TO MONITOR MOST 10BASET HUBS, YOU stand in front of them and watch their lights. Status lights can tell you whether a port is busy but not how busy or that a collision is occurring but not how often. Status lights don't help analyze traffic to optimize network performance and plan network expansion; nor do they notify you at your Mac when problems occur.

To measure traffic, count errors, and receive trouble alerts, you need a *managed hub*, such as Cabletron Systems' MMAC FNB Concentrator and MRXI, Farallon's PhoneNet StarController EN, or NRC's MultiGate Hub. A managed hub, also known as a smart hub or intelligent hub, counts numerous traffic and error statistics for the whole hub and for each port 24 hours a day. The MultiGate Hub, for

TWISTED-PAIR HUBS COMPARED

					Connectors Available			
Company	Product	Number of Ports	Price	Management (In-Band/ Out-of-Band)	RJ-45	RJ-21	AUI	BNC
3Com Corporation	LinkBuilder 10BT	12	$1095	○/○	●	○	●	●
	LinkBuilder 10BTI	12	$1995	●/●	●	○	●	●
	LinkBuilder ECS	4–120	$2290–$22,650	●/○	●	○	●	●
	LinkBuilder 3GH	88	$31,525+	●/●	●	○	○	○
	MultiConnect	45	$1650–$5995	○/○	●	○	●	●
Anco Corporation	E-Net 10Base-T 8-Port Hub	8	$450	○/○	●	○	●	●
	E-Net 10Base-T 12-Port Expandable Hub	14	$950	○/○	●	○	●	●
Asanté Technologies	10T Hub/8	9	$399	○/○	●	○	○	●
	10T Hub/12	14	$799	○/○	●	●	●	●
Cabletron Systems	MR9T	9	$695	○/○	●	○	○	○
	MRX	12	$1395	○/○	●	●	●	●
	MRXI	12	$2195	●/●	●	●	●	●
	MMAC FNB Concentrator series *	12–168	$1250–$1850	●/●	●	●	●	●
Chesapeake Systems	SuperStar 9	9	$499	○/○	●	○	●	○
	SuperStar 18AB	18	$1098	○/○	●	○	●	●
ChipCom	OnLine Workgroup Hub 5108H-TP	9	$595–$695	○/○	●	○	●	○
	Online Workgroup Hub	14	$1995	●/○	●	○	●	●
	6-Slot Online System Concentrator *	48	$2295	●/○	●	○	●	●
	17-Slot Online System Concentrator *	180	$4950	●/○	●	○	●	●
David Systems	VolksNet	13	$795	○/○	●	●	●	●
	ExpressNet Hub	13	$1695	●/●	●	●	●	●
	5-Slot ExpressNet Concentrator *	12–48	$900	●/●	●	●	○	○
	12-Slot ExpressNet Concentrator *	12–132	$1200	●/●	●	●	○	○
	12-Slot ExpressBus Concentrator *	12–144	$1995	●/●	●	●	○	○
Dayna Communications	DaynaStar MiniHub	8	$449	○/○	○	●	○	●
	DaynaStar Hub-12	12	$995	○/○	●	●	●	●
Du Pont Electro-Optic Products	LAN One Hub	12	$995	○/○	●	○	●	●
	LAN One Concentrator *	12–60	$3715+	●/○	○	●	○	○
	Paragon Concentrator *	12–228	$7880+	●/●	○	●	○	○
Farallon Computing	PhoneNet StarController EN	12	$1895	●/●	○	●	○	○
Hewlett-Packard	HP EtherTwist Hub-8	8	$650	○/○	●	○	○	●
	HP EtherTwist Hub-Plus	12	$1895	●/●	●	○	●	●
	HP EtherTwist Hub-Plus 48	48	$4795	●/●	●	○	●	●
NetWorth	EtherNext MicroHub	9	$645–$675	○/○	●	○	○	●
	Series 4000 Concentrator *	12–120	$239–$24,000	●/●	●	○	●	●
Network Resources Corporation	MultiGate Hub	32–134	$2495–$3495	●/●	○	●	●	●
Shiva Corporation	Hublet	4	$299	○/○	●	○	○	○
Sonic Systems	StarBase T	7	$499	○/○	●	○	●	●
	StarBase T+	13	$699	○/○	●	○	●	●
SynOptics Communications	LattisNet 2800	12	$995	○/○	●	○	●	●
	LattisNet 2810	12	$1995	●/●	●	○	●	●
	LattisNet 2310	38	$5495	●/●	●	○	●	●
	LattisNet 3000 Concentrator *	12	$2750	●/●	●	●	●	●
TechWorks	TechWorks HubWorks-8	8	$399	○/○	●	○	●	●
Thor Manufacturing	MixNet StarMaster 8E	8	$699	●/●	●	○	●	○

● = yes; ○ = no. * Concentrators include a multiport repeater module and one or more 10BaseT modules. You can combine modules to create configurations with varying numbers and types of ports, price

one, comes with *in-band* management software that lets you gather statistics and manage multiple hubs from a Mac anywhere on the network. Other companies offer in-band management software as an option. To manage Cabletron's MMAC or MRXI in-band, you must buy Cabletron's $3995 MacLANView software. Similarly, to manage the PhoneNet StarController EN in-band, you must install one of Farallon's extended-management LocalTalk hubs. Both LocalTalk and Ethernet hubs can then be managed at once from one Mac.

iber-Optic	Cascade Port	Disable Link Integrity	Warranty
●	●	●	3 years
●	●	●	3 years
●	●	●	1 year
●	○	●	1 year
●	○	●	1 year
○	●	○	2 years
○	●	○	2 years
○	●	○	5 years
○	●	●	5 years
○	●	○	90 days
●	●	○	90 days
●	●	○	90 days
●	●	○	90 days
○	○	●	1 year
○	○	●	1 year
○	●	○	1 year
○	○	●	1 year
●	●	●	1 year
●	●	●	1 year
○	●	●	2 years
○	●	●	2 years
○	●	●	2 years
○	●	●	2 years
○	●	●	2 years
○	○	○	1 year
○	○	○	1 year
○	○	○	1 year
○	○	●	1 year
○	○	●	1 year
○	○	●	1 year
○	○	○	5 years
●	○	●	1 year
●	○	●	1 year
○	●	●	1 year
●	●	●	1 year
●	○	●	3 years
○	●	○	5 years
○	●	○	5 years
○	●	○	5 years
○	●	●	1 year
○	●	●	1 year
○	○	●	1 year
●	○	●	1 year
○	●	●	lifetime
○	●	●	1 year

tatus lights.

Some hubs include *out-of-band* management software that lets you gather statistics without adding overhead to the network and manage hubs even if the network is down. Other hubs, such as the MultiGate Hub, MMAC, and MRXI, let you manage a network out-of-band, albeit less elegantly—you gather statistics by running an inexpensive terminal program on any computer connected to the hub's special management port.

Not only can you monitor managed hubs with management software, but you can also control them. Farallon and NRC software, for example, can turn individual ports on and off and can enable and disable the link-integrity test for any port.

Managed hubs can detect hub and port errors, such as jabber and collision, at the hardware level. Tracking such errors helps you spot electrical interference, cross talk, malfunctioning transceivers, and unreliable Ethernet adapters. What's more, network analyzer programs gather statistics only while running on a networked Mac, whereas managed hubs gather statistics continuously.

Choosing a Hub

MANAGED HUBS COST CONSIDERABLY more than unmanaged hubs. You can justify the extra expense if the success of your business depends on your network's optimum performance and minimum downtime, which a managed hub's statistics help you achieve. Traffic and error statistics can also save you time in setting up a large network or in expanding your network. Of the managed hubs we tested, Farallon's PhoneNet StarController EN costs the least, but NRC's MultiGate Hub in a configuration of 24 10BaseT ports is a better value with its out-of-band management, built-in bridge, and backbone port options. Cabletron's MMAC will appeal only to those with large networks and large budgets.

If you want an unmanaged hub, you have many to choose from. All hubs perform equally, and the ability to cascade 10BaseT hubs from different manufacturers makes them all inherently expandable. A backbone port increases expandability, and you must have one if you need to connect your hub to an Ethernet backbone. If you have old Ethernet adapters that don't support 10BaseT's link-integrity testing, you need a hub that lets you switch off link-integrity testing, port by port. Apart from those considerations, cost and the number of 10BaseT ports you need are the crucial variables. Get out your crystal ball and see how many ports you will need six months or a year from now (figure at least 50 percent more than you need now). Then buy the hub with the features you need and the best price per port. Keep in mind that you'll pay less than the list price if you buy from a discount store or mail-order company. **m**

See *Where to Buy* under "Star Controller Hubs" for contact information.

MW EDITORS' CHOICE

TechWorks HubWorks-8 A good bet for small networks, this unmanaged hub has eight RJ-45 ports, one of which you can switch for cascading without a crossover cable. This hub can connect to a backbone using its AUI port or its BNC port. It has a good manual and a lifetime warranty. **Company:** TechWorks. **List price:** $399.

Asanté 10T Hub/12 This low-price unmanaged hub has all the features a midsize network needs—disable link integrity, a dual backbone port, a switchable twisted-pair crossover port, and an interchangeable twisted-pair connector panel. **Company:** Asanté Technologies. **List price:** $799.

MultiGate Hub If you need a managed hub, MultiGate has capabilities well worth its higher price, including complete in-band management from any Mac, out-of-band management from any computer, a built-in bridge, and up to three backbone port connectors. It also has the best manual we saw. **Company:** Network Resources Corporation. **List price:** $2495–$3495.

SCOTT PETERSON

Concentrators such as Cabletron's MMAC-3 FNB Concentrator provide optimal expandability. You buy a chassis and then purchase modules **(1)** that provide connectors such as RJ-45 **(2)**, fiber optic **(3)**, and thick Ethernet **(4)**. Modules can also provide extras such as a modem connector for out-of-band management **(5)** and status lights **(6)**.

Contributing editor LON POOLE is author of *Macworld Guide to System 7* (IDG Books Worldwide, 1991) and *Amazing Mac Facts* (Microsoft Press, 1991).

Macworld Lab testing supervised by TIM WARNER.

Math ANALYSIS

FIVE MATH PROGRAMS THAT HELP SCIENTISTS AND ENGINEERS SOLVE COMPLEX COMPUTATIONS

by Charles Seiter

In the original vision of Charles Babbage, the computer was a steam-driven gear-and-ratchet machine that would calculate and print mathematical tables. In the visions of John von Neumann and Alan Turing almost a century later, the computer would be a general-purpose device capable of abstract manipulation of logical symbols. Finally, the vision of Alan Kay and others a few decades ago saw the computer as a dynamic notebook, using processor power to solve problems expressed in the user's own notation and to provide reference information.

A Macintosh outfitted with the latest mathematics software embodies all these visions and more. A few years ago an explosion of math software occurred, as multimegabyte Macs provided the memory needed to accommodate programs originally designed for workstations and minicomputers.

Today, there is a range of math software designed for many types of users, from chemical engineers to biologists to nuclear physicists. And even for pure mathematicians. These programs fall into two basic categories: symbolic manipulation and engineering.

Symbolic Manipulation

SYMBOLIC MATH PACKAGES CAN PERform algebraic transformations on equations and math expressions. Because most principles in science are summarized with an equation rather than a number, transformation is often used to simplify results or to expand expressions to explore the meaning of individual terms.

The main programs in this category are Wolfram Research's Mathematica, Brooks/Cole Publishing's Maple, and Prescience Corporation's Theorist.

■ *Mathematica* This is probably the best-known symbolic math program. That's partly because it provides a comprehensive set of numerical and symbolic routines (2.0 includes 843 functions), but also because the reputation of its remarkable developer, Stephen Wolfram, secured its early adoption by leading research centers. Wolfram's background in many types of physics convinced him that a math program should contain any facil-

ematics

ity that a researcher is likely (or even unlikely) to need, and Mathematica's capabilities are indeed vast.

Mathematica has a serious advantage over its competitors not only in scope and programmability but also in the quality and quantity of its support literature. The Mathematica Help Stack from Variable Symbols is a model technical help program; Stan Wagon's *Mathematica in Action* (W. H. Freeman, 1991) is one of the most entertaining, serious mathematics books yet produced; and the Mathematica book series from Addison-Wesley (1988–1992), covering topics from discrete mathematics to programming, is likewise excellent.

Cathy Stockwell, an engineer at Lockheed Technical Operations, needs all three types of capabilities that Mathematica offers for her work with satellite control: symbolic math for transforming and simplifying the equations of satellite orbital mechanics, numerical operations for computing actual trajectories, and 2-D/3-D graphics for inspecting the orbits. (Try to picture evaluating an orbital calculation from a table of computed results, and you see how crucial graphics are.)

All orbital problems have a distinct underlying similarity, which means you can use a set of related computations to handle them, rather than a completely new set for each problem. Mathematica offers a Notebooks feature that lets users easily produce active files of results from sets of related computations. Notebooks store dynamically linked equations, text, and figures; for example, a solution notebook for one type of satellite orbital problem can be extended into a series of notebooks with similar orbital maps, descriptions, and modified satellite data.

Wolfram Research sells three versions of Mathematica 2.0 (a Mac Plus/SE version for $595, a student version for $175, and a coprocessor version for $895). Most Mathematica users probably encounter the product through a site license.

The program is a tight fit in 4MB of RAM (6MB is necessary for serious work), so a stand-alone Plus or SE is not an ideal platform. Mathematica's memory demands are directly related to the high number of features in version 2.0. This new version has built-in sound capability and waveform analysis, numerical integration of differential equations, support for debugging and code tracing in the Mathematica programming language, a numerical-expression compiler, and nearly 300 new functions.

■ *Maple V* Like Mathematica, Maple V ($450, $132 for the student version) offers every type of function normally encountered in math or science work to the Ph.D. level and beyond (the Maple manual index lists more than 1400 functions).

Maple's roots, like Mathematica's, reach back to the beginnings of symbol-manipulation programs (the mainframe-based Macsyma in the early 1970s), but Maple's developers at the University of Waterloo in Canada took a more conservative programming approach than Wolfram Research did for Mathematica. Instead of being a single, giant package, Maple has a smaller core (about 600K) and modules of function sets (nearly 8MB all together) that you load as needed. Maple can thus run handily on a stock Mac SE—even on a 2MB Classic—making Maple a good choice for educational settings in which smaller Macs aren't networked to more powerful hardware.

Phoebe Judson of Trinity University has designed her calculus lab around

DAN MILLS

Ted Mitchell, a business professor at the University of Nevada–Reno, finds the focused tool set of Prescience's Theorist ideal for business computations and visual analysis.

Maple and the Maple calculus workbook. She reports that beginning calculus students usually find the program easier to use than Mathematica, both for small special projects and for standard homework in differentiation and integration.

The $132 student version includes the complete Maple algebra system and library, and separate packages for linear algebra, number theory, graphics, basic statistics, optimization, and orthogonal polynomials. Judson thinks it's a bargain on price compared with Mathematica (the student system includes a coprocessor version) and a bargain on features compared to Theorist (which lacks comprehensive advanced-math packages). Maple V is a rewritten and reoptimized version of Maple 4.2.1; additions include three-dimensional color graphics, fast Fourier transforms, and a Maple-to-C language translator.

■ *Theorist* Prescience's Theorist 1.11 is unique among these symbolic-manipulation products in several respects. It's available only in a Mac version (the others are available for Unix workstations and DOS/Windows PCs). It represents equations in real math notation (Prescience also developed the equation-writing program Expressionist). Theorist depends mostly on menu-based commands for its operation (Mathematica and Maple are really extensions of C programming by comparison). And because it has a much smaller set of functions than the other main Mac symbol processors, Theorist can be mastered quickly.

This simplicity makes Ted Mitchell, a professor at the University of Nevada–Reno, believe that Theorist is the right math program for students in his business classes. For business students, the availability of number-theory modules or built-in Fourier transforms common to other programs is a distraction, he says.

With Theorist, Mitchell has developed a set of case studies in quantitative management methods, ranging from simple break-even models to formal time-series analysis of marketing data. Theorist offers complete graphics capabilities (including 3-D color surface plots), so Mitchell's case-study assignments on disk let students explore business data visually as well as computationally.

This approach recognizes that graphs and fairly simple equations are usually more appropriate than high-end math machinery for analyzing noisy and often incomplete business data. "Theorist lets the students think through the principles of an analysis without worrying about the mechanics of symbol manipulation in deriving simple results," Mitchell says.

Despite its simplicity, Theorist includes a respectable assortment of functions (including those for matrix algebra, special functions of physics, and symbolic calculus), an animation feature for reviewing the time evolution of computed graphics, and easy PICT/EPS file transfer for desktop publishing. To encourage undergraduate use, Prescience has a site license/academic discount program.

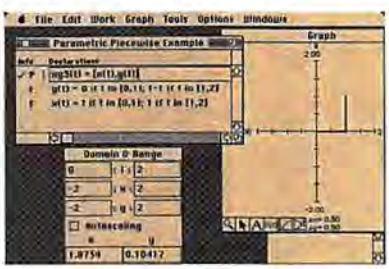
Archimedes' Little Helpers

All the programs featured in this article aim to provide solutions to a wide range of math problems. For more modest aims, modest budgets, or modest platforms, it's worth considering a selection of other programs.

Brooks/Cole Publishing, besides offering Maple V, offers two other math products. Calculus T/L ($39.95), which is based on a subset of Maple, offers symbolic and numerical capabilities grouped around the topics normally covered in a first-year calculus course and provides an automated version of many paper-and-pencil calculus exercises. TeMath ($39.95) offers a wide assortment of graphics tools and numeric capabilities for exploring precalculus and calculus textbook topics (for more on TeMath, see *Reviews, Macworld,* April 1992).

Lascaux Graphics offers the program f(z) ($89.95) for exploring complex variables graphically, Fields & Operators ($99.95) for vector calculus, and the outstanding program Models ($89.95) for investigating systems of iterated equations (see *Reviews, Macworld,* March 1992). Models is probably the easiest system ever presented for exploring chaotic-dynamics, economic, and ecological models, as well as time evolution of complex systems behavior.

For symbolic and numeric computation in its most compact form, PowerMath II 2.51 ($149.95) from Central Products Corporation is worth considering. This program runs on any Macintosh, from the ancient 128K to the Quadra series, and is respectably fast and easy to learn. If you've got the space, the student version of Maple offers more for the money, but PowerMath II at least gives you a way to extract some value from a 512K gathering dust.



Calculation Tool Suite Brooks/Cole Publishing's TeMath can handle very complicated function definitions for plotting, including parametric plots specified piecewise.

Finally, you can implement a minimalist approach to math with the tools in the catalog from Heizer Software, specialists in add-ons for Microsoft Excel, Microsoft Works, and HyperCard. Individual packages of Excel macros, for example, handle Fourier transforms, time-series analysis, special functions of physics, and statistics. If you want to perform specific tasks in the friendly environment of a familiar spreadsheet, Heizer can give you access to advanced math functionality for about $20 per module.

Engineering Analysis

ONE IMPORTANT CATEGORY OF MATHematics users is engineering, where the final result of an analysis is more often a number than a symbolic expression. Programs emphasizing numerics are faster than symbolic packages at raw calculation, which is an advantage to engineers working under deadlines, and the vendors have anticipated exactly what engineering users need, offering results tailored to specific engineering problems.

The mainstay applications for Mac-based engineers are The MathWorks' MatLab and MathSoft's MathCAD.

■ *MatLab* The MathWorks' MatLab 3.5 ($795) offers the fastest matrix operations of any program available commercially, plus special toolboxes for modeling, time-series analysis, digital signal processing, and control systems, among others. In many cases, the combination of MatLab with a toolbox offers, in canned form, the required solution to a particular engineering problem.

But it is MatLab's script language that turns out to be one of the program's principal attractions for Michael Brooks, a scientist and electronics designer at Hughes Aircraft's radar applications division. In an environment full of Macs, DOS PCs, and Sun Sparcstations, MatLab's script language lets Brooks write custom modifications of toolbox routines for computer-

aided control systems and simulating electronic filters. "We have all sorts of platforms and essentially every piece of published math software, and at many tasks we find MatLab to be the system to use," Brooks observes.

■ *MathCAD* Version 2.0 ($495, $175 for educational institutions) offers another example of vendor concern for user productivity. Besides the basic program, MathSoft also sells two kinds of statistics applications packs, an advanced numerical-methods pack, an electrical engineering pack (MathCAD already includes an "electronics handbook" full of useful formulas and constants), two mechanical engineering packs, two packs for civil engineering and one for chemical engineering, and a special educational pack on basic math methods. From designing concrete beams to planning chemical batch reactors, MathSoft offers an off-the-shelf solution.

The program itself, while not as incredibly fast as MatLab, includes an engineering equation solver; an advanced function library that includes Fourier transforms as well as matrix arithmetic; a reasonable approximation of correct math notation on screen; and nice integration of text, equations, and graphics for presentation-quality reports.

Because most of his students major in science or engineering rather than math, James Rowell of the University of Minnesota at Duluth uses MathCAD instead of a symbolic math package for calculus instruction, and has written a MathCAD textbook emphasizing mathematical modeling. Because MathCAD runs on any Mac and offers add-on packages for specific applications, he sees it as a practical choice that students can use throughout their engineering curriculum.

MathCAD 3.0 on Windows-based PCs already offers a capability expected for the Mac version later this year: symbolic math in an engineering-oriented program. MathSoft has incorporated the core symbolic algebra capabilities of Maple into MathCAD, under an agreement in which MathSoft also becomes a Maple distributor—the Mac version including a Maple core will offer engineers a striking value.

■ *HiQ* Another program that emerged this spring for engineers is the long-awaited HiQ from Bimillennium Corporation. Its principal developer, David Russell, wrote MathView Professional, one of the first math programs for the Mac, and he has paid particular attention to computational efficiency in HiQ.

The result, according to beta user Jeffrey Kane, a biomedical researcher at Massachusetts General Hospital, is a program that formulates large systems of coupled differential equations with remarkable ease and solves them 20 to 50 times faster than Mathematica does. A powerful scripting language combined with HiQ engineering notebooks lets Kane specify models of oxygen transport in tissue culture (basically, animal cells growing artificially in special bottles or plates), ranging from simple diffusion models to finite-element models that account for detailed properties of cell layers. Because parts of models can be easily copied from one HiQ notebook to another, it is simple to construct a hierarchy of models of increasing conceptual complexity. Other beta sites were equally enthusiastic about HiQ's speed and script language, emphasizing that the product has been clearly tailored to engineering uses.

ROBERT HOLMGREN

Cathy Stockwell, an engineer at Lockheed Technical Operations, controls satellite movement using Wolfram Research's Mathematica to calculate satellite orbits.

Making Decisions

SOME SOFTWARE CHOICES HERE ARE obvious. If you are a theoretical physicist at a major American university, you probably already have Mathematica. Similarly, if you design complex digital filters in the radionics division of an aerospace company, you are probably one of MatLab's 100,000-plus users.

These two application areas specifically call for the highest order of capabilities in symbolic and numerical computation respectively. In the case of Mathematica, there are the additional advantages of the biggest infrastructure (books, tutorials, and classes) in scientific computing and a well-designed programming system; in the case of MatLab, there's a decade's experience in tailoring solutions to engineering problems.

For another category of scientists—biologists, economists, physical chemists, and surprisingly enough, some types of mathematicians—the routine computational load may not justify high-end hardware or much investment of time in mastering software details. These people should be pleased to hear that Maple now offers the same range of transformations as Mathematica does (Mathematica still has distinct advantages in graphics, in its new sound/DSP features, and in programming for complex problems), performs acceptably at numerics, and runs on a modest Mac.

MathCAD and Theorist also have modest hardware and training requirements, but take different approaches.

MathCAD is almost like an automated version of the famous *Schaum's Handbook* (McGraw-Hill) series of paperback science and engineering textbooks: through the program or through its add-ons, MathSoft tries to anticipate every type of common problem and solve it for you. You might use Maple or, more likely, Mathematica to generate a computer-based proof of a theorem in tensor calculus, but you would almost certainly be happier turning to MathCAD for a simple one-page beam-deflection problem.

Theorist, in contrast, has good graphics, real on-screen math notation, and general-purpose symbol-manipulation capability; but Theorist has a limited rule set. As an instructional system Theorist at least forces students to think through most of their own problem-solving rules, and for some research problems it's efficient. But it's also far from the canned-solution machinery of the other packages, which is not a criticism.

As a guideline in program selection, one last word may be helpful: base your decision on your limitations, not the program's. Any one of these packages, even on a low-end Mac, can do things scientists 20 years ago could only dream about. When you look at the range of the program's capabilities, ask yourself how much time you want to invest in getting the software to solve your problems. If you have complex and changing needs, the investment in a larger package is well repaid; if you need an answer by noon Friday and it's Thursday morning now, something smaller is the better choice. **m**

See *Where to Buy* for contact information.

CHARLES SEITER, a *Macworld* contributing editor, has worked with symbolic math programs since the late 1970s.

RENDERING PROGRAMS LET YOU SPECIFY ALL THE ELEMENTS YOU NEED TO MAKE A 3-D SCENE LOOK REALISTIC

Rendering

Making Realistic 3-D Graphics

BY DAVID POOLE

If you watch much television or read many magazines, then you've surely seen some slick three-dimensional graphics. But before you try to create your own, you need to carefully choose the software and hardware it takes to make realistic images—and you have to set aside a large chunk of time to master the process. ▪ First, you need a 3-D modeling package to build a representation of a scene (see "3-D: Structure, Surfaces, and Movement," *Macworld*, February 1992). Then you use a rendering program to specify *surface attributes* (textures, lighting, and special properties such as transparency or reflection) of objects in the scene. Finally, the Mac takes the data you have specified and renders a photo-realistic image of the scene. Whether it takes minutes or days to render an image depends on program performance, type of rendering, scene complexity, and type of Mac you use. ▪ This article reviews 10 programs that offer photo-realistic rendering capabilities. These programs simulate realistic transparent, textured, and reflective objects. Capabilities vary widely enough that serious 3-D users may end up owning two or more of the programs. ▪ **Creating Surfaces** All of the renderers can create basic surface properties, such as matte, shiny, and transparent finishes. (These basic properties are generally used to create plastic, metal, and glass surfaces.) Most programs give you immediate visual feedback when you change the shininess or transparency of an object. Typically, the program displays a round ball on a patterned background within a dialog box. As you change the degree of, say, transparency for a selected object in the scene, the ball (which stands in for the selected object) becomes more or less see-through.

▪ The only programs that don't give you immediate visual feedback for surface properties are Byte by Byte's Sculpt 3D, Sculpt 4D, and Pixar's MacRenderMan. These programs require you to render the scene or an individual object each time you want to see the effect of a change. Because rendering can be slow, this method discourages much experimentation. (MacRenderMan does come bundled with Showplace, a program Pixar developed as a front end for arranging and viewing objects without rendering.) ▪ To add texture, such as that of wood or marble, to an object, you need a renderer with texture-mapping capabilities. Texture mapping is the process of applying a PICT or

TIFF image file to a 3-D object. The type of texture mapping you use depends on the shape of the object you are rendering. For example, if you're mapping an image of the earth onto a sphere, you use spherical texture mapping. Or if you need to map a brick texture onto a building, you use cubic mapping. Other common mapping types include cylindrical (for wrapping labels onto cans) and planar (for projecting images onto flat surfaces, like billboards).

Although all the programs can accomplish planar, cylindrical, and spherical mapping, not all of them support other types. Alias Research's Alias Sketch and Sculpt 3D and 4D, for example, don't offer cubic mapping. To get the effect of cubic mapping in Alias Sketch or Sculpt, you have to create six separate flat planes with a texture on each and then combine them to simulate a cube. Be careful when you use this type of texture-mapping kludge. If an object doesn't have the right surface or texture, then the illusion you are trying to create may be destroyed.

"ALICE" © CHUCK CARTER/CYAN

Alice from Infini-D This conglomeration of objects from Alice in Wonderland was ray traced in Infini-D. Note the reflections in items such as the pocket watch and Drink Me bottle. The user specifies the percent of reflectivity desired, and the program calculates and creates the reflections. Environment maps were used to make the surface of the teapot and the metal on the key and the watch look slightly reflective.

Creating Bumps and Dents

ANOTHER POPULAR WAY TO CREATE SURFACE textures is to use a process called bump mapping, which creates the appearance of nicks, dents, or bumps in a 3-D model. If you needed to create a photo-realistic image of an orange, you'd be hard put to create a 3-D model that included all the dimples. An easier approach is to apply a bump map to a sphere; the bump texture employs the variation in light and shadow to create the impression that there are hundreds of little dimples on what is actually a plain old sphere.

A bump map, like a texture map, is an image file that is projected onto an object. Since bump mapping uses only the light and dark values of an image to create a bumpy surface, gray-scale images are generally used—the color information would be redundant. The most capable program for creating bump maps, Electric Image's ElectricImage Animation System, offers in-depth control, allows you to have two bump-map images per object, and creates pronounced, high-quality bumps.

Creating Reflections

ADDING REFLECTIONS TO METALLIC AND GLASS surfaces can be accomplished by using either reflection maps or ray tracing. In ray tracing, the program uses algorithms based on natural laws to create reflections. These reflections are highly realistic, making objects appear to truly reflect their environment.

Reflection maps produce less realistic images than does ray tracing. A reflection map, like a texture map, is an image file. Unlike texture files, which are attached to the object, reflection maps wrap around the space surrounding the object. This creates the illusion that the object reflects its environment, but makes it extremely difficult to mirror individual, detailed objects. Reflection maps work best on surfaces that distort whatever they reflect—say, on a curved candlestick or chrome logo.

Procedural Textures and Bumps

PROCEDURAL TEXTURES don't require the use of an image file. They are generally used to create wood and marble textures and are generated by a computer from algorithms that define the color, size, pattern, and distortion of the texture. Procedural textures cover a 3-D object naturally, as if the object were carved from a hunk of the texture. Each

MacRenderMan's Kitchen MacRenderMan calls bits of code, or shaders, to create the textures in its images. Every element in this image is based on a shader that MacRenderMan created, including the metallic knobs on the cabinets and refrigerator.

program uses its own algorithms for procedural textures, thereby creating different results. MacRenderMan offers incredibly high-quality procedural textures of great diversity.

Like procedural textures, procedural bumps are computer-generated. These algorithms create random nicks or bumps on a object. MacRenderMan excels at creating procedural bumps, with Sculpt 3D and 4D coming in a close second.

Light and Shadow

RENDERING PROGRAMS GENERALLY SUPPORT FOUR types of lights—ambient, radial, distant, and spot. Ambient light controls how dark and what color the darkest areas will be. High ambience gives the impression of daylight; low ambience creates a starkly lit scene, such as you would find at night or indoors. All the programs support ambient light. Radial lights generate light outward in all directions, much as does a light bulb. Distant lights can be pointed in a specific direction, giving the impression of, for instance, sun lighting an entire scene from the west. Spotlights focus one intense beam of light and behave very much like their theatrical counterparts.

As with texture mapping, the lighting capabilities of these programs differ greatly. Some programs offer all four light types. Some programs have ambient light but no spotlights. Others have spotlights but no distant lights. Sculpt 3D and 4D and AT&T Graphics Software Labs' MacTOPAS determine the position and intensity of a light, but don't let you aim it in a particular direction. MacRenderMan, ElectricImage, Strata's Stratavision, MacroMind Paracomp's MacroMind Three-D, and VIDI's Presenter Professional excel at lighting. MacroMind Three-D offers immediate visual feedback and is very flexible, allowing you to adjust the fuzziness of spotlights, the amount that the light will fade, and other parameters.

It would seem that if a program could simulate the appearance of bright sunlight, then it could produce shadows behind every well-lit object in a scene. Not so. Shadows are not treated equally by all rendering programs. Some programs allow only one light source to cast shadows, while other programs can create shadows only under certain conditions. To

Chessboard from Alias Sketch This image uses ray tracing to create realistic reflections and refractions. Note how the chess pieces reflect one another. The artist built the chess pieces out of glass and assigned a specific refractive index for the glass material. As a result, some pieces distort light as it shines through them.

Faster Rendering

Rendering speed is directly related to how complex an image or animation is. As you add more objects, lights, and textures, rendering speed decreases. This is why many people render elements separately and then composite them later by using alpha channel masks. The only other option is *distributed processing.*

Distributed processing is a loosely used term that basically means distributing the work load of one computer to other processors. In the case of rendering, it means sending various rendering tasks either to coprocessor boards installed in a Mac or to other Macs on a network. Unlike accelerator boards, coprocessor boards are designed specifically to speed rendering. Some informal tests that I conducted revealed that these boards are eight times faster than a Mac IIfx—a speed that is roughly equivalent to workstation performance. If all you're after is fast rendering, then buying one of these boards and a used Mac II is better than buying a new Quadra.

Currently, Yarc Systems and StarTech offer coprocessor boards that cost between $4000 and $8000, depending on the configuration you choose. The boards work only with certain programs, however; Yarc Systems' Nusprint board works with Sculpt 3D/4D and Presenter Professional, and StarTech's RenderEdge board speeds MacRenderMan. For a real speed boost, you can install three or four boards in one Mac and have them all work on one image. (The one exception is Presenter Professional, which does not support this feature while running on the Nusprint). Although a single- or multiple-board solution is expensive, you may find it worth the expense to increase performance by 10 to 20 times.

Radius plans to release Saturn V, a technology that will allow multiple Radius Rocket accelerators to work in tandem on a rendering job. This means that you could potentially have four Rockets in the same machine, each rendering a part of an image.

Another solution for increasing performance is *network rendering,* which works by parceling out pieces of an image to several Macs on a network. Ideally, network rendering cuts the rendering time proportionately, depending on the number and type of Macs on a network. Although no software was available for testing at the time this article was written, Ray Dream, Strata, Specular International, and VIDI will have solutions shortly. Pixar already has a version of NetRenderMan for the Mac, but it sends Mac image files to Unix machines, not Macs, for processing. (Pixar plans to release software that will render images on a Mac-only network.)

Rodney's Pond from Sculpt 3D This fanciful image uses numerous texture maps, which the artist precisely positioned. Sculpt 3D's rendering algorithm is designed to produce deep, rich colors. Note also the reflections of the fish and the water. The artist created a flat surface under the fish, applied a bump map, and set the level of reflection. Sculpt 3D automatically generated the reflections.

create a more realistic scene, Alias Sketch and MacTOPAS even allow you to type in time and location information (such as March 15, 4:20 p.m., at *x* longitude and *y* latitude) to create real-world outdoor lighting conditions.

Miscellaneous Features

SOME RENDERERS SUPPORT ATMOSPHERIC EFFECTS, such as fog or depth cuing. Fog is not as simple as it might sound—to create it, you use an image processing technique that lets you define, from your point of view, how the mist begins and how far it extends before obscuring the image entirely. Fog can add a high degree of realism, creating, for example, a skyscraper disappearing into clouds. Depth cuing makes objects in the distance appear naturally blurred.

Another feature that many users want is the ability to work with composite images. To offer this capability, a program must support at least one *alpha channel*, an antialiased mask that is included in the rendered image. The mask data in an alpha channel ensures that only the area that has rendered imagery will be used during compositing.

For still-image work, alpha channels make it possible to separate certain elements from each other for processing. An added benefit is that alpha channels can contain transparency information, which means that the background can show through an image (like a pane of glass) when you composite the rendered images.

Alpha channels are also extremely valuable for animation work. For example, when animating objects that will appear in front of a complex background image, it's more efficient to render each frame with the objects on a black background and composite the animated objects and the complex background through alpha channels afterward. This saves the renderer time and hard drive space. There are a number of ways, via hardware or software, to combine rendered images when compiling the layers of the animation for final production.

Selective Rendering

SELECTIVE RENDERING LETS YOU HIDE OBJECTS in order to avoid rendering an entire scene if all you want to do is work on one element. For example, if you are creating a museum showroom full of artifacts, you may want to spend extra time tweaking one particular object. Rather than render the entire scene each time you adjust the texture or lighting for that object, you can select only that object to render, thereby saving immense amounts of time.

Compound Surfaces

COMPOUND SURFACES ARE TEXTURES THAT ARE made up of two or more textures. A number of pro-

A GUIDE TO RENDERING PROGRAMS

	Alias Sketch 1.0.2	ElectricImage Animation System 1.03	Infini-D	MacRender-Man 1.1	MacroMind Three-D 1.0	MacTOPAS
Company	Alias Research	Electric Image	Specular International	Pixar	MacroMind Paracomp	AT&T Graphics Software Labs
Price	$995	$7495	$895	$995 [1]	$1495	$7495
Cubic mapping/bump mapping	●/●	●/●	●/●	●/●	●/●	●/○
Reflection mapping	○	●	●	●	●	●
Procedural textures and bumps	○	○	●	●	●	○
Spotlights/point lights	●/●	●/●	●/●	●/●	●/●	○/○
Distant lights	●	●	○	●	●	●
Fog/depth cuing	○/○	●/○	○/○	●/●	●/●	●/●
Alpha channels	○	●	○ [2]	●	●	○
Renders selected objects or areas	●	●	●	●	●	○
Compound surfaces	○	●	●	●	●	○
Ray tracing/suspended ray tracing	●/●	○/○	●/○	○/○	○/○	○/○
Exports RIB files	○	○	○	●	●	●
Batch rendering	○	○	●	●	●	●
Network rendering	○	○	●	●	○	○
Supports a RISC board	○	○	○	●	○	○
30-day money-back guarantee	●	●	●	●	●	○
Toll-free telephone support	●	○	○	●	○	○

● = yes; ○ = no. [1] *Price includes Showplace.* [2] *The next version of Infini-D will include alpha channels.* [3] *With separate extension program.*

grams offer compound surfaces. Sculpt 3D and 4D allow you to combine two procedural textures to create a new surface, whereas Infini-D enables you to combine several layers of procedural and image-file textures. ElectricImage offers advanced capabilities, allowing you to have two texture maps, with accompanying alpha channels, as well as a reflection map for each object in a scene. Furthermore, ElectricImage lets you use alpha channels as a mask to control almost every aspect of surface attributes (such as luminosity, ambience, or reflection).

Rendering Schemes

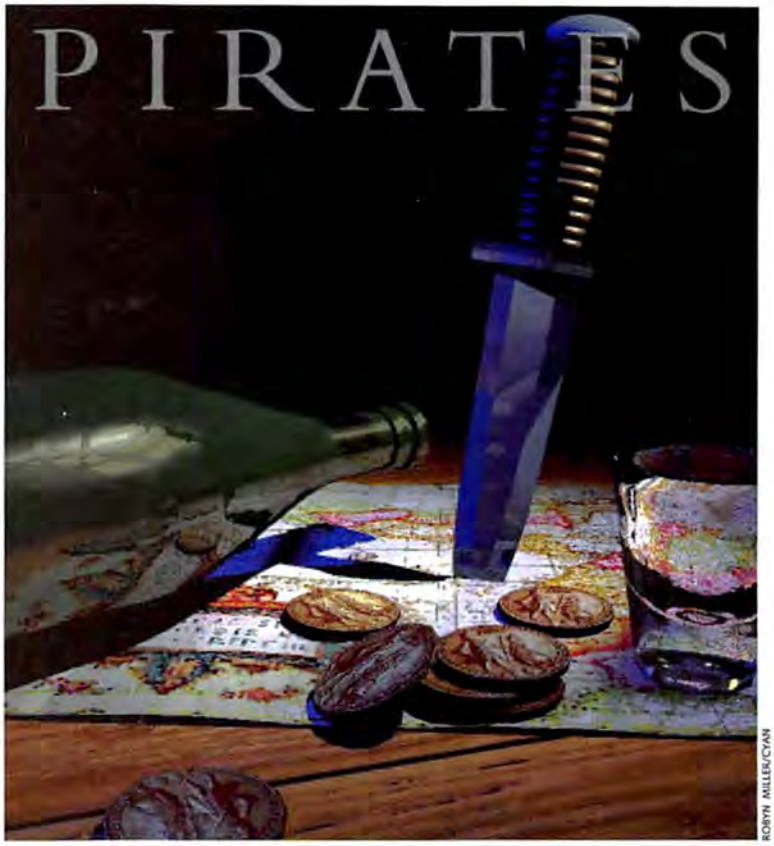
COMPUTERS CAN RENDER 3-D IMAGES VIA PHONG shading, ray tracing, radiosity, or Renderman. Many renderers offer a choice of rendering methods. Phong shading is the quickest method, and all the programs support it. The trade-off, however, is that you can't create procedural textures with Phong shading.

Ray tracing generally creates the most realistic 3-D imagery, but it's also generally the slowest method. That's because ray-tracing programs calculate the reflection of each beam of light off of every object in a scene. You get very realistic images with incredibly detailed reflections and realistic shadows. Unfortunately, the trade-off in rendering time for this realism can be prohibitive for large images or long animations. Ray Dream Designer, Alias Sketch, Presenter Professional, Sculpt 3D, Sculpt 4D, and Stratavision 3D allow you to suspend ray tracing.

Renderman—or MacRenderMan, as the Mac version is called—is a specific type of rendering language created by Pixar. It uses algorithms to create textures, bumps, lights, fog, and practically every other element of an image. Renderman is currently the most widespread rendering scheme—you can render a Renderman file on the Mac and on DOS PCs, Unix workstations, and Next machines.

Presenter Professional 1.1	Ray Dream Designer 2.0	Sculpt 3D/4D	Stratavision 3D
VIDI	Ray Dream	Byte by Byte Corporation	Strata
$3600	$895	$2500/$3500	$995
●/●	●/●	○/●	●/●
○	●	●	●
●	●	●	●
●/●	●/●	○/●	●/●
●	●	○	●
○/○	○/○	○/○	●/●
●	●	○	○
●	●	○	●
●	●	●	●
●/●	●/●	●/●	●/●
●	○	○	●[3]
●	●	●	●
●	●	○	●
●	○	●[4]	○
●	●	●	●
○	●	○	○

[4] *This feature is in Sculpt 4D only. Sculpt 4D includes animation features.*



ROBYN MILLER/CYAN

Pirates from Stratavision This complex image shows off the results you can get from ray tracing. For instance, the refraction on the shot glass realistically distorts the map image, and the reflections on the knife are highly realistic. Note also that the surface of the coins was created using a bump map.

MacRenderMan provides an extremely sophisticated, and a sometimes difficult, way to generate 3-D images. Since MacRenderMan is a dedicated renderer, it cannot create models. The RIB files that modeling packages produce (and that MacRenderMan uses) vary, so it is sometimes necessary to modify them with a word processor—an involved process. Still, MacRenderMan's quality is top-notch and Pixar's Showplace helps with the modification process, so any problems you run into may be well worth solving.

Radiosity, a relatively unused approach, is currently supported only by Stratavision. (And in fact, radiosity is a proprietary technology—Strata has implemented its own version of this technology, which

BRUCE BENNETT

MacTOPAS Piano This photo-realistic image uses a wood-grain texture for the table and cylindrical mapping to wrap the keyboard image around the mug. Transparency mapping was used to create the smoke rising from the mug.

it terms "raydiosity.") Although even slower than ray tracing (some users feel its rendering times are prohibitive), Stratavision's raydiosity feature provides sophisticated characteristics that are unavailable in other renderers. The most notable feature of radiosity is its ability to deal with reflected light rays. For example, if you point a white light at a shiny red sphere, it will reflect that red light onto other objects in the vicinity of the ball.

Speed: The Bottom Line

ASK ARTISTS AND ANIMATORS, "WHAT IS THE worst thing about 3-D graphics?" and they'll tell you that it's the amount of time it takes to render images. It's common for a renderer to take a few hours or more to complete a complex image. Rendering a 30-second animation (requiring 30 images per second) could take three to four months. Hardly a realistic time frame, given that your employer or client will have forgotten who you are by then. Currently, only ElectricImage offers reasonable rendering speed on an ordinary Mac. To speed up other programs, you must use special hardware (see "Faster Rendering").

Why are rendering times so slow? First of all, no Macintosh has the power of a 3-D workstation. Although the Quadra 900 may be able to render images at twice the speed of a Mac II, this is generally not enough of a performance increase to make the Mac a 3-D production system. And while installing an accelerator, such as a 68040-based Radius Rocket, is better than having no accel-erator at all, you are still far outside the performance range that you need for creating complex work in a short amount of time.

The Effects of Fog To create fog the user generally defines two points —the point at which the fog starts and the point at which visibility is reduced to zero. Most programs also let you choose the color of the fog. This image was produced in Stratavision, first with no fog (top) and then with the fog setting enabled (bottom).

Speed versus Quality

RENDERING SPEED ALONE doesn't tell you which program is the best renderer. You should also look at a program's specific features and the quality of the images it creates. For example, ElectricImage creates extremely-high-quality images. MacTOPAS and MacroMind Three-D also create high-quality images, albeit at slower speeds.

Ray Dream Designer, which is fast for a ray-tracing program, creates images that are so jaggy that Ray Dream recommends that you run them through its antialiasing utility, JAG. Stratavision and Sculpt 3D and 4D are extremely-high-quality ray-tracing programs, but their rendering times are slow. Luckily, Sculpt 3D and 4D currently provide an option for increasing performance, and Strata is working on a scheme to speed up Stratavision (see "Faster Rendering"). Alias Sketch is a reasonably fast, high-quality renderer for both Phong shading and ray tracing.

Prime Considerations

ALL OF THE RENDERERS CAN CREATE PHOTO-realistic imagery—otherwise they differ greatly in capability. For instance, Infini-D's antialiasing is not as high-quality as that of other programs, and Infini-D does not perform as well as some other programs—but it offers an amazing set of special effects that other programs don't. Some of those effects include sine-wave patterns for creating rippling water, fractal mapping for creating random landscape patterns, and composite surfaces for combining multiple textures. Thus, you may end up buying Infini-D for its effects, and another product for its overall quality.

Keep in mind that rendering is only one part of the 3-D process. Take a look at the modeling and animation programs that work with the renderer. Many professionals take a modular approach, creating models in one program, animating them in another, and rendering them in yet another. If you're truly interested in 3-D, then given the field of modeling, animation, and rendering programs, there's a solution out there for you. **m**

See *Where to Buy* for contact information.

MW EDITORS' CHOICE

Under $1000

MacRenderMan MacRenderMan is an extremely-high-quality renderer and offers a full range of features and special effects. If you use another program as a front end to MacRenderMan, you may never see any of the program's complexity, yet still be able to create high-quality images. Alternatively, you can learn to program MacRenderMan in order to create custom procedural textures. **Company:** Pixar. **List price:** $795; $995 with Showplace.

Stratavision Stratavision creates crisp, vibrant images and offers a full array of ray-tracing capabilities. In addition, Stratavision has a huge library of textures. Stratavision's rendering times, which have traditionally been slow, are improved, and Strata has announced a network rendering solution. **Company:** Strata. **List price:** $995.

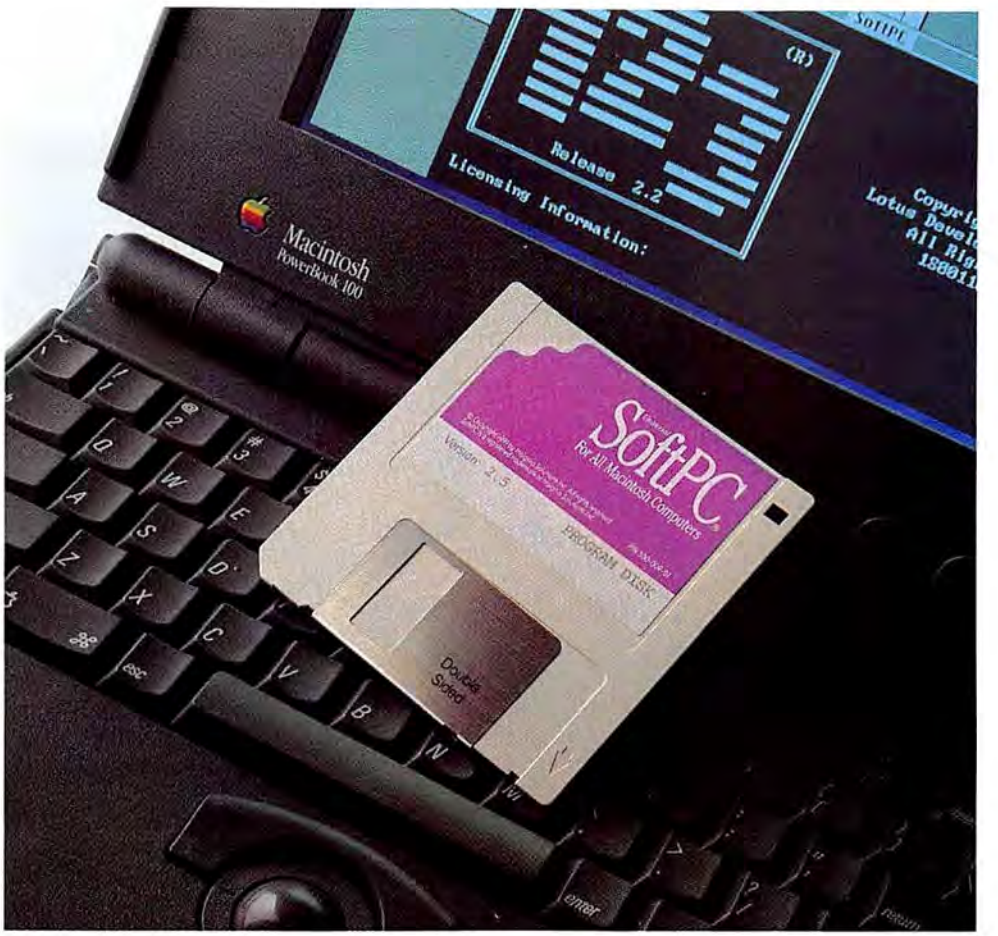
Over $2000

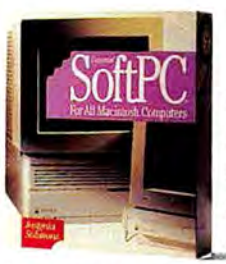
ElectricImage Animation System ElectricImage is a phenomenal rendering program, with the best overall performance. It can create sophisticated surfaces with a variety of special effects. Image quality is extremely impressive, making this program the most intelligent choice for serious animators. **Company:** Electric Image. **List price:** $7495.

MacTOPAS MacTOPAS is a high-quality Phong-shading program that does a fairly fast job of rendering sophisticated images with textures, reflections, and shadows. The program provides a fairly full set of features in all three key areas—modeling, rendering, and animation. **Company:** AT&T Graphics Software. **List price:** $7495.

DAVID POOLE is a consultant, animator, and graphic designer for Zen Over Zero in New York City. He has worked as a broadcast TV writer and producer and has been a consultant to ad agencies, video production facilities, and TV broadcasters for Mac graphics and video.

Why Your Next IBM Computer Should Be A Macintosh.





SoftPC makes your Mac an IBM compatible. With SoftPC, the new Macintosh computers are more than just powerful and portable. They are also the most compatible computers available. Now they can run a whole world of MS-DOS software. Because SoftPC® from Insignia Solutions lets you run any MS-DOS program on a Macintosh. Even over a Novell PC network.

And SoftPC works on any Mac, from the Plus to the new Powerbooks and Quadras.

It's simple. Just load SoftPC and an IBM window appears on the screen. There's no hardware installation required. It's like having two computers in one.

If you don't believe it can be that simple, call us at (800) 848-7677. We'll answer all of your questions, and show you how your next IBM computer could be Macintosh.

Insignia Solutions™
Bridging Worlds Of Software™

INSIGNIA SOLUTIONS INC., 526 CLYDE AVENUE, MOUNTAIN VIEW, CA 94043 FAX: (415) 964-5434 CALL: (415) 694-7600

SoftPC is completely compatible with Apple's System 7 software. SoftPC is a registered trademark of Insignia Solutions Inc. All other product names are trademarks or registered trademarks of their respective holders.

Circle 72 on reader service card

Reviews

IN THIS ISSUE: Macintosh 16" Color Display, Showplace, Muse, WordScan, ArchiCAD, FreeHand, Expert Color Paint, The Complete Annotated Alice, WordPerfect for the Mac, and more

Color Monitor

Macintosh 16" Color Display

PROS: True-to-life colors; uniform display quality; minimal curvature; built-in ADB connectors. **CONS:** Works only with Macs. **COMPANY:** Apple Computer (408/996-1010). **REQUIRES:** Mac IIci, IIsi (with NuBus Adapter Card), or IIfx; Macintosh Display Card 8•24 or 8•24GC. **LIST PRICE:** $1599.

MW ★★★★

JOHN WILLIAM LUND

APPLE'S LONG-AWAITED 16-INCH color monitor is something to behold. The Macintosh 16" Color Display is likely to be the standard against which other monitors in this size class are measured, even longtime players like E-Machines and its T16 monitor.

Vivid Display

IN 24-BIT MODE, THE MACINTOSH 16-inch monitor displays colors vividly across the spectrum, producing subtle colors subtly and dynamic colors dynamically. This range diversity means that artists and publishers working with images can confidently predict the results of their color changes based on what they see on the monitor.

Macworld Lab tests do show some strange color falloff patterns. Normally, a monitor shows high falloff as colors get darker. For example, it's typical for a monitor to display 12 percent blue when you specify 15 percent, and to display 6 percent when you specify 10 percent—the darker the color (the lower the brightness), the greater the difference in what appears. That's because it's hard to control the voltages of the electron beams at such low settings. But the Mac 16-inch monitor sometimes has sharp falloff, then little falloff, and finally sharp falloff as colors get darker. While this odd pattern is noticeable occasionally, most people won't encounter it in normal images.

In addition to very good color range, the Macintosh 16-inch monitor has excellent color uniformity, according to Macworld Lab tests. This means that a color displayed on one part of the screen will be nearly identical to the same color elsewhere on the screen. This may sound like a given, but the physics of the screen phosphors and of the electronic beams that strike and illuminate them result in differences across the screen unless the electronics controlling the monitor can compensate. The electronics of the Macintosh 16-inch monitor do just that.

The Color Display offers both high brightness and sharp contrast, which on a large monitor is no mean feat. The monitor needs to send a strong enough beam to all areas of the screen to gain high brightness and do so quickly enough to avoid flicker and slow image-refresh rates.

We did notice a slight reddish tinge to the monitor, which we've seen before in monitors using the Sony Trinitron tube (which the Apple monitor uses). Just as different brands of photographic film have different color casts, so do different brands of tubes. You can partially compensate for the reddish tinge by lowering

the contrast and brightness or by using the Monitors control panel to set the gamma (which controls how red, green, and blue are mixed) to Macintosh standard white, which tends to be bluer than paper white gamma or uncorrected white gamma.

The shape of the Trinitron tube makes the screen appear flat, despite a slight side-to-side curve. Flatness is especially important on a larger monitor, since a curve on its broad surface can distort how shapes appear. A rectangle, for example, can easily look bowed on a tube with a significant curve. The Macintosh 16-inch monitor is flat enough that bowing is not a problem.

The Trinitron tube has an aperture pitch of 0.26mm, which is typical of monitors of this size, giving the Macintosh 16" Color Display enough pixels to display images sharply. An 832-by-624-pixel resolution makes the Macintosh 16-inch monitor a 70-dots-per-inch display.

Performance

WE TESTED THE MACINTOSH 16" Color Display on a Quadra 700 with 2MB of video RAM, which let it easily handle 24-bit color at a resolution of 832 pixels by 624 pixels. The Quadra's built-in video was designed to handle large monitors at 24-bit color depth. Our results proved that its screen redraw is speedy in 24-bit color—in fact, speedier than in 8-bit, since the built-in video does not have to map 24-bit colors to 8-bit substitutes.

A sampling of extremely-low-frequency (ELF) radiation emissions show the monitor to be well within the guidelines set by the Swedish government and now used as a de facto standard by monitor manufacturers.

Ergonomics

RECOGNIZING THAT A LARGE MONITOR may be too big to fit on a desk that has a Mac on it already, or too high when placed on top of that Mac, Apple built several ports into the Macintosh 16" Color Display: two sound-in, two sound-out, and three ADB. The inclusion of three ADB ports means you can move the Mac out of the way and still keep the keyboard and mouse accessible. You connect the monitor to the Mac's ADB port though a cable (included with the monitor) and then connect the keyboard and mouse to the monitor. The video cable is long enough to let you move the Mac away from the monitor and the user. The monitor's tilt-and-swivel stand is well designed.

The rest of the controls are characteristic of all of Apple's Macintosh monitors—power, brightness, and contrast. Degaussing (removing built-up magnetism, which can affect display quality) happens automatically when you turn on the power. The Color Display comes with no software, instead relying on the System 7 Monitors control panel.

Although touted as having an antiglare screen, the monitor has noticeable reflection, especially in dark areas. This is an engineering trade-off: the more glare protection added to a monitor, the less sharp the pixels, since the glare coating acts as a distorting lens. Using an OCLI antiglare screen developed by Optical Coating Laboratories would have cut glare without distorting image clarity, but it is expensive, and it cuts brightness considerably. Instead, Apple chose a light, standard coating and let users handle glare by changing lighting conditions.

The monitor's screen is antistatic, fulfilling government regulations in Europe limiting the amount of static electricity that a device may build up. Like ELF emissions, static buildup is an area where some research suggests potential health problems, although there is a great deal of debate over whether, much less at what levels, people should be concerned with ELF and static buildup. A nice side effect is dust won't settle as easily.

Not a Multisync

LIKE ALL OF APPLE'S MAC MONITORS, the Macintosh 16" Color Display works only with Macs. You cannot use it in a mixed environment of DOS, Unix, and Mac computers. For many users this is no loss. Others should look at vendors (like NEC, Ikegami, and Sony) that support multiple platforms with one device.

The Macintosh 16-inch monitor is also limited to one resolution—832 by 624 pixels—despite the trend toward monitors that can display images at several resolutions (typically 640 by 480, 832 by 624, and 1024 by 768) no matter what the screen size, in effect providing a zoom feature without losing detail.

This lack of multisync capability is why the Color Display has no options for repositioning the screen image. Multisync monitors have such controls because an image might be off-center after switching between resolutions or computers.

A Quality Product

APPLE HAS A HIGH-QUALITY MONITOR in its 16-inch Color Display, legitimizing this new class of monitor size and setting a standard for its competitors. While others entering the market will stress features like multisync, color balancing, and software controls, monitor makers will be hard put to surpass the quality of the Macintosh 16-inch monitor's screen display.

—GALEN GRUMAN AND TIM WARNER

Rendering Program

Showplace 1.1

PROS: Straightforward interface; fine collection of objects and textures; produces predictable results; includes MacRenderMan for photo-realistic rendering; both applications support background processing. **CONS:** Cannot align objects to each other or select random surfaces within an object; nonintuitive rendering scheme. **COMPANY:** Pixar (510/236-4000). **REQUIRES:** Mac with math coprocessor; 5MB of RAM; color monitor; System 6.0.3; 32-bit QuickDraw. Recommended: 8MB of RAM; 24-bit video board; 3-D modeling program. **LIST PRICE:** $995.

MW ★★★

NO ONE CAN DISPUTE PIXAR'S CONtributions to the world of photorealistic computer graphics. The company's award-winning shorts (*Luxo Jr.*, *Tin Toy*) and ground-breaking television commercials (Lifesavers, Listerine) earned Pixar its reputation as a pioneer in the field. Also notable is Pixar's RenderMan Interface Bytestream (RIB) format, which has facilitated compatibility between software from different developers. The water monster from *The Abyss* and the liquid-steel effects from *Terminator II*, for example, while not rendered on a Macintosh, demonstrate the potential of the RIB format.

One of the few problems in this leader-of-the-pack scenario has been MacRenderMan, Pixar's shading and rendering software. True, you can render professional-quality images from MacRenderMan as easily—though certainly not as quickly—as printing a page from a word processor. However, the program supplies no graphical interface to apply any of the program's lighting and shading effects; you must resort to a module that is little more than a front end for a complex programming language.

That's where Showplace comes in. Recently upgraded to version 1.1, Showplace is a straightforward graphics application that organizes the process of shading and rendering into five basic components—importing and manipulating objects, applying surface detail, selecting and placing light sources, positioning the camera, and rendering the final scene. The effect is rather like having a small photographer's studio right inside your monitor.

Assembling the Pieces

SHOWPLACE IS NEITHER A MODELER nor an animation program; its purpose is to render still scenes within a specified

continues

frame size. To assemble such a scene, you can import one or more objects stored in the RIB format. Showplace provides a starter library of 42 ClipObjects, ranging from simple discs and spheres to full-blown images, but you'll find yourself either purchasing additional ClipObject libraries or using a modeling application to create your own. If modeling isn't your strong point, you can purchase additional ClipObjects libraries from third-party developers, including Acme Animotion Group (Emerson, NJ; 201/261-5977), Acuris (Palo Alto, CA; 415/329-1920), and the Valis Group (Point Richmond, CA; 510/236-4124).

Once you've imported an object, you position it relative to other objects in the current scene, resizing and rotating it as you want. All objects in the ClipObjects starter library are scaled accurately with respect to one another, so you should import all the objects you plan to use before resizing any of them.

With every scene, Showplace provides a reference plane that serves as a grid for your creations. You can align the width, height, or depth of one or more selected objects to the plane. Because Showplace always aligns the exact center of an object to the center of a plane, you can align only one side of a selection at a time. You can't align objects with respect to each other, either—a major drawback, in my book.

Computer Detailing

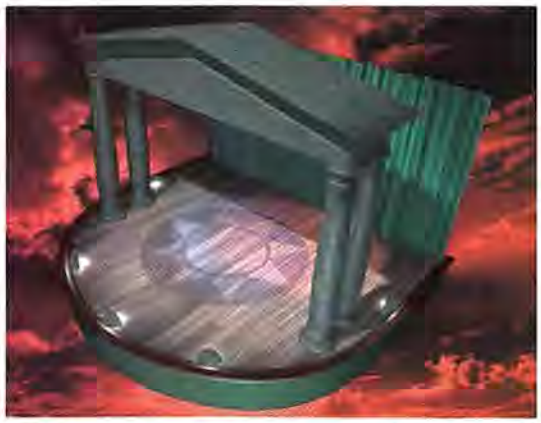
TO APPLY TEXTURES TO AN OBJECT, you select the portion of the object that you want to affect, then select a texture from the Looks library. Unfortunately, this is the only instance in which you can select one detail in an object separately from the rest of the object. Even then, the details are predefined by whatever modeling application was used to create the object; if the two wheels of a bicycle have been assigned to the same surface group in Swivel 3D, for example, you cannot apply a different texture to each wheel with Showplace.

You can modify the color and luster of many textures after their application, or use the LabelMaker utility to create your own Looks. The upgraded LabelMaker 1.1 allows you to bevel fonts (similar to carving characters' edges) to create 3-D logos and other special text effects. For example, by making the white portions of a label transparent, you create a decal, which is useful for making emblems that appear painted or etched onto other surfaces. When you label an object, however, you replace the previous texture, so if you want to apply a decal over an existing surface (as demonstrated by the sun symbol in "Stargazing"), you have to import a flat object such as a disc, position the disc over the textured object, and apply the decal to the disc.

Lights, Camera, Ad Infinitum

LIGHTING IS ONE OF THE PROGRAM'S most satisfying features. You can choose from four kinds of lighting: unfocused ambient light, distant parallel light (as from the sun), point light (as from a light bulb), and focused spotlight. You can create as many lights as you want, and each may be of a different color; you can also position and orient lights at precise *x*-, *y*-, and *z*-coordinates throughout your graphic. Best of all, a light can affect all objects that surround it, or it can dissipate gradually, as in real life.

You define the field of view using Showplace's camera tools. Each tool allows you to change the position of the camera (that is, the viewer) and that of the "lookat point," which represents the exact center of the area seen by the camera. This distinction can be confusing at first, but becomes extremely useful once you're up and running with the program. For example, you can instruct the camera to look at a selected object, then move the camera so that you're viewing the object from an entirely new angle. If you think you'll want to revisit a view, you can save the camera position with the current file. After a while, you'll find yourself moving the camera regularly to examine all angles of your scene.



Stargazing Using a Mac IIci equipped with 20MB of RAM, this image was rendered from Showplace 1.1 over the course of 13 hours.

Rendering is Showplace's most powerful but least intuitive feature. The program relies on a draft-quality renderer, which is satisfactory when rendering to videotape, but otherwise only fit for proofing purposes. If you intend to output the final scene to a high-resolution imagesetter or film recorder, you need to install the photo-realistic rendering module included with MacRenderMan. To specify which rendering module you want to use, you have to select it from the Chooser, not a step normally associated with rendering a file to disk. A single set of rendering preferences controls all rendering, whether you're creating a final image or merely previewing the objects on screen. It's not uncommon, therefore, to specify a low-quality screen preview while rendering to the screen, then forget to change the setting before rendering the final image. Since even low-resolution images can take an hour or more to render, you waste valuable time before you notice your mistake. You also have to take into consideration the amount of time it takes Showplace to write to disk enormous lighting and texture files to calculate the appearance of shadows and other memory-intensive elements. (Showplace required 39MB of disk space to render the stage image shown in "Stargazing.")

On the upside, both Showplace and MacRenderMan make use of the RenderMonitor application, which renders scenes in the background. Over the course of several days of rendering various images in the background, I encountered no system errors or sluggish performance while working in the foreground application. Once, RenderMonitor canceled a project because it ran out of disk space, but it saved the portion of the scene it had rendered up to that point. This allowed me to reconfigure Showplace to render the scene from that point on, thereby minimizing time loss.

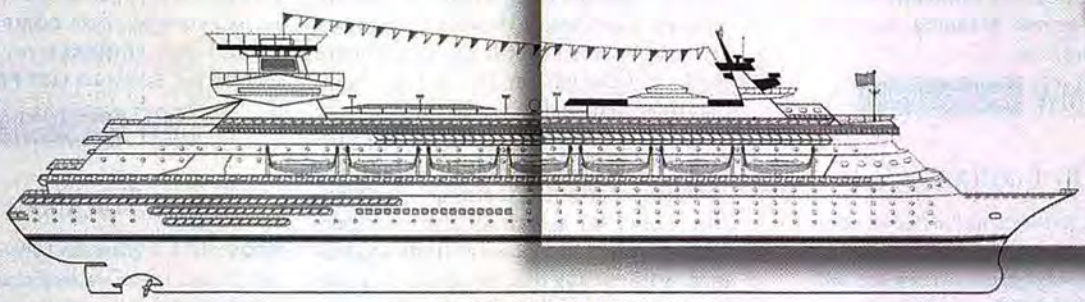
Showplace's simplified interface is ideal for beginners; you need only learn a small set of tools and commands to begin rendering in earnest. The program also meets the needs of intermediate users by providing a library of objects and surface textures that can be mixed and matched.

If you have used other modeling and rendering applications, you may find Showplace's feature set too small. Of course, you can always switch over to the more powerful MacRenderMan as your requirements expand, but I can't imagine many users wanting to make the leap from Showplace to the minimalist, nuts-and-bolts interface of MacRenderMan.

So, while Showplace presents a rare opportunity for the entry-level user to jump into the world of 3-D programs, I expect that a more powerful version will be necessary to make a dent in the Macintosh computer graphics market.

—DEKE McCLELLAND

DON'T MISS THE BOAT.

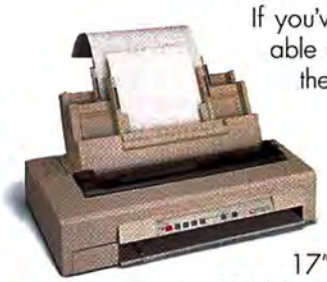


S.S. OCEAN DUCHESS

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 our 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 894.

The WideWriter 360 is available for the amazing price of just $1699! To order your WideWriter 360 or for the name of the dealer nearest you, simply call us toll-free. 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™

© 1992 GCC Technologies, Inc. All listed trademarks are trademarks or registered trademarks of their respective manufacturers. GCC dealers are independent businesses and as such may offer different prices, policies and service arrangements.

22006P

End user's circle 260 on reader service card

Dealers circle 262 on reader service card

File-Finding Utilities

Gofer 2.0

PROS: Extensive text search options; doesn't require indexing. **CONS:** Slow; can only view files; can't search by file name. **COMPANY:** Microlytics (716/248-9150). **REQUIRES:** Mac 512KE. **LIST PRICE:** $79.95.

On Location 2.0.1

PROS: Fast; displays formatted files; indexes in background. **CONS:** Takes time to index; can't exclude search strings; can't use wild-card characters. **COMPANY:** On Technology (617/876-0900). **REQUIRES:** Mac Plus; System 6.0.4. **LIST PRICE:** $129.95.

AN OLD COLLEGE PROFESSOR OF mine liked to snap his fingers to show us how fast our brain cells were dying. Well, whether it's because my brain is shrinking or the data on my hard drive is expanding, I do seem to have more trouble keeping track of my files these days. But where there's a need, there's a utility, or in this case, two utilities.

Gofer

GOFER IS BEGINNING TO LOOK A little long in the tooth, even in its second incarnation. A desk accessory, Gofer scans a hard drive by looking for files that contain designated text—you can't search for files by name, and you can view files only as plain text. Text can be transferred to the Clipboard, and a handy feature lets you copy noncontiguous selections.

Gofer's search functions are more than flexible enough for most users. You can locate files that contain *Tom* or *Dick* but not *Harry*, for example. You can even tell Gofer how many lines separate two text strings you're looking for. An asterisk (*) acts as a wild card for any character, and a pound sign (#) substitutes for any digit.

Gofer can search for text in most Mac file types, and volumes don't have to be preindexed. Unfortunately, you pay a price for convenience: Gofer is relatively poky, even on a fast hard drive. Gofer wastes time by continuing to process files after the search text has been found—there should be a way to stop the search after you have found the text you want. Although you can speed things up by limiting searches to specific folders, that's not much consolation if you don't know where to begin looking.

On Location

THE NEWEST VERSION OF ON LOCATION adds several useful features to an already-popular utility. Now you can perform multiword searches, and you can specify if all of the words have to be in the file, or if any one word will do. Wild-card characters still aren't allowed, though you can scan by word root if you're unsure of spelling. Although On Technology claims that most people don't need the extensive Boolean options such as those Gofer offers, I would like to be able to exclude files containing specific text strings. The algorithm used for searching also isn't perfect—rarely, On Location finds a document without any true word matches, and only when you try to view the file does it tell you that word is not in the file.

Unlike Gofer, On Location can scan file names as well as embedded text, and you can delete, copy, move, or rename files. Documents can be displayed with styling intact if the appropriate XTND translator file is in the System Folder. (On Location ships with 11 XTND filters.) On Location also lets you open or print a document if you have the application that created it.

On Location's greatest advantage is speed: when you search by name, new files pop up almost as fast as you can type. Text searches are slower but still leave Gofer in the dust. In one test, On Location took 33 seconds to scan 689 files for my last name, compared with Gofer's 9 minutes. The key to On Location's performance is precompiled indexes, which you have to create for each volume you want to search. The indexes are fairly compact, usually occupying less than 3 percent of the files indexed. If storage is tight, you can save space by excluding specific file types or numbers from the index.

Indexing a large volume can take hours, though. Occasionally, On Location freezes while it's generating an index, forcing you to remove the problem document and start again. (After four frustrating attempts at indexing my hard drive, I disabled nonessential INITs.)

On Location keeps up with changes to your files by updating indexes in the background. You can vary the frequency of automatic indexing, or you can eliminate it entirely if it bothers you. Over many months of testing, On Location's background processing was never obtrusive.

Unlike the tortoise's steady pace, speed makes On Location the undisputed winner in this race. It's ideal for keeping tabs on huge volumes like CD ROMs, and the ability to view formatted text is a plus. On Location is one of the few utilities I wouldn't want to be without.

—FRANKLIN N. TESSLER

Input Devices

MouseMan

PROS: Comfortable shape; three programmable buttons; click-lock feature enables precise movement. **CONS:** Takes some getting used to; three-button advantage sometimes moot. **COMPANY:** Logitech (510/795-8500). **REQUIRES:** Any Mac with ADB port; System 6.0. **LIST PRICE:** $119.

TrackMan

PROS: Three programmable buttons plus trackball; click-lock feature enables precise movement. **CONS:** Right-hand bias; can be uncomfortable with extended use. **COMPANY:** Logitech (510/795-8500). **REQUIRES:** Any Mac with ADB port; System 6.0. **LIST PRICE:** $139.

A³ Mouse

PROS: Smooth ride; high resolution; ships with NuPaint DA. **CONS:** Murky software and documentation; compatibility problems. **COMPANY:** Mouse Systems Corporation (510/656-1117). **REQUIRES:** Any Mac with ADB port. **LIST PRICE:** $149.95.

ADAPTING TO AN UNFAMILIAR pointing device can take time. For some users and some applications, the comfort of a trackball or the benefits of a mouse with multiple buttons easily outweighs the initial burden of learning something new. Logitech's MouseMan and TrackMan, and Mouse Systems' A³ Mouse combine programmability with ergonomic design to provide alternatives to Apple's standard mouse.

MouseMan and TrackMan

OF THE THREE, THE BEAR-PAW–SHAPE MouseMan is my favorite. It's handsome and solidly made, with a rounded back and convex top that make it comfortable to hold, although my lab assistant Igor (with hands the size of catchers' mitts) and I (with my very small hands) both wished it were a bit smaller. The MouseMan's three buttons are responsive and produce an audible click, so you always know when you've touched off a mouse event. The center button is dimpled to orient your fingers, though a little more tactile differentiation between buttons wouldn't hurt. Logitech thoughtfully offers both a right-hander's and a left-hander's mouse. The MouseMan also has ADB throughput, so

continues

THE BLP ELITE. NOW JUST $1399.

The first affordable PostScript® printer designed specifically for Macintosh® users has just become more affordable. It's from GCC Technologies,® and it's called the BLP Elite.™ A printer so advanced that it offers exactly the features you're looking for, at a price you've never seen before. Now just $1399.

That's significantly less than the nearest competitor. But that doesn't mean the BLP Elite has less to offer. In fact, the BLP Elite is packed with more features you want, like true Adobe® PostScript and built-in AppleTalk® for sharing over a network. There's also edge-to-edge printing for super-sized spreadsheets and banners, and a straight-through paper path for printing wrinkle-free envelopes and labels.

The new BLP Elite is a faster printer, too.

In fact, with its 16.67 MHz processor, it's one of the fastest 4 ppm (page-per-minute) PostScript printers you can buy.

But what makes the BLP Elite a more sophisticated, more affordable printing machine is its breakthrough technology, engineered at GCC.

At the heart of the BLP Elite is the most compact, cost-effective PostScript controller board ever designed. A compact controller means two things: fewer components and lower manufacturing costs, which translates to exceptional product reliability and a significant cost savings for you.

800-422-7777 for the BLP Elite, extension 844.

The BLP Elite PostScript printer is available from your Authorized GCC Dealer or directly from GCC. Call 800-422-7777, extension 844, for the name of the dealer nearest you or to place your order directly with us. Either way, you'll find it's painless to go lean and mean with the BLP Elite.

GCC TECHNOLOGIES
Peripherals With Vision™

© 1992 GCC Technologies, Inc. All listed trademarks are trademarks or registered trademarks of their respective manufacturers. GCC dealers are independent businesses and as such may offer different prices, policies, and service arrangements.

End user's circle 221 on reader service card

Dealers circle 212 on reader service card

22006H

ALEX VIARNES

Left to right: Logitech's MouseMan, TrackMan, and the Mouse Systems A³ Mouse.

it's possible to have two devices plugged in at once—a mouse plus a trackball, say, or graphics tablet.

The Logitech TrackMan, like the MouseMan, has a convex top, a dimple on the center button, and ADB throughput. It's about the size of your average sandwich. When oriented for right-handed use, the three buttons sit on the TrackMan's front-right edge, and the small trackball lines up under the first joint of your thumb. Logitech suggests that left-handed users rotate the unit, but that really does not compensate for the fact that the TrackMan is not laid out for southpaws.

I found the TrackMan less satisfactory than the MouseMan. The ball itself felt too small, too light, and too glossy to provide adequate kinesthetic feedback. My thumb tended to slide over the surface of the ball instead of moving it.

Both Logitech units gain functionality from the MouseKey control panel (cdev for systems before 7.0), which replaces Apple's Mouse cdev. You can assign key combinations to the three buttons so that they act like function keys, even if you do not have an extended keyboard. Alternatively, these buttons can mimic standard mouse events: double-click, triple-click, and the admirable click-lock. The last is especially useful for click-and-drag maneuvers, allowing you to concentrate on precise motions instead of downward pressure; it also eases the strain on your hands and wrists. With both Logitech devices, I eventually settled on single-click, double-click, and click-lock for the three buttons, but you're not limited to one set of choices. The Logitech software lets you customize the buttons for every program you use.

The A³ Optical Mouse

MOUSE SYSTEMS' A³ OPTICAL MOUSE gives the smooth ride and tight resolution characteristic of optical devices, and has three light-touch keys at the front edge of its squarish casing. Strong software would make the A³ Mouse an attractive package. Unfortunately, the A³'s software limits you to keyboard commands; you can't assign mouse-click variations to the extra buttons. Thus, for example, you could assign ⌘-0 to one button for opening folders and files, but you'd have to highlight the icon first with a single click.

Moreover, the A³ is incompatible with some very common commercial INITs. The software turned off both After Dark and Adobe Type Manager on my SE running System 7. Mouse Systems' technical support claimed that moving A³'s control panel to the System Extension file would cure this, but it didn't. Reshuffling and reconfiguring my other INITs didn't help either. The A³ also ships with NuPaint, a paint desk accessory that also evinced compatibility problems.

What's Your Pointer?

THE REASON FOR ALL THE VARIETIES of input devices is to provide comfortable, efficient ways for people's hands to communicate with computers, so that people can work (or play) with minimum risk of repetitive strain injuries.The only sure way to avoid computer-related hand injuries is to take periodic breaks. The only sure way to find the best input device for you is to experiment. See if a trackball (large or small) works for you, check out the software, and decide whether programmable buttons make a positive difference in the way you work. And avoid buying a pointer you can't return. You may not find out that you and your new HyperTurboRodent don't get along until you've been acquainted a week or three.—TERESA NIELSEN HAYDEN

Data-Analysis Software

Muse 1.0

PROS: Innovative approach to organizing and reporting data; free-form query language; carries units and scale with data items. **CONS:** Conceptually demanding; output is limited to spreadsheets and graphs (no reports); limited graphics and analysis capabilities; error messages unhelpful. **COMPANY:** Occam Research Corporation (617/923-3545). **REQUIRES:** Mac II; 5MB of RAM; System 6.0.5; hard drive with 10MB of free space. Recommended: Math coprocessor; System 7. **LIST PRICE:** $695.

MW ★★★

MOST BUSINESS ANALYSES ARE not difficult to carry out or understand. Often, though, the process of finding and assembling the required data is a lot of work and error-prone besides. Moreover, it's often hard to extract exactly what you need because a single datum is located at the intersection of many dimensions. For example, your current salary is located by at least three indicators: who you are, what point in time is of interest (current), and what data item is wanted (salary). Wouldn't it be useful to have a program that lets you specify data extraction, analysis, and display, and enables you to do so in a natural, interactive way?

Muse is such a program—almost. It is based on a large, ambitious vision of how to organize and use data. It has relational databases, called DataBooks, from which you extract the data of interest. It has spreadsheets, called WorkBooks, in which the data are presented and analyzed. And it has graphs for presenting data visually. Underlying all of this is a dictionary-based, syntax-driven query language around which all Muse activities revolve. The language is enough like English to fool you, at least for a little while. English or not, it should be easy enough to learn how to request simple analyses.

Scaling, Scaling

MUSE OFFERS A UNIQUE AND POWERful combination of several capabilities not available in other data-analysis programs. Muse keeps units and scaling with each data item and understands how to use them. For example, the query six feet by eight inches returns 5 square feet. Typing $123 thousand in French francs yields 700,854.70 French francs (Muse understands the word *thousand*). Data can be indexed by up to eight indicators (keys). Spreadsheets are organized not only in rows and columns, but also in pages and chapters, making them capable of displaying data indexed by all eight keys. Muse smoothly changes views for you when you display with different keys (see "Comparing Apples and Oranges"). This capability alone is worth the price of the package.

Muse can have up to 15 DataBooks open at once, and it automatically establishes relational links among variables that have the same name and definition (you provide the names and definitions when loading the data). If the name is the same but the definition is different, a dialog box asks you if you want to link the variables anyway. For example, the definition of *fiscal year* might be different for two companies being compared. You can also link variables manually. Each DataBook can include one script as well, so that specialized analyses, unit conversions, and so forth can travel with the data to which they refer.

Data can be entered from many external sources into a DataBook. Occam Research recommends loading data into a WorkBook first and reorganizing them

continues

IF YOU DON'T HAVE THE PLP II, YOU'LL NEED SPECIAL EQUIPMENT TO GET EDGE-TO-EDGE PRINTING.

If you want a printer that's a cut above the competition, look no further than the $949 Personal LaserPrinter™ II (PLP™ II) from GCC Technologies.® GCC's exclusive edge-to-edge printing gives you the power to produce larger graphics, flow charts, and much more. With other printers, like the Apple® Personal LaserWriter® LS, you're forced to cope with margins that confine your graphics and narrow your options.

Edge-to-edge printing is just one of the features that set the PLP II apart from the pack. Other features include:

- **PostScript upgrade.** Provides an upgrade path to PostScript® and AppleTalk® networking.
- **Greater scaling capabilities.** Scales from 25% to 400% in 1% increments, compared with the Personal LaserWriter LS, which is limited to 50% and 75%.
- **Straight-through paper path.** Ensures wrinkle-free printing of heavy stocks, envelopes, labels, etc.
- **New! Background printing.** Lets you get back to work on your computer faster, and allows sharing using AppleShare® with System 7.0.
- **Faster print time.** Prints faster than the Personal LaserWriter LS. In fact, *MacUser* (May 1991) found the PLP II to be 20% faster than the Apple Personal LaserWriter LS on their Microsoft® Word test document, 40% faster on their MacDraw® II test, and twice as fast on their Excel test.
- **On-screen page preview.** Saves time, toner and paper.

Of course, the PLP II also features the unmatched reliability and innovation that go hand-in-hand with the GCC Technologies name. It's the name to count on when you're looking for a high-quality, affordable laser printer. And there's no margin for error.

Easy Ordering. 800-422-7777, extension 763.

To acquire your new PLP II, simply call us toll-free, and we'll give you the name of the GCC Technologies dealer nearest you. Or order direct from us, with a 30-day money-back guarantee and $9 overnight delivery.

GCC TECHNOLOGIES
Peripherals With Vision™

© 1992 GCC Technologies, Inc. All listed trademarks are trademarks or registered trademarks of their respective manufacturers. GCC dealers are independent businesses and as such may offer different prices, policies, and service arrangements.

22006N

End user's circle 231 on reader service card

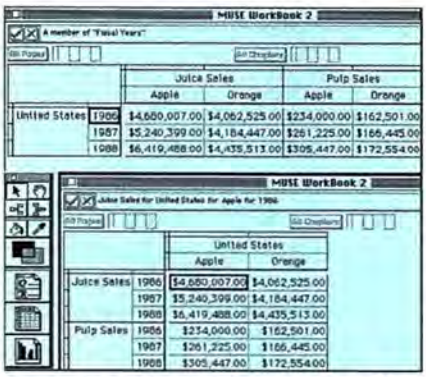
Dealers circle 232 on reader service card

there, then saving them to their final destination. Muse supports WKS, WK1, DBF, DIF, and SYLK formats, along with tab- or comma-delimited text, and fixed-field data. The documentation is thorough and clear about how best to organize data into an optimal form for flexible access. Files can also be imported directly from a flat-file database into a databook.

Putting It Out

OUTPUT FROM MUSE IS LIMITED TO spreadsheets and graphs. This is fine if you're giving a presentation to the boss, but generating written reports requires a lot of cutting and pasting. Conventional database applications support mail merge–like output such as "Dear Mr. *XXXXX*. We notice that your *YYYY* invoice for *ZZZZZ* is *WWW* months overdue . . ." Muse has nothing like this. Its graphics are flexible but limited. If two- and three-dimensional bar charts aren't enough, you can animate a 3-D chart to give it a fourth dimension. You can change colors, fonts, backgrounds, and axes to your heart's content—you can even change the perspective on 3-D plots. In the end, though, only the usual business-type graphics are supported: bar, column, and pie charts, as well as scatterplots and *x-y* graphs. In general they're showy but not very informative.

Muse support sophisticated analyses such as time series projections. It concentrates instead on calculating factors such as sales by region, and yield per unit of raw material. Given its extensive library of scientific constants, units, and functions, you'd think Muse would be useful in the laboratory, but it has no scientific analyses such as curve fitting. Nor does it support any technical graphics such as true contour plots and histograms; it supports only linear and log scatterplots and line graphs. Muse's units and scaling functions are confusing as well as useful. A request for one century in days returns Units Conflict. Yes, it's true that this century has 36,524 days and the next one will have 36,525, but give me a break—this could be a useful conversion. At least give the user a hint as to the problem. Muse also attempts to handle the delicate question of significant figures, and the result is mixed. Typically, returned answers have far too many significant digits given the precision of the question.



Comparing Apples and Oranges These Muse WorkBooks show two ways financial data can be indexed by four keys: Sales of Juice or Pulp, Fruit Type, Fiscal Year, and Country. You can rearrange the rows and columns, and Muse automatically restructures the data. Note that the row labels for Fiscal Year are repeated for each type of sales.

My biggest concern is the language interface. Muse's queries—its programming language—are deceptively easy to misread as English. It's much harder to write correct queries than it appears to be. Most amateur attempts result in diagnostic messages such as 'What' cannot begin a sentence, right after five successful questions beginning with What. More pernicious, though, are the improperly framed questions that do get answered. Buried in the back of the reference manual are all the rules for precedence of operators and parsing sequences, but it takes experience to know how to interpret and use them. Any programmer knows that understanding these rules is crucial for getting the right answer. Do I read 5 * 6 + 4 as (5 * 6) + 4, which equals 34, or as 5 * (6 + 4), which equals 50? Muse's tutorial teaches by example, and the reference material clearly explains a few ways to avoid going wrong, but it's not enough. Nonprogrammers will either plow ahead and make some unseen mistakes or bog down and give up. Don't misunderstand—this is a major issue for anyone who deals with natural language, but it's still a problem.

Muse's extensive documentation is well written and helpful, if a bit tedious and repetitious. The program makes use of System 7 balloon help and includes a nice elementary tutorial. What's missing is a large example that a student can work through from data loading through final output. In a product of this scope and complexity, this is essential.

I found a few bugs and Mac interface anomalies. The zoom box fills all possible monitors in a multiscreen Mac II setup; it should fill just the currently active one. Multiple selection in scrolling lists is done by dragging, not shift-clicking, and there's no Select All function. To restore a deleted data entry, you press the escape key, but if you clear a cell using ⌘-B, you use ⌘-Z to undo.

If You've Got a Niche

OVERALL, I'M VERY IMPRESSED BY THE scope and ambition of Muse, and it clearly fills a niche not currently addressed. It's an excellent environment for certain kinds of data handling—for example, if you want to analyze your little corner of an enormous corporate database. As the product and its user base mature, Muse should realize its potential.—PHILIP STEIN

Educational Games

Number Munchers 1.1

PROS: Combines arcade excitement with learning; outstanding color graphics. **CONS:** Repetitive cartoon sequences; no mechanism for creating custom word lists. **COMPANY:** MECC (612/569-1500). **REQUIRES:** Mac Plus; System 6.0.2. **LIST PRICE:** $49.95; with teacher materials $69; five-pack $149; network license $399.

MW ★★★★

Super Munchers 1.0

PROS: Combines arcade excitement with learning; outstanding color graphics. **CONS:** No mechanism for creating custom word lists. **COMPANY:** MECC (612/569-1500). **REQUIRES:** Mac Plus; System 6.0.2. **LIST PRICE:** $49.95.

MW ★★★★

Word Munchers 1.0

PROS: Combines arcade excitement with learning; outstanding color graphics and digitized voice cues. **CONS:** Repetitive cartoon sequences. **COMPANY:** MECC (612/569-1500). **REQUIRES:** Mac Plus; System 6.0.2. **LIST PRICE:** $49.95; with teacher materials $69; five-pack $149; network license $399.

MW ★★★★

"I'D PLAY IT TILL MY EYES FELL OUT (if I could)."—Andy, age 10. Andy's not talking about playing a take-no-prisoners shoot-'em-up at the local arcade but Number Munchers, an educational game designed to build arithmetic skills. Number Munchers is one of a trio of programs that combine the thrill of arcade action with solid educational principles. The result: everybody wins.

Number Munchers

IN NUMBER MUNCHERS, THE PLAYER maneuvers a cartoon Muncher around a matrix game board, finding and gobbling up numbers. In a typical game the player's job is to navigate the Muncher to each multiple of four so it can eat the number. Correctly chomped numbers earn points; incorrect bites wipe out the Muncher. Each game begins with four Munchers and ends when all four are gone.

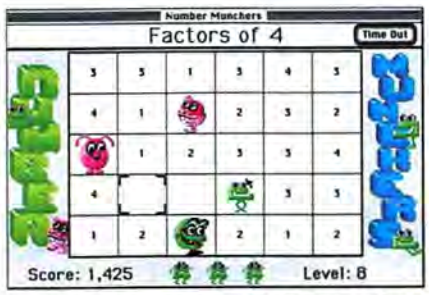
To make things more interesting, evil

continues

If you said you could buy an 040 upgrade for under $1500, people would call you crazy.

Troggles (which look like "Muppet Show" extras) wander across the grid, changing numbers and gobbling up any Munchers they encounter. As the game progresses, Troggles become more abundant and troublesome. Experienced players take advantage of the Time Out button to plan strategies and do calculations when Troggle activity gets too intense.

For every three levels completed, the player is rewarded with a short cartoon depicting a clever Muncher confronting a frustrated Troggle.



Troggle Trouble Troggles roam the screen, changing numbers and gobbling up nearby munchers (and other Troggles).

Word Munchers

WORD MUNCHERS IS ESSENTIALLY the same game, but the Muncher's job is to eat words with vowel sounds that match the target sound. For example, if the message says "u as in huge," the Muncher gets points for eating *cube*, *feud*, and *spew*, but loses big if he tries to eat *truck*. Players who have trouble reading the word can use the Hear Vowel command to hear a digitized voice pronounce the sound; there's no option for pronouncing the words in the grid, though.

Super Munchers

FROM A KID'S POINT OF VIEW, SUPER Munchers has a longer-lasting appeal than the two other Muncher games. It's targeted for the home market, and the game titles sound like categories on a TV quiz show: Animals, Famous Americans, Food and Health, Geography, Music, Odds 'n' Ends, and Challenge. A word or phrase at the top of each screen represents a "target rule," such as European countries, romantic composers, and animals with an exoskeleton. The Muncher is supposed to swallow words conforming to that rule.

Most of all, kids like the arcade extras, new to Super Munchers. Get 20 consecutive correct answers, and a Transformation Cell temporarily turns a Muncher into a Super Muncher capable of clobbering Troggles and peeking at correct answers. And for every three levels completed Super Munchers rewards the player with one of five interactive minigames ranging from simple logic games to fast-pace arcade games.

Food for Thought

ALL THREE GAMES CONTAIN PASSword-protected Management menus that allow parents and teachers to control the curriculum. Word Munchers lets you specify the difficulty level (from grade 1 to grade 5+) and choose any or all of 20 distinct vowel sounds. Number Munchers can be set up to ask for multiples, factors, primes, equalities, and inequalities; each of these categories can be fine-tuned. You can also choose a predetermined curriculum based on grade level, from 1 to 8+. Similarly, Super Munchers allows you to individually turn off selected games, rules, levels, and options; it also lets you choose a Quick Set option, from Grades 3–4 to Ultimate. Unfortunately, none of the programs accept custom data sets.

All in all, my testing crew loved these games, especially Super Munchers. The games are available in lab packs, complete with teacher guidelines, and Network menu options permit management from one central Mac.

The Munchers are no threat to Super Mario Bros., but even kids recognize that the Muncher trilogy offers more than just arcade fun.—GEORGE BEEKMAN AND THE SHOOBEDOOBOP SOFTWARE TESTING TEAM

OCR Programs

Wordscan 1.0
Wordscan Plus 1.0

PROS: Read any font accurately with little setup; recognize dot matrix characters; highlight errors in text editor; support PICT and TIFF file formats generated by scanner or fax modem. **CONS:** Idiosyncratic interface; incompatible with some hardware and system functions. **COMPANY:** Calera Recognition Systems (408/720-8300). **REQUIRES:** Mac Plus; 3MB of RAM; hard drive. **LIST PRICE:** WordScan $495; WordScan Plus $895.

MW ★★★

CALERA'S TOPSCAN OPTICAL CHARacter recognition (OCR) system has been widely praised for speed and accuracy, but its price tag (approximately $20,000) limits its user base to corporations and a few prosperous service bureaus. Calera now addresses the needs of us mere Mac mortals with two software-only products, WordScan and WordScan Plus. Both provide scanning and text-recognition options that easily put them in a league with the current OCR champs, Xerox Imaging Systems' AccuText and Caere's OmniPage (see "OCR: Teaching Your Mac to Read," *Macworld*, November 1991). WordScan Plus goes a few steps further, adding style sheets, a pop-up window to compare a word to what was originally scanned, and a feature that automatically identifies graphics on a scanned page and saves them to separate files. Throw in user-definable dictionaries, support for deferred processing (scanning pages, then running the OCR software later), and the ability to jump from one questionably recognized word to the next inside the text editor—features found in WordScan and WordScan Plus—and you're looking at two of the finest OCR programs for the Macintosh.

Lean and Mean

THE BEST THING ABOUT WORDSCAN (I am using the product name to include both WordScan and WordScan Plus) is the degree of automation it offers. In addition to the ability to read virtually any typeface, including draft-quality dot matrix text—an attribute equaled only by OmniPage and AccuText—WordScan can automatically subdivide a page into the appropriate number of columns. In OmniPage and AccuText, you have to either specify the number of columns prior to recognizing a page, or preview a scanned page and determine the boundaries of each text block. In WordScan, previewing is necessary only when you want to isolate a specific area of a scanned page, such as a single story on the front page of a newspaper. The program automatically reads through each column and displays a progress window to let you know what percentage it has recognized. WordScan Plus allows you to manually select and link columns, but this laborious process is rarely necessary.

While OmniPage and AccuText are commendably accurate text readers, you must fool around with brightness and contrast settings to yield the most favorable results. WordScan is the only OCR program I've used that lets you sit down and immediately begin scanning. Without any scanner adjustment whatsoever, WordScan consistently performed better than either of its competitors (though, with sufficient effort, OmniPage and AccuText can be made to read as well as or better than WordScan). As with the Macintosh itself, you just plug WordScan in and it's ready to use.

One Word or Another

TO MAINTAIN ACCURACY, AS WORDScan reads words, it compares them to those in a built-in dictionary. AccuText also provides this function, but WordScan's version is considerably faster. Still,

continues

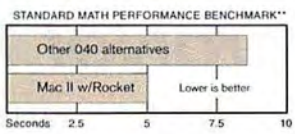
Padded cell not included.

No one will think you're skeptical, money conscious or overly cautious for not considering the Radius Rocket 25i. Just basically insane.

Simply because the Rocket is the easiest way to turn your Mac* into one bad apple. It easily plugs into your NuBus slot and protects your current investment by utilizing your Macintosh, not replacing it. Rocket enables your existing motherboard to handle I/O commands while its 040 co-processor races up to six times faster than your Mac II.

$1499

Recent tests conducted by MacWEEK show the Rocket beating the pants off other 040-based alternatives in graphics performance.



Requests for processing time and integer-math tests.

If you're interested in an incredible 040 upgrade with the $1,499 Rocket 25i, or the $1,999 Rocket with the integrated math coprocessor, call us at 1-800-227-2795 for a free Rocket Lift-Off compatibility disk and brochure. Or dial 1-800-966-7360 for faxed information.

If you'd like, we'll reserve you a brand new Rocket. If not, we'd love to reserve you a suite at Happy Acres.

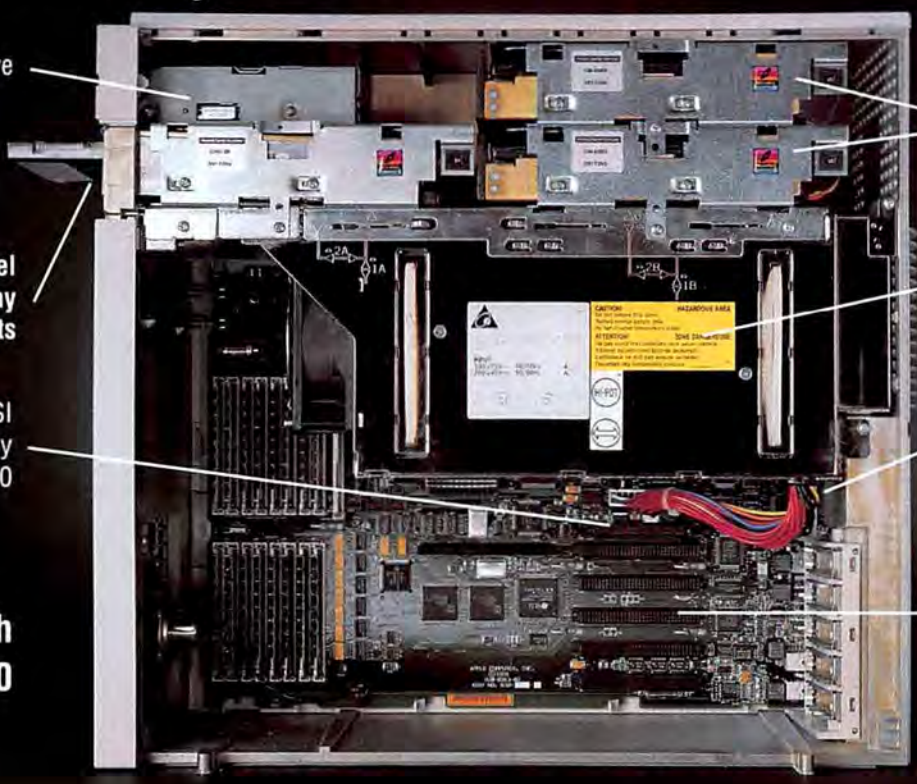
radius

WE MAKE ORDINARY COMPUTERS DO EXTRAORDINARY THINGS

©1992 Radius Inc. The Radius logo and all Radius product names are trademarks of Radius Inc. For your local Radius International Reseller, call 408-434-1010. *Compatible with the Macintosh II, IIx, IIcx and IIci. Tested under System 6 Finder with RAM cache off. Tests performed in black and white on 12- or 13-inch monitors, with AppleTalk off, minimum disk cache and extensions turned off. MacWeek 10/22/91.

Circle 178 on reader service card

Disk Array•040!



High Performance Storage For The Macintosh Quadra 900
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 900! 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 that employs FAST·SCSI-2 technology. With data bursts as fast as 10 MBytes/sec, and average access times as low as 7 ms, these new systems are four times faster than the standard 160 MByte drive. They install internally and range in capacity from 624 to 2,020 MBytes.

Performance Quality AWARD OF EXCELLENCE Support Commitment

The RAVEN·040 is expressly designed to use the built-in SCSI-2 ports of the Quadra 900. 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, CAD/CAM, and file-servers, where speed and capacity are paramount.

The RAVEN·040 is the ultimate data storage system for Quadra 900.

No one can match the power of our RAVEN·040 storage solutions. Call our sales department today. We're ready to talk. 1-714-837-6033.

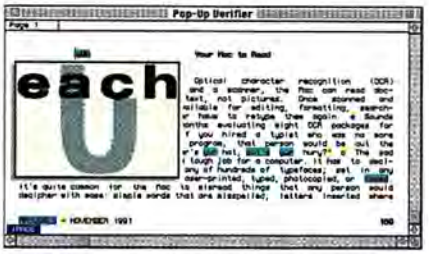
MicroNet Technology, Inc.

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



Cheat Sheet WordScan Plus shows you a detail of the original scanned page to compare with questionable words and misread characters.

like any OCR program, WordScan frequently misreads text. But rather than requiring you to find and correct errors on your own, WordScan highlights recognition errors—words that don't match its dictionary—and lets you jump from one error to the next. WordScan provides no post-recognition spelling checker, as OmniPage does, but it does provide a search-and-replace command. WordScan Plus enables you to display an enlarged detail of the questionable entry so you can proof and correct a mistake without the original hard copy.

Once mistakes have been corrected, WordScan Plus provides a style-sheet feature that can automatically format a current document, including character and paragraph attributes. Unlike similar functions in word processors that save style sheets within documents, WordScan Plus saves style-sheet definitions to a preferences file, so that they can be applied to other documents. Unfortunately, you cannot apply more than one style sheet per document.

WordScan provides drivers for Apple, Epson, Howtek, HP, and Microtek scanners. WordScan also recognizes text from PICT and TIFF files, whether scanned to disk or received via fax modem. Additionally, if a fax image has a low resolution, as in the supported 100-by-200-pixel picture received by a Dove fax modem, WordScan doubles the horizontal or vertical resolution of the image to increase the potential for recognition.

Some of WordScan's commands could be better implemented. It took me several minutes to figure out that choosing the Pop-Up Verifier command takes you to the built-in text editor. I encountered a handful of problems not mentioned in the documentation. For example, while Calera claims that WordScan is fully compatible with System 7, the program does not allow you to position scanner drivers in the Extensions folder, despite the fact that WordScan's drivers are Chooser extensions. And the program is incompatible with 24-bit color display.

I don't consider any of WordScan's problems debilitating—especially in light of the deluge of problems normally associated with OCR. In fact, once I got used to its idiosyncratic interface, I found WordScan worked more accurately with less effort than either OmniPage or AccuText. WordScan Plus offers some nice conveniences, but I'm not sure they justify the $400 difference in price. If Calera were to knock $300 off the list price of WordScan Plus, I would easily recommend it over any other OCR product costing less than $1000. Of the two programs, I lean toward the less expensive WordScan. It gets the job done, and in the world of OCR, straightforward recognition is what it's all about.—DEKE McCLELLAND

Still-Video Cameras

Dycam Model 1

PROS: Compact; easy to use. **CONS:** Produces gray-scale images only; short battery life. **COMPANY:** Dycam (818/998-8008). **REQUIRES:** Mac SE; 32-bit QuickDraw. **LIST PRICE:** $895.

MW ★★

Canon RC250

PROS: Stores up to 50 color images per video floppy disk; easy to use; hooks up to any television. **CONS:** Included video-digitizing board adds video artifacts to images. **COMPANY:** Canon (516/488-6700, ext. 3359). **REQUIRES:** Mac II; 2MB of RAM; 8- or 24-bit graphics display. Recommended: Hard drive. **LIST PRICE:** $1099.

MW ★★★

CAPTURED VIDEO FRAMES ARE EXcellent components of desktop presentations and, with the advent of QuickTime, are becoming more widely used. The primary video sources for frame capture are prerecorded formats like videotape and laser disc, and live, full-motion video from a camcorder. But they're not your only choices.

A still-video camera is much like a regular film camera, except that it captures a video image and saves it on a miniature floppy disk or in RAM.

Canon RC250

THE CANON RC250 (FORMERLY CALLED the Xap Shot) resembles a standard 35mm film camera, but instead of exposing film, the RC250 captures images on a solid-state chip called a charge-coupled device (CCD). The CCD captures one field of 16-bit color video. Up to 50 images can be stored in an analog format on a 2-inch video floppy disk. Resolution is comparable to that of many VHS camcorders, and you can play back your pictures on most televisions, using the supplied video adapter and battery charger. The camera has a built-in automatic flash, a small LCD panel showing the number of shots taken, and a few buttons that control recording and let you step through your shots on playback.

To get these still pictures into the Mac, you need a video-capture board, which digitizes the analog image saved on the video floppy disk. Canon bundles the RC250 with Digital Vision's ComputerEyes/Pro.

The RC250-ComputerEyes/Pro bundle is easy to use. After charging the camera's battery, I inserted the video floppy, turned on the camera, and started taking shots. After taking a variety of shots, I hooked up the camera to the charger/video adapter, and connected the adapter to my television via a standard RCA-plug video cable. The pictures appeared on the screen.

The picture quality is extremely dependent on the available light. Some shots that I took outdoors just before sundown were too dark, although there was plenty of light to the eye. With sufficient light, the pictures are much clearer and more detailed, although video scan lines are quite noticeable. The ComputerEyes/Pro digitizing board is just as easy to use as the RC250. After loading the board's software and placing the board into a NuBus slot on my Mac, I plugged the camera adapter's video-out into the digitizing board. The video-capture application allows you to preview an image and make adjustments to the brightness and color balance before you capture the frame to disk. You can save the captured image in PICT or TIFF format. As previously reported in *Macworld* (see "Frame by Frame," March 1992), the ComputerEyes/Pro's captures lack contrast, and the board tends to add color speckles, smearing of fine details, and other video artifacts into the picture. I was able to get cleaner captures from two other video-capture boards, but in fairness, those boards each cost more than the whole RC250-ComputerEyes/Pro bundle. For the user looking for an inexpensive still-video system, the ComputerEyes/Pro board provides adequate captures.

Dycam Model 1

THE DYCAM MODEL 1 DIGITAL STILL Camera uses a different approach than that of the RC250. The flat, vertically shaped camera has a built-in flash and a fixed-focal length lens. The Dycam records images in 8-bit gray scale, digitizing and saving them to RAM inside the cam-

continues

YOU'RE USING PRESENTATION SOFTWARE AND THEIR EYES ARE STILL GLAZED OVER.

Let's face it. Audiences today are bored to death with presentation software. Everyone on the planet is using it. And it all looks the same. But there is a way to break the snooze factor—project your software on one of In Focus' new color LCD projection panels. Not only will your ideas look better, they'll have the waking power you need.

FORTUNATELY, OUR NEW LCD PANELS WILL MAKE

Simply slip one of our lightweight, portable panels on top of an overhead projector, and plug it into your PC or Mac. In mere seconds you're giving a full-color interactive presentation right off your computer. (Let everyone else fumble with transparencies and slides.) So you come across looking more polished, professional and persuasive. A change your audience will definitely notice.

YOUR IDEAS SCREAM OUT

And talk about efficient. Since you don't have to make hard copies of your presentation, turn-around time and outrageous costs are no longer issues. Plus, you can animate your information, even work with it during the meeting, which is infinitely more interesting than static data. All in vibrant colors, with unparalleled quality, saturation and contrast.

& WAKE THE

We offer a wide variety of products including the new 7000FX+ with 24,000 colors; the TVT-3000 active-matrix panel for multimedia; and the 7600XGA—the only panel for projecting stunning XGA images at 1024 x 768 resolution. So call 1-800-327-7231 for a free brochure with all the specifics. And bring dead presentations back to life.

InFocus®
SYSTEMS

CALL 800-327-7231

DEAD!

©1992 In Focus Systems, Inc. All rights reserved. In Focus is a registered trademark of In Focus Systems, Inc. All other trademarks are for identification purposes only and are the property of their respective companies.
7770 SW Mohawk Street, Tualatin, Oregon 97062. Phone (503) 692-4968. Fax (503) 692-4476. In Europe: Planetenweg 91, 2132 HL, Hoofddorp, The Netherlands. Phone 31 (0) 2503 23200. Fax 31 (0) 2503 24388.

era. There's enough RAM to store 32 images, but you can't store them for long—the rechargeable batteries inside the Model 1 ran out of juice overnight (the manual warns you to recharge the batteries as often as possible). Recharging takes about six hours. The Dycam Model 1, however, is easy to use; you simply point and shoot. The flash works automatically; there's no manual override.

Using Dycam's software, you download the images to the Macintosh via a cable plugged into the modem port. You can save the images as TIFF files. The Dycam creates detailed gray-scale images, and it also supplies a limited gray-scale–editing program.

I prefer the RC250 to the Dycam. The RC250 stores images permanently on floppy disks, it plays them back on any standard TV, and the images are in color. The Dycam Model 1 is uncomfortable to hold and shoot because of its vertical shape, and you need to quickly download the images. The Dycam pictures, although gray-scale, are more detailed and better balanced than the RC250's, without the RC250's scan-line problems. If you don't need color and if detail is of primary importance to you, the Dycam is the better choice. However, at $895, the Dycam is overpriced. You can get the RC250-ComputerEyes/Pro bundle for not much more money, and you'll be getting a more convenient, color product.
—TOM NEGRINO

Architectural CAD Software

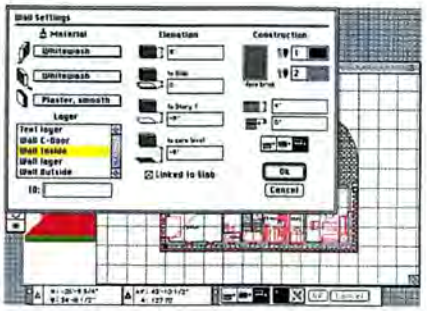
ArchiCAD 4.02

PROS: Good 3-D importing and exporting capabilities; includes photo-realistic renderer with Phong shading; has large library of 3-D objects; stand-alone plotting software accepts most CAD formats; powerful macro language. **CONS:** Cannot draw in section view; slow redraw in some views; weak 2-D drafting tools. **COMPANY:** Graphisoft USA (415/737-8665). **REQUIRES:** SE/30 or Mac II with coprocessor; 4MB of RAM; System 6.0; hard drive with 8MB of free space. **LIST PRICE:** Version 4.1 $4450.

MW ★★★★

ARCHICAD BY GRAPHISOFT IS A powerful, full-featured, integrated CAD package designed especially for the architecture and engineering markets. ArchiCAD's graphic interface is considerably improved over previous versions and now includes a selection tool for stretching and moving objects with the mouse.

The program's 3-D interface is simple but powerful. It builds on a construction metaphor, using basic block shapes to represent slabs, walls, and roofs, which the user defines (along with their material attributes) through a dialog box. These elements can then be combined and manipulated to produce architectural forms—from simplified buildings to complex interior spaces and urban-design projects.



Wall Dialog Box Block size and material attributes are entered through dialog boxes in ArchiCAD.

Once you've defined a block, ArchiCAD's 3-D tools let you cut, stretch, and rotate it, punch multisided holes into it, and combine it with other blocks to form curved surfaces. Blocks can be multisided and faces need not be vertical. The Cleanup Intersections command can be invoked manually or automatically to tidy up wall intersections.

ArchiCAD comes with a powerful macro language called GDL (Geometric Description Language). With GDL you can create parametrically defined solid objects that represent building components such as structural elements, doors, windows, and furniture. My experience, however, is that most architects are not experienced with programming and will leave GDL to the techie types. ArchiCAD also allows you to import complex 3-D objects directly from any modeler that creates export files in DXF format.

You begin by entering a design in plan view. ArchiCAD's database structure enables you to make all revisions from there, updating all elevations, sections, 3-D views, and materials requirements accordingly. The floating-point–based database is extremely accurate. Unfortunately, unless you use one of the faster Macs (ideally a IIfx or Quadra), even simple structures usually redraw very slowly. System 7.0.1's SANE (Standard Apple Numerics Environment) patch helps, as does turning off hatching and using smaller windows, but then, why bother to have those expensive 19-inch monitors?

Another shortcoming is that while the program lets you view a design from almost any viewpoint (plan, section, elevations, perspective, and isometric), you can only draw in the plan view. This means that creating, modifying, and selecting stacked objects (such as transom windows above doors) all require extensive use of dialog boxes to set *z* parameters (height). This quickly becomes tedious in a production situation.

One impressive aspect of program design is ArchiCAD's ability to cut more than one oblique section plane through a 3-D object, in any of three viewing windows, effectively carving a new object from the original. The new part can be saved to the program's 3-D object library.

ArchiCAD comes with a large library of parametrically defined 3-D objects. Doors and windows are available as both 3-D objects and related 2-D plan symbols. Graphisoft's libraries are based on the American Institute of Architects' architectural graphics standards and organized according to the 16-division Masterformat classification system—a nice touch.

When you've completed a design (or while you're working on it) you can do a complete quantities takeoff (calculation of necessary materials) of your project. The Bill of Materials spreadsheet provides materials descriptions, shows areas and volumes, and calculates cost estimates based on unit costs you supply in the creation dialog boxes. However, finding net areas in ArchiCAD is much more difficult than with a competing product, Architrion, from Gimeor.

You can print or plot directly from ArchiCAD, but the package also includes a stand-alone program, PlotMaker, for combining, arranging, and plotting CAD files from almost any source. I was unable to test PlotMaker, but according to the documentation, it accepts ArchiCAD, DXF, HPGL, and PICT formats, as well as supporting all the popular pen and electrostatic plotters and laser printers.

Rendering and Animation

THE MOST SIGNIFICANT IMPROVEMENTS in ArchiCAD version 4.02 are its photo-realistic renderer and animation tools. The program accurately casts building shadows based on solar date, time, and location on earth. ArchiCAD accounts for a material's surface qualities and can define its reflectivity (both specular and diffuse) and the degree of transparency or emission (glowing). You can select faster flat shading or slower but more realistic Phong shading, and you can also include antialiasing.

The program allows you to place PICT images, such as a cloudy sky, to create a background behind a model. The renderer has only one light source, but models can be easily exported to either Pixar's MacRenderMan or Strata's StrataVision 3d for rendering with multiple

continues

With MacLinkPlus, Transforming Files Between Macs And PCs Is Amazingly Simple.

Transforming files between Macintosh and PC formats can be a real beast. But there is an amazingly simple way to make PC files totally at home in a Mac environment. And vice versa.

MacLinkPlus. The world's leading data translation package, and the only choice for complete, effortless file conversion.

MacLinkPlus is a vast resource of over 400 translator combinations for the most popular programs running under Macintosh, MS-DOS or Windows. Including Microsoft Word, WordPerfect, Excel, Ami Professional, MultiMate and dozens of other word processing, spreadsheet, database and graphics applications.

File translations are automatic with "point-and-click" simplicity, and we include DOS Mounter software so MS-DOS disks show up right on your Macintosh desktop. We even offer complete compatibility with XTND file conversion.

No matter what version of System you're running, MacLinkPlus sets the standard in ease of use. And our new version 6.0 is packed with features that exploit System 7 innovations.

For file translations when you're connected via a network, file server, or SuperDrive, all you need is MacLinkPlus/Translators. And for the added capability of file transfer using a cable or modem, MacLinkPlus/PC includes the same full array of translators as well as a serial cable and communications software.

Get MacLinkPlus 6.0 today. And watch all your PC files transform themselves before your very eyes. For more information, call DataViz at (800) 733-0030.

DATAVIZ™
THE DATABRIDGE SPECIALISTS

All product names are trademarks or registered trademarks of their respective holders. DataViz, Inc., 55 Corporate Drive, Trumbull, CT 06611 (203) 268-0030

Circle 36 on reader service card

light sources, texture mapping, or ray tracing.

ArchiCAD's animation tool, Fly Through, lets you set a sequence of views through a project. These can be saved as a sequence of PICT or PICS files for use in animations or QuickTime movies.

ArchiCAD incorporates most of the features that an architect could want in an integrated package. That is not to say there aren't deficiencies. The 2-D drawing and dimensioning tools are weak, lacking the automatic tangent, fillets, and perpendiculars options that competing products have (Graphisoft says version 4.1 greatly strengthens the 2-D drawing tools). Also, not being able to work in section view is a serious shortcoming, one that I hope will be corrected in the future. The construction metaphor is good, but in the early stages of a design (massing studies, for example) I would like to work without worrying that I haven't filled in all the attribute choices in the dialog boxes.

On the other hand, the documentation is very readable, organized, and well indexed—a rarity among CAD manuals. The tutorial guide is also well done, with a good sample building project.

At $4450, ArchiCAD is not an impulse purchase. The ongoing support relationship with a software company is as important as the software's feature set. Good, knowledgeable CAD dealers are also important. You want to deal with people who will both provide an overall orientation of the software's features and tailor training to fit the way your office works. Graphisoft has a regular upgrade cycle for its software (averaging one minor and one major upgrade per year), and offers free upgrades and unlimited toll-free telephone support for the first year. A maintenance contract is available after the first year. In addition, Graphisoft provides training seminars throughout the United States, and ArchiCAD user groups have been formed regionally. The company has a mentor program that connects new users with experienced users to help them get started. There's even an active online network of ArchiCAD users, in addition to Graphisoft's own America Online tech support.—DANIEL M. GONZALES

ALEX VIARRÉS

MacSpeakers (left), Bose RoomMates (right)

Shielded Stereo Speakers

Bose RoomMate

PROS: Rich, bassy sound; doubles as regular stereo bookshelf speakers. **CONS:** Heavy; expensive; muddy highs. **COMPANY:** Bose Corporation (508/879-7330). **REQUIRES:** Mac Plus; Mac II series for stereo. **LIST PRICE:** Pair $339.

MW ★★★

MacSpeaker

PROS: Beautifully designed for close-up listening; unique movable stereo image; crystal-clear highs. **CONS:** Weak bass; not powerful enough for use as regular stereo-system speakers; unwieldy transformer. **COMPANY:** Persona Technologies (415/871-6000). **REQUIRES:** Mac Plus; Mac II series for stereo. **LIST PRICE:** $249.

MW ★★★

WE CAN PROBABLY AGREE THAT the Mac's little built-in speaker doesn't stir the blood of audiophiles everywhere. But even if you need better sound quality (because you're a musician or a megalomultimediac for instance), why do you need special speakers?

Unfortunately, speakers are basically electromagnets. So you need *shielded* powered speakers, which have a special interior lining to prevent any magnetic distortion of your delicate computer.

MacSpeaker

THE MACSPEAKER IS A PAIR OF SLEEK, platinum-color speakers 8½ inches tall; they come with Velcro to fasten them to the sides of the Mac. For people who care, they've got 10 watts per channel and have a frequency response from 70Hz to 18,000Hz. What's more, the MacSpeakers, unlike normal stereo speakers, are designed to be positioned only 2 feet apart, and you're supposed to listen to them from only a few feet away.

What's especially likable is that the messy power and Mac jack cables are attached to the left speaker. Only a single thin cord snakes behind the Mac to the right speaker; nonetheless, the volume, stereo-imaging, and bass knobs on the left speaker control the sound coming out of both. What's not so likable is the power transformer: it's a gargantuan 2-pound black cube halfway along the AC cord.

But most noteworthy is the stereo-imaging sound control. You can adjust a knob on the left speaker to make it sound as if the right and left sound sources are farther apart. This is handy for three reasons: first, you can adjust the focus point of the stereo sound to accommodate your distance from the Macintosh. Second, making the stereo-image sound wider means that more than one person can receive the full stereo effect, without being perfectly centered between the two speakers. And finally, the sound experience when the speakers seem to drift apart is really cool.

And they sound pretty good. They're three-element speakers, meaning there are three individual speaker cones in each; the results are crisp highs and a meaty midrange. The bass is wimpy, though, even at the bass control's highest position. If you need a fuller sound Persona sells the MS Sub, a compatible subwoofer unit that should put the "not enough bass" complaints to rest.

Bose RoomMates

THE BOSE ROOMMATE COMPUTER Monitor speakers are identical to the regular RoomMate speakers, except for the added shielding and the platinum color. They're at least twice as heavy and a third wider and deeper than the MacSpeakers; that makes them sound bassier and quite a bit richer, although the single 4½-inch speaker cone in each cannot make the highs sparkle like the MacSpeakers can. Although Bose refuses to release its product specifications, a friendly technician revealed that the RoomMate speakers have an 80Hz to 15,000Hz frequency response with 6w to 8w per channel. The Bose speakers are clearly the choice where power and room-filling sound is important.

The physical design is nice enough: the volume knob is cleverly set into the face of the speaker for easy access, and there's no ugly transformer box—only a thin power cord that emerges from the left speaker. There's no way to mount them on the Mac, but Bose offers a $50 mounting stand for your desk. The RoomMates' key aspect is that they can double as regular bookshelf speakers for a stereo system; of course, that's the flip side of saying that they're not really designed for close-up listening as the MacSpeakers are.

So what do you buy? The MacSpeakers have the edge on price ($100 less), sound clarity, and attractiveness. The RoomMates sound fuller and have more power, but lack the crisp highs. Otherwise, both speaker sets work well with regular audio equipment and with what few stereo Mac products there are. But stereo sound isn't all speakers are good for; anything the Mac utters benefits from amplification and crisp, clear broadcast. The Talking Moose never had it so good.
—DAVID POGUE

Historical Strategy Game

Nobunaga's Ambition

PROS: An absorbing, challenging game with good historical background; beautiful sounds; limited but nice graphics. **CONS:** Black and white only; manual not designed for Mac; interface sometimes annoying. **COMPANY:** Koei (415/348-0200). **REQUIRES:** Mac Plus; System 6.0.3. **LIST PRICE:** $59.95.

MW ★★★

NOBUNAGA'S AMBITION IS A FASCINATING strategy game in which one to eight human players are each cast as the daimyo, or warlord, of a small part of feudal Japan in 1560, during the bloody and tumultuous Warring States period. This is the age of Tokugawa Ieyasu (Clavell's Toronaga in *Shogun*), who unified Japan and established the dynastic Tokugawa Shogunate after the epoch-ending Battle of Sekigahara in 1600. Also ruling different fiefs are the famous Takeda, Ashikaga, and Hojo clans, among others, and of course Oda Nobunaga, a feared warrior who died just as he nearly realized his ambition of unifying Japan. Your aim, like his, is to conquer all the small states and usher in an era of peace.

The game teaches what all wise feudal leaders knew: a strong peasantry is the key to long-term success. Through the judicious use of rice and gold you must improve peasant loyalty, peasant wealth, productivity, flood control, army size, and army loyalty; and you must expand the fief's main town. Meanwhile, the neighboring lords are either invading your fief or sending ninja who steal your peasants, set fire to your town, or destroy your flood-control dams right before the summer typhoons. The game's designers say they have added as much historical accuracy as possible. If you destroy the enemy command unit, all the enemy troops surrender and become loyal to you. But at times the enemy command unit will advance against or even attack a superior unit. It doesn't make tactical sense, but it fits with Bushido, the samurai code of honor.

The Struggle Begins With the player cast as Lord Uesugi of Echigo and Kozuke, the battle for Japan starts with the basics: improving the lot of the peasants and building up the fiefdom.

The game's most annoying flaw is its interface: when you attack, you get a dialog box, with a slide bar, that asks how many thousands of soldiers you want for your invasion. After you move the slide bar to the number, the program brings up another slide bar and asks how much rice you want to bring along. Unfortunately, the default mode sets to only one unit of rice. You can set the proper amount, but if you hit the return key before changing the default setting, your army will not have enough rice to feed itself. At that point you can't stop the invasion, and your carefully trained and expensive army will defect to the enemy.

It's important to read the manual because there are lots of important subtleties. For instance, an army's command unit is marked by an X or an O instead of a unit number. It's not immediately apparent that the X means that an ordinary general is commanding the army, while the O means that the lord himself is with the troops.

The manual, although informative and full of historical information, was written for the PC version, and not all the commands are parallel. Overall, I really enjoyed playing Nobunaga's Ambition. If you appreciate games like Risk, Diplomacy, Strategic Conquest, or Spaceward Ho, and especially if you have an interest in medieval Japan, you'll find it totally absorbing.—TOM MORAN

Draw Program

Aldus FreeHand 3.1

PROS: Pressure-sensitive freehand tool works with or without tablet; exports to PICT format; substitutes missing screen fonts. **CONS:** Flawed support for stationery pads; insufficient text tools; most old problems unresolved. **COMPANY:** Aldus Corporation (206/622-5500). **REQUIRES:** Mac Plus; 2MB of RAM; System 6.0.5. Recommended: 5MB of RAM; System 7.0. **LIST PRICE:** $595.

MW ★★★

IN 1991 DENEBA SOFTWARE'S CANVAS and Adobe Illustrator both nudged out FreeHand in major awards as the best drawing packages of the year. If the new upgrade of FreeHand is any indication, however, Aldus is back in fighting form.

The most remarkable new feature in FreeHand 3.1 has got to be the pressure-sensitive freehand tool, the first of its kind in any vector-based drawing package. Teamed with a pressure-sensitive stylus and tablet, the freehand tool produces calligraphic lines of varying weight. Technically, this is impossible because lines printed to a PostScript printer must be constant in weight; FreeHand's workaround is to define the freehand line as a closed path—that is, a snaking shape that becomes thick and thin with the pressure of the stroke. Even without a tablet, you can vary the weight of a line from the keyboard.

FreeHand 3.1 fully supports TrueType fonts, even letting you convert a TrueType character to Bézier paths—a function previously offered only in Canvas. The upgrade also supports System 7 balloon help and publish and subscribe. The only slipup is in the implementation of stationery pads. If you change an illustration file to a stationery pad at the Finder level, you convert the file to a FreeHand template, which opens as an untitled document. If you save a file as a template from within FreeHand, however, the file is not perceived as a stationery pad at the Finder level, which means that you can't search for it by kind, you can't view the icon in the Open dialog box, and so on.

When you export an EPS file from FreeHand 3.1, the program creates a link between the EPS file and its current illustration file. If, after you've placed the EPS file into a PageMaker document, you want to edit the original file, PageMaker will launch FreeHand and instruct it to open the original illustration, allowing you to make the desired changes. When you save the edited original, FreeHand automatically updates the EPS file on disk, and PageMaker automatically updates the placed version inside the PageMaker document. This procedure also works for EPS files placed in a FreeHand document.

The fact that FreeHand can now open and edit some of its own EPS files qualifies as a step in the right direction. (I also place in this category FreeHand 3.1's ability to export in PICT format. FreeHand beats Illustrator in exporting PICT files, but plays catchup to every other drawing package.) Other changes, such as the smaller font size used in the palette lists, are only cosmetic.

But many enhancements are bona fide improvements. For starters, FreeHand 3.1 lets you substitute fonts for those present in an illustration but absent in your System file. When you open an illustration that contains text for which FreeHand cannot locate the correct screen font, the program gives you the option of printing the text in Courier (the FreeHand 3.0 solution) or formatting the text in a new font.

FreeHand 3.1 still needs improvement. Its text-editing tools, for example, rank among the worst in any draw program. (The new FreeHand 3.0 for Windows lets you create and edit text directly in the drawing area. FreeHand 3.1 for the Mac still requires that you create and edit text within a cumbersome dialog box.) And virtually all of the other complaints I had about FreeHand 3.0 still exist (see *Reviews*, *Macworld*, August 1991). Even so, FreeHand 3.1 is a move in the right direction.—DEKE McCLELLAND

New Peachtree Accounting For Macintosh. Only $99!

Peachtree. The First And Best In Mac Accounting.

Back in 1984, as Apple was sowing the seeds of a revolution, we introduced a pretty revolutionary idea of our own: the first accounting software for the Macintosh®.

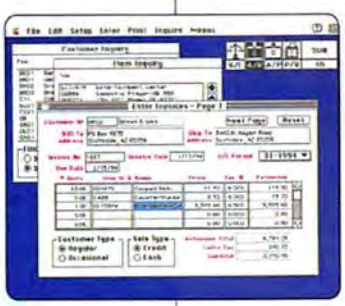
Since that time, we've continued to search for ways to make Mac accounting even more productive. The result is Peachtree® Accounting for Macintosh (you probably know it by its original name, atOnce!®).

Rave Reviews From The People Who Know Best.

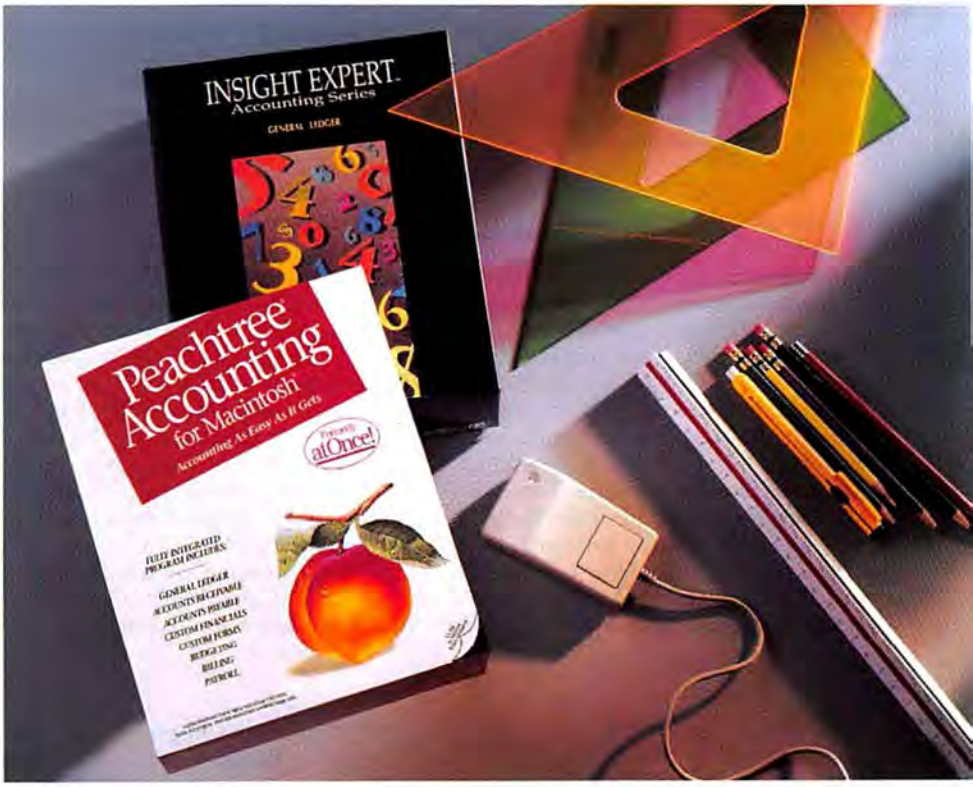
Macworld called our Mac program "an excellent choice for beginning accountants." MacUser gave it four and one-half mice. But don't just listen to the reviewers. Ask your accountant about Peachtree Accounting for Macintosh. He'll tell you it's the next best thing to having an accounting teacher at your side.

ASK YOUR ACCOUNTANT

Peachtree Makes Mac Accounting Easier Than Ever.



You don't have to be a CPA to figure this program out. For the remarkable price of $99, it combines all the functions your small business needs – General Ledger, Accounts Receivable, Billing, Accounts Payable, Payroll, and Custom Forms Design – in one powerful package. As well as an on-line accounting textbook and glossary that take the mystery out of small business accounting. And if you need it, there's even an on-line tutorial that teaches you to use the program.



Insight Expert Accounting®: The Power To See Beyond The Numbers.

For even more in-depth analysis, consider the Insight Expert series of advanced Mac accounting modules. With Insight Expert, you get tremendous accounting flexibility, not only for crunching numbers, but for analyzing data and forecasting trends. Plus, a remarkable "zoom" function lets you instantly view the detail of any graph by double-clicking. No other Mac package makes analysis so easy. All for $395 per module.

Designed For The Macintosh.

Peachtree Accounting for Macintosh and Insight Expert were designed for the Mac – not grafted from a DOS platform. Maybe that's why they've won more awards than any other Mac accounting software.

Of course, we back all our Mac products with 30 days of free support and a money-back guarantee. So see your local dealer or call PeachLine at (800) 428-9980.

Peachtree®
The first name in small business accounting software.™

MacUser Editors' Choice Award Winner

MacWorld 1990 World Class Award Winner

MacWorld World Class Award Winner

4½

☎ *PEACHLINE. There's no way we could squeeze all the features of our Mac accounting products into one ad. So if you'd like to talk with a Mac-literate human being about your specific needs, or you'd like a free catalog, call (800) 428-9980.*

©1992, Peachtree Software, Inc., Norcross, GA • All products are trademarks of their respective companies.

Circle 100 on reader service card

Object-Oriented Development Environment

Prograph 2.5

PROS: Data-flow diagram is the program; supports all standard OOP features; completely supports *Inside Macintosh* standards; includes multiuser database engine; excellent tutorial and documentation. **CONS:** Steep learning curve; difficult to use on small screen. **COMPANY:** TGS Systems (902/455-4446). **REQUIRES:** Mac Plus; 2MB of RAM; hard drive; System 6.0 or A/UX. **LIST PRICE:** $495 (additional interfaces and tool kits optional).

MW ★★★★

PROGRAPH 2.5 PLACES MACINTOSH custom application development within the reach of Mac enthusiasts who have some programming experience. More-experienced developers can take advantage of the icon primitives that implement routines presented in *Inside Macintosh*, Apple Computer's six-volume guide to programming. Prograph's compiler creates stand-alone applications that fully conform to Macintosh interface standards. Version 2.5 takes advantage of the features of System 7, including IAC, balloon help, and 32-bit memory mode. Prograph is elegantly designed and its documentation is excellent, especially the tutorial overview. Learning the program requires some time, but the effort is amply rewarded.

Prograph is a fully object-oriented system. It supports data abstraction by encapsulation, which shields the user from complexity; inheritance, which lets objects take on characteristics of a parent; and polymorphism, which means that each object responds with a method appropriate to its class.

Conceptually, Prograph is more advanced than traditional object-oriented programming (OOP) in that Prograph sends a copy of the object through the data-flow diagram rather than just messages from an object. Prograph's visual language shows input data and the resultant output data from an icon as connecting lines, as in any data-flow diagram. Diagrams, tables, forms, and icons are the programming elements of the Prograph visual environment, making it easy to visualize a program's logical branching.

Prograph's tool kit helps you specify application components, such as menus and windows, by using system classes for these elements. Components appear on screen just as they will in the finished application; you don't have to write code. The tool kit integrates the Prograph development environment with the Mac ROM-based toolbox and Mac Operating System managers. Toolboxes for C, Pascal, and SQL databases are also available from TGS Systems.

Prograph is well poised to take advantage of parallel processing computers. Its data-flow diagram is mature and powerful. Icons of different shapes help differentiate the processes. There is a standard set of classes, which the user can augment. TGS provides 15 icons for operations such as Get Attribute and Set Attribute, and 13 for controls such as Loop, List, and Next Case; more-refined distinctions among the icons are handled by labeling them.

Prograph manages the event loop for you, simplifying Macintosh programming. The integrated editor/interpreter lets you build an application, run it, stop the application to make changes, and then resume running.

C, Pascal, and FORTRAN language routines can be used from within Prograph. You can also invoke XCMDs and XFCNs that were created for use with Apple's HyperCard or Spinnaker Plus. New to version 2.5 is a database engine for creating flat-file, relational, and object-oriented databases. A sample flat-file database comes with the package, along with the source diagram so you can make changes.

Prograph has an international following notably in Japan, where the graphics-based program is particularly appreciated. With the program's solid design and expanded capabilities, Prograph's user base should broaden even further.—DAN SCHUSTER

SAT Training Program

StudyWare for the SAT 3.7N

PROS: Inexpensive; acquaints student with test formats; on-screen timer. **CONS:** No mathematical graphics; some supplied booklets not coordinated with program. **COMPANY:** StudyWare Corporation (619/495-0190). **REQUIRES:** Mac 512K; second disk drive. **LIST PRICE:** $49.95.

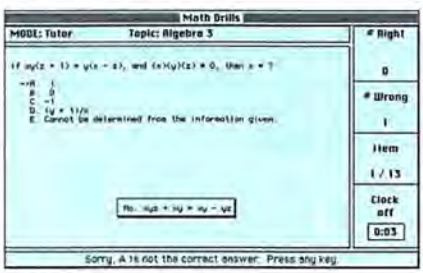
MW ★★★

SAT SCORES ARE ONE OF THE more terrifying aspects of high-school life. StudyWare Corporation, a leading vendor of drill programs for the whole alphabet soup of standardized tests that confront American students—ACT, GRE, GMAT, LSAT, and so on—offers a low-cost Mac study aid for the Scholastic Aptitude Test that can help lessen students' fears.

The StudyWare package includes a 250-page Cliffs *SAT Preparation Guide* as well as two booklets containing long text passages and geometrical figures. This material is not, however, as helpful as most of the widely available large-format SAT handbooks, such as Barron's. The program itself is essentially a follow-up quiz on the printed study material, with some additional drills.

In adapting the program for the Mac from earlier IBM-compatible and Apple IIGS versions, StudyWare failed to put geometrical figures or paragraph-length text on screen. Thus you find yourself reading the questions from a booklet but answering them on screen, which gets awkward. The interface is pretty stark, and some features of program operation (the timer, for example) aren't adequately explained. On-screen graphics and text windows—promised (along with MultiFinder compatibility) for future editions—will be a significant improvement.

The program presents four full sample tests that emulate the SAT; a test on standard written English; and a series of drills on math (four levels of algebra, computation, and word problems), on verbal skills (synonyms and antonyms, analogies, vocabulary, and so on), and on reading.



That's SAT In Tutor mode, wrong answers prompt an on-screen correction that may be characterized as a) short, b) terse, c) minimal, or d) all of the above.

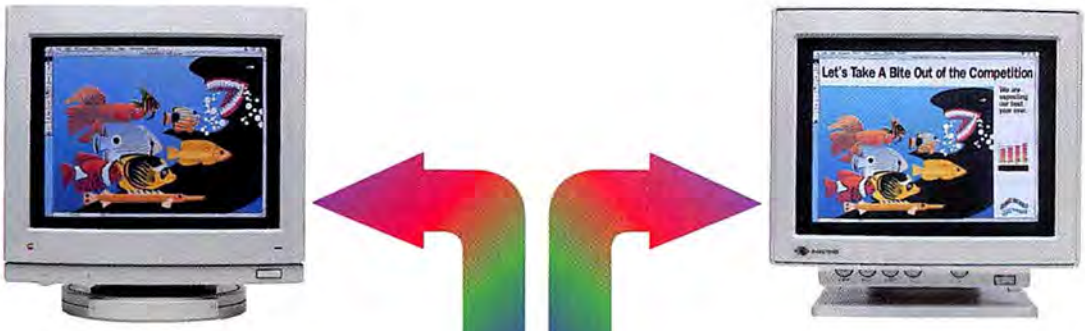
In Tutor mode, the drills give one-line explanations when you answer incorrectly (see "That's SAT"). That's not an awful lot of tutorial assistance, but it provides more training than the Test mode does. By contrast, Score Improvement for the SAT ($99.95 from Queue) makes up custom drills based on the student's weak areas in a preliminary test. You can perform the drills in timed mode to simulate real SAT pressure.

StudyWare is most appropriate for students who need a quick brushup in some test areas and want to familiarize themselves with the SAT format, rather than those who need extensive work in the basics. To make a fair evaluation of the program, I first took two sample tests, then worked through all the available drills and the Cliffs guide, and took the remaining two tests. From my improved scores in the second pass at the tests, I estimate that conscientious work through the drills and sample tests is worth between 50 and 120 points each on the verbal and math parts of the SAT.

That's not bad for $50 (or as little as $27 from mail-order distributors), considering that high-school letter jackets cost more than $150 and a prom date can run several hundred. The modest investment in money—and time—may pay off in some lasting results.—MARY S. TOTH

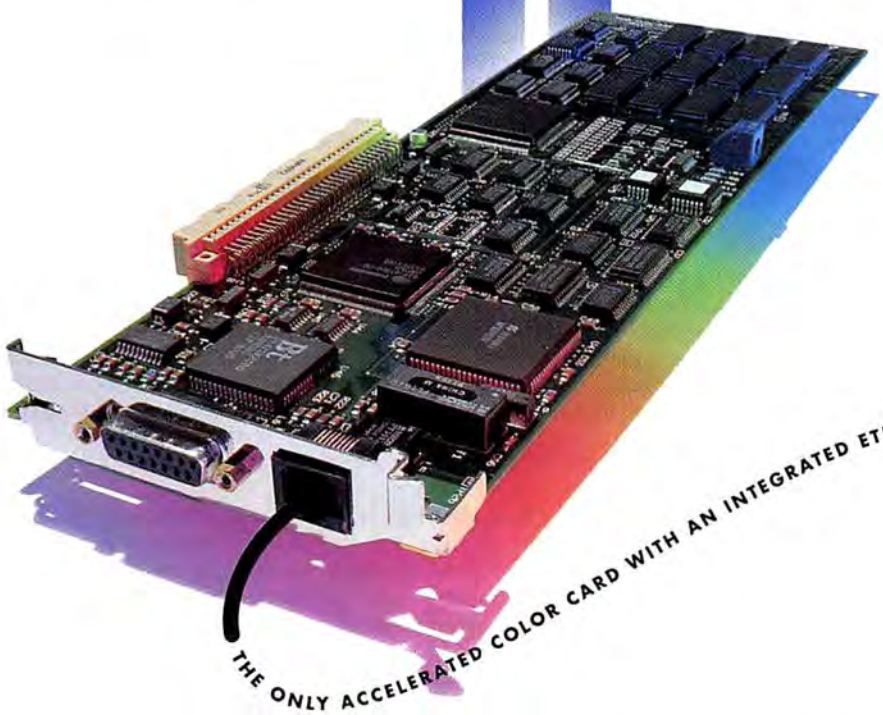
NICE

JUST RIGHT



APPLE 16-INCH DISPLAY
One Choice: *One-Page*

E-MACHINES 16-INCH DISPLAY
Two Choices: *Two-Page and One-Page*



THE ONLY ACCELERATED COLOR CARD WITH AN INTEGRATED ETHERNET 10BASET NETWORK CONNECTION.

THE ONLY BUSINESS CARD . . . WITH THE RIGHT CONNECTIONS

E-Machines continues to set the 16-inch standard for business productivity. With "switch-on-the-fly" dual resolutions, accelerated 24-bit color, video-out and integrated 10BaseT Ethernet networking. On one card, that drives any display, costs less than a single function card and takes up only one slot. You get the increased productivity of viewing up to two pages, and fast Ethernet data exchange that allows you to see more and do more in a lot less time. Nice with any display. Just right with an E-Machines 16-inch display.

ColorPage™ T16

E-MACHINES
E-Magination at work™

For your nearest dealer, call or write.
9305 SW Gemini Drive, Beaverton, OR 97005
Fax: 503-641-0946

1-800-344-7274

Copyright © 1992 E-Machines. All other products are trademarks or registered trademarks of their respective companies.

Circle 303 on reader service card

Cordless Input Devices

SICOS Cordless Rechargeable Mouse

PROS: More freedom of movement than with corded mice; rechargeable. **CONS:** Flat case is hard to grip; material on desk can interfere with transmission; limited tactile feedback. **COMPANY:** Softcode Canada (416/477-5474). **REQUIRES:** Any Mac with ADB port. **LIST PRICE:** $89.

MW ★★

SICOS Cordless Trackball

PROS: More freedom of movement than with corded trackballs. **CONS:** Click-lock button is hard to reach; material on desk can interfere with transmission. **COMPANY:** Softcode Canada (416/ 477-5474). **REQUIRES:** Any Mac with ADB port. **LIST PRICE:** $109.

MW ★★★

THE SICOS CORDLESS RECHARGEable Mouse and Cordless Trackball work by sending infrared signals to a compact unit that plugs into the Mac's ADB (Apple Desktop Bus) port. The manual recommends that either device be at least 1 foot away from the receiver. Maximum operating distance is normally about 5 feet; a switch on the trackball lets you move up to 23 feet away, though battery life decreases. My house isn't big enough for me to verify the company's claim for the trackball, but both it and the mouse work from 10 feet away. Both units work equally well even when not in a direct line with the Mac.

The trackball uses four standard AA batteries, while the mouse runs on rechargeable batteries (a convenient mouse pocket also serves as a battery charger). Both the mouse and trackball shut down automatically after 10 minutes of inactivity. Hitting an on/off switch reactivates them.

The mouse has the same flat shape as the company's corded model; both are harder to grip than contoured mice. Also, the mouse button doesn't provide much tactile feedback. The trackball's layout could benefit from a few design changes, too. For example, it was awkward to reach over the ball to press the middle, click-lock button and rest my wrist comfortably on the desk.

Both devices come with a handy variable acceleration feature: if you roll the mouse or trackball slowly while pressing the on/off switch, the cursor tracks slowly; press the switch and move your hand quickly, and the pointer jumps across the screen.

The infrared transmission scheme requires constant line-of-sight communication, so you must be careful where you place the receiver. In some ways, both the mouse and the trackball are more reliable away from the Mac than on the desktop, where clutter can interfere with transmission. At close range, if you want to shift the mouse or trackball to a new position, you usually have to move the receiver too.

TOM GIBSON

SICOS Cordless Trackball, Receiver, and Mouse

The most annoying problem has nothing to do with mouse or trackball design. Most Mac applications require that you use the keyboard every now and then, so the SICOS products are best suited to presentations, which don't call for typing.

Overall, I can't recommend either the mouse or the trackball for desktop use—the gain in mobility just isn't worth the compromises. Away from the desk, the mouse still needs a pad or other firm surface to work on. For stand-up work, the Trackball is an acceptable choice.—FRANKLIN N. TESSLER

Gray-Scale Hand-Held Scanner

PageBrush Professional

PROS: Ingenious concept; can scan full-page (or larger) images; produces 300-dpi gray-scale images. **CONS:** Very slow; hypersensitive mouse buttons; expensive. **COMPANY:** Mitsubishi International (415/544-2781). **REQUIRES:** Mac II; 2MB of RAM; hard drive with 4MB of free space; System 6.0.5. **LIST PRICE:** $795.

MW ★★

SURELY IT'S A CURSE OUT OF GREEK mythology—to be blessed with a brilliant idea, but condemned to see it poorly executed. So it seems to be with Mitsubishi, whose PageBrush Professional gray-scale scanner (formerly marketed by Mouse Systems) is so clever that it makes your jaw drop—but the final product's rough spots make your heart sink.

The idea is that you can swipe this chalkboard eraser–size scanner across a full-size page in a zigzag, as though you're wiping the image with a sponge. As you scan, you actually see the image melt onto the screen, stroke by stroke, at up to 300 dots per inch, looking sharp. The software continually stitches the image together from your swaths across the page—so if you miss a spot, it's perfectly OK to rub back over it. When you're finished scanning, you can touch up the on-screen image with a simple but well-designed set of painting tools and effects (Lighten, Darken, Enhance Contrast, and so on).

For the first time, you're freed from the 4-inch-width tyranny of all other hand-held scanners. You can scan anything, bound or not, as long as you can fit the 13-by-15-inch clear plastic sheet (whose invisible etched lines tell the scanner how far it has moved) over it. You're even liberated from the hassle of SCSI and power cords: the PageBrush Pro NuBus board slips into a Mac II, and the scanner itself is the only thing that dangles from the Mac.

Unfortunately, the rest is disappointing news. First, the unit doubles as a mouse—evidently a great idea in the DOS PC version, but a clunker for the Macintosh. As a mouse, the PageBrush Pro is too big, its trackers are far too sensitive (making the pointer fly across the screen with the slightest twitch), and the two hair-trigger mouse buttons almost click just by looking at them. What's wrong with oversensitive buttons? Nothing—except that the tricky scan-preparation process for this particular scanner involves two delicately timed mouse clicks; a third click ends the scan. Brush a button at the wrong time, and you've blown the whole scan.

Trying to avoid those buttons isn't the only physical challenge you have while scanning. You can't move the mouse/scanner faster than about an inch per second across the page, or its stitching-brain gets confused and you have to start over. And even if you do everything perfectly, successive wipes of the page can still get misaligned by a pixel or two, producing visible seams in scanned images containing physical or implied straight lines (like text columns).

The other problem is that the software is agonizingly slow. Applying an image filter to a 2-inch-square selection takes 2 minutes—you're hardly encouraged to experiment. Saving a postcard-size gray-scale TIFF file took 15 minutes (Photoshop, by comparison, took 33 seconds).

Oh, what a disappointment. If the PageBrush Pro scanning-setup process weren't so slow and finicky, if the manual had been proofread, if the clear plastic sheet weren't so vulnerable to fingerprints and scratches, and if the scanner weren't also a mouse, then the impressive technology built into this device would shine through, making it an eminently practical piece of graphics gear.

Still, though—what about the money you save? Isn't it worth the inconveniences to avoid the expense of a flatbed scanner? You decide. At this writing, you can get a Microtek gray-scale flatbed scanner by mail order for $50 more.—DAVID POGUE

ADD YOUR handwriting TO THE FONT MENU!

Personalize your Mac with a font that reproduces your own handwriting. Just fill out the handwriting sample form on the reverse side and we'll send you your Personal Font (both TrueType™ and PostScript®). Then you can type a handwritten letter, including your signature, and when it is printed on a PostScript printer you'll get connected cursive characters just like when you write long-hand. If you have a non-PostScript printer, the characters printed will be disconnected, just as it displays on the screen.

Name_____

Company_____

Address_____

City,State,Zip_____ Country_____

MasterCard VISA #_____ Exp_____

Signature_____

Complete the form on the reverse side by writing the characters within the boxes just below them. Don't forget the punctuation! Your letters can be connected and/or disconnected. Use a pencil or a pen. Practice first on a separate sheet of paper. The darker you write, the better the results. Remember, whatever you write will become your font. Since each order is custom processed please allow 4 to 6 weeks for delivery.

Personal Font **$99.95** + $5.00 shipping and handling. Check, Visa / MC.

Fold Here First

Personal Font

patent pending

Only **$99.95** + $5 shipping & handling

You're looking at a font of my handwriting. By simply filling out the form on the next page, you can have a font of your handwriting, too! With Personal Font, you can type letters and address envelopes and have them print out in long-hand. Sign faxes from the keyboard or personalize editorials in the company newsletter. Everything you'd like to do in long-hand you can now do straight from your Mac's keyboard including numbers, letters, punctuation, and your signature - in any size or style. I'm very proud of my Personal Font and hope you enjoy yours, too!

David Fenwick
Signature Software, Inc.
(800) 925-8840

Fold Here Last

Put Your handwriting in your Computer!

PLACE STAMP HERE

Signature Software, Inc.
10075 SW Barbur Blvd. Suite 5-401
Portland, OR 97219

Please tape closed; do not staple

Center the characters within the boxes just below them using the broken lines as a base. Try to write neatly. Don't forget the punctuation! Remember, what you write here will become the final font.

© Copyright 1992 Signature Software, Inc.

Statistical Software

Minitab 8.2

PROS: Complete statistics package; uniform over many platforms; excellent teaching tool. **CONS:** Weak, typewriter-like graphics and output; results are static, requiring repeated analyses to view changes. **COMPANY:** Minitab (814/238-3280). **REQUIRES:** Mac Plus; hard drive; System 6.0. **LIST PRICE:** $695; for educators $395.

MW ★★★

MINITAB IS ONE OF THE OLDEST statistical-analysis packages, and one of the best. It supports a broad (though not exhaustive) set of statistical tools; it's easy to learn from and easy to use. As a result, it has always been a favorite for teaching statistical computing. Its emphasis on graphics naturally leads students away from a fixation on the numbers, toward a greater understanding of the meaning that lies beneath.

Minitab was first designed for mainframes and minicomputers. The user typed in commands via a dumb terminal and received results (including graphs) in typed form. This command-line interface is a poor fit in the Mac world, and Minitab has been seen as a second-class citizen, its only advantage being uniformity across platforms.

Release 8.2 eliminates most of Minitab's interface problems. Macintosh-style menus and dialog boxes type the user commands in a window for you. Analyses, graphs, and session history appear in separate windows. Aside from a few gaffes (you can drag, but not shift-click, to make multiple selections), the interface is comfortable and Mac-like.

Many of Minitab's statistical limitations are gone too. You can now do unbalanced ANOVAs with a user-specified model, and there's a complete quality-control tool set, including CUSUM and EWMA charts. There's even an experimental-design set of functions, letting you generate statistically correct experimental protocols. Minitab's tables and graphs for means comparison after ANOVA have always been excellent, and they're even better here. For example, after a two-way ANOVA, Minitab displays graphs of means and confidence intervals.

Minitab still occasionally trips over its old-style interface. Data entered mistakenly in an unused worksheet cell yields a whole column of missing-value symbols that must then be erased. The graphics are a higher resolution than what you can get from a typewriter, and you can color your plots, but they are still far from what the Mac can do. The program supports only its own font and in only one size, but you can export plots to Canvas and make font and other graphic changes there. I also exported tables and analyses to Microsoft Word, but the columns came out space-delimited rather than with tabs and didn't line up unless I used a fixed-pitch font such as Courier anyway.

Minitab's greatest drawback is that each analysis and plot is a one-shot deal: it's carried out and then displayed or printed—the end. The best Mac statistical packages have live output: graphs can be rescaled and rotated, analyses repeated with additional variables, and data related and highlighted among the various displays (for example, selecting the USA bar on a chart showing automakers highlights all domestic cars in a related scatterplot of horsepower versus mileage). The best products also offer context-sensitive help with advice on how to proceed further. Minitab has none of these useful functions.

The documentation upholds Minitab's reputation as a good learning environment. It includes an extensive reference manual, a separate text on basic statistics, and a year of free telephone help. Unfortunately, neither book is Mac-specific. Aside from a good Quick Start tutorial, none of the reference materials mention menus or windows. The manuals leave you to find the Mac equivalents for commands in a forest of menus, dialog boxes, and radio buttons. Online help is a guide, but I wound up typing everything anyway—just as I did when I used Minitab in 1979. *Plus ça change . . .* —PHILIP STEIN

Bibliographic Database Manager

Pro-Cite 2.0

PROS: Flexible; 20 predefined and 6 user-defined record forms; sorts by Dewey decimal and Library of Congress call numbers; compatible with DOS-based version of program. **CONS:** Some features complicated to use; does not directly download from online databases. **COMPANY:** Personal Bibliographic Software (PBS) (313/996-1580). **REQUIRES:** Mac Plus; System 6.0.2. Recommended: Hard drive. **LIST PRICE:** $395; search-only version $195.

MW ★★★★

PRO-CITE 2.0 BRINGS WELCOME relief for scholarly disorganization. A database program designed for bibliographic references, it enables researchers to store and retrieve bibliographic records for a wide range of materials. A variety of output formats make it easy to produce bibliographies in many styles, including those required by academic journals and professional associations. Pro-Cite can manage multiple databases of 100,000 records each, making it useful in professional settings such as libraries as well as to individuals.

A pop-up menu gives access to 20 predefined data-entry forms (called *workforms*)—from those for books and periodicals to those for letters, manuscripts, works of art, music scores, and computer programs. You can add up to 6 custom forms. Records can contain up to 45 fields of variable length. Standard library bibliographic fields include author, title, publication dates, and call number (Library of Congress or Dewey decimal). For more specialized needs, you can add fields for such items as a reference within a source; storage location; type of document; or an abstract. The manual explains how to correlate bibliographic styles with Pro-Cite workforms. For example, a record for a published conference proceedings uses the Book, Long Form workform; unpublished proceedings use the Conference Proceedings workform; interviews take the Manuscript workform.

When it comes to selecting references for a bibliography, you can search a particular field, all fields, or fields using Boolean modifiers. You can save search expressions for reuse during a later retrieval. In addition, you can simply browse records, marking selections for a bibliography one by one.

Besides letting you create a bibliographic database from scratch, Pro-Cite imports records easily from the DOS version of the program and imports ASCII files from other databases. If you have PBS's Biblio-Link application ($195), you can import and format records from online databases and CD ROM products.

A supplemental disk contains authority lists of frequently cited authors and journal titles, as well as bibliographic formats for the humanities and a broad range of the sciences. Users can also create custom authority lists. An Alternate Text feature saves typing by automatically substituting a full title or name for abbreviations when a bibliography is printed. This is handy, but requires the user to embed codes in each record.

Pro-Cite's powerful punctuation files transform database records into bibliographies formatted according to, among others, the Modern Language Association, the *Chicago Manual of Style*, and *Science* magazine. The ability to produce large and complex bibliographies is immensely valuable, but the user is required to step through numerous windows to select the records and the appropriate punctuation file, set up the bibliography, and add field-style options. Manuscript Search creates a bibliography from citations in a document stored as text or in MacWrite or Microsoft Word format. It scans for embedded references and matches these to records in a Pro-Cite database, identifying citations either by author and date or by database record number.

Pro-Cite is a useful and powerful bibliographic tool. I just wish it were adaptable to other collection-management functions such as archival finding aids or museum inventories.—ROBIN CHANDLER

Folder-Protection Utility

FolderBolt 1.02

PROS: Easy to use; extremely flexible; excellent online help. **CONS:** No file encryption; does not work over a network. **COMPANY:** Kent Marsh (713/522-5625). **REQUIRES:** Mac 512KE; System 6.0.4. **LIST PRICE:** $129.95.

MW ★★★★

FolderBolt isn't designed to protect entire disks or individual files. Instead, it works at the folder level. You can designate three levels of folder protection. Read-only folders contain documents that can be read by applications but cannot be altered without a password. This type of folder is particularly useful on a shared computer, where sets of important documents need to be accessible to everyone, but only one person (the one with the password) is charged with keeping the data up-to-date.

A second level of protection is the drop folder. Anyone can deposit files in a drop folder, but only those who know the folder's password can see or read them. Coworkers can leave files for you in a drop folder on your hard drive, confident that no one else will be able to see or change them.

FolderBolt's highest level of security is the password-protected folder, which requires a password to do anything to the files—delete, copy, modify, or add new files.

What's special about FolderBolt is its flexibility. Virtually everything can be configured to your preference. For passwords, you can specify a minimum length, how they display when typed, whether they're case-sensitive, and whether they should be verified when first entered. When you choose Shut Down from the Special menu, FolderBolt can automatically relock all folders. You can also designate several bolted folders as belonging to a set, allowing you to deal with them collectively at start-up or shutdown, for instance.

The FolderBolt Administrator program provides a safety net for a forgotten password. As long as you have the original Administrator (or a copy made from the original disk), you can unlock any folder, set of folders, or all bolted folders. Since you also use the Administrator to set preferences and view the activity log, you'll probably want to keep a copy of it on the hard drive, too. To maintain security, you can require a password to run the Administrator.

There are a few compatibility issues. DiskTop can circumvent FolderBolt's read-only folders and make copies of items within the folders. And TOPS 3.0 is incompatible, though later versions work.

Of greater concern to most users is that FolderBolt security may make other types of file, folder, and hard drive protection less convenient to perform. Disk-recovery tools, such as those included in SUM, MacTools Deluxe, and The Norton Utilities for the Macintosh, cannot operate on FolderBolt-protected folders. Similarly, backup programs cannot back up FolderBolt-protected folders. The workaround is to periodically use the FolderBolt Administrator to override the entire drive's protection, run the disk-recovery or backup program, and then restore FolderBolt protection.

Although FolderBolt works well under System 6.0.4 and later versions, it works best with System 7. Under System 7 you can use folders to protect applications, for instance, placing an application inside a read-only folder to make certain that none of your colleagues unknowingly alter the program. Or you might want to put that same program in a password-protected folder so that no one other than you can run it. Double-clicking on a document made by the program still results in launching the program, but under System 7, FolderBolt denies access to the application.

If you don't need encryption, FolderBolt should easily meet your security needs. If you decide later that you want encryption too, Kent Marsh sells an EncryptInit that works hand in hand with FolderBolt. —STEVEN SCHWARTZ

Historical Simulation Game

Patton Strikes Back: The Battle of the Bulge

PROS: Superior graphics; easy to play. **CONS:** Off-disk copy protection. **COMPANY:** Brøderbund (415/382-4400). **REQUIRES:** Mac Plus; 2MB of RAM for color; hard drive with 5MB of free space; System 6.0.7. Recommended: Color monitor. **LIST PRICE:** $39.95.

MW ★★★★

IN THE PAST, MILITARY SIMULATION games—with all their military jargon and hefty manuals—took weeks to figure out. With Patton Strikes Back, however, veteran programmer Chris Crawford scores a direct hit. This easy-to-play and entertaining game pits your military skill against the Mac's in a simulation of World War II's critical Battle of the Bulge.

Patton Strikes Back has enough variations that you can avoid playing the same game twice. In the Historical setup, weather conditions and reinforcements closely follow those of the historic battle; in the Random setup they vary randomly. There are five difficulty levels, varying as to the speed with which the computer reacts to your divisions and devises its overall strategy. Since the game is an adaptation of the historical Battle of the Bulge, the Americans have the advantage of superior air power and reinforcements. For an additional challenge, you can opt to lead the German troops.

The game opens to a map of eastern France as it appeared on the morning of December 17, 1944. The Germans are in the east (in red), the Americans (in blue) in the west. Each division (or unit, as they are called in the game) is represented by a symbol on the map and can take on any one of four modes—attack, defense, mobile, and shattered. To move a unit or issue orders you use either the mouse or the keyboard. The unit's estimated time of arrival at the destination shows in a text window at the bottom of the screen. You earn points by beating enemy units in battle and capturing towns, bridges, and road junctions. You can see all the strategic landmarks by selecting Show Landmarks from the Analysis menu. The game ends at 6 a.m. on December 28.

On the Run After the first day of battle the Germans (in red) have broken through the American lines, sending the U.S. troops (in blue) into retreat.

The text window provides valuable information, including the current date, the overall score, and each unit's vital statistics. You can click on any unit symbol, friend or foe, to find out its strength and battle readiness. The strength, readiness, mode, and type of unit determine the outcome of any given engagement.

Once or twice a day (in game time) the action stops and you zoom to a screen with a historical anecdote. This background is one of the game's best features, but if you're eager to press on just click on Return to Game. Clicking on Tell Me More brings up another screen with additional details. The History Book menu accesses a veritable warehouse of information not covered in the anecdotes.

Patton Strikes Back does have its quirks. If you're really thrashing one of the opposing units, the Mac tries to figure out a way to beat you, and the game slows down noticeably or even stops. My other complaint is the game's off-disk copy protection. But overall, I strongly recommend Patton Strikes Back. It's simple to learn but complex enough to keep even the most sophisticated player entertained.—ANDREW MILLER

See gorgeous color. Print gorgeous color.

If you've ever wished you could afford to print in vivid color, the new Canon Color Bubble Jet™ printers are for you.

The first thing you'll notice is the brilliant, rich color. That's because both the BJC-800 and the BJC-820 print up to 360 dpi using four snap-in ink cartridges: black, cyan, magenta, and yellow. So you get true black and richer darker shades.

You'll also admire these printers' versatility. They print on virtually any size plain paper up to 11″ by 17″, on transparencies and envelopes.

Now you can be as creative as you want, preparing stunning presentations, graphics, even posters, right in your office. You'll be able to see results and make changes immediately, which saves time and gives you more control.

All these advantages are yours whether you use an IBM® PC or a Macintosh,® because the BJC-800 has a parallel interface and the BJC-820 has a SCSI interface.

You'll even be impressed with the cost. Both printers are a lot less than you'd expect, and the cost per page is remarkably low when compared with most other color printers.

Simply call 1 (800) 848-4123, and see how easily you can afford to improve your image.

Canon
COLOR BUBBLE JET PRINTERS
BJC-800/BJC-820

Canon® and BJ®. are registered trademarks and Bubble-Jet is a trademark of Canon Inc. Macintosh® is a registered trademark of Apple Computer, Inc. IBM® is a registered trademark of International Business Machines Corp. © 1991 Canon U.S.A., Inc.

Arcade Word Game

Wordtris 1.0

PROS: Fun for all ages; multitude of variations. **CONS:** A little sluggish on slower Macs; copy protected. **COMPANY:** Spectrum HoloByte (510/522-3584). **REQUIRES:** Mac Plus; System 6.0.3; 2MB of RAM and hard drive for color. **LIST PRICE:** $49.95.

MW ★★★★

TETRIS SURELY DESERVES SOME kind of award. It's available on everything from high-end Macs down to palmtop Nintendo Game Boys. This puzzle classic defined a genre and inspired dozens of imitations and variations, including three from Spectrum HoloByte, the publisher of the Mac versions of Tetris, Welltris, Faces, and now Wordtris.

Like the others in the series, Wordtris is a falling-block game: tiles fall from the sky at an ever-faster rate; it's up to you to use the arrow keys to arrange them into words so that they disappear before filling a well. In this game the well is half-filled with water, so the tiles float. And instead of irregular geometric shapes, the puzzle pieces are square letter blocks. To clear the tiles, you must form words from the falling letters.

That's the basic idea, but there are plenty of embellishments. For example, one "magic" word is always displayed at the top of the screen; if you can spell that word out of the random stream of falling letters, you earn extra points and clear the well. There's also an occasional "mystery tile" that has a question mark instead of a letter; if you type a letter soon enough, the mystery tile turns into that letter. And every once in a while, a falling eraser allows you to remove a tile.

Wordtris has a way of steadily raising your pulse as you advance to higher levels and the pace increases. But Wordtris isn't for the purely arcade crowd; it's a word puzzle game that rewards strategy, literacy, and quick thinking under pressure. Wordtris is an arcade game for Scrabble lovers.

Pick a Letter When a question mark falls, you can turn it into any letter you want by typing that letter—but you have to be quick.

Wordtris is surrounded with graphics and music that reflect its Russian origins. The package includes both color and monochrome versions of Wordtris. The color version has stunning graphics, but not without cost; it demands 3MB of hard drive space and 2MB of memory.

If it included only the basic single-player game, Wordtris would rank as a first-rate Macintosh game. But Wordtris has all kinds of variations on the basic theme. Rare is the game that gives the user so much control. A Children's mode slows down the action so kids can keep pace. Tournament mode allows players to take turns with the same block sequence. Two people can play at the same time in the same well, choosing either Competitive mode or Cooperative mode. Head-to-Head enables two players to compete on separate Macs that are connected by a network or by modem; each word completed on one Mac puts a rock in the bottom of the other Mac's well. Head-to-head games can be especially exciting, but they tend to favor the faster Mac.

Wordtris uses a 60,000-word dictionary to determine whether letters make words, and you can add up to 1000 custom words. (If only English teachers and editors were so forgiving.) Wordtris is, in short, a super game. Let's hope it's not the last word in the tris series.—GEORGE BEEKMAN AND THE SHOOBEDOOBOP SOFTWARE TESTING TEAM

Color Painting Program

Expert Color Paint 1.0

PROS: Inexpensive; 15 levels of Undo; built-in virtual memory; versatile selection tools. **CONS:** Buggy at low memory settings. **COMPANY:** Softsync (305/444-0080). **REQUIRES:** Mac II; 2MB of RAM; System 6.0.3; 32-bit QuickDraw. Recommended: 4MB of RAM; color monitor; System 7. **LIST PRICE:** $49.95.

MW ★★★★

ONE DAY, I'M DISMAYED AT HOW expensive software can be; the next, I'm wondering how much lower prices will go. Now, for example, for a street price of around $28, Expert Color Paint offers more capabilities than Delta Tao's Color MacCheese ($99.95) and nearly as many as MicroFrontier's Color It ($119.95). In fact, in a blind taste test, few users would be able to tell Color It and Expert Color Paint apart. The look-and-feel of the two programs is just short of identical; they share unusual command traits such as 15 levels of Undo; they even feature the same wacky set of default fill patterns.

The reason for the similarities is that MicroFrontier is responsible for both programs. As the story goes, Softsync admired Color It and asked MicroFrontier to write a similar product. But with the users' best interest in mind, Softsync also recognized problems in Color It's interface and sought to remedy these in its new paint program. But is the result better than Color It, or is it just cheaper?

Like Color It, Expert Color Paint supplies a virtual memory feature that allows you to open an image whose size exceeds the amount of available application RAM. But where Color It has a complicated collection of memory-allocation options, Expert Color Paint doesn't bother you with details. This is both good and bad—good because it streamlines the interface, bad because it takes away a level of control that advanced users might appreciate. In Color It, for example, you can instruct the program to stop short of filling up the hard drive or to switch over to a second drive, floppy, or cartridge drive when the first becomes full—two options that can prove especially useful when scanning large images. By contrast, Expert Color Paint uses the start-up disk; when that disk is full, you're out of luck. Also unlike with Color It, you cannot scan images into Expert Color Paint.

Expert Color Paint equals Color It in many respects—Expert provides antialiasing, full support for System 7, and superior selection capabilities including a flexible magic wand tool that can be used to select multiple areas of color. But Expert Color Paint lacks some of Color It's more sophisticated options. Color It provides support for the GIF, JPEG, and Photoshop formats; Expert Color Paint supports only the basic three: MacPaint, PICT, and TIFF. Color It provides masks, selection feathering, and unique dithering capabilities. Expert Color Paint does not.

But Expert Color Paint offers a straightforward interface that most users can master without reading the manual. In fact, I found its collection of moderate capabilities to be generally in keeping with its astonishingly low price tag. The only real problem I had with the program was at low memory settings. By default, Expert Color Paint is set to use 900K of application RAM when running under MultiFinder or under System 7. At 900K, I encountered bugs, particularly when trying to use patterns. Sometimes I could not select the pattern I wanted; other times when I tried selecting multiple patterns, most of the patterns never took effect. When I increased the RAM setting, these problems disappeared.

If you're a seasoned Macintosh artist, Expert Color Paint isn't likely to excite much interest. But for the novice, its tidy collection of features and low price tag make it a wonderful value, not to mention an ideal introduction to the color painting environment. —DEKE MCCLELLAND

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® ImageWriters™ 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.

FIFTH GENERATION SYSTEMS, INC

Circle 151 on reader service card

After Thousands of Hours Working With CD-ROM Drives, I Knew The Best When I Saw It.

Scholar, pianist and university professor Robert Winter is the author of the best-selling CD-ROM music software ever marketed—the Voyager CD Companion to Beethoven's 9th Symphony.

"Over the last two years I have spent more than 3,000 hours working with CD-ROM drives. I have used at least a half dozen drives, including those from all of the major manufacturers. Through hard experience I came to have very specific desires for the ideal drive — one I thought I would never see.

When I found the Chinon drive at a trade show, I couldn't believe my eyes — or ears. All the things I was looking for were there: a small (but elegant!) footprint for easy portability; a separate power supply to eliminate cooling fans and overheating; a fast 350 ms access time; direct RCA audio outputs; a headphone jack with full-range volume control; rugged construction to withstand heavy use and travel; and a great price. It's the drive I recommend to anyone who asks — with only raves from those who have purchased it. Those who claim that CD-ROM is a slow, stodgy technology haven't tried a Chinon drive."

Chinon drives are available in external versions for both IBM-compatible and Macintosh computers, and a half-height internal version for IBM compatibles.

Experience Chinon's exciting CD-ROM/Audio drives for yourself. Call TOLL-FREE for the reseller nearest you. Whether for work or play, data or audio, it'll be music to your ears.

CHINON

Chinon America, Inc., 660 Maple Avenue, Torrance CA 90503
Toll-Free (800) 441-0222
In California (213) 533-0274 Fax: (213) 533-1727

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

Circle 94 on reader service card

Animated Clip Art

Animation Clips

PROS: Generally well-drawn animations; can be customized. **CONS:** Some clips choppy. **COMPANY:** Media In Motion (415/621-0707, 800/395-2547; fax 415/621-1724). **REQUIRES:** Mac Plus; 2MB of RAM; animation or authoring program; hard drive. **LIST PRICE:** Business 1 and Business 2 each $99; with sound $129.

MW ★★★★

MEDIA IN MOTION'S ANIMATION Clips Business 1 and Business 2 each offer 30 clips in PICS format, with optional sound. You can import the PICS-format clips into animation programs such as Authorware Professional, Gold Disk's Animation Works, and Motion Works' Addmotion, and then customize or combine them with other graphics and animations. MacroMind Director users can order the clips in Director format and open them with that program. Animation Clips' license allows you to incorporate up to five clips in any presentation for distribution.

Since the collections are business-oriented, they're heavy on office equipment, electronics, and computers. Other clips can be used metaphorically in business presentations, like a cleaver splitting a coin, calendar pages ripping away, and mercury blasting out the top of a thermometer. Less businesslike animations include a jukebox, a ray gun, and beer pouring into a glass.

On the whole, the clips are well rendered—the jukebox, for instance, is a work of art. A few don't make the grade, though, like the pouring beer, which looks as if the artist might have imbibed a bit while drawing. Many of the animations are a bit choppy, since they're composed of a minimal number of frames, to keep the file size manageable; the clips range from 8K to 1155K, with most clips in the 20K-to-80K range.

I tested clips in Director, Addmotion, and Animation Works with no problems (they even work in Berkeley Systems' After Dark screen saver). You have to know your animation program to customize the clips, of course, but even amateurs can add text or make small changes to the clips.

Although most of the clips are of good quality, some of the choices of subject matter puzzle me. The stapler is nicely done and even makes a realistic *ka-chunk* when it staples, but I cannot conceive of an occasion where I'd need an animated stapler. The same goes for the saw cutting a board (the manual suggests using it to represent cutting through red tape, but I'd use scissors myself, or maybe dynamite). But perhaps I'm being unfair; working alone in my home office, I rarely find myself creating business-related multimedia presentations.

However, to get into the spirit of things, I altered a few of the Animation Clips to make my own presentations in Director. I took the envelope animation from Business 2 and added my own message. Now, when my personal reminder program beeps at me on April 15, I can play the following sequence. An envelope appears on the screen, a letter opener zips in and opens it (complete with a ripping noise), and a piece of paper comes out of the envelope and unfolds, revealing the message: "Don't forget to make your quarterly tax payment, kiddo!" And all I had to do was type in the text.

For another project, I started with the Camera file from Business 1, one of my favorite clips in the collection: a camera appears, the bulb flashes, and a photo slides out of the camera; then you watch as the picture develops, using a dissolve effect from Director. I replaced the face in the photo with a picture of myself, and added a title, "Employee of the Month" (so I'm the only employee here—a little praise helps morale).

On the whole, I like the Animation Clips collections. Image quality varies somewhat, but most of the clips could enhance a presentation, assuming the subject matter is what you need; as with any clip art collection, you get the publisher's choice of subject matter.—ERFERT FENTON

Wireless Message Transmitter

Notify 1.0

PROS: Uses Mac for message input; easy to use. **CONS:** Unreliable; works only with System 7. **COMPANY:** Ex Machina (718/965-0309). **REQUIRES:** Mac Plus; 4MB of RAM; numeric or alphanumeric pager; paging service; 300-bps modem; System 7. **LIST PRICE:** Personal version $149; network version $399.

MW ★★

IF YOU WEAR A PAGER, YOU KNOW the service it provides. You have the exciting possibility of being contacted day and night. Someone dials your pager, plugs in a phone number for you to call, and as soon as you can get to a phone, you're connected. But it's not always easy to find a telephone, especially if you're stuck in traffic or sitting in the middle of a theater. Then, you pull off the road or climb over 11 pairs of knees just to receive an urgent, life-shattering message like, "The caterer is out of Camembert—will Brie do?" Using Ex Machina's Notify in combination with a Mac, a modem, and an alphanumeric pager can provide a brief message along with your page. But, like most version 1.0 applications, Notify has some limitations and lots of room to grow.

The concept and operation of Notify are simple enough. The application allows you (or a designated messenger) to type a message of up to 240 characters on your Mac. The message is queued in the Notify Server (in the System Folder) for transmission via modem to the paging company. The paging company transmits the message over radio airwaves straight to the pagee.

During my testing, Notify worked fine about 80 percent of the time. I made an alias of Notify and put it in my Apple Menu Items folder and launched it from there. The interface for sending a message is straightforward and intuitive. You only need to enter the addressee and the message.

It was after I constructed my first message that I started encountering minor problems. On more than one occasion, after queuing a message into the Notify Server, the machine froze until Notify finished sending the message over the modem. On other occasions, immediately after start-up, my machine mysteriously began sending messages over the modem. I never received a page from this transaction so I chalked it up to a bug in the software. The people at Ex Machina were also unable to resolve this problem. An on-screen status indicator would be helpful in this instance to provide details of this modem activity.

A bigger problem concerns Notify's reliability. More than once the pagee received a page I had sent even though Notify informed me that the paging company was unable to transmit it. Several times the pagee received only a portion of the message even though Notify gave no indication of an error.

Mac Goes Cellular With Notify, you can quickly send messages to a single person or a group of people from the Mac.

Unfortunately, it's not always easy to lay blame for these problems on the application or the paging company. This new way of communicating needs some hard testing and/or error correction before it can be accepted. Paging companies need to increase their awareness of this technology, and software companies need to establish more stringent error checking with paging services.

Notify needs some work before it can become an effective business tool that enjoys widespread use. I am anxious to see the results.—MATTHEW R. CLARK

It doesn't take a rocket scientist to figure it out. But one did.

Quite a few scientific types focused on the heavens above have found that NewGen™ high-resolution, PostScript®-compatible printers offer advances found nowhere else on earth.

Like Image Enhancement Technology (IET)™, for character quality that's out of this world. Plus Automatic Recognition Technology (ART)™, to select the right interfaces and emulations for you. And Program Updating with the latest in controller technology to make your NewGen printer virtually obsolescence-free.

Resolution close up.
13 point Courier enlarged 500%.

300 dpi Turbo PS/300p

Turbo PS/400p with IET

Yet, for all their innovation, you'll find they're offered at very down-to-earth prices.

Take our TurboPS Pro Series, delivering incredibly crisp, professional documents and superb performance at up to 800x400 dpi for single and work group users alike.

We also offer the compact and very affordable TurboPS Personal Series, for 300 or 400 dpi resolution at 4 pages per minute.

Then there's the new T Series, with exceptional 1200x600 dpi in 11"x17" format for truly outstanding graphics capability.

You can add a second paper tray, IC memory cards, SCSI interface and other options as you like.

And with NewGen, you can count on solid customer and technical support as well.

All of which makes NewGen a leader in the printer technology race.

To learn more, or for your local NewGen Dealer, call today. We'll be happy to help you decide which of our machines is just right for your mission.

newgen The Hi-Res People™

NewGen Systems Corporation
17580 Newhope Street, Fountain Valley, CA 92708
Telephone 714/436-5100 FAX 714/641-2800
Toll Free 1-800-756-0556
Dealer Inquires Welcome

© 1991, NewGen Systems Corporation. NewGen, NewGen Systems Corporation, NewGen logo, Image Enhancement Technology (IET) and Auto Recognition Technology (ART) are trademarks of NewGen Systems Corporation. PostScript is a registered trademark of Adobe Systems, Inc.

End User's circle 74 on reader service card

Dealers circle 75 on reader service card

Word Processor

WordPerfect for the Macintosh 2.1

PROS: Supports QuickTime. **CONS:** Dictionary-editing utility undocumented; expensive upgrade price. **COMPANY:** WordPerfect Corporation (901/225-5000; 800/451-5151). **REQUIRES:** Mac Plus; System 6.0.5; hard drive. **LIST PRICE:** $495.

MW ★★★

WORDPERFECT FOR THE MAC HAS evolved from a product that only a converted DOS PC user could tolerate to a powerful alternative to Microsoft Word. With version 2.1, WordPerfect goes a step further by adding support for a number of System 7 functions and QuickTime, the new video-display and -compression technology.

WordPerfect 2.1 provides both the regular online help found in the previous version plus comprehensive balloon help under System 7. And although the Save dialog box lacks a New Folder button, version 2.1 does a good job of supporting System 7's publish and subscribe, stationery pads, and TrueType fonts. Basic Apple events are also supported.

WordPerfect 2.1 is the first, and so far the only, word processor to support QuickTime. It even includes the 444K QuickTime extension. When you select an imported QuickTime movie, a play bar appears below the image. You use the play buttons or simply double-click on the movie to play it, sound and all; you click on the movie to pause at the current frame. You can even vary the sound level while the movie is playing. Thanks to version 2.1's improved handling of competing word processing formats, such as Microsoft Word and WriteNow, WordPerfect has become an ideal application for inserting visual demonstrations into a wide range of existing documents.

Gramps Canyon As the first word processor to support QuickTime, WordPerfect 2.1 can be used to add movies to documents created in Microsoft Word or WriteNow.

WordPerfect 2.1 lets you add words to its main dictionary and edit the hyphenation of any word in its dictionary. This feature is ideal for users with specialized needs, as well as for Canadian and British users and others who subscribe to different word spellings (*colour* instead or *color*, for example). But to edit the main dictionary, you have to use the Spell/Thesaurus Maintenance Utility, a separate program that is entirely undocumented—no information in the manual, no ReadMe file, no online help. In fact, there is absolutely no mention of it or its capabilities except in the press release.

If you already own WordPerfect 2.0, you can upgrade to version 2.1 for $89 or, if you want to forgo the expanded (though still incomplete) documentation, pay $39 for the disks only. If you're a corporate Mac manager, this news may seem hardly worth mentioning; you'll pay what you have to pay. But if you use WordPerfect at home or in a small office, $89 amounts to a third of the street price many users paid for the original product ($278). A gratis upgrade might have been a better way of promoting the company's reputation on the Mac. WordPerfect 2.1 is priced comparably to other high-end word processors, but except for serious QuickTime enthusiasts and self-guided dictionary editors, few owners of WordPerfect 2.0 will find the upgrade to version 2.1 worth the price.—DEKE McCLELLAND

9600-bps PowerBook Data/Fax Modem

PowerPort/V.32

PROS: Internally mounted; V.42bis compression; attenuates noise on the line; sends and receives faxes; fax autoprint option. **CONS:** External telephone interface; limited modem-status information. **COMPANY:** Global Village Communication (415/329-0700). **REQUIRES:** Mac PowerBook. **LIST PRICE:** $795.

MW ★★★★

IN THE WORLD OF MODEMS, THE V.32 fax/data modem is becoming a standard commodity. It not only exchanges faxes at 9600 bits per second (bps), but also exchanges data at the same fast rate. The PowerPort/V.32 supports sending and receiving faxes; V.42, MNP Class 5, and LAP-M error-correction protocols; and V.42bis and MNP Class 5 data compression. The well-written and complete manual includes detailed installation instructions, with clear photos detailing how to open the PowerBook, mount the modem board, and close the computer successfully. To preserve your Apple warranty, though, you must have the modem installed by an authorized dealer.

Because the PowerPort's electronics take up all available in-board space, Global Village put the analog telephone interface and jacks into an outboard credit card–size adapter that attaches to the PowerBook via a stubby 4-inch cable. There are some advantages to this approach: the adapter contains an extra jack for plugging in a telephone, and different adapters provide various European phone connectors (although only a U.S. adapter is supplied). The disadvantage is that you must carry, and avoid losing, the external adapter.

The PowerPort has no speaker, external switches, or status lights. When a Mac application activates the modem, a miniature bar graph appears in the menu bar, depicting the volume of data flow through the modem. Dialing and connecting sounds are routed directly through the PowerBook's built-in speaker.

In speed and compatibility tests with a dozen popular Mac communications programs, the PowerPort performed flawlessly in 2400- and 9600-bps operations. With V.42bis data compression turned on, throughput on long file transfers jumped to about 29,000 bps.

The PowerPort is in a unique position to take advantage of 9600-bps data speeds using Apple's AppleTalk Remote Access (ARA). ARA lets you call your base-station Mac while on the road and establish a network connection just as if you were hooked up locally via AppleTalk.

To send a fax, you choose a destination address from the built-in phone directory, and then choose among options for image quality, cover-page style, and so on. You can send the document immediately or spool it for later transmission. The transmission process operates in the background. The menu-bar status display lets you monitor the progress of the transmission page by page. The PowerPort performs automatic error recovery, attempting to retransmit a document a predetermined number of times.

You can set up the PowerPort to answer the phone and receive faxes automatically, or to receive faxes manually. Using automatic mode, you can optionally have the PowerPort wake up your sleeping PowerBook to answer incoming calls. You also can set an option to automatically print incoming faxes. Receiving and printing, like sending, occur in the background.

A stand-alone application called FaxCenter lets you view and print received faxes and uses a drag-and-drop interface for scheduling faxes for transmission. You can combine faxes (enveloping), and forward (retransmit) received faxes to another location. The FaxCenter utility also maintains a fax activity log that records every fax transmission and any errors that occur.

Overall, PowerPort is a capable and reliable communications tool well suited to PowerBook users' needs.—MEL BECKMAN

"Take home everything you've ever wanted for your Mac

Call **1-800-367-4222** US & Canada • **Visa/MC/AMEX** *accepted*

See listings under Hard Drives

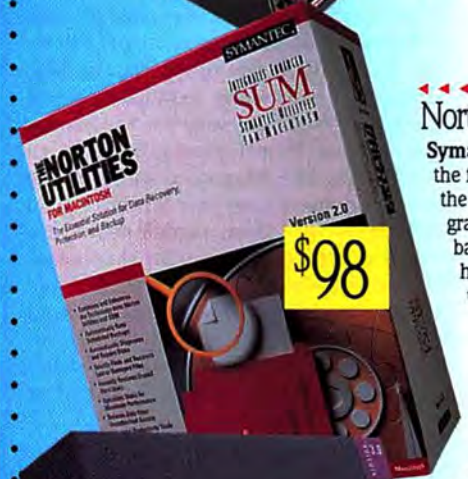
DP + Hard Drives

DataPlace 7 O Available only at Mac's Place! These quality Quantum hard drives and Syquest Removable Cartridge drives come with DataWare formating software, Alysis Software's More Disk Space and Central Points MacTools Deluxe. Each drive features a selectable SCSI ID switch, two 50 pin SCSI connectors, an external fuse and two AC Plug-ins.

$798

Bernoulli Transportable 90 Meg

IOMEGA 7 O Long known for reliability, IOMEGA now offers fast, 19 millisecond access time, and affordable removable storage with a 5-year warranty. Durable in design and built for speed.



$98

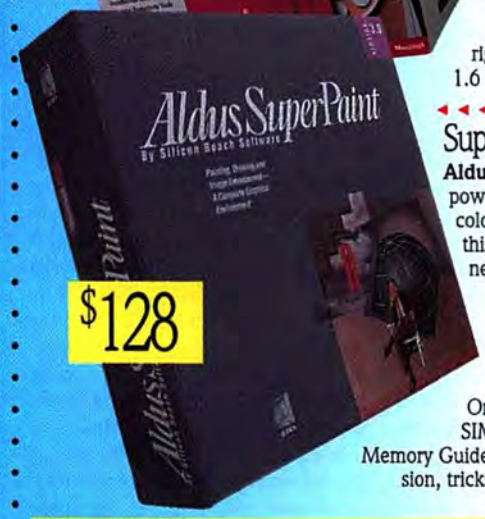
Norton Utilities 2.0

Symantec Corp. 7 O New Version! Combines and enhances the features of SUM II and Norton Utilities. The result is the first Mac utility software package to fully integrate advanced disk repair & recovery, automatic backup, data security, productivity tools and enhancements, in one informative, easy-to-use product.

$378

SupraFaxModems V.32bis

Supra Corporation 7 O Fax and data communications have never been easier...or faster! This modem's 14,400bps transmission rate means unprecedented savings in time and phone charges. Fax direct from your Mac as effortlessly as you print, and get started right away: the complete package includes FAXstf and MicroPhone 1.6 software.



$128

SuperPaint 3.0

Aldus 7 O Painting, drawing, and image enhancement in one powerful, easy-to-use graphics program. One- through 24-bit color, textures, gradients, and EPS graphics importing make this latest version ideal for anything from the simplest business illustrations to sophisticated full-color art.

$37 ea

SIMMs

Mac's Place 7 O Expand the mind of your Mac! One Meg SIMM, 80 nanoseconds, only $37! Four Meg SIMM only $128! Also included, Connectix Macintosh Memory Guide, the complete guide for RAM configuration, expansion, tricks and traps. See Listings for PowerBook RAM prices.

Here's the fine print for the Mac's Place Speed Shopper Sweepstakes.

*The first rule is to remember these dates: April 20 to July 31, 1992. Those are the days you can enter our sweepstakes. No entries will be accepted later. There are two ways to enter. Every time you place an order between the dates above, you'll be asked if you want to enter our sweepstakes. Obviously, the more times you order, the more times you'll be entered in the sweepstakes. If you're not ready to order, you can enter by writing your name, address and phone number on a postcard and sending it to: Sweepstakes Offer, Mac's Place, 8461 154th Ave NE, Redmond, WA 98052. All correspondence, including addressing, must be in your personal handwriting. No machined and/or electronic correspondence will be accepted. No mass/bulk mailing of any kind will be accepted. Please note that we cannot take sweepstakes entries over the phone without an order. Sweepstakes drawing will be held on August 14, 1992. Mac's Place employees and their families are not eligible to enter. Good luck!

Mac'sPlace

Call 1-800-367-4222 or Fax your P.O. 1-206-881-3090

7 System 7 Compatible 7 System 7 Savvy O 30-60 Day Money Back Guarantee

"A whistle blows and you're off! It's you against the clock.

Call 1-800-367-4222 US & Canada • Visa/MC/AMEX accepted

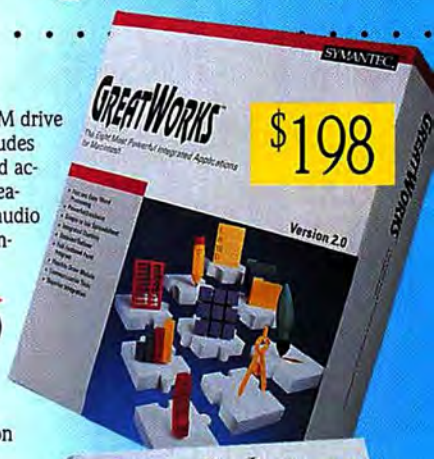
Access CD Allegro

$648

Optical Access Intl. 7 O The fastest CD-ROM drive available with a 310 ms. access time. Includes SuperCache software for lightning speed access to large amounts of information. Features headphone jack, stereo RCA type audio connectors, and deluxe desk accessory. Includes cable, sample CD, and one caddy.

GreatWorks 2.0

$198



Symantec 7 O The only productivity software you may ever need. Eight full-featured applications in one powerful, easy to use integrated program. You'll get started fast and keep working fast because common tasks are performed the same way in every module, saving you valuable time and money.

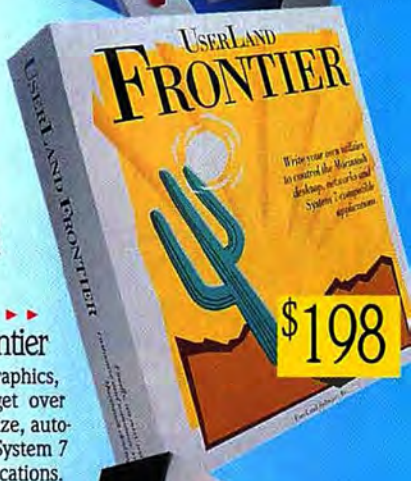
DoveFAX Desktop + 2.0

$268

Dove Computer 7 O New Low price!. Dove, the leader and originator in desktop FAX/Modems just made their prime product more affordable. Includes a fully Hayes-compatible 2400 baud modem, Send and Receive FAX, PLUS unsurpassed voice mail capabilities. Automatically switches from Data, FAX and Voice.

Frontier

$198



UserLand Software 7 Now you can write scripts to drive graphics, page layout, file management, electronic mail, and utilities. You get over 100 sample scripts that you can use right away or modify. Customize, automate, and simpify the Mac operating system, file system, networks, and System 7 compatable applications.

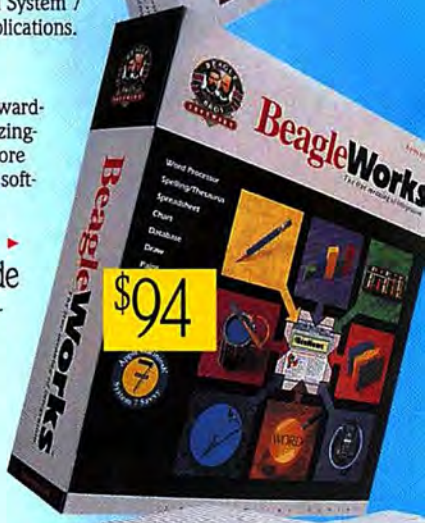
See listings under Hardware

Universal PowerCache Card

DayStar Digital 7 O When you feel the need for speed, the award-winning PowerCache gives you the best combination of blazing-fast speeds (up to three times) and cost-effective prices. More important, it's guaranteed 100% compatible with all your software and hardware, while running at full speed.

BeagleWorks Competitive Upgrade

$94



Beagle Brothers 7 O Upgrade to where the true meaning of integrated software has finally been defined. Includes seven modules so fully integrated you can easily access the Word Processor, Database, Spreadsheet, Chart, Paint, Draw and Communications modules from anywhere in the program using revolutionary In-Contexting Editing™. Non-Upgrade price $184.

Painter 1.2 /6 x 9 Tablet

$698

Fractal/Wacom 7 O Painter, the natural media painting program chosen by critics: MacUser Eddy 1991, 5-Mice, MacWeek's Target Award. The Wacom tablet has the premier pressure sensitive stylus. Now specially priced together.

Sweet 16

$1288

RasterOps 7 O This high resolution screen delivers color graphics and images with superior definition. The black face plate enhances the contrast so colors are displayed more distinctly. High refresh rate renders the screen flicker-free to reduce eyestrain.

MacsPlace

Call 1-800-367-4222 or Fax your P.O. 1-206-881-3090

7 System 7 Compatible 7 System 7 Savvy O 30-60 Day Money Back Guarantee

"Business programs, graphics, CD ROM drives...

$158

Inspiration

Ceres 7O Innovative visual thought processor for brainstorming, organizing, and communicating ideas as diagrams, mindmaps, presentation visuals, outlines, reports, and proposals. Integrates diagramming and outlining to help you see and communicate your ideas as visuals and text.

$84/168

Cricket Graph/Cricket Draw III

Computer Associates 7 Cricket Graph - Quick and easy to use charting application ideal for anyone who needs to create graphs for reports, presentations or data analysis. Cricket Draw III - intuitive, object-oriented drawing program, produces professional-quality graphics. Both entry level and skilled users will appreciate it's ease of use and power.

$128

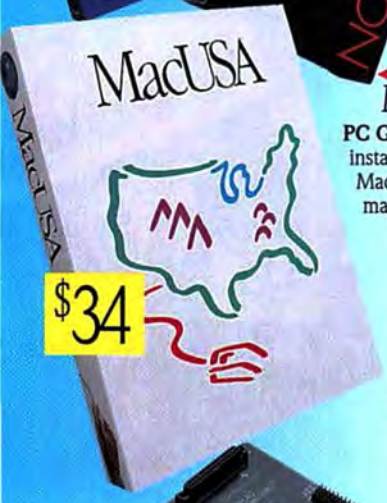
ON Location/In Control/SuperDisk!

ON Technology 7O Three extremely useful utilities at an incredible price (normally $219). ON Location will allow you to find any file or text stream instantly, In Control is the ultimate in list management and SuperDisk! gives lightning fast and efficient compression.

$105/194

Soft Node 1.0/Universal SoftPC 2.5

Insignia 7 Add SoftNode to either Universal SoftPC or SoftAT and your Mac will run MS-DOS applications and share programs over a Novell PC Network! With SoftPC, your next IBM computer could be a Macintosh.



$34

MacUSA

PC Globe 7 New state-of-the-art electronic atlas program that delivers instant profiles of all 50 states and Puerto Rico. Also ask about MacGlobe which profiles 190 countries. Both programs packed with maps, graphics and annually updatable.

$128

SNOOPER

MAXA Corporation 7 Find problems fast with Snooper, the revolutionary suite of hardware diagnostic and testing tools. Snooper is easy-to-use, powerful and saves you time. No set of Mac utilities is complete without Snooper, the hardware diagnostic. Also available with Nubus diagnostic card for only $168.

$788/1468

TransWarp SE w/FPU

Applied Engineering 7 25Mhz version increases the performance of a standard SE by up to 500%, while the 40 Mhz board can boost an SE's performance up to 1000%. Comes standard with a 68882 math chip and will support 16-MB of memory.

$74/83

HayesConnect/Smartcom II

Hayes Microcomputer 7 HayesConnect-Network serial device sharing software that allows any serial device to be shared over a network from a server. SmartCom II-Communications program that features error-free file transfers via Hayes Verification, XMODEM , MacTerminal XMODEM, VT 100/102, VT52, & TTY emulation. Plus many other features!

...fax/modems, huge monitors"

"It's a Mac fanatics dream come true!"

$98

Lotus 1-2-3 Competitive Upgrade

Lotus Development 7 O Upgrade your current spreadsheet (Excel, Wingz or Resolve) to the remarkable 1-2-3 from the leader in spreadsheet technology! Includes features like, AppleEvents and In-Cell Editing. Call for details on upgrading today!

$124/14

Word 5.0 Live Upgrade

Microsoft 7 O Simplify using your existing MS Word by upgrading today to vers. 5.0. The ribbon control bar brings dozens of commands directly to your desktop. Too many features to list here. Call now for details.

$69ea/89

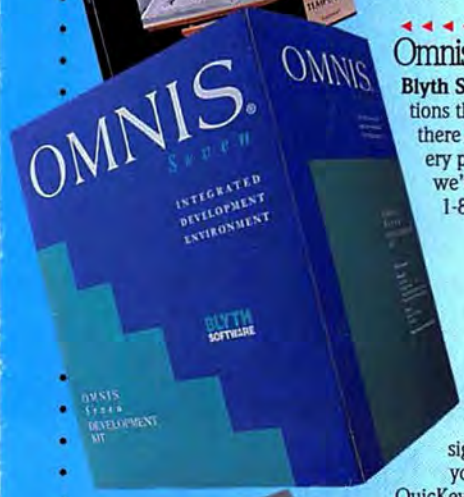
Effects Specialist/Layouts

Postcraft International 7 Effects Specialist transforms bitmap and PostScript fonts into sparkling headlines or eye-catching logos. Offers kerning and 120 different effects. Two different Layouts packages (PageMaker or XPress) each offer over 200 DTP sample templates for ready-made solutions to typical business publishing problems.

$58

On Cue II

ICOM Simulations 7 Move from one program to another instantly, bypassing the desktop maze, eliminating "window buildup", and ending the frustrating wait for folders to open and close. Works smoothly, quickly, and efficiently.



Omnis Seven

Blyth Software 7 Create industrial strength client/server applications that run identically on both Macs and PCs. Mac's Place agrees, there simply isn't a better tool available, "We use Omnis in every phase of our operation. It never let's us down and we've been programming with it since 1986." Call 1-800-34-OMNIS for more information.

$149

Mac 101E Keyboard w/ QuicKeys 2

DataDesk 7 O Improve your typing performance! Advanced keyboard utilizes the industry standard 105-key layout, with specially designed positive-tactile feedback keys that let you type faster with fewer mistakes. Includes QuicKeys 2.1, the popular keyboard macro utility, for even further functionality! Works with all Macs!

Call

The Miracle Piano Teaching System

Software Toolworks 7 The first keyboard that teaches you how to play it! Makes learning the basics a pleasure. Professional keyboard with 49 standard-sized velocity-sensitive keys, 128 digitized instruments and sounds, with full MIDI-compatiblity. Includes hundreds of songs and lessons and full orchestral accomplaniment.

$548

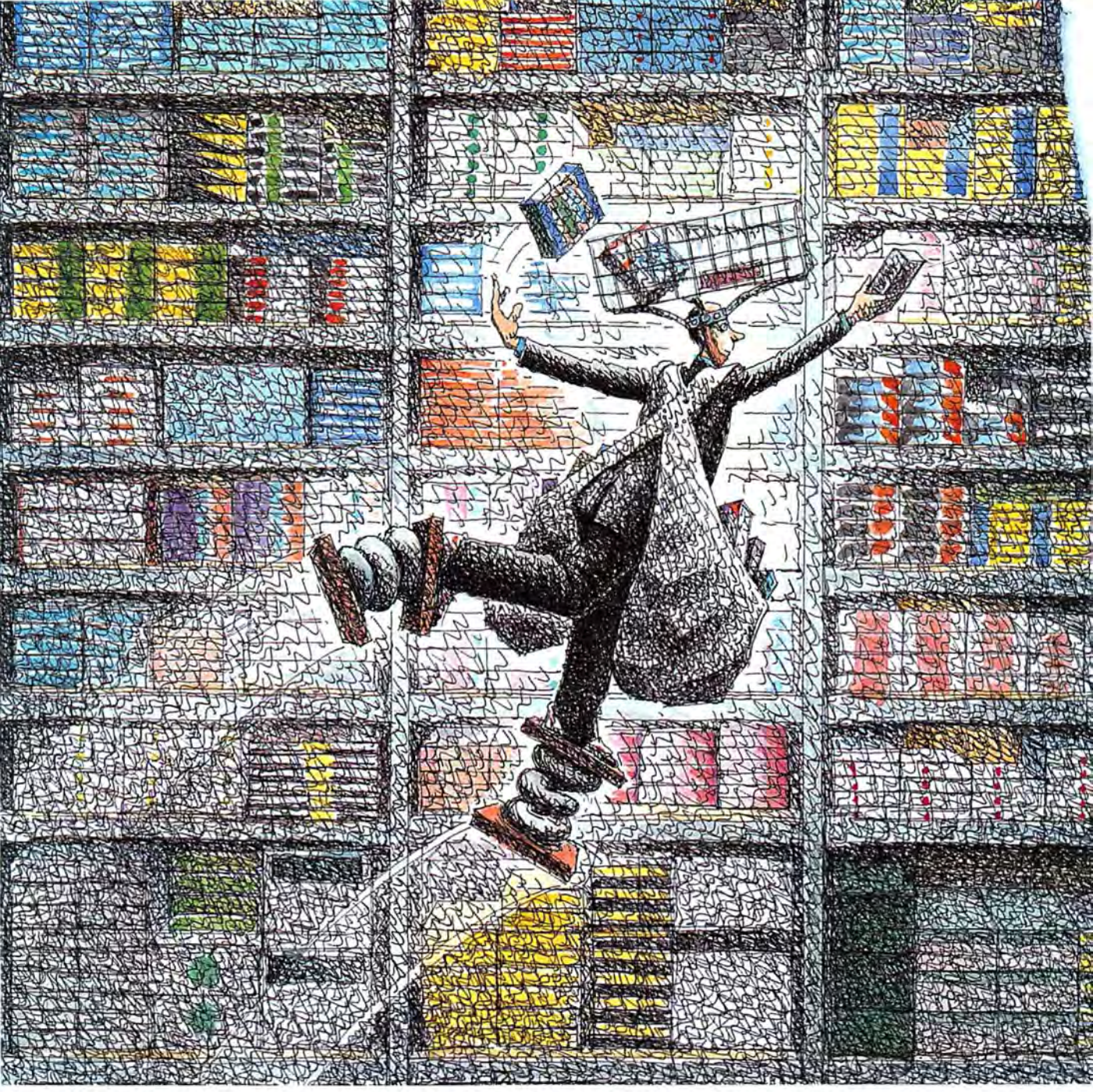
XPress 3.1

Quark Inc. 7 Many, many new features in Version 3.1, including Colors Palette and enhanced word processing (new time saving Tab Refinements and Style Sheets Palette). XPress is the best in advanced Desktop Publishing!

Call 1-800-367-4222 or Fax your P.O. 1-206-881-3090

Mac'sPlace

7 System 7 Compatible 7 System 7 Savvy O 30-60 Day Money Back Guarantee



Speed Shopper Sweepstakes. Enter Now.

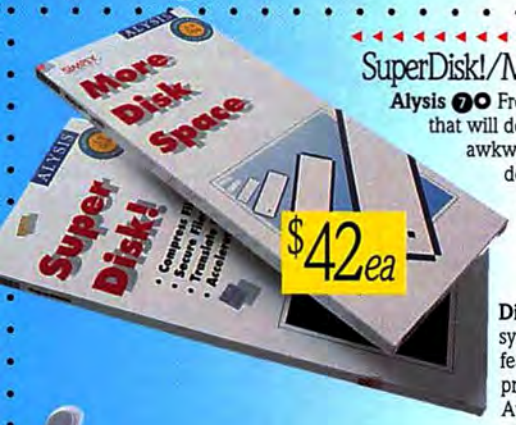
Enter the Mac's Place Speed Shopper Sweepstakes any time from April 20 to July 31, 1992. Whoever wins the grand prize is going to have an amazing amount of fun. We'll fly you and a companion to our warehouse which is packed with sophisticated graphics programs, exciting games, state of the art CD ROM hardware, Fax/modems, business software, monitors, and even a **PowerBook 170** . Then a whistle blows and you're off, piling boxes in your shopping cart— tossing equipment worth hundreds—no thousands—of dollars in your backpack. Your goal is to take home as much as possible. When you're done, we'll wisk you and your companion to the Seattle area's elegant Woodmark Hotel for an all-expenses paid weekend of luxury. If you don't win the grand prize, don't despair. Second prize is a PowerBook 100 and a $500 Mac's Place gift certificate. Third prize is a Mac's Place $1,000 gift certificate. Order from this ad and we'll enter your name in the Sweepstakes. See rules for details.

Mac's Place™

Our Hours: Monday through Friday 6AM-10PM PST and Sat/Sun 6AM-6PM PST Call **1-800-367-4222** US & Canada

* We understand Macintosh products better than anyone because we work on them every day. And since our sales consultants aren't paid on commission like other companies we know, we'll guide you to exactly the right products that will work best for you. Our only job is to make you happy. That's what customer service is all about. Right?

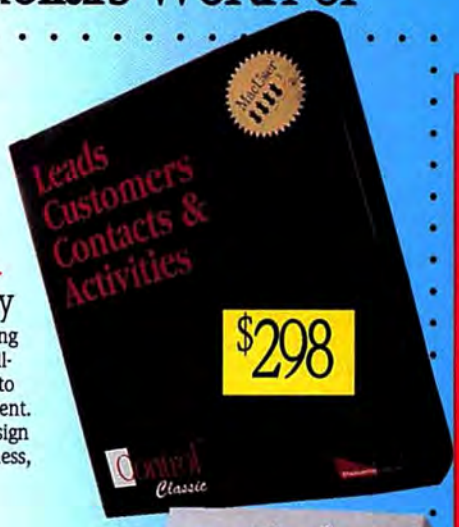
...piling hundreds—no thousands of dollars worth of



$42ea

SuperDisk!/More Disk Space

Alysis 7 O From the makers of Super Disk! A simple utility that will double your hard disk capacity. Throw out those awkward archivers and compression programs and double click on More Disk Space! Instant access to compressed files, zero decompression time! You won't even know it's there.



$298

Control Classic w/Zip Query

Diamante Software 7 Complete Desktop Marketing system! Combines a powerful relational database, full-featured word processor and a calendar mechanism to provide unparalleled personal information management. Automate the follow-up process with sales leads, design your own custom reports and labels to fit your business, and much, much more.

$58/39

HELLCATS/MouseStick

Graphic Simulation/Advanced Gravis 7 The most realistic flight simulator ever! Incredibly fast and fluid graphics. Take command with the Gravis MouseStick, fully designed to transform you into a battle-hardened naval aviator, with programmable buttons to command potent firepower.

$88

RateFinder

Elefunt Software 7 End Shipping Rate Confusion! Easily tells you the shipping charges for any package, both domestic and international. Comes with UPS, Federal Express, US Mail, and Airborne Express tables, and you can easily enter others. Just enter in the weight and destination, RateFinder knows the rest.

$68

44 Meg Removable Cartridges

Syquest 7 Having extra hard disk space has never been this inexpensive. Order one or order 20 for the same low price per cartridge. Ask for pricing on the new 88 megabyte removable cartridges.

$378

Cinemation

Vividus 7 Easily create interactive presentations with professional-quality animation, sound, and QuickTime video. Also animates PowerPoint and Persuasion presentations. Includes painting tools, the CinePlayer, a HC-XCMD to control movies, and 12-MB of animation, templates, and sound.

See listings under Hardware

VideoSpigot

SuperMac 7 O New! Make QuickTime movies on your Mac LC on up to the Quadra 900. Grab video from your VCR, camcorder or TV and pour it right onto your hard drive or optical cartridge. Import as high-image-quality digital data right into QuickTime applications and treat them just like text or graphics. Call for pricing and information today!

$848

Director 3.1

MacroMind/Paracomp 7 New vers. 3.1! The professionals choice for multimedia production is now the ultimate QuickTime authoring tool. Author, edit, playback and export interactive QuickTime movies with no additional hardware. Other features include expanded help, added functionality in the Score, a $195 Accelerator and license free distribution of your multimedia productions.

Call **1-800-367-4222** US & Canada • **Visa/MC/AMEX** *accepted*

goods in your cart."

Call 1-800-367-4222 or Fax your P.O. 1-206-881-3090

7 System 7 Compatible 7 System 7 Savvy O 30-60 Day Money Back Guarantee

MacsPlace

"Will you find the PowerBook 170 that we've

Call 1-800-367-4222 US & Canada • Visa/MC/AMEX accepted

ACCESSORIES

Advanced GravisO
- Mousestick ... 59.

Apple
- Toner LaserWriter II ... 98.

Articulate SystemsO
- Voice Navigator II ... 548.

CoStar CorporationO
- Stingray Trackball ... 79.

DataDeskO
- Mac 101E (All Macs) ... 126.

Fellowes Diskette Holders
- Oak (Holds 45) ... 19.
- Oak (Holds 120) ... 31.

InCom
- Compu-Case PowerBook Bag .. 78.

Kensington MicrowareO
- 7' Long ADB Keyboard Cable ... 24.
- Turbo Mouse Adb ... 107.

Key TronicO
- Mac Pro Plus ... 138.

L B Innovators, IncO
- Red,Charcoal or Navy Blue WristSaver ... 12.
- WristSaver Mouse Pad ... 12.

Mac's Place
- 7 Outlet Noise/Surge ... 15.
- Mac's Place Speed Pad ... 7.

Sony
- Double Sided 10 Pak ... 9.
- Double Sided-Bulk 50 Pak ... 33.
- High Density 10 Pak ... 15.
- High Density-Bulk 50 Pak ... 60.
- DG 90 2gig DAT Tape ... 22.

Sophisticated CircuitsO
- PowerKey 2.0 w/QuicKeys Lite 75.

BUSINESS

ACIUS
- 4th Dimension V2.2 ... 518.

AEC Management Systems
- FastTrack Schedule 1.5 ... 135.

After Hours Software
- TouchBASE ... 79.

AldusO
- Persuasion ... 318.

Ark Interface, IncO
- Workspace ... 79.

ASD Software
- Active Memory Single User .. 125.
- Active Memory 5 User ... 314.
- WindoWatch ... 88.

Attain Corp.O
- In Control ... 94.

Bananafish SoftwareO
- ThoughtPattern ... 94.

Beagle Brothers Inc.O
- BeagleWorks ... 184.
- Competitive Upgrade ... 94.

Calera
- Wordscan ... 248.

Ceres SoftwareO
- Inspiration 3.0.1 ... 158.

CheckMark SoftwareO
- Cash Ledger ... 112.
- MultiLedger 2.0 ... 225.
- Payroll ... 174.

Chena SoftwareO
- Fair Witness 1.1 ... 315.

Claris
- Claris Works ... 198.
- FileMaker Pro ... 208.
- HyperCard V2.1 ... 139.
- MacProject II V2.5 ... 348.
- MacWrite II ... 88.

CompuServe
- CompuServe Membership Kit . 25.
- CompuServe Navigator ... 49.

Computer AssociatesO
- Cricket Graph 1.2.3 ... 84.

DeltaPointO
- DeltaGraph Professional ... 198.

DiscTech Corp.
- Facilitator ... 218.

Freesoft CompanyO
- White Knight V11 ... 85.

Insignia Solutions
- AccessPC ... 59.

SoftPC
- Entry Level V2.5 ... 125.
- Universal V2.5 ... 194.
- AT V2.5 ... 298.

IntuitO
- Quicken 3.0 ... 39.

JIAN
- BizPlanBuilder ... 94.
- LivingTrustBuilder ... 94.

Lotus Development
- Lotus 1-2-3 ... 338.
- 1-2-3 Compet. Upgrade ... 98.

Micro Planning Intl.
- Micro Planner Manager ... 378.

MicrosoftO
- Excel 3.0 ... 298.
- Office V2.0 ... 478.
- Word 5.0 ... 298.
- Works ... 159.

New Era Software
- nuBASE Pro 1.5 ... 248.
- dBASE to Pro 1.5 Upgrade ... 128.

Nolo PressO
- For The Record ... 21.
- Will Maker 4.0 ... 35.

Now SoftwareO
- Up to Date (1 User) ... 64.
- Up to Date (5 User) ... 258.

Paragon Concepts
- Nisus ... 245.
- Nisus Compact ... 98.

Pastel DevelopmentO
- DayMaker ... 58.

Portfolio Systems
- DynoDex 2.0 ... 69.

Prescience
- Expressionist ... 77.
- Theorist ... 245.

Reality TechnologyO
- Wealth Builder ... 94.

SoftSyncO
- Accountant Inc. ... 338.
- Accountant Inc. Multi-User ... 568.

Software VenturesO
- MicroPhone II V4.0 ... 208.

Spider Island SoftwareO
- TeleFinder Unlimited Ed. ... 272.

SuperOffice Corp.O
- SuperOffice ... 228.

SymantecO
- GreatWorks 2.0. ... 198.
- More ... 264.

T/MakerO
- PowerBundle ... 158.
- WriteNow 3.0 ... Call

TelewareO
- M.Y.O.B. ... 139.

Timeslips CorporationO
- TimeSlips III V2.1 ... 192.
- Accounting Link (TAL) ... 52.

WestwareO
- Contact Ease V1.3 ... 188.

Wolfram Research Inc.O
- Mathematica Standard 2.0 ... 498.
- Mathematica Enhanced 2.0 .. 788.

WordPerfect Corp.
- WordPerfect V2.1 ... 278.

WordStar
- American Heritage Dictionary . 62.
- Correct Grammar ... 62.

Wyoming SoftwareO
- Business Sense 1.5 ... 124.

GRAPHICS

Adobe
- Illustrator 3.2 w/ATM 2.0 ... 368.
- Photoshop 2.0 ... 548.
- Premier ... 308.
- Streamline 2.0 ... 117.
- Type Manager ... 59.

AldusO
- Freehand 3.1 ... 388.
- Gallery Effects ... 128.
- Pagemaker 4.2 ... 489.
- Personal Press 2.0 ... Call
- SuperPaint 3.0 ... 128.

AltsysO
- Fontographer 3.5 ... 258.

Ares SoftwareO
- FontMonger ... 59.

Broderbund
- Print Shop ... 35.
- TypeStyler 2.0 ... 128.

Calliscope Software
- Satellite 3D ... 128.

Claris
- Claris CAD ... 598.
- MacDraw Pro ... 278.

Computer Associates
- Cricket Draw III ... 168.

CoSA
- PACo Producer 2.0 ... 158.
- PACo Producer Bundle ... 374.
- XPLayPACo XCMD ... 158.

D'pixO
- FOLIO 1 ... 344.

Delta Tao SoftwareO
- Monet ... 198.

DenebaO
- Canvas V3.0 ... 248.

Fractal DesignO
- Painter 1.2 ... 248.

Frame Technology
- FrameMaker ... 594.

MacroMind/Paracomp
- MacroMind Director ... 848.
- Magic ... 248.
- Model Shop V2.0 ... 598.
- Swivel 3D Professional ... 468.

MicroFrontierO
- Color It! ... 75.

Motion Works
- ProMotion ... Call

PhotoDisc Inc.
- PhotoDisc Vol A or B ... 198.

Pixar
- Showplace/MacRenderMan . 629.

Quark Incorporated
- XPress 3.1 ... 548.

Ray DreamO
- JAG ... 68.
- Ray Dream Designer ... 589.

Specular InternationalO
- Infini-D ... 648.
- Replicas Vol. 1 or 2 ... 188.

Strata, Inc.
- StrataVision 3D V2.5 ... 628.

Timeworks
- Publish It! Easy ... 145.
- Competitive Upgrade ... 99.

Virtus
- WalkThrough ... 308.

Vividus Corp
- Cinemation ... 378.

CD-ROM

Agfa Corp.
- CD-ROM 3.0 Intro-Pack ... 60.
- With CD-ROM Drive ... 698.

Cyan
- Cosmic Osmo CD ... 39.

Discovery Systems
- Berkeley BMUG PD ROM ... 65.
- Nautilus BackPac (1 or 2) ... 44.
- Nautilus Starter Disc. ... 20.

FM WavesO
- DTPro CD-ROM ... 75.

ICOM Simulations
- Sher. Holmes Consult. Det. ... 45.

Optical AccessO
- CD/Allegro (310 ms) ... 648.
- Access CD 6/Pak ... 1198.
- Access/MF Gigabyte ... 3248.

Magneto-Optical 3.5 Read/Write
- RD/Aria-128 MB ... 1598.

Pixar
- Showplace/MacRenderMan . 448.

Quantum Leap
- CD-7 Super Library 2 Disk Set . 72.
- Giga-ROM 2.0-Super Library ... 98.
- Macademic-Education Library . 73.

EDUCATIONAL

Broderbund
- Kid Pix V1.2 ... 37.
- Nigel's World ... 36.
- Spelunx ... 29.
- The Playroom V2.0 ... 29.
- Type! ... 18.

Compu-Teach
- Destination: MARS! ... 38.
- Once Upon A Time-Vol. I-III ea. 34.

Davidson & AssociatesO
- Alge-Blaster Plus ... 36.
- Math Blaster Plus ... 36.
- SAT Personal Trainer ... 36.

Knowledge Revolution
- Interactive Physics ... 156.

Learning CompanyO
- Math Rabbit ... 35.
- OutNumbered! ... 36.
- Reader Rabbit 1 V3.0 ... 35.
- The Writing Center ... 50.

MECCO
- Number Munchers ... 28.
- Word Munchers ... 28.
- Oregon Trail ... 28.

Nordic SoftwareO
- Pre-Schoolpack ... 35.
- Word Search Deluxe ... 35.

Software Toolworks
- Mavis Beacon Typing ... 29.

ENTERTAINMENT

Baseline PublishingO
- Talking Moose ... 22.

Broderbund
- Carmen San Diego? Europe, Time, U.S.A, World ea.29.
- SimAnt ... 35.
- SimCity ... 28.
- SimCity Supreme ... 47.
- SimEarth ... 40.

Casady & GreeneO
- Glider ... 29.

Deadly GamesO
- Battle of Britain II ... 31.
- Bomber (w/Headphones) ... 31.

Delta Tao SoftwareO
- Spaceward Ho! 2.0 ... 35.
- Strategic Conquest 3.0 ... 35.

DigiTek Software
- Hole-In-One Miniature Golf ... 24.

Electronic Arts
- PGA Tour Golf ... 35.
- Tournament Course Disk ... 16.

Graphic Simulations
- HELLCATS Over The Pacific ... 39.

Inline Design
- 3 in Three ... 29.
- Darwin's Dilemma ... 29.
- Mutant Beach ... 40.
- Swamp Gas ... 29.
- Tesserae ... 29.

Lucasfilm Games
- Indiana Jones/Last Crusade ... 28.
- Loom ... 29.

Mallard Software

Flight Simulator Add-Ons
- Scenery Upgrade I-IV ... ea.36.

MicroProse
- Railroad Tycoon ... 40.

MicrosoftO
- Flight Simulator 4.0 ... 39.

Sierra On-Line
- Space Quest IV ... 36.

ORDER INFO

Mac's Policies
- Visa, Mastercard, American Express, and OPTIMA gladly accepted.
- Your credit card is never charged until your products ship.
- When a partial order is shipped, we pay freight on additional shipments. (U.S. Only)
- Most items carry the manufacturer's 30 or 60 day Money Back Guarantee (MBG). Mac's Place has a 30 day MBG on most hardware (USA only). We maintain the right to limit quantities on MBG returns. Ask for details when ordering.
- 120 day limited warranty on all products, some hardware items carry one and two year warranties. Defective software is replaced immediately with like item(s). Defective hardware items repaired or replaced at our discretion.
- Most personal and company checks approved upon receipt to insure immediate shipment. For non-standard checks and checks over $1,000, allow ten working days for clearance.
- No sales tax (except WA residents add 8.2% to total, including shipping).
- All returns must have an authorization number. Please call 800-367-4222.
- All prices & promotions subject to change without notice. All items subject to availability. Not responsible for typographic errors.

Orders USA: Orders placed weekdays by 7:30 pm E.S.T., 4:30 pm P.S.T. for "in stock" items ship same day (barring system failure, etc.) for overnight delivery via Airborne Express. Our $3.00 shipping charge includes insurance at no extra charge. Rural locations may require an additional day for delivery. Areas not serviced by Airborne (Airborne does not deliver to P.O. Boxes) will be sent via U.S. Priority Mail.

Purchase Orders: Government, school, and institutional P.O.'s clear immediately. Corporate PO's subject to credit approval. Full shipping charges apply, prepaid and added.

International Orders: Call 206-883-8312. We ship throughout the free world via Airborne Express International. INTERNATIONAL ORDERS ARE CHARGED FULL SHIPPING CHARGES. Contact Mac's Place for information. Mail, FAX or electronic orders gladly accepted.

Electronic Mail Orders: Compuserve (76635,660); GEnie (MACSPLACE); America Online (MacsPlace). Mac's Place uses CE Software's QuickMail™ to check our mail regularly.

Phone: 800-367-4222, 206-883-8312, FAX 206-881-3090

© 1992 Mac's Place, Inc.

Like all aspects of Mac's Place's operation, this ad was entirely designed and assembled using Macintosh technology. No paste-up. No stripping.

Mac's Place: 8461 154th Ave. NE, Redmond, WA 98052

Mac'sPlace

Call 1-800-367-4222 or Fax your P.O. 1-206-881-3090

System 7 Compatible O 30-60 Day Money Back Guarantee

"Enter the Super

hidden on one of the warehouse shelves?"

Software Heaven
- OIDS 25.

Spectrum Holobyte
- Tetris 23.
- Vette 34.
- WordTris 24.

Strategic Simulations, Inc.
- AD&D: Silverblades 38.
- AD&D:Curse of Azure Bonds 38.

Strategic Studies Group
- American Civil War Vol 1 30.
- Gold of the Americas 30.
- Panzer Battles 28.
- Reach for the Stars 30.
- Rommel Battles for N. Africa 28.
- Warlords 38.

Three Sixty Pacific
- Harpoon 39.
- Harpoon BattleSet #2 or #3 22.
- Harpoon Scenario Editor 26.

Velocity
- Spectre 38.
- Spectre LAN PAK (3 Nodes) 58.

Virgin Games
- Monopoly 30.
- Scrabble Deluxe 30.

HARDWARE

Applied Engineering
- AEHD Superdrive 219.
- FastMath LC(68882 16Mhz) 138.
- Plus Drive 308.
- QuadraLink w/AE Shadow 199.
- QuickSilver IIsi 236.

TransWarp Accelerators
- LC 33Mhz w/FPU 998.
- LC 40Mhz w/FPU 1378.
- LC 50Mhz w/FPU 1498.
- SE 25Mhz w/FPU 788.

Asanté
- 10T Hub/8 258.
- 10T Hub/12 548.
- MacCon3 IIsi 248.
- MacCon3 NB 218.
- MacCon3 SE 218.
- EN/SC 328.
- EN/SC PowerBook 348.
- EN/SC-10T 258.
- EN/SC-10T PowerBook 288.

Caere
- Typist + Graphics 468.

Cayman Systems
- GatorBox 1949.

CoStar Corporation
- LabelWriter II 1" Head 188.
- LabelWriter II Plus 298.

Dayna Communications
- DaynaPORT SCSI/Link PB 298.
- DaynaPORT SCSI/Link-3 PB 348.
- DaynaPORT SCSI/Link-T PB 298.
- DL/2 288.
- DL2000 218.
- EtherPrint-T 338.
- EtherPrint-T Plus 598.

DaynaPORT Ethernet Cards
- E/II 178.
- E/II-T 178.
- E/si-T 168.
- E/si-TFP 248.
- E/ZT (External) 278.

DayStar Digital
- ComboCache IIsi 248.
- ComboCache IIsi w/FPU 328.
- DualPort IIsi w/FPU 168.
- Equalizer LC 198.
- Equalizer LC w/FPU 278.
- Fast Cache 040 358.
- PowerMath LC 118.
- SCSI Powercard (0MB RAM) 1048.

PowerCache(SE/30, all IIs, and LC)
- 33Mhz 698.
- 40Mhz 858.
- 40Mhz w/FPU 1098.
- 50Mhz 1358.
- 50Mhz w/FPU 1589.

Dove
- DoveFax Desktop V2.0 198.
- DoveFax Desktop Plus V2.0 268.
- DoveFax LE 138.
- DoveFax PB-PowerBook 198.

DoveFaxLAN
- 5, 10, 20, 30, or 50 User Call.

E-Machines

Color Displays
- ColorPage E16 1045.
- ColorPage T16 1398.
- ColorPage T16II 1698.

Color Interface Cards
- DoubleColor 328.
- DoubleColor LC 395.
- Futura EX 568.
- Futura SX 878.
- Futura SX/8 698.
- Futura MX 1298.

Ethernet-24-Bit Color
- ColorLink EX/T 658.
- ColorLink SX/T 998.

Everex
- EMAC 150-MB Tape BU. 678.

Farallon

PhoneNET
- Connectors 29.
- Connector (10Pk) 195.

Global Village

TelePort
- 2400 with MNP5 128.
- Fax 9600 (Send Only) 179.
- Full Fax Send/Receive 228.
- PowerPort/V.32 PowerBook 488.

Harris Labs

Performer
- 16 Mhz Accel. 239.
- 16 Mhz Accel.w/FPU 318.

Logicode

Fax Modems-Send/Receive
- 9624 148.
- 9624 V.42bis 198.
- 9696 V.42bis 398.
- 14,400 V.42bis 518.

Quicktel Modems
- 14,400 V.32bis,V.42bis,MNP5 488.

Micron
- XCEED Gray-Scale 30 78.
- XCEED Color 30 279.
- XCEED MacroColor II 469.
- XCEED MacroColor 30 488.

Microtek
- ScanMaker 600GS 848.
- ScanMaker 600ZS 1398.
- TrueLaser Printer 1398.

RasterOps

Color Monitors
- 16" 1288.
- 19" Hitachi 1698.

24-Bit Color Video 13",19",21"
- 24MX 1288.
- 24MXQ 1288.
- 24Sx 648.
- 24XLi 2148.
- PaintBoard 24 1698.

Monochrome/Grayscale Monitors
- 19" Mono/Gray-Scale 858.

Video Boards-Monochrome
- ClearVue/XL 348.

Video & Multi Media
- Expresso Pers. Slide Scan. 698.
- 24STV 828.
- MediaTime 1698.
- VideoTime 1288.
- Video Expander 498.

Seiko
- Seiko CM 1445 14" Trinitron 598.

Shiva
- Ethergate 1289.
- FastPath 5 1795.
- NetBridge 398.

SIMM

PowerBook Memory 140/170
- 4-MB Psuedo-Static 358.
- 6-MB Psuedo-Static 458.

Single Inline Memory Modules
- SIMM 1-MB 80ns 37.
- SIMM 2-MB 80ns 75.
- SIMM 4-MB 80ns 128.
- SIMM FX 4-MB 80ns 148.
- SIMM FX/NTX 1-MB 80ns 42.

SuperMac
- Monochrome Card 358.
- PowerBook Display Expander 538.
- SuperMatch Calibrator 538.

8 Bit Display Cards
- Spectrum/8 LC 538.
- Spectrum/8 Series III 538.
- Spectrum/8 si 538.

24 Bit Display Cards
- ColorCard/24 538.
- Spectrum/24 1078.
- Spectrum/24 Series III 1528.
- Spectrum/8•24 PDQ 898.
- Spectrum/8•24 PDQ si 898.

Monochrome/Greyscale Monitors
- Platinum 19" 1044.
- Platinum 21" Two-Page 1138.

SuperMatch Color Monitors
- 17" Multimode Color 1138.
- 20" Color 1898.
- 20" Dual-Mode Trinitron 2698.

Multimedia/Video Spigot
- Spigot & Sound NuBus 798.
- Spigot & Sound Pro NuBus 1698.
- Spigot LC 538.
- Spigot NuBus 538.
- Spigot Pro NuBus 1438.
- Spigot si 538.
- Spigot Pro si 1438.
- SuperSqueeze 798.

Supra Corp.

Supra FaxModem
- FaxModem Plus MacPac 198.
- FaxModem V.32 328.
- FaxModem V.32bis 378.

Supra Modem
- 2400 109.
- MacPac 2400 138.
- MacPac 2400 w/MNP 5 198.
- Plus 2400 (MNP5,V.42 BIS) 158.

Thunderware
- LightningScan Pro 256 489.

UMAX Technologies Inc.
- UC 630 1398.

Wacom

12X12 Digitizers Cordless Stylus
- Standard 758.
- Electro Static 836.

6 X 9 Digitizers Cordless Stylus
- Standard 518.

HARD DRIVES

DataPlace

All DP+ Drives come w/Mac Tools Deluxe & More Disk Space! They are tested and Pre-formatted. 2 year warranty.

External Hard Drives
- DP+ 52-MB Quantum 338.
- DP+ 105-MB Quantum 468.
- DP+ 240-MB Quantum 828.
- DP+ 425-MB Quantum 1398.

Internal Hard Drives
- DP+ 52-MB Quantum 268.
- DP+ 105-MB Quantum 398.
- DP+ 240-MB Quantum 758.
- DP+ 425-MB Quantum 1298.

Removable Syquest Hard Drives
- DP+ 44-MB w/cartridge 508.
- DP+ 88-MB w/cartridge 698.
- 44-MB Cartridges 68.
- 88-MB Cartridges 107.

Accessories
- Mounting Bracket (IIcx/IIci) 19.
- Case Opener/Torex Kit 8.

FWB Software

PowerBook Hammer
- Hammer PB60 638.
- Hammer PB80 788.
- Hammer PB120 868.

PocketHammer
- 50-MB 568.
- 100-MB 768.
- 200-MB 1198.

Iomega

Bernoulli
- Transportable 90-MB 798.
- Kit w/MacTools Deluxe 38.
- Kit w/Retrospect 98.
- Single 90-MB Cartridge 139.
- Tri-Pack 90-MB 408.

Quantum Drives
- ProDrive LPS 52-MB 248.
- ProDrive LPS 105-MB 378.
- ProDrive 240-MB 738.
- ProDrive 425-MB 1278.

Seagate Technology

Full Height Drive
- WrenRunner II 676-MB 1998.

MUSIC

Ars Nova
- Practica Musica 2.3 68.

Opcode Systems
- Book Of MIDI 28.
- EZ Music Starter Kit 155.
- EZVision 98.
- Galaxy Universal Librarian 188.
- MIDI Translator 42.
- Studio 3 MIDI/Smpte Intfc. 288.
- Vision 368.

Passport Designs
- MIDI Interface 78.

PROGRAMMING

Bowers Development
- AppMaker 1.5 214.

Microsoft
- QuickBASIC 1.0 68.

Symantec
- Just Enough Pascal 49.
- THINK C 5.0 198.
- THINK Pascal 4.0 159.
- THINK Reference 69.

TGS Systems
- Prograph V2.5 298.

Zedcor Inc
- ZBasic 5.0 95.

BOOKS

Addison Wesley
- Guide to Mac Family Hdw. 21.
- Mac C Prog. Vol 1 or 2 19.
- Mac Pascal Prog. Vol 1 19.
- Macintosh Program Secrets 18.

Inside Out Series
- Complete Book of HyperTalk 2 19.
- Learn C w/Thin C Lite 28.
- Mac Prog Guide MPW Vol 1 19.
- ResEdit Complete w/ResEdit 23.

Bantam Books
- HyperCard Handbook 21.

Microsoft Press
- MS Excel 3 Companion 20.

Peachpit Press
- Canned Art 2 ed.:Clip Art/Mac 24.
- Canvas 3.0: The Book 14.
- DataBase 101 W/ Demo Disk 14.
- DTP Survival Kit 18.
- Little Mac Book, 2nd ed. 12.
- Little Mac Word 5 Book 14.
- Little QuicKeys Book 12.
- Little System 7 Book 10.
- Macintosh Font Book 18.
- PM 4:An Easy Desk Ref. 24.
- QuarkXPress Book 20.
- Real World Freehand 22.

Ventana Press
- System 7 Book 18.
- System 7 Companion Disks 12.

UTILITIES

Aladdin Systems
- StuffIt Deluxe 2.0 59.

Alsoft
- DiskExpress II 55.
- MasterJuggler Call.
- Power Utilities Call.

Alysis Software
- More Disk Space 48.
- SuperDisk! 56.

ASD Software
- FileGuard 2.7 129.

Asanté
- PersonToPerson 10-User 262.
- PersonToPerson Zone Pack 458.

Berkeley Systems
- After Dark 2.0 28.
- More After Dark (M.A.D.) 23.
- After Dark & M.A.D. Bundle 39.

Casady & Greene
- Crash Barrier 48.

CE Software
- Disktop 4.0 + Gofer & Util 62.
- QuicKeys 2.1 89.

QuickMail 2.5
- 5 Users 239.
- 10 Users 365.

Connectix
- HandOff II 2.2 55.

Custom Applications
- Freedom of Press Lite 58.

Dantz Development
- DiskFit Pro 67.
- Retrospect 145.

Dayna Communications
- DOS Mounter V3.1 54.

Farallon
- Timbuktu 4.0 128.
- Timbuktu Remote 3.0 129.

Fifth Generation
- FastBack Plus 118.
- Suitcase V2.0 49.
- SuperLaserSpool 98.

FWB Software
- Hard Disk Toolkit 126.

Information Electronics
- QMConcierge 168.

IBSO
- Data Club Classic 3 Pak 179.
- Data Club Classic 10 Pak 498.

Kent Marsh
- FolderBolt 69.
- NightWatch II 89.

MAXA Corporation
- Snooper 128.
- Snooper Kit w/board 168.

Microcom
- Virex 59.

MicroMat
- MacEKG 59.

Now Software
- Now Utilities V 3.0 83.

Sabastian Software
- Image Grabber 3.0 35.

Salient
- AutoDoubler 45.
- DiskDoubler 45.

Software Architects Inc.
- Hard Drive Tune-Up 59.

Sound Source Unlimited

SoundWare
- Star Trek Sounds Vol. 1 or 2 29.

Symantec
- Norton Utilities 2.0 98.
- S.A.M.III 59.

Teknosys
- Help! 89.

Thought I Could
- Wallpaper 38.

Call **1-800-367-4222** US & Canada • **Visa/MC/AMEX** *accepted*

Shopper Sweepstakes"

Circle 209 on reader service card

Call 1-800-367-4222 or Fax your P.O. 1-206-881-3090

System 7 Compatible 30-60 Day Money Back Guarantee

MacsPlace

Hand-Held Gray-Scale Scanner

LightningScan Pro 256

PROS: Creates 8-bit scans at up to 400 dots per inch; images scanned in two passes can be joined flawlessly. **CONS:** Large files scroll very slowly in ThunderWorks software. **COMPANY:** Thunderware (510/254-6581). **REQUIRES:** Mac Plus; 2MB of RAM; System 6.0.2. Recommended: 4MB of RAM; gray-scale monitor; 68020 or 68030 processor to run Enhance software. **LIST PRICE:** $649.

MW ★★★★

THE LIGHTNINGSCAN PRO 256 IS an excellent piece of equipment. It does all Thunderware claims it can with hardly a hitch. It outperforms other hand-held gray-scale scanners and compares favorably with flatbed scanners that cost much more.

A true gray-scale unit, the LightningScan Pro 256 records images as wide as 4 inches, in 256 shades of gray, at up to 400 dpi. (The file for an 8-bit, 400-dpi image is large; you will need lots of extra RAM and hard drive space.) The LightningScan Pro 256 records grays directly—rather than using a dithering-interpolating scheme as some units do—resulting in the best possible scan. And increasing the resolution does not decrease the scan width.

Images wider than 4 inches can be scanned in several passes and then joined together using the remarkable ThunderWorks software. When you join two pieces, ThunderWorks temporarily turns the right-hand image into a flexible sheet. Using the Skoogy tool, you stretch the image to align with the left-hand image, fixing each properly matched segment with the Tack tool as you go. I scanned a 4-inch-wide halftone in two passes and joined the halves; the resulting image was virtually indistinguishable from the same halftone scanned in one pass. This is something other hand-held scanners cannot do. The software also lets users calibrate the scan head and compensate for normal manufacturing variations that might affect scanned images. ThunderWorks does have a few minor shortcomings. I found its memory partition needed to be at least 3.5MB. Large images scroll very slowly, and saving a TIFF file takes noticeably longer than in Adobe Photoshop.

Pinning It Down The right half of this image has been "Skoogied" into alignment with the left half and is being nailed into place with the Tack tool.

The scan head has three controls—resolution, contrast, and output—as well as a light that warns you when you drag the scanner too fast. To help you make straight scans, there's a plastic guide that snaps onto the bottom of the scanner. The controller is a box roughly 6 by 8 by 2 inches; it has two 25-pin SCSI outlets, a SCSI ID switch, and an external power supply. Thunderware supplies a 25-pin SCSI terminator and a 25-to-25-pin SCSI cable. (If the scanner isn't the first item in a SCSI chain, you'll need a 25-to-50-pin SCSI connector.) The scanner and software are System 7–compatible and, according to Thunderware, 32-bit clean.

The LightningScan Pro 256 ships with MicroFrontier's Enhance gray-scale–editing software (a good low-cost product, but no match for Adobe Photoshop); Olduvai's Read-It OCR software; and a plug-in for scanning from within Enhance, Photoshop, Read-It, and Silicon Beach Software's Aldus SuperPaint and Aldus Digital Darkroom.

The LightningScan Pro 256 lists for about $200 more than competing products, but it's such a well-executed product that it's worth the difference.—BILL JUSTIN

Shipping-Cost Tables

RateFinder 1.5

PROS: Facilitates shipping-rate comparisons; all-inclusive rate tables. **CONS:** Slow; numerous user-interface violations; weights must be entered in pounds or in ounces; manual lacks index. **COMPANY:** Elefunt Software (510/843-7725). **REQUIRES:** Mac Plus; 2MB of RAM; 5MB free hard drive space. **LIST PRICE:** $149.

MW ★★★

I GET A LOT OF EVALUATION SOFTware delivered by the friendly Fed Ex folks. Software publishers constantly use overnight-mail service, and they consistently choose the most expensive carriers. But who can blame them? Comparing shipping costs is a hassle, what with the myriad carriers, service classes, surcharges, discounts, and so on. RateFinder compares the costs of shipping via various carriers.

RateFinder comes with national and international rate tables for Federal Express, United Parcel Service (UPS), and the U.S. Postal Service for packages weighing less than 150 pounds. A sample Airborne Express rate table is also included, but it must be adjusted to reflect actual rates assigned by Airborne based on shipping volume. You can also enter information for any other carriers, but the process is very tedious.

You enter your zip code (of the point of origin) plus the weight and destination of the package. Unfortunately, the method for entering weights is inflexible and clumsy, and you can't use the metric system.

Entering international destinations is also awkward. Domestic packages require only the five-digit zip code of the recipient, but for international packages you must enter the country's full name or select it from a pop-up menu with a clumsy Find feature.

After you enter the weight and destination, RateFinder consults its tables and displays the rates charged by the various carriers for different classes of service. On my Mac IIci, RateFinder took about 15 seconds to display information for a typical domestic package. RateFinder is no speed demon, but it's significantly quicker than flipping manually through several rate tables.

If the package doesn't meet a carrier's requirements, no rate appears for the invalid class of service. I'd prefer an option to hide invalid carriers and classes altogether. And there should be a way to list the carriers from the lowest to the highest rate.

Double-clicking on a carrier line in the Rate Shop window presents the Rate Totals window, where you can compute the total shipping cost, taking into consideration the charges for insurance, return receipts, and pickups, as well as allowances for applicable discounts. A dimensional weight calculator allows you to enter in the package's height, width, length, and divisor (dimensional weight).

Because RateFinder was developed using Odesta's Double Helix, it is slow and has numerous user-interface violations (some windows that appear almost off the screen, nonstandard confirmation dialog boxes, radio buttons improperly used to initiate actions). Having worked with the initial release of RateFinder, however, I appreciate the effort the company put into improving the performance, simplifying the interface, and adding new features.

One particularly noteworthy new feature is the Rate Find window, where you can quickly look up a rate for a particular carrier. MacFederal and MacParcel ($39.95 each from Computer:applications) offer much the same functionality of the Rate Find window, but handle only domestic Federal Express and UPS queries, respectively.

RateFinder beats the old-fashioned task of checking rate tables by hand. Even if you send only a few packages a week, RateFinder will pay for itself in less than a year's time by finding the least expensive way to ship. And given Elefunt's track record of prompt upgrades, I expect RateFinder will significantly improve before that year is up.
—OWEN W. LINZMAYER

Fax and Data Modem for Networks

ComStation 2, ComStation 4

PROS: Chooser-selectable modem; personal phone books; simple, easy-to-use interface; QuickFax DA good for sending short, text-only faxes. **CONS:** Incoming faxes are sent to fax manager; fax distribution needs fax program; uninformative error messages; ComStation 4 requires two Macs. **COMPANY:** PSI Integration (408/559-8544, 800/622-1722; fax 408/559-8548). **REQUIRES:** ComStation 2: Mac Plus; System 6.0.7 (hard drive recommended). ComStation 4: Mac Plus; AppleShare server; AppleTalk network. **LIST PRICE:** ComStation 2 $599; ComStation 4 $699.

ComStation 2

ComStation 4

USING A FAX MACHINE HAS BECOME as much a part of business as using the telephone. But who wants to go through the hassle of printing a document and taking it to a fax machine to send? ComStation 2 lets you send a fax directly from your Mac, and ComStation 4 provides network users fax capabilities. ComStation 2 is a solid product, but ComStation 4 has a few shortcomings, particularly in receiving faxes.

Both packages consist of a fax/data modem and fax software; ComStation 4 also has fax-server software. The modem is a standard 2400-bits-per-second data modem and 9600-bps fax modem that plugs into the serial port of the fax-server Mac or your Mac. To set up the ComStation 4 for network use, the fax-server Mac must have the FaxMonitor INIT installed. However, for other network users to send or receive faxes, they must have a fax folder in their name in the fax folder on the AppleShare server.

The software for sending and receiving faxes is the same for both ComStation 2 and 4. To send a fax, you simply select the NetFaxPrint (or FaxPrint for ComStation 2) icon in the Chooser and print the document as usual. The Mac converts the document to a bitmapped fax file as if you were printing the file. The NetFaxPrint (or FaxPrint) software then asks you to select a telephone number from your address book, or you can enter the name and telephone number of the recipient. Until the ComStation 4 FaxMonitor sends the file, fax files are stored in the fax folder bearing the sender's name, on the AppleShare server. The FaxMonitor INIT periodically checks each user's folder in the fax folder for documents waiting to be faxed, retrieves them, and faxes them to the appropriate telephone numbers.

Receiving a fax is a different story. All incoming faxes arrive at one location, the FaxSpool folder on the ComStation 4 fax server. The server administrator must read each fax, using ComStation's FaxManager software, and send a copy of the fax to the appropriate user's folder on the AppleShare server. All this is fairly awkward; it would be easier if the recipient could use a Copy command within the FaxManager program so that the fax could be directed to the appropriate folder after viewing.

Once a fax is stored in a user's folder on the AppleShare server, the user can read the file using the copy of the FaxManager software. You can also store the fax as a TIFF or PICT file once it has been opened.

(With ComStation 2, sending and receiving faxes takes place in the background on your Mac; you can use the FaxStatus DA to monitor incoming and outgoing fax transmissions.) The ComStation 2 has well-designed fax software and a handy QuickFax DA for sending short memos as faxes.

ComStation 4's requirement of a separate fax server and file server is a distinct disadvantage; both functions should be on one Mac, or the FaxMonitor should be on the AppleShare server. ComStation 4's FaxManager interface is easy to use, and the QuickFax DA, which lets you send up to 255 characters of text as a fax, is handy for short faxes. But the process for distributing incoming faxes is still a bit awkward and needs some improvement.—DAVE KOSIUR

System-Security Tools

Citadel with Shredder

PROS: Feature packed; easy to use. **CONS:** Passwords require at least eight characters; encrypted files must be removed from vaults before using them. **COMPANY:** Microcom (617/762-9310). **REQUIRES:** Mac Plus; System 6.0. Recommended: Hard drive. **LIST PRICE:** $149.95; five-user pack $499.

CITADEL'S SECURITY TOOLS ARE designed to prevent unauthorized use of a Mac's drives and files. You can encrypt files, lock up hard drive volumes and removable media (SyQuest cartridges, for instance), prevent people from using the floppy drive, permanently erase sensitive documents, invoke a password-protected screen saver, and scan disks for viruses.

You can assign a separate password to each hard drive or removable. After locking a volume, there's no way to mount it on the desktop without knowing the password; even starting up from a floppy or carrying the drive or disk to a different Mac won't let you bypass the protection. You can also lock the floppy drive so that without the password, no one will be able to copy files to or from the Mac. This option also helps protect your system from viruses.

Citadel enables you to create *vaults* for protecting sensitive files and folders. Each vault receives its own password and can hold as many files as the drive has space for. To open a vault, you simply double-click on its icon or use one of the Citadel utilities, and then provide the password. Files can be moved into and out of unlocked vaults as needed and encrypted with any of three data-encryption algorithms.

Citadel's screen locker blanks the screen to protect it from burn-in and also locks up the Mac. When the screen locker is active, pressing a key or using the mouse brings up a password screen. Users who lack the password are denied access to the Mac.

The program provides two ways to remove important files permanently from your disks. By overwriting deleted files with a string of zeros, Disk Cleaner makes it impossible to restore such files using a file-recovery program. The Shredder INIT (not to be confused with DLM Software's file-erasure utility Shredder) intercepts the Finder's Empty Trash command and asks whether you want to delete its contents manually or replace the contents with zeros; optionally, Shredder also handles files deleted from within programs, such as by using Microsoft Word's Delete command.

Citadel also includes a copy of the Virex INIT, which can scan any file, folder, or drive for viruses; can automatically scan disks on insertion; can check each file as it's opened; and can scan at start-up or shutdown. Note that the INIT is for detection only. To remove viruses, you need a virus-protection utility.

Citadel has only two weaknesses. First, every password must be at least eight characters long. Second, encrypted files are inaccessible from the creator programs' Open dialog boxes. You must use Citadel, the DA, or the INIT to move the files to the desktop and then move them back into the vault after a save, which is a hassle. (During testing, I uncovered a bug. Closing the Shredder Options dialog box on a Mac Plus running System 7 causes the screen to lock and the system to crash. This does not occur on other configurations.)

Citadel provides an emergency access procedure: the Administrator disk can open any Citadel-locked drive, even if you've forgotten the password. Since it can bypass all passwords, it should be treated with the same respect as the passwords themselves—don't leave it lying around.

Overall, Citadel's utilities are extremely easy to use and appear to cover all bases, from a security standpoint. Having multiple methods to access vaults and lock drives increases the convenience of using Citadel, too.—STEVEN SCHWARTZ

HyperCard-Based Book

The Complete Annotated Alice

PROS: Contains "lost" out-of-print chapter; large-print option. **CONS:** Slow; reading may strain eyes; no index to illustrations; quickly discharges battery. **COMPANY:** The Voyager Company (310/451-1383). **REQUIRES:** Mac SE/30; 640-by-400-pixel monitor; System 6.0.7; HyperCard 2.1. **LIST PRICE:** $19.95.

MW ★★★

THE COMPLETE ANNOTATED ALICE is one of three Expanded Books published by The Voyager Company especially for PowerBook users. It consists of *Alice in Wonderland* and *Through the Looking Glass*, integrated with Martin Gardner's *The Annotated Alice* (New American Library, 1960) and *More Annotated Alice* (Random House, 1990). Dedicated Carrollians will rejoice at the inclusion of a famous "lost" episode available only in this HyperCard edition. Alice comes compressed on a 1.4MB floppy disk; decompressed it consumes nearly 2MB of hard drive space. It requires HyperCard 2.1 (the run-time version that comes with the PowerBook works fine).

This story is about my adventures in Alice's newly computerized world, and what I saw there. Alice opens briefly to the book's pleasant "cover" artwork, then to the table of contents. The keyboard arrow keys let you leaf through 60 pages of prefaces and introductions and then on through the two Alice books. You can also click on a chapter title to go directly to that chapter.

Carroll's prose and Sir John Tenniel's illustrations appear murky compared with my freshly typeset $2.50 paperback edition (Bantam, 1981). This is not necessarily a complaint, because most users of the Expanded Books version will probably play with Alice rather than read it. Reading anything on screen for a long time is fatiguing, but the Expanded Book's most annoying quirk is its slowness, even on a PowerBook 170.

To be fair, the electronic version does let you set bookmarks, go directly to a page, and monitor your progress with a progress gauge. In the wide white margin you can type notes or mark passages with black lines. Still, reading from the screen felt claustrophobic. I never got the satisfying sense of being transported that reading customarily inspires.

Getting around Wonderland Handy tools let you type notes, open annotations, dog-ear pages, attach paper clips, and find words in context.

The product succeeds as a type of literary hypertext hide-and-seek. Underscored words and phrases indicate hot buttons that are linked to annotations. Click on one and the annotation appears. You can search for key words within the text and annotations. Pressing on any word reveals a pop-up menu that lets you search for the word's next, last, or every occurrence, in context if you like. These features make it easy to bounce between words, annotations, and books.

Alice demands nearly continuous hard drive access. Set to rest after 30 seconds of inactivity, my hard drive awakened whenever I turned a page, selected an annotation—did anything involving a command. Beginning with a fully charged battery, I was able to use Alice for about 90 minutes.

To my mind, Alice's most significant feature is the large-print option, which simply changes the screen font to an easier-to-read 18-points. Thanks to this, the visually impaired can more freely journey to Wonderland. Amazing how a few hundred extra dots can change a person's view of the world. Applause, Voyager.—JOE HUTSKO

Network-Management and Paging Utility

NetWorks 1.0.1

PROS: Uses little system memory; versatile; flexible. **CONS:** None. **COMPANY:** Caravelle Networks Corporation (613/596-2802; fax 613/596-9659). **REQUIRES:** Mac Plus; System 6.0.5. **LIST PRICE:** 20-device version $495; unlimited devices $1195; TCP/IP Protocol unlimited devices $1995.

MW ★★★★★

SO YOU GET THIS SOFTWARE TO monitor your busy network. The box pictures an executive type sitting at a table with a steaming cup of coffee and a pager in her hand. She looks relaxed, in control. Immediately you think, "What do I have in common with this woman? Not a bead of sweat rolls down her face." After using NetWorks, I know why she is so imperturbable—NetWorks works. It's easy to use, flexible, and it doesn't require a lot of system resources.

The main window has six buttons that enable you to quickly configure NetWorks: Add, Remove, Start, Stop, Get Info, and Attach. When you click on the Add button, NetWorks quickly scans the network for network devices. Built-in, customizable filters let you select only the devices you want to add. On-screen status lights indicate if devices are Up, Down, Not Tested, or On Hold (useful for out-of-service equipment).

Waiting for that Down indicator to flash is obviously impractical. NetWorks' alternative is to attach a notification to any or all of the selected network devices. There are six notification methods: a simple message on your computer; an electronic message sent via modem; a recorded message; an audio message; an E-Mail message; and a pager notification. You can customize notification messages, or use NetWorks' default message, which includes the device name, the zone, and the time the device went down. These messages can be collected in a log or exported to a spreadsheet, database, or word processor for detailed evaluation of equipment performance.

The Big Picture NetWorks' main document window transforms you into a network demigod with omnipresent capabilities over network devices.

You can decide when and how often you want to be disturbed . . . er, ah . . . notified—when the network device or service goes down, goes up, or both. You can set notifications to go off at different intervals depending on the importance of a device. For example, for a rarely used printer you could set NetWorks to notify you with a screen message after 5 minutes and a pager message when the device is down for 30 minutes. For a critical file server you have to set an immediate notification via pager.

I used the Motorola Advisor paging service (approximately $20 per month) with NetWorks and it was terrific. After working out a few technical problems with the paging company (setting the baud rate, for example), I felt I knew exactly what was happening on the network at all times. If you decide to use a pager with NetWorks, I suggest an alphanumeric pager that allows a few lines of display; a strictly numeric pager doesn't give you enough information.

NetWorks uses only 256K of RAM, although it allots 512K, and it can run in the background under MultiFinder, or be hidden in System 7.

The documentation is concise and well written; the baud rate information should be included in the manual, however. NetWorks might seem pricey, but eliminating end users' calls makes it worth its weight in gold.—MATTHEW R. CLARK

Arcade-Style Game

Creepy Castle

PROS: Clever use of classic Hollywood horror films; good manual. **CONS:** Poor performance; limited scenarios; copy protection. **COMPANY:** Reactor (312/573-0800). **REQUIRES:** Mac Plus; System 6.0; hard drive. **LIST PRICE:** $49.95.

MW ★★

WHILE I LIKE THE IDEA BEHIND Creepy Castle—combating early Hollywood black-and-white horror-movie ghouls in order to save the beautiful (if scantily clad) woman kidnapped by the mad doctor—I didn't much like playing the game. The author, Bill Appleton, who is best known for his HyperCard and SuperCard accomplishments, has built performance delays into your stockily built character, Melvin "T-Bone" Powers, that make for less-than-great arcade response. Pauses for punches or cowering spells, where T-Bone gets the heebie-jeebies, leave you helplessly open for attack.

When battling the more ominous creatures, such as the Werewolf, the Bride of Frankenstein, or the Mad Scientist himself, I felt a little like a dog lifted out of a swimming pool—my legs were kicking like crazy, but I wasn't going anywhere. I would give my worthy opponent a Van Damme–esque flurry of punches and flying kicks without anything happening, only to expend all my limited energy like a whirling dervish once the nasty was gone and the keyboard caught up with me.

Creepy Castle has four scenarios: the Woods, where wolves and ravens stalk; the Graveyard, where the dead rise again; the Castle, where vampires haunt the halls; and the Dungeon, where the doctor unleashes his best creations. In addition, the game has four skill levels—beginner, intermediate, advanced, and expert. On the higher levels you face the same nasties—they're just stronger and faster—and Melvin's poor performance is intolerable. If the game were a bit more varied and clever, rather than limited to a few formulaic scenarios, the play would be less frustrating. Your only hope is the banes—such as wolf's bane, holy water, and garlic—which destroy all the opponents in sight. Good luck even picking them up on the expert level.

Bats in this Belfry One holds the key you need to enter the dungeon.

The sound effects, reminiscent of Spaceship Warlock's, are good, and the characters look great (except for the rats—I hate rats—and I'm not so sure about the beautiful woman).

Two other redeeming features are in the manual. Delightful tidbits of horror-movie trivia from 15 Hollywood classics provide the copy protection for Creepy Castle, and four riddles make up the hint list that sheds light on the tricks for defeating the Super Ghoul at the end of each scenario.

Besides the performance issues, Creepy Castle could be improved by adding more scenarios, such as a labyrinth or a tomb, and different tricks for each scenario at the higher skill levels. A special key on the keyboard should be used to pick up banes. And I think a gray-scale version for color and gray-scale monitors would give the game an appearance and feeling more like the old movies.

The folks at Reactor have put out some great stuff, and I look forward to their future offerings; but Creepy Castle's limitations outweigh its merits, and I would not spend my hard-earned dollars on it.—TIM WARNER

Collaborative Software

Aspects 1.01

PROS: Good control of simultaneous multiuser access to documents; offers both individual and linked views of a document. **CONS:** Lacks outlining and spreadsheet modules; limited import facilities for word processing documents. **COMPANY:** Group Technologies (703/528-1555). **REQUIRES:** Mac Plus; any network or a modem; System 6.0. **LIST PRICE:** Version 1.02 $299; 5-pack $895; 10-pack $1295; 100-pack $7995.

MW ★★★

ASPECTS PROVIDES THE TOOLS for a group of 16 workers to collaborate and generate ideas over a network, or for 2 participants to work together via modem. Participants can work with text and bitmapped or object-oriented graphics. Changes made to Aspects documents automatically appear to all the participants in the current session. You can create documents during a session, or you can import Microsoft Word (versions 3.0 and 4.0), MacWrite II, MacWrite 5.0, ASCII, PICT, and MacPaint files.

The organizer, or moderator, of a session decides who participates and to what extent each participant can change the document. The moderator chooses one of three mediation levels: Free For All, Medium, and Full. The Free For All level lets all participants edit a document at the same time. Medium mediation allows only one participant at a time to edit a document, although participants can edit other documents belonging to the session while someone is editing the main document. Full mediation allows only one participant at a time to make changes to any of the Aspects documents belonging to the session. The moderator decides who can edit a document and can assign or withdraw edit control.

When you're working in Full or Medium mediation, icons appear in a floating Conference Tools window to let you know whether or not you can edit the document. An upraised hand means it's not your turn to edit, the pen-in-hand means you can edit, and a closed pen means you cannot edit the document. To request edit control, you click on the closed pen. A list of participants can be displayed as a pop-up menu from within the Conference Tools floating window.

Having several people edit one document is chaotic. Aspects gets around this problem in several ways. Each participant uses a unique pointer that appears to the other participants; unfortunately, you can't tell which pointer belongs to whom. Aspects also limits multiuser editing according to the type of document being worked on. If you're working in Free For All level on a word processing document, only one user can work in a given paragraph at a time; in a Draw document, the object one participant is working on cannot be altered by other users till the first person is done with that object (in a Paint document, however, there is no such locking).

Participants see only one screenful of the document they are working on, even though other participants might be working on other sections of the same document. But to ensure that all participants are viewing the same thing, Aspects has a Linking Views option. With Linking Views invoked, the person editing a document controls the other participants' screen—as the editor scrolls through a document, the other participants' windows scroll accordingly.

Aspects presents a reasonably-easy-to-understand interface for group work and handles many joint-editing conflicts. Aspects is best for preparing reports and simple presentations that require a group effort. It provides limited support for brainstorming sessions, since it includes no outlining functions. Reports creation is also limited, since Aspects has neither a table function nor a spreadsheet-import option. If you plan to do lots of brainstorming or need to use other programs, such as a spreadsheet, using Farallon's Timbuktu is a better choice. —DAVE KOSIUR

Now Available!
MACDRAFT® FOR WINDOWS

CHOOSE THE RIGHT TOOL FOR THE JOB.

Every toolbox has a variety of tools. And each one has a different purpose. You wouldn't use a screwdriver to drive a nail, so why use an artistic program to do your technical drawings?

If you need to do artistic illustration, it makes sense to look at one of the artistic programs shown here. But if you do technical illustration, MacDraft's the right tool for you.

MacDraft is designed specifically for architectural/engineering design & drafting and technical illustration. It provides you with a complete scaled drafting environment designed to respond quickly and accurately to the way you think and work. You can create multi-layered drawings and even assign a different scale to each layer to create details. As you switch between layers, MacDraft will automatically display the sizes of objects, dimension lines and area calculations in the units of that particular layer. You can also create custom line styles and store commonly used graphics in user-created symbol libraries.

When it's time to get your technical drawings done, you need a tool designed specifically for the task at hand. You'll find MacDraft's finely crafted drawing tools incredibly easy to use, powerful and amazingly accurate. In addition, most tools provide a number of options that will allow you to tailor the tool to meet your drawing needs. For example, with a simple click of the mouse, you can choose to draw arcs by their radius, any 3 points or even draw an elliptical arc.

So for your technical drawing needs, choose the tool that was designed specifically for the job. MacDraft. For your Macintosh® and now available for Windows.

idd
Innovative Data Design, Inc.

Call Innovative Data Design at 510.680.6818 for more information or to order a Demo Disk.

MacDraft is a registered trademark of Innovative Data Design, Inc. Macintosh is a registered trademark of Apple Computer, Inc. Windows is a trademark of Microsoft Corporation.

For information on MacDraft for the Macintosh:
Circle 129 on reader service card

For information on MacDraft for Windows:
Circle 229 on reader service card

Look It Up!

BY DAVID POGUE

THE CONDEMN ALOFT, SWALlow it or nay, is what you blarney anon you suffer a brace of Raincoat thesauruses whorish on *this* doom.

The sentence above, believe it or not, is what you get when you let a couple of Macintosh thesauruses loose on *this* sentence. Which just goes to show ya: you are still the brains of the operation; an electronic reference book can only make suggestions.

But lately, companies are making a lot of dictionaries, and the dictionaries are getting smarter. These online dictionaries and thesauruses are abridged, of course, so as not to completely engulf your hard drive; otherwise, they're twice as good as their physical counterparts—faster, easier to use, and paper-cut–free.

American Heritage Electronic Dictionary

THIS ELECTRONIC DICTIONARY/THEsaurus desk accessory (Wordstar International, $99) was obviously prepared by some big-time word nerds: the definitions are generous, juicy, and painstakingly crafted. Entry words are in bold, parts of speech are italicized, and there's plenty of what graphic designers call white space in the window, making AHED the easiest-to-read dictionary on the market. Like all electronic references, AHED also lets you look up a word *within* a definition by double-clicking. Or click on Thesaurus, and get a screenful of synonyms (see "Words at Work"). You can also work in reverse, for those moments when you know there's a word for something, but your brain's just not operating—you can type in a couple of words you think would be in the definition (like *influence* and *payment*), and let AHED find the entry for you (*kickback*).

AHED's Mac integration, alas, has some woeful drawbacks. For example, its nine files (3MB total) must live in the System Folder—loose and cluttery. More astonishing: AHED has virtually no interaction with your word processor. (Other programs can look up a highlighted word in a document, and automatically replace it with a synonym you select.) You can copy and paste single words to and from AHED, but—and this is a big but—you can't copy *definitions*.

Still, AHED remains the word lover's dictionary of choice—with its built-in anagram maker (which tells you that *emanate* is a scrambled *manatee*), how could it not be? And believe it or not, AHED is the only electronic dictionary that shows you pronunciations—a critical feature for those of us who talk.

Funk & Wagnalls Standard Desk Dictionary

THE FUNK & WAGNALLS (INDUCTEL, $79.95) has no thesaurus, anagram module, or pronunciation guide. (You really miss that pronunciation guide, too—how else do you settle the argument about whether it's *har*ass or ha*rass*?) It displays a glitch or two under System 7. And this dictionary, like AHED, requires you to type (or paste) the word you want defined—it can't look up a highlighted word unless you're in System 6 and MultiFinder. (A new version is en route, which has System 7 features, autolookup of a highlighted word, and that anagram thing.)

Sounds wretched, right? It's not. Its definitions are less attractively displayed than AHED's, but there are many more entries—nearly 5.5MB's worth. (Inductel claims it has 103,000 definitions, but I stopped counting at around 25.) You get to choose the font for the display. And F&W searches are much quicker than AHED's.

Finally, Inductel includes a set of secondary dictionaries that give the F&W more breadth than its rival: Computer Terms, Gazetteer (place names), Abbreviations, Biographies, and so on. The entries therein are a bit abrupt (United States: "country, North America; pop. 226,545,805; cap. Washington."), but they're nice to have online. If you're a System 7 user, steer clear until the update appears; if not, get AHED for eloquence and the thesaurus, or F&W for speed and word count.

Electronic dictionaries and thesauruses get language under control

Word Finder Plus 4.0

WOULD YOU BELIEVE THAT this 1 million–word thesaurus (Microlytics, $69.95) takes up less than 300K of disk space? I have *no* idea how they did that. But it's the right idea—and the only option for use with a Mac PowerBook.

Highlight a word in any program and choose Lookup from the Word Finder Plus menu. After a moment, a list of synonyms appears, grouped by shade of meaning. Microlytics touts its sophisticated autoinflection feature, which automatically displays words that match the part of speech and tense of the selected word. (In the olden days, a search for *eating* gave you synonyms like *devour*, *munch*, and so on—without the *-ing*.) Sorry to burst Microlytics' bubble, but every thesaurus I could find (except Microsoft Word's) does autoinflectioning.

No, what really makes Word Finder Plus attractive is its smart word selection. While it produces far fewer synonyms than Thunder 7 does, the ones it does display are much more useful. (Even so, in my unscientific test of ten words, WF+ produced almost four times as many synonyms as did Word or AHED.) A simple double-click returns you to your word processor, where the original word is replaced. At 290K and under $70, this is a slick little package.

Thunder 7 1.0.5

WHAT'S A SPELLING CHECKER DOING here? It turns out Thunder 7 (Baseline Publishing, $99.95) is a thesaurus too. It works just like Word Finder Plus, except you get scads more synonyms. They're sort of hard to read, since there are no blank lines between groups, and ugly underlining mars the type. (Yo, Baseline! We use italics now!) But what's nice about Thunder's search results is that the words aren't simply grouped by shade of meaning; each meaning-group gets a definition (as they do in the American Heritage thesaurus).

There are lots of nice things about Thunder-the-spelling-checker, of course—its glossary feature is the coolest—but the thesaurus can be pretty dumb. Some of the thesaurus's synonym-group definitions sound like they

continues

came from a Monty Python skit: for *fish*, the program comes up with "one who is victimized or made to look foolish." For *blood*, Thunder's first definition is "a man who is conspicuously fashionable." And my personal fave: Thunder's first-choice definition of *mouse* is "a woman who is a man's usual or preferred companion." Well, maybe for Mickey. Thunder misses other boats, too—like *boat*, which produces no synonyms at all. (Word Finder Plus offers *vessel, skiff, ship*, and so on.) Sometimes you can find what you are looking for way down the list—and sometimes not (*storm* offers several meaning groups, none of which refers to the weather). I don't know what Thunder 7's thesaurus is thinking, but maybe it ought to read the dictionary.

Rhyme Design 2.1

YES, THERE'S AN IMPERFECT RHYME IN the very title of this rhyming dictionary (Rapture Studios, $89.95). But by golly, the thing really works: type in a word, get a list of words that rhyme with it. If you enter a word with alternate pronunciations, like *wind*, the program smartly asks you whether it sounds like *blind* or *grinned*.

Rhyme Design's most disappointing quirk is that it only rhymes one-syllable words. You can't enter *bubble* and get *trouble*. Then, too, there are some odd missed opportunities: *list* doesn't give you any past-participle rhymes like *missed*. And I guess I have to mention the copy protection, although I understand the impulse—when your market is the handful of Mac-owning lyricists, even one illegal copy can be 5 percent of your potential sales. But hey—in the next version, gimme two-syllable rhymes and better spelled-different/sounds-alike support, and I'll persuade the rest of the handful to buy.

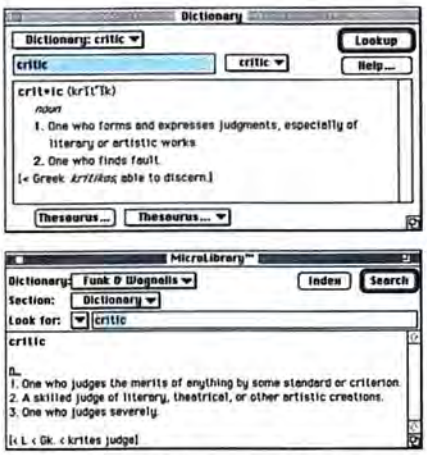
The Random House Encyclopedia 1.0

DIDN'T PEOPLE ALWAYS SAY, "SEE THIS floppy disk? You could fit the whole encyclopedia on one of these"?

WORDS AT WORK

Thesaurus	Meaning groups	Synonyms
Roget's	3.4	70.3
Word	1.2	5.5
AHED	1.2	5
Thunder 7	1.5	25.7
Word Finder Plus	2.1	18.7

Ten words were flung at each program; this table shows the average number of meaning groups and synonyms offered per search. The hardbound *Roget's Thesaurus, Fourth Edition* is shown for comparison (not shown: the *quality* of synonyms). The test results, including the actual words, are downloadable from the Macworld section of America Online.



AHED and Funk Both online Mac dictionaries are excellent for different reasons. The American Heritage dictionary (top) contains a more attractive layout, complete with pronunciation and a direct line to a thesaurus. The Funk & Wagnalls definitions are sometimes more complete, and there are more total entries.

In reality, it takes seven floppies to hold this encyclopedia (Microlytics, $119). It's exactly what you'd hope for: type in a topic, or some keywords, and get a list of encyclopedia entries that match. Considering that the program has several million years' worth of events to cull, the searches are remarkably quick. The articles, though rarely as long as a page, are nonetheless thoughtful, painstakingly nonpartisan, and unbelievably succinct.

Even at 5MB how could a program possibly give appropriate coverage to every major event, person, concept, and place? Somehow RHE comes close; my searches were fruitful about 90 percent of the time. The only holes are some weird choices in recent American culture: entries for Oprah but not Donahue; the Beatles but not Michael Jackson; acid rain but not AIDS. (The encyclopedia is current to 1989.)

You can copy an article to the Clipboard, but it's in that gross format where there's a carriage return at the end of each line. Otherwise, RHE is one Really Handy Encyclopedia.

Correct Quotes 1.0

OH, GIMME A BREAK. WORDSTAR INTERnational is selling a HyperCard stack for $49.95? How good could a famous-quotations stack be?

Well, better than you'd think. Six thousand quotations may not sound like many, but the people in charge of content have made some creditable choices. For each topic (from Ability and Absence through Zeal and Zest), you get a couple screens of quotations (and their authors); profundity outweighs wittiness, but you can find both if you're patient.

Suppose you're writing a speech about the Apple-IBM joint venture, and you want to open with a zinger. You might search for *cooperation*, which would yield this: "Great discoveries and improvements invariably involve the cooperation of many minds" (Alexander Graham Bell). Nah. So you'd check out the *compromise* card, and find "Compromise is never anything but an ignoble truce between the duty of a man and the terror of a coward" (Reginald Wright Kaufman). Hmm. That ought to get them buzzing.

This stack would be four times better if it were twice as well-stocked. Still, you can always add your own choice of quotations and topics; as Charles Caleb Colton said, "Where we cannot invent, we may at least improve."

Microsoft Word 5.0

THE BEST THING ABOUT WORD'S NEW built-in thesaurus is that it's built-in, and you don't pay extra for it. It's extremely simple to use: highlight a word (or don't even bother—Word will look up the word closest to the cursor), choose Thesaurus, and a double list appears. On the left, you see a list of meaning groups (for *water*: *liquid* [*noun*] and *irrigate* [*verb*]); on the right, a list of synonyms for the currently selected meaning (for *liquid: rain, ice, pond*, and so on).

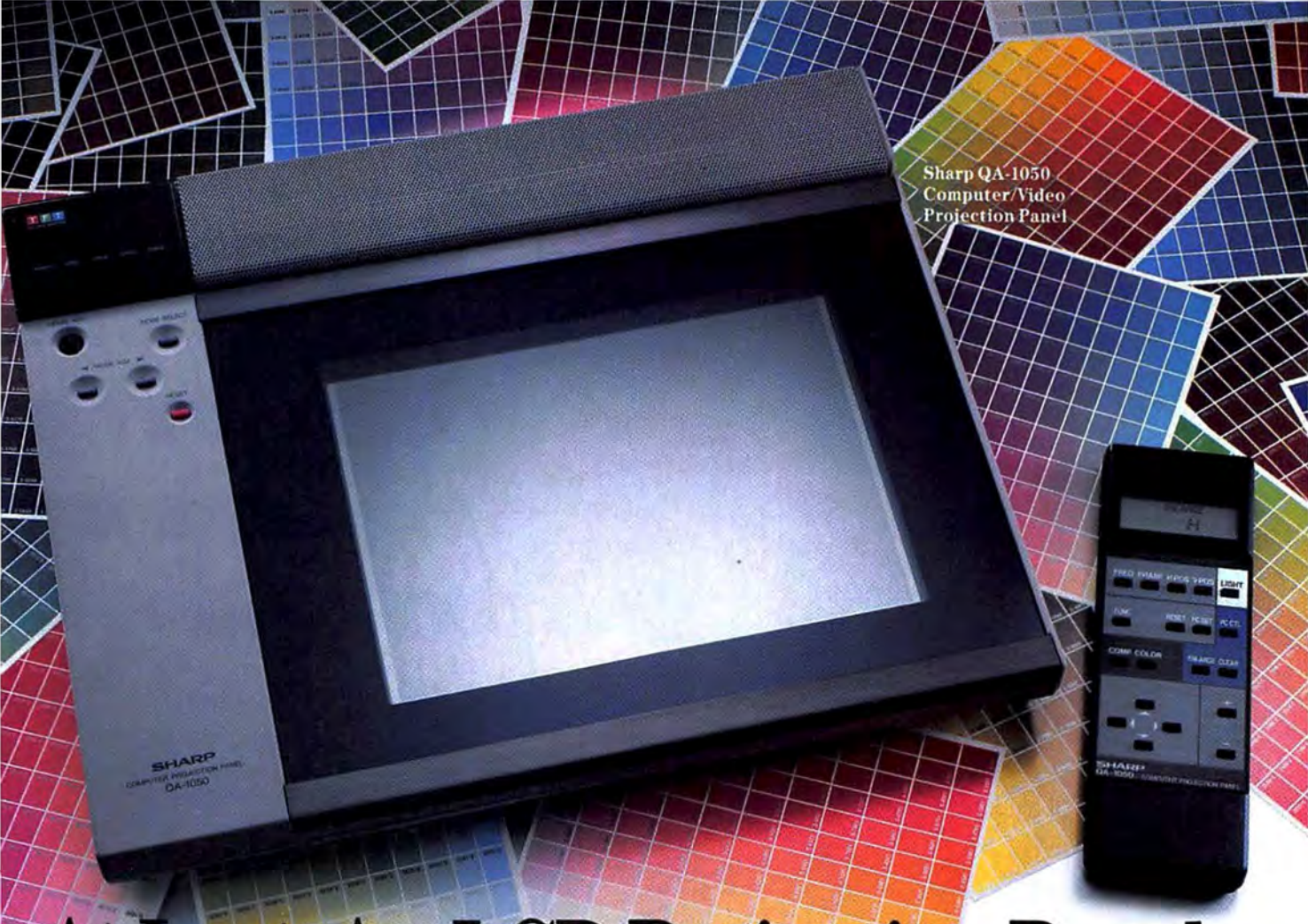
While the synonyms it produces are remarkably usable, Word's thesaurus is highly wimpy in sheer word count (see "Words at Work"); you simply get fewer choices. If you care at all about word power, here's a tip: trash the 386K U.S. English Thesaurus from the Word Commands folder; use Word Finder Plus instead. You get five times as many words—for 150K less disk space.

The Upshot

THERE ARE A COUPLE OF DELIBERATE omissions: BigThesaurus and Spelling Coach Professional (Deneba Software) and Language Master (Franklin Electronic Publishers) are getting major overhauls and weren't available for this column. In the meantime, however, I slightly prefer the American Heritage dictionary, despite its "I don't have to interact" attitude, and Word Finder Plus for a thesaurus. We don't have much market choice in encyclopedias, quotation collections, or rhyming dictionaries—fortunately, there's one of each, and they're just fine (*agreeable, bright, good, pleasant . . .*). **m**

See *Where to Buy* for contact information.

Contributing editor DAVID POGUE is a writer (one who engages in literary composition) and a New Yorker (one who avoids eye contact with strangers).



At Last, An LCD Projection Panel With All The Colors You Need To Get Your Presentation Moving.

The Sharp QA-1050. 185,000 Colors For Crisp Computer Images And Live-Action Video.

Even the most complex multi-media presentations run smoothly with the Sharp QA-1050. Its 185,000 colors and TFT Active Matrix Technology guarantee computer and video images of unparalleled realism. And animated graphics and live-action sequences that move without ghosts and shadows.

The Sharp QA-1050 offers almost universal computer compatibility, including VGA and MAC® II. And, it also offers the convenience of remote control. In short, everything you need to present what no panel could present before: dramatic, true-to-life, full-motion color.

So, contact your local authorized Sharp Industrial LCD Products Dealer for a demonstration or call 1-201-529-8731. Fax 201-529-9636.

SHARP
FROM SHARP MINDS COME SHARP PRODUCTS™

© 1991 Sharp Electronics Corporation, LCD Products Group, Sharp Plaza, Mahwah, NJ 07430-2135
Mac is a registered trademark of Apple Computer, Inc. PANTONE,® Pantone, Inc. Sharp is not licensed by Pantone for color capability.

Circle 47 on reader service card

Super modem!

Xeba Fax/Modems are upgradable to Voice and Caller ID —and higher speeds, too!

"...its looks knocked me out. What a pleasant surprise that it came complete with cables and elegant software... everything I needed to 'plug and play.'" ***—Laurie Reis, MIS Mgr.***

"The Xeba is priced lower than most of the send/receive fax modems now available. With Fax[stf] included, it is a solid buy that'll give you a full range of fax features and a data modem that will perform well—even in a wind tunnel."
—Joseph Schorr, Macworld, April '92

9624 bps Fax/Modem

Everything you could want in a fax/modem. All the style of Xeba—complete with software, cables and power supply. 9600 send and receive fax with 2400 bps/ V.42 bis modem. List: $429

Limited Offer **$199**

96/96 bps Fax/Modem

Save toll and and connect charges with modem speeds of 9600 bps up to 38.4K with V.42 bis and 9600 bps send/ receive fax, plus all cables and software. List: $813

TrueFAX

Limited Offer **$399**

V.32 bis Fax/Modem

Speed through large files at rates from 14.4K bps up to 57.6K bps when connected to a similar modem. 14.4K send/ receive fax capability, software and cable. List: $864

TrueFAX

Limited Offer **$449**

QUICKTEL easy upgrade

PROUDLY MADE IN THE U.S.A.

QUICKTEL™

Call direct (800) 735-6442

MERISEL MACAMERICA
Call 1-800-MERISEL
Call 1-800-535-0900

Quicktel modems from Logicode Technology, Inc., 1817 DeHavilland Drive, Newbury Park, CA 91320 (805)499-4443 Fax: (805)499-8588

©1992 Logicode. Trademarks are property of their respective owners.

Note: We're adding two exciting new capabilities, concurrent voice communication and caller identification. These features are not yet available from any modem manufacturer, but as soon as the technology permits (estimated to be third quarter of '92), we will offer it in an easy upgrade to our Xeba line. Caller identification may not be allowed in all states.

New Products

The Latest Macintosh Releases

EDITED BY EVAN COOPER

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

10T Hub/8
An eight-port 10BaseT Ethernet concentrator that automatically shuts down a bad port when jamming signals are detected, thus isolating network failures. In addition to the eight RJ-45 ports, the product includes a BNC port for connecting thin coaxial cable, and an

10T Hub/8

in/out selectable UTP port for connecting to other hubs using unshielded twisted-pair wiring. $399. Asanté, 408/752-8388; fax 408/734-4864.

16-Inch Trinitron Display
Color monitor that offers a screen resolution of 832 by 624 at 72 dpi, a screen refresh rate of 71Hz, and a universal power supply. The 16-inch display is coated with OCLI anti-glare treatment, has a tilting swivel base, and works with the built-in video on the Quadra 700 and 900, LC, IIsi, and IIci. $1299. Mirror Technologies, 612/633-4450, 800/654-5294; fax 612/633-3136.

16-Inch Trinitron Display

Accel-a-Writer 8000
A laser printer based on the Canon SX print engine and the PhoenixPage PostScript interpreter with a user-selectable resolution from 300 by 300 pixels to 600 by 600 pixels, and 35 resident fonts. The printer incorporates the company's Virtual Disk technology, which uses the product's 512K of onboard memory as a virtual disk to store additional fonts. It also has a SCSI port for adding a hard drive, and comes with 6MB of RAM upgradable to 16MB. $4495. Xante, 205/476-8189; fax 205/476-9421.

Acecat
A digitizing tablet that uses electromagnetic inductive technology and supports resolutions of up to 1000 lines per inch. Product weighs 1.2 pounds and comes with a stylus for use on the

Acecat

tablet; a serial interface cable; and a 5-volt power adapter. $149. Acecad, 408/655-1900, 800/676-4223; fax 408/655-1919.

Art-Getter
A three-pass charge-coupled device (CCD) scanner that scans line art at up to 2400 dpi and in 24-bit color and gray-scale at 600 dpi. The device is built around a UMAX Technologies scanner engine and takes documents up to 8½ by 14 inches. Adobe Photoshop 2.0, Adobe Streamline, a driver for Caere's OmniPage, and a plug-in module for Photoshop are among the software included. $2795. DPI Electronic Imaging, 513/474-4028; fax 513/474-4028.

BridgePort EX
A board that fits into the expansion slot on the HP LaserJet IIISi printer to allow nonnetworked DOS PCs, networked PCs, and Macintoshes on EtherTalk or AppleTalk to share the same printer. The board features Automatic Lan-

BridgePort EX

guage Switching, a technology that determines whether an incoming print job is PostScript or PCL and automatically configures the printer to the appropriate language; product also supports 10BaseT and thin-coaxial connections. $995. Extended Systems, 406/587-7575, 800/235-7576; fax 208/377-1906.

CirrusOptical
External, magneto-optical drive that uses cartridges that are identical in size to a floppy disk, but each has a 128MB capacity. The company claims the drive has a 45ms average seek time. Includes Silverlining drive-management software, 5MB of public domain shareware, and one blank cartridge. $1699. La Cie, 503/691-0771, 800/999-0143; fax 503/691-5590.

DOSFloppy Drive
An external SCSI floppy drive that allows the Macintosh to access files from 1.2MB and 360K 5.25-inch DOS-formatted floppy disks. Using AccessPC and SoftPC from

DOSFloppy Drive

Insignia Solutions, the user can read and write directly to DOS-formatted disks using a Mac. $599. PLI, 510/657-2211, 800/288-8754; fax 510/683-9713.

EN+
A multiport Ethernet wide-area network router for integrating remote LocalTalk and EtherTalk networks into an existing backbone; router can connect up to four remote locations via digital phone services. User can choose between 10BaseT and BNC Ethernet connections on the unit, and wide-area connections are made via standard V.35, RS-232, RS-449, and X.21 interfaces. The

EN+

box is based on a Motorola 68000, has a battery backup to protect the unit's memory, and uses programmable gate arrays for hardware upgrades. From $2995, depending on number of ports. Engage Communication, 408/688-1021; fax 408/688-1421.

Fax2800DI
A plain-paper laser fax machine that can serve as a stand-alone Group III fax, or as a fax terminal on a network with the use of Ricoh's ImageNet software (available for $395). For network use, the fax machine communicates at 19.2 Kbps and can use a networked computer's memory for tasks such as automated document distribution, and image storage and retrieval. The product has a 126-number autodialer and a 30-page automatic document feeder and prints at resolutions up to 196 by 392 lines per inch. $4995. Ricoh, 201/882-2000; fax 201/882-2506.

Flex 8 LC and Flex 8 si
8-bit graphics boards for the Mac LC and IIsi that provide 16 different sets of resolutions up to 1152 by 882 pixels and that support monitor sizes of up to 21 inches. The boards feature hardware-based pan and zoom, allowing the user to enlarge images on screen by up to 200 percent above an application's enlargement capabilities, and display 256 colors or shades of gray. $999 each. Nutmeg Systems, 203/966-3226, 800/777-8439; fax 203/966-7972.

HP EtherTwist 28692A ThinLAN Hub Plus
A multiport, thin-coaxial repeater for use in Ethernet and IEEE 802.3 local area networks; supports SNMP/IP and IPX-based network management. The hub has nine thin-coaxial ports and one AUI port for connection to thin- or thick-coaxial, fiber-optic or twisted-pair cables. Status LEDs on the device aid in troubleshooting; using SNMP-based network-management applications from HP or other vendors, network managers can configure, monitor, and control the hub remotely or from a station on the network. $2900. Hewlett Packard, 415/857-1501, 800/752-0900.

IDSQ Series
External, removable-cartridge drives with Winchester drive mechanisms, available in 44MB and 88MB formats with a 1:1 interleave ratio. The 5¼-inch drives feature a 20ms average seek time, according to Identity, and a 1-year warranty. 44MB $999; 88MB $1499. Identity Systems Technology, 214/235-3330, 800/723-8324.

Infinity MaxOptical 1GB
Magneto-optical drive that uses a proprietary method of disk formatting called zoned constant angular velocity (ZCAV) that allows the drive to use 1GB cartridges; drive also accepts standard ISO/ANSI 600MB cartridges. Using ZCAV, the drive adds more sectors of information to the storage medium's data tracks as they get farther from the center of the platter, allowing for the 1GB capacity. The company claims the MaxOptical has an average access time of 48ms. $5699. PLI, 510/657-2211, 800/288-8754; fax 510/683-9713.

LM-300
A hand-held laser bar-code scanner that connects through an ADB port and weighs less than 11 ounces. Software allows the user to program prefix and suffix characters and bar-code formats. The device sends scanned bar codes directly

continues

to any application. $1395. TPS Electronics, 415/856-6833, 800/526-5920; fax 415/856-3843.

LM-300

MacRecorder Sound System Pro
System for use with Macintoshes with a 68020 or faster processor. Includes a MacRecorder (audio digitizing hardware) and SoundEdit Pro (software for recording, editing, and integrating sound into other applications). Software enables user to record directly to disk, input sound from any device compatible with the Macintosh Sound Input Manager, save sounds at 8-bps or 16-bps sample sizes, and sample sounds at any rate up to 48kHz. $349. MacroMind Paracomp, 415/442-0200, 800/248-4477; fax 415/442-0190.

MicroPorte 4232bis
A V.32bis portable modem that weighs 10 ounces and that company claims can achieve throughputs of up to 38,400 bps. Product supports MNP 10 protocol, which regulates transmission speed and packet size, allowing the modem to stay connected over poor-quality cellular or land-based lines. The modem also supports MNP 2–4 error control, MNP 5 and V.42bis data compression, and other modulation standards. Includes an AC power pack and rechargeable batteries. $899. Microcom, 617/551-1000; fax 617/551-1007.

MicroPorte 4232bis

MMU/LC
A Memory Management Unit (MMU) board for the Mac LC; supports virtual memory and can be equipped with an optional math coprocessor. The board can be disabled from the Mac's Control Panel. $149; with math coprocessor $248. System Technology Corp., 904/428-0411, 800/638-4784; fax 904/428-0765.

Nexus fx
A 68030 accelerator with a clock speed of 50MHz or 55MHz, a 128K SRAM cache, and a 68882 math coprocessor also running at 55MHz. Both the 68030 and the 68882 have heat sinks, and the RAM cache is matched to the 55MHz clock rate. Accelerator must be factory-installed by company. 50MHz version $895; 55MHz version $1295. Perspect Systems, 310/821-7884, 800/736-1546; fax 310/827-5360.

Phaser II PXe
A color thermal-wax transfer printer that implements Adobe Systems' PostScript Level 2 software, prints at 300 dpi, and has parallel, serial, and AppleTalk ports so the printer can be shared over a network. The printer also supports HPGL and ships with TekColor PS, a software utility that improves the color accuracy of output from common applications. The printer can be upgraded for Ethernet connectivity by installing the company's 4511A interface. Comes with 17 Adobe fonts and 4MB of RAM; can be upgraded to 8MB for an additional $995. An optional font SIMM with 22 more Adobe fonts is priced at $595. $4995. Tektronix, 503/685-3585, 800/835-6100; fax 503/685-3063.

Phaser II PXe

Plus Drive
A high-density, 3½-inch external disk drive that formats, reads, and writes 1.44MB, 800K, and 400K Macintosh disks. Drive does not need the SWIM chip upgrade required when installing an Apple SuperDrive. Device uses a Sony drive mechanism and also works with 720K and 1.44MB MS-DOS–formatted disks using a Mac-to-DOS transfer program. $449. Applied Engineering, 214/241-6060, 800/554-6227; fax 214/484-1365.

Plus Drive

Pocket BulletModem P9696MX
A 6½ ounce, wallet-size portable modem that sends faxes and data at 9600 bps and supports V.42bis, V.32bis, V.22bis, v.22, and MNP 2–5 protocols. The device also supports MNP Class 2 and 3 faxes and comes with QuickLink fax software. The modem can be powered by an AC adapter or batteries. $745. E-Tech Research, 408/730-1388; fax 408/730-2488.

Quicktel M9696XV
Send/receive fax and data modem (both at 9600 bps) that supports V.32, V.42, V.42bis, and MNP 5 protocols. Eight lighted icons on the modem's front panel display modem status information. Comes with Faxstuff and QuickLink II communications software and is available in black or platinum gray. $599. Logicode Technology, 805/499-4443; fax 805/499-8588.

Quicktel M9696XV

ScanMate
A color drum SCSI scanning device that scans at 2000-dpi, providing 4096 shades of gray and 36-bit output. The product can scan art from 35mm to A4 (8.25-inches by 11.63

Used Regularly, Prevents Unwanted Conflict Build-up.

Why wait for your Mac to bomb when you can keep it running smoothly with Help!™? Help! is a configuration problem solving utility. It's the first intelligent Macintosh program which pinpoints conflicts, incompatibilities, and other problems and tells you how to fix them.

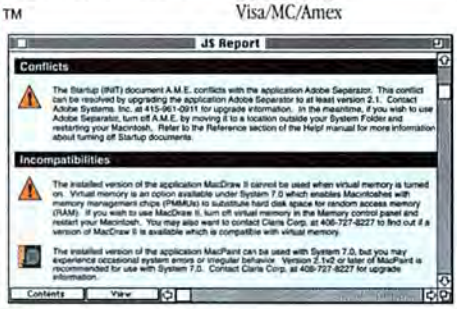
With Help!, you can improve the efficiency of your Macintosh and avoid disastrous system crashes. It's like having a Mac expert right at your desktop!

Help! uses its SMART Teknology™ expert system to draw upon a built-in knowledgebase of problem information covering over 2,200 Macintosh software and hardware products.

Help! detects and helps solve: Startup document conflicts • Incompatibilities between hardware, system software and applications • Improperly installed files • Memory problems • Insufficient disk space • Damaged files • Duplicate files.

The sooner you get Help! the sooner your Mac will run at peak performance. Single user version just $149. To order call: **1-800-873-3494** Outside the U.S., call: 813-620-3494 Visa/MC/Amex

Help!™ Every Mac User Needs It.



"This impressive technical-support program belongs in the shirt pocket of every system administrator." – MacUser Magazine 4/92 ★★★★

Teknosys inc.
3923 Coconut Palm Drive
Suite 111
Tampa, FL 33619

Circle 142 on reader service card

-inches) format and can take negatives, transparencies, reflected art, and line art as input. Software includes a plug-in for Photoshop and ColorStudio that allows scans to be input directly into these programs and lets the user adjust scanning parameters in a low-resolution preview phase. $29,995. Danagraf, 314/535-8807, 800/535-7689; fax 314/535-9829.

ScanMate

Spectra Star Model 450
A color thermal-wax printer with a built-in 32MB hard drive and a desktop film recorder attachment that produces PostScript-compatible 35mm color slides. The product is based on a RISC processor and also prints 300-dpi color prints and overhead transparencies. $14,990. General Parametrics, 510/524-3950; fax 510/524-9954.

SupraFaxModem V.32bis
Fax and data modem with Group III fax compatibility, MNP Class 1 and Class 2 commands, and a data-transmission rate of up to 14,400 bps. Modem also supports V.42bis, MNP 2–5, and MNP 10 data-compression and error-correction protocols. The status display shows up to 25 different messages, and a firmware upgrade scheduled for release in mid-1992 will enable modem to include voice and caller-ID features. $399.95. Supra Corp., 503/967-2400; fax 503/967-2401.

TokaMac ci 25i
Processor Direct Slot (PDS) accelerator for the Mac IIci; utilizes the 68LC040 version of the Motorola 68040 processor (the 68LC040 does not include a built-in math coprocessor). The product installs in the cache slot of the IIci, has an on-board cache, and processes 20 MIPS. Three software programs included in the package let the user control the board's functions

TokaMac ci 25i

and switch between the board's 68040 and the host computer's 68030. $1695. Fusion Data Systems, 512/338-5326; fax 512/794-9997.

Triam Grayscale Monitor
A gray-scale, 15-inch monitor with a 680-by-870-pixel (80-dots-per-inch) resolution and a refresh rate of 75Hz. The product comes with a 4-foot video cable and a 1-year warranty; monitor is compatible with power sources from 110V to 230V AC. $499. APS Technologies, 816/478-8300, 800/235-2752; fax 816/478-4596.

TVT-3000
An active matrix LCD projection panel that can display 262,144 colors with a 640 by 480 resolution and a contrast ratio of 100:1. The product features a built-in loop-through function (so the user can see the image on the monitor and the projection screen simultaneously), a remote control for image adjustments, and on-screen setup menus. $5995. In Focus Systems, 503/692-4968, 800/327-7231; fax 503/692-4476.

Viper Drive
A floptical disk drive that is capable of reading and writing high-density (1.44MB) disks as well as very-high-density (20MB) floptical disks. Available as an internal version for the Quadra 900 and an external SCSI version. The product comes with the necessary cabling on the external version, plus one preformatted floptical disk. The driver software included allows the user to configure media diagnostics, change the drive's interleave ratio, and partition and password-protect the drive. Internal $595; external $695. Second Wave, 512/343-9661; fax 512/343-9663.

SOFTWARE

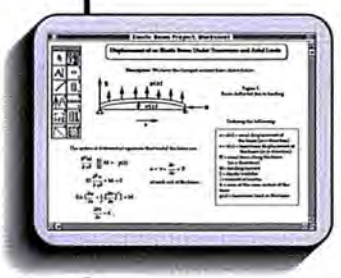
Business GuardDog
A collection of over 60 policies and procedures designed to help managers uncover and prevent business losses from employee carelessness and theft. Policies are geared specifically toward manufacturing and distribution companies and cover a variety of operations including accounting, data processing, inventory, and shipping. Information is presented in 16 chapters that are formatted and saved in popular word processing programs so the text can be edited and pasted into company employee manuals. 1MB min. memory. $159. Jian Tools for Sales, 415/941-9191, 800/346-5426; fax 415/941-9272.

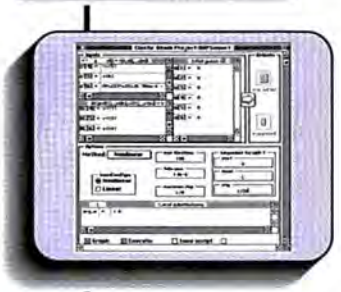
CAD to Mac
An application that imports HPGL plotter files from any CAD package and converts them into PICT format for pasting into other programs. The software can print imported files and has editing capabilities that include image rotation, dragging, and resizing. Product includes a serial cable and an adapter for connecting CAD stations on other platforms to the Mac. 1MB min. memory. $495. Celect Software, 513/733-6300; fax 513/733-6365.

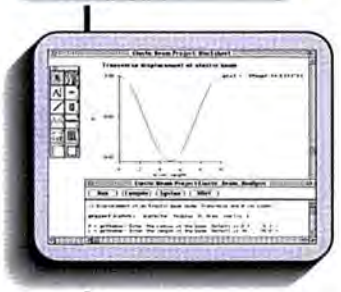
CameraMan
An INIT that allows a user to capture screen activity into a QuickTime or PICS file for use in training, instructional media, and product demonstrations; the product records screen activity, including menu access and cursor movements, and works in all color modes and on all screen sizes. Movies can be captured at frame rates up to 30 frames-per-second and can include the full screen, a selected screen area, or a selected area around the cursor. 2MB min. memory. $149. Vision Software, 408/748-8411, 800/800-8476; fax 408/748-9584.

Cinemation
An application for creat-

continues







ENGINEERS & SCIENTISTS: SIMPLICITY IS POWER!

HiQ is the first software environment that integrates all the tools you need to solve Real World engineering problems:

- The Project Worksheet interface, which lets you organize and link everything you create in HiQ.
- Over 600 built-in functions.
- Problem Solvers™, graphical interfaces for solving most standard applied math problems.
- HiQ-Script™, a new structured "4GL" programming language for engineers.
- The Grapher™, a real-time 2D & 3D interactive graphical editor.

HiQ is available for your Macintosh for just $695.

Call 1-800-488-8662 today!

HiQ™

Bimillennium

First in Power Computing Software

Bimillennium Corporation
101 Albright Way
Los Gatos, CA 95030

AVAILABLE NOW!

Actual screen shots from top:
1) HiQ's Project Worksheet is a dynamic, interactive, multipage project document.
2) HiQ's Problem Solvers automatically generate HiQ-Script code along with numerical or graphical results to a problem.
3) HiQ dynamically links HiQ-Script to all data in a project.

Circle 233 on reader service card

ing interactive presentations with animation, sound, and QuickTime movie clips. Software includes a 24-bit paint program, a stand-alone application for playing back Cinemation movies, and a MovieWindow XCMD for playing and controlling presentations from within HyperCard. The program's AutoMotion feature lets users import Microsoft PowerPoint and Aldus Persuasion files and add motion to them, and a ghosting command displays any series of movie frames through a transparent easel so the user can paint in-between frames or align objects in context. Comes with 12MB of clip animation, templates, and sounds. 1MB min. memory. $495. Vividus Corp., 415/494-2111; fax 415/494-2221.

CMaster
A program that installs into Think C version 4.0 or 5.0 and adds tools for editing code in C, including an icon bar, a menu bar, and keyboard commands, all of which can be customized. The program also allows you to add markers to code, save window positions in memory, and has parenthesis-kissing capabilities. 2MB min. memory. $69.95. Jersey Scientific, 212/736-0406; fax 212/947-4981.

Communism and the Cold War
An interactive educational videodisc with accompanying software that was developed by ABC News InterActive and the Florida Department of Education. The videodisc provides information on communism in Eastern Europe and the former Soviet Union and a chronology of events leading to the breakdown of communism in these regions. It also includes case studies on regional conflicts and proxy wars, and it has a video glossary as well as biographical information. The videodisc is narrated in Spanish and English and is close-captioned for hearing-impaired students. It includes bar-coded lesson plans and a printed directory. $618.75. Optical Data Corp., 908/668-0022, 800/524-2481; fax 908/668-1322.

Communism and the Cold War

DateBook
A personal organizer that creates and organizes to-do lists, has scheduling and reminder features, and can search and print. The product integrates with the company's contact-management application, TouchBase, to import contact information from existing TouchBase files. Schedules can be viewed by year, month, week, and day, and in text, Gantt chart, or time-bar format within each view. 2MB min. memory. $125. After Hours Software, 818/780-2220; fax 818/780-2666.

FaxOCR
A software package that recognizes faxes received at both 200-by-200 and 200-by-100 resolutions, and converts them to text format. According to press materials, the product converts a one-page document to text in less than 30 seconds. Converted documents can be saved in Word, PageMaker, and other popular formats. 2MB min. memory. $199. PSI Integration, 408/559-8544, 800/622-1722; fax 408/559-8548.

Font Sampler
A program that runs in HyperCard 2.1 (included) and lets the user print out sample sheets and keyboard maps for any fonts that are installed in the user's system. Sample sheets can be customized to contain a phrase of the user's choosing. 1MB min. memory. $19.95. Daedalus Scientific Software, 718/423-3881; fax 718/423-3881.

FrontCard
A HyperCard-based programmer's tool for creating front ends for mainframes that includes a 3270 terminal emulator and XFCNs and XCMDs for the development of HyperCard applications. The functions provided in the package are 3270-specific and let the user transfer files, modify terminal settings, remap keyboards, read and write function keys to the host session, and check for host error messages. The software requires a MacMainFrame Workstation or Gateway product tooperate. 4MB min. memory. $2495. Avatar Corp., 508/435-3000; fax 508/435-2470.

Half-QWERTY
Software for configuring a standard Macintosh keyboard to work as a one-handed keyboard by superimposing the keys on the right side over the keys on the left in a mirror image. By pressing a modifier key, user can switch between left- and right-side keys. User can touch-type with one hand while using the mouse with the other. 2MB min. memory. $79.95. The Matias Corp., 416/749-3124.

Heaven & Earth
A game with three segments that can be played separately or combined to form a fourth module called The Pilgrimage. The three modules are the Heaven&Earth card game based on the Japanese game Hanafunda, played with 48 cards of 12 suits; The Illusions, which has four levels, each having 13 types of brainteasers; and The Pendulum, a series of 12 animated simulations. 1MB min. memory. $59.95. Buena Vista Software, 818/841-3326, 800/688-1520; fax 716/873-0906.

Heaven and Earth

IcePick
A view editor and development environment that allows MacApp programmers to quickly see and change view hierarchies, run programs to test views, and select multiple objects. This prototyping

Rub lamp and say:
"I want vivid color from an affordable printer."
"I want vivid color from an affordable printer."
"I want vivid color from an affordable printer."
If that doesn't work call 1-800-835-6100, Dept. 22C.

The Phaser™ II PXe color printer produces 16.7 million of the world's brightest, most vivid colors. It prints at 300 dpi onto transparencies or paper using PostScript Language-Level 2. It works with PC or Mac applications, it's fast, it's networkable and at $4995, unexpectedly affordable. Rub for awhile, then call.

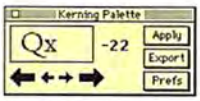
Tektronix

Circle 143 on reader service card

tool also lets users align objects, use constrained dragging tools, and use the arrow keys to nudge objects and views 1 pixel at a time. 1MB min. memory. $149.95. ExIS, 415/493-2000; fax 415/855-9222.

Incubator
A program that allows the user to create customized TrueType fonts by modifying existing ones. The user can adjust a font's lightness and darkness, width, contrast, and slant; the application then styles the new font and saves it as a TrueType file. The application can also read .AFM metric data and apply it to any font, or create new .AFM data for newly created fonts. 2MB min. memory. $149.95. Type Solutions, 603/382-6400; fax 603/382-4839.

The Kerning Palette
A QuarkXtension that allows the user to edit kerning tables for fonts from within QuarkXPress using a floating palette that displays selected letter pairs with their current kerning value and lets the user edit the values for problem pairs. Modified kerning tables can be stored in suitcase files or in the XPress preferences file



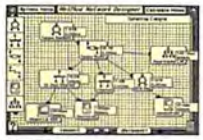
The Kerning Palette

using Quark's proprietary method of storage. Tables can be output as text files. 4MB min. memory. $295. Clearface, 212/529-4362, 800/538-6779; fax 212/673-0114.

LibraryBrowser
An online public-access program designed to replace traditional card catalogs and assist users in searching library catalogs built with LibraryWorks. The program accepts full Boolean searches of call numbers, authors, titles, subjects, and keywords. Records can be displayed in card format or in short, medium, or long report formats. After the program has been inactive for a predefined length of time, all fields are automatically cleared. A lock feature prevents users from quitting the program without a password. 1MB min. memory. $195. Caspr, 408/446-3075, 800/852-2777; fax 408/446-1574.

MacNumerics-II
An application that allows the user to input data using mathematical notations found in textbooks and create graphs that can be edited, labeled, exported, and printed. Online help screens and a Show Steps function aid students in understanding mathematical concepts and problem solving. Program can graph conic sections, matrices, polynomials, and polar equations, among other things. Designed for use by high school, junior college, and university students. 2MB min. memory. $289.95. Spring Branch Software, 319/927-6537.

NetMod
A network modeling tool that enables network designers to generate complex configurations and evaluate a variety of design alternatives. The program was created in HyperCard and comes configured with the operating characteristics for numerous network technologies as well as vendor-specific network devices. NetMod applies mathematical models that use closed-form analytical techniques to calculate component utilization, throughput, and packet delays, and it can create model networks with


NetMod

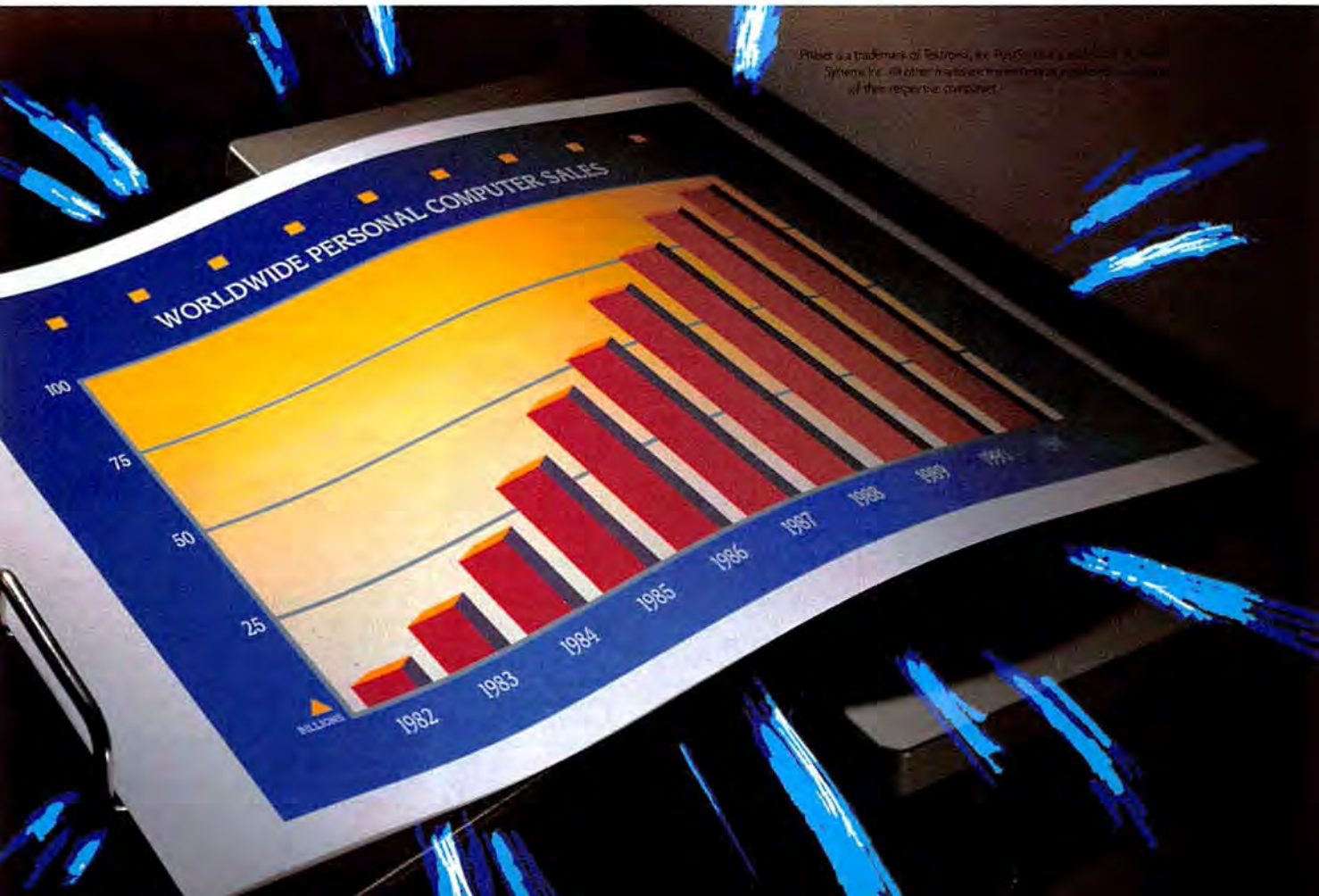
more than 50,000 nodes. 1MB min. memory. Single-user versions are $250 for academic users and $500 for commercial users. University of Michigan Software, 313/936-0435; fax 313/936-1330.

Office-Wiz
Office-management software with 16 modules designed to handle all computerized tasks for a small office. Functions include the ability to track clients and projects, schedule and record activities, monitor time for billing purposes, generate management and accounting reports, and print checks. The program also has bookkeeping and accounting capabilities, creates multiple invoices, and prints form letters and envelopes. 4MB min. memory. Single user $695; multiuser package $1495. Oryx Associates, 415/563-9971; fax 415/563-0238.

PacerForum
A conferencing application that runs as a desk accessory for distributing information, group brainstorming, collaborative design, and project planning; essentially works as a local bulletin board service. The conference area is organized into a set of bulletin boards—each with one or more supervisors. Users can arrange and view bulletin boards by priority. Messages may include any combination of text, graphics, Macintosh files, and sounds; users can select from a variety of notification options. 1MB min. memory. 5-user pack $549; 25-user pack $1995. Pacer Software, 619/454-0565; fax 619/454-6267.

PowerPrint
A QuickDraw printer driver package that includes software drivers and a serial-to-parallel-port cable that enable the Mac to print to more than 850 different types of printers, including models by Canon, NEC, Hewlett-Packard, and Epson. Software options allow for custom paper sizes, two-sided printing, reducing and enlarging images, and producing cover pages. 1MB min. memory. $149. GDT Softworks, 604/291-9121; fax 604/291-9689.

PrintMatch
A family of Photoshop-compatible plug-in filters, each customized to calibrate colors for one desktop color digital printer. User applies a PrintMatch filter to a Photoshop image to calibrate the image to the printer's color space.
continues



MacEnvelope

We never interrupt your program for these important messages.

All Just a D.A. Away

With MacEnvelope® you can create and print bar-coded labels, envelopes and business reply forms... you can sort and search lists... recall and save addresses — all without ever quitting your spreadsheet or your letter or whatever else you're so busy working on. So before you call it quits, call us.

To order, call **(800) 447-9639** or fax **(718) 768-3997**

SYNEX

Makers of MacEnvelope® Plus, MacPhoneBook™ and Bar Code Pro®

Circle 204 on reader service card

Individual filters are available separately or in groups. Company is working with third-party vendors and printer manufacturers to supply filters for all popular color printers. 4MB min. memory. Under $200. Savitar, 415/243-3030; fax 415/243-3080.

Programmer's Bag of Tricks

Programmer's six-section library that includes source code written in Think C and interface files for MPW and Think Pascal. Sections include Listboxes, Modem and Communications, Offscreen Drawing, and Scroll bars. Each section and its associated routines are documented and ready for use in programs. 2MB min. memory. $134.50. DataPak Software, 206/573-9155; fax 206/573-9269.

Sequencher

A package of software tools designed to aid in DNA sequencing. The product's alignment algorithm detects overlapping ends and assembles them into a consensus sequence called a contig. Notes can be attached to each fragment, and changes to bases in each sequence are highlighted for easy identification. Sequences can be read back through the Mac's speaker, and the package gives multiple views of assembled data. 2MB min. memory. Noncommercial site license $1200; commercial $2000. Gene Codes, 313/769-7249.

The Whirlitzer of Wisdom

Virtual jukebox containing enigmatic bits of wisdom; includes sound and animation. Jukebox-like interface works like an electronic fortune cookie, displaying bits of information on the screen and opening pathways to further metaphysical adventures. Requires HyperCard 1.2 or later. 1MB min. memory. $39.95. ZBS Foundation, 518/695-6406.

Workspace

A program that runs under MultiFinder and acts as a graphical user interface for organizing work, automating routine computer functions, and keeping track of time spent on projects. The application creates a three-dimensional office space with a worktable where projects are opened and closed, a bookshelf with binders for storing and accessing other applications, portfolios to hold documents, and a calendar that tracks time expenditures. 2MB min. memory. $149. Ark Interface, 206/654-4127; fax 206/654-4188.

Workspace

Xpress Tips

HyperCard-based application designed to run alongside a QuarkXPress document under MultiFinder and offer tips and hints for QuarkXPress. Tips cover topics like how to easily create style sheets and how to increase the application's speed. 2MB min. memory. $19.95. Dan Graphics, 612/870-4596; fax 612/870-4596.

CD ROMS

The Orchestra

An interactive guide to the orchestra—based on the *The Young Person's Guide to the Orchestra,* by Benjamin Britten—that offers lessons in conducting; exercises in the "Orchestration Lab," where compositions are put together; arcade games, such as Name That Instrument and Music Trivia; and a time line that teaches music history. In one mode the instrument that is playing appears on screen, and users can click to learn more about how that instrument is played. The sound track is recorded in digital stereo and can be played on any CD player. 2MB min. memory. $79.98. Warner New Media, 818/955-9999; fax 818/955-6499.

Sky: Volume One

A collection of 100 color photographs of the sky; comes with a four-color catalog of printouts and includes unlimited reproduction rights. The images were scanned on a drum scanner from 35mm film at 2000 dpi. The CD uses a customized

Sky: Volume One

version of Radius's Impress-It 1.1 to decompress files. 1MB min. memory. $129.95. CD Folios, 818/887-2003, 800/688-3686; fax 818/887-6950.

Soundtrak

Database and library of 150 original songs in MIDI format that can be played back on MIDI equipment or previewed in 8-bit digital audio. Songs can be searched and cataloged by description or style using the included software, and exported as MIDI files or to programs such as HyperCard. User can mix audio with a 16-channel mixer window that includes automated fade-in and fade out. 1MB min. memory. $395.95. Opcode Systems, 415/369-8131; fax 415/369-1747.

Talking Classic Tales CD

A collection of five fairy tales on CD that are fully narrated in a digitized human voice and are accompanied by color illustrations. Users can click on difficult words, which are highlighted, to hear a definition read aloud; clicking on action buttons causes animated sequences to play. The stories in the collection are: *The Frog Prince, Rumpelstiltsken, The Elves and the Shoemaker, The Queen Bee,* and *Puss in Boots.* 2MB min. memory $99. Compton's NewMedia, 619/793-4817, 800/532-3766; fax 619/793-4813.

The Virtual Portfolio

A multimedia showcase compiled to help corporate buyers find artists, designers, writers, and musicians for the creation of projects ranging from ad copy to interactive multimedia presentations. The CD contains over 400MB of samples of graphics, sounds, and animation from more than 250 artists. Entries are cross-referenced and indexed visually and by medium used. Artists pay a per-megabyte fee for inclusion, and the CD is distributed free to qualified corporate art and presentation departments. 5MB min. memory. $99. One World Interactives, 503/683-4020; fax 503/683-3157.

ACCESSORIES

DiskGrafx

Custom disk imprinting service that prints images, logos, and text directly onto disk exteriors. Minimum order is 500 disks, and cost includes design and art production services. Pricing varies based on quantity. Lampro Graphics, 708/369-1251, 800/332-2240; fax 708/369-1989.

DiskGrafx

Mouse Grip

A product made of thermoplastic elastomer that adheres to the top and sides of a standard Mac ADB mouse to provide better grip and a larger area for the user to grab. Available in blue and neon green. $10.95. Surface Concepts, 408/265-7236, 800/453-4747; fax 408/265-7236.

Parosingle

System for transferring computer graphics to fabric surfaces, such as cotton T-shirts or canvas. Requires a Mac connected to a color laser copier via a Canon IPU or an EFI Fiery CLC Controller. Paper also works with color copiers that are not connected to a Mac. Images are printed on the paper and then are transferred to fabric using a heat press. 100 sheets $150. Graffoto, 604/683-1232, 800/888-7838; fax 604/683-1235.

Parosingle

SentinelEve

Hardware and software package enables developers to provide a software

protection scheme for an application. Hardware key plugs into the ADB port; the software portion sends a message to the protected application, telling it not to operate if the key is not present. The hardware key has seven general-purpose, 16-bit registers with programmable memory to aid in building a custom security plan. Evaluation kits for developers $39. Rainbow Technologies, 714/454-2100, 800/852-8569; fax 714/454-8557.

SentinelEye

TouchWindow
A touch-sensitive screen that fits over any monitor and allows user to pull down menus, make selections, move objects, and draw on-screen by touching the screen with a finger. The product is compatible with all Macs except the Portable and connects through an ADB port. $335. Edmark Corp., 206/861-8200, 800/426-0856; fax 206/861-8998.

VariTask Workcenter
Computer workstations, available in six models, that have a double pedestal base, allowing independent height and tilt

VariTask Workcenter

adjustments on both front and rear work surfaces, and a 250-pound lifting capacity. Units also have monitor brackets for securing monitors and two electrical outlets. $2500 to $3600, depending on configuration. Mayline Hamilton, 414/457-5537, 800/822-8037; fax 414/457-7388.

BOOKS & VIDEOS

The Electric Cookbook
A binder containing step-by-step "recipes" for graphic artists; the binder is divided into two sections: a set of hand-drawn thumbnails of typical print designs, and a collection of one-page support documents. The thumbnail section provides maps that indicate which support document should be used for a particular design, and each page discusses and demonstrates a particular computer workstation task. Quarterly updates include additional support pages and additional thumbnails. Annual subscription $395. Lanman Systems Group, 813/287-0662, 800/683-0835; fax 813/287-0948.

Personal Training for Lotus 1-2-3
Audiotape-based training series for Lotus 1-2-3 on the Mac with three modules: Beginning Spreadsheets, Intermediate Spreadsheets, and Business Graphs. The training series teaches users to create and use spreadsheets; to format and present information; to solve "what-if" problems; and to share data between applications. $99.95. Personal Training Systems, 408/286-1635; fax 408/977-1166.

Principles of Software Engineering
A training package that consists of 14 videotapes and provides an overview of current practices in software engineering. The course takes 11 hours to complete; student notebooks, supplemental training aids, and on-site teacher training from the author are also available. $6000. Technology Media, 719/687-1889; fax 719/687-6041. **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.

StatView

The Best Macintosh Statistics Software

You said it! *Macworld* readers have voted StatView the "Best Statistics Software on the Macintosh" for the fourth time. No other statistics software has *ever* won this award.

MACWORLD 1991 World Class Award Winner

Why?

Because StatView combines powerful statistics with a remarkably easy-to-use interface. And StatView is the only statistics package with fully-integrated presentation graphing, enabling you to analyze data and present your results all in one program.

If you analyze data with a Macintosh, you should be using the best — StatView.

To find out more about StatView, call **1-800-666-STAT, ext. 231.**

ABACUS CONCEPTS

© 1992 Abacus Concepts, Inc., 1984 Bonita Avenue, Berkeley, CA 94704-1038, (510) 540-1949. StatView is a registered trademark of Abacus Concepts, Inc. All other trademarks are property of their respective holders.

Circle 50 on reader service card

MACINTOSH SECURITY PRODUCTS

COMPLETE LINE OF PROVEN AND EASY TO INSTALL SECURITY PRODUCTS FOR MACINTOSH COMPUTERS.

PREVENT COMPUTER THEFT!

***MacKablit*™ Security System**

This system allows you to secure all your computer components: CPU, monitor, keyboard, printer. ***Internal component security***: Kablit fasteners secure the rear panel of CPU protecting internal boards and hard drives. Fasteners available for all applications. List price **$39.95.**

ACCESS SECURITY

Disk Drive Lock™

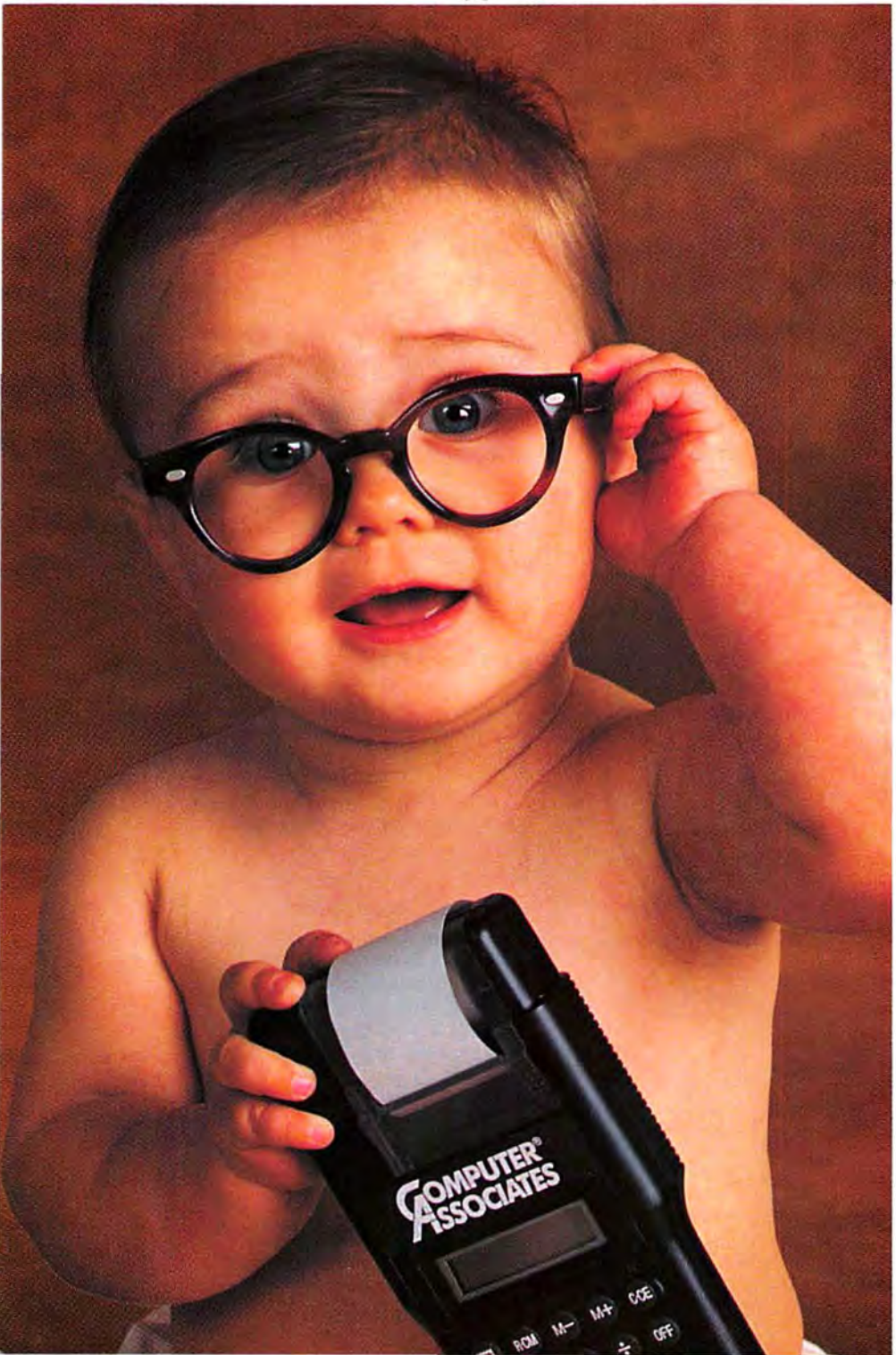
Prevent anyone from copying your data. Protect your data from harmful viruses. Prevent unauthorized use of your drive. Installs easily and quickly. Models available for all Macintosh models (except Mac Plus). List price **$24.95.**

Order your free catalog of these and many other security products.
Purchase orders accepted. Quantity pricing available. Shipping not included. MC/VISA accepted. Dealer inquiries invited.

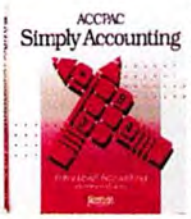
Secure-It, Inc.
18 Maple Court
East Longmeadow, MA 01028
1-800-451-7592

Circle 239 on reader service card.

Some People Are Born Accountants. For The Rest Of Us, There's New ACCPAC Simply Accounting.



Easy To Learn, Easy To Use And Only $199.



Now there's an accounting program anybody can use—new ACCPAC® Simply Accounting,™ the quickest and easiest way to take care of your books.

You'll have it up and running in minutes. And you can do anything with just a few clicks of the mouse. Write a check. Print out an invoice. Do your payroll. Manage your receivables.

What used to take hours now takes just minutes. So you can spend less time counting your money—and more time making it.

CA90s
CA's Computing Architecture For The 90s Protects Your Investment.

And since it costs only $199, you can take care of your books without breaking the bank.

Call us today at 1-800-531-5236 in the U.S. or 1-800-663-6904 in Canada for the location of your nearest dealer.

It's the accounting program anybody can use.

And we mean anybody.

COMPUTER ASSOCIATES
Software superior by design.

For Only $199 You'll Get: · General Ledger · Accounts Payable · Accounts Receivable · Payroll · Inventory Control · Job Costing · Prints Checks, Statements, Invoices and Mailing Labels · Produces Standard Accounting Reports · Quick Set-Up

©1991 Computer Associates International, Inc., 711 Stewart Avenue, Garden City, NY 11530-4787. All trade names referenced are the trademarks or registered trademarks of their respective companies.

Circle 10 on reader service card

Questions and Tips from Macworld Readers

BY LON POOLE

IF YOU INSTALLED THE WILD MAGic control panel along with Apple's new QuickTime software, you may have discovered that After Dark (Berkeley Systems, 510/540-5536) no longer displays your favorite screen-saver module. Wild Magic works with System 7 to retrofit the copying, pasting, and playing of QuickTime movies to most word processors, spreadsheets, and other applications that can display PICT graphics but lack built-in QuickTime capabilities. An old version, Wild Magic 2.0b8, conflicts with the After Dark control panel unless you force Wild Magic to load before After Dark at start-up time, as described in last month's sage tip about such problems, "Conflict Resolution." For example, you could prefix After Dark's name with a tilde (~), as suggested by Matthew Bender of Poseyville, Indiana. Better yet, you can get Wild Magic 2.0 or later from a user group such as BCS Mac (617/625-7080) or BMUG (510/549-2684); Wild Magic is also available from online information services such as America Online. (Although QuickTime works with System 6.0.7, Wild Magic requires System 7.)

Excel Mix-Up

Last February I said that Excel 3.0's Page.Setup macro command could set the Page Orientation option to Landscape, and it can—in the Windows version of Excel. Moreover, the Windows version can set the paper size or scaling factor but the Mac version cannot. Ole A. Kongsgaarden of Kristiansand, Norway, read the Excel Function Reference manual very carefully and spotted a paragraph that states these limitations in the Mac version. On the Mac, the Page.Setup macro command can set only the options that Microsoft has added to Apple's standard Page Setup menu command—header, footer, margins, center horizontally, center vertically, print row and column headings, and print guidelines. Having virtually identical versions of Excel for the Mac and for Windows may simplify file exchange between the two, but surely complicates the manuals.

Fax-OCR Mystery

In December 1991 I said OmniPage, optical character recognition (OCR) software from Caere (408/395-7000 or 800/535-7226), can convert the text from a fax modem's graphic image to text you can edit. JoJo Mastrianni of Schenectady, New York, couldn't get OmniPage 2.0 (an old version) to open fax image files. According to Caere, most fax modems save fax image files in Type 3 or Type 4 TIFF graphics formats (both also known as CCITT TIFF), which even OmniPage 3.0 purportedly can't open. Inexplicably, OmniPage 3.0 opened and converted my sample fax files from two hard drives and an AppleShare file server but, I later discovered by accident, not from four other drives. Caere's flagship OCR software, OmniPage Professional 2.0, can open and convert black-and-white (also called line-art) TIFF formats 1 through 4, making it compatible with most receive-fax modems. It worked with my sample fax files (received and saved by Global Village's TelePort/FullFax) on all the hard drives I tried it with. An upgrade from any version of OmniPage to OmniPage Professional 2.0 costs $150.

Better Centesimals

The formula in last October's *Quick Tips* for averaging times that include centesimals (hundredths of a second) did not correctly calculate the average centesimals. It ignored all but the centesimals themselves in that calculation, whereas the other values (hours, minutes, and seconds) can all have an effect on the average centesimals. For instance, if there were seven times that summed to exactly 1 hour, the original formula would give an average time of 8:34.00, but the correct average is 8:34.29.

The original formula was based on a spreadsheet with the columns in cells B2:D9 representing hours, minutes, and seconds, and totals of each column in cells B10:D10. Using the same cells, Tyler Abbot of San Francisco suggests calculating the total number of seconds with the following formula in cell D11:

```
=(B10*3600+C10*60+D10)/ROWS(B2:D9)
```

To display the average, use this formula:

```
=TEXT(TIME(0,0,D11),"h:mm:ss")&TEXT(D11-TRUNC(D11),".00")
```

Designing big desktop patterns, configuring multiple monitors, and more

Missing Control Panel

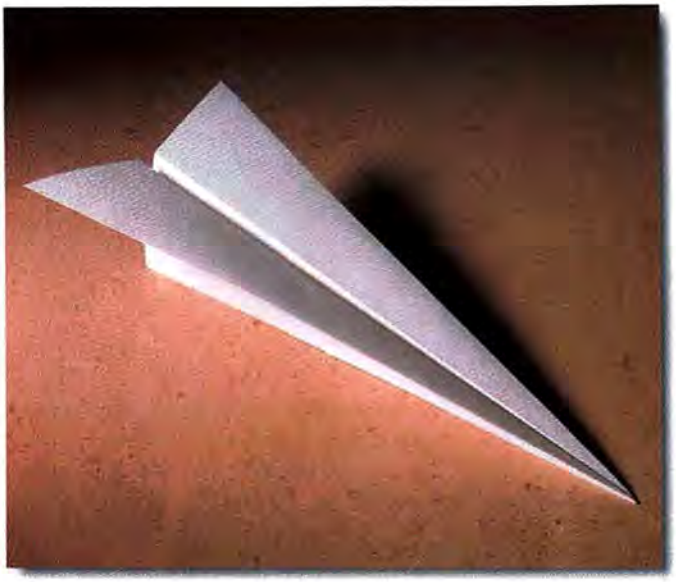
Q. While trying to install a screen-saver DA using Font/DA Mover on my Mac LC, I mistakenly removed the Control Panel desk accessory. I couldn't find it in the Trash or in the System Folder. I used the Finder, MacTools, and everything else I could think of, without success. Where did my Control Panel go and how do I get it back?

Louise Pettus
Rock Hill, South Carolina

A. Since you're using Font/DA Mover and were able to remove the Control Panel with it, you must be using System 6. (With System 7 you don't need Font/DA Mover, and the Control Panel is a folder inside the System Folder. You install desk accessories in System 7's Apple menu by dragging them to the System Folder icon, or you can open them directly by double-clicking them.)

When Font/DA Mover removes a desk accessory or a font, that item is gone. You can't undo the removal and you can't recover a removed font or desk accessory with a disk utility program like MacTools. To get the Control Panel back, use Font/DA Mover to copy it from a backup of the System file or from the System file on your original system software floppy disks. Be careful to lock the disk before inserting it so you can't accidentally remove anything from it. If you need

continues



Now there are two ways to make an 11″x 17″ sheet of paper fly.

The new LZR 1560 from Dataproducts is a complete departure from ordinary laser printers. At 15 ppm it's not only faster than most laser printers, it can also deliver output up to 11″ x 17.″ Which means it can print spreadsheets, illustrations—any two-page layout—in the time it normally takes to process a letter-size page.

This kind of performance is the result of combining two powerful innovations. Namely, a RISC-based controller, for quicker rendering of fonts and graphics, and PostScript® Level 2, an advanced printing language that delivers PostScript's vast graphic capabilities faster than ever before.

Plus, while most laser printers give you only "enhanced" 300 dpi, ours gives you *true* 400 dpi. So you get outrageously crisp and clean text and graphics. And switching back to 300 dpi can be done with a click of the mouse.

Imagine creating two-page desktop publishing layouts without cutting and pasting. Or finally getting your full production timeline on a single page that has *legible* 6-point type.

You'll still have a desk to work on too, since the LZR 1560 is the smallest 11″ x 17″ printer available. And with one, two or three paper input tray models available, even your biggest jobs are handled easily.

So call **1-800-334-3174** for the name of your nearest Dataproducts dealer. And discover why the LZR 1560 is the only way to fly.

11″ x 17″ Laser Printer Market Snapshot

SPECIFICATIONS

Manufacturer/Model	Resolution (DPI)	Speed (PPM)/Processor	Page Description Language	List Price
Dataproducts LZR 1560	**300x300 OR 400x400**	**15 Weitek 8200 RISC**	**Adobe PostScript Level 2 & PCL4**	**$5,695**
QMS PS2210	300x300	20 Motorola 68020	Adobe PostScript	$9,995
LaserMaster 400XL	400x400	20 None	Microsoft TrueImage	$9,995
Varityper VT600W	600x600	7 Motorola 68020	Adobe PostScript	$16,995
DEC PrintServer 20	300x300	20 N/A	Adobe PostScript	$25,247
ATI LC6020	300x300	20 Motorola 68020	ATI LaserDrive & PostScript	$15,995

400 dpi offers greater halftone range and sharper images than standard 300 dpi.

Dataproducts.

The high performance printer people.™

© 1992 Dataproducts Corporation. Dataproducts and its associated logomark are registered trademarks, and its tagline and LZR Series are trademarks, of Dataproducts Corporation. All rights reserved. All other product and brand names are trademarks or registered trademarks of their respective holders. Matrix source Dataquest 1991 and Dataproducts.

Price breakthrough!

- 400 DPI
- Adobe PostScript Level 2
- 11″ x 17″ format
- $5695!!

Circle 191 on reader service card

replacement system software disks, ask a friend, a coworker, a local dealer, or a Macintosh user group (call 800/538-9696 to locate a user group).

Multiple-Monitor Configuration

Q. My Macintosh IIfx has two monitors, a 14-inch color and a 2-page gray-scale display. I made the gray-scale monitor the main monitor by dragging the miniature menu bar in the Monitors section of the Control Panel, but the start-up screen and INIT icons still appear on the color monitor. How can I move them to the gray-scale monitor? Swapping video boards in the NuBus slots did not work.

Michael T. Fussell
Missoula, Montana

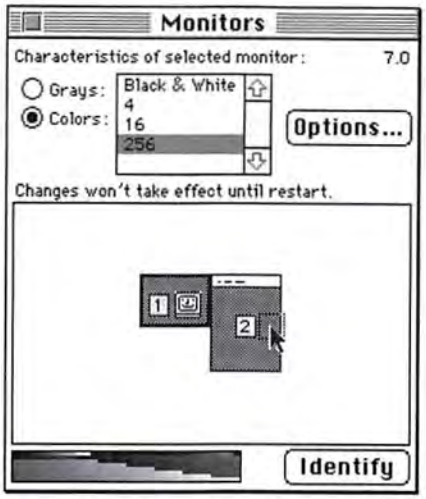
A. Two monitors aren't just for Mac II systems. For example, an SE or SE/30 can have a large-screen monitor connected to its expansion slot and still use the built-in monitor. A Plus or Classic can have a similar arrangement even though neither one has an expansion slot. You can use the Monitors section of the Control Panel (the Monitors control panel in System 7) to change the monitor used at start-up time (see "Monitors Option"). If you also drag the monitors in the Control Panel to rearrange them, you may have trouble aligning them so that you can slide the pointer smoothly across the top (or the bottom) from one monitor to the other. Pressing one of the arrow keys nudges the selected monitor in the control panel, helping you precisely align the monitors. To quickly check alignment, close Monitors and open it again. If the monitors aren't lined up perfectly, adjust them and check again. Sometimes it helps to press the shift key and drag all the monitors as a group to a different spot in the Control Panel.

Confused Ruler

Q. I alternate between two Macs with 9-inch monitors and have noticed that Microsoft Word's ruler shows 6.7 inches on one Mac and only 6 inches on the other. How do I change the 6-inch ruler to fit 6.7 inches across the screen?

Andrew I. Sue-A-Quan
Don Mills, Ontario, Canada

A. Most word processors adjust their formatting rulers according to the resolution (dot density) of the printer last selected with the Chooser desk accessory. You may have noticed that when you close the Chooser after you change printers, the Chooser tells you to choose Page Setup and click OK in all your open applications. Doing that resets the ruler to match the newly selected printer. You get a 6.7-inch ruler with a LaserWriter, StyleWriter, or Personal LaserWriter LS. With an ImageWriter, you get a 6.7-inch ruler if the Page Setup command's Tall Adjusted option is on, but you get a 6-inch ruler if that option is off. You can select any type of printer listed in the Chooser whether the Mac is connected to one of those printers or not. For example, you might select LaserWriter in the Chooser on your ImageWriter-equipped Macintosh at home or your Mac PowerBook in flight so the documents you create would be ready to print later on a LaserWriter at work. To add another type of printer to the Chooser's list, simply copy the printer driver file that has that printer's name and icon to the System Folder.



Monitors Option If your Mac has multiple monitors, you can use the Monitors control panel (in System 7) to designate any one as the start-up monitor. Pressing the option key marks the current start-up monitor with a tiny smiling-Mac icon in the control panel. Drag the tiny icon to the monitor you want to use during start-up and restart the Mac.

Big Desktop Patterns

TIP With ResEdit 2.1 or later you can modify System 7 to decorate your desktop with a custom pattern of up to 64 by 64 pixels. (The standard desktop patterns you select with the General control panel are 8 by 8 pixels.) Unfortunately, designing 64-by-64-pixel patterns can be quite tedious. The Terraform module of Berkeley Systems' More After Dark [which requires After Dark 2.0—L.P.] can create beautiful patterns that repeat perfectly on the desktop. Here's how:

1. In After Dark, select the Terraform module and set the Repeat Size option to 64. Activate After Dark by moving the pointer to the sleep corner or by click-

continues

MacLabelPro.
The Best Just Got Better!
NEW!
Postal Bar Code, Desk Accessory & Clip Art from 3G Graphics!
1.
Greg Richards
National Blueprint
339 E. Columbia Roadway
Columbia MI 77301
Postal Bar Code...
2.
ACME REAL ESTATE
BACK UP DISK
DISK 1 OF 5
Diskette Labels...
3.
ACCOUNTS PAYABLE
OFFICE RENT
File Folder Labels...
4.
Acme Computer Supplies
5385 W. Green Street
Dayton, Ohio 53290
Specializing in repairs and maintenance of all computers
Tel: (513) 555-8290
Fax: (513) 555-8291
Contact: Robert Sorenson
Card Products...
Rotary Cards, Index Cards, Post Cards, Name Tags with plastic holders.
5.
SALES
Custom Tab Dividers...
MACLABELPRO™
Software
MacLabelPro features include:
- Preset formats for Avery Laser and Dot Matrix Labels
- Easy mail merge
- Sophisticated tool palette (drawing, graphic sizing, text rotation)
- Postal bar code capability
- Desk accessory for quick labels
- Professional clip art from 3G Graphics
Call 1-800-462-8379 for a dealer near you or upgrade information. Retail price only $99.95
AVERY DENNISON
Circle 160 on reader service card

Hardware VS Software

The MS-DOS® Challenge

Orange Micro Challenges any MAC/PC "soft" solution to match the Orange386 MS-DOS Coprocessor

✔ **Speed**

If you've become accustomed to top Mac performance, why compromise? The Orange386 is a Nubus card which allows you to run PC programs by functioning as a second computer inside your Mac. The on-board 16MHz or 25MHz 80386sx processor benchmarks* up to 12.2 times faster than "soft" MS-DOS emulators for the Mac. *Take the challenge.*

✔ **Compatibility**

Running thousands of older MS-DOS programs is not much of a challenge for the Orange386. The true test of compatibility lies with current PC software like Windows 3.1 and the full functionality of DOS 5.0. These all depend on "Protected Mode" which *requires* hardware to function. Also, the Orange386 has full VGA compatibility not available with software emulators. So, if running the latest and future DOS software is important, *take the challenge.*

✔ **Networkability**

The hardware based Orange386 offers PC serial, parallel and floppy ports; and two innovative PC/AT bus slots which allow you to add PC cards inside your Mac. Now you can direct connect to any PC dominated network by adding an Ethernet, Token Ring, Arc Net, etc. card. In terms of connectivity, the Orange386 is uncontested by its software competitors. *Take the challenge!*

✔ **Take The Challenge**

If you have discovered that Soft PC® is just too "soft", we invite you to test drive our Orange386. Call us and, *take the challenge!*

Orange Micro inc.

"12 Years of Innovation and Excellence"
1400 N. Lakeview Ave. Anaheim, CA. 92807
(714) 779-2772

*Lotus 1-2-3 spreadsheet; call for details. © Orange Micro Inc., 1992

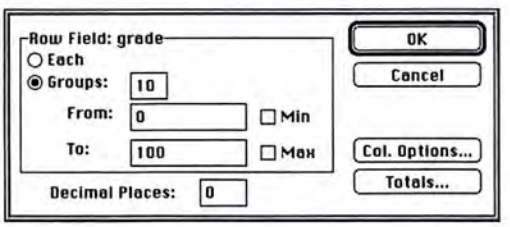
Circle 33 on reader service card

Frequency Distribution

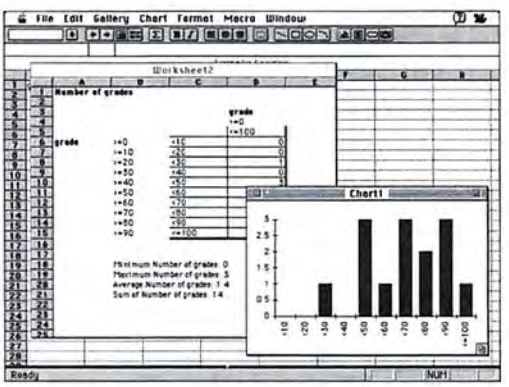
A university instructor who teaches large classes, Larry MacPhee of Irvine, California, likes to examine a frequency distribution of his students' test scores before he signs them letter grades. Creating histograms that graphically depict data distributions should be easy, but Microsoft Excel offers this function only as a library macro with less-than-clear instructions. After much trial and error, MacPhee figured out the correct procedure and recorded it using Apple's MacroMaker system extension so he could forget all the convolutions. He had better luck with MacroMaker than with Excel's built-in macro recorder. (MacroMaker doesn't work reliably with System 7, but you could use CE Software's QuicKeys 2.1.1 instead.) Here are the steps for Excel 3.0.

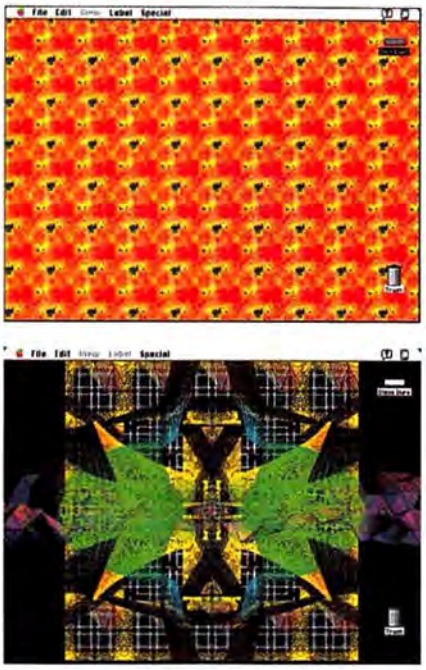
1. Enter student grades in a column with a label such as Grades at the top of the column (in this example, column A). Copy that column into the adjacent column (in this example, column B). You have to copy the data because Excel's Crosstabs macro requires at least two columns of data to generate a distribution. Next select the block of cells containing data and labels (A1:B15 here) and choose Set Database from the Data menu. Open the Crosstabs file, which is located in the Macro Library folder in the Excel folder. If you want to automate the procedure, start recording with MacroMaker or QuicKeys now. Then run the Crosstabs macro by choosing Crosstabs from the Data menu.

2. In the Crosstabs dialog box that appears, click the Row Options button, and another dialog box appears. In it change the Row Field option to Groups and enter 10 in the Groups box to set the number of intervals in the distribution. To set the distribution range manually, you must turn off the Min and Max options. Enter 0 in the From box and 100 in the To box, and then click the Col. Options button. Do everything the same way in the Col. Options dialog box, except enter 1 in the Groups box instead of 10. Click OK to return to the main Crosstabs dialog box and click OK there to run the Crosstabs macro.



3. A new worksheet appears reporting the frequency distribution in intervals. Stop recording in MacroMaker or QuicKeys and save your recording so that next time you can let the machine set the intervals and ranges automatically. Finally, select the data in the worksheet table and create a new bar chart of the distribution based on the data.





Fancy Desktops You can use ResEdit to replace System 7's standard gray 8-by-8-pixel desktop pattern with a big, colorful 64-by-64 pattern made by More After Dark's Terraform module (top). Or replace patterns with a picture (bottom) by installing DeskPict or DeskPicture software in your System 6 or System 7 System Folder. (This picture was created by *Macworld* associate editor Cathy Abes using an After Dark MultiModule.)

ing the Demo button. Wait until you see a pattern you like and then press ⌘-shift-3 to have System 7 capture the screen in a PICT file at the root level of your start-up disk (not in a folder). You can experiment with colors and textures by clicking the Terraform module's Terrain button and trying different settings in the dialog box that appears.

2. Open the screen capture, named Picture 1, with a program that enables you to select a 64-by-64-pixel piece. I use GIFConverter 2.2.8, which shows the size of the selection as you use the marquee tool (selection rectangle). Select the 64-by-64 area that you want to become your desktop pattern, and copy it to the Clipboard (with the Edit menu's Copy command).

3. Copy the System file with the Finder—for example, press option while dragging the System file from the System Folder to the start-up disk icon—and then open the copy with ResEdit 2.1 or later. In ResEdit, scroll until you see the icon for the resource named ppat (pixel pattern) and double-click it to open it. There should be one resource numbered 16; open it by double-clicking. A pattern-editing window appears along with three new menus—Transform, Color, and ppat. Choose Pattern Size from the ppat menu and set the pattern size to 64 by 64, making the pattern-editing window larger. Paste the pattern from the Clipboard to replace the standard gray pattern. Quit ResEdit, answering yes when it asks whether you want to save changes to the System file.

4. Drag the unedited System file out of the System Folder, drag the edited System file into that folder, and restart. When the Finder's menu bar appears, you should be rewarded with a very pleasing desktop pattern.

James Crawford
Baltimore, Maryland

ResEdit, Apple's resource editor for manipulating icons, patterns, and much more, is available from user groups and online information services. So is GIFConverter, a shareware program by Kevin A. Mitchell for viewing and converting the format of graphics files. Many commercial graphics programs also show the selection size, including Canvas 3.01, PixelPaint Pro, Studio/8 1.0, and SuperPaint 3.0. To take desktop patterns to the next step—multiple patterns in sizes up to 128 by 128—you can get the Wallpaper control panel (Thought I Could, 212/673-9724). It works with System 6.0.5 and later, as well as System 7, on any color-capable Macintosh (including the Classic II and the SE/30) and includes pattern-editing tools. Instead of a desktop pattern, you can display a desktop picture (see "Fancy Desktops") by installing the DeskPict system extension (available from user groups and online information services) or the DeskPicture control panel (part of Now Software's Now Utilities, 503/274-2800).—L.P.

Label-Alignment Check

TIP To check the position of laser-printed mailing labels without wasting sheets of labels, make a template by removing every other label from one sheet, leaving a checkerboard pattern of spaces where the translucent backing paper shows through. Print test labels on plain paper and lay the template over it to check alignment.

Alan M. Winslow
Pleasanton, California

We pay from $25 to $100 for tips published here. Send tips or questions (include your address and phone number) to *Quick Tips, Macworld,* 501 Second St., San Francisco, CA 94107. Send electronic mail to CompuServe (70370,702) or MCI Mail (294-8078). All published submissions become the property of *Macworld.* Due to the high volume of mail received, we're unable to provide personal responses. ■

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).

When we introduced our first desktop scanner, we set a standard by which all others are judged. Now, with the Nikon LS-3510AF, we've managed to set an even higher standard by bringing you a better, faster 35mm scanner. For less.

Better control. First we improved color scanning capability. The LS-3510AF offers you the option of either standard 8-bit or true 12-bit scanning for even greater color resolution.

Next, we added Autofocus which automatically provides the sharpest image for each scan regardless of the type of mount used. The scanner also adapts to a wider range of film processing variables and "learns" about each manufacturer's film as it's first scanned. Then it automatically corrects for gamma and color balance and stores all that information in its memory. A feature available only from Nikon.

Faster scans. With the LS-3510AF, you can complete an 8.3MB (2048 x 1365 pixels) scan suitable for full page, 133 line screen reproduction including Autofocus and other corrections in under 110 seconds.

New SCSI Interface. A SCSI interface is now available for direct connection to a variety of desktop computers and workstations.

Automatic Operation. For high volume scanning requiring unattended operation, an optional Auto-feeder is available. It can scan up to 300 slides unattended.

Lower price. Faster scanning. Optional 12-bit operation. Your choice of GPIB or SCSI interfaces. A complete selection of film holders including ones for free-rotation and strip film. At a lower price. Nikon. Our standards are hard to beat.

For more information, write or call: Nikon Electronic Imaging, Dept. B2, 101 Cleveland Avenue, Bayshore, NY 11706, (516) 547-4355. Or call 1-800-52-NIKON for the nearest dealer.

Bundled with PhotoStyler for Windows 3.0 applications; Photoshop or ColorStudio for MAC applications.

THE LS-3510AF SCANNER.

A HIGHER STANDARD OF QUALITY, SPEED AND ECONOMY.

Nikon®

ELECTRONIC IMAGING

r e c r e a t i v i t y

PhotoStyler, Windows, Photoshop, ColorStudio, Macintosh are trademarks of their respective companies. ©1991 Nikon, Inc.

Customizing Word Processors

BY JIM HEID

A WORD PROCESSING PROgram lets you concentrate on writing instead of mechanics. Go ahead and type—there's no fussing with paper, no pressing the return key at the end of every line, no painting with correction fluid. A variety of fonts, type sizes, and styles are a menu away. Advanced formatting is relatively easy, too. An on-screen ruler lets you change margins and create indents and tab stops. You can automatically number pages and create *headers* and *footers* that appear at the top and bottom of every page.

If you used to write with a typewriter or if you use a word processor only occasionally, you might be so taken with these basic word processing features that you haven't bothered to explore the more-sophisticated labor-saving features your program provides. But you should. Whether you write a memo once a week or a chapter every day, you can save time by customizing your word processor.

I examine several customizing techniques in this month's column; after each tip, I describe how to apply the technique to the Macintosh world's most popular and powerful word processors: Microsoft Word 5.0 and WordPerfect for the Macintosh 2.1. For tips on applying this information to programs such as T/Maker's WriteNow, Claris's MacWrite II and ClarisWorks, and Microsoft Works, see "Customizing Other Programs."

Create a Personal Dictionary

THOUGH A WORD PROCESSOR'S SPELLing checker can't guarantee perfect spelling, it can help. But what if you use words that aren't in the program's dictionary? Names, scientific jargon, abbreviations, and slang can confound a spelling checker. And as you hurry to complete a document, it's tempting to click on the spelling checker's Ignore or Skip button to bypass terms you know are spelled correctly.

But wait—instead of telling your program to ignore those terms, add them to your *user dictionary*. Sometimes called a *custom dictionary*, this is a separate file that supplements the program's built-in dictionary. Adding terms to a user dictionary essentially expands your word processor's vocabulary. The spelling checker runs faster, you don't have to click on Ignore all the time, and your documents are that much more accurate.

How to: Word Click on the Add button in the Spelling dialog box. Microsoft Word 5 can work with numerous custom dictionaries at once; consider creating separate dictionaries for different types of terms—legal terms, names, and so on. Use the Spelling option in the Preferences dialog box to switch among and edit custom dictionaries (see "Editing Dictionaries"). To add a word to a specific custom dictionary, select the dictionary's name from the Add Word To pop-up menu before clicking on Add.

To add a word to a custom dictionary in Word 4, select the dictionary's name and then click on the plus sign (+) button in the Spelling dialog box. Better yet, upgrade to Word 5; its spelling checker is greatly improved.

How to: WordPerfect Click on the Add button in the Speller dialog box. To edit the user dictionary, use the ST Utility program that comes with WordPerfect 2.1. To edit the user dictionary in WordPerfect 2.0, choose Open, select the All option from the Show pop-up menu, and then double-click on the file named USA-User Dictionary.

Word and WordPerfect also let you customize other aspects of their spelling checkers. You can use the Spelling option in the Preferences dialog box to tell Word to ignore words in all capitals as well as words containing numbers (such as 100K). You can use the Check menu in WordPerfect's Speller dialog box to tell the program to watch for duplicate words (such as *and and*) and ignore words containing numbers.

If you work in the legal or medical profession or with languages other than English, you might consider buying a specialized spelling checker dictionary. For Word 5, Alki Software Corporation's Comprehensive Proofing Tools series includes a custom dictionary containing 74,100 medical, legal, and business terms. Alki Software also sells the dictionaries Microsoft ships in countries other than the United States. WordPerfect Corporation sells a variety of dictionaries.

How to save time and keystrokes by customizing your word processor

Create Stationery

IF YOU ALWAYS CREATE SIMILAR TYPES of documents—memos, letters, fax cover sheets, contracts—create *stationery* for them. A stationery document is electronically preprinted with whatever text, graphics, and formatting information you use in a certain kind of document—just as a piece of company stationery is preprinted with a name and address. Stationery for a letter might contain your return address. Stationery for a newsletter might contain the publication name, placeholder text for the headlines and table of contents, and formatting settings for multicolumn pages.

Using a stationery document is easy: you just open it and start writing. Couldn't you simply open an old newsletter or memo and replace its contents? Yes, but you might accidentally choose Save instead of Save As, thereby losing the old document. By contrast, your word processor will open an untitled copy of the stationery document so you can't accidentally change the original.

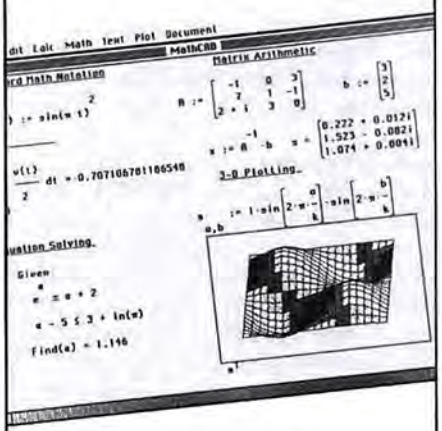
How to: Word and WordPerfect Create the text and graphics and/or specify the desired margin and formatting settings, and then choose Save As from the File menu. In Word, choose the Stationery option from the Save File As Type pop-up menu. In WordPerfect, choose WordPerfect Stationery from the Format pop-up menu. Type a name and then click on Save.

Cut Keystrokes with Glossaries

CHANCES ARE YOU FREquently use certain terms or sections of text—a return address, a closing for a letter, scientific terms, contract clauses. Instead of typing them over and over again, store them as entries in a Word *glossary* file. A glossary entry can contain any amount of text, from a

continues

Technical calculations made easy!



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

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

Call 800-MATHCAD to request a free demo disk!

In Massachusetts, call 617-577-1017.

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

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

Name_____

Title_____

Company_____

Address_____

City_____ State___ Zip_____

Phone(____) _____

MathSoft

MathSoft, Inc
201 Broadway
Cambridge, MA 02139
USA

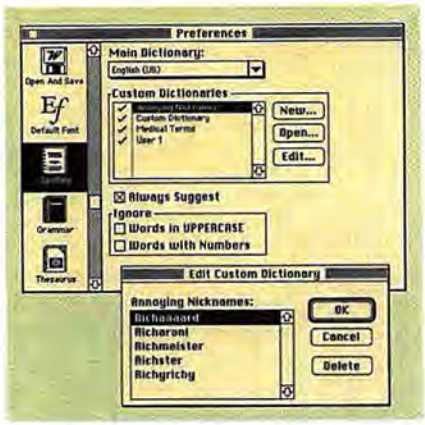
MCTECH 2.0

Circle 34 on reader service card.

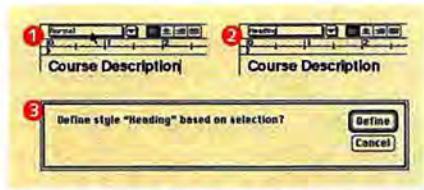
single character to an entire document, including graphics. You can insert a glossary entry into text with a few keystrokes. A single glossary file can contain as many entries as will fit on disk. You can also create any number of glossary files and switch between them. You might create separate glossaries for separate jobs—one for letters, one for contracts, one for technical manuals.

How to: Word Type the text to be stored, then select it and choose Glossary from the Edit menu. In the Glossary dialog box, type a short name for the entry and then click on Define. To insert a glossary entry in your document, press ⌘-delete, type the entry's name, and then press return. (Or, choose the Glossary command, select the entry, and then click on Insert.) To add a glossary entry to the Work menu, choose Glossary, press ⌘-option-equal sign, and then click on the entry's name. To save or open a glossary file, choose Save or Open from the Glossary dialog box. See page 249 of the Word 5 *User's Guide* for more details. (These functions work in Word 4.0 also.)

How to: WordPerfect WordPerfect lacks a glossary feature, but you can obtain the same keystroke-saving benefits by creating a *macro*—a series of keystrokes and/or menu choices that you record and save for later playback.



Editing Dictionaries In Word 5.0, you can switch between custom dictionaries using the Spelling option in the Preferences dialog box (top). Check marks indicate open dictionaries. Tip: When adding a large number of words to a dictionary, uncheck the Always Suggest option; that way, Word won't waste time looking up alternative spellings. Selecting a dictionary and then clicking on Edit displays the dialog box, where you can remove words (bottom).



Formatting with Style To create a style in Word, format some text and then click within the ruler's Style pop-up (1). Type a name for the style (2), and click on Define (3). You can then apply the style to a different paragraph by selecting the paragraph and choosing the style from the ruler's pop-up.

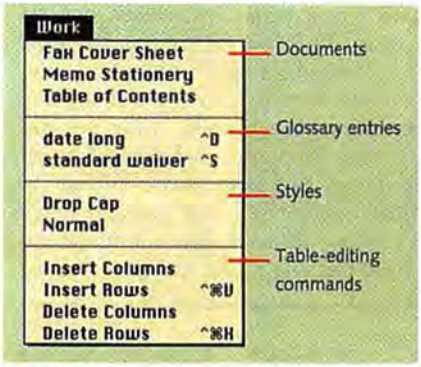
Automate Formatting with Styles

IF YOU FREQUENTLY SWITCH BETWEEN text formats within a document, you ought to be using *styles*. (A style is a set of text formats—font, size, type style, line spacing, and so on—that you can apply in one fell swoop; a style sheet is a collection of styles for a given document.) For example, say you always format reports to have double-spaced 14-point Helvetica Bold headings and single-spaced 10-point Times body text. If you define styles for the headings and body text, you can format these elements with a single mouse click or keystroke—no traveling from menu to menu and threading through dialog boxes. Besides saving time, styles help ensure consistent formatting. This can be especially valuable for projects involving numerous writers: you can create a stationery document containing the styles used in a project, and then give each writer a copy.

Styles have additional advantages. If you change a style's description—perhaps switching from 10-point Times body text to 12-point Palatino—your program will reformat all text formatted under that style. This lets you experiment with different formatting options without a lot of manual reformatting. Another plus: Word and WordPerfect styles are supported by publishing programs such as Aldus PageMaker and QuarkXPress. You can import a Word or WordPerfect document into either of these programs and retain the original style definitions and formatting.

How to: Word Format some text as desired. Display the ruler (choose Ruler from the View menu). With the blinking insertion point within the text, click once within the ruler's style pop-up menu (see "Formatting with Style"). Type a name for the style and then press return. When Word asks if you want to define the style based on the selection, click on Define. To apply the style to another paragraph, place the insertion point within the paragraph and then choose the style's name from the ruler's pop-up.

How to: WordPerfect Format some text as desired. With the insertion point within the text, choose New from the Layout menu's Styles submenu. Type a name for the style and then click on New. To apply the style to another paragraph, place the insertion point within the paragraph and then choose the style's name from the Styles submenu.



Put Word to Work Word's Work menu can hold the names of items you use frequently. To add a keyboard shortcut to a Work menu command, press ⌘-option–plus sign using the plus sign on the numeric keypad. The pointer turns into a ⌘ symbol. Choose the command to which you want to add a shortcut, and then type the key combination you want to assign to that command. Consider using control-*key* sequences to avoid having to replace a built-in ⌘-*key* sequence. The control key is indicated in menus by the caret symbol (^).

Both Word and WordPerfect also let you link styles together so you can automatically switch from one style to the next when you press return (or, in WordPerfect, enter). For instance, if you link your heading style to the body text style, the program automatically switches to the body text style after you type a heading. Both programs also let you base one style on another. If, for example, you're creating two styles that use the same line-spacing settings but different fonts, you can base the second style on the first. If you want to change line-spacing settings later on, you need alter only the first style. For details on these options, see page 189 in the Word 5 *User's Guide*, and page 426 in the WordPerfect 2.1 *Reference*.

Tailoring Keyboard Shortcuts and Menus

LET'S LOOK AT SOME WAYS TO CUSTOMize your word processor itself, starting with its keyboard shortcuts and menus. Word lets you change its keyboard shortcuts and even reorganize commands within its menus. If you never use any of the footnoting and indexing commands, for example, you can remove them to tidy up your menus.

Better still, you can add commands that correspond to options within Word's dialog boxes. For example, Word's Table Layout command lets you change the arrangement of rows, columns, and cells in tables created with Word's table editor. But when you're performing major surgery on a table, choosing Table Layout over and over again gets old quickly. The solution: Add the Table Layout dialog

continues

What's the Difference between a Font and a Typeface?

...And what's all this about PostScript® versus TrueType? Is there a difference between tracking and kerning? What is an outline font, anyway?

At Altsys, we've spent the last 6+ years understanding and developing Macintosh® software for creating and editing type and fonts. And during that time, a special vocabulary has developed just for computer type. It's made up of new words and different uses of traditional typographical terms.

So, to help you understand fonts in this age of technology, we'd like to offer you a free copy of our booklet, ***Type Terminology on the Desktop***. Just call us at the phone number and extension below or use the enclosed magazine reader reply card.

Remember, "When you need more than a pretty face, we're just your type!"

ALTSYS

Altsys Corporation
269 W. Renner Road
Richardson, Texas 75080
Phone: (214) 680-2060, Ext. 687
Fax: (214) 680-0537

Circle 35 on reader service card.

Now Available At:

EGGHEAD SOFTWARE

DeskPaint & DeskDraw

DeskPaint & DeskDraw, the award winning graphics software, combines paint and draw graphics in two programs with the same elegant interface and ease-of-use. They provide a powerful environment for the creation of graphics, illustrations, drawing and forms. They are also ideal for the editing of existing PICT and TIFF images created in other graphics programs or scanned in from your favorite scanner. For unparalleled graphics editing capabilities, DeskPaint & DeskDraw is the obvious choice!

4½
MacUser Magazine
November 1990

One of the "Top painting software (programs) at worksites"
MacWeek Magazine
February 24, 1992

For more information call your favorite dealer or call Zedcor toll free at:

1.800.482.4567

ZEDCOR

Circle 161 on reader service card

box's options to Word's menus, where you can choose them directly.

Word provides a special menu, called Work, that can hold the names of often-used documents, styles, and glossary files. You can add keyboard shortcuts to menu commands, thus gaining one-key access to the files, styles, and glossaries you use most (see "Put Word to Work").

WordPerfect also lets you change and create keyboard shortcuts for menus and the style sheets and macros you create. Unlike Word, WordPerfect also lets you reorganize the position of keyboard characters themselves. For example, if you use the trademark symbol (™) frequently, you might want to assign it to the option-T key sequence instead of its usual (and more easily forgotten) option-2 sequence.

How to: Word To remove a command from a menu, first press ⌘-option-hyphen. When the mouse pointer turns into a bold minus sign, simply choose the doomed command. To add a dialog box option to a menu, open the dialog box and then press ⌘-option-equal sign (the key to the left of the delete key). When the pointer turns into a bold plus sign, click on the desired dialog box option. (If the pointer remains a bold plus sign, the op-

Customizing Other Programs

You don't use Word or WordPerfect? Take heart. You can apply many customizing techniques to other programs.

Custom spelling checkers All popular word processors and integrated packages have spelling checkers and support custom dictionaries.

Stationery You can create stationery with ClarisWorks, T/Maker's WriteNow 3.0 (which should be out by the time you read this), and Claris's MacWrite II. It's worth noting that if you use System 7, you can turn a document created in any program into stationery. At the Finder, select the document and choose Get Info from the File menu, and then check the Stationery Pad box. Thereafter, when you open the stationery document, the Finder duplicates the stationery document and then opens the duplicate. Apple built this feature into System 7 to enable you to create stationery for programs that don't support stationery directly.

Glossaries Only Word has a glossary feature, but ClarisWorks and Microsoft Works have macro recorders that enable you to record and play back key sequences. You can also save and insert repetitive text in any program using CE Software's QuicKeys² keyboard-enhancement utility.

Styles WriteNow 3.0 has excellent style features. MacWrite II's custom-styles features let you store and recall character formatting, but not paragraph-level formatting such as line spacing, margins, and indents. ClarisWorks and Microsoft Works lack style features, but you can simulate them by recording macros that choose formatting commands.

Menu and keyboard customizing You can use ClarisWorks or Microsoft Works macros to create your own keyboard shortcuts. Better yet, use QuicKeys² to create shortcuts for all your programs.

Macros With QuicKeys² you can add macro features to any program. QuicKeys² doesn't offer all the power and flexibility of a built-in macro feature, but it does let you record and play back repetitive tasks. And it lets you customize other aspects of your Mac.

JUST HOW MUCH FASTER IS 2FAST™ STORAGE?

2FAST.
9 MB/sec.*

NOT 2FAST.
3.5 MB/sec.*

We put storage speed to the test by benchmarking our powerful new 2FAST family of storage systems against the competition's best offerings. Time after time, 2FAST systems were faster. Two, three, even five times faster. That performance edge is critical when you're running drive-intensive applications such as imaging, multimedia, prepress and graphics.

THE WINNING COMBINATION: INNOVATION AND INTEGRATION.

2FAST is a superior implementation of Fast SCSI-2 interface technology. By integrating our advanced driver software and innovative Fast SCSI-2 busmastering co-processors with a new generation of Fast SCSI-2 drives, we create a truly optimized storage system that smashes the I/O bottleneck. **Circle 1 on reader service card**

GET TOMORROW'S TECHNOLOGY TODAY. AND A FREE GUIDE TO FAST SCSI-2.

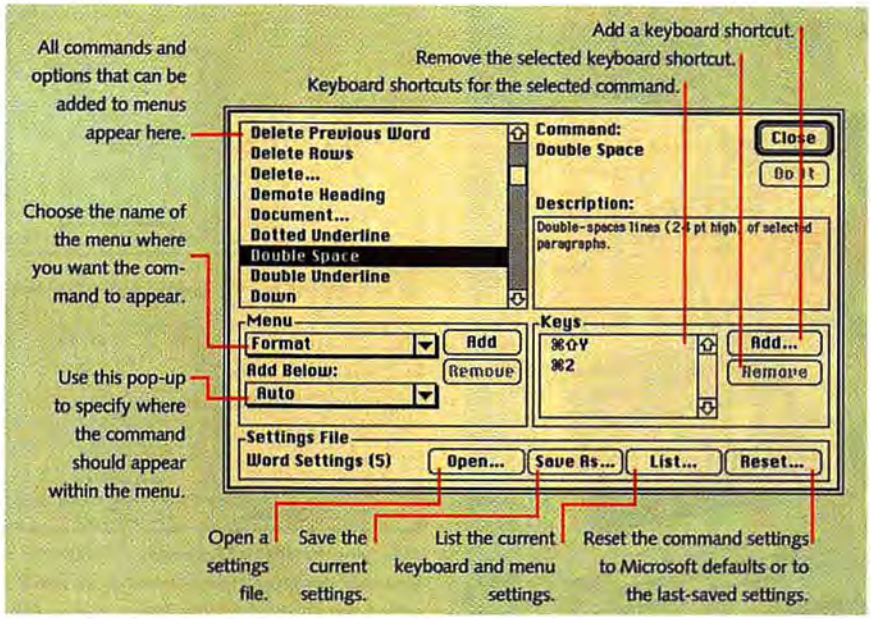
Fast SCSI-2 is the platform of the future. And with our 2FAST storage systems, available from 235 megabytes to 8 gigabytes, your future is built in. Our "Advanced SCSI-2 Technology Guide" presents an objective look at what SCSI-2 can mean to you. Write Storage Dimensions at 1656 McCarthy Blvd., Milpitas, CA 95035, or call toll-free 800-765-7895 for your free copy. Find out for yourself how 2FAST will make your Mac™ applications run faster. A lot faster.

* Chart measures sequential reads (350 blocks) using MacinMeter with a 2GB Fast SCSI-2 hard drive. 3.5 MB/sec. test was run on the Macintosh Quadra native SCSI port.

tion you clicked on lacks a corresponding command. To restore the normal pointer, press ⌘-period or the esc key.) You can also use the Commands dialog box to add or remove commands and to switch between *settings files*, which store command settings (see "Command Performance").

How to: WordPerfect Choose Keyboards from the Preferences submenu (File menu) to display the Keyboard Management dialog box. Use the Type pop-up menu to specify how you want to modify the keyboard; for example, choose Characters to change a keyboard character, Commands to assign or remove a keyboard shortcut, or Styles to assign a shortcut to a style. Then select a character, menu command, or style or macro name and use the Assign or Remove button to add or remove a keyboard shortcut (see "Modifying WordPerfect Keyboards").

WordPerfect keyboard settings are stored in a *keyboard template*. You can create as many keyboard templates as you like and switch between them using the Keyboard Management dialog box.



Command Performance Word's Commands dialog box is the gateway to modifying the program's menus to your own specifications.

Macros: Writing on Autopilot

IF YOU FREQUENTLY PERFORM THE same sequence of steps, consider recording those steps in a macro for later playback. Macros can perform simple jobs, such as inserting often-used text or automatically changing all double hyphens (--) to typesetter's em dashes (—). But a macro can also perform a sequence of events—opening a document, searching for and replacing some text, saving the document, and then printing it. You can even create macros that display dialog boxes and then make decisions based on your response. For example, you could create a form letter whose contents vary depending on whether a client's account is paid up or past due.

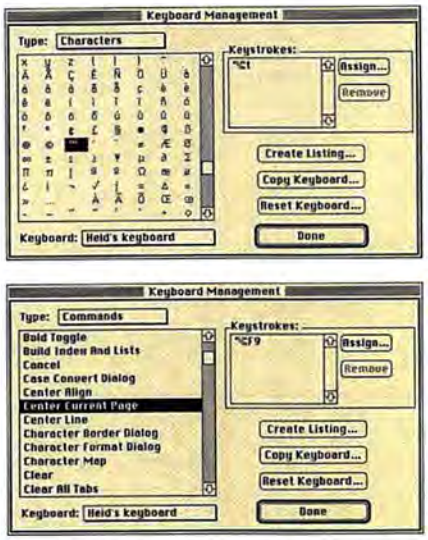
continues

A LOT FASTER.

STORAGE DIMENSIONS

2FAST is a trademark of Storage Dimensions. © 1992 Storage Dimensions. Mac and Macintosh Quadra are registered trademarks of Apple Computer, Inc.

MacFriends History Lesson #8
BRAIN POWER
MAC PLATO
These RAM value Macs have the brain power to get work done!
I Mac therefore I am!
"Academic Answer" Mac si $1888
CPU price in package
Lease $118/mo. 36/10%
INCLUDES SYSTEM 7.0!
The perfect Mac for the student or anyone who makes smart decisions.
• 9 MB RAM • 120 MB HD
• 14" Color Monitor
• Extended keyboard w/Quickeys Light
Total Package Price $3388
Ask About QuicKor Kare Extended Service
NEC Silentwriter Model 95 Printer
• Postscript Level 2
• 6 ppm
• 35 scalable Adobe fonts
• 2MB expandable to 5MB
• Auto interface switching
• Envelope feeder & cassette
$1588
Lease Only $58/mo.
NEW 030!! The first ones are here!
"Scholar Special" Mac LC $1188
CPU price in package
Lease $91/mo. 36/10%
Now the Mac LC has the speed you need for home!
• 6 MB RAM • 120 MB HD
• Sony 13" Hi Res Monitor
• Expanded Video RAM
• Ext. keyboard w/Quickeys Light
Total Package Price $2488
800 331-1322
24 hour QUICKFAX (503) 286-8710
Local: (503) 286-9350
MacFriends
Think before you buy! Call MacFriends today and discover the true meaning of value.
AMERICA'S "MAC-ONLY" STORE
QuicKor Card
Federal Express
Circle 58 on reader service card



Modifying WordPerfect Keyboards WordPerfect's Keyboard Management dialog box changes with the option you choose from the Type pop-up menu. Top: The Characters option lets you move characters to different positions on the keyboard; here, option-T is assigned to the trademark symbol. Bottom: The Commands option lets you assign shortcuts to menu commands. Here, option-F9 is assigned to the Center Current Page command.

How to: Word Word 5's macro language, called WordBASIC, is scheduled to be available by the middle of this year. Unlike the macro features in WordPerfect and most other programs, WordBASIC will not provide a record mode that watches over your shoulder and records your keystrokes and command choices; instead, you will have to create macros manually by typing commands into a window. But the language will be powerful; advanced users will be able to write macros that do such tasks as display dialog boxes prompting for information, link Word documents to Microsoft Excel spreadsheets, and much more.

How to: WordPerfect To record a macro, choose Record from the Macro menu. Type a name for the macro and then click on New. Next, perform the steps you want to record. If you need to scroll while recording, use the keyboard's scrolling keys, not the mouse. When you've finished recording, choose Stop Recording from the Macro menu. (You can also pause recording by choosing Pause from the Macro menu's Options submenu; choose Resume to continue recording.) When asked to save changes, click on Yes. Unless you say otherwise, WordPerfect stores macros in your *private library;* this file, located in the System Folder, can hold macros, styles, keyboard templates, and more. Items in the private library are available in any open document. If you want a macro (or a style, keyboard template, or other item) to be available only when a certain document is open, save it in that document.

Fine-Tuning Memory and Disk Requirements

FREE MEMORY AND DISK SPACE ARE often in short supply. If you're willing to forgo some speed and features, you can dramatically reduce your program's appetite for kilobytes.

To reduce any program's memory requirements, select its icon at the Finder and choose Get Info from the File menu. In the Get Info window, specify how much memory you want to give the program by typing the value in the Current Size box. (In system versions prior to 7.0, this box reads Application Memory Size.)

Reducing disk space requirements means doing without. Remove files corresponding to features that you don't use, remove sample or tutorial documents you don't need, and expunge any unneeded *converters*, which enable the program to swap documents with other programs.

How to: Word Word runs in as little as 512K of memory, although performance suffers and the grammar checker doesn't work. You may also encounter low-memory messages during a lengthy search-and-replace operation or when compiling an index or table of contents. As for saving disk space, Word 5's modular design makes pruning the program easy: simply drag any modules and converters you don't want out of the Word Commands folder (located in the Word folder). The grammar checker is one candidate for the Trash: it and its accompanying file use nearly a megabyte of disk space.

How to: WordPerfect WordPerfect runs in 800K of memory, but just like Word, it slows down. To save disk space, delete file converters you do not need by dragging them out of the Conversions folder. To access the Conversions folder, you open the System Folder, then the Preferences folder, and then the WordPerfect folder.

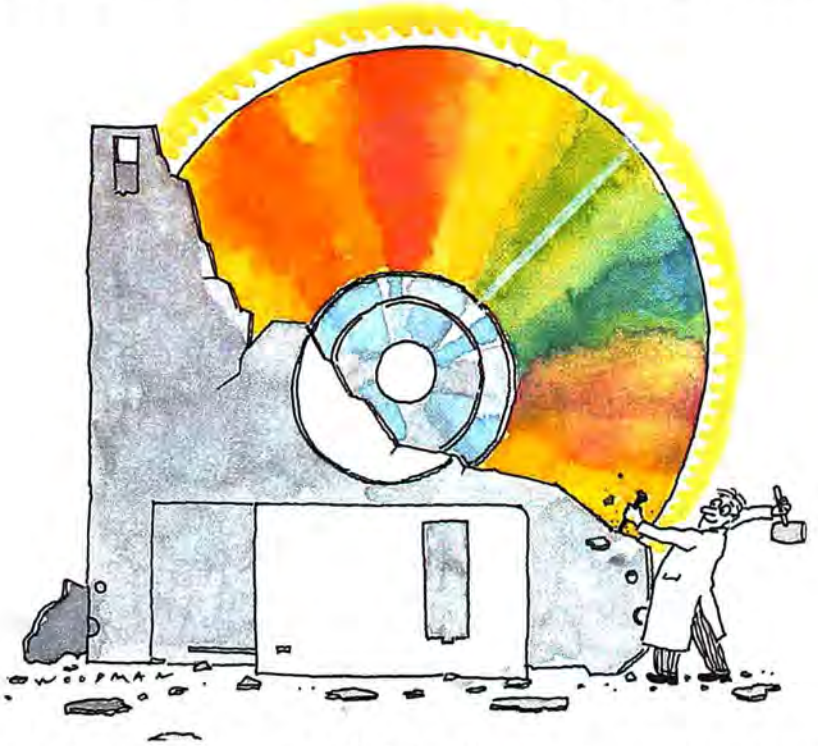
Customizing a word processor is one of those jobs that takes some time at first but pays off in the long run. As you create dictionaries, styles, and stationery; tweak menus and keyboard shortcuts; and write macros; you'll tailor your program to your writing habits. You'll create a word processor that feels just write. **m**

See *Where to Buy* for contact information.

Contributing editor JIM HEID looks at a different aspect of Mac fundamentals each month. His latest books are *Macworld Guide to Microsoft Word 5* and *Macworld Complete Mac Handbook,* both published by IDG Books Worldwide.

Release Your Imagination

Experience the Power of Multimedia Computing at the 6th Annual CD-ROM Expo



September 30 - October 2, 1992 • World Trade Center • Boston

Release yourself from the limits of conventional computing. Discover new ways of managing information with unprecedented ease and efficiency. From indexing and retrieval to developing and publishing, to the multimedia mix of text, image and sound, CD-ROM gives you the power and the ability to reach new markets, and do more in less time.

Find out how at CD-ROM Expo.

You'll see the advantages of optical technology, whatever the environment you work in. The versatility and ease of CD-ROM allows you to cruise through complicated tasks of researching, editing and presenting information. You have complete control over publishing, engineering, manufacturing, and many other mission critical applications.

At CD-ROM Expo you can see how optical technology can work for you by visiting these exhibitors: **3M Optical Recording, Dataware, EDUCORP, Fulcrum, Hitachi, IBM, Meridian Data, NEC Technologies, Northern Telecom, Pioneer, Sony, Toshiba,** and many more. You'll experience first hand the wide range of applications available, as well as the hardware, software, development systems, and multimedia platforms that makes them possible. Plus, our outstanding conference program offers unique insights on the latest technologies and markets, with experts in the field sharing their knowledge and experience. Find out more about CD-ROM Expo and get a FREE Exhibits-only ticket by returning the coupon below. And make your plans now to experience the technology that's as unlimited as your imagination.

MACWORLD MPC WORLD ETA

In association with *Macworld* magazine, *MPC World* and Emerging Technology Applications

CD-ROM EXPO

YES, I want to release my imagination at CD-ROM Expo, September 30 - October 2, 1992, World Trade Center, Boston.

- ○ Please send me a FREE Exhibits-only ticket.
- ○ Please send me a complete conference brochure.
- ○ Please send me details about reserving booth space.

NAME _____

TITLE _____

COMPANY _____

ADDRESS _____

CITY _____

STATE _____ ZIP _____

PHONE _____

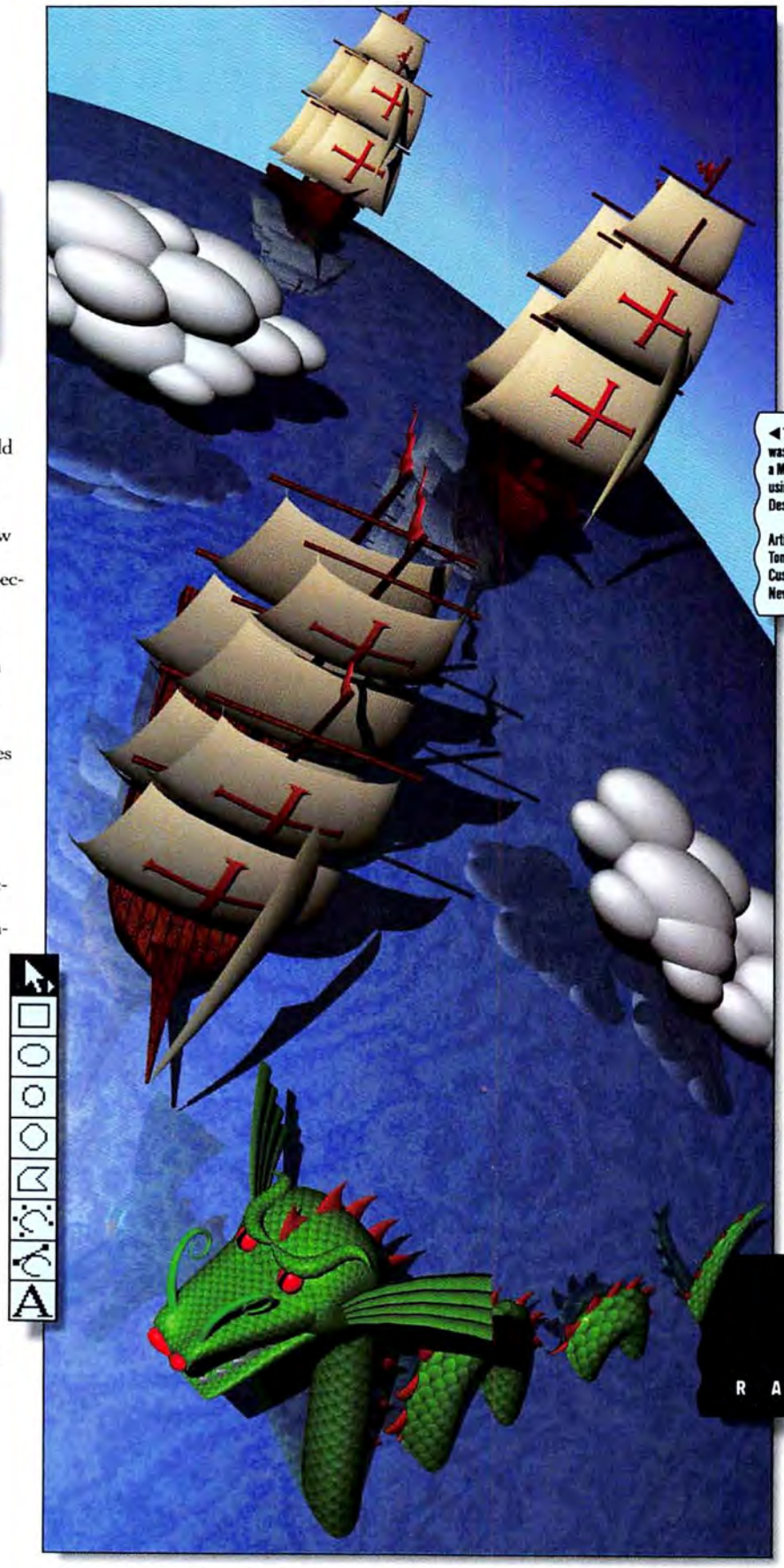
Fax to 617-361-9074 or mail to CD-ROM Expo, c/o Mitch Hall Associates, 260 Milton St., Dedham, MA 02026. REP

Columbus Was Right.

Chris had the right idea. He knew the world wasn't flat, nor was he afraid to explore it. Now you too can explore a spectacular new dimension in Mac illustration with Ray Dream Designer.™

The software handles the complex details—modeling, perspective, lighting, textures, reflections—while you concentrate on being creative.

You'll use the same kinds of drawing tools you already know, and images from virtually any popular Macintosh illustration, retouching or page layout program. You can manipulate text, and even wrap 2D designs around 3D objects. Automatically.



◀ This image was produced on a Macintosh using Ray Dream Designer 2.0.

Artist: Tom Cushwa, Cushwa Studio, New York.

Your voyage from start to finish doesn't take forever, either. Ray Dream Designer's built-in DreamNet™ technology gives you all the "wow" of high quality, high resolution 3D illustrations without the "ouch" of hours-long file processing and rendering times.

Best of all, you don't need a queen's ransom to afford Ray Dream Designer. You can discover a copy at your favorite dealer for only $895. Or call toll-free for more information: **1-800-846-0111.**

RAYDREAM

DreamNet, Ray Dream Designer 2.0 and Ray Dream are trademarks of Ray Dream, Inc. All other trademarks are properties of their respective holders. © 1992 Ray Dream Inc. 1804 N. Shoreline Boulevard, Mountain View, CA 94043.

Circle 159 on reader service card

HOW TO CANVAS 3.0

Insights

BY DAVID POGUE

Some Killer Tips to Crank Up Deneba's Latest Rev

You're probably good and tired of hearing Canvas 3.0 called the Swiss Army Knife of graphics programs. But that is a good analogy for a program that can open every Macintosh graphics-file format from MacPaint to EPS, and even a few IBM-file formats.

In an attempt to crowbar a reasonable interface onto all this power, Deneba Software has added some interesting twists to the standard Mac interface. You'll find not only hierarchical submenus, but even sub-submenus. Sometimes clicking on a tool palette icon makes a second palette pop out . . . and sometimes clicking on an icon on that palette makes a third palette pop out. Good thing you can tear off the minipalettes and leave them open on the screen (if your monitor is big enough).

In other words, Canvas is a great program to mine for option-*key* tricks, special-effects nuggets, and other hidden secrets. Some of these tips are from graphics guru Deke McClelland, who went so far as to write *Canvas 3: The Book* (Peachpit Press, 1991). Others are from Deneba's resident artist, Dave Rumfelt, who has nested tool palettes running in his veins. (It's his work that adorns the Canvas 3.0 ads you may have seen, including that zowie racing-car cross section.)

Picking Apart Palettes

One basic concept before we start with the heavy-duty tips: let's demystify those bizarre color-palette icons on the left side of the screen once and for all. There are four of them, and it's no small feat figuring them out.

Pen Pat and Fill Pat—the top two palettes, which combine into one palette when you tear one of them off—refer to the outline and inside of shapes, respectively. Canvas uses the Pen Pattern for lines: straight lines, the perimeters of circles, the outlines of polygons, and so on. The Fill Pattern is what goes inside the shapes. (The Fill Pattern is irrelevant when you draw lines.)

There are also Fore Color and Back Color, both on the bottom left palette. These terms refer to the dark and light portions of the patterns you choose from the Pen Pattern and Fill Pattern palettes. For example, in the brick pattern, the bricks' outline is black (Fore) and the bricks themselves are white (Back). The palettes let you change from black and white to color.

Memory Management

Canvas's modular construction means you can leave out pieces that you won't need; each tool you omit saves RAM and loading time. To select which features will load, hold down the spacebar just after you double-click on the Canvas program icon. The Tool Picker will appear with a list of features, each of which you can toggle on or off. Here are a few you can jettison for starters.

If you're a Mac-only user, turn off the IBM file-format filters—CGM I/O, DXF I/O, IGES I/O. If Canvas is your only graphics program, turn off the other file-format filters: Canvas 1.0 I/O, Canvas 2.0 I/O, Illustrator I/O, MacDraw I/O, MacPaint I/O, StartupScreen I/O, UltraPaint I/O. If

continues

Cool Effect with Steel and Glass

Deneba artist Dave Rumfelt tells how he created the shiny steel parts in the Canvas 3.0 ad.

1. Stack four rectangles, each narrower and lighter-colored than the other.

2. Choose Blend from the Object menu. Specify 25 copies with a constant blend and click on OK. Group the results (⌘-G).

3. Add an oval to the top; choose a light color and convert it to a Bézier shape (⌘-control-B). Duplicate it and place it at the bottom of the cylinder. Double-click on this bottom oval to place it into editing mode.

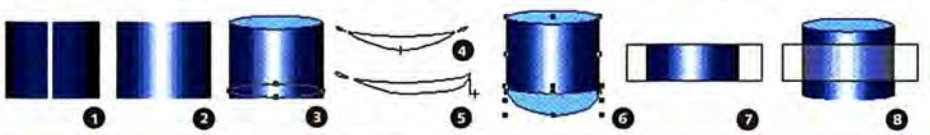
4. To shape the bottom oval into a curved tool to chop off the bottom of the cylinder, first drag the top handle downward past the lower edge of the oval.

5. Click on the rightmost handle; while pressing the tab key, drag the top tangent handle straight down, pulling the bottom lip of the "smile" out of the way, so that the top lip is a smooth curve. Repeat with the left side.

6. Shift-click on the cylinder; choose Subtract. Delete the smile.

7. To make the pane-of-glass effect, duplicate the cylinder. Drag a rectangle across it that has no fill. Select them both, then choose Intersect from the Combine command. Select the remaining chunk of cylinder.

8. From the Special Effects command, choose Tint Objects. Enter 35% in both boxes, set both Tint Toward boxes to white, and click on OK. Group the cylinder chunk with the rectangle, drag it to the original cylinder, and bring it to the front (⌘-F). Presto, steel and glass.



you're running in black and white, turn off the color tools: Dropper, Pantone Colors, RGB Color Manager, Separations. If you won't be needing text in this session, turn off the specialized text handlers: Bézier Text, Search & Replace, Spelling, Text Ruler, Text Utilities. If you're not using System 7, turn off the System 7 features: Balloon Help, System 7.0 Options. And if you're not drafting, turn off the special drafting tools: Dimensioning, Hatch Patterns.

Arrow-Minded

You may be frustrated by the fact that Canvas keeps taking your tools away from you. After you draw anything, Canvas automatically switches to the arrow tool. To switch back to the draw tool you just used, press the ⌘ key. And if Canvas's automatic arrow-selection feature is really getting you down, turn it off altogether. Choose Preferences from the File menu, click on the icon for General preferences, and check the box marked Retain Selected Tool.

Rules for Rulers

Sometimes it's important that your artwork be printed at a precise size. If this is the case, don't trust the on-screen rulers—yet.

First, choose Rulers from the Layout menu. In the dialog box that appears, use the Printer pop-up menu to specify whether you'll be using an ImageWriter- or LaserWriter-class printer. Now your documents should print at an accurate size. If you don't choose a printer, your printed drawing might be as much as 4 percent too big or too small.

And speaking of rulers—don't miss those slick rip-off rulers. Once you've got rulers displayed on the screen, hold down the option key, click on a ruler, and drag. A copy of the ruler peels off, so that you can place it anywhere in your drawing. To get rid of it, just drag it out of the workspace.

Adding Guidelines

You can add nonprinting guidelines to a Canvas drawing just as you can in PageMaker, QuarkXPress, or other programs—by clicking on a ruler and dragging a guideline into the drawing area. That's pretty standard. What's more unusual is that once you've got some objects touching a guide, you can move the guide and the objects all move along with it—provided you press the option key.

Layers for Speed

Like any graphics program, Canvas starts to bog down when you create lots of objects. There are four things you can do to keep its speed reasonable.

- Do as much work as possible in black-and-white mode.
- If you're finished with some elements of the drawing, send them to invisible layers. Select the elements (group them if you want). Choose Arrange from the Object menu, then from the Arrange pop-up menu choose Send to Layer, and then pick a layer from the submenu that appears. You can make that layer invisible by choosing Layer Specs from the Layout menu and deselecting the Visible check box.
- Stop those redraws. Any time Canvas starts to redraw the screen picture, you're not

KEYBOARD SHORTCUTS

To switch temporarily to this tool . . .	hold down these keys
Dropper tool	option and tilde (~)
Grabber hand tool	spacebar
Zoom tool (magnifying glass)	⌘-shift-option
Text tool	⌘-option-T

Click,
It's A Mac.

Click,
It's A Mac
And A PC.

Creating Text Outlines

1. To create wild text effects—and logos aplenty—start by selecting a text block. From the Object menu, choose Create Béziers (Filled or Hollow).

TeachText

2. Ungroup the result. Double-click on any character's outline to edit it by dragging handles.

TeachText

3. Press enter to finish editing.

TeachText

committed to waiting till it's finished. (For really complex drawings, one redrawing of the screen can be a several-minute proposition.) If all you want to do is use a menu, scroll again, or work on part of the drawing that's already been redrawn, press ⌘-period (.) to interrupt the redraw. If you've stopped the screen when it's only partially drawn, press ⌘-K to redraw the whole thing.

• For maximum speed, choose Views from the Display menu, and choose Wire Frame from its submenu. (Or press ⌘-1.) It's like working in Adobe Illustrator: confusing, because you can't really tell how objects overlap, but fast.

Setting Objects Aside

If you're in a complex tangle of objects, and some are getting in your way, here's a quick way to toss them aside momentarily: group them, then press ⌘–right arrow, say, three times; each time, the selected group jumps 10 pixels (screen dots) to the right. Now that they're out of the way, you can work on the remaining objects unencumbered.

When you're ready to put the object group back in place, select it and press ⌘–left arrow the same number of times as you pressed the right arrow. Not only does the group jump back precisely to its original position, but even its position in the front-to-back lineup remains intact. For added variety, you can use the other arrow keys, too. And if you press the option key instead of ⌘, the selected object jumps 50 pixels at a time instead of 10.

Multiple Objects at Your Command

Every now and then, you have to add dozens of identical objects to a drawing, like the leaves on a tree.

To do this quickly, draw one leaf, select it, and add it to the MacObject menu by choosing Add Macro from the Macro menu. Give it a name (like Leaf). Now choose it from the same menu. Place the cursor on your drawing, hold down ⌘, and start clicking away. You leave a leaf with each click.

Undocumented Centering Feature

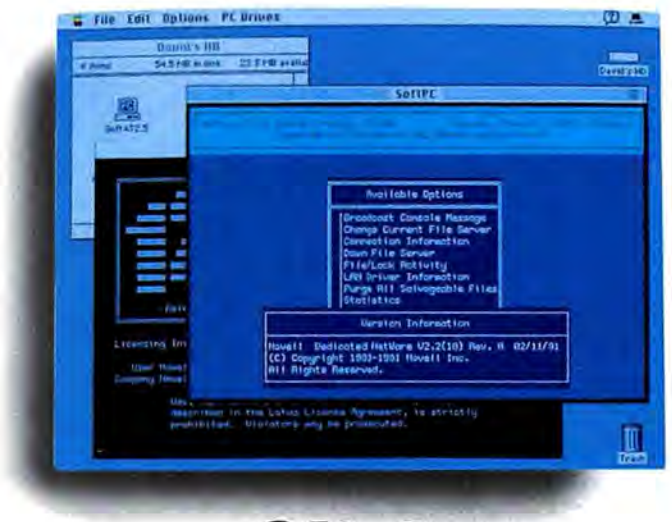
Select something. Using the Zoom Manager (the palette of zoom in/zoom out amounts), choose the same zoom level you already have. For example, if you're at double size (2:1), choose 2:1. The drawing shifts to place the selected object in the middle of the screen.

Aligning Objects

You can use the align tool to distribute tasks—provided you set them up beforehand using the menu command. In other words, one click on the align tool aligns the selected objects according to your most recent settings in the Alignment Specifications dialog box. **m**

See *Where to Buy* for contact information.

Contributing editor DAVID POGUE is a Macintosh music, graphics, and animation nut. He teaches magic, Mac, and music in New York.



Click, It's A NetWare PC Node, Too.

You wanted more. We gave you SoftPC,® the only software solution for running thousands of powerful MS-DOS programs on your Macintosh. But you wanted more. You wanted to be a node on your network.

Now, our bestselling SoftPC can interact as a working node on your existing IBM network by providing access to your Novell Netware server. Add our new **SoftNode™** to Universal SoftPC or SoftAT™ and your Macintosh can share DOS applications with multiple users over a Novell Ethernet network.

Full-featured PC compatibility *and* Novell Netware connectivity for your Mac. All in software. What more can you ask from Insignia Solutions?

How about a dealer near you?

Call Insignia Solutions today at (800) 848-7677 for info on all our products. In Europe, call (U.K.) +44 494 459426.

Insignia Solutions™

Bridging Worlds Of Software™

Insignia Solutions Inc., 526 Clyde Avenue, Mountain View, CA 94043. FAX (415) 964-5434.
SoftPC is a registered trademark of Insignia Solutions Inc. SoftAT and SoftNode are trademarks of Insignia Solutions Inc. All other product names are trademarks or registered trademarks of their respective holders. SoftPC is System 7 savvy.

Circle 216 on reader service card

COPY SOFTWARE ILLEGALLY AND YOU COULD GET THIS HARDWARE ABSOLUTELY FREE.

Software piracy isn't just a crime. It's a shame. Because most people who do it aren't even aware that it's illegal. If you copy software that's protected by copyright, you could lose your job, face a civil suit, pay a $100,000 fine and possibly be imprisoned. So get the facts now. To request more information, contact the Software Publishers Association at 1-800-388-7478. Because in a court of law, ignorance is one thing you won't be able to plead.

Please send me more information on the legal use of software.

Name _____

Organization _____

Title _____

Address _____

City _____ State _____ Zip _____

Please check software format you prefer if you would like to receive SPAudit, a software inventory management tool:

___ DOS 3.5" ___ DOS 5.25" ___ Macintosh®

Mail to: Piracy Update, 1730 M Street, N.W., Suite 700, Washington, D.C. 20036-4510

A-1

SPA Don't Copy That Floppy

Macintosh is a registered trademark of Apple Computer, Inc.

Where to Buy

Products Featured in This Issue

EDITED BY SUZANNE COURTEAU

THIS LISTING PROVIDES COMPANIES AND PHONE NUMBERS FOR PRODUCTS MENTIONED IN THIS ISSUE.

Alias Sketch
Alias Research; 800/447-2542; fax 416/362-0630.
American Heritage Electronic Dictionary
Wordstar International; 415/382-8000, 800/344-6044; fax 415/382-4952.
BeagleWorks
Beagle Bros; 619/452-5500, 800/345-1750; fax 619/452-6374.
BigThesaurus; Canvas; Spelling Coach Professional
Deneba Software; 305/594-6965, 800/622-6827; fax 305/271-7828.
Calculus T/L
Brooks/Cole Publishing; 800/354-9706; fax 408/375-6414.
ClarisWorks
Claris Corp.; 408/727-8227.
Comprehensive Proofing Tools
Alki Software Corp.; 206/286-2600, 800/669-9673; fax 206/286-2785.
Correct Quotes
Wordstar International; 415/382-8000, 800/344-6044; fax 415/382-4952.
Desk
Zedcor; 602/881-8101, 800/482-4567; fax 602/881-1841.
ElectricImage Animation System
Electric Image; 818/577-1627; fax 818/577-2426.
Fields & Operators
Lascaux Graphics; 602/544-4229, 800/338-0993.
Funk & Wagnalls Standard Desk Dictionary
Inductel; 408/866-8016.
f(z)
Lascaux Graphics; 602/544-4229, 800/338-0993.
GreatWorks
Symantec Corp.; 408/253-9600, 800/441-7234; fax 408/252-4694.
HandiWorks
MacVonk USA; 215/660-0606; fax 215/668-4360.
HiQ
Bimillenium Corp.; 408/866-2010, 800/488-8662; fax 408/866-2305.
Infini-D
Specular International; 413/549-7600; fax 413/549-1531.
JAG
Ray Dream; 415/960-0765; fax 415/960-1198.
Language Master
Franklin Electronic Publishers; 609/261-4800; fax 609/261-1631.
MacRenderMan; NetRenderMan
Pixar; 510/236-4000, 800/888-9856; fax 510/236-0388.
MacroMind Three-D
MacroMind/Paracomp; 415/442-0200, 800/248-4477; fax 415/442-0190.
MacTOPAS
AT&T Graphics Software Labs; 317/844-4364; fax 317/575-0649.
MacWrite II
Claris Corp.; 408/727-8227.
Maple; TeMath
Brooks/Cole Publishing Co.; 800/354-9706; fax 408/375-6414.
MathCAD
MathSoft; 617/577-1017, 800/628-4223; fax 617/577-8829.
Mathematica
Wolfram Research; 217/398-0700, 800/441-6284; fax 217/398-0747.
The Mathematica Help Stack
Variable Symbols; 510/843-8701; fax 510/843-8702.
MatLab
The MathWorks; 508/653-1415; fax 508/653-2997.
Microsoft Word; Microsoft Works
Microsoft Corp.; 206/882-8080, 800/426-9400; fax 206/883-8101.
PowerMath II
Central Products Corp.; 713/529-1080; fax 713/529-2006.
Presenter Professional
VIDI; 818/918-8834; fax 818/918-9935.
QuicKeys²
CE Software; 515/224-1995, 800/523-7638; fax 515/224-4534.
The Random House Encyclopedia
Microlytics; 716/248-9150, 800/828-6293; fax 716/248-3868.
Radius Rocket
Radius; 408/434-1010, 800/227-2795; fax 408/434-0127.
Ray Dream Designer
Ray Dream; 415/960-0765; fax 415/960-1198.
RenderEdge
StarTech; 619/457-0781; fax 619/457-0199.
Rhyme Design
Rapture Studios; 219/262-1324; fax 219/262-1324.
Sculpt 3D; Sculpt 4D
Byte by Byte Corp.; 512/795-0150; fax 512/795-0021.
Stratavision 3d
Strata; 801/628-5218, 800/678-7282; fax 801/628-9756.
Theorist
Prescience Corp.; 415/543-2252; fax 415/882-0530.
Thunder 7
Baseline Publishing; 901/682-9676, 800/489-9678; fax 901/682-9691.
VIDI express
VIDI; 818/918-8834; fax 818/918-9935.
Word Finder Plus
Microlytics; 716/248-9150, 800/828-6293; fax 716/248-3868.
WordPerfect for the Macintosh
WordPerfect Corp.; 801/225-5000, 800/321-4566; fax 801/222-5077.
WriteNow
T/Maker; 415/962-0195.

continues

Video In.

Truly affordable video imaging for Macintosh II computers. ComputerEyes includes everything you need to capture 8- or 24-bit color (or 8-bit gray scale) images from any standard composite or S-Video source.

Gray scale-only version also available for Mac+, SE, or II for under $250.

Call today for more information and free demo disk.

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

Professional Series Color Video Digitizer For Under $ 450.

Digital Vision

COMPUTEREYES™

Circle 242 on reader service card.

User Friendly!

Great values are just a phone call away.

in

THE MACWORLD SHOPPER

Direct Response. Direct Results.

ACCELERATORS

Apple Computer
408/996-1010.
Applied Engineering
214/241-6060, 800/554-6227; fax 214/484-1365.
Connectix Corp.
415/571-5100, 800/950-5880; fax 415/571-5195.
DayStar Digital
404/967-2077, 800/962-2077; fax 404/967-3018.
Dove Computer Corp.
919/343-5600, 800/788-3683; fax 919/251-9441.
Fusion Data Systems
512/338-5326; fax 512/794-9997.
Impulse Technology
404/889-8294; fax 404/781-8738.
MacProducts USA
512/472-8881, 800/622-3475; fax 512/499-0888.
Mobius Technologies
510/654-0556, 800/669-0556; fax 510/654-2834.
Newer Technology
316/685-4904, 800/678-3726; fax 316/685-9368.
NewLife Computer Corp.
613/592-5080, 800/663-6395x1806; fax 613/592-9738.
Novy Systems
904/427-2358, 800/638-4784.
Radius
408/434-1010, 800/227-2795; fax 408/434-0127.
Sigma Designs
510/770-0100, 800/933-9945; fax 510/770-0110.
Total Systems
503/345-7395, 800/874-2288; fax 503/343-6293.

INPUT DEVICES

Advanced Gravis
604/434-7274; fax 604/434-7809.
AirMouse Remote Controls
802/655-9600; fax 802/655-5149.
Altra
307/328-1342, 800/726-6153.
Apple Computer
408/996-1010.
Appoint
510/417-0611, 800/448-1184; fax 510/417-0614.
Articulate Systems
617/935-5656, 800/443-7077; fax 617/935-0490.
Asher Engineering
818/962-4063, 800/321-5969.
CalComp
800/932-1212.
CH Products
619/598-2518, 800/624-5804; fax 619/598-2524.
CoStar Corp.
203/661-9700, 800/426-7827; fax 203/661-1540.
Curtis Manufacturing Company
603/532-4123; fax 603/532-4116.
EMac, a Division of Everex Systems
510/683-2222, 800/821-0806; fax 510/683-2151.
Kensington Microware
415/572-2700, 800/535-4242; fax 415/572-9675.
Key Tronic
509/928-8000, 800/262-6006; fax 509/927-5224.
Kraft Systems
619/724-7146; fax 619/941-1770.
Kurta Corp.
602/276-5533, 800/445-8782.
Logitech
510/795-8500, 800/231-7717; fax 510/792-8901.
MacSema
503/757-1520, 800/344-7228; fax 503/757-1146.
MicroSpeed
510/490-1403, 800/232-7888; fax 510/490-1665.
Mouse Systems Corp.
510/656-1117; fax 510/656-4409.
Personal Writer
310/556-1001, 800/322-4744; fax 310/247-1667.
Prometheus Products
503/692-9600, 800/477-3473; fax 503/691-1101.
Softcode Canada
416/477-5474; fax 415/477-4395.
Summagraphics Corp.
203/881-5400, 800/729-7866.
Wacom Technology Corp.
206/750-8882, 800/922-6613; fax 206/750-8924.

STAR CONTROLLER HUBS

3Com Corp.
408/764-5000, 800/638-3266.
Anco Corp.
800/545-2626; fax 714/989-9935.
Asanté Technologies
408/752-8388, 800/662-9686; fax 408/734-4864.
Cabletron Systems
603/332-9400; fax 603/332-4616.
Chesapeake Systems
301/583-7717; fax 301/583-1787.
ChipCom
508/460-8900; fax 508/460-8950.
David Systems
800/762-7848; fax 408/720-1337.
Dayna Communications
801/531-0203, 800/521-0600; fax 801/359-9135.
Du Pont Electro-Optic Products
919/481-5100, 800/888-5261; fax 919/481-0753.
Farallon Computing
510/596-9100; fax 510/596-9020.
Hewlett-Packard
800/752-0900.
Network Resources Corp.
408/263-8100.
NetWorth
214/929-1700, 800/544-5255; fax 214/929-1720.
Shiva Corp.
617/252-6300, 800/458-3550; fax 617/252-6852.
Sonic Systems
408/736-1900; fax 408/736-7228.
SynOptics Communications
408/988-2400, 800/776-6895; fax 408/988-5525.
TechWorks
512/794-8533, 800/688-7466; fax 512/794-8520.
Thor Manufacturing
702/324-6600, 800/346-4694. m

Public domain software, freeware, and shareware are available through online information services; user groups (call 800/538-9696 ext. 500 for information on a local user group); or mail-order clearinghouses such as Educorp (800/843-9497, 619/536-9999) and the Public Domain Exchange (800/331-8125, 408/496-0624 in California).

Circle 28 on reader service card

How to succeed in business.

POWER TIE

POWER LUNCH

POWER DRIVE

HARD DRIVES

MB's	Mechanism	Access	Internal	External
42	Seagate	28ms	$219	$249
52LPS	Quantum*	17	$249	$299
80	Maxtor	19	$279	$339
105LPS	Quantum*	16	$349	$399
210	Maxtor	15	$599	$679
210	Quantum*	16	$629	$689
320HH	Maxtor	14	$999	$1049
320HH	Micropolis	14	NA	$1199
520	Fujitsu	12	$1099	$1149
660FH	Micropolis	16	NA	$1599
1050FH	Micropolis	14	NA	$2199
1050FH	Seagate	14	NA	$2199
1079FH	Fujitsu	12	$1999	$2099
1346FH	Micropolis	14	NA	$2699

REMOVABLE

SyQuest 44MB — $449
25ms. Includes 44MB cartridge. Extra Cartridge $79

SyQuest 88MB — $599
20ms. Includes 88MB cartridge. Extra Cartridge $119

OPTICAL STORAGE

CD/ROM — $539
350ms. External. Uses Chinon mechanism.

TAPE BACKUP

2.0Gig 4mm DAT — $1495
Includes Retrospect™ software, 1 cartridge & cables.

250MB SANKYO — $549
External. Includes tape & backup software.

Extra Tape — $49

MEMORY

1MB(1x8-80ns) — $39
4MB(4x8-80ns) — $159

POWER PRICED

NEW LOWER PRICES

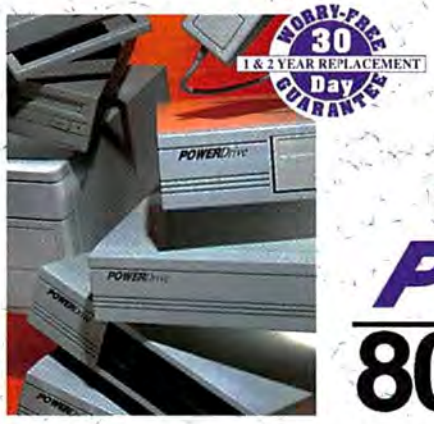
- New, Super Low Prices
- We buy quality components in huge volume & pass the savings to you!

POWER PACKED

- Choice of Brand Name Hard Drives
- Super Fast Access Time: 12ms-28ms
- 50,000+ hours MTBF
- Whisper Quiet fan
- 50-pin connectors to daisy-chain
- Steel Case for low heat & support

POWERDrive

- From the experts at HDI, since '87
- Compatible with all Mac systems
- Toll-free Technical Support
- Step-by-Step Manual Included
- 30-day "Worry-Free" Guarantee
- 1 & 2 Year Replacement Policies.



"...one of the fastest we tested." **MacUser**, 4/91
"Well-constructed, quiet and competitively priced." **Computer Shopper**, 8/1/91
"...some of the lowest prices ever advertised for the Macintosh..." **MacWeek**, 3/20/90
"For aggressive pricing, nobody we surveyed comes close to HDI." **MacWorld**, 11/90

POWERDrive™

800-927-3183

HARD DRIVES International Insight™

Hard Drives International
602-350-1128 FAX: 602-350-1150
1912 W. 4th St., Tempe, AZ 85281

National Accounts
Purchase Orders- Gov't/Educ./Corp.
800-755-3938 FAX: 602-350-1180

International Accounts
800-350-1144
FAX: 602-350-1188

Price/availability subject to change without notice. All items are NEW. P.O.'s accepted from qualified buyers-NET 20. Add $13 shipping for APO/FPO orders. P.O.'s, 30-Day Guarantee & 1 Year Warranty may have some restrictions. Shipping is not refundable. All trademarks are the properties of their respective owners. PowerDrive is a tradename of Insight Distribution Network, Inc. *Manufacturer 2yr warranty.

GHK

We Take Care Of You

Lowest Prices ▪ Overnight Delivery only $3 ▪ Money Back Guarantees*

CALL DR.MAC 1-800-825-6227

Accessories

ABCOM
- CARRY CASE CI, CX,SI, IMGWTR 82
- CARRY CASE SE/PLUS EXTEND KBD 86
- POWERBOOK CASE 72

ARTICULATE SYSTEM
- VOICE NAVIGATOR II 565
- VOICE IMPACT 78
- VOICE IMPACT PRO 198

KEYTRONICS
- MACPRO PLUS 139

ORANGE MICRO
- GRAPPLER LS 67
- GRAPPLER 9 PIN 91
- GRAPPLER II SP 119

WACOM
- 12" X 12" ELECTROSTATIC TABLET 838
- 12" X 12" STANDARD TABLET 775
- 6" X 9" STANDARD 519
- Full line of Digitizing tablets available ..... CALL

VOICE NAVIGATOR II

A voice recognition device that allows you to control any Macintosh application by speaking ordinary words to it! Works with anyone's voice, accent, and language. Use it to format documents, control menus, dialogs, or any command possible in any application. Comes with all hardware and software necessary.

$565

Communications

DOVE
- DOVEFAX PLUS 355

HAYES
- PERSONAL MODEM 2400 PLUS 148
- SMARTMODEM 2400 & SMARTCOM 345
- ULTRA 9600 MODEM & SMARTCOM 782
- SMARTCOM II 3.3 for the MAC 82
- HAYES CONNECT 3.0 46

PROMETHEUS
- MINIPLUS 2400 V.42 & MacKnowlege 128
- 24/96MSR FAX MODEM (MAXFAX) 265
- 9600/9600M PLUS V.32/42 MNP5 665
- ULTIMA14,400 BAUD MODEM/9600 FAX 685

SOFTWARE VENTURES
- MICROPHONE II 4.0 209

Storage

CHINON
- CDC-431 CD ROM REMOTE DRIVE 585

FWB
- POCKETHAMMER 50 MEG 562
- POCKETHAMMER 100 MEG 758
- POCKETHAMMER 200 MEG 1198

IOMEGA
- BERNOULLI90 MB TRANSPORTABLE 778
- CARTRIDGES (90 MEGS) 144

6" x 9"

WACOM

$519

CORDLESS STYLUS & DRAWING TABLET

WACOM's award winning cordless, pressure sensitive stylus and tablet combine to offer a perfect tool for all graphic designers and illustrators.

12" X 12" TABLET **$775**

ONCUEII

Eliminate time-consuming steps in System 6.0 or 7.0. OnCuell instantly launches individual or groups of applications and files with a single mouse click or keystroke. Find, duplicate, delete and search for files without returning to the Finder. Track and launch up to 100 recently opened files. Includes over 10 other productivity boosting features.

$56

SHERLOCK HOLMES, CONSULTING DETECTIVE

Solve three intriguing murder mysteries! For the first time ever, over 90 minutes of full-motion video brings Sherlock Holmes to life.

$39

MASS MICRO SYSTEMS
- DATAPAK 45 REMOVEABLE HD 639
- DATAPAK 88 REMOVEABLE HD 849
- DIAMOND PORTABLE 2" 80MB 435
- DIAMOND PORTABLE 2" 210MB 898
- HITCHHIKER 40MB 495
- HITCHHIKER 80MB 559

MAXTOR
- 60 MB EXTERNAL 318
- 80 MB EXTERNAL 358
- 120 MB EXTERNAL 438
- 213 MB EXTERNAL 678
- 1.2 GB EXTERNAL 2288

PLI
- 45 CARTRIDGE 79
- INFINITY 40 SINGLE W/CARTRIDGE 618
- INFINITY FLOPPTICAL 21MB 548

$82

SMARTCOM II 3.3 for the MAC

Here's the software to help you get the most out of your hardware. For over a decade Hayes has be developing software that turns an Apple computer into a powerful communications tool. Whether you need powerful communications software with a wide range of features or a program for the newcomer to communications, Hayes has it all. And, there's even software that lets you share modems and other devices along an AppleTalk network.

Monitors & Boards

APPLIED ENGINEERING
- QUICKSILVER 265

GENERATION SYSTEMS
- MAC II, CLASSIC 19" MONO SYSTEMS 995
- MAC II, CLASSIC 15" MONO SYSTEMS 635

MASS MICRO SYSTEMS
- RIVAL 19" MONO SYSTEM, MAC II, SE 999

NEC
- MULTISYNC FG SERIES ..... CALL

SUPERMAC
- FULL LINE *NEW LOW PRICING* ..... CALL

RASTEROPS
- FULL LINE *NEW LOW PRICING* ..... CALL

Printers/Scanners

CAERE
- TYPIST PLUS 449

CALERA
- WORDSCAN 214
- WORDSCAN PLUS 638

CHINON
- DS 3000 COLOR SCANNER 696

DEST
- PERSONAL SCAN & RECOGNIZE 669
- MACSCAN 3000 990

GENERAL PARAMETRICS
- SPECTRASTAR 430 COLOR PRINTER ... CALL

KODAK
- DICONIX PRINTER 369

MAXTOR
The Drive for Leadership

$318
60MB Ext.

Maxtor runs circles around the competition when it comes to speed in inch-high 3.5 inch drives. If you're comparison shopping for fast, reliable disk drives, this comparison is really no contest.

- 80 MB External $358
- 120 MB External $438
- 213 MB External $678
- 1.2 GB External $2288

Full line of internals/externals available

LOGITECH
- SCANMAN SCANNER 299

MARSTEK
- MARS 800-MAC 64 HAND SCANNER 299
- COLOR ARTIST HAND SCANNER 579
- LANGELO-COLOR IT! 412
- LANGELO-GRAY MAC256 328
- MACANGELO II MFS 3000 869
- MACANGELO II MFS 6000 1099

MICROTEK
- SCANMAKER 600ZS COLOR SCAN 1459
- TRUE LASER/TRUEIMAGE LASERPRTR. 1349

NEC
- SILENT WRITER 2 MODEL 95 1549
- SILENT WRITER 2 MODEL 90 1499

QMS
- ALL PRINTERS AVAILABLE ..... CALL

UMAX
- UMAX COLOR 630 1375

XEROX IMAGING SYSTEMS
- ACCUTEXT 3.0 510

Business

BANAFISH
- THOUGHT PATTERN 2.0 98

CD TECHNOLOGY
- MULTIMEDIA HANDISK 69

CD-Rom Only

$59

AGFA

AGFATYPE CD-ROM V3.0

Agfa puts a new spin on CD-ROM-PostScript Fonts, TrueType Fonts and much more! The AgfaType CD-ROM contains access to over 1900 Type 1-ATM compatible typefaces; including the Adobe Library. Also included is an electronic catalogue, multimedia typography tutorial and the complete collection of screen fonts to use in your apllications. **You receive all of the above, 20 headline fonts, choice of one PI and Symbols Font and a free typeface.**

POWERVALUE BUNDLE

Get the Toshiba TXM 3301 drive with the AGFATYPE CD-ROM 3.0

Bundle **$688**

$52

MICROSPOT

MACPALETTE II

Now turn your ImageWriter II into a full color printer. Print from almost any Macintosh software — including graphics, page layout, word processors, etc. Color text and color graphics are all available in true WYSIWYG. Requires Mac II series, LC or SE/30, and ImageWriter II and a four-color ribbon. AppleTalk version available.

CLARIS
- CLARIS CAD 2.0 625
- FILEMAKER PRO 209
- RESOLVE 265

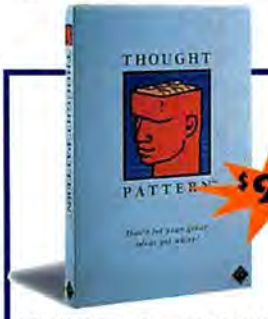
COMPACT DESIGNS
- PROCLAIM 238

DELTAPOINT
- DELTA GRAPH PRO 186

FISHER IDEA SYSTEMS
- IDEAFISHER 2.0 384

JIAN
- BIZ PLAN BUILDER 78
- LIVING TRUST BUILDER 84
- EMPLOYEE MANUAL MAKER 84

MEYER SOFTWARE
- ON THE AIR 126



$98

THOUGHT PATTERN 2.0

The only organizational tool for Macintosh that lets you manage both notes and files in one place. Now you can have immediate access to notes, reminders, contacts, letters, budgets, images and more, through automatic cross-referencing, integrated alarms, superfast searches and direct launching of all other applications. Let Thought Pattern help you get organized so you can spend time doing what you do best instead of searching for lost information.

MICROSOFT
- EXCEL 3.0 308
- MICROSOFT OFFICE CD ROM 495
- MICROSOFT WORD 5.0 308

NEW ERA
- NUBASE 174

PARAGON
- NISUS 3.0.6 238
- NISUS COMPACT 3.3 96

SENSIBLE SOFTWARE
- SENSIBILE GRAMMAR 54

SAS INSTITUTE
- JMP 2.0 589

WOLFRAM
- MATHEMATICA 2.0 ..... CALL

WORDSTAR
- CORRECT GRAMMAR 48
- AMERICAN HERITAGE DICTIONARY 48

Graphics & Publishing

ABRACADATA
- DESIGN Interiors/Landscape/Architecture 62

ADOBE
- ENTIRE FONT LIBRARY . *Special Price* CALL
- ILLUSTRATOR 3.2 WITH ATM 358
- PHOTOSHOP 2.0 535
- PREMIERE 1.0 309
- STREAMLINE 2.0 118
- TYPE ON CALL 45

AGFA
- AGFA TYPE 3.0 59
- STUDIO SERIES SPECIAL
- *any 8 fonts, get 4 studio fonts free* 255
- TOSHIBA XM-3301 CD AGFATYPE 3.0 688

ALDUS
- FREEHAND 3.1 388
- PAGEMAKER 4.2 489
- PERSUASION 2.1 319

CLARIS
- MACDRAW PRO 275

DENEBA
- CANVAS 3.0 246

SPECIAL $535

ADOBE PHOTOSHOP 2.0

A powerful photo design and production tool that lets you create exactly what you imagine. With Adobe Photoshop you can manipulate and retouch color and black-and-white images and produce high-quality separations, right at your desk.

ILLUSTRATOR 3.0

WHEN YOU BUY PHOTOSHOP $316

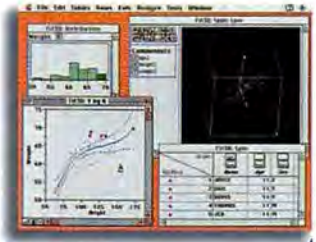
Recognized as the preeminent design tool for professionals. It contains precise illustration, extensive text-handling, page design, color separation and automatic graphing capabilities, all in one easy-to-use package.

DYNAWARE
- DYNAPERSPECTIVE 2.3.1 new version 534

FRAME
- FRAMEMAKER 589

MACROMIND-PARACOMP
- FILM MAKER 465
- MODEL SHOP 2.0 598
- SWIVEL 3D PRO 2.0 465

MICROFRONTIER
- ENHANCE 199
- COLOR IT 69



JMP 2.0

Find out where your data *really* lies and JMP to the right conclusions! JMP 2.0 features *double* the functionality of the original version and provides multi-variate analyses, non-parametrics, non-linear fitting, real time data acquisition, control charts, pareto charts, capability analysis...and much more!

$589

MacUser 1991 Eddie Award

SAL

4½

$33

FONTINA

Fontina improves all your font menus! Drop Fontina into your System Folder, and tedious, disorganized font menus are a memory. Fontina's menus show you all your fonts at a glance, in a compact, organized, multi-column menu. Sample fonts instantly, just by pointing to them! Fontina even gives you a Personal Font Knapsack to hold the fonts you use most often. High speed and huge font capacity make Fontina vital for serious desktop publishing.

QUARK
- QUARKXPRESS 3.1 579

TYPE SOLUTIONS
- THE INCUBATOR 95

VISUAL DEVELOPMENT
- PRESENTER PRO 3299

Networking

ASANTE
- FULL LINE OF PRODUCTS AVAILABLE ..CALL

FARALLON
- FULL LINE *NEW LOW PRICING* ..... CALL

INSIGNIA
- UNIVERSAL SOFT PC 195
- SOFTAT 295

MICROCOM
- CARBON COPY MAC 57

ORANGE MICRO
- ORANGE 386/20sx PROCESSOR 1695
- ORANGE 386/16sx PROCESSOr 1375

SITKA
- MACTOPS BUNDLE 179

$78

BIZPLANBUILDER

A comprehensive business plan with 70+ pages of text and financials. Proven effective—45,000+ sold!

EMPLOYEE MANUAL MAKER $84

125+ policies, 30 benefits and an Employer Survival Guide—a substantial head-start for creating a custom employee handbook.

LIVING TRUST BUILDER $84

Create your own trust with customizable documents. Includes reference guide—how to avoid probate, taxes, etc. Save legal fees.

Utilities/Programming

AFTER HOURS SOFTWARE
- TOUCHBASE 69

CD TECHNOLOGY
- AMERICA ALIVE(CD) 69

CHENA SOFTWARE
- FAIR WITNESS 1.1 299

EASTGATE SYSTEMS
- FONTINA BOSTON SIX 33

FWB
- HARD DISK TOOLKIT 134

ICOM SIMULATIONS
- ON CUE II 56
- SHERLOCK HOLMES CD 39

MICROMAT
- MAC EKG 2.0 65

MICROSPOT
- MACPALETTE II 52
- MACPLOT PEN PLOTTER PRO. 4.0 276
- MACPLOT PEN PLOTTER STANDARD 133

MULTI AD SERVICES
- MULTI-AD SEARCH 108

NINE TO FIVE SOFTWARE
- REPORTS 2.1 93
- RESCUE 63

PC PC
- NETSTREAM 188

$65

MAC EKG 2.0

Preventative Medicine for Your Mac

MacEKG performs 35 benchmark tests which fall into three categories: Logic, SCSI and QuickDraw. The program logs previous test results, which are user accessible through a CDEV, and uses this information to track performance history and warn of possible future failure. The user manual is written in easy to understand laymen terms with a glossary of explanations the casual user may refer to.

PASTEL
- DAYMAKER 64

SALIENT
- DISK DOUBLER 46
- AUTO DOUBLER 46

SERIUS
- SERIUS DEVELOPER 3.0 *new version* 414
- SERIUS PROGRAMMER 3.0 *new version* 275
- SERIUS POWER OPTIONS various ..... CALL

$126

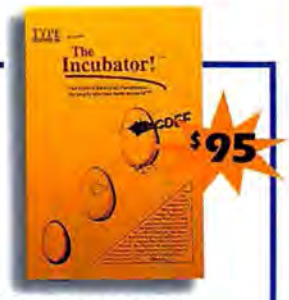
ON THE AIR™

Animated Multimedia for Less Than $200?!

Finally, the hardest thing about presentation/animation software is getting it out of the box! On The Air™ is easy to learn and use for real world presenters, from students to CEOs.

- Path-based animation
- Sample Scenes included
- Import PICT, PICS, SND, others
- Single or multi-screen
- Jump to any Scene, pause, blackout at will

Editor's Choice, MACWORLD June 1992. Also featured in MacWEEK, New Media, Presentation Products, and Tech-nology for Higher Education Journal. Plus, make every remote and net-worked Mac II an On The Air screening room with companion product On The Road—free to all On The Air users!



$95

THE INCUBATOR!™

Create thousands of fonts from your existing TrueType™ fonts! Easy-to-Use program lets you make your own distinctive creations in minutes. Unleash the power of four typographical controls. If you have System 7.0, you have TrueType. If you have TrueType, you need the Incubator!™. Hatch your own batch Today!

SOFTWARE COMPATABILITY
- SOFTWARE BRIDGE 59

SOFTWARE PUBLISHERS
- ACCUZIP6 612

$510

ACCUTEXT 3.0

Now with Interactive Verifier

Xerox Imaging Systems' AccuText 3.0 is Intelligent Character Recognition (ICR) software to convert scanned documents to Mac applications. Features exclusive interactive Verifier which enhances accuracy on poor-quality documents, System 7 compatibility, format retention, on-screen zoning and support for ten languages.

SYMANTEC
- NORTON UTILITIES 2.0 98
- SAM 3.0 63
- THINK C 5.0 196

TEKNOSYS
- HYPERBASIC *SPECIAL* 29
- HELP 96

VISIONARY SOFTWARE
- FIRST THINGS FIRST 41

Policies

- Visa, Mastercard & Amex accepted.
- Credit card is not charged until order is shipped.
- California residents add 8.25% sales tax
- Hours: Mon-Fri 9:30-11 EST
  Sat 11-6 EST
- Call (818) 504-1800 FAX (818) 504-9380
- Compatibility not guaranteed.
- All prices & policies subject to change without notice.

Shipping
- $3. UPS Overnight guaranteed. Hardware over 10 lbs will be shipped ground.
- Same day shipping.

Returns
- Call for R.A. number before return Restocking fee may apply.

Money Back Guarantee
- Most products have a 30-day money back guarantee. Please inquire when you order. Retain original packaging to ensure proper credit.

CALL DR.MAC 1-800-825-6227

Corporate Accounts:

- **Call our Toll Free Corporate Number 1-800-283-7622 (1-800-28 DR MAC)**
- Open an account within 24 hours
- Volume discount pricing Fed. (ID# 95-4183196)

International Dealer Program

- We ship worldwide. Call (818) 504-1800
- Call about our special pricing & services

Dr Mac

1-800-825-6227 from the U.S. & Canada

Fax: (818) 504-9380 or (818) 504-2159

11050 Randall Street, Sun Valley, CA 91352 • (818) 504-1800

TOLL-FREE TECHNICAL SUPPORT 1-800-888-8779

MacLand®

America's Macintosh Hardware Specialists

Quantum

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 a two-year warranty. Internal hard drives also include bracket kits to fit your particular Mac.

INTERNAL		EXTERNAL	
52MB	$229	52MB	$289
105MB	$339	105MB	$389
120MB	$409	120MB	$459
240MB	$659	240MB	$709
425MB	$1199	425MB	$1299

SyQuest TECHNOLOGY

All MacLand Removable Hard Drives come with our own installation and reference manual, DiskMaster Plus™ formatting utility software, cables, and a one-year warranty.

44 Megabyte **$429***

*Does not include cartridge

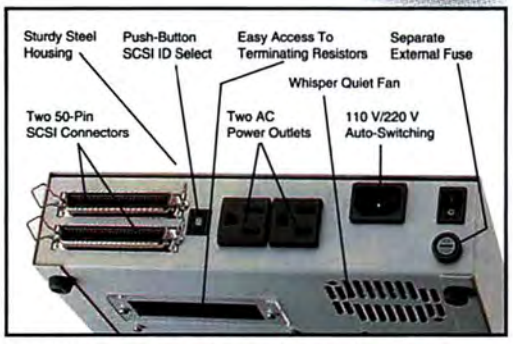
44MB Cartridges **$66**

5 Pak-ea. **$65**
10 Pak-ea. **$64**

88 Megabyte **$529***

88MB Cartridges **$109**

5 Pak-ea. **$105**
10 Pak-ea. **$99**



Special features of both the MacLand Hard Disk Drive and the MacLand Removable Disk Drive are shown in this diagram

QMS-PS® 410

$1,549

NEC Model 95

$1,549

Microtek 24-Bit Color Scanner
600zs w/Photoshop 2.0 ..... **$1349**

MEMORY

1MB 80ns	$39
2MB 80ns	$85
4MB 80ns	$159

To Order Call 1-800-888-8779

MacLand, Inc. 4685 S. Ash Ave., Tempe, AZ 85282 (602) 820-5802
24 Hr. Fax: (602) 345-2217

AIRBORNE EXPRESS.

Product names are trademarks or registered trademarks of their respective holders.

TOLL-FREE TECHNICAL SUPPORT 1-800-888-8779

16 LEVEL GRAYSCALE PLUG 'N' PLAY IIci, IIsi

ORION TECHNOLOGIES
Complete Page Display

- **Crystal Clear Resolution!**
- **Front-MountedControls!**
- **Tilt-Swivel Base!**
- **30-Day Money Back Guarantee!**

Display Only....$459

Display w/Mono Video Card **$649**

Compatibility: SE, SE30, II, IIx, IIfx, IIsi, IIci, IIcx, LC, Quadra 700

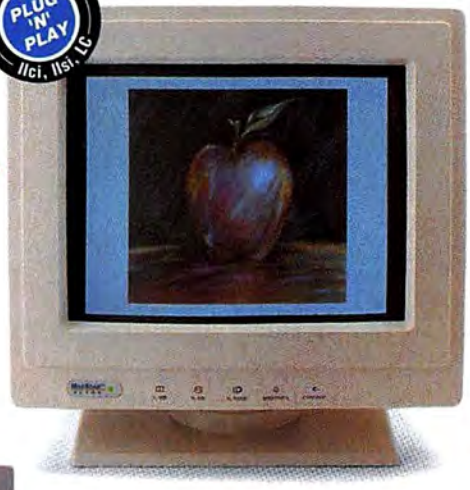
ORION TECHNOLOGIES
Dual Page Display

- **See Two Full Pages At Once!**
- **Sharp Screen Resolution!**
- **Tilt-Swivel Base!**
- **30-Day Money Back Guarantee!**

$799 **Includes Video Card!**

Compatibility: SE, SE30, II, IIx, IIfx, IIsi, IIci, IIcx, LC, Quadra 700

256 COLOR PLUG 'N' PLAY IIci, IIsi, LC



ORION TECHNOLOGIES
MacScan ULTRA

- **14" Color Monitor**

Monitor.....$399
(IIci, IIsi, LC)

Monitor w/ 256 Color Card.....**$689**

COLOR PLUG 'N' PLAY IIci, IIsi, LC

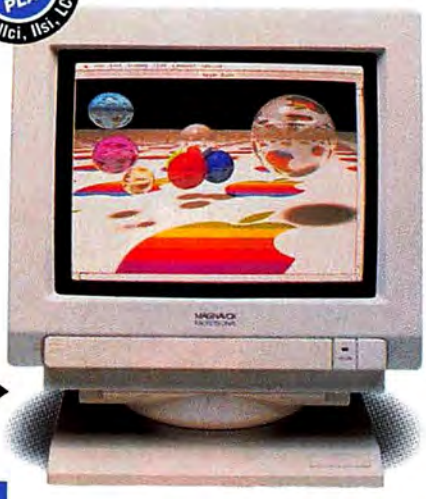
MacLand®
14" Color Monitor

Monitor.....$449
(IIci, IIsi, LC)

Monitor w/ 256 Color Card.....**$749**

Two-Year Warranty!

256 COLOR PLUG 'N' PLAY IIci, IIsi, LC



Magnavox
14" Color Monitor

Monitor.....$489
(IIci, IIsi, LC)

Monitor w/ 256 Color Card.....**$789**

Two-Year Warranty!

VISA MasterCard DISCOVER MacLand

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.

ATTENTION:

Businesses,Government, Educational Inst., Military

- Fax us your P.O. 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.
- LEASING option available... Call for details and pricing!

To Order Call 1-800-888-8779

MacLand, Inc. 4685 S. Ash Ave., Tempe, AZ 85282 (602) 820-5802
24 Hr. Fax: (602) 345-2217

AIRBORNE EXPRESS.

Circle 40 on reader service card

Mac and MORE INC.

Your Mail Order SuperStore™

East Coast Sales & Corporate Office
800-945-1MAC East Coast
5426 Beaumont Cte Blvd., Ste 300; Tampa, FL 33634
813-886-9534 International
813-888-9535 Corp. Fax

West Coast Sales Office
800-846-4MAC West Coast
4730 Walnut, Ste 105; Boulder, CO 80301
303-447-2732 International
303-447-3973 Corp. Fax

Canadian Sales Office
800-846-4622 Canada
360 Bloor St., E, Ste 901; Toronto, Ont M4W 3M3
416-972-1837 International
416-972-6239 Corp. Fax

800-945-TECH Tech Support

New Canadian Office!

Mon - Friday 9:00 - 9:00 | Saturday 9:00 - 5:00 | Sunday 12:00 - 5:00 | Eastern and Mountain

FREE SHIPPING

Australia	Germany	Portugal	Switzerland
0014-800-128-806	0130-8-16024	0501-8-12-198	155-9891

France	Netherlands	Spain	U K
05-90-0581	06-022-2383	900-94-1460	0800-89-9047

toll free international fax lines we speak your language

CPU's and More...

Macintosh PowerBook 100, 140, & 170	CALL
Macintosh Classic	$799.00
Macintosh Classic II 4/40	$1199.00
Macintosh Classic II 4/105	$1549.00
Macintosh LC II 4/40	NEW
Macintosh IIsi 3/40	$1979.00
Macintosh IIci 5/0	CALL
Macintosh IIfx 4/0	$3749.00
Macintosh Quadra 700, and 900	CALL
Mac IIsi NuBus or 030 Direct Card	$189.00
Apple Ext. Keyboard w/CPU Purchase	$160.00
Apple Std. Keyboard w/CPU Purchase	$90.00
MacPro Plus Extended Keyboard	$124.00

Systems and More...

Mac LC Student Package — Ask about free shipping!
4 Mb of RAM, 40 Mb internal hard disk, mouse, microphone, keyboard, Apple 12" RGB monitor and StyleWriter printer. Add $530 for a Personal LS.
Call

PowerBook Travel Package — Ask about free shipping!
PowerBook 100 4/40 with 4 Mb of RAM, 40 Mb internal drive with ext. 1.4Mb floppy, battery, AC adapter, and Apple StyleWriter.
$3299

Mac IIsi Office Package — Ask about free shipping!
5 Mb of RAM, 120 Mb internal hard disk, mouse, microphone, Apple standard keyboard, Apple 13" RGB monitor, and Personal LaserWriter LS.
Call

Macintosh/Fujitsu Package
Purchase a IIci, Quadra 700, or Quadra 900 with any Fujitsu drive (330 Mb, 425 Mb, or 525 Mb) and take $150 off the purchase price!
Save $150

We do custom configurations!

Extended Warranty Service for your Macintosh
CLUB 24
The fastest-growing direct reseller of Macintosh systems can double the warranty on your Mac system. Club 24 Services include:

- 24 month warranty on Apple products
- 72 hour repair or replace turn around
- Shipping via FedEx included both ways

Want more details? Call!

Video and More...

Apple 12" Monochrome Monitor	$229.00
Apple 12" RGB Monitor	$429.00
Apple 13" RGB Monitor	$669.00
Apple 15" Portrait Monitor	$769.00
Apple 16" RGB Monitor	Call
Apple 21" Color Monitor	NEW
Seiko 14" Trinitron RGB	$599.00
Sony 14" Trinitron RGB	$649.00
Macintosh Display Card 8•24	$545.00
Macintosh Display Card 8•24 GC	$1349.00
512K VRAM Upgrade for Mac LC	$99.00
256K VRAM Quadra	$69.00

High-end Video and More...

E-Machines
All New Prices, to HOT to list!

RasterOps

19" Color Trinitron Signature System with RasterOps 8XLi	$3699.00
21" Hitachi Color Systems with RasterOps 24MXQ	$3999.00
19" Hitachi Color Systems with RasterOps 8XL	$2045.00
New 16" Color Systems	CALL
Mac Display Boards	
RasterOps 24XLi Display Board	$1885.00
RasterOps 24Mx Display Board	$1149.00
RasterOps 8XLi Display Board	$905.00
RasterOps 8XL Display Board	$455.00
RasterOps 24 SX Display Board	$609.00
Multimedia Boards	
RasterOps 24STV Board	$785.00
RasterOps 24 XLTV Board	Call

SuperMac

Call Now For New LowPrices!

24-Bit Color	
Spectrum 24 Series III	
Spectrum 24	
Spectrum 24 Accelerators	
ColorCard 24	
8-Bit Color	
Spectrum 8•24 PDQ	
Spectrum 8 LC	
Spectrum 8 Series III	
Monochrome Card	

Call Now For New LowPrices!

Graphic Displays	
SuperMatch 20 Dual-Mode Trinitron	
SuperMatch 20 Color	
SuperMatch 17 Multimode Color	
19" Platinum	
21" Platinum Two-Page	

...we also carry the full line of VideoSpigot

SIMMS and More...

PwrBk 2Mb	$279.00	1x8 SIMM	$37.00
PwrBk 4Mb	$469.00	4x8 SIMM	$139.00
PwrBk 6Mb	$659.00	Others	Call

Best Sellers and More...

Apple 7.0 Personal Upgrade Kit	$99.00
Abaton InterFax 24/96	$279.00
Adobe Type Manager 2.0	$59.00
Adobe Illustrator 3.0	$379.00
Adobe Photoshop	$599.00
Aldus PageMaker 4.2	$549.00
Aldus Freehand 3.1	$399.00
Claris MacDraw Pro	$285.00
Claris MacWrite II	$139.00
Claris FileMaker Pro	$215.00
DoveFax Plus Modem	Call
Kensington Turbo Mouse ADB	$109.00
Microsoft Word 5.0	$319.00
Microsoft Excel 3.0	$309.00
Prometheus ProModem 9600MPlus	$599.00
Quark Xpress 3.1	$569.00

Printers and More...

We also carry the complete GCC Printer Line

QuickDraw	
Apple ImageWriter II	$429.00
HP DeskWriter w/ AppleTalk	$429.00
HP DeskWriter C w/ AppleTalk	$749.00
TrueType	
Apple StyleWriter	$359.00
Apple Personal LaserWriter LS	$899.00
Microtek TrueLaser	$1395.00
PostScript	
Apple Personal LaserWriter NT	Call
Apple Personal LaserWriter NTR	NEW
Apple LaserWriter IIf	$2829.00
Apple LaserWriter IIg	$3599.00
TI microLaser Plus PS17 w/AppleTalk	$1299.00
TI microLaser Plus PS35 w/AppleTalk	$1599.00
TI microLaser Turbo w/AppleTalk	Call
TI microLaser XL PS35 w/AppleTalk	$2899.00
TI microLaser XL Turbo PS35 w/ AT	Call
QMS PS 410	$1629.00
QMS PS 815MR	$4199.00

Networks and More...

Phone network adapters	$19.00
Asanté FreindlyNet Media Adapters	$89.00
Asanté FriendlyNet Cards	$249.00
Asanté MacCon+ 16K Cards	$199.00
Asante MacCon+ 64K Cards	$259.00
Asante 10T Hub	$679.00

Accelerators and More...

DayStar 30 Day Money Back Guarantee restrictions apply

DayStar FastCache IIci	$269.00
DayStar FastCache IIsi	$289.00
DayStar 33 MHz PowerCache LC	$669.00
DayStar 40 MHz PowerCache	$869.00
DayStar 50 MHz PowerCache	$1335.00
Available for the LC, SE/30, II, IIx, IIcx, IIsi & IIci	
Radius Rocket 040 Accelerator	$1629.00

Scanners and More...

NEW Apple One Scanner	$1099.00
Caere Typist Hand Held OCR	$479.00
Microtek 600 GS	$799.00
Microtek 600ZS Color Scanner	$1349.00
Microtek 1850S	$1999.00
UMAX UC - 630 Scanner	CALL

Drives and More...

Internal	
ETC 40 Mb	$199.00
ETC 52 Mb Quantum LPS, 12 msec	$239.00
ETC 80 Mb Maxtor Drive	$329.00
ETC 80 Mb Quantum for PowerBook	NEW
ETC 105 Mb Quantum LPS, 12 msec	$349.00
ETC 120 Mb Maxtor Cheyenne, 15 msec	$359.00
ETC 120 MB Quantum LPS, 11ms	$439.00
ETC 213 Mb Maxtor LXT, 15 msec	$589.00
ETC 240 Mb Quantum LPS, 11ms	$739.00
ETC 340 Mb Maxtor LXT, 13 msec	$1009.00
ETC 425 Mb Quantum PRO, 9 msec	$1269.00
ETC 535 Mb Maxtor LXT, 13 msec	$1449.00
The drives below can be used in the Mac II, IIx, IIfx & 900.	
ETC 307 Mb WREN-4, 14 msec	$1129.00
ETC 337 Mb WREN-Runner-1, 10.7 ms	$1279.00
ETC 613 Mb WREN-5, 16.5 msec	$1349.00
ETC 676 Mb WREN-6, 15.5 msec	$1399.00
ETC 676 Mb WREN-Runner-2, 12 ms	$1649.00
ETC 760 Mb Maxtor, 13ms	$1499.00
ETC 1.2 Gb Seagate, 15ms	$1899.00
ETC 1.2 Gb Maxtor Panther, 13 msec	$2169.00
ETC 1.7 Gb Seagate, 15ms	$2399.00
ETC 1.7 Gb Maxtor, 13ms	$2489.00
External	
ETC 40 Mb	$259.00
ETC 52 Mb Quantum LPS, 12 msec	$299.00
ETC 80 Mb Maxtor Drive	$389.00
ETC 105 Mb Quantum LPS, 12 msec	$429.00
ETC 120 Mb Maxtor Cheyenne, 15 msec	$429.00
ETC 120 Mb Quantum LPS, 11ms	$519.00
ETC 213 Mb Maxtor LXT, 15 msec	$659.00
ETC 240 Mb Quantum LPS, 11 ms	$809.00
ETC 340 Mb Maxtor LXT, 13 msec	$1069.00
ETC 425Mb Quantum PRO, 9 msec	$1339.00
ETC 535 Mb Maxtor LXT, 13 msec	$1509.00
ETC 307 Mb WREN-4, 14 msec	$1279.00
ETC 337 Mb WREN-Runner-1, 10.7 ms	$1429.00
ETC 613 Mb WREN-5, 16.5 msec	$1499.00
ETC 676 Mb WREN-6, 15.5 msec	$1549.00
ETC 676 Mb WREN-Runner-2, 12 ms	$1799.00
ETC 760 Mb Maxtor, 13ms	$1559.00
ETC 1.2 Gb Maxtor Panther, 13 msec	$2279.00
ETC 1.2 Gb Seagate, 15ms	$2049.00
ETC 1.7 Gb Seagate, 15ms	$2549.00
ETC 1.7 Maxtor, 13ms	$2589.00

Call for new Fujitsu Drives, 330, 425 & 550 Mb

Removables and More...

ETC 45R SyQuest Removable $459
Low price includes one cartridge.

ETC Dual 45R/88R SyQuest $1049
Two removable drives in one box. Includes one of each cartridge! Also available is the ETC 44DR Dual and 88DR Dual Syquest Drives for $799.00 and $1299.00

45 Mb Syquest Cartridge $65; 88Mb- $119

MacUser
ETC 88R SyQuest Removable $579
New low price includes one cartridge. MacUsers four mice winner!

Terms and Conditions: Payment: Mac and MORE accepts Visa, MasterCard, CODs, and Purchase Orders. CODs are shipped Cash/Certified Check up to $10,000. Corporate and School Purchase Orders are Net 15 for orders over $2500 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 Mac Order resellers, 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 packaging with software seals unbroken. Shipping: For orders over $5000 we ship to destinations 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. © 1992 Mac and MORE, Inc. All rights reserved. 920301

June 1992

Circle 85 on reader service card

MAC DEPOT

Lowest Prices • Great Service
Overnight Delivery • 30-Day MBG

1-800-222-2808
Canada Toll-Free: 1-800-548-2512
FAX (213) 542-9998

DAYSTAR DIGITAL

PowerCache Family
Call

HARDWARE

ACCELERATORS

APPLIED ENGINEERING
- TRANSWARP SE 25MHZ 819.00
- TRANSWARP LC 25MHZ 635.00

DAYSTAR
- POWERCACHE 33MHZ 689.00
- POWERCACHE 40MHZ 889.00
- POWERCACHE 50MHZ 1359.00

FUSION DATA SYSTEMS (040 ACCELERATOR)
- TOKAMAC ELC 25 ..... 899.00
- TOKAMAC SX 25i (SE/30) 1199.00
- TOKAMAC CI 25 ..... 1199.00

MIRACLE

Piano Teaching System $349.00

RADIUS
- ROCKET 1669.00
- ROCKET 25i 1269.00

DISK DRIVES & CD ROMS

APPLIED ENGINEERING
- 1.44MB DISK DRIVE 245.00
- PLUS DRIVE 319.00

MASS MICROSYSTEMS
- DATAPAK 45 ..... 550.00
- DATAPAK 88 ..... 746.00
- DATAPAK MO/128 (OPTICAL) . 1589.00
- DIAMOND DRIVE 120 PORTABLE 569.00
- DIAMOND DRIVE 310 ..... 1597.00
- DIAMOND DRIVE 610 ..... 2045.00
- HITCHHIKER 80 (POCKET SIZE) .. 699.00

MACDEPOT
- CDROM W/ 3 TITLES 479.00

MICROTECH
- CD600CD-ROM 699.00

OUR POLICIES

30-DAY MBG APPLIES TO DESIGNATED MANUFACTURERS ONLY.
CALL CUSTOMER SERVICE AT (310) 214-0000 FOR A RETURN AUTHORIZATION.
ALL RETURNS WITHOUT AN AUTHORIZATION NUMBER (RA #) WILL BE REFUSED. RETURNED PRODUCTS MUST BE IN ORIGINAL CONDITION AND PACKAGING AND MUST BE SENT BACK WITHIN 30 DAYS OF OUR INVOICE DATE. NO REFUNDS FOR FREIGHT CHARGES.
PRICES AND AVAILABILITY OF PRODUCT ARE SUBJECT TO CHANGE WITHOUT NOTICE.
PERSONAL CHECKS REQUIRE UP TO 10 WORKING DAYS TO CLEAR. INCLUDE: NAME, ADDRESS AND TELEPHONE NUMBERS (NO P.O. BOXES PLEASE). IF ORDERING BY CREDIT CARD, INCLUDE EXPIRATION DATE AND BILLING ADDRESS.
CALIFORNIA RESIDENTS (ONLY) ADD 8.25% FOR SALES TAX.

- NOVA 50 ..... 499.00
- NOVA 200 ..... 925.00
- NOVA 400 ..... 1539.00
- NOVA 900 ..... 2799.00

INPUT DEVICES

APPOINT
- MOUSE PEN PRO 69.00
- THUMBELINA 69.00

COSTAR
- STINGRAY TRACKBALL 85.00

CURTIS
- MVP MOUSE 85.00

EMAC
- SILHOUETTE TRACKBALL 85.00

KENSINGTON
- TURBO MOUSE 105.00

ZNIX
- CORDLESS MOUSE 69.00

WACOM
- 6X9 TABLET 499.00
- 12X12 TABLET (STANDARD) 715.00
- 12X12 TABLET (ELEC-STATIC) .. 785.00

MODEMS & FAXES

COMPUTER PERIPHERALS
- VIVA 9624e V.32/V.42BIS 379.00
- VIVA 2400 BAUD MODEM 139.00
- HOOK-UP 2400SE 79.00

DOVE
- DOVEFAX 219.00
- DOVEFAX PLUS 289.00
- DOVEFAX LAN 485.00

GLOBAL VILLAGE
- TELEPORT / FULL FAX 229.00
- POWERPORT / V.32 ..... 499.00

SUPRA
- FAX/MODEM 195.00
- FAX/MODEM V.32BIS 349.00

ZOOM
- FX9624 FAX MODEM 135.00

PRINTERS & SCANNERS

GCC TECHNOLOGIES
- PLP II ..... CALL
- PLP IIS ..... CALL
- BLP II ..... CALL
- BLP ELITE ..... CALL

GENERAL PARAMETRICS
- THERMAL COLOR PRINTER 3995.00

NEWGEN - 30 DAY MONEY BACK GUARANTEE
- TURBO PS/300P (300DPI) 1399.00
- TURBO PS/400P (400DPI) 1799.00

MICROTEK
- TRUE LASER 1345.00
- SCANMAKER 1850S 1979.00

MONITORS & VIDEO BOARDS

ENVISIO (POWERBOOK)
- DISPLAY ADAPTOR 2MB 919.00
- DISPLAY ADAPTOR 4MB 1229.00

GENERATION SYSTEM
- FULL PAGE DISPLAY IISI/IICI 479.00
- TV BOX 159.00

MICRON
- 8BIT VIDEO CARD SE/30 ..... 279.00
- 24BIT VIDEO CARD SE/30 ..... 399.00

RADIUS
- DIRECT COLOR INTERFACE 529.00
- FULL PAGE PIVOT - SE/30 ..... 1299.00
- POWER VIEW 529.00
- PRECISION 24X INTERFACE 1679.00
- PRECISION COLOR DISPLAY/19 2079.00
- RADIUS TV SYSTEM 1459.00

RASTEROPS
- 24SX 629.00
- 24XLI 1959.00
- 24STV 829.00
- CLEARVUE/SD21 ..... 1449.00
- COLORBOARD 264/SE30 ..... 715.00
- SWEET 16 MONITOR 1209.00

SAMPO
- ALPHASCAN LS 14" HI-RES 399.00

SEIKO
- CM1445 HI-RES MONITOR 550.00
- CM1760LR 16" MONITOR 1299.00

Hewlett-Packard

3-YEAR WARRANTY

- Deskwriter with cable $399.00
- Deskwriter C with cable $699.00
- LASERJET IIISI 4699.00
- SCANJET IIC 1349.00
- NEW! PAINTJET XL 300 ..... CALL

SONY
- 1304 14" MULTISCAN 599.00
- 1604 17" MULTISCAN 1199.00

SUPERMAC
- THUNDER/24 ..... 2595.00
- VIDEOSPIGOT IISI 379.00
- VIDEOSPIGOT NUBUS 449.00

SOFTWARE

BUSINESS

CAERE - 30 Day MBG
- OMNIPAGE 489.00
- OMNIPAGE PRO 659.00

UMAX

UC-630
With Photoshop . $1265.00

CALERA - 30 Day MBG
- WORDSCAN 409.00
- WORD SCAN PLUS 709.00

CLARIS - 30 Day MBG
- CLARIS WORKS 139.00
- FILEMAKER PRO 199.00
- HYPERCARD 139.00
- MACWRITE II 99.00
- RESOLVE 269.00

INTUIT - 30 Day MBG
- QUICKEN 45.00

MICROSOFT - 30 Day MBG
- EXCEL 3.0 ..... 305.00
- WORD 5.0 ..... 299.00

WORDPERFECT - 30 Day MBG
- WORDPERFECT V2.1 ..... 289.00

DTP & GRAPHICS

ADOBE - 30 Day MBG (Except fonts)
- ADOBE TYPE MANAGER 63.00

VISA · MasterCard · American Express Card · DISCOVER

WACOM

Call for Pricing

- ILLUSTRATOR W/ ATM 365.00
- PHOTOSHOP 2.0 ..... 545.00
- PREMIERE 299.00

ALDUS - 30 Day MBG
- GALLERY EFFECTS 128.00
- FREEHAND 3.1 ..... 389.00
- PAGEMAKER 4.2 ..... 495.00
- PREPRINT 320.00
- SUPER PAINT 3.0 ..... 132.00

CLARIS - 30 Day MBG
- MACDRAW PRO 269.00

FRACTAL DESIGNS
- PAINTER V1.2 ..... 229.00

QUARK - 30 Day MBG
- QUARK X PRESS 3.1 ..... 579.00

UTILITIES

BERKELEY - 30 Day MBG
- AFTER DARK 28.00
- MORE AFTER DARK 23.00

PowerBook Accessories

See the new items!

- Microtech 80mb $639.00
- Targus PremierCase $139.00
- Tenba Case418 ..... $109.00
- Newer 4mb module $399.00
- Newer 6mb module $499.00
- POWERPORT V.32 ..... $499.00
- PSI Power Modem $215.00

FIFTH GENERATION - 30 Day MBG
- SUITCASE II 53.00

NOW SOFTWARE - 30 Day MBG
- NOW UTILITIES 79.00

SALIENT SOFTWARE - 30 Day MBG
- AUTODOUBLER 59.00

SOUND SOURCE
- STAR TREK - LOGICAL COLLECTION 29.00
- STAR TREK - FINAL FRONTIER 29.00

SYMANTEC - 30 Day MBG
- NORTON UTILITIES 85.00
- SAM 65.00

ESTABLISHED 1985

MAC DEPOT

1-800-222-2808
4453 REDONDO BEACH BLVD.
LAWNDALE, CA 90260
Canada Toll-Free: 1-800-548-2512

Corporate, educational, and government purchase orders accepted.

MACDIRECT

Specialists in Mac Storage

Fujitsu Special!

Fujitsu 520MB Int. $1258
Fujitsu 1.2 Gig Int. $1948
- 5 Year Warranty
- 200,000 Hrs MTBF
- 9 to 11.5ms access time!
- Incredibly Reliable!
- Perfect for the Power User

The Fujitsu PicoBird 4 Drives 520, 425 & 330mb

9 ms access times and a 256k cache make them fast!
- 20% faster than the Quantum 420
- 30% faster than the Maxtor 535

5 year warranty, 200,000 MTBF make them reliable!

Fujitsu Drives

	Internal	External
45 MB 3.5" Low Profile/Low Power 3yr warr, 50,000MTBF	$218	$278
90 MB 3.5" 3yr warr, 50,000 MTBF	$278	$348
135 MB 3.5" 3yr warr, 50,000 MTBF	$378	$448
185 MB 3.5" 3yr warr, 50,000 MTBF	$498	$568

- Incredibly reliable less than .0006% returned on the 45mb!
- 3 year warranty! 50,000 hours MTBF (Mean Time Between Failure)

330 MB 3.5" 9ms Access	$1128	$1188
425 MB 3.5" 9ms Access	$1198	$1258
520 MB 3.5" 9ms Access (The Fastest 3.5" Available!)	$1258	$1318

- Incredibly fast the PB-4 drives are the fastest 3.5" drives we have tested!
- 5 year warranty! 200,000 hours MTBF (Thats 22 years of continuous operation!)

680 MB 5.25" 16ms	$1288	$1388
1.2 Gig 5.25" 11.5ms (MacWorlds Fastest Gig!)	$1948	$2028
2.06 Gig 5.25" 11.5ms (5,400RPM & Fast SCSI)	$3498	$3598

- MacWorlds fastest 1.2 Gig drive (July '91)
- 5 year warranty! 200,000 hours MTBF

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

Hitachi Drives

	Internal	External
420 MB	$998	$1098

- The Hitachi 420 is our best value drive ever!
- 3.5" 5 yr warr. 13ms 150,000 MTBF*!

1.6 Gig	$2798	$2898

- The Hitachi 1.6Gig is our largest drive available!
- 5.25" 5 yr warr. 12ms 150,000 MTBF!

Ricoh Optical

600mb Optical.....$1998.00
- Read write reliable storage
- Great for archiving, color scans, etc.
- Includes cartridge.
- Available in ISO and non-ISO

Toshiba CD ROM

Toshiba 3301.....$538
- Includes driver CD carrier and cables
- 325ms access time
- MacWorld and MacUsers Highest Rated!

SyQuest 44MB & 88MB

44MB Removable $448.00
88MB Removable $648.00
- Both Drives include Cartridge
- Dual AC Outlets, 40 Watt power supply
- SCSI Select and 2 Year Warranty

Quantum Drives

	Internal	External
C 105 MB 3.5"LPS	$338	$438
C 120 MB 3.5"LPS	$449	$539
C 240 MB 3.5"LPS	$699	$789
C 425 MB 3.5"	$1248	$1348

Conner Drives

	Internal	External
C42 MB 3.5" LPS	$238	$298
C 85 MB 3.5"LPS	$298	$378
C 120 MB 3.5"LPS	$428	$498
C 170 MB 3.5"LPS	$548	$598
C 212 MB 3.5"LPS	$648	$728

DAT Tape Backup

WangDat 2.1 Gig Capability.....$1498
ArDat 2.1 Gig Capability $1398
- Up to 10 mb per minute backup time
- Includes SoftBackup II for Fast network and unattended backup capabilities

SONY 2.1Gig DAT $1248!

Sony 2.1 Gig DAT $1248
- Up to 2.1 Gig per tape
- Our best buy ever on DAT !
- Up to 10 mb per minute backup time
- Includes SoftBackup II for Fast network and unattended backup capabilities

MACDIRECT Specialists in Mac Storage

60 East Chestnut - 145, Chicago, IL 60611

Visa, Mastercard, Amex, COD, Telecheck approved checks, Government, Corporate, and University P.O.s welcome . All new drives preformatted with latest stable system software. Factory warranty. Bracket, cables and software included. 30 Day money back guarantee on MacDirect drive products only. Prices, terms, specifications and availability subject to change without notice

800-621-8467

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

MACDIRECT

Monitor Special!

Sony 19" Trinitron..$1698
Sampo 20" $598
- Two Page displays
- Perfect for DTP & CAD/CAM
- Include Interface cards

16" Full Page Display.....$398

14" Direct Color...$298
- Plug compatible with the Mac LC

14" Sony Trinitron...$498
- Plug compatible with the Mac LC

14" Goldstar Color $368
- Plug compatible with the IIsi, CI and the LC

Sony Trinitron 19" Color System

8 Bit System **$1698.00**
24 Bit System **$2598.00**

Sampo* 20"

Mono System **$598.00**
Grey Scale System **$898.00**

- The SONY 19" Trinitron is one of our best buys yet! True Trinitron color at a great price! The SAMPO is a high quality dual page display without the high cost!
- Includes 1 bit*, 8 bit or 24 Bit Video board and cable
- 2 page displays
- Support all Mac IIs', the SI, SE-30, SE* and the LC

NuDesign Full Page Grey Scale $398.00

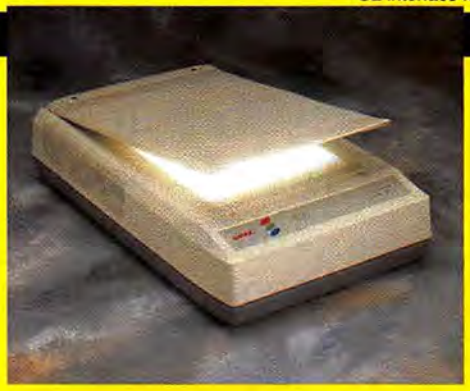
- Plug compatible with Si, Ci and Quadra, available for all Mac IIs' , SE-30, SE and the LC with Lapis interface card $488.00 (B&W).

* 20" Monitor manufactured by Sampo for Apollo/HP
* SE interface for Sampo/Apollo-HP only, 1Bit for Sampo only

19" Sony Trinitron System
W 8 Bit interface.....$1698
W 24 Bit interface.....$2598

NuDesign Full Page Display
Grey Scale For CI, SI, Quadra.$398
II, IIfx, FX, SE,SE-30.....$488

20" Ikegami Trinitron System
W/RasterOps 8Bit.....$2398
With 24Bit.....$3198



Scanners! UMAX 600DPI COLOR SCANNER $1248.00

Umax UC-630 With PhotoShop $1248.00
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
- Includes Adobe Photoshop • 8 1/2 x 14 Scanning area

NuDesign/Tamarack Scan-600 With PhotoShop.....$1098.00
Transparency/Slide Scanner Option.....$648.00
- Rated four mice by MacUser (Dec '91) • "Its hardware is impressive" MacUser (Dec '91)
- "Tamarack and Umax produced the best images..."MacUser
- "Tamarack and Umax excel in speed and color accuracy..." MacUser
- Includes Adobe Photoshop • 8 1/2 x 11.5 Scanning area

Sharp JX-320 With PhotoShop $1598.00
- One pass scanner • 8 1/2 x 11 Scanning area • Includes Adobe Photoshop

MACDIRECT Specialists in Mac Storage

60 East Chestnut - 145, Chicago, IL 60611

Visa, Mastercard, Amex, COD, Telecheck Approved Checks, Gov., Corp., Univ., P.O.s welcome. All new Drives. Preformatted with latest stable system software , Factory warranty. Bracket, cables and software included. 30 Day Money back Guarantee on MacDirect drive products only, this does not include monitors, scanners, printers etc. Prices, terms, specifications and availability subject to change without notice

800-621-8467
Hours: 8:30 - 8:00 CST, Saturdays 10:00 - 4:00
Technical Service and Order Tracking call: 312-664-8225

ADVERTISER INDEX

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 ourFastFacts Product Information Card located on the next page.

Page No.	Advertiser	Reader Svc. No.	Phone
239	Abacus Concepts	50	800/666-STAT
289	Advanced Business Center	—	800/274-7747
329	Agfa	—	800/395-7007
122	Aldus	—	800/685-3563
249	Altsys	35	214/680-2060
107-108	America On-line	—	800/827-6364
4	Anthro	—	800/325-3841
42-45	Apple	—	—
80-81	Apple	—	800/365-3690
13	Applied Engineering	167	800/554-MACS
278	APS	15	800/235-2752
71	Attain Software	—	617/776-1110
243	Avery Dennison	160	800/462-8379
106	Berkeley Systems Design	218	510/540-5535
235	Bimillennium	233	800/488-8662
282-283	BottomLine Distribution	—	900/420-3636
130	C E Software	—	—
104	Caere Corporation	73	800/535-SCAN
36	Calliscope	—	800/645-8550
109	Canon USA	164	800/OK CANON
209	Canon USA	110	800/OK CANON
253	CD ROM Expo	—	—
212	Chinon America, Inc.	94	800/441-0222
84	Compumation Inc.	198	800/SPOOLER
73	CompuServe	319	800/848-8199
240	Computer Associates	10	800/531-5236
87	Contemporary Cybernetics	188	804/873-9000
22	Curtis Manufacturing	20	603/532-4123
76	Dantz Development	26	510/849-0293
242	Data Products	191	800/334-3174
200	Dataviz	36	800/733-0030
5	Deneba Software	57	800/6CANVAS
85	Design CAD	336/337	918/825-4848
279	DGR Technologies	—	800/235-9748
302	DGR Technologies	—	800/235-9748
259	Digital Vision	242	800/346-0090
262-263	Dr. Mac	—	800/825-6227
205	E-Machines	303	800/34GRAPH
260	Educational Resources	28	800/624-2926
331	Educorp	157	800/843-9497
26	Engineered Software	12	919/299-4843
128	Envisio	222/224	612/339-1008
275-277	Express Direct	—	800/535-3252
14-15	Fifth Generation Systems	135	800/477-8212
211	Fifth Generation Systems	151	800/477-8212
17	Frame	60	800/U4-FRAME
187	GCC Technologies	260/262	800/422-7777
189	GCC Technologies	212/221	800/422-7777
191	GCC Technologies	231/232	800/422-7777
105	GDT Softworks	42	800/663-6222
132	Global Village	9	800/736-4821
78	Graphsoft	46	301/461-9488
261	Hard Drives International	—	800/776-DISK
38	Hunt Manufacturing	199	800/446-7823
102-103	IDG Books	19	—
133	Image Club	—	—
198	In Focus Systems, Inc.	—	800/327-7231
228	Innovative Data Design	129/229	510/680-6818
124	Insignia Solutions	235	800/848-7677
183	Insignia Solutions	72	800/848-7677
256-257	Insignia Solutions	216	800/848-7677
BC	Kensington Microware Ltd.	—	800-535-4242
27-34	La Cie	—	800/999-0143
41	Lapis	202/204	800/43-LAPIS
120	LaserMaster Corporation	182	800/950-6868
232	Logicode Technology, Inc.	—	800/735-6442
266	Mac and More	85	800/MAC-0052
216-223	Mac's Place	209	800/367-4222
20	MacAcademy	106	800/527-1914
274	MacBest	98	800/530-5050
294	MacCenter	—	800/950-3726
46-69	MacConnection	—	800/800-3333
267	MacDepot	—	800/222-2808
268-269	MacDirect	—	800/621-8467
16	MacFriends	—	800/622-8804
100	MacFriends	—	800/622-8804
245	MacFriends	—	800/622-8804
252	MacFriends	—	800/622-8804
264-265	MacLand	40	800/888-8779
290-291	MacNews	—	800/243-9383
287	MacProducts USA	—	900/420-3636
292-293	MacProducts USA	—	800/MAC-USA1
88-95	Mac Zone, The	70	800/248-0800
274	Macs Now	171	800/766-2313
286	MacSource	48	800/285-2622
280-281	MacTel Technologies	105	800/950-8411
138-145	MacWarehouse	270	800/255-6227
295-301	Macworld Expo Boston	—	—
248	Mathsoft, Inc.	34	800/628-4223
86	Microcom, Inc.	41	919/490-1277
196	MicroNet Technology, Inc.	113	714/837-6033
IFC-01	Microsoft	—	800/541-1261
9	Microtek Labs, Inc.	63	800/654-4160
IBC	Mirror Technologies	125	800/654-5294
82	Mobius Technologies	89	800/523-7933
10-11	NEC Technologies	68	800/NEC-INFO
136	NEC Technologies	180	800/NEC-INFO
37	Nest Software	177	800/524-3315
214	NewGen Systems, Inc.	74/75	800/879-4639
246	Nikon	—	800/NIKON US
70	NoRad	133	800/262-3260
21	Now Software	13	800/237-3611
72	O.C.E.A.N. Microsystems	131	800/2-OCEAN1
244	Orange Micro	33	714/779-2772
97	Outbound Systems	219	800/444-4607
96	Outbound Systems	30	800/444-4607
258N	Pacer Software	91	—
203	Peachtree Software	100	800/443-9361
126-127	Pinnacle Micro	266	800/553-7070
25	PLI	208	—
35	Prescience	179	800/UC-RMATH
288	Printer Connection	55	714/758-8832
329	Quantum Leap Technologies	136	800/762-2877
193	Radius	—	800/227-2795
195	Radius	178	800/227-2795
6-7	RasterOps	—	800/729-2656
254A	RayDream	159	800/846-0111
98-99	Salient	39	415/321-5375
26	Scanco	—	800/722-6263
239	Secure-It	239	800/451-7592
231	Sharp Electronics	47	201/529-8731
39	Sigma Designs	176	800/845-8086
206A-206B	Signature Software	—	—
77	StatSoft	99	918/583-4149
250-251	Storage Dimensions	1	800/765-7895
40	Strata	293	800/869-6855
18	SuperMac Technology	132	800/334-3005
79	SuperMac Technology	88	800/334-3005
74	Symantec	96	800/441-7234
24	Symantec	166	800/441-7234
238	Synex	204	800/447-9639
12	T B S P	25	800/755-TBSP
8	T/Maker Company	174	415/962-0195
234	Teknosys	142	800/873-3494
236-237	Tektronix	143	800/835-6100
134	Texas Instruments	313	800/527-3500
284-285	Thirdwave	156	800/284-0486
110-119	Tiger Software	114	800/888-4437
330	World Expo	—	—

Turn to The Macworld Shopper on page 303 to find additional advertisers

THE MACWORLD SHOPPER
Direct Response. Direct Results.

FAST FACTS

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.

FAST FAX

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 August 24, 1992 S1 June 1992

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 August 24, 1992 S2 June 1992

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 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 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.
SOFTWARE		
BUSINESS		
71	Attain Software	—
104	Caere Corporation	73
240	Computer Associates	10
17	Frame	60
248	Mathsoft, Inc.	34
IFC-01	Microsoft	—
203	Peachtree Software	100
77	StatSoft	99
238	Synex	204
12	T B S P	25
249	Zedcor	161
CAD/CAM		
85	Design CAD	336/337
26	Engineered Software	12
78	Graphsoft	46
228	Innovative Data Design	129/229
248	Mathsoft, Inc.	34
CD ROM		
329	Quantum Leap Technologies	136
COMMUNICATION		
130	C E Software	—
200	Dataviz	36
DATA MANAGEMENT		
249	Zedcor	161
EDUCATIONAL		
260	Educational Resources	28
35	Prescience	179
FONTS		
249	Altsys	35
133	Image Club	—
GRAPHICS/DTP		
329	Agfa	—
122	Aldus	—
249	Altsys	35
36	Calliscope	—
5	Deneba Software	57
259	Digital Vision	242
17	Frame	60
133	Image Club	—
228	Innovative Data Design	129/229
37	Nest Software	177
254A	RayDream	159
40	Strata	293
LANGUAGES		
235	Bimillennium	233
MULTIMEDIA		
40	Strata	293
NETWORKING		
84	Compumation Inc.	198
183	Insignia Solutions	72
256-257	Insignia Solutions	216
124	Insignia Solutions	235
258N	Pacer Software	91
PERSONAL		
71	Attain Software	—
16	MacFriends	—
252	MacFriends	—
100	MacFriends	—
245	MacFriends	—
16	MacFriends	—
SECURITY		
239	Secure-It	239
STATISTICAL		
239	Abacus Concepts	50
77	StatSoft	99
UTILITIES		
243	Avery Dennison	160
106	Berkeley Systems Design	218
76	Dantz Development	26
14-15	Fifth Generation Systems	135
211	Fifth Generation Systems	151
105	GDT Softworks	42
86	Microcom, Inc.	41
21	Now Software	13
98-99	Salient	39
74	Symantec	96
24	Symantec	166
234	Teknosys	142
VERTICAL		
235	Bimillennium	233
12	T B S P	25
WORD PROCESSING		
37	Nest Software	177
8	T/Maker Company	174
MISCELLANEOUS		
105	GDT Softworks	42
HARDWARE		
BOARDS		
13	Applied Engineering	167
41	Lapis	202/204
280-281	MacTel Technologies	105
244	Orange Micro	33
193	Radius	—
195	Radius	178
18	SuperMac Technology	132
79	SuperMac Technology	88
COMPUTER SYSTEMS		
42-45	Apple	—
80-81	Apple	—
282-283	BottomLine Distribution	—
276-277	Express Direct	—
274	MacBest	98
16	MacFriends	—
252	MacFriends	
100	MacFriends	—
245	MacFriends	—
275	MacNews	—
287	MacProducts USA	—
274	Macs Now	171
286	MacSource	48
96	Outbound Systems	30
DIGITIZERS/SCANNERS		
104	Caere Corporation	73
212	Chinon America, Inc.	94
246	Nikon	—
DISPLAY		
205	E-Machines	303
276-277	Express Direct	—
198	In Focus Systems, Inc.	—
41	Lapis	202/204
275	Express Direct	—
IBC	Mirror Technologies	125
82	Mobius Technologies	89
10-11	NEC Technologies	68
97	Outbound Systems	219
6-7	RasterOps	—
231	Sharp Electronics	47
39	Sigma Desgins	176
EXPANSIONS/UPGRADES		
13	Applied Engineering	167
101	Xante	119
HARD DISKS/STORAGE		
278	APS	15
87	Contemporary Cybernetics	188
279	DGR Technologies	—
261	Hard Drives International	—
27-34	La Cie	—
268-269	MacDirect	—
264-265	MacLand	40
292-293	MacProducts USA	—
196	MicroNet Technology, Inc.	113
C3-C5	Mirror Technologies	125
72	O.C.E.A.N. Microsystems	131
126-127	Pinnacle Micro	266
25	PLI	208
250-251	Storage Dimensions	1
284-285	Thirdwave	156
INPUT DEVICES		
22	Curtis Manufacturing	20
BC	Kensington Microware Ltd.	—
MODEMS		
132	Global Village	9
232	Logicode Technology, Inc.	—
PRINTERS		
209	Canon USA	110
242	Data Products	191
302	DGR Technologies	—
189	GCC Technologies	212/221
191	GCC Technologies	231/232
187	GCC Technologies	260/262
120	LaserMaster Corporation	182
290-291	MacNews	—
9	Microtek Labs, Inc.	63
136	NEC Technologies	180
214	NewGen Systems, Inc.	74/75
288	Printer Connection	55
6-7	RasterOps	—
236-237	Tektronix	143
134	Texas Instruments	313
VIDEO		
109	Canon USA	164
128	Envisio	222/224
244	Orange Micro	33
193	Radius	178
195	Radius	—
250-251	Storage Dimensions	1
79	SuperMac Technology	88
MISCELLANEOUS		
331	Educorp	157
38	Hunt Manufacturing	199
SERVICES		
ON-LINE		
107-108	America On-line	—
73	CompuServe	319
TRADESHOWS/CONFERENCES		
253	CD ROM Expo	—
295-301	Macworld Expo Boston	—
TRAINING		
20	MacAcademy	106
ACCESSORIES		
FURNITURE		
4	Anthro	—
MISCELLANEOUS		
243	Avery Dennison	160
22	Curtis Manufacturing	20
302	DGR Technologies	—
38	Hunt Manufacturing	199
C6	Kensington Microware Ltd.	—
70	NoRad	133
26	Scanco	—
MAIL ORDER		
289	Advanced Business Center	—
329	Agfa	—
278	APS	15
282-283	BottomLine Distribution	—
279	DGR Technologies	—
262-263	Dr. Mac	—
260	Educational Resources	28
331	Educorp	157
261	Hard Drives Internatiol	—
266	Mac and More	85
88-95	Mac Zone,The	70
216-223	Mac's Place	209
274	MacBest	98
294	MacCenter	—
46-69	MacConnection	—
267	MacDepot	—
268-269	MacDirect	—
264-265	MacLand	40
290-291	MacNews	—
292-293	MacProducts USA	—
287	MacProducts USA	—
274	Macs Now	171
286	MacSource	48
280-281	MacTel Technologies	105
138-145	MacWarehouse	270
288	Printer Connection	55

CODs Welcome

Looking for the BEST price? We'll pay for the call.

1-800-530-5050

Hours: Monday - Friday 9:00 to 7:00 cst Saturday 10:00 to 4:00 cst

International (816) 741-6587 Fax (816) 741-6847
2631 NE Vivion, Suite 27 • Kansas City, MO 64118

When looking at price, does theirs include • Toll free ordering • Toll free technical support • No sales tax outside Missouri • No surcharge for credit cards • Free overnight freight both ways on Apple warranty repairs • Only top-quality, new products • A total commitment to customer satisfaction *At MacBest, you get it all for a great price.*

CPU'S

MAC CLASSIC II, 4MB 40MB	1249.00
MAC LC II, 4MB 40MB	1449.00
MAC LC II, 4MB 80MB	1599.00
MAC II SI, 3MB 40MB	1999.00
MAC II SI, 5MB 80MB	2389.00
MAC II CI, 5MB 1 FLPY	2649.00
MAC II CI, 5MB 105MB	3049.00
QUADRA 700, 4MB 1 FLPY	4359.00
QUADRA 900, 4MB 1 FLPY	5499.00
PB 140, 4MB 40MB	2649.00
PB 170, 4MB 40MB	3799.00

We also offer custom configurations to suit your needs.

VIDEO

APPLE 12" RGB	399.00
APPLE 13" RGB	679.00
APPLE 16" RGB	1219.00
NEC 3FGX	669.00
SONY 1304 13"	659.00
SEIKO CM1445 14"	569.00
radius	CALL
RasterOps	CALL
E-MACHINES	CALL

PRINTERS

STYLEWRITER	349.00
PERSONAL LASER LS	899.00
PERSONAL LASER NTR	1689.00
LASERWRITER IIF	2749.00
LASERWRITER IIG	3499.00
HP DESKWRITER	399.00
HP DESKWRITER C	729.00
TI MICROLASER PLUS PS/17	1269.00
TI MICROLASER PLUS PS/35	1569.00
TI TURBO MICROLASER PS/35	1999.00

SOFTWARE

ADOBE TYPE MANAGER	59.00
ADOBE ILLUSTRATOR 3.2	369.00
ADOBE PHOTOSHOP	549.00
ALDUS PAGEMAKER	489.00
ALDUS PERSUASION	329.00
MICROSOFT EXCEL	299.00
MICROSOFT OFFICE	479.00
MICROSOFT POWERPOINT	249.00
MICROSOFT WORD	299.00
MICROSOFT WORKS	159.00
WORD PERFECT	279.00

Prices are subject to change without notice - **Always call for the most current prices**. International orders are subject to a 5% surcharge. COD orders are shipped via Federal Express only and are 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

800 766-2313 MacsNOW 800 766-2313

For the Best Price on your Custom Package Call our knowledgeable staff.

All systems are ready to run, including all cables and connectors, Mouse, SuperDrive, HyperCard, 5-1.44mb Diskettes with case, Mouse Pad, 6 Outlet Electronic Surge Protector, Game, Utility, Educational, Business, Graphic and Virus Protection Software!

Mac Classic

Design you own Classic System 2 or 4 megabytes of RAM, with a 40, 80 or 105 megabyte Hard Drive.

Call for New Low Price!

Mac Classic II

Design you own Classic II System 2, 4 , 6 or 10 megabytes of RAM, with a 40, 80, 105 or 240 megabyte Hard Drive.

Call for New Low Price!

New Mac LCII

Design you own LCII System 4 , 6, 8 or 10 megabytes of RAM, with a 40, 80, 105 or 240 megabyte Hard Drive.

Call for current price!

Mac IIsi

3 megabytes of RAM, 40 megabyte Hard Drive, Extended Keyboard, 14" High Resolution Color Monitor.

System Price $2,599
5/105 System $3,075
9/240 System $3,575

Mac IIci

5 megabytes of RAM, 105 megabyte Hard Drive, Extended Keyboard, 14" High Resolution Color Monitor.

System Price $3,799
8/240 System $4,249
16/425 System $5,499

PowerBooks*

Build you own PowerBook 140/170 2, 4, 6 or 8 megabytes of RAM, with a 20, 40 or 80 megabyte Hard Drive.

Call for New Low Price!

Quadras

We are now stocking Quadras! Call us for our current Quadra packages, or let us help you custom design a Quadra for your specific application.

Call for New Low Price!

Printer Special

With the purchase any system, you can buy an Apple StyleWriter at a special low package price.

MacsNow keeps most advertised systems in stock.

Macintosh prices are constantly changing, please call us for our most current prices.

8am - 8pm CST Weekdays
10am - 5pm CST Saturday

MacsNOW
9705 Burnet Road, Suite 201
Austin, Texas 78758
(512) 837-9722
FAX (512) 837-2609

Terms and Conditions: American Express, Visa, MasterCard Cashiers Check and COD accepted. Returns require an RMA #. All returned or refused orders will be charged a minimum 15% restocking fee. Returns must be in original packing with software seals unbroken. All warranties on Apple or Macintosh products sold by MacsNow will be honored by MacsNow only. Prices do not include shipping and are subject to change.
*PowerBooks include 1 Battery, Power Adapter and Microphone

YOU WANTED YOUR MAC YESTERDAY.....CALL MacsNOW TODAY!
MOST SYSTEMS SHIPPED SAME DAY

Circle 171 on reader service card

Mac Systems

BUILD YOUR COMPLETE SYSTEM

CLASSIC, 2/40	$995
CLASSIC II, 4/80	$1,445
MAC IISI, 3/40	CALL
MAC IICI, 5/0	$2,795
QUADRA 700, 4/0	CALL
QUADRA 900, 4/0	$5,595
POWERBOOK 170	CALL

It's Two Displays for the Price of One!

1-Page & 2-Page

NEW!
$1,595

E-MACHINES DISPLAYS

E-Machines ColorPage E16
16" Multi-Resolution Color Display

E-Machines ColorPage T16
16" Full-Page Sony Trinitron Display

E-Machines ColorPage T19
19" Two-Page Sony Trinitron Display

E-MACHINES

E-Machines ColorPage T16 II

- 16" Color Display
- Sony Trinitron
- Dual Resolution
- Full-Page 832x624
- Two-Page 1032x768
- 24-bit color with Mac Quadra on-board video
- Reduced magnetic emissions

#1 WORLDWIDE RETAILER

Nobody sells more E-Machines than Express Direct. So nobody can give you better advice or a better price!

from only $319

NEW E-MACHINES COLORCARDS

E-Machines Interface cards work with Apple, RasterOps, Radius, Sony and virtually any display from 12" to 24".

Express Hours (central time):
M-F 8am-7pm; Sat 10am-2pm
24hr Fax, 7 days/week

EXPRESS DIRECT

"The Mac Systems Company"

International Orders Shipped Daily • FAX 312.549.6447
1801 W. Larchmont Ave. • Chicago, IL 60613 USA • 312.549.0030

1-800-535-3252

Prices and are subject to change without notice. All warranties on Macintosh/ Apple brand products sold by Express Direct will be honored by Express Direct or its authorized agents only. All other manufacturers' warranties still apply.

Ref: 26

Make the Right Connections with Asanté

LET US HELP.
At Express Direct we understand Ethernet. Let us help you connect your Macs, PCs and other workstations to a high-speed 10BaseT network.

ASANTÉ

10 BASET HUBS

Asanté 10T Hub/8 **$259**
9 ports: 8UTC, 1 BNC
Asanté 10T Hub/12 **$539**
14 ports: 12 8UTC, 1 AUI, 1 BNC

ETHERNET CARDS

MacCon3 NB **$229**
For Mac II's; thick, thin & 10BaseT with 64K
MacCon3 for IIsi (& se/30) **$249**
Thick, thin & 10BaseT with 64K
MacCon+ LC **$229**
Thick, thin & 10BaseT

ETHERNET SCSI DEVICE

EN/SC **$339**
SCSI Ethernet for Classic & Plus; thick, thin & 10BaseT
EN/SCPB **$389**
SCSI Ethernet for PowerBook; thick, thin & 10BaseT
EN/SC10TPB **$319**
SCSI Ethernet for PowerBook; 10BaseT

PERSONTOPERSON

Twin Pack **$129**
10-User Pack **$329**
Zone Pack **$499**

Personal messaging software with live network chatting, QuickSend mailbox, voice messaging, built-in calender & electronic Post-it note

We're Only Going to Go Over this Once

SHARP®

$1,395
with purchase of transparency option

Sharp JX-320 Color Scanner

One-Pass Scanner with variable resolution from 30 to 600 dpi • Scans in 24-bit color, grayscale or black and white • OCR capability • 8.5" x 11" bed area

One Pass, 600 dpi Scanners at Express Direct Prices

$1,095

JX-320 Transparency Option
Add this user-installable option for film transparencies and 35mm scanning

WE CARRY THE FULL LINE OF SHARP SCANNERS

Sharp JX-600 Color Scanner .....Call
Eddy award-winner allows scanning of reflective art and transparencies up to 11" x 17"
Sharp JX-450 Color Scanner .....Call
30 to 300 dpi with scanning area of 11.7" x 17" for reflective art and 8.25" x 11.7 for transparencies

BUY SHARP DIRECT. Now you can get the complete line of quality Sharp scanners at direct prices. Express Direct has them in stock and priced to move. So before you buy from just anybody, call us for the direct price.

Easy Payment Options & Leasing Terms We accept money orders, cashiers checks and Visa/ MasterCard with no surcharge and your card will not be charged until product ships. Purchase orders are also accepted for those who qualify. Leasing terms available on most products.

EXPRESS DIRECT
1-800-535-3252

Prices and are subject to change without notice. All warranties on Macintosh/ Apple brand products sold by Express Direct will be honored by Express Direct or its authorized agents only. All other manufacturers' warranties still apply.

Don't Just Back up, Move up to PLI

PLI

PLI Infinity Floptical 21MB
21 megabyte capacity on just one 3.5" floppy disk • Downward compatible with 1.44MB and 720K floppy diskettes • Twice as fast as standard floppy diskettes • Ideal for backup and distribution

PLI Infinity 44 Removable
Lightning fast drive comes with cartridge • FREE 2yr warranty • FREE Software & Utilities • FREE Technical Support • FREE Data Recovery

★★★★½

WE CARRY THE FULL LINE OF PLI STORAGE DEVICES

PLI Infinity 88 Removable $829
with cartridge & all the features of 44MB
PLI Quick SCSI .....Call
PLI Infinity Optical 3.5" .....Call

Pull a Fast One for Just $1,995

TEXAS INSTRUMENTS

$1,995

TI microLaser TURBO
• Fast 9ppm engine • Postscript Level 2 RISC processor • 300 dpi • 35 PostScript fonts and 2.5 MB RAM standard

Get Texas Instruments Speed at Express Direct Prices

WE STOCK ALL TI ACCESSORIES

FREE AppleTalk Interface Included on Every Model

TI microLaser Plus PS/35 .....$1,565
9ppm engine, 300 dpi, 35 PostScript fonts
TI microLaser TURBO XL .....Call
16 ppm Turbo microLaser PS/35 XL
TURBO Upgrade Kit .....Call
Upgrade microlaser or microLaser XL to Turbo

TI microLaser Plus PS/17
9ppm , 300 dpi, 17 PostScript fonts

BUY TEXAS INSTRUMENTS DIRECT. Now you can get the complete line of quality TI laser printers at direct prices. Express Direct has them in stock and priced to move. So before you buy from just anybody, call us for the direct price.

Express Hours (central time):
M-F 8am-7pm; Sat 10am-2pm
24hr Fax, 7 days/week

EXPRESS DIRECT
"The Mac Systems Company"

International Orders Shipped Daily • FAX 312.549.6447
1801 W. Larchmont Ave. • Chicago, IL 60613 USA • 312.549.0030

1-800-535-3252

Ref: 26

Quantum
240mb
$699

MB	INTL	EXTL
52	$239	$299
GO•80	599	N/A
105	359	449
120	449	539
240	699	789

Toshiba
CD ROM
$579

3301 $579

Limited offer includes free "Nautilus" & "Showcase" CDs

Maxtor
213mb
$599

MB	INTL	EXTL
120	$359	$439
213	599	699
340	999	1099
535	1549	1649
760	1649	1799
1.2G	2299	2499

WREN
1.2gb
$1949

330	1349	1449
425	1499	1599
600	1399	1549
630	1699	1799
1.2G	1949	2099

Prices and Specifications Subject to Change Without Notice

APS DAT
Compression
$1899

APSArchive $1899
2.6gb Compression DAT

APSArchive 1499
Desktop and Portable Units

TEAC 155 599

WangDAT 1799

SyQuest
88mb
$699

SQ-555 44mb $479

SQ-5110 88mb 699

• 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 •
Quantum, Maxtor, Syquest and ARDAT Drives carry a two-year "parts & labor" disk-for-disk replacement warranty. WREN, Teac, WangDAT drives and Syquest Cartridges carry a one-year "parts & labor" disk-for-disk replacement warranty.

TriAm
16 grays w/Si, Ci, Quadra built-in video
Monitors

TriAm $499

TriAm 799
256 grays w/Lapis card for SE/30, LC, Mac IIs

Sampo
Dual-Page
Monitors

Sampo $799
Monochrome w/Lapis card for SE, SE/30, NuBus Mac IIs

• Toll-Free Technical Support •
Toll-Free Technical Support, 9am to 7pm Monday – Friday, CST. As often or for as long as you need.

• Brackets and Cables Included •
All Hard Drives include brackets, cables, cords and LEDs required for operation in the specified Macintosh. All Hard Drives come pre-formatted with Apple's latest stable all-platform System software, 13mb of compacted shareware, and APS Technologies' "ALLIANCE POWER TOOLS" SCSI formatter/hard partitioner.

AMEX ACCEPTED
GOV., UNIV., PO's, NO SURCHARGE

DISCOVER · MasterCard · VISA

VISA/MC, DISCOVER NO SURCHARGE
ACCEPTED CORP. PO's, NO SURCHARGE

Toll Free U.S. & Canada

1-800 235-2752

M-F 7AM–9PM CST SAT 10AM–4PM CST

TOLL FREE UK: 0800-897-545 TOLL FREE AUSTRALIA: 0014-800-125-875

INTERNATIONAL: 1-816 478-8300 FAX: 1-816 478-4596 (24 HRS)

APS TECHNOLOGIES

ALLIANCE PERIPHERAL SYSTEMS. 2900 S. 291 HWAY. LOWER H. INDEPENDENCE MO 64057

Circle 15 on reader service card

Move Over SyQuest,® Optical Just Got Affordable.

Introducing the DGR Technologies 3.5" 128MB Read/Write Optical Drive

"With their high capacity, imperviousness to magnetic fields, and small size, 3.5-inch erasable optical drives promise to be a superior alternative to magnetic SyQuest, Ricoh, and Bernoulli drives." – MacUser, November '91

SyQuest revolutionized hard disk storage with **portability** and speed. Now, DGR Technologies ups the ante: 128 megabytes of removable, erasable optical storage on **fast**, ultra-reliable 3.5" disks. The 128REM™ represents substantial media savings over SyQuest 45MB and 88MB technology – do the math. The real savings, though, is peace of mind. Optical storage spells **reliability**: No more head crashes and no more magnetic data corruption. Above all, the **128REM™** is built to perform. 9 millisecond short seek time and a built-in 128K buffer translate into significant improvements over current removable standards – giving you the capacity and **performance** you've been waiting for. The 128REM™ is built with the future in mind, conforming to both ANSI and ISO standards, ensuring future **compatibility**. Price. Performance. Reliability. The DGR Technologies 128REM™.

$1,499

FWB

The DGR 128REM Now Includes FWB's Hard Disk ToolKit Lite!

$99	128 Megabyte Optical Cartridge
3.5"	Erasable Disk Cartridges
1yr	Direct Replacement Warranty
30	Day Money Back Guarantee

To Order Call TOLL FREE Monday-Friday 9am to 6pm CST
DGR Technologies accepts MC, Visa, Discover, Pre-Paid, COD, & Wire Transfer Orders.

Order Direct 800-235-9748

DGR Technologies • 1800 Rio Grande, Suite 205 • Austin, Texas 78701 • 512/476-9855 • Fax 512/476-6399

dgr technologies

© DGR Technologies Inc. All brands and product names are trademarks of their respective holders.

YOU CAN'T MISS WITH

SLEEKER & SLICKER, INSIDE & OUT

Introducing the New Index External Hard Drives

At MacTel Technology, we don't believe in slapping a cheap case around a fine mechanism. When you buy an Index external half-height Quantum or Micropolis drive, it will come harmoniously housed in a new custom-designed case: beautiful, solidly built, and loaded with features discriminating buyers demand. Available in 52Mb, 105Mb, 240Mb, 425Mb and 765Mb capacities.

Which of These Features Could You Do Without?

- **An external termination adaptor,** *so that you can decide where to terminate your daisy chain*
- **110-220v variable power supply,** *so that it can go with you overseas*
- **fully shielded power supply inside,** *so that interference from TVs, etc. is minimal*
- **2 power receptacles,** *so that you can plug peripherals into the case & cut down on wall plug-ins*
- **push button SCSI selector switch, placed away from the power supply switch,** *so that it's easy for you to engage it without accidentally turning the drive off*
- **external circuit breaker switch,** *so that minor surges don't damage your drive*
- **removable filter for fan,** *so that you can clean it yourself easily & prolong your drive's life*
- **ferrite ring inside,** *so that you have a less noisy drive with a minimum of magnetic interference*
- **security latch,** *so that you can chain and secure your drive*
- **3-foot double-shielded SCSI cable,** *so that you can place the drive on another work surface, if you wish to*
- **Index external drives come with all these benefits...AND MORE!** *(see below)*

INDEX ELITE HARD DRIVES

Index Elite drives combine a Quantum mechanism (the best!) with FWB Lite driver/formatting software (the best!) for optimum performance. Index Elite drives also include FREE! BRU Pro backup utility (another winner!) and 25 Mb of the very latest, System 7 savvy shareware.

Index Elite 3.5" Quantum:	Int'l	Ext'l
•52 Mb, 12 ms	$299	$389
•105 Mb, 12 ms	$429	$489
•240 Mb, 12 ms	$739	$829
•425 Mb, 12 ms	$1437	$1529

INDEX ECONOMY HARD DRIVES

Good driver/formatting software and 10 Mb of shareware ship with all Index Economy drives.

Economy 3.5" Quantum:	Int'l	Ext'l
•52 Mb, 12 ms	$259	$349
•105 Mb, 12 ms	$389	$449
•240 Mb, 12 ms	$699	$789
•425 Mb, 12 ms	$1397	$1489

All Index drives come preformatted, support partitioning, password protection, and are A/UX and System 7 compatible. You get all necessary cables & brackets FREE.

We ship drives in custom-designed boxes using less foam and all recycled/recycleable materials.

INDEX COLOR MONITOR SYSTEMS

Index 20" Ikegami CT20 Trinitron Systems
These are the genuine, top-of-the-line CT20 Ikegami monitors.

w/8-bit non-upgradeable board $2497
w/8-bit upgradeable, accelerated board $2997
w/24-bit XLM board (supports acceleration) .$2997
Editors' Choice, MacWorld 1/92 for clarity & price!
w/24-bit XLI board (acceleration on board) ..$3497

Index 20" Sony GDM 1936 Multiscan Systems

w/8-bit non-upgradeable board $2997
w/8-bit upgradeable, accelerated board $3497
w/24-bit XLM board (supports acceleration) .$3497
w/24-bit XLI board (acceleration on board) ..$3797

All Index monitor systems come with tilt/swivel, in 110v or 220v.

MONITORS

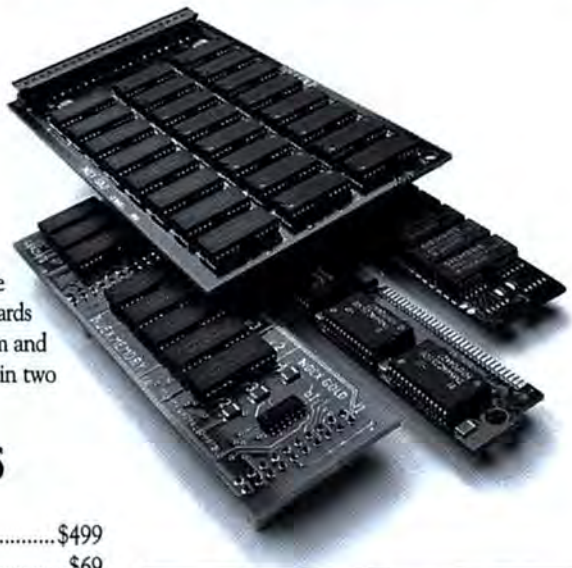
- Apple 13" RGB Trinitron $729
- Seiko 1445 14" Trinitron $629
- Sony 16" Trinitron (Multiscan) $1297
- Ikegami 20" CT20 Trinitron $1897
- Sony 20" GDM 1936 Trinitron $2497

INDEX QUALITY AND VALUE

VOLUME DISCOUNTS

CPU'S

Call us today for a competitive quote on your custom system. Upgrade with genuine Index Gold memory, boards and drives. Add a great monitor system and keyboard, too! Most systems ship within two days. The quote is free — call now!



STORAGE SOLUTIONS

- Index 45R w/1 cartridge ★★★★ $499
  SyQuest cartridge SQ400 ..... $69
- 2 GB DAT w/Retrospect + 1 tape $1449
  2 Gb DAT tape, 60m $29
  2 Gb DAT tape, 90m $39
- 3.5" Index 128 Mb Optical $1499
  3.5" 128 Mb Optical disk $69
- 650 Mb Sony Optical drive w/1 cartridge $2897
  3.5" 650 Mb Optical disk $149

MICROPOLIS LARGE CAPACITY DRIVES

5-year warranty!!! For maximum speed, your drive comes bundled with FWB Lite formatting software. Included FREE! BRU Pro backup utility, and 25Mb of the latest-and-greatest shareware.

	Internal	External
• 765 Mb	$1497	$1649
• 1.2 Gb	$1949	$2099
• 1.6 Gb	$2549	$2699
• 2.0 Gb	$3149	$3299

INDEX EXTENDED KEYBOARDS

Index ADB keyboards have a 105-key layout, 15 function keys, cursor control keys & number pad. Foreign language keyboards are bundled with appropriate keyboard layout software.

English $99
French, German, Swiss-German,
& Spanish $119

Circle 105 on reader service card

SALES & TECH SUPPORT

From continental USA, call
1-800-950-8411
From outside continental USA, call
1-512-451-2600
Or by fax: 1-512-451-3323

Please specify type of Mac when ordering!

Sales, Service & Support Hours:
Mon.-Fri., 8:00 a.m. - 5:00 p.m. Central Time

"...in MacTel I've finally found a Macintosh after-market vendor that stands behind its products and knows the meaning of support and service...your service has truly been exceptional." — unsolicited customer mail, 3/92

FEDERAL EXPRESS

Our products are shipped via fast, reliable Federal Express®

INDEX GOLD MEMORY MODULES AND UPGRADES

YOUR MAC DESERVES THE BEST!

Index Gold™ SIMMs & boards are exceptionally fine. It's a fact! Other, more cheaply manufactured SIMMs "may actually damage the Mac, as well as cause operating problems." (MacWeek, 2/24/92) Get Index Gold™ SIMMs. Manufactured to the highest industry standards, only MacTel makes SIMMs and board products with gold contacts, traces & leads for enhanced conductivity and durability. Each one backed with a lifetime warranty.

- 1 Mb Index Gold™ SIMM, 70/80ns $37.95
- 1 Mb Index Gold™ FX & NTX, 70/80ns ... $38.95
- 2 Mb Index Gold™ SIMM, 70/80ns $84
- 3 Mb Index Gold™ Classic upgrade $109
- 4 Mb Index Gold™ SIMM, 70/80ns $139
- 8 Mb 70/80ns upgrade $499
- 16 Mb 70/80ns upgrade $575
- PowerBook 2 Mb (100,140,170) $195
- PowerBook 4 Mb (140,170) $375
- PowerBook 6 Mb (140,170) $595
- 1 Mb Index Gold™ TI MicroLaser PS 17/35 & XL SIMM $69
- Mac LC V-RAM Index Gold™ upgrade $69
- Quadra 256K V-RAM Index Gold™ upgrade $59
- Classic II Index Gold™ MathMate NEW! $79

On-board 68882/16 MHz math co-processor for Classic II. FREE! Benchmark software included.

- Mac LC Index Gold™ MathMate $79

Accelerate math-intensive operations on your LC by up to 39% with a 68882/16 MHz math co-processor and get a 15% overall CPU improvement. FREE! Benchmark software included.

- Mac IIsi 030 Index Gold™ Direct Slot Interface $99

On-board 68882/20 MHz math co-processor with adaptor for Macintosh IIsi. FREE! Benchmark software included.

MacTel Technology
3007 North Lamar,
Austin, Tx 78705

At your request, we'll be happy to provide our latest catalog listing our full product line.

mactel
TECHNOLOGY CORPORATION
1•800•950-8411

TERMS:

No surcharge for Visa or MasterCard. European banking service available. University, government, military, and corporate (on approval) NET 30 purchase orders accepted. Allow 10 days for personal and company checks to clear. Maximum on COD order of $3000. Returned merchandise must be authorized. Call 512/451-2600 for RMA number. Defective merchandise will be replaced or repaired at MacTel's discretion. Shipping and handling charges are not refundable. Products returned without RMA number will be refused. Any products returned for any reason (RMA, warranty service, etc.) must be in original shipping container including all packing materials. Minnesota residents add 6 1/2% sales tax. All products are subject to a 15% restocking fee. All products subject to availability. ***All prices are subject to change.***

NEW! Quark XPress 3.1 $511

Ask about our wide selection of Quark XTensions.

FWB FWB's Hard Disk ToolKit Lite Included with DGR 128REM!

NEC Silentwriter II Model 95 $1475

300 DPI Postscript Level 2•Auto PC-Mac Switching
RISC Processor • 6ppm • 35 Resident Fonts
NEC Printer RAM Upgrades **Call**

DGR 128MB Removable 3.5" Erasable Optical $1399

Erasable Optical Drive with 35ms access.
3.5" 128MB cartridges only $59

DoveFax 24/96 $222
DoveFax Plus 24/96 $305

HP DeskWriter $389
HP DeskWriterC $722

SyQuest 45/88 Cartridges
$63 / $119

Abaton Interfax 24/96
With InterShare $229

Microtek TrueLaser
RISC 6ppm $1248

Panasonic 19" Mono $499
19" Greyscale $699

Includes Video Card

Seiko CM-1445
14" Trinitron $539

JetInc. Inkjet Refill
Twin Pack $15.99

For HP DeskWriter & Apple StyleWriter

NEW! Sony 1604 17"
Trinitron $1099

Umax 630 24-bit Scanner
with PhotoShop $1229

MacUser, Dec 91

SYSTEMS

New Prices! Call for PowerBook RAM & Quadra VRAM

SYSTEM LEASING NOW AVAILABLE

Macintosh Classic 1/0	825
Macintosh LC 4/40	1387
Macintosh LCII 4/40	Call
Macintosh IIsi 3/40	1989
Macintosh IIci	2725
Macintosh IIfx	3745
Macintosh Classic Model II 4/40	1125
Macintosh Classic Model II 4/80	1379
Macintosh Quadra 700	4369
Macintosh Quadra 900	5375
Macintosh PowerBook 100 2/20	1849
PowerBook 100 2/20 w/ Floppy	2029
Macintosh PowerBook 140 2/40	2298
Macintosh PowerBook 140 4/40	2544
Macintosh PowerBook 170	3734

Now Included With All Macintosh Systems – FWB Hard Disk ToolKit Lite!

NETWORKING

Asante 10baseT Hub	610
Asante 16k /64k Cards/ All CPU	239/255
Cayman Gatorbox/GatorPrint	1849/359
DaynaPort /DaynaPort FPU	245/349
Dayna EtherPrint /EtherPrint Plus	325/589
Farallon Star Controller/EN	799/1199
PhoneNet 10 Pack	188
QuickMail 10 User	285
Shiva Ethergate / FastPath 4	1262/1850
Shiva Netbridge/ Telebridge	399

Generation Systems

14" Color Monitor.....$429
20" 24-bit Color System.....$2138
20" 8-bit Color System.....$1710
SE/30 8-bit Color Card $269
All Generation Systems In Stock!

Timbuktu Remote Access Pak	732

INPUT/OUTPUT

Apple Extended Keyboard	170
Datadesk Keyboard 101E	115
EMAC Silhouette	75
Kensington Turbo Mouse	101
Keytronic MacPro Plus Keyboard	115
Mac Recorder Digitizer Only	89

MODEMS & FAXES

Global Village Teleport ADB SendFax	175
Global Village FullFax Send & Receive	215
Practical Peripherals 2400b	164
Practical Peripherals MacPak	225
Shiva Net Modem v.32	1230
US Robotics Courier 9600 V-32	695
ZOOM 2400 Baud Modem/Fax	65
ZOOM 24/96 Send/Receive Fax	119

PRINTERS

Abaton LaserScript LX	1499
Apple LaserWriter IIf 20MHz 030	2764
Apple LaserWriter IIg 25MHz 030	3533
Apple StyleWriter	349
Apple Personal Laser LS/NT	915/1575
NEW Apple Personal LaserWriter NTR	Call
Hewlett Packard Lasers	Call
Hewlett Packard DeskWriter/C	389/722
LaserMaster High Res Printers	Call
LinoType 330,550, & 630 with RIP 4	Call
QMS PS-410	1485
Seiko ColorPoint	Call
Tektronix Color Quick InkJet	1651
TI microLaser PS XL 17/35	2449/2799
TI MicroLaser Turbo/TurboXL	1949/3129

VIDEO SOLUTIONS

Apple 12"/13" HighRes RGB	425/639

GCC Printers

ASK ABOUT GCC REBATES!

GCC PLP II 4ppm $849
GCC PLP IIs 8ppm $1246
GCC BLP Elite 4ppm $1415
GCC BLP II 4ppm $1659
GCC BLP IIs 8ppm.....$2409

Apple 21" Color RGB	3534
E-Machines Monitors –All Models	Call
Envisio PowerBook Video Card	829
Ikegami CT-20" Trinitron	1795
Mass Micro Quick Image 24	579
NEC MultiSync 3FGx	659
NEC Monitors –All Models	Call
Seiko CM-1445	539
Sony 1304 14" Trinitron	609
Sony 1604 17" Trinitron	1099

ACCELERATORS & CACHE

APPLIED ENGINEERING

AE QuickSilver IIsi	225
AE QuickSilver IIsi w/FPU	269
AE TransWarp LC 33MHz	759
AE TransWarp LC 33MHz w/FPU	895
SIMMs: all types/best prices	Call
ATTO IIci Cache Card	149
Motorola PMMU 68852	79
Sigma Double-Up Card	189
TokaMac 040 for the IIci	2399
TokaMac 040 for the LC	2079
TokaMac for the IIsi & SE/30	2228

SCANNERS

Microtek 600GS with PhotoShop LE	1118

BOTTOM LINE INTERNATIONAL DEPARTMENT

Bottom Line Distribution is committed to the needs of the international Macintosh user and reseller. Contact our full-time international department via fax at **(512) 476-6399**. We offer discounted rates with DHL, UPS International, or Federal Express. Delivery times to most countries is 2 to 3 days. We stock 220v versions of most hardware. Dealer inquiries are welcome. Language interpreters are available. Internationale Händlerkonditionen. DHL

国際ディーラーの条件が出来る　日本語で注文できます

INTERNATIONAL SALES FAX (512) 476-6399

Bottom Line Distribution 1800 Rio Grande, Austin, Texas 78701

Turbo microLaser PS/35 $1949

9 ppm engine • Postscript Level 2 RISC processor
Appletalk interface included on all models
16ppm Turbo microLaser PS/35 XL $3129

TI 1MB UPGRADE $59

TI microLaser Plus PS/17 $1225
TI microLaser Plus PS/35 $1525

Appletalk interface & 1.5MB RAM included on all models
1MB TI Upgrade $59 • Replacement Toner $55

MICROTEK

Microtek 600ZS $1239

600 DPI 24-bit Scanner with Photoshop 2.0
& ScanMatch Calibration Software

Microtek 1850S Slide Scanner $1689

1850 DPI Color Slide Scanner with Photoshop 2.0

BOSTON

SUPERMAC.

Spectrum /8•24 PDQ	$799
Spectrum /Series III 8/24	$515/$1375
Spectrum /8 IIsi & LC	$478
Thunder 8/24 Video Cards	Call
19" Platinum Display	$882
21" Platinum Two-Page	$1030
SuperMatch 20" Dual Mode Trinitron	$2459
SuperMatch 20" Color	$1625

Video Spigot starting at $399
Thunder Cards – Call!

RasterOps™

CorrectPrint 300DPI Dye-Sub Color	$6999
ProColor 32 CMYK 9-bit DAC	$3099
8/24XLi 24-bit Accelerated Card	$989/$1699
24STV 24-bit with Frame Grabber	$789
24s / 24sx –24-bit Video	$399/$629
Video Expander (NTSC/PAL)	$479
24XLTV Large Screen Live Video	$2649
19" Trinitron/ 19" Hitachi	$2499/$1595

RasterOps 364 Board $699
24-bit Card with Frame Grabber *Limited Qty!

radius™

Rocket 040 Accl /25i	$1640/$1295
Two Page Interface II, IIsi, SE, SE/30	$415
24-bit Interface 72 DPI	$2515
Two Page Display 19"/21"	$975/$1199
Color Display 19"/21"	$2999/3149
Color Pivot Interface II, IIsi, LC, SE/30	$549
Precision Color 24X System	$4259
Precision Color Calibrator	$485

Radius Color Pivot $1265
Landscape or Portrait View • Tilt Swivel Stand

DAYSTAR DIGITAL

Accelerators for LC, SE/30, II, IIsi, IIcx, IIci	
33MHz PowerCache	$613
40MHz PowerCache	$795
40MHz PowerCache with 68882 FPU	$985
50MHz PowerCache	$1228
50MHz PowerCache with 68882 FPU	$1475
FastCache IIsi	$269
FasteCache IIci	$245

Daystar 50MHz PowerCache with 68882 FPU $1475

Microtek 600ZS with Photoshop	1239
Microtek 1850 Slidescanner	1689
Sharp JX320 w/Interface	1495
Sharp JX450 w/Interface	4159
Sharp JX600 w/Interface	9989
Umax 630 w/Photoshop	1229

DRIVES & TAPES

Applied Engineering 1.44 Drive	209
Applied Engineering Plus Drive	283
Bernoulli 90MB w/ Interface	814
PLI Super Floppy	399
PLI Turbo Floppy	287
PLI Quick SCSI with Cable	319
Conner 40 MB Limited Qty	169
Quantum 105MB LPS	349
Quantum ProDrive 170MB	629
Quantum ProDrive 240MB	659
Quantum 425MB	1275
Fujitsu Drives All Models	Call

CD ROM

Chinon CD-ROM	525
NEC CDR-36 w/ Type Gallery	469
NEC CDR-73	616
PLI CD ROM	636
Toshiba CD-ROM XM 3201A	685

Microsoft Office - CD ROM	574
Type Gallery PS	229
NEC Clip Art 3-D	221

SOFTWARE

4th Dimension 2.2	469
Adobe Illustrator 3.2 w/ATM	335
Adobe PhotoShop 2.0	515
Adobe Type Manager 2.0.2	54
Adobe Type Reunion/Streamline2	36/115
AfterDark & More After Dark Bundle	37
Aldus Freehand 3.1	369

PLI Drives

PLI Infinity 45 SyQuest	$569
PLI Infinity 88 SyQuest	$719
PLI 3.5" Sony 128MB	$1575
PLI 5.25" Tahiti 1.0GB	$4129
PLI 3.5" 21MB Floptical	$515
PLI Sony CD-ROM	$636

Aldus PageMaker 4.02	475
Aldus Superpaint 3.0	129
Aldus Gallery Effects	129
Aldus Persuasion 2.0	299
At Once! 1.2	177
Canvas 3.0	239
Carbon Copy 2 Pack	153
Claris Works	184
DiskFit Pro	67
Disk Doubler 3.7	39
Disk Top 4.0	62
Farallon Media Tracks	171
Far Side Calendar	46
Fastback Plus 2.6	115
FileMaker Pro	181
FilmMaker	399
Fontagrapher 3.3	249
FontMonger	65
Foxbase +Mac 2.01	265
Fractal Design Painter	234
FrameMaker	642
Lotus 1-2-3 Minimal Packaging	89
Mac Academy Training Tapes	39
MacDraw Pro	249
Mac Globe	39
MacProject II 2.5	329

Macromind Director 3.0	618
Macromind Accelerator	125
Macromind MediaMaker	449
MacWrite Pro	NEW
Managing Your Money 4.0	92
MasterTracks Pro	183
MicroPhone II 4.0	195
Microsoft Excel 3.0	299
NEW! Microsoft Word 5.0	279
Microsoft Office	489
MS Project	429
MS Works	179

Wacom Tablets

6x9" Standard Surface	$459
12x12" Standard Surface	$659
12x12" Electrostat Surface	$710
12x18" Standard Surface	$969
12x18" Electrostat Surface	$1025
18x25" Standard Surface	$2549

MiniCAD 3.1	469
More 3.1	249
Norton Utilities Mac 1.12	74
OmniPage 3.0	449
Passport Encore	335
Passport Midi Interface	63
PixelPaint Professional 2.0	479
Pixar Renderman	559
Quark XPress 3.1	511
Quick Keys II V.2.1	87
Quicken 3.0	38
Retrospect 1.3	131
Soft PC –All Versions	Call
Stratavision 3D 2.0	579
Studio/32	399
Stuffit Deluxe 3	48
SUM II	87
Swivel 3D Pro	399
System 7.0	99
Think C 5.0	173
Think Pascal 4.0	159
Typestyler 2.0	122
Vellum 2.0	1399
White Knight	75
WordPerfect 2.03	265
Write Now 2.2	111

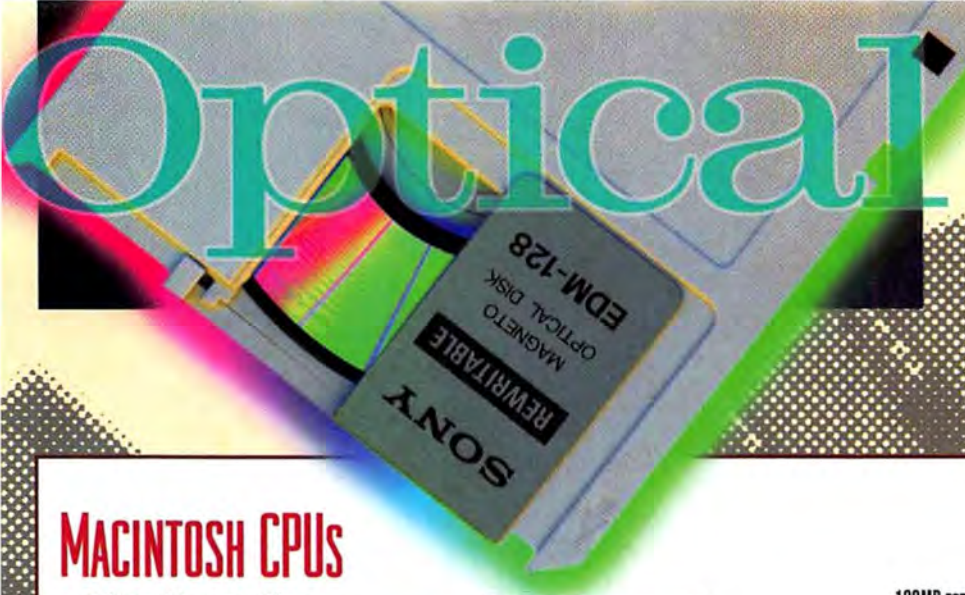
HOW TO ORDER **Payment:** Visa, Mastercard, Discover (no surcharge), checks, and COD's. $6,000 maximum on COD's **Tax:** Texas residents add 8% sales tax. **Prices** and items subject to change and availability. **International:** 5% surcharge on international orders. **Mail In:** Orders accepted with a $10 surcharge. **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.

VISA MasterCard DISCOVER FEDERAL EXPRESS

BOTTOM LINE DISTRIBUTION

Fax: 1-900-420-8770 $10 PER FAX
1800 Rio Grande, Austin, Texas 78701

1-900-420-3636
$2 PER MIN



Macintosh CPUs

Call for pricing on new Macs.

We can help you design your entire system. Just give one of our sales consultants a call.

Third Wave Optidisk 128

The new removable standard!

128MB per cartridge at only 30% the media cost of SyQuest! Plus the data reliability inherent in magneto-optical technology. Our Sony based drive is only $1599 and cartridges are only $59. Ask about our special offer for qualified service bureaus!

Rated Number One by MacUser

5 Year Warranty

Thick/Thin or Thick/10T	169.00
Thick/Thin/10T, 64K	229.00
Friendly Net/Thin or 10T	229.00
10T 12 port hub	529.00
10T 8 port hub	299.00
Thick to 10T adapter	99.00
SCSI Ethernet	from 299.00
Dayna Etherprint	335.00
Dayna Etherprint Plus	805.00
16MHz 882 for LC Ethernet	49.00
20MHz 882 for IIsi Ethernet	69.00

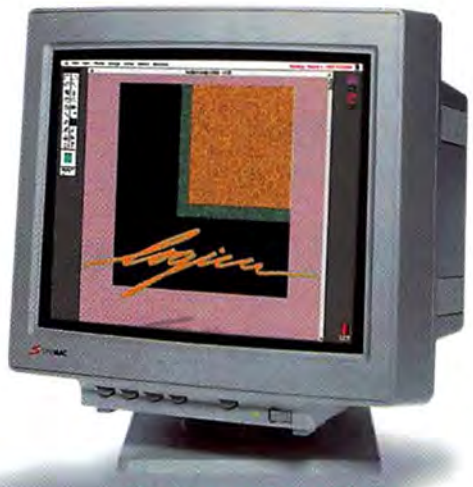
Asante Ethernet from $169

Cache Cards, Accelerators, and CoProcessors

TokaMac 040 Accelerators rated faster than the Quadra in three out of four benchmarks. MacWeek– 10/22/91

Cache cards from Logica speed up your IIsi or IIci by 40 percent! The LogiCache IIsi plugs into the IIsi slot or into the Logica Dual Slot Adapter for use with SE30 or IIsi expansion cards. Logica math coprocessors for LC, Classic II, and IIsi speed math calculations by over 100 percent. For maximum performance, choose '030 accelerators from Applied Engineering and Daystar, or '040 accelerators from Fusion Data and Radius.

LogiCache IIci	159.00
LogiCache IIsi	169.00
IIsi Dual Slot Adapter	59.00
20 MHz Math chip for Adapter	89.00
DayStar PowerCache 33,40,50 MHz	CALL
DayStar PowerCache above w/882	CALL
Radius Rocket and Radius Racket 25i	CALL
Applied Transwarp 040	1749.00
Applied Transwarp LC 33,40,50 w/882	CALL
TokaMac 040 Accelerators for the LC, IIsi, SE 30, IIci, and the Mac II FX	CALL
16 MHz 882 CoProcessor for LC	89.00
16 MHz 882 CoProcessor for Classic II	89.00



Display Systems

SuperMatch color displays 17 - 21 inches.
Spectrum and Thunder video cards.
VideoSpigot, VideoSpigot Pro, Spigot and Sound, Spigot and Sound Pro.
Radius Precision Color products, Radius Pivot, Color Pivot.
We are authorized resellers of Radius, RasterOps, and SuperMac.
Call for latest prices on video.

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)682-0099

STORAGE SYSTEMS

REMOVABLE MEDIA

OptiDisk 600 It's a SONY!	2695.00
OptiDisk 1000	3695.00
45 SR (SyQuest) w/cartridge	475.00
88 SR (SyQuest) w/cartridge	669.00
DATadrive 2GB	1395.00
DATadrive 5GB	1595.00

DISK DRIVES

	INTERNAL	EXTERNAL
120 MB	449.00	539.00
240 MB	719.00	809.00
520 MB	1299.00	1399.00
650 MB	1399.00	1499.00
1000 MB	1999.00	2099.00
1300 MB	2599.00	2699.00
1700 MB	CALL	CALL

SyQuest, Optical, and DAT available internally for the Quadra 900!

"Quietest" — March '91
"One of the best manuals" — "Highest SCSI Eval. Read/Write" — September '91

All of our DAT drives include Retrospect 1.3, one DAT cassette, one DAT cleaning cassette, and your choice of SCSI cable.

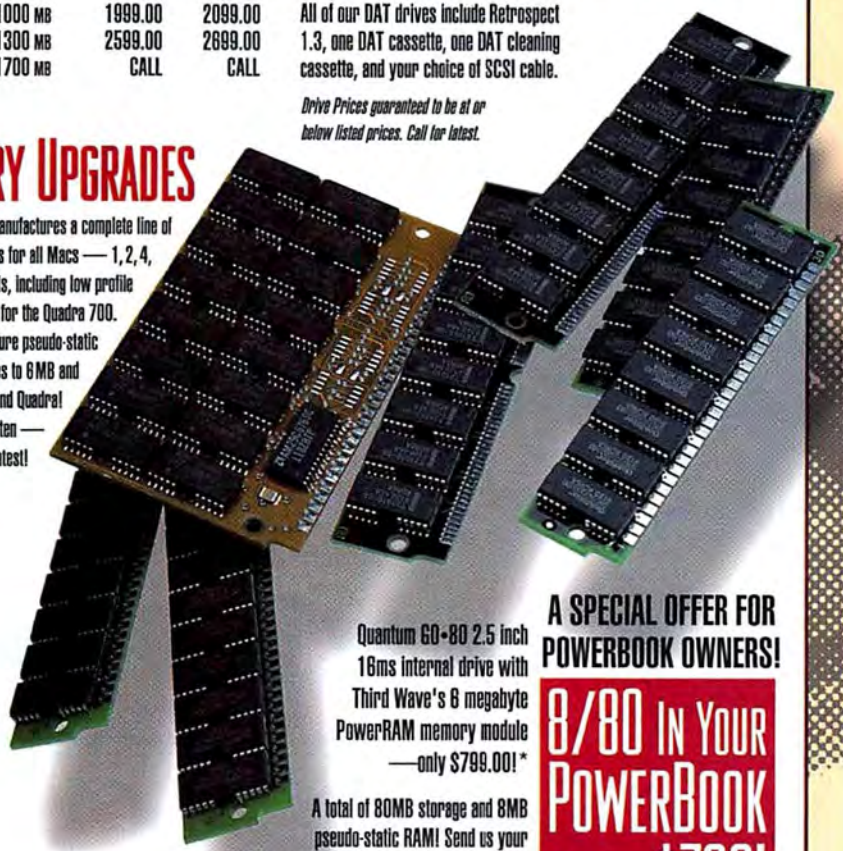
Drive Prices guaranteed to be at or below listed prices. Call for latest.

MEDIA

60 MB Tape for Teac	17.00
150 MB Tape for Teac	24.00
SyQuest 45 or 88 MB cartridge	68.00 /115.00
DAT cassette 60 or 90 meter	17.00 / 29.00
Optical cartridge (ISO) 512 kb/sector	125.00
Optical cartridge (ISO) 1024 kb/sector	125.00
Optical cartridge for Tahiti	269.00
Optical cartridge 128 MB	59.00

MEMORY UPGRADES

Third Wave manufactures a complete line of memory products for all Macs — 1, 2, 4, and 16MB SIMMs, including low profile 16MB SIMMs for the Quadra 700. We also manufacture pseudo-static PowerBook modules to 6MB and VRAM for the LC and Quadra! Prices change often — call for the latest!



ADOBE PHOTOSHOP ONLY $449!

The latest version Adobe Photoshop 2.01! This is a special offer on the full, complete version— not a bundle or limited edition version.

Quantum 60•80 2.5 inch 16ms internal drive with Third Wave's 8 megabyte PowerRAM memory module —only $799.00!*

A total of 80MB 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.)

A SPECIAL OFFER FOR POWERBOOK OWNERS!

8/80 IN YOUR POWERBOOK FOR ONLY $799!

Circle 156 on reader service card

THIRD WAVE COMPUTING, INC. 1826B Kramer Lane Austin, Texas 78758 (800) 682-0099 (512) 832-8282 FAX (512) 832-1533

Our Macintosh Prices Can't Be Beat

May Special: Get this Quadra 700 with a 16-inch Colorpage T-16 for only $7,739. It can't be beat!

OPEN M-F: 8AM - 9PM Sat & Sun: 12 - 6PM

ColorPage T-16

Quadra Compatible!

E-Machines ColorPage T16 16-inch display. Works with the Macintosh Quadra Built in video! Displays 832x624 resolution at 72dpi. The T-16 Judged Best 3 years running by MacUser Magazine.

$7,739.

ColorPage T-16 — *Please Call For Price*

Color Displays

ColorPage T16 II	Call
ColorPage E16	Call
E-Machines TX16	$1750
E-Machines T19/8 Bit	

Color Interface Cards

Futura EX	In Stock! Call

24-bit Accelerated NuBus interface card for the Apple 12 and 13-inch displays, ColorPage E16, and Mac compatible displays with 640 x 480 resolutions. And like all E-Machines cards: On board acceleration, virtual screens, and pan and zoom.

Double Color Board for the T16	$359
Futura SX/8	$699
Futura SX	$899
Futura MX	$1399
ColorLink EX/T	$695
ColorLink SX/T	$1050
E-Machines TXsi and T19/si	$949
E-Machines TXSE30/8	$949

Options

Futura SX/8 to Futura SX Upgrade	$210
Futura EX to Futura SX Upgrade	$350

ZOOM 9600 Modems

9600 V.32/v.42 ..... $359

9600 Baud, Cable, Software Included

Zoom 2400 Baud	$79

cable and software included

Solectek Fax Modem	$199
Dove FaxPlus Fax Modem	$349
Courier HST Dual Standard	$840
Sportster 2400 w/ MNP1-5	$159
All Other Modems	Call

Input Devices

Keytronic MacPro Plus	$139
DataDesk SwitchBoard	$169
Apple Extended Keyboard	$180
Curtis MVP Turbo Mouse	$89

Wacom Graphic Tablets

6x9 Standard	$489
12x12 Standard	$695
12x12 ElectroStatic	$769
12x18 Standard	$1049

Call For More Wacom Pricing

Macintosh IIsi Special

Macintosh IIsi, 5mb RAM, 105mb Hard Drive, 1.44mb Apple FDHD, Mouse, MacPro Keyboard, 14" Color Monitor, 8 Bit Color. With 24-bit Accellerated color add only $685.

High Speed. No Drag Pricing.

Call For Price

JetFill™ Ink Refill

Clean, Affordable and Good for the environment. **JetFill** ink refill two-packs are the perfect way to refill your HP DeskWriter and StyleWriter Ink Cartridges. Refills come in four colors and also come with a money back guarantee. Plus, over night shipping is available for only $6 more.

TWO PACK

BUY THREE 2-PACKS AND GET OVERNIGHT SHIPPING FREE

$16

MacSource

QUADRA System

Quadra 700, 20mb RAM, 240mb Hard Drive, 1.44mb Apple FDHD, Mouse, Extended Keyboard, 16" ColorPage T-16 Monitor, Futura SX Color Card, 832x624 resolution, 24-Bit Accelerated Color, Pan and Zoom, Virtual Screens and DiskMaker formatting software.

Only ... $7,739

Mac IIci System

Macintosh IIci, 5mb RAM, 105mb HD, 1.44mb Apple FDHD, Mouse, Extended Keyboard, 14" Color Monitor, 8-bit color.

For A Limited Time Only

Super Special $3559

with accelerated 24-bit color only $499 more

Classic 2/40	$995
Classic II 2/40	$1159

Call For Other CPU configurations

Extras *only* from MacSource

Every Mac we sell includes Golden Triangle's DiskMaker software. Plus our expert technical support staff is available for any hardware related questions you may have about your MacSource CPU purchase. All products carry at least a one year manufacturer's warranty. Call for more information on pricing and warranties.

Prices subject to change without notice.

CALL TOLL FREE 1-800-285-2622

MacSource™ • 7801 North Lamar, Suite E-190 • Austin, Texas 78752 • (800) 285-2622

FAX: (512) 467-2642 • Technical Support: 1-800-723-2622• International Quotes: (512) 467-6871

Visa & MasterCard **Accepted with No Surcharge.** Customers may deduct 1% for prepayment by Cashier's Check

Technical Support is only available for Macintosh Systems. For support on software or other products please contact the manufacturer.

©1991 MarSpec, Inc. MacSource is a trademark of MarSpec, Inc. Apple and Macintosh are trademarks of Apple Computer Corporation. Group Sales Photo ©1991 PR Dunn Photography. All other trademarks are property of their respective holders. E-Machines, The E-Machines Logo, and ColorPage are trademarks of E-Machines.

300% Cheaper

Than buying a new Macintosh IIci with a 19" monitor

500% Larger

Our 19" monitor versus the 9" built-in Mac display

700% Faster

Than your existing SE, Classic, or Plus

1000% Smarter

Macintosh IIci Performance For Your SE, Plus or Classic

Magic delivers the newest, hottest solutions for your Macintosh. Our latest offering: The Magic RailGun 030Pro System - a 19" Two-Page display bundled with a superfast 25Mhz 68030 accelerator.

Check out the competition's accelerator package and you'll see why our solution is best. We offer a 32-bit video address path. They've only got 16. We support 3rd party displays, including Radius. They don't. Our maximum resolution is double theirs. Our video operates at the accelerator speed – not locked into a paltry 8MHz like some. The RailGun 030Pro can be upgraded all the way to 40MHz at need. And ours ships with a full Motorola 68030 processor with onboard FPU and PMMU - not an econo-version like theirs. And on top of all that, we offer our standard one year warranty, 30 day money back guarantee, System 7 compatibility, and support for up to 16mb RAM.

RailGun 030Pro System™ vs. Mobius 030™

Features	RailGun 030Pro	Mobius 030	Macintosh IIci
Base Price	$999	$1295	$3299
CPU Support	SE, Classic, & Plus	SE & Classic	N/A
Processor	25 MHz 68030	25 MHz E68030	25 MHz 68030
Math FPU	68882 Included	$130 Extra	Included
PMMU	Built into 68030	$200 Extra	Included
Video Path	32-bit Video	16-bit Video	32-bit Video
Monitor	19" 1152 x 876	19" 1024 x 768	$800-$1500 Extra
Video Support	All 3rd Parties	Only Mobius	All 3rd Parties
Total Price	Still $999	$1625	$4099

Now that you know what we've got, ask Mobius about their features. Then ask them about their price. Then call us for the RailGun 030Pro System — the only system that makes sense.

$999 Includes 25MHz 68030 Accelerator, Built-in Math FPU, PMMU, & 19" Display

Magic **RAIL***Gun 030Pro System*™

VISA MasterCard DISCOVER

MacProducts USA
1 800 622 8721

Tel 512-472-8881 • Fax 512-499-0888
608 West 22nd Street • Austin, Texas 78705

All trademarks are the property of their respective holders.

LOWEST PRICES HERE

Microtek 600 ZS
$1269

Microtek Truelaser
$1299

SYSTEMS

	Price
Mac LC 4/40	1570
Mac IIfx - 4 meg	4179
Mac IIci - 5 meg	**2749**
Mac IIci - 5/105 (Quantum)	**3049**
Mac IIsi - 3/40	1999
Mac IIsi - 5/80	2549
Extended Keyboard	170
Mac Quadra 700 - 4 meg	4399
Mac Quadra 700 - 4/105	4799
Mac Quadra 700 - 4/210	5159
Mac Quadra 900 - 4 meg	5675
Mac Quadra 900 - 4/210	6385
Mac Powerbook 140 2/20	2223
Mac Powerbook 140 2/40	2479
Mac Powerbook 140 4/40	2749
Mac Powerbook 170	Call

MONITORS

Ikegami	
CT20 Color Trinitron	1845
CT20 w/8 Bit Card	2299
CT20 w/24 Bit Card	2990
Grayscale 19" w/8 Bit Card	**1150**
Grayscale 19"	690
8-Bit Color Card 13"-20"	399
24-Bit Color Card	979
Radius	
19" Precision Color Display	**2290**
21" Color Display	3125
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	1700
Precision 8x	799
Rocket Accelerator	**1700**
Apple	
Apple 13" Highres	649
Seiko	
Seiko CM-1445	569

MONITORS (cont.)

	Price
Sony	
Sony 14" Trinitron	569
SuperMac	
Platinum 19" Display	964
Platinum Two-Page Display	1239
Super Match 19" Color	1929
Super Match 21" Two-Page Color Display	2899
Dual-Mode Trinitron 19"	2599
Thunder/8	1159
Thunder/24	2699
Spectrum 8.24 PDQ	899
Magnavox	
14" Color Monitor	499

DRIVES

	Ext.	Int.
Quantum 105 Pro	469	369
Quantum 210 Pro	835	710
Quantum 240 Pro	909	789
Maxtor 120	519	399
Maxtor 213	779	659
Maxtor 340	1229	1099
Maxtor 180 meg	1800	1679
Seagate 1.2 gigabyte	2269	2149
Syquest 44MB	519	
Syquest 88MB	879	
Internal Drive Kit		29
Syquest 44MB cart.		75
Road Runner 80 meg for Powerbook		670

SOFTWARE

Microsoft Word	269
Microsoft Excell	309
Aldus Pagemaker	497
Caere Omnipage	499
Adobe Photoshop 2.0	515
Quark Express	579

PRINTERS

Microtek TrueLaser	**1299**
TI Microlaser PS35	1519
TI Microlaser PS17	**1219**
QMS PS410	**1549**
NEC Model 95	1439
Apple Stylewriter	Call
Apple Laserwriter IIf	2799

PRINTERS (cont.)

	Pri
Apple Laserwriter IIg	353
HP Deskwriter	3
HP Deskwriter Color	**6**
HP IIp for Mac	15
HP IIIp for Mac	17
HP III for Mac	23
HP IIIsi for Mac	46
HP Deskwriter Ink Cartridge	
Appletalk Connectors	
Color Printers	
NEC PS 40	47

SCANNERS

Logitech ScanMan 32	2
Microtek 600ZS w/Photoshop	12
Microtek 1850S Slide Scanner	**17**
Umax UC-630 w/Photoshop	13
Caere Typist	4

MODEMS

Zoom	
FX9624 Plus 2400 BPS	1
Modem MX 2400S w/SendFax 9600 BPS	1
v.32 Turbo w/v.42*bis* w/MNP software	4
Dove Fax Modem 9624	2
Dove Fax Modem 0624 Plus With Voicemail	3
PSI for Powerbook 140 & 170 internal 9600/2400	2

ACCELERATORS

Daystar	
40 Mhz PowerCache	8
50 Mhz PowerCache	13
50 Mhz PowerCache w/68882	15
Radius Rocket	**17**

MEMORY

1 meg for LC/CI/SI	
4 meg for LC/CI/SI	1
Powerbook 140 & 170 4 meg	2
Powerbook 140 & 170 6 meg	3
Envisio Powerbook Display Adapter and memory	C

Printer Connection

(714) 758-8832
FAX (714) 635-1752

Overnight and Federal Express Shipping Available

Circle 55 on reader service card

YOUR ONE SOURCE FOR COMPLETE MAC SOLUTIONS

1 (800) 7-ADVANCE • 1 (800) 723-8262

SERVICE

- Friendly, knowledgable sales & support consultants ready to serve you, with Toll-Free Ordering and Tech 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 & Institutional P.O.s Accepted
- EXPRESS 2-DAY SERVICE on ALL SOFTWARE PACKAGES for only $6

SUPPORT

- All purchases are backed by our 30-day satisfaction money-back guarantee and 1 full year limited warranty (see details at bottom)
- Express Service Plan Available - Offering 72-Hour Complete Turnaround (Repair or Replacement) on all Hardware
- Buy with confidence, as ABC is a strong, rapidly growing company with both Mac & PC Experience

LEASING

ABC LEASING... TOMORROW'S TECHNOLOGY AFFORDABLE TODAY! CALL OUR LEASING DEPARTMENT ABOUT:

- INTERNATIONAL LEASING
- CORPORATE EXPRESS LEASE
- PERSONAL LEASING
- BUSINESS LEASING

$ 25,000 Busines Lease Line of Credit Available in 15 Minutes, Call Today!

Monitors

E-MACHINES NEW!! T-16 II w/Futura SX SYSTEM — $2190 or $83* (p/mo. on lease)
24-Bit Accel. Card w/New Dual Resolution Trinitron 16" Color Monitor

Sale price/Lease price

IKEGAMI CT-20 TRINITRON 24-BIT SYSTEM .... $2849 / $108 mo.*
Quality 24-Bit 20" Trinitron System at Unbeatable Price!
IKEGAMI 19" GRAY SCALE SYSTEM ..... $1295 / $49 mo.*
SEIKO 14" COLOR MONITOR $555
Sony Trinitron Quality in 14" Mac Monitor
SIGMA FULL PAGE GRAY SCALE MONITOR $555
Sharp Image & Lower Emmissions Portrait Monitor

*Please call for details

Software

ADOBE ILLUSTRATOR	$369
ADOBE PHOTOSHOP	$425
ALDUS PAGEMAKER 4.2 (NEW!)	$496
CLARIS MACWRITE II (GREAT NEW PRICE!)	$95
CLARIS WORKS	$195
CLARIS FILEMAKER PRO	$199
QUARK XPRESS 3.1 (NEW!)	$545
FRAME FRAMEMAKER	$565

Printers

QMS

QMS PS-815 MR 600 DPI LASER PRINTER — $3850 or $112* (p/mo. on lease)
QMS PS-410 $1599 / $59 mo.*

NEWGEN PS 400P (400DPI)
$1795 / $66 mo.*

HP COLOR DESKWRITER C
$719

Sale price/Lease price

SEIKO PERSONAL COLORPOINT PS ..... $4595 / $139 mo.*

SEIKOSHA MAC PRINTER $195
ImageWriter II-Compatible

* On Lease - Please call for details

WE FEATURE THE FOLLOWING PRODUCTS AT OUTSTANDING PRICES:

SUPERMAC	Large Screen Monitors, Multimedia, PowerBook Video, Accelerated Video Boards
E-MACHINES	16" & 19" Monitors, Accelerated Video, Multimedia Products
QMS	Color Printers, High Resolution PostScript Laser Printers, Personal Laser Printers
Quark	Quark XPress Software
ADOBE Adobe Systems Incorporated	Adobe Premiere, Illustrator, PhotoShop, ATM, Type Align, Whole Library of Fonts
CLARIS	ClarisWorks, MacWrite II, MacDraw Pro, FileMaker Pro, Claris CAD, HyperCard, etc.
UMAX Maximize your image	High Resolution Gray Scale and 24-Bit Color Scanners
MICROTEK Better Images Through Innovation	High Resolution Gray Scale and 24-Bit Color Scanners, Laser Printers
RasterOps	Color Monitors, Accelerated Video Boards, MultiMedia, Color Calibrators, Color Printers
SIGMA DESIGNS	Monochrome Full Page and Two Page Monitors, Full Page Monitor for PowerBook
ULTRA	Aldus PageMaker, FreeHand, Persuasion, Gallery Effects, PrePrint, SuperPaint, etc.
hp	DeskWriter Inkjet Printers, Laser Printers
Quantum	Hard Drives
DAYSTAR DIGITAL	Acceleration Boards and Cache Cards
RADIUS	Macintosh Compatible Notebook Computers
DOVE	Internal and External Modems and Fax Modems, Network Modems, Acceleration Products
zoyo Newgen Systems Corporation	High Performance Laser Printers
Farallon	Networking Products
CO STAR	Envelope Printers, Label Printers
KENSINGTON	Stands, Accessories
Microsoft	Microsoft Word, Excel, Project, Works, Office

Mac Systems

APPLE QUADRA POWER SYSTEM
Mac Quadra 700 8MB RAM/210MB Hard Drive, E-Machines' NEW T16 II 16" Trinitron Color Monitor w/Futura SX Card (Dual Resolution, Accelerated, Hardware Pan & Zoom, 24-Bit Color in 16" mode), Extended Keyboard
$7695 / or $195 mo. on lease*

APPLE Mac IIci TOTAL POWER SYSTEM
Mac IIci 5MB RAM/120MB HD, E-Machines T16 II Dual Resolution Trinitron Color Monitor & Futura SX Card, NewGen 400P 400 DPI Laser Printer, UMAX 24-Bit Color Scanner w/Adobe PhotoShop, Keyboard, Quark XPress, Adobe Illustrator, Claris FileMaker Pro & MacWrite II, & Norton Utilities.
$9850 / or $244 mo. on lease*

APPLE MAC IIci SYSTEM ..... $3850/ $116 mo. on lease*
5MB RAM/120MB HD, 14" Seiko Trinitron Color Monitor, Ext. Keyboard
APPLE MAC IIsi SYSTEM ..... $3185 / $97 mo. on lease*
5MB RAM/120MB HD, 14" Seiko Trinitron Color Monitor, Ext.Keyboard

POWERBOOK DREAM DEAL
Mac Powerbook 170 4/40 w/Internal Modem, 8-Bit Color Video Adapter, Apple Hi-Res 13" Trinitron Color Monitor, HP Color Deskwriter & Claris FileMaker Pro & MacWrite II, Norton Utilities, and Targus Carrying Case
$6329 / or $160 mo. on lease*
w/ 8MB RAM/80MB HD, Deluxe Leather Case
$7599 / $192 mo. on lease*

LEASING SPECIALS

MAC IIci SUPER SYSTEM! ..... $279 mo.*
Mac IIci 5/120 HD, Ikegami CT20 20" Trinitron Monitor w/24-Bit Color Board , Ext. Keyboard, NewGen 400 DPI Laser Printer, UMAX UC-630 Color Scanner w/ Adobe PhotoShop, PLI 44-MB Remov. Cart. Drive, Adobe Illustrator, Quark XPress

MAC IIci SUPER DELUXE SYSTEM!! ..... $375 mo.*
Mac IIci 5/120 HD, Ikegami T20 20" Trinitron Monitor w/24-Bit Color Video Board, Ext. Keyboard, LaserMaster 1000 Laser Printer, UMAX UC-630 Color Scanner w/ Adobe PhotoShop, PLI 44-MB Remov. Cart. Drive, Adobe Illustrator, Quark XPress

0% Down & No Payment for 90 Days On Lease Specials

FIRST MAC COMPATIBLE NOTEBOOKS!
OUTBOUND 2030E..... $2825 / $82 mo.*
25MHz, 4MB RAM, **60MB HD**, Floppy Drive
2030E w/80MB Hard Drive ..... $3069 / $90 mo.*

Peripherals

UMAX UC-630 24-BIT COLOR SCANNER — $1295 or $47* (p/mo. on lease)
INCLUDES ADOBE PHOTOSHOP

MICROTEK 600ZS 24-BIT COLOR SCANNER ..... $1395 / $52 mo.*
Full True-Color Flatbed Scanner w/Adobe PhotoShop

* Please Call for Details.

C.O.D. ORDERS: Add $5.00 on Federal Express. Money orders & Cashiers Checks are accepted, no company or personal checks please.
Shipping: Please Call for shipping methods and rates.
California residents (only) add 8.75% for sales tax.
Mail Order: 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 (213) 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.
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, Master Card, American Express and Discover.
Not responsible for typographical errors. All information presented believed accurate at time of printing. Information subject to change without notice.

(800) 274-7747

(800) 723-8262 / (800) 274-7747
(310) 325-1422 / FAX: (310) 325-4073
23510 Telo Ave. #5, Torrance, CA 90505

ADVANCE BUSINESS CENTER

Mac News

Monitors to

We've got it all In Stock

RASTEROPS®

Now There's One Place for All Your RasterOps Needs. MacNews Stocks the Complete Line!

Color Displays

with purchase of color board

RasterOps 20" Trinitron $2,495
20" Color display • Dual scan
1152 x 870 • 81 dpi • 1024 x 768 • 72 dpi

RasterOps 21" Hitachi .....Call
21" Color display • 824 x 632 • 72 dpi

$1,595

RasterOps 19" Hitachi Color Display
19" Color display • 1024 x 768 • 72 dpi

$995

RasterOps Sweet 16
16" Color display • 824 x 632 • 72 dpi

Color Video Boards

with purchase of color display

Let Us Help You Pick the ColorBoard Perfect for Your Needs.
We've Got Them All at *the Best Prices*!

8XLi Accelerated 8-bit color board ....**Call**
New PaintBoard 24 .....**$1,595**
Accelerated 24-bit color board
24XLi .....**Call**
Accel. 24-bit color board • VRAM expandable

24MX Accelerated 8-bit color for 16" **$995**
24 MXQ Accel. 24-bit for 16" with Quadra **$995**
24XLTV 24-bit live video for large screen **$2,695**
24STV 24-bit live video for 13" **$745**

Macs Macs Macs Macs

Mac Classic, 2/40 .....**$995**
Mac Classic II, 4/80 .....**$1,445**
Mac IIsi, 3/40 .....**Call**
Mac IIci, 5/0 .....**$2,795**
Mac Quadra 700, 4/0 .....**Call**
Mac Quadra 900, 4/0 .....**$5,595**
Mac PowerBook 170 .....**Call**

Mac cpu's

Custom configurations available. Some quantities are limited. Publication deadlines don't always allow us to advertise our latest price. So call for latest details!

Apple, Mac are trademarks of Apple Computer. Prices subject to change without notice. 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.

the Macs!

– at the Lowest Prices

Printers

We've Got All Texas Instruments Accessories In Stock !

TI microLaser Plus PS/17
9ppm, 300 dpi, 17 PostScript fonts

TEXAS INSTRUMENTS

TI microLaser Plus PS/35 ....$1,565
9ppm engine, 300 dpi, 35 PostScript fonts

TI microLaser TURBO XL ....Call
16 ppm, PostScript level 2, 35 fonts

TURBO Upgrade Kit .....Call
Upgrade microLaser or micro XL to Turbo

TI microLaser TURBO
9 ppm, PostScript level 2, 35 fonts

SHARP®

JX-320 Transparency Option $995
Add this user installable option for film transparencies and 35mm scanning

Sharp JX-450 Color Scanner .....Call
300 dpi for reflective art and transparencies

Sharp JX-600 Color Scanner .....Call
Eddy award-winner allow 1200 dpi scanning of reflective art and transparencies up to 11" x 17"

Sharp JX-320 Color Scanner
600 dpi, 24-bit scanner with Photoshop 2.0

Scanners

Microtek 600ZS $1,295
600 dpi, 24-bit scanner with Photoshop 2.0

Microtek 1850S Slide Scanner $1,895
1850 dpi, color slide scanner with Photoshop 2.0

Umax 630 Scanner $1,245
600 dpi, 24-bit scanner with Photoshop 2.0

Networking

ASANTÉ

Call for pricing on the complete line of Asanté 10BaseT Hubs, Ethernet Cards, Ethernet SCSI Devices and PersonToPerson Software.

Drives/Storage

PLI

PLI Infinity 44 Removable $599
with cartridge

PLI Infinity 88 Removable $799
with cartridge

PLI Quick SCSI .....Call

PLI Infinity Optical 3.5".....Call

PLI Infinity Floptical
21 MB on one 3.5" floppy disk

Over 17,000 Mac Products Available

No matter what you're looking for, call MacNews for the lowest price and fastest delivery

"Make all my new macs, *MacNews!*" – Michael Stricker • Burlington, NJ
Graphic Designer & Enthusiastic MacNews Customer

Ref: 26

1-800-243-9383

24 HR FAX 312-871-4556
1555 SHERMAN AVE • SUITE 361 • EVANSTON, IL 60201

MasterCard VISA FEDERAL EXPRESS

- *The RailGun030 is Available for the Macintosh Plus, SE, & Classic*

- *Available in 16, 25 & 33MHz Accelerations*
- *System 7 Compatible*

***NEW!** RailGun 030Pro System includes 68030 Accelerator & Display In One Package*

- *Includes RAM-Disk capabilities & up to 16MB of RAM Expansion!*

- *"The Magic 45R is one of the best SyQuest drives available, offering high speed and high quality."* ***–MacUser Magazine***

- *External Drives Include Magic Case with 40 watt power supply and two external outlets*

- *All MagicDrives Include 2 year warranty!*

- *All MagicDrives include a 30 day money back guarantee!*
- *All MagicDrives Include cable & FWB Drive Software!*

Magic**RAIL***Gun 030*

68030 Accelerators for the Macintosh SE, Classic, & Plus

*19" Monitor only **$299** with purchase of RailGun 030Pro*

RAIL*Gun* 030 **PRO SYSTEMS***	Price Without Monitor
16MHz **RAIL***Gun* PRO & 19" $899	$599
25MHz **RAIL***Gun* PRO & 19" $999	$699
33MHz **RAIL***Gun* PRO & 19" $1199	$899

*Add $99 for Classic or Plus Version

RAIL*Gun* 030	Buy	Lease
Magic **RAIL***Gun* 16MHz	$399	$12
Magic **RAIL***Gun* 25MHz ..... from $499		$18
Magic **RAIL***Gun* 33MHz ..... from $699		$27
16, 25, or 33MHz **MATH** CoProcessor	$49	$1
RailGun **SCSI** Accelerator	$49	$1
Magic **CACHE** IIci	$169	$5

NEW RailGun 030Pro Systems beat the competition!

- Up to 4X faster video than Mobius Display Systems.
- 30% More display area than Mobius Display Systems.
- Available as separate accelerator, accelerator with video or the whole complete system including Monitor & Accelerator.
- Compatible with Radius, E-Machines Sigma, Moniterm, Nutmeg, Ehman, Mirror, Supermac RasterOps & more.

Magic**MATH** *030*

The Magic MATH *030* adds System 7 Vitual memory capabilities and built-in math coprocessor to your Macintosh LC and Classic II.

Magic **LC***030* with CoProcessor	$199	$6
Magic **MATH** LC CoProcessor	$99	$3
Magic **MATH** Classic II CoProcessor	$99	$3
Magic **IIsi** 2 Slot Card with FPU	$99	$3

Magic**HARD***Drives*

Fixed, Removable, Optical & Tape Mass Storage Solutions

FWB

FWB Hard Disk ToolKit Lite Now Included with all Magic Drives!

Since 1985 MacProducts has been supplying Magic solutions for the Macintosh. The fact is, no other company has been continuously delivering hard drives and memory upgrades to the Macintosh community longer than MacProducts USA. This shows in the integrity of our products and in the service you can expect.

Int.Kit **$29** • FWB Int.Kit **$49** • External Kit **$99**

Magic **40MB** Hard Drive*	$199	$6
Magic **52MB** Quantum LP	$239	$7
Magic **100MB** Hard Drive	$299	$9
Magic **105MB** Quantum LP	$369	$11
Magic **240MB** Quantum LP	$699	$21
Magic **425MB** Seagate	$1299	$39
Magic **600MB** Seagate	$1499	$45
Magic **600MB** Wren Runner	$1599	$48
Magic **1.2GB** Seagate	$1999	$60

* One Year Warranty Only

Magic **45R** & **88R**

Includes External Case with 40 Watt of Power

Magic **45R** SyQuest Drive	$449	$13
Magic **88R** SyQuest Drive	$549	$16
SyQuest **45 & 88** Cartridges	$69/$119	$2

128MB Optical Price Drop!

NEW! 256MB Optical!

Magic **128** Optical

28ms access time • Indestructable media!
Includes FWB Hammer Hard Disk TooKit Lite!

Magic **128MB** REM Optical	$1299	$42
Magic **256MB** REM Optical	$1599	$48
Magic **128MB** 3.5" Cartridges	$59	$2

Magic **Tape**

Includes Retrospect Automated Archiving!

Magic **150MB** Tape Backup	$699	$21
Magic **525MB** Tape Backup	$999	$30
Magic **1.3GB** DAT Backup	$1695	$51
Magic **2.0GB** DAT Backup	$1695	$51
Magic **2.4GB** 8mm Backup	$2895	$87

Drive*Accessories*

Magic SCSI II & Data Mirror Card	$379	$11

MacProducts USA

MacProducts USA 1-800-622-8721

Fax 512-499-0888
Tel 512-472-8881
Singapore 65-287-5181
Canada 800-624-9307

Customer Service
(512) 472-8881 ext 631
Technical Support
(512) 472-8881 ext 628

Hours M-F 8am-9pm
Sat 9am-6pm
608 West 22nd, Austin, TX 78705
Returns: Returns require an RMA#.

Call (512) 472-8881 Ext 625.
Returns subject to a restocking fee.
Opened software NOT returnable.
Prices subject to change & availability.

BUY OR LEASE any Macintosh System or Peripheral!

Lease Prices Listed in *Gray Shaded Columns* reflect 48 month lease. Minimum lease of 24 months. Call MacProducts today for Details!

MagicVIEW

Complete video solutions available from 15" Monochrome Systems to our full-blown 20" 24-bit Trinitron System with block-mode transfer for faster screen redraw!

Magic *VIEW* 19" & 15" Monitor Special!

Single or Double Page Displays with 1152 x 870 Resolution!

	Buy	Lease
15" Panasonic Monochrome w/ Card	$399	$12
19" Panasonic Monochrome w/ Card	$499	$15
19" Panasonic GreyScale w/ Card	$799	$24

Magic**VIEW** *Monitors*		
Magic *VIEW* **20"** Sony Trinitron	$1999	$60
Magic *VIEW* **20"** Color Monitor	$1350	$40
Magic**VIEW** *VideoCards*		
Magic *VIEW* **20"** 24-bit NuBus Video Card	$999	$30
Magic *VIEW* **20"** 8-bit NuBus Video Card	$499	$15

RasterOps™ radius™ SUPERMAC™ & More!

RasterOps 8XLi/24XLi Upgrade Kit!

Limited Quantity Available.

RasterOps **8XLi** Upgrade to a full working 24XLi.		
Magic RasterOps **8XLi to 24XLi** Upgrade	$499	$18
RasterOps **24XLi** (Upgraded)	$1699	$51

Software

Adobe Illustrator 3.2	$385	$12
Adobe Premier –QuickTime Video	$345	$10
Aldus Gallery Effects	$139	$4
FileMaker Pro	$199	$6
InfiniD	$669	$20
Microsoft Word 5.0	$299	$9
Quark XPress 3.1	$549	$3
System 7	$80	$2

Macintosh Call for Pricing!

MacProducts USA offers **Complete System Solutions** to suit your specific computing needs. MacProducts also offers the option to buy or lease your system. Macintosh Classic, Classic II, Macintosh PowerBook 100, 140, 170, Macintosh LC, IIsi, IIci, IIfx, Quadra 700, Quadra 900.

Scanners

Sharp JX 320	$1499	$45
Sharp Transparency Unit	$895	$27
Microtek 600ZS 24-bit 600DPI Scanner	$1329	$40
Microtek 1850S 24-bit Slide Scanner	$1699	$49
UMAX 630 24-bit 600DPI Scanner	$1299	$39

Printers

All Models Available. Call for Pricing!
GCC, NEC, QMS, Qume, Texas Instruments, and More!

NEW PRICE! **QMS** PS-410 Laser Printer	$1599	$49
TI microLaser PS/17 & PS/35	$1299/$1599	$39
NEC SilentWriter Model 95	$1595	$49

MagicModems

Magic Modems are available in speeds from the economical 2400 baud modem to the blazing fast 14400 Modem with error correction capabilities built-in!

Magic**Modems**	Buy	Lease
Magic**14400** Transmit at speeds up to 57600 Baud! V.32 bis/V.42 bis MNP-5	$259	$8
Magic**9600** Baud V.32/V.42bis MNP-5	$249	$8
Magic**2400** V.42bis MNP-5	$139	$4
Magic**2400** Baud Modem with software	$69	$3

MagicFaxModems

Magic Modems are available from the reliable MagicFax 24/96 to the fast and fully automated 14400 V.32 FaxModem with error correction built-in.

Magic**Fax** *Modems*		
Magic Fax**14400** V.32bis /V.42bis MNP-5 Transmit at speeds up to 57600 Baud!	$289	$9
Magic Fax**24/96** Group 2	$139	$4
Magic Fax**24/96** Group 1 /4800 receive	$89	$3

MagicMemory

MacProducts USA carries a complete line of System and Printer Upgrades.

Macintosh **RAM**		
1MB SIMMs	Starting at $29	$1
2MB SIMMs	$79	$3
4MB SIMMs	$129	$4
16MB SIMMs	$575	$18
2/4MB PowerBook RAM	$149/$299	$6
6MB PowerBook RAM	$399	$15
4MB Classic Upgrade	$99	$3
LC VRAM	$69	$3
Quadra VRAM	$49	$2

Printer **RAM**		
GCC PLP II/S 1MB	$49	$2
LZR 960 8MB Upgrade	$499	$15
NEC Silentwriter 2 Model 90 2MB Upgrade	$249	$7
QMS PS-410 4MB Upgrade	$299	$8
QMS PS-815 4MB Upgrade	$349	$8
TI 1MB RAM Upgrade	$59	$3

MagicNET

Magic networking solutions available for any network situation!

Magic Ether **NET** –Thin/Thick/10baseT	$199	$6
Magic**NET** (localtalk node)	$18	$1
Magic**NET** (localtalk node) 12 Pak	$10	$1
Magic**NET** (localtalk node) 48 Pak	$9	$1

1-800-MAC-USA1 MacProducts USA

Fax 512-499-0888
Tel 512-472-8881
Singapore 65-287-5181
Canada 800-624-9307

Customer Service
(512) 472-8881 ext 631
Technical Support
(512) 472-8881 ext 628

Hours M-F 8am-9pm
Sat 9am-6pm
608 West 22nd, Austin, TX 78705
Returns: Returns require an RMA#.

Returns subject to a restocking fee.
Call (512) 472-8881 Ext 625.
Opened software NOT returnable.
Prices subject to change & availability.

VISA MasterCard DISCOVER

A06

№ 1 IN VALUE

MacCenter™

The Center Of The Macintosh Universe™

№ 1 IN SERVICE

WE CARRY MAC SYSTEMS! CALL 800•950•3726 FOR A FREE CATALOG!

DAYSTAR DIGITAL

SALE!
Limited Supply!

40 MHz PowerCard 030
306% Faster than a Macintosh II! **$649**

50 MHz PowerCard 030
370% Faster than a Macintosh II! **$999**

All DayStar PowerCards are brand new, in original DayStar boxes. All sales final.

Why Buy a Quadra?!

PowerCards Are:
- 100% Compatible With All Standard Software
- Available for Mac II, IIx, and IIcx
- Available with 68882 Math Coprocessor
- System 7 & A/UX Compatible

100% Compatible

E-MACHINES

Futura EX, SX/8, SX, & MX **Call!**

Rated #1 three years in a row by MacUser, the E-Machines T16 and now the E16 and T16 II are industry standards.

T16 $1295
T16 II $1495

We will meet or beat any of our mail order competitor's deliverable prices for in-stock items.

We Will Not Be Undersold!

NEC

MultiSync 3FGx , 4FG, 5FG **Call!**

Ikegami

CT20 Trinitron *In Stock!*	Call!
CN20 Hitachi Invar Mask	Call!

Seiko CM-1445 14" $589
w/ E-Machines 8 bit accelerated $899

Sony 1604 17" $999
1304 14" $649

SUPERMAC

SuperMatch 20" Color Display	$1699
20" Platinum Monitor (Grey Scale)	$999
Spectrum/8•24 PDQ	$849
Monochrome Card	$349
VideoSpigot In Stock!	Call!

WIN A MACINTOSH AND A TURBO! CALL FOR DETAILS.

ALL PRINTER PRICES INCLUDE FREE TONER

FREE ADOBE TYPE MANAGER AND ADOBE GARAMOND WITH EVERY TURBO! $346 VALUE

microLaser *Plus* PS17	$1245
microLaser *Plus* PS35	$1565
microLaser XL PS17	$2425
microLaser XL PS35	$2725
microLaser *Turbo*	$1995
microLaser *Turbo XL*	$3125

GCC TECHNOLOGIES

PLPII, PLPIIS	Call!
BLPII, BLPIIS, BLP Elite	Call!
WriteImpact, WriteMove	Call!

NEC

Silentwriter2 Model 95	Call!
Silentwriter2 Model 990	$2895

QMS

We Stock All Accessories & Supplies for Our Printers

PS 410	$1599
PS 410 2 Meg Upgrade	$99
PS 815MR	$3895
PS 825MR	Call!

HARD DRIVES

Five-Year Warranty!

		Int	Ext
385 MB	4.4 ms	$1099	$1199
760 MB	4.6 ms	$1399	$1499
1.2 Gig	4.1 ms	$1999	$2099
1.5 Gig	4.1 ms	$2599	$2699
1.6 Gig	11.5 ms	$2999	$3099
2 Gig	3.9 ms	$3399	$3499

Thirty-Day Money Back Guarantee!

These drives are SCSI-2, System 7 & A/UX compatible, carry a Five-Year Warranty, include brackets or metal cases, universal power supplies, cables and 15 MB of shareware.

MacCenter™ also carries fine drives from FWB, Fujitsu, Quantum, Hewlett-Packard, Micropolis and Seagate.

SIMMs

4 Meg 80ns	**$88** (with trade in)
1 Meg 80ns	**$30**
2 Meg 80ns	**$65**
6 Meg PowerBook Memory	**$369**

LIFETIME WARRANTY

HOURS: 8:00 am - 8:00 pm CDT M-F
10:00 am - 4:00 pm CDT Saturday
Sunday: Call, you may get lucky.

AIRBORNE EXPRESS · UPS · MasterCard · VISA

MACCENTER™
812 San Antonio Street; Suite 406 • Austin, Texas 78701-2224

800-950-3726
FAX 512-476-3726
International Orders 512-476-7466

©MacCenter 1992
Prices valid 4/28/92 - 5/28/92

NEW!

International United Kingdom 0800-89-5074 · Germany 0130-81-4748 · France 05-90-1430 · Mexico 95-800-292-7029

PREREGISTER/SAVINGS PREREGISTER/SAVINGS PREREGISTER/SAVINGS PREREGISTER/SAVINGS PREREGISTER/SAVINGS PREREGISTER/SAVINGS

What You Seek

PREREGISTER/SAVINGS PREREGISTER/SAVINGS PREREGISTER/SAVINGS PREREGISTER/SAVINGS PREREGISTER/SAVINGS PREREGISTER/SAVINGS PREREGISTER/SAVINGS PREREGISTER/SAVINGS PREREGISTER/SAVINGS PREREGISTER/SAVINGS PREREGISTER/SAVINGS PREREGISTER/SAVINGS

Seeking Macintosh information, and lots of it? Look no further than MACWORLD Expo/Boston 1992. MACWORLD Expo has it all; there's amazing exhibits, brand new products and Macintosh excitement. And if you're seeking concentrated, in-depth information on a variety of subjects, look no further than the MACWORLD Expo Conference Program.

Is What You Get

MACWORLD Expo/Boston 1992

The Conference Program

The MACWORLD Expo/Boston 1992 Conference Program offers more insight and expertise than ever before. To get your Macintosh "drive" up and running in the morning, the Keynote Address by Apple Computer and friends is a must. It's become an annual tradition! Then you can plan to attend up to TWELVE intensive conferences whose topics reflect the growing sophistication of the Macintosh user. And with MACWORLD Expo's one-price conference admission, you can create your own agenda. You can spend as much time as you'd like at any or all of these conference seminars:

1. **The Design Conference.** Insights, guidelines, and hard-earned secrets for — and from — graphic artists, advertising agencies, designers, and production houses.

2. **The Multimedia Conference.** Macintosh magic combining video-audio-text-animation-graphics, including the latest technological developments and dazzling examples of multimedia in everyday life.

3. **The Programmer/Developer Forum.** The ultimate gathering for veteran and novice Mac techies; the place to share your latest brainstorm.

4. **The How-to-Get-Started Conference.** Complete guidelines for those who are brand-new to the Mac, or need a concentrated lesson on popular Mac applications.

5. **The Advanced User Conference.** Experienced users share their expertise to reveal hot new ideas and insider's tricks.

6. **The You-Asked-for-It Conference.** Fact-filled sessions covering the latest market developments and responding to your special requests — including the perennial favorite, MUSE (MACWORLD Expo User Group Extravaganza).

7. **The Connectivity Conference.** Users share insights on solving connectivity problems, and vendors discuss new developments in networking that will impact your business, your bottom line, and your Macintosh.

8. **The Big Business Conference.** Sessions dedicated exclusively to solving the problems of Mac users in large organizations — focusing on databases, executive information systems, software licensing, MIS issues, and more.

9. **The Home Office/Small Business Conference.** Hard-learned lessons on how to reduce the chaos in a Mac home/small business, along with a look at hardware and software especially designed to save you time and money.

10. **The Entertainment Conference.** Trends, how-to's, and exciting examples of the Mac's uniquely helpful role in music, desktop video, production, and more. The Mac can slash your costs!

11. **The Special Interest Group Conference.** For "birds of a feather" looking to compare Mac notes with others in a similar setting — you can solve special problems, see how colleagues across the country are getting more mileage out of the Mac, and develop an invaluable "user network."

12. **The Education Conference.** A complete mini-conference program in one! Twelve education-specific sessions make this the world's largest and most information-rich collection of Macintosh topics designed especially for educators. An excellent and unprecedented opportunity for educators, administrators, and students nationwide to show and be shown new and classic examples of the Mac as a teaching tool — including multimedia, CD-ROM, HyperCard, networking, and QuickTime for teachers.

And don't miss the UGWUMP (User Group Welcoming/Unwinding/Meeting Place)

— MACWORLD Expo's "People Networking Parlor" for user groups. Share success stories, exchange newsletters and literature. Learn how to start a user group in your area!

Seeking more Macintosh excitement at MACWORLD Expo/Boston 1992? Just turn the page...

MACWORLD EXPOSITION®

Illustration by Mick Wiggins

MACWORLD
EXPOSITION
VIDEO
MAC
DOS

A better solution.

Introducing JetInc.™ from DGR Technologies. The ink refill unit for your Apple StyleWriter & Hewlett Packard DeskWriter inkjet printer.

JET INC.™ For about one half the cost of an original printer cartridge, a single **JetInc.™** refill unit replenishes your inkjet printer with water-resistant ink that produces clear, crisp, laser-quality impressions – so you leave a good impression. **JetInc.** also introduces definitive color to your inkjet output, to give everyday documents an eye-catching flare. Red, Green, Blue, and Brown refills add the perfect sparkle for spot color or text. Because we designed **JetInc.** with the end-user in mind, you get a quick, easy refilling process that means no mess. In one smooth step the original cartridge is recharged to its normal printing capacity. And, using **JetInc.** will give you the satisfaction of helping to save the environment: All components of **JetInc.'s** product and packaging contain recycled materials. The **JetInc.** cartridge refill is the perfectly practical alternative to disposable printer cartridges.

Twin Pack $15.99

- Economy Twin Pack
- Permanent Ink
- Sharp, Solid Blacks
- Bright, Vivid Colors
- Extends the life of your inkjet printer cartridge
- Money Back Satisfaction Guarantee

VISA MasterCard DISCOVER

To Order Call TOLL FREE Monday-Friday 9am to 6pm CST
DGR Technologies accepts MC, Visa, Discover, Pre-Paid, COD, & Wire Transfer.

Order Direct 800-235-9748

DGR Technologies • 1800 Rio Grande, Suite 205 • Austin, Texas 78701 • 512/476-9855 • Fax 512/476-6399
DGR Technologies welcomes domestic and international dealer inquiries. Call for details.

dgr technologies

© DGR Technologies Inc. All brands and product names are trademarks of their respective holders.

Billboard Advertisers Index

Peripherals
MacOutlet
800.622.6885 304

Peripherals
Pilot Technologies
800.682.4987 305

System Upgrades
MicroMac Tech
714.362.1000 305

Memory Upgrades
Athena Computers
800.580.9269 305

Accelerators
Aztech Micro Solutions
800.524.3500 305

Optical/Hard Drives
Bauk Research
800.854.2285 306

Input Devices
Infogrip, Inc.
504.766.8082 306

Networking
JAM Software
203.630.0055 306

CD/ROM
ABCD ROM
416.222.3766 307

CD/ROM
Ergonomic Software
804.272.4431 307

Games
Amtex Software
613.967.7900 307

Utilities
Microspot
800.622.7568 307

Advertising Sales Staff

Niki Stranz
Account Manager, Billboard
415.978.3105

Carol Johnstone
Eastern Account Manager, Catalog
415.978.3152

Wendi Smith
Western Account Manager, Catalog
415.978.3117

Beverly Schneider
Telemarketing Sales Manager, The Macworld Shopper

Call 800.888.8622

Catalog Product Index

Hardware

Bar Code 308
Computer Systems 308
Memory Upgrade 313
The LLB Co. 314
Peripherals 317
Relax Technology 318-319
Printers 320

Software

Astrology 320
Bar Code 320
Business 321
CAD/CAM 321
CD/ROM 321
Clip Art 321
Communications 322
Computer Shopping 322
Desktop Publishing 322
Educational 322
Entertainment 323
Fonts 323
Genealogy 323
Graphics 323
Graphics Translators 324
Hyper Card Stacks 324
Import/Export 324
Languages 324
Medical 324
Music/Midi 324
Property Management 325
Public Domain 325
Religion 325
Sales/Marketing 326
Scientific 326

Services

Computer Insurance 326
Computer Repair 326
Data Conversion 326
Data Recovery 326
Desktop Publishing 327
Laser Recharge 327

Accessories

Cases 327
Converters 328
Covers 328
Diskettes 328
Furniture 328
Supplies 328

BILLBOARD

Peripherals

800-622-6885 Lowest Prices...Guaranteed

RasterOps

NEW !!! RasterOps PaintBoard 24 System 19" RasterOps Trinitron with 24 bit accelerated video board		$3995.
NEW !!! RasterOps MediaTime 24 bit board w/ real time digital video and 16 bit digital audio.		$CALL.
NEW !!! RasterOps 16" Color Monitor RasterOps own technology. Made in USA		$CALL.
NEW !!! RasterOps 24MxQ		$CALL
NEW !!! RasterOps MxTV		$CALL
RasterOps New 24STV Board	PRICE BREAK	$799.
RasterOps 24XLI 2075 System		$4599.
RasterOps 8XL 1960H System		$2139.
RasterOps 8L/24L 2075 System		$3100./$3495.
RasterOps 208		$199.
RasterOps 264 30/24SX		$649.
RasterOps 21" Mono System		$1450.
RasterOps 19" Greyscale System		$1299.
803 Accelerator for STV		$195.
RasterOps Video Expander II		$489.
RasterOps Expresso Slide Scanner		$749.

TOLL FREE LINE FOR BOTH ORDERS AND TECHNICAL SUPPORT

▼

THREE-YEAR WARRANTY ON ALL RASTEROPS SUPERMAC AND DAYSTAR

▼

Daystar Digital

Universal PowerCache 40MHz	$895.
Universal PowerCache 40MHz w/68882	$1049.
Universal PowerCache 50MHz	$1299.
Universal PowerCache 50MHz w/68882	$1549.

Fusion Data Systems

TokaMac CI 25 MHz 68040 PDS based Accelerator for Mac II ci.	$CALL
TokaMac SX 25 MHz 68040 PDS based Accelerator for Mac II si and SE/30.	$CALL
TokaMac LC 25 MHz 68040 PDS based Accelerator for Mac LC.	$CALL

Dove

DoveFax Desktop / DoveFax NuBus 2400 bps data/9600 bps fax modem.	$249./$279.
DoveFax+/DoveFax+ NuBus 2400 bps data/9600 bps fax modem plus voice mail.	$329./$379.
DoveFax LAN 2400 bps data/9600 bps fax network modem.	$499.

NEC

NEW 4FG 15" MultiSync Monitor	$CALL
NEW 3FGX 15" MultiSync Monitor	$CALL
NEW 5FG 17" MultiSync Monitor	$CALL

SuperMac

Call for current pricing!

BEST TECHNICAL SUPPORT AVAILABLE

▼

30 DAY MONEY BACK GUARANTEE

E-Machines

E-Machines T-16 Trinitron 16" monitor. Top rated three years running.	With any board purchase	$1295.
E-Machines NEW! T-16 II/SX24 Trin. Sys. 24 bit accelerated video board. Incredible Value!		$2499
NEW! E-Machines E-16 Monitor 16" color monitor for on board video. Quadra ready.	New Low Price	$995.

TechWorks

NuBus 10 Base T, Ethernet Card	$199.
NuBus 10 T, Thin, AAUI Ethernet Card	$269.
GraceLAN Std. 50 User Version 2.0	$329.
GraceLAN Asset Manager	$559.

Seiko

CM1445 24 Bit Color Bundle 14" RGB monitor with RasterOps 24SX 24 bit color board.	$1229.
CM1445 8 Bit Color Bundle	$779.

MacOutlet
GRAPHICS DISPLAY SYSTEMS SPECIALISTS

CALL TOLL FREE 800-622-6885

CALL FOR FREE CATALOG

48860 Milmont Drive #103C
Fremont, CA 94538
(510) 623-8890 Fax (510) 623-8894

Circle 575 on reader service card

For your ad to appear in The Macworld Shopper, please call 800.888.8622

BILLBOARD

Peripherals

INTRODUCING THE BOOKENDZ™ POWERBOOK™ DOCKING STATION

- Eliminates Cable Confusion
- Uses Your Connectors
- Instant Attach or Detach
- Requires No Power
- Model 100, 140 or 170
- Low Cost

Imagine never having to fumble with connectors again! No more crawling under your desk looking for that elusive cable. No more bent or broken pins on a mismatched connector. You'll never leave your PowerBook on your desk again just because it was difficult to disconnect everything. When you return, you'll reattach everything for true desktop power in seconds.

CALL 800-682-4987 TODAY!

INTRODUCTORY PRICING:
Model 100 $149 Model 140/170 $179

Pilot Technologies, Inc.

Patent Pending
PowerBook is a trademark of Apple Computer, Inc.

BOOKENDZ™
MAKING ENDS MEET

Circle 584 on reader service card

System Upgrades

MicroMac Your Older Mac

The MicroMac Upgrade System, used by some of the largest Mac sites, is a complete 68030-based enhancement for your older Mac that you can assemble in less than one hour.

You can upgrade your existing PLUS, SE, or SE/30 for as little as $995 into a modular system with a large full page, dual page or color screen.

Call today for complete pricing and options!

MicroMac Technology

Phone: (714) 362-1000
or FAX: (714) 362-5428
27111 Aliso Creek Rd, Ste 145, Aliso Viejo, CA 92656

MicroMac Upgrade System, shown here with full page display, repackages your existing small screen Macintosh into a modular system with additional expansion capabilities.

MicroMac Upgrade System

Circle 583 on reader service card

Memory Upgrades

PRICING THAT'S A GODSEND. ONLY FROM ATHENA.

RamPak $89/99
Upgrade your Classic to **3 ($89) or 4 ($99) MBs** of required system RAM.

Coprocessors
Greatly increase math speed on all math intensive applications.

NEW **PowerKey ADB—$89**
Give your Classic, Classic II, LC or LC II power-on from the keyboard & shut down from the finder.

Classic II FPU

16Mhz	$69
33Mhz	139
50 Mhz	159

LC FPU

16Mhz	$69
33Mhz	139

ATHENA COMPUTER

Orders: (800)580-9269
Tech: (800)580-6227
FAX (512)451-2208
1204 Fairbanks Dr. Ste. B
Austin, TX 78752

Circle 586 on reader service card

Accelerators

More Than Just An Accelerator.

With upgrade kits and slot extenders Aztech Micro Solutions, Inc. offers you more than the standard accelerator fare.

More Slots and Power for LC, IIsi and SE30

Our Gelexa series of slot extenders enable you to add an accelerator plus video board, Ethernet, RAM and/or another card of your choice. In addition to more slots the Gelexa also adds two additional internal hard drive bays - even on an LC! From $695.

Upgrade Your Plus, SE or SE30

Build a modular style system from your Plus or SE with high speed accelerator and large screen display. Upgrades available with or without Mac logic boards and color options. Prices start at $995.

Aztech Micro Solutions, Inc.
800~524~3500
130 McCormick #103, Costa Mesa, CA 92626

Circle 576 on reader service card

For your ad to appear in The Macworld Shopper, please call 800.888.8622

BILLBOARD

Optical Drives

BAUK Research-Opticals, Flopticals, Removables, Hard Drives

Are your programs and data scattered on hundreds of floppies - do you spend more time trying to find your work than actually doing it - or are you simply frustrated by inadequate hard drive capacity? At Bauk Research we specialize in providing the most **advanced, reliable and affordable** storage solutions for the Mac.

We are proud to introduce the **Bauk OP121, a rewritable optical drive with an incredible 121 Mbs of storage on a disk the size of your 3.5" floppy** and the **Bauk FL021, a floptical drive with 21mbs of storage on a 3.5" diskette that allows you to read and write 720K & 1.44 mb disks.** These products are ideal for storing programs, high resolution graphics, backing-up networks, desk-top publishing and CAD.

- **Bauk OP121** **$1499**
  128mb Optical read/write drive, w/1 diskette
- **Bauk FL021** **$599**
  21mb Floptical drive, w/1 diskette
- **128 mb Diskette** **$59**
- **21 mb Diskette** **$29**

Drives include: formatting, partitioning, password protection, diagnostics, A/UX & 7.01 compatible software. ***30 day*** *money back guarantee.*

Call for products not listed.

BAUK Research
11008 Jollyville Road, #221 Austin, TX 78759
Ph: 512-795-0215 FAX: 512-795-0216

800-854-2285
International Dealer Inquiries welcome!

Circle 577 on reader service card

Input Devices

Infogrip strikes a new Chord

INFOGRIP Chord KeyPad™ - The Chord KeyPad is a revolutionary keyboard that enables users to enter data by pressing various combinations of keys, much in the manner chords are played on a piano. Each ChordKeyPad emmulates a complete Macintosh extended keyboard. The Chord KeyPad is easily learned, both novices and experienced operators learn it in about 45 minutes.

Chord KeyPad and Mouse – Mac operators can greatly enhance their performance by keeping their eyes on the screen while entering data with one hand on a single Chord KeyPad with the other on a mouse.

Infogrip, Inc. 504/766-8082 Fax: 504/336-0063
5800 One Perkins Place, Suite 5F Baton Rouge, La 70808

Circle 585 on reader service card

Networking

The Next Generation is Here...

Smart Schedules™

Imagine viewing multiple schedules on the screen - at the same time...you can now see the big picture at last.

Schedule individual and workgroup activities quickly and simply, sending notifications and reminders for *both* meetings and appointments.

Set reminders from your phone book, from notes or To-Do Lists and prioritize your work on Smart Schedules. Fully Multi-user & network compatible for System 6 and System 7.

From
JAM Software USA ***(the Smart Alarms company)***
843 W. Main Street, Meriden, CT 06450
(203) 630-0055
(203) 686-1900 (Fax)

Circle 581 on reader service card

Easy Access!

Great values are just a phone call away.

THE MACWORLD SHOPPER
Direct Response. Direct Results.

Direct Response. Direct Results.

"The Macworld Billboard has played a key role in MacOutlet's success as one of the nation's largest dealers in graphics technology." *Steve Glovin*
President, **MacOutlet**

THE MACWORLD SHOPPER

For your ad to appear in The Macworld Shopper, please call 800.888.8622

BILLBOARD

CD/ROM

ABCDirectory

the electronic multimedia publication

ANNUAL SUBSCRIPTION
$39.95
FOR 4 QUARTERLY EDITIONS
(PRICE INCLUDES S&H)

Subscriptions Call:
TEL (416)222-3766
FAX (416)946-8688

ABCD-ROM Inc.

This exciting new CD-ROM features:

- New product news and demos
- Detailed company service & product information
- 100's of fonts, shareware, & clipart
- Fast, custom designed relational database
- Dynamic multimedia movies with color, animation, & sound
- Comprehensive printing & exporting options
- System 7 savvy

USA • 5330 MAIN STREET, SUITE 272 • WILLIAMSVILLE, NY 14221 • USA
CANADA • 2750 14TH AVENUE, UNIT 2 • TORONTO, ONTARIO • CANADA L3R 0B6

Circle 582 on reader service card

CD/ROM

PANORAMIX CD Vol 1

High Quality, Professional Desktop Photographic Library

615 megabytes of beautiful photographs that can be reproduced commercially. 110 natural scenes ideal for DTP, multimedia, brochures, education, graphic arts and publishing.

Ready to use in your DTP, page layout or graphic applications.

Order Direct and Save on the Retail Price of $129.95
Pay only: $89.95

Send Check or Money Order to:
Ergonomic Software Products, Inc.
P.O. Box 3924
Richmond, VA 23235
For Info Call: 1-804-272-4431

No Royalty payments, — includes License Agreement!

24 & 8 bit Color and Grey Scale TIFF & PICT Files

Circle 580 on reader service card

Good Buys!

Great values are just a phone call away.

THE MACWORLD SHOPPER
Direct Response. Direct Results.

Games

Challenge Yourself With TRISTAN

A digital pinball simulation for the Mac II series of computers.

TRISTAN features:

- Fabulous Sound
- Realistic Ball Action
- Tremendous Scoring Possibilities
- Superscore Contest
- Informative Manual
- Nudge
- Tilt

And Much More...

February Superscore Contest Winner Shunsuke Kanda
300,119,200

LC Version Now Available

Amtex Software Corporation
206 George Street
Belleville, Ontario, Canada K8N 3H4
613/967-7900 Voice 613/967-7902 Fax

Circle 578 on reader service card

User Friendly!

Great values are just a phone call away.

THE MACWORLD SHOPPER
Direct Response. Direct Results.

Utilities

MacPalette™ II ImageWriter Color Printing

250,000 colors - from an ImageWriter II. Works with almost any software - quickly and easily from within the Chooser. And fully System 7.0 compatible.

Requirements: SE/30, Mac II series, Classic II, LC, Quadra series or PowerBook 140/170; an ImageWriter II and a standard four-color ribbon.

$69

AppleTalk Version...$249

20421 Stevens Creek Blvd., Suite 240
Cupertino, CA 95014
408 253 2000 • FAX 408 253 2055

Call Microspot at 1-800-622-7568

Circle 579 on reader service card

For your ad to appear in The Macworld Shopper, please call 800.888.8622

CATALOG

Hardware

Bar Code

BAR CODE READERS

- Top rated by independent review!
- Complete with steel wand — $399
- 64K Portable with wand — $799

"The WDP Reader is highly reliable and easy to use." Brett Fifield, Bitstream Inc.

- For all Macintosh models
- Attaches as second keyboard
- 2of5, UPC/EAN, 128, MSI, Code 39
- Magstripe, laser, or wand input
- Same day shipping, Free UPS Blue
- 2 year warranty
- 30 day money back guarantee

800-345-4220

OR 408-458-9938

WORTHINGTON DATA SOLUTIONS 417 Ingalls Street Santa Cruz, CA 95060

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

Portable Bar Code Readers

TimeWand I DuraWand TimeWand II

Data collection is fast, easy, and extremely accurate when using Videx portable bar code readers. Cordless operation, compact size and light weight allow you to take the Wands wherever the work needs to be done. **Call Videx today for your free information kit, 503-758-0521.** Prices starting at:

Videx

TimeWand I $248
DuraWand $495
TimeWand II $698

1105 NE Circle Blvd., Corvallis, OR 97330-4285
503-758-0521 • FAX 503-752-5285

TimeWand and Videx are registered trademarks of Videx, Inc. DuraWand is a trademark of Videx, Inc.

CIRCLE 443 ON READER SERVICE CARD

Computer Systems

ELITE COMPUTERS & SOFTWARE, INC.
Buy • Sell • Trade • Lease • Repair • Service
"Macintosh Specialists Since 1987"

Lotus 1-2-3 / Mac II 2-40 ..... $249 / $1399
Mac Plus / Mac SE-30 / Mac IIx 4-80 ..... $499 / $1649 / $2199
Mac SE 2-20 / Mac SE FDHD 2-20 / IIcx 2-40....$799 / $899 / $1899
Mac Portable 1-40 / PowerBook 170 4-40 (In Stock) ..... $1099 / Call
Mac IIci / IIfx / Quadra 700 & 900 (In Stock) .....$2499 / $3399 / Call
ImageWriter I / I WC / II / LQ ..... $149 / $199 / $249 / $349
LaserWriter I / Plus / IINT, IINTX, IIf & IIg .....$899 / $1199 / Call
Lowest Prices Guaranteed !! - Used Mac's Wanted !!

Phone: **408-725-1556** • Fax: **408-973-1483**
ECS • Post Office Box 756 • Cupertino • CA • 95015-0756 • Hours: Mon. - Fri. 8:00-6:30 • 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

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

Computer Systems

We will not be UNDERSOLD.

CLASSIC 2/40	$969
CLASSIC II 2/40	$1099
CLASSIC II 4/80	$1379
LC 4/40	$1389
LC 4/80	$1649
SI 3/40	$1959
SI 5/80	$2279
SI 5/120	$2349
SI 5/240	$2699
II CI 4/80	$2749
II CI 4/120	$2819
II FX	$CALL
QUADRA 700 4/120	$4549
QUADRA 900 4/160	$5999
Powerbook 100 4/40	$1869
Powerbook 140 4/40	$2499
Powerbook 140 4/80	$2799
Powerbook 170 4/80	$4349
Laser Writer II F / IIG	CALL US!
Style Writer	$325
Apple One Scanner	$999
*Apple Original 40MB	*$149
*Apple Original 80mb	*$389
*Apple Original Cache	*$99
Radius Full Page Mono	$569
Radius Pivot Mono	$689
Radius Pivot Color	$1249
Radius 19" Mono Display	$899
Radius 21" Mono Display	$1129
Radius Precision 19" Disp.	$1999
Radius Precision 20" Disp.	$2649
Radius 21" Color Display	$2999
Radius 24 Bit GX Card	$399
Radius Precision 8 Card	$510
Radius Precision 8x Card	$729
Radius Precision 24x Card	$1429
Radius Rocket 040 (w/CO)	$1599
Radius Powerview	$510
QMS PS 410 with Toner	$1379
QMS 815/815MR	$2599/$3549
QMS 825/825MR	$3079/$4299
QMS ColorScript 100	Call
Sony 1304/1604	$569/$979
Sony 1936 20" Trinitron	$2329
Supermac Accelerator	$99
Supermac 8bit Spect. III	$529
Supermac 24bit Spect. III	$1599
Supermac 8.24 PDQ	$849
Supermac THUNDER 24bit	$3149
Supermac 19" Supermatch	$1449
Supermac 19" Dual Mode	$2399
Supermac 21" Supermatch	$2899

We only sell new computers!

We do not buy or carry used computers. Chances of recieving a used computer instead of a new one by mistake is ZERO PERCENT!

Micro USA

310-473-2535
Fax us a quote 310-473-5236
2329 PURDUE AVE, LA., CA. 90064
Prices Subject to Change. NO CREDIT CARDS.

CIRCLE 427 ON READER SERVICE CARD

IN BUSINESS SINCE 1983

MAC CLASIC II 2/40	$1170.
MAC CLASICII 8/80	$1660.
MAC CLASICII 4/120	$1660.
MAC II CI 5/120	$2999
MAC II CI 8/200	$3440.
MAC II SI 5/80	$2222
MAC II SI 5/120	$2333
MAC II SI 5/240	$2695
MAC LC 4/40	$1425.
MAC LC 4/80	$1695.
QUADRA 700 4/40	$4195
QUADRA 700 8/200	$4895
QUADRA 900 8/200	$5995
QUADRA 900 16/650	$6996
POWERBOOK 140 2/20	$2125
POWERBOOK 140 2/40	$2350.
POWERBOOK 140 4/40	$2595
POWERBOOK 170 4/40	$3750.
MAC IICX 2/40 (DEMO)	$2195
MAC SE30 1/40 (DEMO)	$1895
LSR WRTR NT(DEMO)	$1950.
CLASIC 2/40 (DEMO)	$790
LSR NTX (DEMO)	$2295
LSR WRTR IIF/IIG	$2710/$3
PERSONAL LS/NT	$870 / $1
APPLE STYLE WRITER	$ 410.
QMS PRINTERS	BEST PRI
GCC ALL MODELS	CA
HP DESKWRTR COLOR	$695
HP SCANER IIC CLR	$1399
HP DESK WRITER	$395.
NEC 2/90 POSTSCRIPT	$1595
TI PS17/XLPS35	$1295.00/$2
MICROTEK 600ZS	$1388
RADIUS COLOR PIVOT	$1225
RADIUS MONO PIVOT	$739.
RADIUS ROCKET68040	$1675
RADIUS COLOR 21"	$2895
RASTEROPS 19", TRI	$2495
RASTEROPS 21" HTCHI	$2795
SUPERMATCH 19" CLR	$1595
SUPERMATCH 21" CLR	$2795
TUNDER 24 CLR CARD	$3195
E-MACHINE MONITORS	CA
GEN-SYS 20", TRI, 8 BIT	$2295
GEN-SYS 20", TRI, 24BIT	$2895
APPLE 13" RGB/12"	$669/$425
MAC 21" CLR DISPLAY	$3440
SEIKO 20"/13" TRI	$1950.00/$56
APPLE EXT KEYBOARD	$159
2/4/6 MB F/170&140	$195/395/4

COMPU-D 6741 VAN NUYS BL VAN NUYS CA 9140

TEL:(818) 787-3282
FAX:(818) 787-2111
1-800-783-5783

CIRCLE 434 ON READER SERVICE CARD

For your ad to appear in The Macworld Shopper, please call 800.888.8622

Computer Systems

WE WILL NOT BE UNDERSOLD!

Mac Classic/II	Call
Mac LC 2/40 or 4/80	Call
Mac IIsi 3/40	1985.
Mac IIsi 5/120	2369.
Mac IIci 5/120	2985.
Quadra 700 4/120	4575.
Quadra 700 8/240	5095.
Quadra 900 32/525 HD	7280.
Powerbook 100 2/20	Call
Powerbook 140 4/40	2575
Powerbook 170 4/40	3795
Powerbook 170 8/40	4295
LaserWriter IIF/IIG	Call
LaserWriter LS/NT	850/1350
Newgen 800 DPI	3750
Seiko Colorpoint 11x17	7795
Microtek True Lsr 300dpi	1388
Umax UC-630 +Adobe P.	1385
Microtek 600ZS+Adobe P.	1375
Ikegami 20" Trin.+24bit	2975
SuperMac 19" Trin.+24bit	3295
RasterOps 19" Trin.+8XLi	3675
Radius color Pivot	1265
Sony 16" Color Trinitron	1195
GS 19" 2pg blk&wht +card	895
GS 15" Full page display	495
RasterOps 24XLi card	1975
Apple Orig. 40MB HD	**165**
Apple Orig. Cache card	**89**

DEALERS AND INTERNATIONAL SALES WELCOME.
Best Prices, Service, Delivery! Call or fax for best quotes

DATA COMPUTER CENTER
TEL 310-470-9555
FAX 310-470-9457
2253 Westwood Blvd, LA, CA 90064

CIRCLE 508 ON READER SERVICE CARD

MAC PRO

Sales (818) 342-4488 (818) 719-0007
FAX 342-4438 719-9115

Power Book 140 4/40	$2599
Power Book 170 4/40	$3799
Quadra 700 4/105	$4599
Quadra 700 8/170	$4999
Quadra 900 4/80	$5499
Quadra 900 8/170	$5799
MAC II FX All Models	Call
MAC II CI 5/80	$2975
MAC II CI 8/170	$3275
MAC II SI 3/40	$2025
MAC II SI 5/105	$2495
NEW MAC LC	Call
Classic & Classic II	Call
12" Monitor Color	$399
13" Monitor Color	$689
14" Seiko Trinitron	$589
16" Monitor Color Apple	Call
19" Gray Scale Apple	$1189
Radius Pivot Color	$1289
Radius 19" Gray Scale & Card	$1389
Radius 21" Gray Scale & Card	$1689
Radius 20" Color	$2789
Radius Rocket	Call
Super Match 19" Color	$1589
Thunder 8/24	Call
Rastar OPS Monitors & Cards	Call
Laser Writer II F	$2784
Laser Writer II G	$3434
Personal NT	$1494
Style Writer	$334
HP Deskwriter Color	$714
QMS Laser Printers	Call
MicroTek Scanners	Call
HP Scan Jet IIC Color	Call

We guarantee best complete package pricing.
We Sell New Products Only.
1 YEAR WARRANTY
19801 Ventura Blvd., Woodland Hills, CA 91364

CIRCLE 436 ON READER SERVICE CARD

WANTED: USED MAC's

WE BUY YOUR USED MAC EQUIPMENT FOR TOP DOLLAR, CASH! WE SELL REFURBISHED MAC's AT DISCOUNT! CALL FOR QUOTE. **RENTEX INC.** (800) 545-2313, (617) 423-5567

CIRCLE 521 ON READER SERVICE CARD

Fujitsu Drives

Capacity/Sz.		Access	Warr.	Int.	Ext.
330 MB	3.5"	9 ms	5 Year	$1099	$1179
425 MB	3.5"	9 ms	5 Year	$1149	$1229
520 MB	3.5"	9 ms	5 Year	$1229	$1309
680 MB	5.25"	16 ms	5 Year	$1259	$1359
1.2 Gig	5.25"	11.5 ms	5 Year	$1899	$1999
2.06 Gig	5.25"	11.5 ms	5 Year	$3199	$3299

Call ProDirect 800-524-9952
International Orders Fax 612-935-8352 or Call 612-935-8201
30 Day Money Back Guarantee On All Drives

CIRCLE 480 ON READER SERVICE CARD

WE CARRY A FULL LINE OF PARTS + PERIPHERALS
FOR IBM,CPQ,MAC,APPLE,EPSON + MANY,MANY MORE

FAX 718-939-7193 718-939-7976

Mac Classic-I drive	-810	12"RGB	-400	Mac X	-215
Mac Classic 2/40-	1150	13" RGB	-665	Appleshare PC-	115
Mac LC- 2/40	-1675	Two page mono	-1460	File server	-575
Mac LC- 5/80	-2060	Radius	-CALL	Print server	-210
Mac I ci-5/0	-2850	Rasteropps	- Call	System 7	- 93
Mac I ci-5/80	-3275	Stylewriter	-450	"SPECIALS"	
Mac I si-3/40	-2200	Imagewriter	-405	I qs	- 550
Mac I si-5/80	-2600	Laser LS	-875	reg KB	- 89
other CPU	- CALL	Laser NTX	-3350	ext KB	- 158
		Deskwriter	- 410		
		Deskwriter color	- 710		

Computer Add Ons, Inc. "Export Inquiries Welcome"

CIRCLE 411 ON READER SERVICE CARD

Reach your audience when it counts.

Catalog readers are ready to buy!

CRA
700 So. University Parks Dr.
Suite 350
Waco, TX 76706

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, Powerbook 100, 140,170)
Used & Demo Macintosh CPU's (Se, Se30, Portable, II, Cx, X, Ci, Fx)

CLEARANCE SPECIALS

Apple LaserWriter IInt, Ntx,IIf,IIg	Call	FastPath 4 Ethernet Router NEW	$1499
Mitsubishi G370-10U Color 300dpi *w/Freedom of the Press Postscript driver*	$3999	Howtek Scanmaster III w/Trans Opt. NEW	$3999
QMS Colorscript 100-10 DEMO	$5500	HP Scan-Jet 400 dpi 16GS DEMO	$899
QMS PS Jet Plus 8ppm Postscript Laser	$1999	Laserwriter Plus Upgrade Roms NEW	$399
Supermac 19" Color New & Used	$1899	Maxtor 650 meg SCSI NEW	$1499
E-Machines Color Page 15" w/8 Bit	$1100	Mirus, Montage & Agfa Film Recorders	Call
Mitsubishi 16" 1024 X 768 w/8bit	$1599	PhoneNet StarController NEW	$759
RasterOps Trinitron, 8 & 32bit	From $2999	Rodime 210 Cobra	$699
Sony 1908 Industrial Trinitron NEW	$2699	Sharp JX450 11x17 color 24-bit scanner	Call
Sony 19" Trinitron DEMO	$1999	Adobe Type Manager	$54
600 X 600 DPI Postscript Laser	$2499	DiskFit v.1.5	$45
		MacDraw II (w/free Pro Upgrade)	$279

CIRCLE 467 ON READER SERVICE CARD

Continued...

For your ad to appear in The Macworld Shopper, please call 800.888.8622

CATALOG

Computer Systems

1

Best Mac Buys

When it comes to used Mac's, we're the best. As the Nation's largest buying force, we stock over $1 million in used Mac's, unmatched anywhere and at the lowest prices around. When we say refurbished, that's exactly what we mean, not wipe and send. Our quality control department assures you the best machine available for the money—or your money back—*guaranteed.*

For Free Catalog Call Anytime

1-800-821-3221

Box 4059—Logan, UT 84321, Fax 801/755-3311

Sun Remarketing, Inc.

CIRCLE 424 ON READER SERVICE CARD

Mac In Town

Buy, Sell, Rent, Lease or Trade Your Favorite Macs.

Call 800-MAC N TOWN or 201-224-4273
International Orders - FAX 201-224-6449

Call us before you sell your used Mac. No quantity too small or large. Call for pricing for all new Macs.

Save 50% to 60% from New Price

CIRCLE 574 ON READER SERVICE CARD

Mac•In•Stock

- Macintosh Computers
- High-End Display Systems
- Leading Storage Products
- Printers/Scanners/& More!
- Expert Assistance
- Toll-Free Support
- Free Warranty Repair
- Rock-Bottom Prices

SHOP FOR THE BEST PRICE.

©1992 HiRel Marketing, Inc.
dba Mac•In•Stock
Ft. Lauderdale, FL

(But Make Sure These Four Freebies Are Included:)

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 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 sale shipment.

4. Support
Tech support is toll free. Repairs or replacements are handled via Federal Express (in and out at our expense).

!Call Now !

!!800-944-6227!!

Fax: 305/321-0905 Int'l: 305 321-0904 1-800-944-MACS

CIRCLE 457 ON READER SERVICE CARD

For your ad to appear in The Macworld Shopper, please call 800.888.8622

CATALOG

Computer Systems

Mac SALE INTERNATIONAL
New Jersey

Entire Macintosh Line
New and Used, Bought and Sold
Latest models in stock!

1-800-729-7031
Compare Our Prices, Quality & Service.

We'll pay cash for your Macintosh Equipment.

Call for Monthly Specials

We also offer

TI	SONY	DAYSTAR	HARRIS LABS - "PERFORMER"
H.P.	RADIUS	QUANTUM	GCC TECH
NEC	SyQuest	SUPERMAC	MASS MICRO
QMS	RasterOps	E-MACHINES	APPLIED ENG.

CIRCLE 401 ON READER SERVICE CARD

Used Mac Truckload Sale!

Mac Plus Upgrades
Upgrade your 128/512 for Mac Plus CPU-Only $399.
Upgrade 512k enhanced -Only $199.

$999
Mac Portable 2/40

Laserwriter Plus -$999.

LaserWriter Plus with 6-Meg 600 D.P.I. Xante Upgrade $1999.

New Macs & Upgrades

IIci to Quadra 700	$1999.
IIcx to Quadra 700	2499.
Mac II to IIfx	2199.
Mac IIx to IIfx	1999.

Mac Parts!

Blowout Parts & Stuff!

8-bit video board	$199.
IBM LocalTalk interface board	99.
(everybody needs at least one)	
Samsung 19" monitor & bd.	599.
Portrait Monitor (gray-scale)	599.
LaserWriter II engine	1495.
Fujitsu 800k external floppy	79.

Shreve Systems 800-227-3971

CIRCLE 425 ON READER SERVICE CARD

Continued...

For your ad to appear in The Macworld Shopper, please call 800.888.8622

CATALOG

Computer Systems

Computer Design & Graphic Systems™

Specialists in Graphic System Configurations

CDG CUSTOMERS... THANK YOU! #1 Supplier to the Graphics Industry

CPU'S — CALL FOR UPDATED PRICING

MAC IIsi 3/40	$1969
MAC IIci 5 MB	$2649
MAC IIci 5/105	$2999
MAC IIci 8/240s	$3489
Quadra 700	$4199
Quadra 900	$5199
PowerBook 170	$3849
PowerBook 140	$2449
Classic II 2/40	$1189

MONITORS

Seiko 14" Trinitron	$579
E-Machines T16	**$1289**
RasterOps 16" 24 bit sys.	**$1849**
NEC 3FGX	$669
SuperMac 21"Color	$2749
RasterOps 19" Color	$1599
Radius 20" Multisync	$2740
SuperMac 17" Trin.	$999
RasterOps 19" Hitachi	1599
19" Trin. 24 Bit Sys.	$3199

PRINTERS

GCC BLP Elite. GCC PLP II	
NewGen PS400P	$2099
NewGen PS840E	$3795
NEC Colormate	$4392
NEC Sientwr. 95	$1449
QMS 815MR	$3849
Seiko ColorPoint	$3999
HP DeskWriter	$419
Seiko Color 11 x 17	$7399

STORAGE/MISC.

CORE 128 MB Optical	$1499
Pinnacle 128 MB Optical	$1599
Panasonic 1 gig Optical	$2999
Global Village PB fax/mod.	**$539**
80 MB HD for PowerBook	$649
PowerBook 6MB Memory	$549
APPLE 40 MB HD	**$169**
ALL POWERBOOK ACCESSORIES	
PLI 88 Removable	$739
Fujitsu 1.2 Gig Internal	CALL

DISPLAY CARDS

RasterOps 24STV	$799
VideoSpigot si	$399
Envisio 8 bit Powerbk Adapt	$599
E-Machines Futura 24 bit	$969
E-Mach Futura MX 24 bit	$1329
SuperMac Thunder 24	**$2549**
RasterOps MediaTime	$1499
RasterOps Paint Board	$1549
RasterOps ProColor 32	$2999
Radius Precision Color 24x	CALL

SCANNERS

UMAX UC630	**$1299**
Microtek 600 zs	$1349
UMAX True 1200 DP	$4595
Howtek 11" x 17"	CALL
Sharp JX-320	$1199
Barney Scan	CALL

Lowest Prices on Graphic Software!

FREE SHIPPING! ...call for details

Over 2,700 products for the serious... *Graphics User!*

E-MACHINES · GCC TECHNOLOGIES · NEC · QMS · radius · RasterOps · SUPERMAC · SII

Specialists in Graphic System Configurations

6120 NW 32nd Terr. • Ft. Lauderdale, FL 33309
12734-36 Kenwood Center • Ft. Myers, FL 33907

800 741 6221

LOCAL: 305-974-7332 • SUPPORT: 305-974-1681 • FAX: 305-974-4715

CIRCLE 406 ON READER SERVICE CARD

QUADRAS AT THE LOWEST PRICES

QUADRA 900/950 COMPLETE SYSTEMS
HIGH END SCANNERS AND VIDEO EQUIPMENT

(800) 880-8888

neoVIEW

8760 RESEARCH AUSTIN TX 78758

USED T & J ENTERPRISES PRESENTS MAC MANIA

After you've called the rest... ...call us for the best quotes in used Macs.

901/755-1314 Fax 901/757-4653

CIRCLE 421 ON READER SERVICE CARD

MacBYTE

Buy • Sell • Trade Macintosh Computers

Preowned Macs with Warranty
Cash For Your Mac or Peripheral
Low & High End Custom Setups
FAX 310-317-1583

800-432-BYTE
Open Monday - Saturday
22775 PCH, Malibu, CA 90265

CIRCLE 428 ON READER SERVICE CARD

For your ad to appear in The Macworld Shopper, please call 800.888.8622

CATALOG

Computer Systems

Mac One

The Latest Macs & Hardware

Your #1 Export Source !

Route #107•Glen Head, N.Y. •11545

Why Buy from Mac One? Here's Why!

- Family Owned & Operated Since 1987•No Sales Commissions!
- Safe & Reliable Worldwide Delivery•48 Hours to Europe!
- We Specialize in Exporting- our competitors DON'T!
- Our New York Location + Experience= Great Deals!
- We Stock what we sell, we are NOT 'Computer Brokers'.
- Foreign Orders110/220V Our Specialty...Fax Us!
- No Sales Tax Due On Sales Outside New York State.

ssic 2/40 $999 | LC 4/40 $1499 | Fx 4/Floppy $3849
ssic II 4/80 $1699 | LC 4/80 $1799 | Fx 8/210 $4749
erbook 100 2/20 $1599 | Si 5/80 $2399 | Quadra7• 8/105 $4899
erbook 140 4/40 $2499 | Ci 5/105 $3099 | Quadra9•20/425 $7099
erbook 170 4/40 $3799 | Ci 8/210 $3599 | Apple 16" Trinitron $1299

Our Small Ads mean BIG Savings for YOU!

516. 626. 5572•Fax 516.626.5573

Sales Line Open: Monday-Friday 10am-5pm EDT N.Y.
Fax Line: Open 24 Hours- Call us for weekly specials!

We Feature the Following Product Lines:

•Apple•Abatron•Asante•DayStar•Dove•E-Machine•HP•Ikegami•MicroTek•
EC•NewGen•PLI•Quantum•QMS•Radius•RasterOps•SuperMac•SyQuest•
xas Instrument•Wacom... just to name a few! Please call for a quote.

Terms: Cash prices shown Visa/MC, add 3.5% or Check, Wire Xfer, Domestic COD's OK
All prices shown subject to stock- Call & compare for best quotes! All items NEW only!

CIRCLE 410 ON READER SERVICE CARD

1-800-334-KIWI

Mac Classic 2/40mb....$Call
Classic II 2/40mb.....$Call
Classic II 4/120mb.....$1499
Mac LC 4/40mb with
14" color monitor.....$1899
Mac LC 4/120mb with
14" color monitor.....$2149
PowerBook 140.....$Call
PowerBook 170.....$Call
Mac IIsi 5/120mb.....$2399
Mac IIci .....$Call
H.P. Deskwriter.....$Call
Personal Laser LS.....$899
Personal Laser NT.....$1499

All items new. 1 year warranty.
Most items in stock today.
Visa & Mastercard No Surcharge.
C.O.D. orders accepted.
Established 1986. 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 8.30am-4.30pm PST

CIRCLE 404 ON READER SERVICE CARD

the mac store

Best Prices In Canada Since 1989
No Customs Hassles
The Best Warranty In The Business
Same Day Repair/Replace
Satisfaction Or Money Refunded
True Mac Experts On Staff
All Major Hardware,Software
Service Contracts

(416)466-8107 (800)268-7805

CIRCLE 426 ON READER SERVICE CARD

"I saw it in Macworld!"

New RackMacs™

Macintosh LC and 13" RGB Monitor in one 19 inch rack-mounted NEMA 12 package. Ideal for operator control stations.

Industrial grade Mac IIx, IIfx, and now IIci available with matching industrial touchscreen display and rack-mounted keyboard/mouse drawer. For vehicle, medical, laboratory, automated test, process control and operator entry applications.

GreenSpring Computers Inc.
1204 O'Brien Dr. Menlo Park, CA 94025
415-327-1200

CIRCLE 519 ON READER SERVICE CARD

Memory Upgrade

POWERBOOK MEMORY

SIMMS & VRAM
For All Macintoshes

CACHE CARD
IIci & IIsi

ACCELERATOR CARD

MAC PORTABLE RAM

For instant product info via ROBOFAX
Call 1~800~424~3299 Day or Night

ADD•ON AMERICA
A DIVISION OF ROHM CORPORATION

433 N. Mathilda Ave.
Sunnyvale, CA 94086
Ph: 1~408~746~1590
Fax: 1~408~746~1593

1~800~292~7771

CIRCLE 415 ON READER SERVICE CARD

"Our decision to choose Macworld was based solely on the quality of our leads and conversion rate. With Macworld, we definitely made a change for the better."

Cynthia Gorsh
Agio Designs

Continued...

For your ad to appear in The Macworld Shopper, please call 800.888.8622

Memory Upgrade

MEMORY MADNESS FROM THE LLB COMPANY

BERNOULLI DISKS ARE FINALLY HERE!

SIMMs

$35 1x8x80

1x8x70	$38
1x8x100	34
4x8x70	124
4x8x100	120
4x8x80 MacII/IIx	139

$121 4x8x80

1x8x80FX	$38
1x8x70FX	39
4x8x80FX	127
4x8x70FX	129
8x8x80	445

$75 2x8x80

8x8x80FX	$445
16x8x80	799
16x8x80FX	799

APPLIED ENGINEERING

Quicksilver IIsi		$219
QuickSilver IIsi with FPU		279
Quadralink		182
Transwarp LC:	33mhz	919
	40mhz	1259
	50mhz	1389
Transwarp SE		729

POWERBOOK

2MB	4MB	6MB
$199	$299	$399

Roadrunner 80MB Internal Hard Drives	$769
Powerbook Carrying Cases	109

$65 44MB

$115 88MB

SYQUEST CARTRIDGES

BERNOULLI FROM IOMEGA

Removable Disk 3 Packs:
44MB ..... $265 90MB $435

COMPARE OUR LOW SHIPPING PRICES:

$6 Overnight shipping by Airborne Express.

$4 Ground shipping by UPS.

CD GALLERY FROM NEC

NEC 36/ CDGM1 **$495** NEC 73/ CDG7M1 **$735**

QUICKTEL FAX MODEM

Xeba 9600 Baud Send/Receive Fax Modem **$195**

DAYSTAR

Universal PowerCache:

33mhz	$659	With FPU	$859
40mhz	859	With FPU	1059
50mhz	1319	With FPU	1589

TECHNOLOGY WORKS

TECHWORKS

IIci Cache Card	$151
Mac IIsi Adapters	129
LC Video RAM	65

MISCELLANEOUS

Mac Portable SIMMs: 1MB $199
3MB $515 4MB 615
Math Co-Processors:
16mhz for LC or Classic II 75
Quadra 256K Video RAM 48

PRICES SUBJECT TO CHANGE

ALL GOVERNMENT & EDUCATIONAL PO'S ACCEPTED UPON APPROVAL

Call between 7AM and 6PM Pacific Time

1-800-848-8967

The LLB Company, Inc. • 300–120th Ave NE • Bldg. 7, Suite 108
Bellevue, WA 98005 • Phone: (206) 454-7258

FAX YOUR ORDER 24 HOURS A DAY

(206) 454-7302

- Orders received before 7:30PM Eastern Time weekdays ship same day.
- We export to most countries in the world.
- Bank cards accepted. Your card is not charged until the order is shipped.
- Quantity pricing for dealers.

CIRCLE 573 ON READER SERVICE CARD

For your ad to appear in The Macworld Shopper, please call 800.888.8622

CATALOG

Memory Upgrade

Mail order can save you time— *and money!*

Lowest Priced Memory!

PowerBook

Model 140/170 compatible
2 Mb $230
4 Mb $300
6 Mb $400

Below List Pricing on
•Uninterruptible Power Supplies
•Line Conditioners
•Hardware and Software Products

Dynamic Engineering
435 Park Dr.
Ben Lomond, Ca. 95005
408-336-5531

M/C
Visa
Discover

(800) 487-4655 24 hrs. sales

CIRCLE 555 ON READER SERVICE CARD

MEMORY DIRECT!
"Don't pay retail...buy direct"

SYQUEST CARTRIDGES
★ 44 MEG $64 ★
★ 88 MEG $116 ★

16 MEG SIMMS !
★ $725 ★

MACINTOSH

1 Meg SIMM	$35
2 Meg SIMMS	$79
4 Meg SIMMS	$122
8 Meg SIMMS	$399
16 Meg SIMMS	$725

QUADRA

★ 4 Meg SIMMS	$124
★ 8 Meg SIMMS	$399
★ 16 Meg SIMMS	$725

POWERBOOK

★ 2 Meg Card	$239
★ 4 Meg Card	$375
★ 6 Meg Card	$475

HARD DRIVES

Quantum	Internal
52 LPS	$235
105 LPS	$345
240 LPS	$725
425 Pro	$1275
Maxtor	**Internal**
80 Meg	$299
120 Cheyenne	$365
213 LXT	$595
535 LXT	$1299

SUPERMAC

Thunder 8	$1319
Spectrum 24 PDQ+	$2049
Thunder 24	$2875
Spec 8•24 PDQ	$835
Video Spigot NuBus	$499
Video Spigot Si	$419
Video Spigot Pro NuBus	$1369

RasterOps

RO 24 x Li	$1880
RO 24MX	$1145
RO 8XLi	$899
RO 8XL	$449
19" Trinitron Color	$2999
19" Color	$1625
16" Color	$1249

DAYSTAR DIGITAL

		W/ Math
33 MH	$655	$855
40 MH	$869	$1065
50 MH	$1355	$1599
Fast Cache si	$289	$362
Fast Cache ci	$259	

NewLife™

16 MH Accellerator Plus	$569
16 MH Accellerator Classic	$569
16 MH Accellerator SE	$469

WE WILL NOT BE UNDERSOLD!

Lifetime Warranty!
Highest Quality
Same Day Shipping

800-486-2447

Corporate PO's
Government PO's
Educational PO's

MasterCard VISA

Fax (714) 847-5043
7911 Professional • Huntington Beach, CA 92648

American Express Card DISCOVER

CIRCLE 516 ON READER SERVICE CARD

Continued...

For your ad to appear in The Macworld Shopper, please call 800.888.8622

CATALOG

Memory Upgrade

PB Ram™
Memory For All Powerbooks

$Lowest per 2 MByte

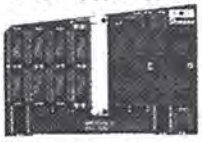
- 2/4/6 MByte
- *Upgradeable!*
- Gold Plated

16 MB SIMM's $750
(for Mac IIci, IIsi, IIfx, Quadras)

- 16 or 32 MB SIMM kit (4 or 8-4 MB/-80 ns) for the Mac IIcx, ci, si, fx, Quad's $525/$1050
- 8 MB kit for the Mac LC $263
- 2 MB SIMMs for the Mac IIsi, IIci, LC $79
- 4 MB SIMM kit for any Macintosh $149

PortaRam™

for the Mac Portable
*Call if you find a lower upgradeable price - we'll beat it!



$205* per Mega-byte (1 to 8)

- One to Eight Megabyte
- User Upgradeable!
- Built-in Surge Protector
- Gold Plated Boards
- Uses RAM Slot - Not PDS
- Very Thin 5/8" Max

Shadow Technologies
1767 Morning Glory Road
VISA Livermore, CA 94550
M/C (510) 548-0130

CIRCLE 462 ON READER SERVICE CARD

RAM Cards and Big Screen Video for the Mac PowerBooks.

1. **BookRAM™** memory card for all PowerBooks. Comes with 2 megs, 4 megs or 6 megs of Pseudostatic RAM, factory upgradeable.

2. **BookRAM™ DRAM** memory card. Deft circuit design yields low cost and low power drain for a 4 meg card. Maintains battery life.

3. **BookView.™** Duplicates the visual display on the built in LCD screen to an external monitor, interfaces to major displays.

4. **BookView™ Imperial.** Adds 4 megs of DRAM and provides color or grey scale monitor output for the 68030 models and monochromatic output for the 68000 model. For VGA, Apple monitors, NTSC and overhead projectors.

Call for prices on 1 meg, 2 meg and 4 meg SIMMs, Softstep® and Two Step™ memory expansion modules, Pac RAM™ for the Portable, Video Mac Pac for the Portable, and Mac Rescue™ upgrade board for Enhanced 128K & 512K Macs.

Ford Centre, Suite 1180
420 North Fifth St.
Minneapolis, MN 55401
(612) 371-0061
(800) 950-CARE (2273)
(612) 371-9342 Fax
AppleLink: D6962

Computer Care

Dealer inquiries welcome. Visa, MC, AMEX, Discover accepted.

CIRCLE 505 ON READER SERVICE CARD

Macworld

#1 in bringing buyers and sellers together!

SIMMs

1 meg 70ns	$39
1 meg 80ns	$35
1 meg 100ns	$34
2 meg 80ns	$75
4 meg 80ns	$121
16 meg 80ns	$749

68882 FPUs

16mhz/Mac LC	$69
50mhz/Mac LC	$199
IIsi : 20mhz+2 slots	$119
20mhz/Classic II	$75
50mhz/Classic II	$199

Cache Cards, etc.

IIsi 64K Cache Card	$159
IIci 64K Cache Card	$149
IIsi 2-slot card & 68882	$119

PowerBook Memory
Call for all configurations

68030 25mhz Accelerators
Novy's *Quik30* for Mac SE, Plus, and 512Ke

- Runs the speed of Mac IIci
- System 7/Virtual compatible
- Add up to 16 Megs of RAM

$529 for 25mhz version!!

Video Upgrades

4 bit to 8 bit Upgrade	$24
256K Quadra VRAM	$49
512K Mac LC VRAM	$65

Printer Upgrades

T.I. MicroLaser 1 meg	$59
HP 2 Meg Upgrade	$99
HP 4 Meg Upgrade	$199

MMU for Mac LC (to run Virtual)	$139
Mac Classic 3 Meg Upgrade	$99
512Ke to Plus Upgrade Board	$255
68851 16mhz PMMU (for Mac II)	$89

PERIPHERAL OUTLET
800-256-6581
327 E. 14th, P.O. Box 2329 • Ada, OK 74820
International Phone : 405-332-6581 • Fax : 405-436-2245

Accelerator/Video Combo
Novy's *ImagePro* for Classic, SE, Plus, 512Ke

- ***Unbelievably fast!!!***
- System 7/Virtual compatible
- Adds up to 16 Megs of RAM
- Optional Display : 15, 19, 21"
- 16, 25, 33mhz speeds

CIRCLE 454 ON READER SERVICE CARD

For your ad to appear in The Macworld Shopper, please call 800.888.8622

CATALOG

Peripherals

ZOOM® Modems
Made in U.S.A.! Fully Hayes®-compatible
Free S/W, Cable & Shipping!
2400 bps MX2400R 7 yr. warranty $79
Send/Receive Fax FX96/24 7 yr. warranty $129
S/R Fax w/V.42bis Error corr & Data comp. $179
V.32 Turbo Serious Telecommunication! 2 yr. warr. $409
14" Color Monitor $359
By Goldstar. Excellent quality; sharp, rich color at a great price. Works with all Macs from LC up!
HWH Microsystems Panchromatic Solutions
800-673-0586
M/C & Visa Welcome

CIRCLE 556 ON READER SERVICE CARD

Pinnacle Micro, Sony, Ricoh, Micronet, SyQuest, and PLI STORAGE SPECIALS!

All drives include SW, cables and 1 cartridge

SONY 501
600MB 5.25" OPTICAL
$2,599
- 66 msec access!
- Sony 600MB cartridges as low as $129!
- 30yr Warranty on Sony cartridges!

SONY 301
128MB 3.5" OPTICAL
$1,499
- 37 msec access!
- Sony 128MB cartridges as low as $49!
- 30yr Warranty on Sony cartridges!

RICOH 9200EII
600MB 5.25" OPTICAL
$2,299
- 66.7 msec access!
- 3M 600MB cartridges as low as $119!
- 10yr Warranty on 3M cartridges!

Cost Per MByte?
3M 600MB = $0.198
Sony 600MB = $0.215
Sony 128MB = $0.383

SuperMicro
We Also Sell SW, Scanners & Printers
2227 Artesia Blvd #102
Redondo Bch, CA 90278
FAX: 310-214-8642
1-800-352-3415

CIRCLE 442 ON READER SERVICE CARD

OMNISHORE ELECTRONICS MFG. CORP.
- A quality source of your external SCSI hard disks, tape backups, and combo units. Apple, Mac, IBM compatible.
- An exclusive manufacturer of all FIRST CLASS PERIPHERAL SIDERS. Also provide service, repair, and upgrade on existing models.
- See our AD in the upcoming issues of this magazine.

1700 Forrest Way
Carson City, NV 89706
Sales: 800-982-3232
Tech Spt: 702-687-2800
• PLEASE MENTION THIS AD •
HARD / TAPE / CDROM / OPTICAL

CIRCLE 564 ON READER SERVICE CARD

Announcing our New Name!!
Still the best Products, Prices and Service
1-800-626-1889
formerly DeskTop Direct, Inc.®
MediaCosm
The Desktop Media Universe

Z-NIX MAC Cordless Super Mouse $75.
Most popular cordless mouse for PCs, now for the Mac. Transmits data via infrared light, six feet from the receiver. Automatically charges its own battery and a spare. 400 points-per-inch, requires less desktop. Great for 19" monitors!

DAYSTAR
FastCache IIsi with FPU $265
PowerCache (w/ adapter)
33MHz or with Math Chip $699 / 899
40MHz or with Math Chip $899 / 1099
50MHz or with Math Chip $1399 / $1679

PLI
Infinity 40 rem hard drive $595
Infinity 88 rem hard drive $775
Infinity Floptical; 21MegaBytes. $550
Infinity Optical; 128MegaBytes. $1680
QuickSCSI; SCSI II accelerator. $360
330 MB Hard drive; Int / Ext $1235 / $1390
425 MB Hard drive; Int / Ext $1440 / $1585
520 MB Hard drive; Int / Ext $1525 / $1680

RasterOps
MediaTime; video captureand real-time playback, stereo audio input and output. $1645
Sweet 16 System; 16" color monitor and 24-bit display board for MacII or Quadra. $2470
24XLTV; 19" Color Hitachi System, video capture and two-page 24-bit display. $4524
24STV; video capture and 24-bit display board. $825
24XLi; Accelerated 19" color Hitachi system $3705
8XLi; Accelerated 19" color Hitachi system $2635
Color System SE/30; 19" solor system $2470
ClearVue/GSXL; 19" gray scale system $1300

MAK-105 "Click Tactile" Extended Keyboard $95.
Identical 105-key layout as the Apple Extended Keyboard. Click tactile mechanical keyswitches, dual Apple Desktop Bus (ADB) interfaces, coiled keyboard cord. Very high quality construction and styling.

6113 South 380 West, Salt Lake City, Utah 84107 801-265-8882 Fax# 801-265-8884 *Not Affiliated with DEC

CIRCLE 541 ON READER SERVICE CARD

Call Up Your Ad On Our Screen.
The Macworld Catalog.
800.888.8622

Continued...

CATALOG

Peripherals

SyQuest · Seagate · RasterOps · TEAC · Pioneer

20 Inch 256 GrayScale Package! $799

Complete package includes monitor, Relax View II 8-bit video board, & cable!

Hurry - available for only a limited time!

Video Boards, Monitors & Packages

New! RasterOps!

Color Displays with purchase of color board:

NEW! "Sweet 16" (w/24Mx or 24MxQ)	999
20" RasterOps Color - Hitachi	1,549
20" RasterOps Color - Dual Mode	2,299
21" RasterOps Grayscale	1,149
21" RasterOps Color - Hitachi	2,749

RasterOps video boards & more:

NEW! RasterOps PaintBoard 24	1,599
RasterOps 24XLi	1,899
RasterOps 8XLi	899
RasterOps 8XL	469
RasterOps 8LC	559
RasterOps 24Mx/MxQ	1,199
RasterOps 24Sx	629
RasterOps 24STV - Multi Media	789
RasterOps ColorBoard 264/SE30	699
RasterOps ClearVue/GSXL	479
RasterOps Expresso Slide Scanner	749
RasterOps TV Tuner	399
RasterOps ImagePak Still Compression	319

14 Inch 256 Color Package! $499

Includes monitor, 8-Bit video board, & cable!

20 Inch C/N 20 Color Package! $1,499

Includes 20" Ikegami C/N 20 monitor, Relax 8-Bit video board, & cable!

20" Pkg. - 256 Colors	1,499
20" Pkg. - 16 Million Colors	2,399

20 Inch Trinitron 256 Color! $1,999

Includes Trinitron, video board, & cable!

20" Trinitron - 256 Colors	1,999
20" Trinitron - 16 Million Colors	2,899

SIMMS

All SIMMS are guaranteed and are covered by our limited lifetime warranty!

1 Meg. 1M x 8 - 100* $32**

512K - Mac LC only**	59
1 Meg. - 1Mx8-100/Mac***	32
1 Meg. - 1Mx8-80/Mac***	36
2 Meg. - 2Mx8-80/Mac**	75
4 Meg. - 4Mx8-80/Mac**	119
8 Meg. - 8Mx8-80/Mac*	445

4 Meg. 4M x 8 - 80 $119**

16 Meg. - 16Mx8-80/Mac High Profile*	749
16 Meg. - 16Mx8-80/Mac Low Profile*	799
1 Meg. - 1Mx8-80/IIfx***	39
4 Meg. - 4Mx8-80/IIfx**	139
16 Meg. - 16Mx8-80/IIfx High Profile*	849
4 Meg. - 4Mx8-80/II & IIx w/PAL**	149
Quadra - 256K Video SIMM***	59
Classic - 3 Meg. Exp. Card w/1 Meg.*	49
Co-Processor - Classic II & LC*	79
Powerbook - 4 Meg. Expansion Card*	399
Powerbook - 6 Meg. Expansion Card*	499

Powerbook 6 Meg. Card* $499

* no minimum ** minimum = 2 *** minimum = 4

24-Bit Color Scanner

$999 Epson Engine

Available with Color Studio LE, and Scan-Do software. 16 million colors/256 grayscale - 300 x 600

An affordable, true quality, flatbed (A/4A4), 24-bit color scanner for business and professional applications. Priced for less than 8-bit color scanners. Provides precise single-pass, 16 million colors/256 grayscale at 300 dpi and output at 600 dpi. Auto recalibrate with every scan. Three separate tube xenon lamps for true colors.

24-Bit Color Scanner (110 VAC)	999
24-Bit Color Scanner (220 VAC)	1,099
Software Bundle	149

Color Studio LE, and Scan-Do Software.

CD-ROM Players

Pioneer 6-Disc CD-ROM Mini-Changer $949

Pioneer DRM-600A

Holds up to 6 Removable CD-ROM Discs - More than 3 Gigabytes of Data - On-Line!

Each compact, easy-loading magazine holds up to 6 different discs. **Additional Mini-Changers can be daisy-chained together to create a CD-ROM library of over 20 Gigabytes of on-line information!** Compatible with SUN, IBM and Macintosh. Can even be used as a CD-Audio jukebox! Full audio control via software is provided by the **Music Box** software (included). Includes SCSI cable, Mac software, and sample CD-ROM.

6-Disc CD-ROM Changer - Pioneer	949
6-Disc CD-ROM Magazine - Pioneer	13
Educorp Public Domain CD (Mac)	29
Software Bundle - 6 CD's (Mac & IBM)	269

Countries of the World, US History, Shakespeare, The complete Sherlock Holmes, Audubon's Birds of America, & Software Potpourri.

Toshiba CD-ROM Player

The Vista Toshiba CD-ROM Player is a High Quality CD player for Mac, IBM or SUN.

Featuring the **Toshiba XM3101B** Vista CD-ROM provides state-of-the-art performance including a sealed cartridge/non-tray environment and an automatic lens cleaning mechanism which dramatically improves reliability. **Performance is a fast 325 milliseconds average access.** Compatible with SUN, IBM and Mac. Can be used to play CD Audio discs! Full audio control via software is provided by the **Music Box** software (included). Includes SCSI cable, Mac software, and sample CD-ROM.

CD-ROM - Vista - Toshiba Player	579
CD-ROM Disc Caddy	8

Erasable Optical

$1,399 3-1/2" Optical 128 Meg.

IBM compatible, small and portable!

Each 3-1/2" erasable optical cartridge holds over 120 megabytes of data! The **Sierra MO** shown is an ideal primary or backup storage device for IBM or Macintosh personal computers. Featuring the RICOH 3010E drive, the **Sierra MO** is IBM and SONY compatible - and it is fast! Complete package - includes SCSI cable, Mac software, and external power supply. Specify 110 or 220 VAC.

Includes media, software & cables - additional media next page.

128 Meg. Ricoh ISO 3010E New!	1,399
128 Meg. Optical Cartridge New!	49

$1,899 600 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. 110/220 VAC.

600 Meg. Ricoh ISO 5030E-I (Lowest cost per megabyte - 62 ms. average access.)	1,899
600 Meg. Ricoh ISO 5031E New! (High performance - 35 ms. average access.)	2,799
1.0 Gig. Maxoptix Tahiti-II (High capacity - 1 Gigabyte - 35 ms. average access.)	3,499

$5,999 3.0 Gig. ISO Optical Jukebox

- 3.0 Gigabyte Capacity per 5 Cartridge Carrier
- Macintosh - IBM - SUN Compatible
- Low Cost - High Performance Data Library

The **Optical Jukebox** offers true data library features at a low price. It is fast, featuring the RICOH 3031E the average access is 35 milliseconds. The **Optical Jukebox's** quick cartridge handling provides needed information from up to 5 disc cartridges almost instantly. 110/220 VAC.

3.0 Gig. Jukebox - Ricoh ISO 5031E	5,999

Océ Color Printer

$4,999 "A" & "A+" Size Color Printers

$6,990 List, Save $1,991!

- 16 Million Colors - Pantone Certified
- True Adobe Postscript, 300 DPI, Mac & Windows
- PC Week rated as "Best Machine"
- Personal Publishing's "Product of the Year"

Fast and affordable. Uses flat sheet paper or clear film for transparencies. Two models to choose from: 4 MB RAM provides "A" (8.5" x 11.0") images; 8 MB RAM provides "A+" (8.5" x 14.0") images in 4-colors. Call for print sample and literature. 110 VAC only.

Océ G5241-PS "A" w/4 Meg. RAM	4,999
Océ G5241-PS "A+" w/8 Meg. RAM	5,999

Demo Special!

Océ Graphics "B" Color Printer	3,999

Miscellaneous

9600 Send/Receive FAX 2400 bps Modem $169*

Powerbook Carry Case $59

- Tough Reinforced Nylon
- Custom Manufactured for Macintosh
- Weather Resistant

Targus Powerbook (all models)	59
Targus Classic	69
Targus SE, SE/30 w/extended keyboard	79

Emergency Power Supply $79

CIRCLE 422 ON READER SERVICE CARD

For your ad to appear in The Macworld Shopper, please call 800.888.8622

CATALOG

Peripherals

ARCHIVE · Maxoptix · RICOH · FUJITSU · Quantum

SyQuest Drives

$429 Mobile 44 **$589** Mobile 88

Complete! Includes: cartridge; cables; and software!

Low Cost Additional Cartridges:	1 to 4	5+
Mobile 44 Cartridge	68	65
Mobile 88 Cartridge	109	99

Cartridges & Tapes

	1 to 4	5+
44 Meg. SyQuest Cartridge	68	65
88 Meg. SyQuest Cartridge	109	99
60 Meg. Teac Compatible Tape	19	14
160 Meg. Teac Compatible Tape	24	19
250 Meg. DC-6250 Tape	33	29
600 Meg. Teac Compatible Tape	39	35
1.3 Gig. DAT 4 mm	19	14
2.0 Gig. DAT 4 mm	29	25
2/5 Gig. ExaByte Compatible 8 mm	18	13
128 Meg. 3-1/2" Optical Plastic	49	47
600 Meg. 5-1/4" Optical Plastic Single	139	119
600 Meg. 5-1/4" Optical Plastic 5-Pk	595	495
600 Meg. 5-1/4" Optical Glass Single	189	159
1.0 Gig. Optical - Glass, Maxoptix	269	229
600 Meg. Optical - Plastic, Pioneer	189	169
600 Meg. WORM, Pioneer	119	99

Pocket Portable & Transportable Drives

120 Meg. Pocket Portable **$379**

Small, light-weight, and low power best describes this state-of-the-art drive system. Dimensions 3 x 4 x 8"

60 Meg. Pocket - Maxtor, 17 ms.	279
80 Meg. Pocket - Maxtor, 17 ms.	329
105 Meg. Pocket - Quantum, 25 ms.	379
120 Meg. Pocket - Maxtor, 17 ms.	379

105 Meg. Sierra **$389**

Light weight and rugged, the Sierra is the affordable and transportable hard disk!

50 Meg. Sierra - Quantum, 25 ms.	269
105 Meg. Sierra - Quantum, 25 ms.	389
120 Meg. Sierra - Maxtor, 17 ms.	389
240 Meg. Sierra - Quantum, 10 ms.	709

Hard Disk Drives - Internal & External

520 Meg. **$1,299**
Fujitsu 2624SA, 9 ms.
While quantities last!

Vista -
The ***Relax Vista*** is our most popular and most dependable enclosure. Simple, rugged (metal construction), and stylish. The ***Vista*** has a "zero footprint" for the Classic.

The power supply is *auto sensing* (90 - 230 VAC, 40 watts half height, 50 watts full height).

Every ***Vista*** comes complete with all cables, software and manuals. The ***Vista*** utilizes external termination and dual 50-pin Centronics connectors and a push-button SCSI address switch for ease of use.

Every unit is tested, formatted, loaded with software, and tested again to assure your complete satisfaction.

Seagate	Internal	Vista External
3-1/2" Half Height		
20 Meg. - ST325N, 28 ms.	139	199
240 Meg. - ST2383N, 12 ms.	599	659
330 Meg. - ST1401N, 12 ms.	1,099	1,159
425 Meg. - ST1481N, 14 ms.	1,309	1,369
510 Meg. - ST1581N, 14 ms.	1,509	1,569
1.0 Gig. - ST11200N, 12 ms.	2,609	2,669
5-1/4" full Height - WREN		
300 Meg. - ST4350N, 16.5 ms.	1,099	1,159
600 Meg. - ST4702N, 16.5 ms.	1,439	1,499
1.0 Gig. - ST41200N, 15 ms.	1,839	1,899
1.4 Gig. - ST41650N, 15 ms.	2,699	2,759
1.9 Gig. - ST42100N, 12.9 ms.	3,369	3,429
5-1/4" Full Height - WREN Runner		
330 Meg. - RUNNER, 10.7 ms.	1,299	1,359
660 Meg. - RUNNER, 11.9 ms.	1,639	1,699

Fujitsu		
3-1/2" Half Height		
90 Meg. - 2612SA, 12 ms.	299	359
330 Meg. - 2622SA, 9 ms.	1,139	1,199
520 Meg. - 2624SA, 9 ms.	1,239	1,299
5-1/4" Full Height		
350 Meg. - 2261SA, 16 ms.	1,199	1,259
650 Meg. - 2263SA, 16 ms.	1,239	1,299
960 Meg. - 2266SA, 11.5 ms	1,939	1,999

Quantum	Internal	Vista External
3-1/2" LPS		
50 Meg. - LPS 52, 9 ms.	229	289
105 Meg. - LPS 105, 9 ms.	349	409
120 Meg. - LPS 120, 10 ms.	399	459
240 Meg. - LPS 240, 10 ms.	659	719
3-1/2" LPS - "Low Power" Series		
50 Meg. - LPS 52LP, 25 ms.	219	279
105 Meg. - LPS 105LP, 25 ms.	339	399
3-1/2" - "Go•Drive" Series - for PowerBook only		
80 Meg. - Go•Drive 80, 16 ms.	499	n/a
3-1/2" Pro Series		
425 Meg. - Pro 425, 8 ms.	1,139	1,199

MicroScience		
5-1/4" Full Height		
300 Meg. - FH3414, 18 ms.	799	859
660 Meg. - FH3777, 18 ms.	1,239	1,299

Maxtor		
3-1/2" Low Profile/Low Power		
60 Meg. - 7060S, 17 ms.	239	299
80 Meg. - 7080S, 17 ms.	289	349
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.	1,839	1,899
1.5 Gig. - Panther, 13 ms.	2,439	2,499

Price -
Our size allows us to purchase at the lowest possible cost, and we manufacture in our own factory. Then we pass the saving on to our customers.

Service -
All products are 100% tested. You probably won't need our help - but if you do, our ESP service program will have you up and running in 48 hours - guaranteed!

Performance -
Serious business and professional users demand top performance drives like the WREN Runner from Seagate and Quantum high-performance 3-1/2" drives.

Selection -
We offer more than 500 different products for the IBM, Macintosh and SUN. From 120 Megabyte portable hard disk to 24-Bit Trinitron video packages we offer more of what you need. Call for 1992 catalog.

Quality -
We only offer quality products that you can depend on. And if for any reason you are not 100% satisfied we offer a 30-day money back guarantee!

OUR 14 ANNIVERSARY 19 78

We guarantee your complete satisfaction or your money back!

Archive DAT, ExaByte & Teac Tape Drives

Tape Drives include: media; software; and cables!

60 Meg. Tape Vista - TEAC	479
160 Meg. Tape Vista - TEAC	579
250 Meg. Tape Vista - Archive	599
600 Meg. Tape Vista - TEAC	779
2.0 Gig. Tape DAT Sierra - Archive	1,359
2.2 Gig. Tape Vista - ExaByte	1,999
5.0 Gig. Tape Vista - ExaByte	3,299

2.0 Gig.
Transportable backup solution for the Mac. Backup software and cassette included!
$1,359

© 1992 Relax Technology. RELAX, Sierra, Macintosh, Pocket Portable, Vista II and Vista are trademarks of Relax Technology, Inc. All Trademarks and Registered Trademarks are the property of their respective holders.

Call or FAX for Fast Service!
No surcharge for **VISA** or **MasterCard**, terms available for approved accounts. We ship same day via **Federal Express**.

FEDERAL EXPRESS · MasterCard · VISA

We will BEAT any competitor's price for comparable product - call for details!

510-471-6112

Relax Technology, Inc
3101 Whipple Road
Union City, CA 94587
FAX: 510-471-6267

RELAX TECHNOLOGY

"Providing exceptional value and an extra measure of service - since 1978!"

CIRCLE 422 ON READER SERVICE CARD

For your ad to appear in The Macworld Shopper, please call 800.888.8622

CATALOG

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 Imgewr. I/II....48.00

M422 4-color Adapter 40.00

Universal MacInker.....79.45
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 502 ON READER SERVICE CARD

600 x 600 dpi LIQUIDATION
PostScript
$2495

- 7 megs of Ram
- Cannon 8ppm Laser Printer Engine
- Advanced AMD 29000 RISC Processor
- Up to "10" times faster than the IINT
- ISI (simultaneous PC or MAC Printing)
- Appletalk, RS232, SCSI Inerface
- Dual Page Processing

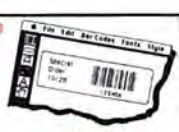
1-800-375-9000 1-817-754-2120

CIRCLE 499 ON READER SERVICE CARD

The *Macworld* Catalog makes it easy to buy the products you need TODAY!

Bar Code

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
- 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**

WORTHINGTON DATA SOLUTIONS 417 Ingalls Street, Santa Cruz, CA 95060
800-345-4220 OR 408-458-9938

Bar Code Generation Software

The best software application available in the market today allows you to create high precision, quality film masters. Unique quality control features include output adjustment and a film master verifier. Call BCS, the bar code experts, today to find out why our customers say our package is the most sophisticated; yet, the easiest to use.

800-343-0343
FAX 404-343-0343
INT'L 404-399-7837

BCS BAR CODE SYSTEMS INC.

CIRCLE 479 ON READER SERVICE CARD

Software
Astrology

McHOROSCOPE

Be your own astrologer, for fun or profit.

Produce amazing astrological reports for friends and family. **$199.50**

"McHoroscope" (Chart Interpreter) produces beautiful natal charts plus 15- to 17-page interpretations. Professional astrologers charge $50.00 and more for similar reports. Excellent study guide for students and great fun for parties and get-togethers.

•Astrology for the Macintosh from Time Cycles Research•

• Write or call for free brochure •

Time Cycles Research 27 Dimmock Rd Waterford, CT 06385
MC•Visa•Amex
(203) 444-6641

CIRCLE 447 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

★★★★1/2 "This is the best product of its kind, and it's reasonably priced too." MacUser, 6/90

Sales
1-800-BEAROCK
916-622-4640
FAX
916-622-4775

USPS CERTIFIED

Bear Rock TECHNOLOGIES
6069 Enterprise Drive • Diamond Springs, CA 95619

For your ad to appear in The Macworld Shopper, please call 800.888.8622

CATALOG

Business

OFFICE WIZ

Integrated Office Management

Ideal for lawyers, ad agencies, engineers & consultants— See us in New Products

• Clients & Projects • Status Reporting • Calendaring
• Time & Billing • Accounting • POs & Estimates

Single and Multi-User — Demo Available

Oryx Associates 1867 Union St. Suite B, San Francisco, CA 94123
tel: (415) 563-9971 — fax: (415) 563-0238

CIRCLE 439 ON READER SERVICE CARD

Successful Business Plan

Proven with Bankers, SBA, Investors and Senior Management

It's easier to edit than to write from scratch. Over 90 pages of headlines, started sentences and fill-in-the-blank paragraphs are already organized and typed for you — simply edit using *any* Mac+ (or larger) and your favorite wordprocessor. Financials, pre-formatted in Excel, contain the formulas for easy calculation. Hints and suggestions throughout guide you to completing your plan. • NOT a Hypercard Application • Comprehensive, 120+ Page Business Primer • Complete 5-year financial projections • Over 55,000 Sold! • 30 Day Money Back Guarantee!

JIAN

(800) 346-5426

127 Second Sreet Los Altos, CA 94022 415/941-9191

$129 +shipping/handling CA add 8.25% tax

CIRCLE 461 ON READER SERVICE CARD

Mail order can save you time— *and money!*

PLANMaker™

The key to building a profitable business. An hour after receiving our software, you'll be developing a BUSINESS PLAN that sells your business idea!

Launching or expanding a business can mean exciting profits. Bankers and investors now require a professional Business Plan. PLANMaker takes you step by step, page by page, from Executive Summary through Financial Forecasts. Easy entry boxes and an extended selection of narrative make customizing easy. Three complete and diverse business plans in memory; import part or all, then edit. All calculations and formatting are automatic with PLANMaker.

"... We just received final bank committee approval on our $110,000 loan. . . Your PLANMaker program was exactly what we were looking for." —A. Technology

Self supporting, requires no other software—$129 + s/h
MAC System 6.0.5 or later, 2 MBs RAM, w/Hard Drive

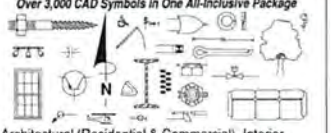
PLANMaker
1920 S Broadway St. Louis, MO 63104
VISA/MasterCard/AmEx
Order or Brochure: (800) 955 3337
FAX (314) 421 0668
Worldwide: (314) 421 0670

CIRCLE 446 ON READER SERVICE CARD

CAD/CAM

asd **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.
1010 Stagecoach Blvd., P.O. Box 3131
Evergreen, Colorado 80439
(303) 674-2222 to Order

Compatible with Claris CAD™, MacDraw II™, PowerDraw™ and Canvas™
(Specify Claris CAD, MacDraw II, PowerDraw or Canvas Version)

CIRCLE 408 ON READER SERVICE CARD

CD Rom

"WETLANDS" - CD/ROM

Wetlands Clip Art: 350 MB Nature CD-ROM showing the unbelievable beauty of Wetlands! 1,111 Animals (Amphibia, birds, insects...), plants and 55 animal sounds! PICT, 8-bit and 24-bit JPEG images. All this catalogued into one high speed environment, Mariah, the first true multimedia organizer! Search and Retrieval in 5 languages (Eng., Fr., Ger., It., Lat.). Photos: Felix Labhart. $299.

Fdtn. NeoCortex for Interactive Media
University of Basel
CH-4031-Basel, Switzerland
VISA Accepted.
0041-61-265-26-32 Fax

Clip Art

Full Page Backgrounds (EPSF) ARTBEATS

Improve your ads, flyers, posters, brochures...-anything you print!
Each volume-$99.95 CD-ROM-$499

800-444-9392 or 714-881-1200
ARTBEATS, Box 20083, San Bernardino, CA 92406

CIRCLE 430 ON READER SERVICE CARD

Screen Caffeine

500 MB OF COLOR IMAGES, ANIMATION, AND ALPHA CHANNELS!

CD ROM $199

NEOVIEW 800/880-8888
8760 Research Blvd. Austin, TX 78758

Only $199. (30 day return policy) $49.00 with software purchase: —Director 3.0 $649.00 — Photoshop 2.0 $549.00

Continued...

For your ad to appear in The Macworld Shopper, please call 800.888.8622

CATALOG

Clip Art

MAPS!

Professional Quality Maps for Graphic Design!

Publications • Presentations • Brochures • Slides • Teaching Aids

World • Continents • Major Countries • 25 Major US Cities
Detailed Coasts, Islands, Lakes, Rivers
Globes • US States with Counties

Available as object EPS or PICT files
Compatible with all popular DTP and Graphic Design software!

★★★★★ –MACWORLD

For FREE catalog with Sample Maps:

800-334-4291

MICROMAPS SOFTWARE
55 Main St. Box 757, Lambertville, NJ 08530
Voice: 609-397-1511 • FAX: 609-397-5724

CIRCLE 417 ON READER SERVICE CARD

FREE CLIP ART AND FONT CATALOG

24 Pages! ASP Member

SOFTSHOPPE, INC.
P.O. BOX 3678
ANN ARBOR, MI 48106
Tel: (313) 761-7638
FAX: (313) 761-7639

Toll-Free—24 Hrs.
1-800-851-8089

CIRCLE 458 ON READER SERVICE CARD

CK MC VISA **800/736-1567**

MediClip MEDICAL CLIP ART

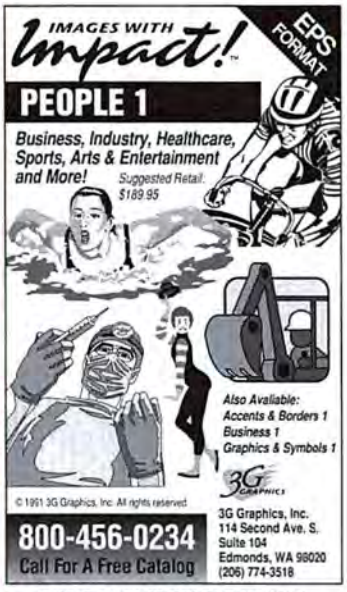
- 100 IMAGES
- BONES
- TISSUES
- ORGANS
- EPS
- $100.00
- MAC AND PC

CA RES. ADD 7% SALES TAX

ASK ABOUT OUR OTHER PRODUCTS

ALPHA Telecommunications
1245 16th St., Ste 100, Santa Monica, CA 90404-1201

CIRCLE 431 ON READER SERVICE CARD



CIRCLE 554 ON READER SERVICE CARD

Communications

TeleFinder™

★★★★ • **Group Edition BBS** The Bulletin Board System for business. "The most useful BBS that we have seen" *MacUser 7/90(UK)*. Multi-user, E-mail, file transfer, message threading, find file, and icon interface. System 7 savvy. Just $425.95 for unlimited users. *Call for free demo!*

• **NetConnect™** Hayes compatible "AppleTalk BBS" extension. $149.95.

• **TeleFinder Pro** icon interface terminal program with built-in mini host, scripting and ZMODEM. $79.95.

Spider Island Software
4790 Irvine Blvd #105-347 Irvine, CA 92720
tel (714)669-9260 fax (714)669-1383
bbs (714)730-5785

CIRCLE 435 ON READER SERVICE CARD

Wherever the market goes, Macworld is there first!

Computer Shopping

UP TO 75% UNDER RETAIL PRICES! UP TO 50% UNDER TV SHOPPING!

Purchase Top Quality - 14K SOLID GOLD JEWELRY at Rock Bottom Prices! - PRICES TIED DIRECTLY to the DAILY FLOATING PRICE of GOLD!!! Your Macintosh Can NOW access our COMPUTER SHOPPING CLUB™ ...And NO MODEM IS REQUIRED! Any Macintosh Computer will do. YES to SYSTEM 7.0! Get the Complete MacJewelry™ KIT NOW! This is TRULY a RECESSION BEATER! Why pay RETAIL MALL prices? Over 3,000+ 14K SOLID GOLD ITEMS to choose from! A Perfect Gift for HIM or HER. Satisfaction Guaranteed

MacJewelry™

- All 14K Solid Gold Jewelry and Precious Gems • 3,000+ Items
- Satisfaction Guaranteed

The MacJEWELRY KIT INCLUDES:
- Discount Shopping Data Base Software
- Gold Pricing Software • Ring Sizer Kit
- 131 Page Full Color Catalogue

The Computer Shopping Club™
18 Main Street, Concord Mass 01742
$39.95 + $3 Shipping & Handling

FAX 508-653-
800-234-

MC/VISA 800-234-JEWEL

Desktop Publishing

CAD to Mac

Universal CAD Graphics Importer for Macintosh Publishing

Having trouble getting editable CAD images into your Mac publishing software?

CAD to Mac™ moves images from virtually any workstation or PC based CAD system which supports HP plotters and converts them to editable PICT format.

Eliminate cutting, pasting or redrawing

- size, rotate, and print image before translation
- disk compatibility not required
- serial transfer software and cable included
- $495 plus $8.00 S&H

C E L E C T SOFTWARE
3630 Glendale-Milford Road
Cincinnati, Ohio 45241-3187

To order
Call 513-733-6300
(fax) 513-733-6365

CIRCLE 420 ON READER SERVICE CARD

Educational

Grade Machine™

Gives you FAST full-screen editing of grades, weighted assignments & categories. Style sheets help customize reports. Each class file holds 250 student 250 assignments, and 6 grading period Money-back guar-antee. NOT copy-protected. Only $79 + $5 S & H. Previo version reviewed 9/90 Macworld (p. 287). System 7 & AppleTalk compatibl Site licenses avail.able.

Misty City Software, Dept. MW6
10921 129th Place N. E.
Kirkland, WA 98033
(206) 828-3107 Phone/Fax

Educational

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
- Character styling w/tabs
- Full graphic placement
- Database selection
- Compatible gradebooks
- Student mastery
- Spelling checker

Highest rated software available in various editions to match your testing needs. Fully guaranteed! Pricing from $149. For complete brochure & free preview disk; call, write, or fax:

Logic eXtension Resources
9651-C Business Center Drive
Rancho Cucamonga, CA 91730
(714) 980-0046 Fax: (714) 987-8706

CIRCLE 407 ON READER SERVICE CARD

E D U C A T O R S O F T W A R E

CLASSMASTER

► Enter student profiles, grades & attendance ► Graph class & student performance ► Print reports ► Import/export data

EPS SCHOOL MANAGER

► Store staff & pupil info, schedules, due process ► 1989-1990 Classroom Comp. Learn. Software Award of Excellence

MAKETEST®

► Store questions ► Print tests, answer keys quickly ► Paste graphics, equations ►Handpick or randomly select questions

MOUNTAIN LAKE SOFTWARE, INC.
"Service at its peak"

1.800.669.6574
Phone: **415.752.6515**
Fax: **415.752.6506**
298 4th Avenue #401
San Francisco, CA 94118

CIRCLE 478 ON READER SERVICE CARD

For your ad to appear in The Macworld Shopper, please call 800.888.8622

CATALOG

Educational

Macの日本語はクォリタスにお任せ下さい。
Qualitas is your Japanese Resource!

New Products

SweetJAM 7.0
compatible with System 7.0 and comes with 2 Japanese TrueType fonts

Mode日本語
lets you install KanjiTalk 6.0.7 into English System 7.0

JapanEase Vol.2
Hiragana•Grammar

To our existing customers:
Our database was destroyed by fire in October 1991. Please send us your address and product serial numbers.

IBM PC related inquiries also welcome

For the Japanese operating system (KanjiTalk), contact the Apple KanjiTalk dealer nearest you:
•**New York** Custom Computer 516-582-6699 / Marubeni 212-599-37508 •**Ohio** Graham MicroAge Computer 513-772-7753 •**Michigan** MicroAge Computer 313-994-6344 •**Illinois** Automated Office 708-831-1192 •**Iowa** AC Computer Systems 712-279-8722 •**Washington** The Computer Store 206-522-0220 •**California** Computer Attic Super Center 415-599-5513 / Computer Selection 408-746-2288 / Sun Computers 213-522-6775 •**Hawaii** Connecting Point 808-523-0040

Please note: We've moved to a new location in downtown Berkeley.

Qualitas Trading Company
2029 Durant Avenue, Berkeley, CA 94704
phone: (510) 848-8080 fax: (510) 848-8009

CIRCLE 414 ON READER SERVICE CARD

Entertainment

For the Businessman on the "Go"!

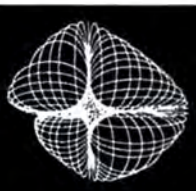
"Learning to play Go well is tantamount to a senior-level course in strategic thinking." United Feature Syndicate 12/12/90

"[Go Junior] Best introduction to Go yet developed." MacWorld 2/91

Toyogo, Inc.
P. O. Box 25460-C,
Honolulu, HI 96825-0460

(800) TOYOGO-9
(808) 396-4126 fax **$35** Go Junior **$69** Go Master **$139** Deluxe Toolkit + **$6.50** S&H

CIRCLE 440 ON READER SERVICE CARD



MacDude! $19.95
Create **Unique** and **Interesting** Computer Art
Extremely **Fast, Easy,** and **Fun** For **All Ages.**
Dude! Software
4710 UniversityWy N.E.#405
Seattle WA 98105 (206) 525-1851

CIRCLE 490 ON READER SERVICE CARD

Macworld Magazine.

When you get down to business, you can't do without it.

calico Tapestry

Banish boring, small desktop patterns forever!!

Tapestry is a control panel that lets you customize the desktop on any color capable Macintosh. Features include:

- Hundreds of patterns
- Large patterns (up to 256x256 pixels)
- Pattern optimization to reduce storage needs
- Can paste any picture to create new patterns
- Can import 'PICT' and various pattern files

Tapestry ..... $24.95+$3.00 S&H
Check, MO, Visa & MasterCard

Calico Publishing
12751 Woodford Way • Bridgeton, MO 63044
(800) 638-1104 US & Canada
(314) 298-0587 (FAX)

CIRCLE 413 ON READER SERVICE CARD

Fonts

HARD TO FIND DESIGNER FONTS.

CALL FOR A FREE BROCHURE SHOWING OVER 1000 TYPESTYLES.
ALL TYPE 1 AND TRUE TYPE FONTS.
1200 BEAUTIFUL KERNING PAIRS.
MAC OR PC.

IF WE DON'T HAVE IT, WE'LL MAKE IT.

OPTIFONT
CASTCRAFT SOFTWARE, INC., 3649 W. CHASE AVE., SKOKIE, IL 60076
CALL: 708-675-6530

CIRCLE 418 ON READER SERVICE CARD

PRECISION TYPE
17 MALL DRIVE
COMMACK, NY 11725
516 • 861 • 0167
1 • 800 • 248 • 3668
AUTHORIZED DISTRIBUTOR FOR:

ADOBE	LANSTON
AGFA	LETRASET
ALTSYS	LINOTYPE
BEAR ROCK	LOGOS ON LINE
BITSTREAM	MONOTYPE
BRODERBUND	PAGE STUDIO
CASADY&GREENE	THE FONT CO.
HEADLINERS	TREACYFACES
IMAGE CLUB	UTF
	PLUS CD-ROMS

fonts VISA

CIRCLE 485 ON READER SERVICE CARD

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™
Most powerful and easy genealogy program on Mac. Rated "BEST" by Macworld. Designed by genealogy profs. •Enhanced •Fully Relational •Graphic Pedigree, Family Group, Individual, Marriage, Surname •Unlimited History •Sorted Lists • Export to WP/data base/ modem. Also, new Jewish version. $149 + 5 s/h. Demo $7. Visa/MC. Free Lit Pak. Call for special Family Heritage Bundle.
Star•Com Microsystems
Windsor Park East
25 West 1480 North
Orem, UT 84057
801/225-1480

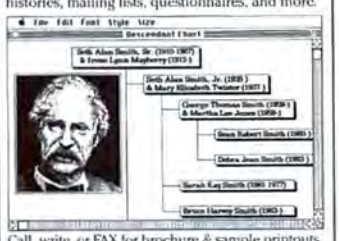
Genealogy

New! version 3.0

REUNION
the family tree software

½ *MacUser* Oct '90

Reunion quickly records and links family tree information. Version 3.0 identifies relationships, supports hi-res color and grayscale images, creates large graphic charts, family group records, family histories, mailing lists, questionnaires, and more.



Call, write, or FAX for brochure & sample printouts.

Leister Productions
P.O. Box 289, Mechanicsburg, PA 17055
phone 717-697-1378 — *fax* 717-697-4373

Graphics

FREE CLIP ART & FONTS

TRY US! Get 274 of our best selling clip art images, or 56 of our best fonts - FREE! 6/3.5' disks per pack. Credit Cards only!

PAY $5.00 SHIPPING / PACKAGE

SMC SOFTWARE PUBLISHERS
619 931-8111 EXT 511

CIRCLE 486 ON READER SERVICE CARD

For your ad to appear in The Macworld Shopper, please call 800.888.8622

CATALOG

Graphics Translators

CADMOVER®

TRANSLATES

your artwork/3D models/designs into a wide variety of file formats without redrawing or sacrificing high resolution by scanning.

Call the KANDU sales office at 703.532.0213 for a complete list of CADMOVER Graphic Exchange Formats.

KANDU Software Corporation

CIRCLE 549 ON READER SERVICE CARD

Import/Export

INTERNATIONAL DISTRIBUTION
High-End Solutions

We specialize in European/Korean/Japanese Products

Fax for prices of Sharp, Danagraf, Quark, Linotype-Hell & others

Manufactures/Developers please send us your product info

PACIFIC DEMAND, INC.
533 Howard Street
San Francisco, CA 94105
Voice: 001-415-512-7790
Fax: 001-415-512-9345

CIRCLE 540 ON READER SERVICE CARD

Medical

macClaimCheK™ Health Insurance Tracke

- ✓ Claim status by person, plan, or item
- ✓ Multiple coverage/multiple persons
- ✓ Reports/audit trail for claimed/unclaimed & paid/unpaid items
- ✓ Multiple plan carry-over
- ✓ Add-on modules for claim form printing
- ✓ Macintosh or DOS Windows

$44.99

TE CORPORATION
POB 140
Campton, NH 0322
(603) 726-7177
fax: (603) 726-8818

Developers of software f

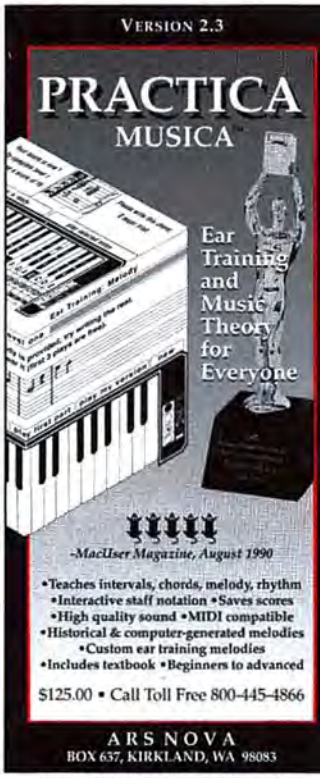
CIRCLE 453 ON READER SERVICE CARD

Medical Office Mgmt.
TessSystem™ software for insurance and billing. Our $1295 package out-performs software selling at three times that price. Expandable line to grow with your needs. Call for product literature and DEMO software today! New modules include electronic claims and multi-user for Mac networks.
Wabash Medical Resources, Inc.
8335 Allison Pointe Trail, Suite 310
Indianapolis, IN 46250
317/579-5900

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
5805 Westheimer
Houston, TX 77057
713/977-2655
800/477-0717
713/784-3759 Fax

CareTracker™
•Patient Care Support System•
$529 comprehensive package featuring a robust clinical database, powerful search and report, progress notes, Artificial Intelligence for "due" status and drug interactions, flow sheets, problem lists, decision analysis, remote modem access, medical literature database and much more. Highly intuitive. Computerize your PRACTICE, not just your office.
Med4th Systems, Ltd.
716 East Carlisle Avenue
Milwaukee, WI 53217
414/963-1985 Voice/Fax

Music/MIDI



CIRCLE 489 ON READER SERVICE CARD

HyperCard Stacks

MacFlash Cards

The Language Quest Software Company

Effective
Expandable
Affordable

Vocabulary tools for all Macintosh computers:

French German
Russian Spanish
Latin Czech

Over 2000 foreign words and 1000 more foreign synonyms.
Only $25 each. Compare our prices and save! ORDER TODAY!
Cyrillic and Czech fonts available!

Call or write for more information:
The Language Quest Software Co.
101 First Street Suite 428
Los Altos, CA 94022
800-622-3574 or 415-949-2876

CIRCLE 451 ON READER SERVICE CARD

Languages

MACTRAN PLUS Ver. 4.0
Integrated Made-for-Mac Development System. Includes: 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 extensions. High & Low level tool box interface. Unlimited code segment size.
DCM Data Products,
610 One Tandy Center
Fort Worth, TX 76102
817/870-2202
817/336-2416 Fax

FORTRAN on Your Desktop
No need to wait for time on the "big" computer any longer. Language Systems FORTRAN lets you run the same high performance FORTRAN programs at your desk. Full integration with System 7, VAX-compatible extensions, built-in user interface, automatic backgrounding, and direct code generation for the Mac II family make this compiler the most powerful FORTRAN for the Mac.
Language Systems Corp.
441 Carlisle Drive
Herndon, VA 22070-4802
703/478-0181
703/689-9593 Fax
800/2LANGSY

Call *The Macworld Catalog* and see why.

800.888.8622

I saw it in The Macworld Shopper.

For your ad to appear in The Macworld Shopper, please call 800.888.8622

CATALOG

Music Midi

Compose yourself $99-
Interactive Learning Software
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
MacBEAT

CIRCLE 438 ON READER SERVICE CARD

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.
FREE CATALOG
800-MAC-BEAT
505-473-4929
MacBEAT

CIRCLE 433 ON READER SERVICE CARD

MidiSchool™
Interactive MIDI Tutor
800-824-4788
•Full function Sequencer •Built-in Glossary •Student Notebook records your progress •Lesson Planner and Quiz Pages for the classroom
$119
EduACTIVE (603) 668-4788

CIRCLE 409 ON READER SERVICE CARD

Public Domain

FREE! 6/3.5" DISKS FULL OF VIRUS-FREE SOFTWARE
Games • Religion • Utilities • Education • Hypercard • Fonts • Graphics and more!
Credit Cards only!
SATISFACTION GUARANTEED
PAY $5.00 SHIPPING / PACKAGE
SMC SOFTWARE PUBLISHERS
619 931-8111 EXT 511

CIRCLE 487 ON READER SERVICE CARD

FREE
MAC & IBM SOFTWARE
CATALOG
24 Pages! ASP Member
SOFTSHOPPE, INC.
P.O. BOX 3678
ANN ARBOR, MI 48106
Tel: (313) 761-7638
FAX: (313) 761-7639
Toll-Free—24 Hrs.
1-800-851-8089

CIRCLE 458 ON READER SERVICE CARD

Computers & Music
Sound Design
Composition
Educational
Sampling
Notation
Multimedia
Sequencing
Digital Audio
Lowest Prices
Free Catalog
Est.1982
Confused about MIDI and music software?
We aren't.
800-767-6161
647 Mission St.
San Francisco, CA

CIRCLE 553 ON READER SERVICE CARD

Religion

ROLL CALL
Church Management Software
ROLL CALL, featuring the power of 4th DIMENSION®, is a premier shepherding tool providing church leadership with a full range of management capabilities.
• Attendance • Visitation Mgt. • Directories
• Personal Records • Pledges • And More!
ORDERLINE: 1-800-554-9116
$495.00 Comprehensive Package / Demo $5.00
By The Numbers • 58117 Homer Avenue
Elkhart, IN 46517-3207 • 219-293-4893
NUMBERS

CIRCLE 412 ON READER SERVICE CARD

Church Data Master Plus
now for
Macintosh or Windows 3.0
CDM+ is the only comprehensive church management program for either Mac or Windows. Available as single modules or integrated. Membership, Contributions and Accounting. Priced from $265. Full featured demo available $10.
Computer Helper Publishing
5898 Cleveland Avenue
Columbus, OH 43231
800/533-5227
614/895-7071

Property Management

lac Landlord
siest-to-use property management
ftware for only $399. Designed by
operty managers for all kinds of rental
operties. Includes recurring income and
penses, check writing, account
lancing, transaction ledgers, mainte-
nce records, printing tenant notices, full
enu of management reports. Password
otection. Free telephone support. Demo
ailable for $25, credited to purchase.
'bana Management Company
O. Box 2037
earborn, MI 48123
13/562-6247**

Property Management
Comprehensive software for managing residential, commercial properties and condo associations. Includes check writing, recurring expenses, financial statements, complete management reporting and a full general ledger for $1,195.
Yardi Systems, Inc.
813 Reddick St.
Santa Barbara, CA 93103
805/966-3666

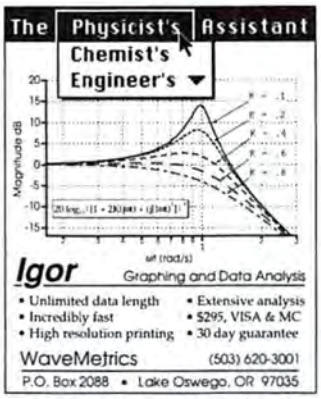
For your ad to appear in The Macworld Shopper, please call 800.888.8622

CATALOG

Sales/Marketing

Sell More, Work Less!!!
MARKET MASTER AUTOMATES the sales follow up you don't have time for and keeps the contacts happening! More than a mere contact manager, it's a SALES LEAD HANDLER! You get unmatched simplicity and maximum control. Versions available for one rep or a whole sales force! Six years on the market – everything works. 30-Day money-back guarantee. Demo Disk $10.00.
Breakthrough Productions
210 Park Avenue
Nevada City, CA 95959
916/265-0911
916/265-8036 Fax

Scientific



CIRCLE 432 ON READER SERVICE CARD

Computer Repair

!!REPAIR BY MAIL
Real low cost, super fast turn-around. Mac Plus, Mac logic boards $95+ parts; 1 yr. warranty. Plus and SE power sweep swap as low as $69+ s/h; 1 yr. warranty. Drive repairs as low as $35. Keyboard repairs as low as $12.50+ s/h. New and used hardware for sale. School orders welcome. Open 12 noon-5, 6:30-10pm eastern M-Sat. We buy dead Apples, Macs, PCs.
Arminius Pubs. & Prods. Inc.
P.O. Box 1265/8519 Orchard Ave.
Merchantville, NJ 08109
609/662-3420

Data Recovery

WE CAN SAVE IT!

DRIVESAVERS™
415•883•4232

- Macintosh Data Recovery
- Repair any Mac Hard Drive
- Optical/SyQuest Recovery
- Fast Nationwide Service

30-D Pamaron Way
Novato, CA 94949

CIRCLE 510 ON READER SERVICE CARD

Scientific

RockWare
Scientific Software
4251 Kipling St., Ste. 595 • Wheat Ridge, CO 80033
(303) 423-5645 • FAX (303) 423-6171
RockFAX *(303) 423-7112
*New 24hr voice/fax product info line.

FREE SOFTWARE CATALOG!
Over 160 scientific applications for the Mac & PC!

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*

*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

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

THE COMPUTERINSURANCE AGENCY, INC.
6150 Old Millersport Road, NE
Pleasantville, OH 43148

1-800-722-0385

CIRCLE 523 ON READER SERVICE CARD

Data Conversion

DATA CONVERSION
If you want the most complete conversion services in the industry, just call...

(800) CONVERT

Capabilities include over 3000 formats.

PIVAR COMPUTING SERVICES, inc.®
165 Arlington Heights Rd. #MW
Buffalo Grove, IL 60089
(708) 459-6010

Stock UP with

The Macworld Catalog

For your ad to appear in The Macworld Shopper, please call 800.888.8622

CATALOG

Data Recovery

Computer Peripheral Repair & Recovery Services

"Data Crash ! ... We're Going In !!"

7570 S. U.S. Hwy. 1, Ste.8 Hypoluxo, FL 33462 800-765-9292 407-586-0011 Ph 407-582-7921 Fax

CIRCLE 452 ON READER SERVICE CARD

Desktop Publishing

SlideImagers®

Any Output, Any Format, Any Software, 24-hours-a-day: Only $4.95

Overnight $4.95 Any Output

- Slides
- Overheads
- Canon Fiery Color Lasers

Adobe PostScript™ Imaging

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

CIRCLE 456 ON READER SERVICE CARD

SLIDE OUTPUT Mac/PC FROM $3

Solitaire® film recorder, slide dupes, overheads, large format. 24 hour BBS. Over 100 programs supported.

Elegant Graphics
750 Princeton, P.O. Box 774607
Steamboat Springs, CO 80477
(303) 879-4334, BBS 879-5210

CIRCLE 527 ON READER SERVICE CARD

Laser Recharge

Quality Remanufactured Cartridges for laser printers

- Remanufactured, not refilled or reconditioned
- Quality products at a low price
- Money back guarantee
- 25% more copies

Call today for more information!
(805) 296-3517 & (800) 497-4QLC

Quality Laser Cartridges
26893 Bouquet Canyon Road-C158
Santa Clarita, CA 91350

CIRCLE 448 ON READER SERVICE CARD

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

Accessories

Cases

A 50-YEAR TRADITION
ZERO HALLIBURTON

The Best Case Scenario

Airline Check-in or Local Use
Zero Halliburton Aluminum Mac Cases:
Lightweight, Durable, Distinctive Styling
PowerBook & Portable Attaches Classic/Plus/SE
IIcx/ci IIsi LC IIx/fx Monitor & Printer Cases

from $299.95 1-800-542-4591
1-310-578-9710

TCC 13101 Wash. Blvd., #110. LA. CA 90066

CIRCLE 403 ON READER SERVICE CARD

MacSac

Mac PowerBook Carrying Cases

MacSac PowerBook, Classic, SE, LC, Stylewriter, and others.

For a dealer nearest you call:
401-274-0595 or 1-800-343-3388

ComputerAid

A Division of Karen Ann MFG. Fall River, MA

CIRCLE 423 ON READER SERVICE CARD

Pack your LC or SI in seconds!

Holds LC or SI with 12" monitor, keyboard, mouse and cables.

WEST RIDGE DESIGNS
For a dealer near you call toll free

1-800-548-0053

1236 N.W. Flanders, Portland, OR 97209

CIRCLE 444 ON READER SERVICE CARD

Powerbook Protection!

MacLuggage™ is also available for the Macintosh LC, IIsi, Classic and others. Sold through Fine Dealers Worldwide.
1-800-241-2122
I/O Design, Inc.
Box 156, Exton, PA 19341

CIRCLE 459 ON READER SERVICE CARD

Continued...

For your ad to appear in The Macworld Shopper, please call 800.888.8622

CATALOG

Cases

Ultimate Protection!

PROTECTIVE REUSABLE CASES
for Apple, IBM, and any other computer system and/or peripheral

VISA · STARCASE INC. · AMERICAN EXPRESS · MasterCard · OPTIMA

(800)822-STAR
(800)782-CASE

CIRCLE 558 ON READER SERVICE CARD

Covers

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) 759-1466 Fax: (415) 564-0506
Contemporary ComputerWear 1320-36th San Francisco94122

CIRCLE 507 ON READER SERVICE CARD

DUST COVERS
ALL FABRIC

- Heat Ventilating, will not become stiff or crack with age! • Easy to Use. • Machine Wash & Dry!
- Highest Quality, Custom-Fit!
- All makes & models! • Custom orders! • Available in Gray, Tan, Navy, Royal, Red or Brown
- 100% Satisfaction Guaranteed!
- Outstanding service since 1983!

11-30 Mac Classic & Kybd	24.95	10-84 Mac SE or II Ext Kybd	9.95
10-74 Mac SE & Std Kybd	24.95	11-34 AppleColor 13"HR Mntr	19.95
10-75 Mac SE & Ext Kybd	24.95	11-23 Radius Pivot Monitor	24.95
11-35 Mac IIsi Computer Only	15.95	10-95 Radius TPD - 19"	24.95
11-36 Mac IIsi,13"HR Clr &Kb	29.95	11-22 Super Mac 19" Clr Mntr	29.95
11-37 Mac IIsi, 12" Mtr & Kb	29.95	11-04 Apple Scanner	15.95
10-73 Mac II, Clr Mtr & Ext.Kb	29.95	10-37 Imagewriter II	15.95
11-02 Mac II,fx,tx,tfx CPU	19.95	10-90 LaserWriter II	24.95
11-01 Mac IIci Computer Only	15.95	11-29 Personal LaserWriter	24.95
10-98 Mac IIci, Clr Mtr & E.Kb	29.95	11-52 StyleWriter	15.95
11-33 Mac IILC,13" RGB &Kb	29.95	11-40 T.I. microLaser PS	19.95
11-32 Mac IILC, 12" Mntr &Kb	29.95	SKIN Keyboard Skins	21.95*

Add $4.00 Shipping & Handling (Check, MO, COD, VISA/MC) *M/W Spot

CO-DU-CO Computer Dust Covers
4802 W. Wisconsin Ave., Milwaukee, WI 53208
800-735-1584 414-476-1581 • 476-9329FAX

CIRCLE 455 ON READER SERVICE CARD

Diskettes

FORMATTED DISKETTES
BASF, VERBATIM, SONY

WITH FORMAT	QTY 250 MIX & MATCH	WITHOUT FORMAT
$.44	5.25" DS/DD	$.39
$.66	5.25" DS/HD	$.56
$.63	3.50" DS/DD	$.53
$1.09	3.50" DS/HD	$.99

- **FREE FORMATTING** on First Orde
- **TYVEC SLEEVES** & Labels Include
- **COLORED MEDIA** Please Add $ 05
- **PRIVATE LABELING** Available
- **SAME DAY** Shipping
- **MONEY BACK GUARANTEE**

800-255-3142
Diversified Systems Group, Inc.
PO Box 1114, Issaquah WA 9802

CIRCLE 496 ON READER SERVICE CARD

Converters

TAKING MAC OVERSEAS?
We've Got
220V/115V Converters
All Wattages

Your Converter & Cable Connection Source!

Cables • Books • Computer Batteries
No. California's Largest "In-Stock" Computer Supplies & Parts Inventory
(800) 321-4524 (CA)
(800) 548-7135 (US/Can)
ELECTRONICS PLUS inc.

CIRCLE 437 ON READER SERVICE CARD

FIND YOUR ROOTS
in
The Macworld Catalog

Furniture

NEW!

"The Best Mac Desk Ever"

AS LOW AS $199

- Ergonomic
- Space Saving
- Strong
- Many Configurations

FREE CATALOG! 800-688-2446

agio BEAVERTON, OREGON 503-690-1400 FAX: 503-690-1444

CIRCLE 402 ON READER SERVICE CARD

Supplies

mountray™
• sit back while you work
• increase room on desktop
• prevent "mouse elbow"
mountray™ enhances ergonomics and is simple to install.

ONLY $19.95 + s/h!

1-800-285-4591 VISA, M/C
• specify thickness of desktop when ordering

Workspace Solutions, 1703 Garfield, S.L.C., UT 84108

CIRCLE 449 ON READER SERVICE CARD

The Macworld Shopper Your Best Buy

For your ad to appear in The Macworld Shopper, please call 800.888.8622

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 launchs or relaunchs. 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

A SEQUEL WITHOUT EQUAL
Volume Two Now Available

Digital Color Prepress—Volume Two is the second book in Agfa's educational series on color prepress. Containing all new information, *Volume Two* is identical in approach to its highly successful companion book, *An Introduction to Digital Color Prepress* (now over 200,000 copies in print in six languages.)

Filled with comparative halftone images, illustrations, and charts, the new book is 32 pages of the latest information on scanners, color correction, calibration, file formats, screen angles, proofing systems, and more.

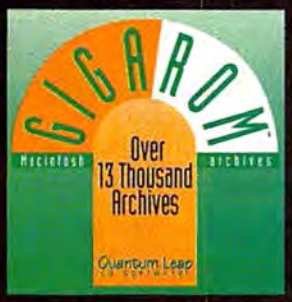
And it's available now for $10.00, plus $2.50 shipping and handling (and applicable sales tax).

To order, call 1-800-395-7007

Or send payment to:
Agfa Prepress
Education Resources
P.O. Box 7917
Mt. Prospect, IL 60056-7917
Please allow 10-14 days for delive.,.

AGFA

High Yield CD



A bit more than a byte.

The Giga-ROM™ is the world's largest archival library of Macintosh software. Over 13,000 pre-compressed files—more than 1,700 megabytes of great shareware and public domain programs—make Giga-ROM™ the undisputed leader in software distribution. All the latest new System 7 programs, from utilities and applications to games, graphics and sounds are included...

Quantum Leap
CD SOFTWARE

We deliver great value.

1-800-762-2877
(305) 885-9985 • Fax (305) 885-9986

Circle 136 on reader service card

Where In The World Is Macworld Expo?

The Macintosh market continues to explode. And MACWORLD Expo is growing right along with it.

The installed base of Macintosh computers has skyrocketed 800% to 4.4 million units since 1985. And that number is expected to almost triple by 1994.*

At the same time, MACWORLD Expo has gone from a single show in 1985 to 17 international expos today.

Everywhere.

The fact is, no matter where in the world you find computer users, you'll find MACWORLD Expo—from Auckland to Amsterdam, Sydney to San Francisco, Toronto to Tokyo, Boston to Birmingham.

MACWORLD Expo brings together the people and the companies who are going places. Some come to share tips and techniques. Others to exchange ideas and innovations. Everyone to see, touch, try, and buy the latest in Macintosh products and services.

For information about exhibiting at the most successful trade show series in the world, complete the coupon and mail it to: MACWORLD Expo, c/o World Expo Corp., P.O. Box 9107, Framingham, MA 01701.

Can't wait? Fax it to us at 508-875-1573.

* SOURCE: International Data Corporation, August 1990.

We'll send you a world of information.

☐ I'd like to know more about *exhibiting* at the MACWORLD Expos checked below.

☐ I'd like to know more about *attending* the MACWORLD Expos checked below.

☐ Amsterdam	☐ Helsinki	☐ San Francisco
☐ Auckland	☐ Hong Kong	☐ Stockholm
☐ Barcelona	☐ Mexico	☐ Sydney
☐ Berlin	☐ Milan	☐ Tokyo
☐ Birmingham	☐ Oslo	☐ Toronto
☐ Boston	☐ Paris	☐ European Summit, Geneva

All MACWORLD Expos are independent trade shows produced by World Expo Corporation, an International Data Group company, the world's leader in information services on information technology. Macintosh and Mac are trademarks of Apple Computer, Inc.

MACWORLD EXPOSITION

NAME _____

TITLE _____

ORGANIZATION _____

STREET _____

CITY/TOWN _____ STATE/PROVINCE _____

ZIP POSTAL CODE/ _____ COUNTRY _____

TELEPHONE _____ FAX _____

MW/JUN92

One Stop.

One Call. 1-800-843-9497

Education

Aquatic Art - Discover marine life from Hawaii & Caribbean. #1625, $149

LifeSaver CD - Learn first aid with this real-life multimedia CD-ROM. #1570. $99

Eddy Award Winner!

Dictionary of the Living World CD - Multimedia encyclopedia #1566, $199

People at Leisure CD 200 color photos. #1736, $149.95

Desktop Publishing

Int'l Graphics Library CD - 200 color global images. #1581, $299

People in Business CD - 200 color photos. #1735, $149.95

Entertainment & Consumer

Spaceship Warlock CD- Epic sci-fi adventure. #1583, $89.95

Exotica ROM 2.0 - 150 color images. #1327, $199

Video & Tools for Multimedia

WraptureReels One CD - Video footage #1659, $179.95

CD-ROM Drive Bundles

Choose from several great bundles and save!

These NEC bundles include hardware, driver software, cables, amplified stereo speakers, and educational CD-ROM titles.

Your choice of NEC drive, 8 educational CDs, and stereo speakers as low as $499!

NEC CD Gallery - Get the Illustrated Encyclopedia, Time Table of History, World Atlas, Beethoven's 9th, Cosmic Osmo, Desert Storm, EDUCORP CD Sampler, & Cinderella (Discis) with: **NEC CDR-36 #C1977, $499 or with NEC CDR-73 #D1978, $769**

12 CDs, speakers, and an NEC drive $575

NEC CD Gallery Plus- Includes all of the CD-ROMs above PLUS Shakespeare, Sherlock Holmes, Birds of America, and Mammals with: **NEC CDR-36 #D1977, $575 or with NEC CDR-73 #E1978, $849**

DTP Bundle - Save $400

Get Ocean Imagery, People at Leisure, International Graphics Library, and The Desktop Publishing CD 2.0 for only $199 when you purchase any CD-ROM drive or drive bundle in this ad. #1003

7 CDs with *any* drive purchase for $199.

Choose from any of the CD-ROM drives below and get the Illustrated Encyclopedia,Time Table of History, World Atlas, Shakespeare, Sherlock Holmes, Birds of America, and Mammals for just $199! **Save over $720! #1599, $199**

CD-ROM Drives and Titles

Create! Learn! Play! Watch! Hear!

Over 200 titles in stock. Whether you're a picture person, a word person, a sound person, or maybe you just want to have a little fun, you're sure to find something of interest.

We'll meet or beat any advertised price on CD-ROM products!

2 FREE CDs

Buy 2 other CDs with your drive & *ANY* CD-ROM bundle in this ad on your 1st order and get ClassROOM & World FactBook free. Quantities limited. **Use code #D2.**

CD-ROM Drives

EDUCORP CD Sampler FREE w/every drive. Driver software and your choice of cable also included. Specify #982 SCSI to SCSI or #981 Mac to SCSI cable.

1981 CD Tech. Porta-Drive $599
325ms/64K buffer, 2-yr warranty, uses the Toshiba XM 3301 mechanism. *Multimedia HANDisc* and *America the Beautiful* are included FREE.

1937 Toshiba XM3301 699
325ms/64K buffer, 1-yr warranty.

1931 Chinon CDA-431 579
350ms/32K buffer, 1-yr warranty, free EDUCORP CD-ROM 2.0

1978 NEC CDR-73 679
300ms/64K buffer, 2-yr warranty.

B1977 NEC CDR-36 479
500ms/64K buffer, 2-yr warranty. *Type Gallery CD* included FREE.

CD-ROM Titles

Education

1775	Amandastories	$49.95
1610	ClassRoom*	49.95
1590	Desert Storm	33.00
1691	FindIT Webster	69.95
1605	Jap. for Everyone	279.00
1261	Learn/Speak Spanish	79.95
1204	Learn/Speak French	79.95
1772	Silly Noisy House	49.95

Desktop Publishing

1389	DTP CD 2.0	99.95
1587	Donatelli: Lingerie	129.95
1680	GraphTec Graphic Designs	49.95
1585	Ocean Imagery	99.00
1594	Photos On Disk	179.95
1730	Pre-SEPS v.1	199.95
1697	Sky v.1	99.95
1595	SwimSuit CD	199.00
1653	Wraptures One	95.00

Entertainment & Consumer

1771	Baseball's Greatest Hits	69.95
1339	Cosmic Osmo	59.95
1300	EDUCORP Shareware 6.0	199.00
1818	EDUCORP CD Sampler	9.95
1356	Exotic Japan	79.95
1611	GameRoom*: over 750 games	49.95
1770	Great Literature	69.95
1598	Macworld Superstacks	15.00
1607	Mister X	29.95
1768	Monarch Notes	79.95
1737	Sherlock Holmes - Detective	59.95
1381	Virtual Valerie	79.95
1876	Wild Places	25.00

Video &Tools for Multimedia

1889	ClipMedia v.1	349.00
1753	Creepy Crawlies	99.00
1778	DiVA VideoShop	449.00
1858	Multimedia Handisc	89.95
1885	Showplace w/MacRenderMan	449.95
1729	PROclaim! v.1	299.95
1762	SpaceTime and Art	179.95

Sound & Music

1347	Beethoven's 9th	79.95
1589	Brahms: German Requiem	55.00
1365	Desktop Sounds	99.95
1354	Magic Flute	55.00
1777	Mozart: The Dissonant Quartet	49.95
1776	Schubert: The Trout Quintet	49.95
1582	SoundFX/CD	199.00
1758	Sound Library 2000	99.95
1576	Stravinsky Rite Of Spring	79.95
1609	The Sound Machine*	49.95

* Indicates software is contained on #1300.

Shareware as low as $4.99/Disk

800K disks packed with our finest Shareware.

800K disks as low as $4.99 each

Individual disks start at $6.99 each, buy 5 for $5.99 each, or buy 10 or more for only $4.99 each.

4414 MacConcept
A full working 3D graphics program.

2129 ResEdit/CICN Editor
Edit and manipulate all resources, from icons and dialog boxes to menus.

2128 Essential INITs Contains Mac-Password Demo for security and virus protection, INIT CDEV, SCSI Probe 3.1.

4601 SoundMaster 1.7.2 Control all Mac sounds: startup, restart, shutdown, and more! Works with system 7.0.

4043 Startup Screens 29 terrific black and white startup screens.

2122 Virus Stompers 7 virus utilities.

4271 Board Games Backgammon, 3D checkers. and 11 others.

7204 Clip Art Stack Over 490 high quality bitmapped clip art.

4270 Thinking Games 11 games to stimulate your mind.

4034 Clip Art Extravaganza
100 high quality bitmapped clip art.

3431 Preschool Education 8 programs including a great dot-to-dot construction set, fun math tutors and more!

4612 Speech Synthesis
MacinTalk and much more.

5-Disk Sets $24.95 ea.

5-Disk Sets $24.95 each

- **1706 System 7 Tools & Utilities** Includes ResEdit 2.1.1, 14 Utilities, 18 TrueType fonts, and 90 color icons.
- **New! 1703 True Type Fonts** 40 True Type Fonts for use with System 7.
- **1708 Color Games** Puzzles, cards, and arcade games in full color!
- **1155 Best of Education**
- **1709 Best of ATM Laser Fonts** 40 Adobe Type Manager compatible laser fonts. ATM not required.
- **1151 Best of Games** 31 fun arcade games, board games, card games, more.

1-800-843-9497

EDUCORP®

Call for your FREE catalog.
EDUCORP Computer Services
7434 Trade Street ■ San Diego, CA 92121
Info: 619-536-9999 ■ FAX 619-536-2345

W5

The Orchestra CD - "The young person's guide..." #1751, $65.00

Grooves CD 100 royalty-free music clips. #1565, $99

Sound & Music

ClipTime CD 200+ QuickTime movies #1677, $169.95

Digital Video Library CD 180 QuickTime movies #1701, $149.95

Video & Tools for Multimedia

Circle 157 on reader service card

Best-Sellers

JUNE 1992

Business Software

Months on chart	Last month	This month		
76	2	1	**Microsoft Excel**	*Microsoft Corporation*
85	1	2	**Microsoft Word**	*Microsoft Corporation*
7	4	3	**Microsoft Office**	*Microsoft Corporation*
23	12	4	**Quicken**	*Intuit*
72	5	5	**Aldus PageMaker**	*Aldus Corporation*
63	6	6	**Microsoft Works**	*Microsoft Corporation*
6	14	7	**Aldus Persuasion**	*Aldus Corporation*
6	11	8	**MacDraw Pro**	*Claris Corporation*
26	3	9	**Adobe Illustrator**	*Adobe Systems*
61	13	10	**MacDraw II**	*Claris Corporation*
1	—	11	**WordPerfect Office**	*WordPerfect Corporation*
37	8	12	**WordPerfect for the Macintosh**	*WordPerfect Corporation*
37	7	13	**FileMaker Pro**	*Claris Corporation*
18	9	14	**Aldus FreeHand**	*Aldus Corporation*
61	10	15	**MacWrite II**	*Claris Corporation*

Education Software

38	2	1	**Where in the World Is Carmen Sandiego?**	*Broderbund Software*
19	1	2	**Where in Time Is Carmen Sandiego?**	*Broderbund Software*
24	4	3	**Where in the USA Is Carmen Sandiego?**	*Broderbund Software*
52	3	4	**Reader Rabbit**	*The Learning Company*
63	5	5	**Math Blaster**	*Davidson & Associates*

Entertainment Software

25	2	1	**Tetris**	*Spectrum HoloByte*
50	1	2	**Microsoft Flight Simulator**	*Microsoft Corporation*
29	3	3	**SimCity**	*Maxis*
15	4	4	**SimEarth**	*Maxis*
28	—	5	**Falcon**	*Spectrum HoloByte*

Network/Data Communications

31	1	1	**PhoneNet**	*Farallon Computing*
54	5	2	**AppleShare**	*Apple Computer*
17	3	3	**MacLink Plus**	*DataViz*
10	—	4	**SmartCom II**	*Hayes Microcomputer Products*
64	2	5	**TOPS**	*Sitka Corporation*

Add-In Boards

14	1	1	**Macintosh IIsi NuBus Adapter Card**	*Apple Computer*
15	5	2	**Pivot**	*Radius*
18	3	3	**Macintosh Display Card 8•24**	*Apple Computer*
4	—	4	**Macintosh IIfx Logic Board Upgrade**	*Apple Computer*
5	2	5	**MacCon+ 30i Ethernet Card**	*Asanté Technologies*

Utility Software

13	1	1	**After Dark**	*Berkeley Systems*
3	—	2	**More After Dark**	*Berkeley Systems*
24	2	3	**SAM**	*Symantec Corporation*
14	5	4	**Virex**	*Microcom*
17	—	5	**Adobe Type Manager**	*Adobe Systems*

The AmCoEx Index of Used Mac Prices

Machine/RAM/ Hard Drive	Average Sale Price	Monthly Change
Mac Plus/1MB/none	$450	0
Mac Plus/2MB/20MB	$700	–25
Mac SE/2MB/20MB	$825	–25
Mac Portable/1MB/40MB	$1300	0
Mac Classic/2MB/40MB	$800	–25
Mac SE/30/2MB/40MB	$1800	+50
Mac LC/2MB/40MB	$1100	0
Mac II/4MB/40MB	$1725	–25
Mac IIsi/3MB/40MB	$1900	+75
Mac IIcx/4MB/80MB	$2300	+200
Mac IIci/4MB/80MB	$2900	+50
Mac IIfx/4MB/80MB	$4200	0
Apple 12-inch B&W display/board	$250	–25
Apple 13-inch RGB display/board	$625	0
LaserWriter Plus	$1100	–50
LaserWriter IINT	$1800	0

Index provided by the American Computer Exchange of Atlanta, Georgia. It reflects sales during the week of March 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 February 1992.

"Tim Says, If There's A Better Value In Peripherals Than Mirror's New 16-inch Color Display, Show Me...

Mirror 16-inch Color Display
$899 for built-in video,
with 8-bit $1299, 16-bit $1499,
24-bit $1699.

Tim Garcia, President
Gateway Area Macintosh Users Group
St. Louis, Missouri

To Screen The Full ror Products."

-Members,
Gateway Area Macintosh Users Group
St. Louis, Missouri

COLOR DISPLAYS

14-inch Color Display	$399*
• 16-inch Color Display	$899*
w/ 8-bit video card	$1,299
w/ 16-bit video card	$1,499
w/ 24-bit video card	$1,699
16-inch Trinitron® Display	$1,199*
w/ 8-bit video card	$1,599
w/ 16-bit video card	$1,799
w/ 24-bit video card	$1,999
• 20-inch ProView V	
w/ 8-bit video card	$1,799
w/ 24-bit video card	$2,299
20-inch ProView (Trinitron)	
w/ 8-bit video card	$2,499
w/ 24-bit video card ★★★★½	$2,999

LASER PRINTERS

NEW *The MirrorImage Laser Printers feature Postscript Level 2, RISC processors, dual paper trays, 35 built-in Adobe fonts, three interface ports, a SCSI port for adding a font drive, and an installation videotape.*

- *The MirrorImage 309 is a 300 dpi, 9 page-per-minute printer for letter or legal size paper. Includes 2 MB of RAM (upgradable to 10 MB).* $1,999
- *The MirrorImage 415 is the smallest tabloid size laser printer available. It offers true 400 dpi printing and a heavy duty 15 page-per-minute print engine. Includes 4 MB of RAM (upgradable to 16 MB).* $4,499

COLOR SCANNER

Mirror's top-rated 600 Color Scanner offers true 600 dpi scanning resolution, 24-bit color and a great price. Comes complete with Adobe Photoshop 2.0. MW ★★★★ $1,299

- *Transparency Adapter for scanning slides and transparencies up to 5"x 7"* $899
- *Automatic Document Feeder for scanning multiple pages automatically.* $549

MONOCHROME DISPLAYS

From our value priced 15-inch portrait displays to our stunning 21-inch two-page display, every Mirror monochrome display offers superb sharpness, ergonomic design and excellent performance. Matching Mirror video cards are available for most Macintosh models.

15-inch Analog Portrait Display	$449*
w/ monochrome video card	$599
15-inch Standard Portrait Display	
w/ monochrome video card	$499
19-inch Two-page Display	
w/ monochrome video card	$799
21-inch Two-page Display	$799*
w/ monochrome video card	$999

STORAGE

All Mirror drives feature rugged steel enclosures, high-grade power supplies, external push-button SCSI address switch, switched convenience outlets, and external termination.

	Int.	Ext.
45 MB	$269	$329
50 MB (Q)	$289	$349
• 60 MB	$279	$339
105 MB (Q) ★★★★	$419	$479
• 120 MB (Q)	$489	$549
210 MB (Q) ★★★★	$739	$799
330 MB	$1,139	$1,199
425 MB (Q)	$1,339	$1,399
595 MB	N/A	$1,599
1 GB	N/A	$2,199
• 60 MB Portable		$299
• 105 MB (Q) Portable		$449
• 128 MB Optical Drive		$1,449
• 128 MB Cartridge		$59
44 MB SyQuest Drive ★★★★		$479
88 MB SyQuest Drive		$649
DAT Drive		$1,499
CD-ROM Drive ★★★★½		$599
• Mirror CD Information Library (with drive purchase)		$189

MW EDITORS' CHOICE Mirror 210 MB *MacWorld Feb. 1992*

MW EDITORS' CHOICE Mirror 1 GB *MacWorld May 1992*

MIRROR

1-800-654-5294

ORDER DIRECT

MEDIA:1012

• *New Product*

Circle 125 on reader service card

Technical Support Hotline: (612) 633-2105 Telephone: (612) 633-4450 Fax: (612) 633-3136 Address: 2644 Patton Road, Roseville, MN 55113

All prices subject to change. Prices are quoted F.O.B. origin. *For built-in video ports. †You pay shipping costs. ® Trinitron is a registered trademark of Sony Corporation.

...So We Told Him
Line Of Mirr

Impressing the members of a Mac user group is never easy, and if that group happens to be from Missouri, the task is all the more difficult. So we were particularly pleased to have the members of Missouri's largest user group tell us they were impressed by Mirror Macintosh peripherals.

It's easy to see why Tim Garcia thinks the new Mirror 16-inch Color Display is so exciting. Never before could you get the productivity and convenience of a 16-inch display and Mirror quality at such an attractive price. At only $899*, the Mirror 16-inch Color Display is perfect for publishing, illustration and scanning. Plug it right into the video port on a Quadra or add one of our high performance video boards (available in 8-, 16-, or 24-bit models) and you've got a hard working system that won't break your budget.

Call for our free catalog.

Another addition to the Mirror product line that's bound to build a strong following is the Mirror 128 MB Optical Drive. It gives you 128 MB of fast, reliable storage on a rugged removable cartridge that fits in your pocket. Priced at only $1,449, the 128 MB Optical drive is perfect for storing large graphics, database files or backups. Additional cartridges are just $59.

Our exciting new laser printers, the MirrorImage™ 309 and the MirrorImage™ 415 give you more features, more functionality and higher performance than printers costing hundreds or thousands more. With state-of-the-art RISC processors, Adobe's PostScript 2, dual paper trays, SCSI port, three interface ports, and a very low cost-per-page for consumables, the MirrorImage Laser Printers can handle even complex jobs with ease.

Like all Mirror Products, the MirrorImage Printers include lifetime technical support and our 30-day, "love it or return it" guarantee†.

Just a few of the GAMUG Members: Gerald McManama, M.D., John Clark, Julie Dueber

The Ultimate Trackball.

It All Starts With A Large Comfortable Ball.

Turbo Mouse

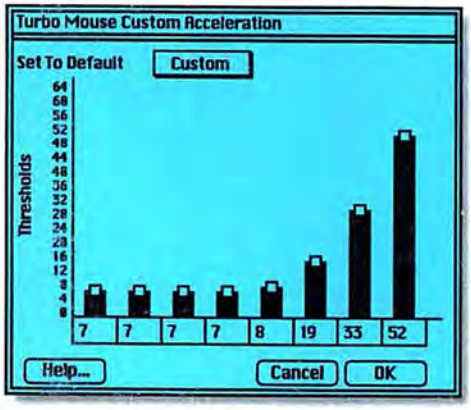
How do you design the ultimate trackball?

With Turbo Mouse®, we start with a large, comfortable ball.

A large-diameter ball means more surface area to work with. Greater cursor control. Less fatigue at end of day.

It is the difference between driving a luxury sedan versus a compact.

For ultrasmooth movement, the ball rests on the highest quality bearings. For durability, everything is housed in heavy duty ABS Plastic.



Special software for customized performance.

Next, the special touches. Like custom software that adjusts both acceleration and double-click speed. Like a time-saving chording feature that performs one of seven useful commands. Like well positioned buttons with a light, responsive click.

Did we succeed in designing the ultimate trackball?

The readers of *Macworld* say we did. They voted us Best Input Device four years in a row. The readers of *Publish!* say we did. They voted us Number One three years in a row. The editors of *MacUser* say we did. They gave us the coveted Five Mice rating.

And the story doesn't end here. Recently, we introduced an exciting new input device — the Kensington NoteBook KeyPad. This external keypad adds full keyboard performance (including 15 function keys) to Macintosh® PowerBook™ and other ADB compatible computers.

Turbo Mouse and NoteBook KeyPad are both System 7 compatible. For more information about our complete line of accessories, ask your dealer or call 800-535-4242. Outside the U.S. 415-572-2700.

NoteBook KeyPa Something new for Macintosh PowerBook.

KENSINGTON

Turbo Mouse and Kensington are registered trademarks of Kensington Microware Limited. Apple, Macintosh and PowerBook are registered trademarks of Apple Computer, Inc. All other registered and unregistered trademarks are the sole property of their respective owners. © 1992 Kensington Microware Limited. 3/92